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PROJECT APPRAISAL DOCUMENT

ON A
PROPOSED LOAN
IN THE AMOUNT OF US\$5.0 MILLION

AND

PROPOSED GRANT FROM THE
GLOBAL ENVIRONMENT FACILITY TRUST FUND
IN THE AMOUNT OF US\$5.0 MILLION

TO THE
REPUBLIC OF EL SALVADOR
FOR THE

ENVIRONMENTAL SERVICES PROJECT

April 22, 2005

**Environmentally and Socially Sustainable Development
Latin America and Caribbean Region
Central America Country Management Unit**

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CURRENCY EQUIVALENTS

Exchange Rate Effective December 30, 2004

Currency Unit = US\$ = US\$1

FISCAL YEAR January 1 - December 31

ABBREVIATIONS AND ACRONYMS

AIP	Annual Implementation Plan
ANDA	National Water Utility (Administración Nacional de Acueductos y Alcantarillados)
BoD	Board of Directors
CAS	Country Assistance Strategy
CBD	Convention on Biological Diversity
CEL	Hydroelectric Executive Commission (Comisión Ejecutiva Hidroeléctrica del Río Lempa)
FAO	Food and Agriculture Organization of the United Nations
FMRs	Financial Monitoring Reports
FONAFIFO	National Forestry Financing Fund of Costa Rica (Fondo Nacional de Finacamiento Forestal)
FONAES	Environmental Fund of El Salvador (Fondo Ambiental de El Salvador)
FONASA	National Environmental Services Fund (Fondo Nacional de Servicios Ambientales)
FUSADES	Salvadoran Foundation for Economic Development (Fundación Salvadoreña para el Desarrollo Económico)
GEF	Global Environmental Facility
GDNP	Department of Natural Resources (Dirección General de Patrimonio Natural)
GOES	Government of El Salvador
HEP	Hydroelectric Power
IUCN	International Union for Conservation of Nature and Natural Resources
M&E	Monitoring and Evaluation
MAG	Ministry of Agriculture and Livestock
MARN	Ministry of Environment and Natural Resources
MBC	Mesoamerican Biological Corridor
MBC/ES	Mesoamerican Biological Corridor in El Salvador MBC/ES
Mesa Permanente	Environmental Services Permanent Committee NGO
NGO	Nongovernmental Organization
OP	Operational Program
PA	Protected Areas
PES	Payment for Environmental Services
PIP	Project Implementation Plan
PMIS	Project Management Information System
RUTA	Regional Unit for Technical Assistance
SANP	Natural Protected Areas System (Sistema de Areas Naturales Protegidas)
SNET	National Land Studies Service (Servicio Nacional de Estudios Territoriales)
SOE	Statement of Expenditures
UFI	Financial Institutional Unit of Ministry of Environment and Natural Resources (Unidad Financiera Institucional)
UNDP-ES	United Nations Development Programme in El Salvador

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**EL SALVADOR
ENVIRONMENTAL SERVICES PROJECT**

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MAPS
Mesoamerican Biological Corridor–El Salvador
Potential Project Pilot Sites

IBRD Map 33768
IBRD Map 33770

EL SALVADOR

Environmental Services Project

PROJECT APPRAISAL DOCUMENT

Latina America and the Caribbean Office

Date: April 22, 2005 Country Director: Jane Armitage Sector Director: John Redwood Project ID: P064910 Lending instrument: Specific Investment Loan		Team Leader: Mark Austin Sectors: FG, AZ, AB, BC Themes: 80, 82, 83 Environmental screening category: B Safeguard screening category:			
Sector Director: John Redwood Global Supplemental ID: P070352 Lending instrument: GEF Focal Area: B-Biodiversity Supplement Fully Blended?: YES		Team Leader: Mark Austin Sectors: FG, AZ, AB, BC Themes: 80, 82, 83			
Project Financing Data:					
[X] Loan [] Credit [X] Grant [] Guarantee [] Other:					
For Loans/Credits/Others: Total Bank financing: US\$5 m; US\$5 m GEF Proposed terms: Fixed-Spread Loan (FSL)					
Financing Plan (US\$m.)					
	Source	Local	Foreign	Total	
	Borrower	2.1	0.2	2.3	
	IBRD	4.5	0.4	5.0	
	GEF	4.5	0.4	5.0	
	Others	2.2	--	2.2	
	Total	13.3	1.2	14.5	
Footnote: All co-financing from other sources including IBRD are fully blended with GEF co-financed activities.					
Borrower: Governmental of El Salvador Responsible agency: Ministry of Environment and Natural Resources					
IBRD Estimated disbursements (Bank FY/US\$m)					
FY	YR 1	YR 2	YR 3	YR 4	YR 5
Annual	0.9	0.9	1.1	0.9	1.2
Cumulative	0.9	1.8	2.9	3.8	5.0
GEF Estimated disbursements (Bank FY/US\$m)					
FY	YR 1	YR 2	YR 3	YR 4	YR 5
Annual	0.8	0.9	1.1	0.9	1.2
Cumulative	0.8	1.8	2.9	3.8	5.0
Project implementation period: Five years Expected effectiveness date: December 2006 Expected closing date: July 15, 2012					

Does the project depart from the CAS in content or other significant respects? <i>Ref. PAD A.3</i>	<input type="radio"/> Yes <input checked="" type="radio"/> No
Does the project require any exceptions from Bank policies? <i>Ref. PAD D.7</i> Have these been approved by Bank management? Is approval for any policy exception sought from the Board?	<input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Yes <input checked="" type="radio"/> No
Does the project include any critical risks rated “substantial” or “high”?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Does the project meet the Regional criteria for readiness for implementation? <i>Ref. PAD D.7</i>	<input checked="" type="radio"/> Yes <input type="radio"/> No
Project development objective <i>Ref. PAD B.2, Technical Annex 3</i>	
The project development objectives are to (i) establish legal, institutional, and financial arrangements to pilot mechanisms of payment for environmental services, (ii) document links between land use changes and water services improvements and biodiversity conservation, (iii) define good practices to replicate, scale up, and sustain PES programs; and (iv) strengthen the capacity of MAG, MARN, community associations, and NGOs to support long-term development of environmental service markets in El Salvador.	
Global Environment objective <i>Ref. PAD B.2, Technical Annex 3</i>	
The global environment objective of the project is to enhance and protect biodiversity by preserving important forest and protected ecosystems. This would be done by piloting a market-based system to contract environmental services.	
Project description <i>Ref. PAD B.3.a, Technical Annex 4</i>	
Component 1 will establish the institutional and financial arrangements to pilot a program of payment for environmental services (PES) that will lead to the protection of globally important biodiversity through the conservation and sustainable use of high priority critical ecosystems.	
Component 2 will strengthen the capacity of national institutions (MAG, MARN), community associations, NGOs, and academic institutions to support long-term development of environmental service markets in El Salvador.	
Component 3 will facilitate the execution and implementation of the project including monitoring and evaluating the project.	
Which safeguard policies are triggered, if any? <i>Ref. PAD D.6, Technical Annex 10</i>	
<u>Environmental Assessment (OP/BP/GP 4.01)</u>	YES
Natural Habitats (<u>OP/BP 4.04</u>)	NO
Pest Management (<u>OP 4.09</u>)	NO
Cultural Property (<u>OPN 11.03</u> , being revised as OP 4.11)	NO
Involuntary Resettlement (<u>OP/BP 4.12</u>)	NO
Indigenous Peoples (<u>OD 4.20</u> , being revised as OP 4.10)	NO
Forests (<u>OP/BP 4.36</u>)	NO
Safety of Dams (<u>OP/BP 4.37</u>)	NO
Projects in Disputed Areas (<u>OP/BP/GP 7.60</u>)	NO
Projects on International Waterways (<u>OP/BP/GP 7.50</u>)	NO

Significant, non-standard conditions, if any, for:

Ref. PAD C.7

Board presentation:

Loan/credit effectiveness:

- (a) Accounting and financial management system implemented and staffed within MARN's Institutional Financial Unit that is acceptable to the World Bank, including procedures for operations and maintenance during project implementation (see Section C2 and Annex 7).
- (b) PCU fully staffed with qualified personnel, including project coordinator, procurement specialist, accountant, and executive secretary, on a no objection basis from the Bank.
- (c) Operations Manual satisfactory to the Bank.
- (d) Content of the PIP satisfactory to the Bank.
- (e) M&E system developed and ready for project implementation.
- (f) Signed Memorandum of Understanding between MARN and MAG defining responsibilities of each institution in the project, submitted and acceptable to the Bank.

Conditions for Disbursement:

- (a) FONASA has been legally established including FONASA Board constituted and FONASA staff hired, FONASA Operations Manual acceptable to the Bank has been adopted, and MARN/FONASA Memorandum of Understanding (MOU) has been signed as a condition for disbursement on environmental service contracts in Component 1.

Covenants applicable to project implementation:

- (a) Counterpart resources from the government of El Salvador will be available at the times specified and amounts agreed within the Legal Agreements, PIP and AIPs.
- (b) Annual implementation plans for all components of the project will be submitted to the World Bank for no objection prior to the beginning of each budget year.
- (c) Agreed plans of accounts and auditing will be implemented by the project. Terms of reference for auditing and a short list of firms will be provided to the Bank prior to signing.
- (d) Quarterly and annual reports will be prepared by the PCU according to agreed formats in the Operations Manual and submitted to the World Bank within 30 days of the end of each quarter, and by January 31 of each year.
- (e) The Bank and the government of El Salvador will conduct a midterm review of project implementation progress and attainment of the project's impact and outcome objectives, not later than the end of the third project year.
- (f) Procurement for all project components will be carried out in accordance with agreed categories in the IBRD and GEF project legal agreements and Operations Manual, and will follow the Guidelines for Procurement under IBRD Loans and IDA Credits (May 2004). All contracting of consultants and consulting services will be in accordance with the Guidelines for Selection and Employment of Consultants by World Bank Borrowers (May 2004).

A. STRATEGIC CONTEXT AND RATIONALE

1. Country and Sector Issues

1. Since emerging from a 12-year civil war in 1991, El Salvador has made remarkable progress in consolidating peace and democracy and implementing economic reforms. The country is now 24th out of 155 countries in the Index of Economic Freedom. Inflation, interest rates, and business uncertainty have fallen. Poverty has declined by more than 27 percentage points and extreme poverty has been halved.
2. However, growth has slowed in recent years, largely due to external shocks. El Salvador's terms of trade deteriorated between 1996 and 2000. The U.S. recession severely affected the country's large maquila (garment industry) sector, and the steep fall in world coffee prices adversely impacted the rural economy. More recently, the economy has been negatively affected by rising oil prices. As a result, growth since 2000 has averaged only 2.0 percent, barely enough to keep per capita incomes constant.
3. El Salvador suffers severe environmental deterioration both in urban and rural areas. Urban areas are affected by air and water pollution. In the Metropolitan Area of San Salvador, 50 percent of solid wastes are not collected. In rural areas there has been extensive deforestation, resulting in the lowest level of remaining forest cover of any country in Central America and the second lowest in the hemisphere. Poor land use practices in El Salvador's agricultural areas increase the problem of land degradation.
4. The proposed project targets poor land use practices in rural areas that degrade locally and nationally important services such as water quality and supply as well as globally important services such as biodiversity conservation and carbon sequestration. It does so by piloting market-based mechanisms that reduce divergences between the incentives of individual land users and those of national and global society.

Key Issues

5. Current land use practices have significant negative repercussions for El Salvador's agriculture sector, natural resource base, and environment, including (i) loss of biodiversity, critical ecosystems, and natural habitats, (ii) severe land and forest degradation, and (iii) poor water resource management.
6. **Loss of biodiversity and critical ecosystems.** El Salvador is endowed with rich natural ecosystems and some unique ecological factors. Despite widespread environmental degradation, the country still has globally significant biodiversity and is an important part of the Mesoamerican Biological Corridor (MBC). Its remaining patches of forest have a high degree of endemism and provide critical functions for biodiversity and for hydrological systems important to both human welfare and natural habitats, including coastal mangroves. Species native to El Salvador include 1,477 vertebrates (including 532 birds), about 7,000 plants (including more than 1,000 trees), 140 reptiles and amphibians, and 800 butterflies. Of the 23 bird species endemic to northern Central America, 17 are still found in El Salvador.
7. Nevertheless, the country's remaining biodiversity is in severe jeopardy. Half of bird species and 27 percent of vertebrates are threatened or at risk of extinction. The IUCN–World Conservation Union's Red List of threatened species in El Salvador includes 11 critically endangered, 15 endangered, and 30 vulnerable species, some of which are endemic. Some species of orchids, trees, birds, mammals, and butterflies have not been reported during the last ten years, according to the Ministry of Environment and Natural Resources (MARN). Genetic and phenotypic diversity within some species has declined, and habitat fragmentation has disrupted corridors for seasonal movements and biodiversity dispersal.
8. Thus, while substantial biodiversity of global importance remains, a concerted effort is needed to ensure the long-term viability of many species and protect ecological functions such as habitat connectivity and carbon sequestration. Because land scarcity severely limits expansion of protected areas, ways must be found to preserve biodiversity within agricultural landscapes. However, private land users typically have little or no incentive to adopt practices that help conserve biodiversity.

9. **Land and forest degradation.** Much of El Salvador is mountainous and vulnerable to erosion, especially when deforested. Only 12 percent of the country has any forest cover and only 2 percent has primary forest. Population pressures, inequality in access to land, and civil war have pushed farmers to bring much of the country's hillsides into cultivation. Traditional agricultural practices leave hillside soils bare at the start of the rainy season. Even though such hillside farms are often among the smallest and poorest in the agricultural sector, they account for about 60–70 percent of total agricultural production.

10. Some impacts of these practices are felt by agricultural land users themselves in the form of declining yields or higher production costs. Land degradation affects about 50 percent of agricultural lands on moderate slopes and 80 percent on steep slopes, with 25 percent of farm households suffering significant soil losses each year. While land users often face constraints in addressing land degradation, over half the fields on moderate and steep slopes have some form of conservation.

11. **Poor water resource management.** Current land uses often have substantial adverse effects on downstream water services. Poor agricultural practices on hillside farms, deforestation, and soil compaction have reduced the infiltration capacity of soils thereby increasing erosion and landslides, exacerbating both flooding and droughts, and reducing recharge of aquifers. Impacts include:

- Increased vulnerability to flooding and landslides. Though spared the brunt of Hurricane Mitch in 1998, the country still had serious flooding in 12 of its 14 departments. At least 374 people died and 55,000 were displaced. Three major bridges were swept away. Severe flooding has become an annual problem even in normal years, especially in the Lempa, Grande de San Miguel, Paz, and Jiboa rivers.
- Dry season water scarcity. Despite average annual precipitation of about 2,000 mm, many parts of the country often face water shortages during the dry season (December through April) that might be exacerbated by reduced infiltration during the rainy season.
- Declining water quality. More than 90 percent of El Salvador's rivers are polluted by runoff, mainly pesticides and fertilizers, untreated wastewater discharges, solid wastes, and sediment. Low dry season water flows exacerbate these impacts. While many municipal water systems now rely on groundwater, depletion and contamination of these sources is also becoming a problem.
- Sedimentation. Sedimentation adversely affects irrigation, municipal water supply, hydroelectric facilities, river and marine ecosystems, and fisheries. For example, the hydroelectric system on the Rio Lempa receives an estimated 10 million to 25 million tons of sediment a year, which threatens to reduce its operational life and increase the cost of producing electricity.
- Stresses on downstream ecosystems. These changes in water flow, quality, and sedimentation also degrade downstream rivers, wetlands, and mangroves that provide ecological services crucial to both biodiversity and human production systems such as fisheries.

12. Because upstream land users reap most of the benefits and bear little of the costs of practices that degrade water services, they have little economic incentive to change such practices. Having downstream water users provide payments for environmental services (PES) could provide such incentives.

Government Strategy

13. Rural development and poverty alleviation through improved natural resources management are priorities for the Government of El Salvador, which is consolidating the regulatory and legal framework for environmental management and developing a national environmental policy and strategy that focuses on:

- Combating land degradation through changes in land use, particularly on hillsides.
- Improving water resources management.
- Improving biodiversity conservation by consolidating and improving management of the national system of protected areas.
- Promoting public participation and wider government involvement in designing and implementing a decentralized, participatory environmental management strategy and building local capacity.

14. A core element of this strategy is to develop environmental service markets to encourage landowners to make the desired land use changes. This initiative would be complemented by enhanced efforts to conserve biodiversity in and around priority protected areas.

15. **Biodiversity conservation.** El Salvador has joined major international treaties and conventions, developed biodiversity and conservation strategies, established the Natural Protected Areas System (SANP), passed a new national environmental law (in 1998), issued policies, regulations, and management plans, participated in the MBC, and worked with national and international NGOs to conserve biodiversity and habitats. The recently approved Land Administration and Protected Areas Consolidation Project is a key part of this strategy, but with such small and fragmented habitats and protected areas, it is also critical to put in place a strong program to conserve biodiversity in private lands and agricultural landscapes.

16. **Combating land degradation.** The government recognizes the link between poor agricultural practices and environmental degradation, but has had difficulty changing them. Many projects to combat land degradation have been implemented with high initial rates of participation, only to be abandoned once project support ends. The government is interested in approaches like PES that could induce longer-term land use changes that both provide environmental services and increase food security and incomes.

17. **Improving water resources management.** The government seeks to improve water services and promote water conservation by creating a more efficient institutional framework and eliminating perverse incentives such as large subsidies. The policy and institutional framework is improving through administrative decentralization, concessions to private companies and municipalities, and allowing the National Water Utility (ANDA) to set rates that cover capital, operational, and maintenance costs, including the cost of protecting water sources. This opens the possibility of developing a PES system through local water markets financed in part by tariffs collected by ANDA.

18. **Decentralization and participation in environmental management.** The project concept was formulated under the Flores administration (1999-2004), whose “Alliance for the Future” program envisioned decentralized and participatory environmental management. The environment became an even higher priority under President Saca. His eleven-point *País Seguro* plan names two issues directly supported by the proposed project—Agricultural Development: Expanding the Chain of Value; and Environment: Legacy for Future Generations—and includes short-term implementation of a PES system as one of its goals.

19. The creation of MARN in 1997, passage of the 1998 environment law, and various other recent reforms, partnerships, regulations, and initiatives have strengthened environmental institutions and support a more decentralized and participatory approach compatible with PES. The Environment Minister now presides over a Committee for Territorial Development, which is responsible for developing a Land-Use Master Plan that could facilitate PES and which includes ministers of key sectors such as Agriculture, Public Works, and Finance. Furthermore, a 2004 decree gives MARN the task of (i) internalizing the economic value of environmental services into public and private decisionmaking, (ii) establishing market-based environmental protection instruments, and (iii) defining a regulatory framework for environment services.

20. **Payments for environmental services (PES).** The PES approach (described in more detail in Annex 1) creates mechanisms that substitute for missing markets. It is based on the principle that those who provide valuable environmental services should be compensated and those who benefit from such services should pay for them. PES programs promise to be more efficient than traditional command-and-control approaches because market-based instruments naturally seek the highest benefits at the lowest cost. Moreover, they give service users a strong incentive to be proactive in ensuring that their money is spent effectively.

21. PES programs are also more likely to be sustainable because they depend on the self-interest of the affected parties rather than philanthropy or the whims of donors. By providing payments on an ongoing basis, PES programs avoid the pattern of short-term adoption followed by rapid abandonment that has characterized past approaches. They can also help reduce poverty because the areas that provide

environmental services (and receive payments) correlate highly with areas of rural poverty. There has been experimentation with PES programs in Central America, including a successful program in Costa Rica that is supported by the Bank and GEF, and three small-scale initiatives in El Salvador.

22. The proposed project for El Salvador would focus on reducing land degradation, conserving forested areas, reverting marginal agricultural areas to forest, and encouraging more sustainable land use in agriculture. It would create PES mechanisms to provide incentives to hillside farmers and other land users in at least two pilot areas (Table 1) and could be expanded to three more sites.¹ It would also create a framework for application of PES approaches that could be applied to other areas on a decentralized basis, responding to local needs and conditions in particular watersheds. El Salvador already has some experience with local, self-organized, environmental services markets to solve specific problems. Three functioning, local systems are described in Annex 1. The strong national interest in PES is reflected in the establishment of the Mesa Permanente de Servicios Ambientales in 2000 as a forum for stakeholders to analyze and promote initiatives related to PES. The development of PES programs for El Salvador is based on lessons from these and other experiences in Latin America.

23. Clear land tenure is important to PES mechanisms and is a high priority of the Salvadoran government. The current World Bank-supported land administration project in El Salvador, which will close in June 2005, has regularized about 65 percent of all privately held land. A second Bank project, approved in March 2005, will regularize all remaining private lands, while a linked GEF project, scheduled for approval in October 2005, will pilot mechanisms for regularizing land tenure in mangroves and protected areas.

Table 1. Initial Pilot Sites for PES Implementation

<i>Site</i>	<i>Potential national benefits</i>	<i>Potential global benefits</i>
Lago Coatepeque– Los Volcanes	<ul style="list-style-type: none"> • Recharge of aquifers serving western El Salvador • HEP • Tourism, ecotourism 	<ul style="list-style-type: none"> • Diverse ecosystems including cloud forest and paramo • 10 critically endangered species • Endangered avifauna • Help consolidate MBC/ES and buffer zone of Apaneca–Lamatepec, Nahuaterique, and Río Sapo PAs
Jaltepeque– Jiquilisco	<ul style="list-style-type: none"> • Industrial and artisanal fishing • Key shrimp habitat • Aquaculture • Tourism, ecotourism • Water filtration 	<ul style="list-style-type: none"> • Unique mangrove forest • High species diversity with endangered (bird) and critically endangered (reptile) species • Important resting ground for intercontinental bird migration; coastal avifauna nesting grounds • Consolidate Corridor Omega, or the Golfo Complex

2. Rationale for Bank Involvement

24. The World Bank has considerable experience in the design, implementation, and support of PES programs in developing countries. Several Bank projects that use PES are under implementation with GEF cofinancing, and others are under preparation (see Table 2). In parallel, the Bank has been undertaking research on PES and providing the results to practitioners through capacity-building efforts. No other institution has the same depth of experience in implementing PES approaches.

25. Other approaches were considered, such as regulation of land use, agricultural extension services, protection and management of public lands, and species-specific conservation efforts. However, the PES approach was chosen because of the highly fragmented and degraded condition of El Salvador's natural habitats, the need to address private land use, the importance of encouraging practices that provide not

¹ The criteria used for site selection were (a) institutional framework, (b) hydrology and other biophysical conditions, (c) locations that can build local biological corridors, (d) land-use practices, (e) national, regional, and global biodiversity significance, (f) potential supply and demand for ecosystem services, (g) socioeconomic factors, and (h) likelihood that land use changes promoted by an ecosystem service market would support development of local biological corridors.

only local but global benefits, and the potential of PES to efficiently target conservation resources and be sustainable over time. Furthermore, a PES program would complement rather than duplicate existing and proposed conservation and protected areas initiatives by national, international, and nonprofit agencies.

26. GEF support is warranted because the project would help (i) conserve globally significant biodiversity, including critically endangered endemic species, (ii) enhance the Salvadoran sections of the MBC, (iii) pilot PES as a sustainable, long-term conservation instrument that could be scaled up and replicated in El Salvador and serve as a model for other countries, (iv) research links between land use change and environmental services; and (v) increase carbon sequestration and knowledge about biocarbon sinks. Without the GEF increment, environmental services payments might not provide sufficient incentive to adopt land uses that would yield global benefits in addition to local and national benefits.

3. Higher Level Objectives to Which the Project Contributes

27. The environmental objective of the Salvadoran government is to protect the environment and sustainably use natural resources to improve living conditions, promote civil society participation, and address environmental issues such as watershed restoration, reforestation, and pollution.

Table 2: World Bank Projects with PES Components

<i>Country, project</i>	<i>Total cost</i>	<i>World Bank loan</i>	<i>GEF grant</i>	<i>Main features</i>
	<i>(US\$ million)</i>			
Costa Rica: <i>Ecomarkets Project</i>	49.2	32.6	8.0	Effective 2001. Supports PES program
Colombia/Costa Rica/Nicaragua: <i>Regional Integrated Silvopastoral Ecosystem Management Project</i>	8.45	-	4.5	Effective 2002. Piloting PES to promote adoption of silvopastoral practices
South Africa: <i>Cape Action Plan for the Environment (CAPE)</i>	49.6	-	9.0	Effective 2004. Uses PES to conserve the Cape Floristic Region
Panama: <i>Rural Poverty and Natural Resource Management II</i>				Under preparation. Will use PES to improve biodiversity conservation and generate water services
Venezuela: <i>Canaima National Park Project</i>				Under preparation. Will use payments from HEP producers to support conservation of Canaima NP
Bolivia: <i>Consolidating Support for the National Protected Areas System</i>				Under preparation. Will pilot use of PES as financing source for PAs
Mexico: <i>Environmental Services of the Forest Project</i>				Under preparation. Will support national PES program for water services.

Note: Only includes projects with explicit PES components.

28. The January 18, 2005 Country Assistance Strategy (CAS) addresses the need to consolidate the regulatory and legal framework for environment issues and support implementation of measures aimed at watershed recovery, reforestation, decontamination, clean production, management of ecosystems, and biodiversity conservation. The CAS notes that vulnerability to natural disasters is closely related to rural poverty and that low productivity and high population pressures have depleted natural resources in many rural areas, caused soil erosion and land degradation, led to loss of habitat, biodiversity, and natural forests, and exacerbated problems in water management and conservation. In response, the CAS supports development of markets for environmental services and strengthening of protected areas management.

29. The project is consistent with the Bank's 2002 rural and environment strategies for Latin America. The rural strategy aims to reduce poverty and promote growth within the context of sustainable natural resources management and calls for better integration of environmental issues into rural development to build consensus around possible "win-win" opportunities. The environment strategy promotes

sustainable, integrated management of natural resources and ecosystems with a focus on highly degraded and disaster-prone areas. The project would support both strategies by developing PES markets that generate win-win opportunities for poverty alleviation, economic growth, and environmental protection.

30. The project also takes into account the Bank's 2002 Forest Strategy, which is built on (a) harnessing the potential of forests to reduce poverty, (b) integrating forests in sustainable economic development, and (c) protecting global forest values. The strategy notes that addressing these three aspects together is complex and multifaceted—not merely about growing trees but rather supporting a complex interaction of policies, institutions, and incentives. It focuses on economic policies and rural strategies that embrace both sustainable use and conservation of vital environmental services, seeking to build markets and financial instruments in support of private investments in sustainable natural resource management.

31. The GEF operational program goal supported by the project. The proposed project supports the GEF Biodiversity Focal Area by protecting natural habitat through forest conservation, reversion of marginal agricultural areas to forest, reduction of land degradation, and promotion of sustainable practices in agriculture. It supports Operational Programs 3 (Forest Ecosystems) and 4 (Mountain Ecosystems) by promoting conservation of biodiversity in key forest and mountain ecosystems. Within the Biodiversity Focal Area, the project particularly fits Strategic Priority 2 (SP2), Mainstreaming Biodiversity in Production Landscapes and Sectors. It will focus on two types of activities under SP2: (i) facilitating the mainstreaming of biodiversity within productive landscapes, and (ii) developing market incentive measures.

32. Facilitating the mainstreaming of biodiversity within productive landscapes. Through this type of activity the GEF seeks to support development of the systemic and institutional capacities of government agencies and other stakeholders that would help secure biodiversity conservation. This could be achieved through enabling legislation, removing barriers to conservation, reforming or creating policies, institutional structures, and management procedures, generating relevant knowledge, and building partnerships between agencies, local communities, and the private sector. Activities of this type under Component 2 of the project include strengthening the capacity of national institutions (MAG, MARN), community associations, NGOs, and academic institutions to support development of PES markets in El Salvador. Component 2 coincides with the government's strategy of promoting intersectoral approaches and strengthening civil society participation in environmental management. MARN activities will help create an enabling environment for development of a PES market in El Salvador, identify financial resources for the PES program, and consolidate the National Environmental Services Fund (FONASA).

33. Developing market incentive measures. Through this type of activity in SP2, the GEF seeks to support innovative market incentive structures (such as demand and supply side interventions, certification of suppliers, purchasing agreements, and codes of conduct) that would catalyze market forces. In doing so GEF seeks to develop partnerships with private sector stakeholders, small- and medium-size enterprises, and others to catalyze the development of innovative processes and activities that improve market efficiency and the ability to provide biodiversity and productive system gains. Activities of this type under Component 1 of the project will support the development of PES markets whereby farmers will receive economic incentives for adopting and/or maintaining land use practices that generate valuable ecosystem services. The markets will be piloted in two to five priority areas that provide environmental benefits at the local, national, and global levels. These mechanisms will support changes in land use practices such as agroforestry, forest management and conservation, reforestation, afforestation, and sustainable agricultural production systems that improve water quality, increase base flows during the dry season, help regulate groundwater and surface flows, and maintain or enhance biodiversity both on-site and by protecting critical ecosystems.

34. The project would also complement the proposed El Salvador Land Administration and Protected Areas Project, a partially blended IBRD/GEF project to strengthen protected areas management. It would do so by reducing land degradation and improving habitats on private lands in buffer zones and corridors around and between protected areas, thereby improving the viability and biodiversity conservation value of the protected areas themselves. Developing PES markets will also foster and strengthen partnerships

between local and national government, NGOs, community organizations, and the private sector and will help promote an integrated ecosystem approach to watershed management (see Annex 17). The protected areas component was originally developed as part of the PES project, but in consultation with the government it was decided that it would achieve greater synergies as part of the Land Administration Project. All preparation studies for the protected areas output were provided to the land project team.

B. PROJECT DESCRIPTION

1. Lending Instrument.

35. Fixed-Spread Loan (FSL). The proposed project would be financed through an IBRD loan of US\$5.0 million, a GEF grant of US\$5.0 million, government counterpart funds of US\$2.3 million, and project beneficiary contributions of US\$2.2 million, for a total project of US\$14.5 million.

2. Project Development Objective and Key Indicators

36. The **project development objectives** are to (i) establish legal, institutional, and financial arrangements to pilot mechanisms of payment for environmental services, (ii) document links between land use changes and water services improvements and biodiversity conservation, (iii) define good practices to replicate, scale up, and sustain PES programs; and (iv) strengthen the capacity of MAG, MARN, community associations, and NGOs to support long-term development of environmental service markets in El Salvador. These mechanisms would encourage a shift from current land uses, which tend to provide very low levels of national and global environmental services, and promote conservation and sustainable use of natural ecosystems, including critical watersheds and buffer zones of priority protected areas in the El Salvador Mesoamerican Biological Corridor (MBC/ES).

37. The **global environment objective** of the project is to enhance and protect biodiversity by preserving important forest and protected ecosystems. This would be done by piloting a market-based system to contract environmental services. Such a system would protect and expand forest cover and biodiversity-friendly land uses in biological corridors and the buffer zones of protected areas (thereby effectively expanding the ecological footprint of the protected areas and the MBC), and reduce perverse land use incentives that negatively affect biodiversity and wildlife in general.

38. These objectives would be achieved by (i) establishing institutional and financial arrangements to pilot a program of payment for environmental services that will help protect globally important biodiversity through conservation and sustainable use of high priority ecosystems; and (ii) strengthening the capacity of national institutions (MAG, MARN), municipalities, community associations, NGOs, and academic institutions to support long-term development of environmental service markets in El Salvador.

39. Key performance indicators related to the project development and global environment objectives are:

- PES mechanisms designed for at least two sites for contracting (buying and generating) environmental services in priority areas, including functioning M&E systems.
- At least 12,000 hectares under environmental service contracts that contribute to biodiversity conservation as demonstrated by specific indicators for vegetation cover, land use practices, and habitat restoration.
- Increased biodiversity conservation in the project sites measured by indicators of landforms, ecosystems, and habitats, in the dimensions of composition, and structure.
- Increased water services in pilot watersheds measured by reduction of sediment production and transport, biochemical oxygen demand (BOD), and total suspended solids.

3. Project Components

40. The proposed project intervention would create a market-based mechanism for willing buyers and sellers of environmental services that generate local and global benefits. The project outcome is expected to improve ecosystem integrity at the landscape level, including areas that provide vital services to the MBC with benefits accruing to El Salvador, the countries of the MBC, and the global community.

Table 3: Project Component Costs and Financing (million US\$)

<i>Components</i>	<i>Indicative costs</i>		<i>Bank</i>		<i>GEF</i>		<i>Government</i>		<i>Local beneficiaries</i>	
	<i>US\$</i>	<i>%</i>	<i>US\$</i>	<i>%</i>	<i>US\$</i>	<i>%</i>	<i>US\$</i>	<i>%</i>	<i>US\$</i>	<i>%</i>
1. Design & Implement PES	9.0	62	3.0	60	2.5	49	1.3	57	2.2	100
2. Institutional strengthening	3.0	21	1.2	24	1.8	36	0.0	0	0.0	0
3. Project Mgmt/M&E	2.5	17	0.8	16	0.7	15	1.0	43	0.0	0
Total	14.5	100	5.0	100	5.0	100	2.3	100	2.2	100

41. **Component 1: Design and Implement a Program of Payments for Environmental Services (\$9.0 million, of which \$2.5 million from GEF).** The main objective of this component is to design and implement an environmental services fund, create several pilot mechanisms to implement the approach in two to five priority watersheds, and develop procedures to replicate the approach more widely. Payments will be provided for activities such as agroforestry, forest management and conservation, reforestation, afforestation, and sustainable agricultural production that generate valuable environmental benefits such as improving water quality, regulating groundwater and surface flows, maintaining or enhancing biodiversity, and increasing carbon sequestration. The two initial pilot areas were selected based on having significant water and biodiversity conservation benefits (Table 1 above). Particular attention would be given to biodiversity corridors, critical ecosystems, and buffer zones for protected areas. GEF resources will help ensure that incentives promote global as well as local and national objectives. A clear set of criteria is being developed to define eligible activities, expected benefits, and level of payments.

42. Key outputs from this component include (a) establishing a functioning environmental services fund (FONASA), (b) designing a program of payments for environmental services; (c) signing contracts between FONASA and the buyers and sellers of environmental services, and (d) providing technical assistance and monitoring contract compliance by environmental service providers.

43. **Component 2: Institutional Strengthening (\$3.0 million, of which \$ 1.8 million from GEF).** This component would strengthen the capacity of all market participants, including national institutions (MAG, MARN), market intermediaries, community associations, and NGOs to support long-term development of environmental service markets. This coincides with the government's strategy to promote intersectoral approaches and strengthen civil society participation in environmental management. MARN will carry out activities aimed at creating an enabling environment for development of a PES system, identifying funding sources for the program, and consolidating FONASA.

44. Key outputs from this component include (a) institutions able to collect, monitor, and analyze data on the causal links between land use change and environmental services, (b) capacity in FONASA to assess buyers needs, linkages between land use and environmental services, community acceptance of the PES program, and sustainability of PES market mechanisms, (c) awareness among project stakeholders of the importance of environmental services, how they benefit from them, and how they can participate in the PES program to help ensure those services, and (d) demonstrated capacity to strengthen market intermediaries in the provision of technical assistance to land owners in implementing land use changes.

45. **Component 3: Project Management and Monitoring and Evaluation (\$2.5 million, of which \$0.7 million from GEF).** This component focuses on project management mechanisms including planning and monitoring and evaluation (M&E). It would help new and existing entities and mechanisms in the

national government conduct project coordination and supervision and strengthen the effectiveness and quality of project operations. In addition, a robust mechanism will be in place to monitor and evaluate (a) project milestones and indicators, (b) environmental services contract compliance, (c) beneficiary perceptions of project impacts, (d) site-specific land use changes, impacts, and environmental services produced, including baseline assessments for each site and contract, and (e) pilot testing of other land use changes to establish and clarify links to hydrologic, sediment, and other environmental services. A key element of this component is establishing the mechanisms, learning process, and knowledge base to replicate the approach in other areas.

4. Lessons Learned and Reflected in the Project Design

46. The key lessons learned from other GEF and non-GEF projects (listed in Annex 2) were taken into consideration in the design of the project (see Annex 19 for more details). These lessons include:

47. *Payment for Environmental Services.* Systems of payment for environmental services to restore ecosystems in very poor areas and to protect globally significant biodiversity by strengthening buffer zones and corridors are relatively new. The El Salvador project has benefited from lessons learned in other projects, including the ongoing Costa Rica Ecomarkets Project, the Regional Silvopastoral Project, and the now completed El Salvador Shade-Grown Coffee Project. In addition, the proposed project has gleaned lessons and recommendations from work published by the World Bank, FAO, Forest Trends, the Institute for International Environment and Development (IIED), and others.² Some key points include:

- Environmental services are very site specific, so approaches should be flexible.
- Early identification of local supporting partners (e.g., NGOs) and their capacity needs are important for promoting participation and strengthening ownership.
- Payments must be continuous and open-ended since the incentives only last as long as the payments.
- Targeted payments are much more cost effective than paying everyone the same amount, though care must be taken to ensure that higher transaction costs do not outweigh efficiency gains.
- Care must be taken to avoid creating perverse incentives.
- PES schemes need to consider all land uses, including agriculture, forests, pastures, and infrastructure.
- The scheme should be piloted before scaling up.

48. *Biodiversity Conservation and Sustainable Use in Productive Landscapes.* One of the most important lessons from GEF-supported projects is the importance of fostering stakeholder participation and ownership. Local populations and institutions must be included in project design and implementation to ensure long-term conservation of biodiversity both in protected areas and production landscapes. The El Salvador project includes technical assistance for local NGOs and associations to support forest conservation activities by small land users and rural women's organizations. Consultations have taken place in priority areas to strengthen local participation. Experiences throughout the MBC and with buffer zone communities in El Salvador's Natural Protected Areas System (SANP) indicates the importance of:

- Clearly defining the role of the executing agency and the communities in project administration, decisionmaking, and implementation to avoid false expectations, ambiguities, and delays.
- Limiting the project focus so that activities are targeted and are appropriate to the social context and current institutional capacity.

² The list of publications include (a) Pagiola et al., 2004. "Paying for Biodiversity Conservation Services in Agricultural Landscapes". World Bank; (b) Pagiola et al., 2002. *Selling Forest Environmental Services*. Earthscan; (c) Chomitz et al., 1998. "Financing Environmental Services: The Costa Rican Experience". World Bank; (d) Scherr et al. 2002. "Making Markets Work for Forest Communities." Forest Trends; (e) Johnson et al. "Developing Markets for Water Services from Forest: Issues and Lessons for Innovators." Forest Trends, World Resources Institute, and the Katoomba Group; and (f) Landell-Mills and Porras. 2002. *Silver Bullet or Fools' Gold?: A Global Review of Markets for Forest Environmental Services and their Impact on the Poor*. IIED.

- Strengthening institutional sustainability, including building the capacity of the executing entity, strengthening public-private partnerships, and building capacity within partner organizations to implement comanagement arrangements.
- Ensuring financial sustainability.

5. Alternatives Considered and Reasons for Rejection

49. Regulatory approaches or remedial measures to improve watershed management. Governments traditionally try to correct the market failure in environmental services through (i) regulations on land use that are often difficult to enforce, particularly where there are many land users upstream, or (ii) expensive civil works projects to correct or prevent damage caused by poor management of upper watersheds. Specific consideration was given to creating an agricultural extension project to help farmers convert to more sustainable production methods. While conversion to agroforestry and other agricultural production systems sometimes produces on-farm benefits, extension services alone do not usually induce sustainable land use change and biodiversity conservation. The sustained incentive of a market-based approach will not eliminate the need for targeted interventions, but will reduce both the extent and severity of problems and the need for remedial measures. Market-based instruments linking upstream actions to downstream benefits are also more efficient than direct government interventions, and require fewer government resources.

50. Relying on public land efforts to protect biodiversity. Biodiversity conservation has typically been addressed by attempting to protect valuable natural ecosystems. This approach is being pursued in El Salvador, but is not sufficient by itself and does not address conservation on private lands at all. Only a small fraction El Salvador still contains natural habitat, and many individual protected areas are too small to be viable on their own. Ensuring their viability will require supporting biodiversity-friendly land use in buffer zones and biological corridors, including payments to land users to provide environmental services.

51. Targeting important conservation species. Given El Salvador's severe deforestation and ecosystem degradation, targeting important conservation species was not considered viable in the long-term.

52. Regional vs national programs. While the El Salvador project was initially conceived along the same lines as Costa Rica's nationwide FONAFIFO initiative, which has led the way in developing PES programs, it has since evolved into a quite distinct approach, with separate PES mechanisms tailored to each watersheds. Emerging evidence suggests that Costa Rica program, which pays all participants the same amount for the same activities, may be quite inefficient and is likely overpaying in some areas while failing to attract participation in others. Indeed, Costa Rica's own program is evolving towards a more regionalized approach with subprograms targeting particular areas. El Salvador's institutional capacity may also be better suited to a smaller-scale, watershed approach than to a large national program.

C. IMPLEMENTATION

1. Partnership Arrangements

53. The proposed project would be coordinated with the Second El Salvador Land Administration Project (IBRD) and the partially blended El Salvador Land Administration and Protected Areas Consolidation Project (GEF). These linked projects focus on defining tenure for all private and public lands in El Salvador, rationalizing the national protected areas strategy, and strengthening two key priority protected areas and regularizing the status of existing communities within them. These activities are strongly complemented by the PES project, which provides incentives to land users in buffer zones and other environmentally sensitive areas to sustainably manage their lands. Together these projects pilot a set of complementary mechanisms for MARN in establishing its 15 Conservation Areas—one for the core protected areas through the land administration GEF and the other for buffer zones through the PES project (see Annexes 10 and 17).

54. Coordination activities are being finalized so that timing of products and activities supported through the land administration projects (tenure information, land data, protected areas management plans, and consolidation activities) can be fed into the PES project implementation strategy. While both the PES and land administration projects support MARN, final implementation arrangements will be designed to ensure complementarity and avoid duplication. For example, staffing of the Project Coordinating Units (PCUs) is being designed in parallel to optimize staff recruiting, training, and placement (including in the National Registry Center, a recognized regional leader in land information systems and project management). Special attention will be paid to the institutional strengthening and legal frameworks of the projects to avoid redundancy and promote synergies (see Annex 17).

55. The Spanish government's project for Management Support for Administration of the Los Volcanes Protected Area overlaps with one of the pilot areas of the PES project, Lago Coatepeque. Coordination of buffer zone activities defined in this management plan will be carried out between the two projects.

2. Institutional and Implementation Arrangements

56. The Ministry of Environment and Natural Resources (MARN) will execute the project and have responsibility for all technical and fiduciary aspects of the project, overall management and supervision of the grant/loan, and monitoring and evaluation. Direct implementation will be provided by a Project Coordination Unit within MARN's Department of Natural Resources.

57. During the first year of implementation MARN, through the PCU, will establish the National Environmental Services Fund (FONASA) within the existing Environmental Fund of El Salvador (FONAES)³ to execute most activities in Components 1 and 2. The PCU will gradually transfer its responsibilities to FONASA as the Fund develops institutional capacity so that by the end of the project the PCU can be dissolved without disrupting the PES system. Other institutional actors in the project include NGOs (acting as PES intermediaries) community associations, and universities. Key stakeholders and participating government agencies will receive training to facilitate coordination, increase understanding of the PES system, and help them assume their roles in the system.

58. FONASA will have a Board of Directors comprised of one permanent member and one deputy assistant each from MARN (Chairman of the Board), MAG, a local NGO, a farmers association, a water association, and a private business association. FONASA will have an open-ended term that will last as long as there is a fund to be administered. The staff of FONASA will include an executive director, natural resources management specialist, promotion/public relations specialist, procurement and financial management specialists, administrative assistant, and secretary. FONASA's functions will include processing environmental service contracts with private landowners, signing environmental services purchase agreements with the private and public sector, monitoring compliance, and preparing reports. The executive director will act as secretary to the FONASA Board. NGOs will operate as intermediaries serving as ES contract promoters, providing technical assistance for Component 1, and compliance monitoring.

59. The PCU will include a project coordinator, administrative assistant, accountant, and procurement specialist. The accountant and procurement specialist will report to the project coordinator but will also support FONASA and will be physically located in MARN's Institutional Financial Unit to strengthen its administrative capacity to manage World Bank-financed projects. The PCU will maintain satisfactory financial management and procurement procedures during project implementation. The financial management and procurement assessments described in Section D3 have identified areas that need to be addressed and include time-bound action plans agreed with MARN. The PCU is meant to be temporary and all its functions and activities to be assumed by FONASA no later than the end of the project.

³ FONAES is an autonomous government agency that was created in 1994 to obtain financial resources, both domestic and international, for promoting the rational use of funds for environmental projects. The government decided that the synergies between a PES program and FONAES warranted creating FONASA inside FONAES instead of as a separate, stand-alone entity.

60. A project Operational Manual will include all rules and regulations for implementation of each project component and operation of the PCU (planning, monitoring, evaluation, institutional arrangements, environmental review, reporting, communication, human resources, risk, coordination, procurement, and financial management). A specific annex of the Manual will define the operations of FONASA. The Operational Manual and any changes to it will require no objection from the Bank.

61. A Project Implementation Plan (PIP) will be prepared jointly by FONASA and the PCU to be submitted to the Bank for no objection prior to the start of each budget year. It will be broken down into Annual Implementation Plans (AIP) and will include four principal sections: (i) description of project activities to be executed during annual time periods; (ii) Gantt Chart/project scheduled with timing of activities, relationship with other activities, and responsible entity; (iii) budget plan; and, (iv) procurement plan. The AIP will be the principal tool for coordination between FONASA and the PCU. FONASA activities must also be approved by the FONASA Board and the AIPs must be approved by the Minister of MARN, including all activities financed by the Bank and GEF in Components 2 and 3.

62. Disbursements will start as transaction-based against statements of expenditure (SOEs), full documentation, direct payments, or special commitments, but they may later become based on Financial Management Reports (FRMs) if the Borrower so chooses. A special account denominated in U.S. dollars will be maintained and operated by the PCU in the Banco Central de Reservas de El Salvador. Deposits into the special account and replenishments up to the authorized allocation set out in the legal agreement would be made on the basis of applications for withdrawals prepared by the project and accompanied by the supporting documentation in accordance with Bank disbursement procedures. Accounting and financial reporting will be done by the PCU and/or FONASA under Bank rules spelled out in the Operational Manual. Separate accounts will be opened for FONASA to handle multiple sources of financing (IBRD, GEF, private sector payments, water tariffs, licensing fees, and other funding from environmental accounts from MARN). Audits of project and FONASA accounts will be carried out under TORs by firms acceptable to the Bank. The project includes financing for audits.

63. The main capacity constraint related to procurement and financial management is MARN's inexperience implementing Bank-financed projects. To address this, the Bank will provide sufficient training to the PCU's procurement and financial management staff, who will be located in MARN's Institutional Financial Unit (IFU) and who will become permanent ministry staff after project completion.

3. Monitoring and Evaluation of Outcomes/Results

64. A key objective of the project is learning. PES programs are by nature country and site specific. Therefore 16 percent of the project budget is dedicated to monitoring and evaluation. During project implementation special quarterly reports will be prepared on the lessons learned during the previous quarter, semester, and year, and on plans for incorporating those lessons into future activities. Learning workshops are planned semiannually to coincide with Bank supervision missions. It is critical to understand for each site the causal links between specific land use changes and environmental services and the amount of change needed to produce specific quantities of those services. A critical weakness of many PES programs is that these links are poorly documented. For that reason, design of an intensive monitoring program for this project is a condition of effectiveness. In addition, site-specific indicators will be defined in each area as part of the environmental service contracts themselves. While causal linkages are site specific, the results and learning from the two initial pilot sites will provide valuable guidance and insights for replication within El Salvador and for PES programs in other countries.

65. By project effectiveness an M&E system and methodology will be put in place to track project implementation, compliance of land users with services contracts, and progress in attaining results. The system will have six modules: (i) Management Information System to track results and financial indicators and provide feedback for decisionmaking; (ii) environmental services contract compliance; (iii) annual beneficiary assessments to report target groups' perceptions; (iv) site-specific monitoring and global

biodiversity and hydrology evaluation studies to quantify land use changes/impacts and environmental services produced, with baseline assessments for each site and each contract and both midterm and final project studies; (v) data collection to better understand causal links between land use changes and environmental services; and (vi) standard auditing and supervision missions at least twice a year to review the technical and fiduciary aspects.

66. The PCU will be responsible for overall project monitoring, including the activities of FONASA. The PCU will aggregate M&E inputs for project-level decisionmaking and reporting. The baseline, beneficiary assessments, and impact evaluation studies will be contracted out, and the PCU and FONASA will be in charge of coordination and technical supervision of the studies. MARN will provide overall project oversight and World Bank staff and consultants will conduct periodic supervision missions (see Annex 3).

4. Sustainability and Replicability

67. Designing long-term sustainability of the PES program has been a central objective throughout preparation, drawing on lessons learned from other PES programs, notably in Costa Rica. Project interventions that would contribute to achieving sustainability include:

- Establishing appropriate programs and institutional mechanisms that will operate beyond the end of the project; and
- Ensuring that PES mechanisms are only implemented in areas with demonstrated demand for services, so that payments from service users fully finance both payments to participating service providers (land users) and the operating costs of the program.

68. A key output of the project is establishment of the environmental fund FONASA (Fondo Nacional Servicios Ambientales) as a mechanism to address an important market failure that causes environmental problems, that is, many of the benefits of particular land uses accrue to people other than those who decide on land use. Land users usually ignore these additional benefits when they make their land use decisions, and as a result the benefits are often lost. FONASA is designed to act as an intermediary between the providers and users of environmental services, including both local ones (such as water services) and global ones (such as biodiversity conservation). FONASA itself has no financing requirement except its own administrative costs. It is not a fund in the strict sense, but rather a fiduciary instrument to channel payments from one party (local, national, and international service users) to other parties (service providers). FONASA's recurrent costs will be completely financed by a service fee on all payments it administers as part of the execution of the PES contracts. The fee will not exceed a set percentage (to be determined) of total contract amounts.

69. The PES system will serve local, national, and global demand for environmental services through different sources of sustainable funding. Local and national demand will constitute the bulk of the demand to be served and global demand, consisting mainly of biodiversity conservation (this is the case of most of the environmental services provided in the Jaltepeque-Jiquilisco site) will be financed through contracts between service users and service providers. As FONASA will act as an intermediary between service users and service providers, financial sustainability depends on service users continuing to provide a continuous flow of funds. This depends on the service users being satisfied that they are receiving the services they are paying for and on their trust in the institutional arrangements. Substantial efforts have been made on both these fronts, including plans for an extensive monitoring effort and establishing FONASA as an independent and autonomous agency with clear, transparent rules. Sites where biodiversity conservation is the main expected benefit pose a specific sustainability challenge because, unlike cases in which water services are most important, it is not possible to arrange for a continuous flow of funds from local sources. The project will explore several approaches to addressing this subset of cases, including the establishment of an endowment fund, which in the future could be capitalized with

contributions from GEF grants and other bilateral or multilateral funding agencies or international NGOs concerned with biodiversity conservation.

70. The PES systems is predicated on the willingness of services providers (mostly land users) to participate in the PES program and on their actual capacity to produce the environmental services sought by service users. Capacity building activities through education, training, and awareness-raising activities that will promote replication of project lessons and transfer of experience would be provided to farmers participating in the PES program. This will ensure their continued participation in project implementation and maintain the momentum of implementation of the PES scheme. Land users will also receive technical support from the extension and research services of the Ministry of Agriculture (as well as other government institutions, NGOs, etc.) so that they have the technical capacity to effect the changes, as well as assistance in getting access to the varieties of annual, semi-perennial, and perennial forest/tree crops required for the establishment of the new farming systems.

71. **Replicability.** This project is conceived as a demonstration mechanism. It is expected that the PES fund and the institutional framework conceived by the project will lead to long-term sustainability and potential for expansion to the national level with only limited external support. The project is starting in two pilot sites and could expand to up to three additional pilot sites. If the pilots are successful, a robust replicability framework will be developed in the third or fourth year to scale up the pilot to the national and regional levels. The replication framework envisages workshops, seminars, study tours, publications, and a web page. The PES program in El Salvador is expected to provide valuable information for programs in other countries, particularly on causal links between land use and environmental services and establishing market based PES mechanisms.

5. Critical Risks and Possible Controversial Aspects

<i>Risk to PDO/GEO</i>	<i>Rating</i>	<i>Risk mitigation measures</i>
There may be political pressure to shape the PES system to achieve nonenvironmental goals, such as assisting politically favored groups irrespective of likely environmental impact.	S	Payments under any individual PES mechanism will only be made for land uses that are expected to generate the environmental services that the service users at that site desire. FONASA will monitor the effectiveness of these land uses in generating the desired services and report to service users.
Lack of political will or economic/financial incentives for key stakeholders to help develop and participate in efforts to replicate and/or scale up the project's piloted PES markets to a national level.	M	The project takes an incremental approach to developing a PES system by focusing on the building blocks of an institutional framework. A dialogue with key stakeholders has already begun, and some preliminary agreements have been reached.
Lack of capacity of national institutions (MAG, MARN), community associations, NGOs, and academic institutions to support long-term development of environmental service markets in El Salvador.	M	The project aims to build the necessary institutional capacity of key actors in a local environmental services market. Component 2 was designed to provide the necessary support and capacity building activities to each institutional actor to prepare them to assume a proactive and productive role in establishing and maintaining the PES system.
<i>Risk to component results</i>	<i>Rating</i>	<i>Risk mitigation measures</i>
Low participation rate of land users.	S	Payments offered will need to be sufficient to compensate land users for their opportunity costs. When this has been the case, PES programs in Colombia, Costa Rica, and Nicaragua are showing high participation rates.

Difficulty in identifying changes in land use that would have the desired effect, particularly with regard to hydrological regulation.	M	Project design is based on the most recent studies of the linkages between land use and hydrology. During implementation the project's effects will be closely monitored and adjustments made for eligible activities and targeted areas. A strong monitoring component will increase knowledge on land use and hydrology relationships.
Willingness to pay by service users will not be sufficient to offer payment levels that induce land users holders to switch to the desired land uses.	L	If willingness to pay is not high enough, then the project will not proceed at that site. The project PES mechanism will discriminate between things worth doing and things not worth doing. PES is a means to an end, not an end in itself. Where willingness to pay by local service users is insufficient but there are substantial biodiversity benefits, the project will explore ways to generate and channel additional funding.
Inability to form strong relationships between the rural farmer, communities, and municipalities to implement project activities at the local level.	M	The degree of social organization at the local level was explicitly considered in choosing the pilot sites. The early stages of implementation will include capacity building to ensure effective local participation.
Unwillingness of service buyers to participate due to free-rider behavior.	S	Initial efforts will focus on cases where such problems are likely to be limited. More generally, implementation of site-specific mechanisms will require agreement among local service users on how to share the financing burden to give leverage against free riding. Experience in Costa Rica and Ecuador shows that free-riding problems can be overcome.
High dropout rates by service buyers, due to poor service delivery.	M	Land uses to be supported at any given site will rely on best available information of their likely effect on services and be agreed with service buyers. The monitoring system will document the extent to which service users are receiving the services they are paying for.

Overall Risk Rating **M**

Risk Rating: H (High); S (Substantial); M (Modest); N (Negligible or Low)

6. Loan/Credit Conditions and Covenants

72. Effectiveness conditions:

- (a) Accounting and financial management system implemented and staffed within MARN's Institutional Financial Unit that is acceptable to the World Bank, including procedures for operations and maintenance during project implementation (see Section C2 and Annex 7).
- (b) PCU fully staffed with qualified personnel, including project coordinator, procurement specialist, accountant, and executive secretary, on a no objection basis from the Bank.
- (c) Operations Manual satisfactory to the Bank.
- (d) Content of the PIP satisfactory to the Bank.
- (e) M&E system developed and ready for project implementation.
- (f) Signed Memorandum of Understanding between MARN and MAG defining responsibilities of each institution in the project, submitted and acceptable to the Bank.

73. Other conditions:

- (a) Counterpart resources from the government of El Salvador will be available at the times specified and amounts agreed within the Legal Agreements, PIP and AIPs.

- (b) Annual implementation plans for all components of the project will be submitted to the World Bank for no objection prior to the beginning of each budget year.
- (c) Agreed plans of accounts and auditing will be implemented by the project. Terms of reference for auditing and a short list of firms will be provided to the Bank prior to signing.
- (d) Quarterly and annual reports will be prepared by the PCU according to agreed formats in the Operations Manual and submitted to the World Bank within 30 days of the end of each quarter, and by January 31 of each year.
- (e) The Bank and the government of El Salvador will conduct a midterm review of project implementation progress and attainment of the project's impact and outcome objectives, not later than the end of the third project year.
- (f) Procurement for all project components will be carried out in accordance with agreed categories in the IBRD and GEF project legal agreements and Operations Manual, and will follow the Guidelines for Procurement under IBRD Loans and IDA Credits (May 2004). All contracting of consultants and consulting services will be in accordance with the Guidelines for Selection and Employment of Consultants by World Bank Borrowers (May 2004).

74. Conditions for Disbursement:

- (a) FONASA has been legally established including FONASA Board constituted and FONASA staff hired, FONASA Operations Manual acceptable to the Bank has been adopted, and MARN/FONASA Memorandum of Understanding (MOU) has been signed as a condition for disbursement on environmental service contracts in Component 1.

D. APPRAISAL SUMMARY

1. Economic and Financial Analyses

75. **Economic analysis.** The objective of the project is to address an important cause of environmental problems: that many of the benefits of particular land uses are externalities that land users ignore when they make land use decisions. As a result these benefits are often lost. The project will establish a mechanism to address this market failure by channeling payments made by the service users to land users whose actions can affect the generation of the desired services. This would not only induce land use changes that generate environmental services with both national (water services and landscape values) and global benefits (biodiversity conservation and carbon sequestration), but also increase income for small farmers. A full cost-benefit analysis would require estimating the value of the services generated, which is complex because of the difficulty of quantifying the level of services provided and estimating their value. Therefore a cost effectiveness analysis is undertaken, as was done in the Costa Rica Ecomarkets Project.

76. Because the specific activities to be implemented will be determined in conjunction with service users and providers during project implementation, the current analysis is based on examples. The data used are broadly representative of conditions in hillside areas of El Salvador, but specific details will vary across and within sites. Detailed analysis will be made of each site prior to implementation of a PES mechanism.

77. The analysis shows that a traditional conservation approach of placing areas off limits for all agricultural use would cost about US\$1,700 per hectare in present value terms over 50 years, using a 10 percent discount rate. By contrast, the example used to analyze the approach followed under the project—a mix of tree crops and conservation measures—would cost about US\$1,000 per hectare. This example is one of the most restrictive and costly options envisioned and in most cases the cost is likely to be lower. The pure conservation approach would probably provide greater levels of environmental services than the project alternative but it is questionable that they would be worth almost doubling the cost. Even if they were worth the extra cost, a pure conservation approach is not politically and socially feasible.

78. **Financial analysis.** Evidence shows that there is substantial demand for the type of services the project will help generate. In Costa Rica, a broad range of water users (private and public hydropower producers, bottlers, municipal water supply systems, irrigation) are already paying to conserve the watersheds from which they obtain their water. An analysis of potential payment sources at the Lago Coatepeque pilot site shows that reasonable user fees would be more than sufficient to cover the estimated US\$90,000 annual cost of making payments to land users.

79. **Incremental cost.** The baseline project would focus on environmental services of national importance. This project would also provide some global benefits, but they would be limited. The GEF alternative boosts the global benefits provided by the project considerably. It supports the conservation and sustainable management of forest ecosystems in El Salvador through explicitly targeting resources for conservation easements in critical ecosystems within the El Salvador MBC, including forests, degraded forest lands, and other critical conservation areas that have high biodiversity values, provide important services for watershed protection, and/or present crucial environmental services for functioning ecosystems at the landscape level. The difference between the cost of the baseline scenario (US\$24.6 million) and the GEF alternative (US\$29.6 million) is estimated at US\$5 million.

2. Technical

80. PES markets are an innovative approach with few operational examples. Lessons learned from the state-of-the-art system in Costa Rica and other cases have been incorporated into the project design (see Section B4). Two primary pilot sites have been selected and project preparation is now focusing on in-depth analysis to refine the payment system for each site. Additional work to finalize pricing structures, targeting, and the mechanism for collection and payment of fees will be done during project appraisal.

81. The project is consistent with the government's needs and will address constraints in environmental conservation, including financing. If successful, the project will demonstrate that a PES system can function in El Salvador and provide the framework for sustainable sources of local financing for environmental protection. In participatory workshops with local communities in the pilot areas, farmers have indicated a high willingness to participate as purchasers of environmental services. A proposal for establishing a PES endowment fund for El Salvador will also be prepared during project implementation.

3. Fiduciary

82. The executing agency, MARN will be responsible for managing the fiduciary aspects of the proposed project through a Project Coordinating Unit (PCU) located within MARN. Its main financial and accounting responsibilities will include (i) maintaining accounting records, (ii) processing disbursements, (iii) preparing project financial statements in accordance with World Bank guidelines, (iv) managing bank accounts, (v) managing financial information systems, (vi) preparing and submitting quarterly Financial Monitoring Reports (FMRs), and (vii) preparing and submitting withdrawal applications.

83. The FM assessment reviewed MARN's experience in managing donor funded projects and its internal operating performance and procedures (budgeting, accounting, internal control, auditing, and reporting). On the basis of the assessment performed, the financial management team concluded that overall MARN has limited capacity with respect to financial management (limited staffing and financial management system) and does not have extensive experience in managing projects financed by the World Bank. Therefore an accountant with appropriate experience must be hired for the management of accounting and financial reporting information of the proposed project. However, MARN has demonstrated its willingness to increase its capacity and assuming that MARN carries out the proposed action plan presented in this

assessment, especially with regards to staffing, it would have in place adequate financial management arrangements that meet the Bank’s minimum fiduciary requirements to manage the specific financial activities of the proposed project. The project is rated modest for overall risk. The action plan (in Annex 7), supervision plan, and scope of the external audit have been designed to manage the risks identified.

84. Annex 7 provides the detailed results of the Bank’s assessment and additional information on financial management arrangements.

4. Social

85. A two-part Social Assessment was carried out in the proposed pilot sites to identify (i) key stakeholders, (ii) the socioeconomic situation, (iii) barriers to stakeholder participation in the PES program, particularly for smallholders, landless peasants, and women farmers, and (iv) mechanisms for removing those barriers. Ninety percent of the key agrarian stakeholders are small farmers, who together own 27 percent of all the productive land. A majority own less than 2.1 hectares. Farms larger than 100 hectares account for 54 percent of all the productive land. The Social Assessment also indicated that the number of landless producers who rent small parcels is larger than previously reported. It identified three disadvantaged producer groups, including landless producers, female farmers, and smallholders lacking registered land title.

86. There are 3.4 million women in El Salvador (52 percent of the total population). Forty-six percent of women are economically active, and 34 percent of heads of household are women. However, women farmers still have very little access to credit and extension programs. None of the communities and families identified themselves as indigenous people.⁴

87. During Phase I of the Social Assessment (2002), the interdisciplinary team of international specialists assembled by MARN–RUTA held a series of consultations on the socioeconomic aspects of the project with national and regional stakeholders, including municipal associations, rural development NGOs, indigenous organizations, women’s organizations, and community development associations.(see Table 4).

Table 4. Summary of Phase I Consultations

<i>Level</i>	<i>Mtgs</i>	<i>Location</i>	<i>Participants</i>	<i>Number</i>
National	2	San Salvador	National working group on PES	60
Site	7	All project sites	Local authorities and leaders	140
Organizations	6	San Salvador	Women, indigenous and local development organizations, National Land Registry	170
Total	15			370

88. Phase II of the Social Assessment (2004) involved a more local focus to reach potential producers of environmental services. Sixty-four producers and heads of household (both men and women) were visited at their parcels and houses within the proposed project areas to discuss social implications, barriers, and incentives for participation. Twenty-seven interviews were also held with representatives of local civil society organizations, development agencies, and governments.

⁴ Leaders of the Communal Association of Lenca of Guatajiagua (ACOLGUA) confirmed that the population of indigenous origin do not identify themselves as such.

89. The project has been designed with active participation from major stakeholders, including the Mesa Permanente de Servicios Ambientales, a national advisory group that includes universities and private and civil society organizations working on environmental services. MARN has made a strong information dissemination effort and organized a series of 10 workshops with 400 participants from local universities, NGOs, farmer cooperatives, and municipalities. They have also held more than 30 local, national, and regional meetings to introduce the project concept and get feedback to enrich the project design.

90. Furthermore, participatory workshops were held in each of the selected project sites, bringing together over 200 local authorities, community leaders, and citizens to discuss project objectives, feasibility, barriers, and benefits. These workshops were attended by all major stakeholders including the Asociaciones de Desarrollo Local (ADEL), Asociaciones de Desarrollo Comunitario (ADESCOS), municipal associations and mancomunidades, producers associations, and local NGOs working on PES pilot initiatives. A series of consultations were held with demand-side stakeholders such as water users, industries, private foundations, and NGOs.

91. The Social Assessment reaffirmed the project's strong emphasis on communication and outreach to raise awareness among key stakeholders, particularly to help "level the playing field" for small farmers, landless farmers, and women. Training for NGOs and community associations, as well as mechanisms incorporated into the Operational Manual, will emphasize inclusion of all stakeholders to ensure participation by disadvantaged groups and avoid domination by larger farmers. A rigorous monitoring and evaluation plan will assess project implementation. Periodic draft evaluations will be presented to participating farmers so that their comments and recommendations can be incorporated into published monitoring reports. Stakeholders will also be invited to attend semiannual learning workshops to review lessons learned and how they will be applied to current and future pilot sites and to scale up the PES program.

5. Environment

92. The project is expected to have highly positive environmental impacts, as it provides incentives for improved environmental management in critical and sensitive areas. At the local level, it will improve water resources management and reduce land degradation by promoting biodiversity-friendly land use in lieu of traditional agricultural practices. At the regional level, it supports the MBC by improving habitat conservation on private lands that form critical protected area buffer zones and biological corridors. Globally, it will contribute to biodiversity conservation and climate change mitigation. Additionally, the project will establish the policy and institutional frameworks for PES, thereby promoting sustainable growth and resource management in the agricultural and environment sectors. Moreover, through providing incentives for conservation-friendly land uses in protected area buffer zones and corridors, it will support the recommendations of the protected areas study being conducted by the Land Administration GEF project, thereby further contributing to local, regional, and global environmental welfare.

93. In addition to the positive environmental impacts of project activities, the project directly supports implementation of El Salvador's National Environmental Policy, Environmental Law, MBC Proposal, and National Biodiversity Strategy. The enabling regulatory and policy environment itself will be further strengthened through the project's institutional capacity building component.

94. The Environmental Assessment completed by the borrower was disclosed on MARN's website in April 2005 where it is available for public comment.

95. The recommendations of the project's Environmental Assessment (EA) are described in the EMP, which will be part of the Operational Manual. The EA and associated Social Analysis (SA) evaluated the

project's potential impacts on environment and local communities. It is expected that the project's system of payments for environmental services could positively affect rural livelihoods both through direct compensation and through reduction in vulnerability caused by environmental degradation.

6. Safeguard Policies

<i>Safeguard Policies Triggered by the Project</i>	<i>Yes</i>	<i>No</i>
<u>Environmental Assessment (OP/BP/GP 4.01)</u>	X	
Natural Habitats (<u>OP/BP 4.04</u>)		X
Pest Management (<u>OP 4.09</u>)		X
Cultural Property (<u>OPN 11.03</u> , being revised as OP 4.11)		X
Involuntary Resettlement (<u>OP/BP 4.12</u>)		X
Indigenous Peoples (<u>OD 4.20</u> , being revised as OP 4.10)		X
Forests (<u>OP/BP 4.36</u>)		X
Safety of Dams (<u>OP/BP 4.37</u>)		X
Projects in Disputed Areas (<u>OP/BP/GP 7.60</u>)		X
Projects on International Waterways (<u>OP/BP/GP 7.50</u>)		X

96. *Environmental screening category:* B – Partial Assessment. This project would have an impact on landholders participating in the pilot environmental services markets, communities, and protected areas near the sites targeted by the project. Hence it is category B requiring an EA focused on key issues.

97. *Key safeguard issues raised by the project:* The EA and SA evaluated the project's potential to trigger relevant safeguards policies. Specifically, the EA assessed the project's potential impacts on natural habitats and forests, and found that the project's impacts are overwhelmingly positive. The EA found that care should be taken to design market mechanisms that avoid creating perverse incentives or rewarding land uses that provide local environmental services but negatively impact natural habitats or biodiversity (such as replaced mixed canopy systems with monocrop tree plantations). The EA found that the project does not trigger safeguards for Natural Habitats, Forests, Pest Management, or Cultural Property. The SA has not identified any safeguard-related social issues.

7. Policy Exceptions and Readiness

98. The project does not require any exceptions from Bank policies. The project does meet the Regional criteria for readiness for implementation.

Annex 1: Country and Sector or Program Background

EL SALVADOR: Environmental Services Project

Country and Sector Issues

1. El Salvador emerged from a 12-year civil war in 1991. Since then, the country has made remarkable progress in consolidating peace and democracy. After implementing a number of economic reforms, El Salvador now places 24th out of 155 countries in the Index of Economic Freedom. Inflation, interest rates, and business uncertainty have fallen. The overall poverty rate fell by over 27 percentage points between 1991 and 2002, and extreme poverty was halved.

2. However in recent years, due in large part to external shocks, growth has slowed. El Salvador's terms of trade deteriorated between 1996 and 2000. The U.S. recession severely affected the country's large maquila sector, and the steep fall in world coffee prices adversely impacted the rural economy. More recently, the economy has been negatively affected by the rise in oil prices. As a result, growth since 2000 has averaged only 2.0 percent, barely enough to keep per capita incomes roughly constant.

3. El Salvador has suffered severe urban and rural environmental deterioration. Urban areas have serious air and water pollution problems, and in the Metropolitan Area of San Salvador 50 percent of solid wastes go uncollected. Rural areas have experienced extensive deforestation, leaving El Salvador with the lowest rate of forest cover in Central America and the second lowest rate in the hemisphere. Poor agricultural land use practices compound problems of land degradation and erosion. Although the country still maintains significant remnants of globally important forest ecosystems and plays an important role in the Mesoamerican Biological Corridor (MBC) (see the maps in Annex 20), its biological diversity is highly threatened and requires urgent support to remain viable.

4. The proposed project targets poor land use practices that degrade valuable environmental services at the local and national level (such as water quality and landscape values) as well as the global level (such as biodiversity conservation and carbon sequestration). It does so by creating market-based mechanisms to capture the externalities created by different land uses and align the incentives of land users with those of society as a whole.

Key Issues

5. Current land use practices have significant repercussions for the country's agriculture sector, natural resource base, and environment, including (i) severe land and forest degradation, (ii) poor water resources management, and (iii) loss of biodiversity and critical ecosystems including natural habitats and forests.

6. **Land and forest degradation.** Much of El Salvador is mountainous and vulnerable to erosion, especially when deforested (World Bank 2001). Only 12 percent of the country has any forest cover at all, and only 2 percent has primary forest. Population pressures, inequality in access to land, and civil war have pushed farmers to bring much of the country's hillsides into cultivation, particularly for small-scale grain production. Moreover, traditional agricultural practices leave hillside soils bare at the start of the rainy season. Today about 60 to 70 percent of total agricultural production comes from such hillside farms, which are often among the smallest and poorest in the agricultural sector.

7. Some of the impacts of poor land use practices are felt by land users themselves in the form of declining agricultural yields or higher costs to maintain current production levels. Land degradation affects approximately 50 percent of agricultural lands on moderate slopes and 80 percent of lands on steep

slopes; approximately 25 percent of farm households suffer significant soil losses each year (World Bank 1996). While land users often face constraints in addressing land degradation on their fields, over half the fields on moderate and steep slopes have some form of conservation (World Bank 1996) and over the years many of projects have assisted such conservation efforts.

8. Poor water resource management. El Salvador faces water shortages despite average annual precipitation of about 2,000 mm. The most abundant supplies are found in the volcanic San Salvador Formation, the interior basins, and on the gentle lower slopes of most volcanoes. Supplies are meager on the steep upper slopes of the volcanoes and other upland areas. Low flows during the December through April dry season is a problem in many areas. The two most pressing water resource management issues in El Salvador are (i) poor watershed management of the Lempa basin (shared by El Salvador, Guatemala, and Honduras) and (ii) poor aquifer management. Of particular concern is the depletion of some aquifers—particularly around San Salvador where urbanization is replacing shade coffee in key areas of aquifer recharge—which increases demand for water from the Lempa River system.

9. Current land use practices often have substantial adverse effects on downstream water services. Poor agricultural practices on hillside farms, deforestation, and soil compaction have reduced the infiltration capacity of El Salvador's soils. Instead, water runs over the surface, causing erosion and landslides, exacerbating both flooding and droughts, and reducing aquifer recharge.

10. Although forests and forest cover generally reduce total annual water flow, in some cases they can increase minimum flows during the dry season (base flows). Likewise, forests and well-maintained agricultural landscapes can provide people and companies with high quality water supplies that have low levels of nutrient and chemical contamination. Finally, forests can regulate surface and groundwater flow in beneficial ways. For example, flooding and landslides have been widely linked to deforestation, road construction, and other forms of development. Beneficiaries of improved flow regulation include farmers, agricultural markets, property owners in floodplains, taxpayers, insurance companies, and a range of government agencies. The best opportunities for market-based instruments to maintain or restore these services are in (a) regions with annual dry seasons or frequent droughts where base-flow demands meet or exceed supplies; (b) watersheds that serve relatively large populations; and (c) watersheds where chronic or catastrophic damage has caused major economic losses (Forest Trends 2001).

11. Some of the major impacts of water management issues are:

- Increased vulnerability to flooding and landslides. Though spared the brunt of Hurricane Mitch in 1998, the country still experienced flooding in 12 of its 14 departments. At least 374 people died or are missing and 55,000 were displaced. Three major bridges over the Lempa River were swept away. Even in the absence of hurricanes, severe flooding has become an annual problem, especially in the Lempa, Grande San Miguel, Paz, and Jiboa rivers (MARN 2000).
- Dry season water scarcity. This is the counterpart to wet season flooding. El Salvador has a pronounced dry season from December through April. Despite average annual precipitation of about 2,000 mm, many parts of the country often face water shortages during the dry season.
- Declining water quality. More than 90 percent of El Salvador's rivers are polluted by surface runoff of pesticides and fertilizers, untreated wastewater, solid wastes, and sediment (U.S. Army Corps of Engineers 1995). Low flows during the dry season exacerbate the impact of water pollution. Many municipal water systems now rely on safer groundwater sources, but depletion and contamination of these sources are becoming a problem also.
- Sedimentation. Sedimentation increases costs to irrigation and municipal water supply systems, reduces the productivity of river and marine ecosystems, and harms fisheries. The hydroelectric

system on the Rio Lempa receives an estimated 10 million to 25 million tons of sediment a year, which threatens to reduce its operational life while increasing the cost of producing electricity.

- Stresses on downstream ecosystems. Some watersheds and wetlands provide crucial ecological services. Degradation of these watersheds threatens the continuity of ecological services.

12. The main beneficiaries of water services, and the main victims of their loss, are downstream users such as municipal water utilities, hydroelectric power producers, irrigators, fisheries, industrial water users, and riparian populations and ecosystems. Therefore land users lack incentives to address the negative impacts of land use on water services, except where it also affects on-site productivity or living conditions.

13. **Loss of biodiversity and critical ecosystems.** El Salvador is endowed with rich natural ecosystems and unique ecological conditions. Its tropical location, extensive volcanic soils, and isolation from Central America's Atlantic moist forests encourage both high biodiversity and a high rate of endemism. Though only 21,000 square kilometers, El Salvador is host to thousands of native species, including 1,477 vertebrates and about 7,000 plants. This includes 510 bird species, 140 reptiles and amphibians, 800 butterflies, and more than 700 trees.

14. At one time more than 99 percent of El Salvador was forested, but because of population pressures and agricultural encroachment, today only 2 percent of primary forest cover remains and only 12 percent of the territory has any forest cover at all. This deforestation, particularly on hillsides, contributes to a multitude of other problems including loss of valuable biodiversity, critical ecosystems, habitats, erosion, and a host of issues related to the hydrological cycle.

15. The isolated patches of forests that remain no longer provide sufficient corridors for biodiversity dispersal and seasonal movements either with the larger MBC or locally—the biodiversity islands syndrome. Several species of orchids, trees, birds, mammals, and butterflies have not been reported during the last ten years, according to MARN. Half of the bird species are threatened and 27 percent of the nearly 1,500 species of vertebrates registered in El Salvador are either threatened or at risk of extinction (World Bank 2001). The IUCN–World Conservation Union's Red List of threatened species in El Salvador includes 11 critically endangered species, 15 endangered species, and 30 vulnerable species, some of which are endemic to El Salvador, such as *Abronia montecristoi*, *Hampea reynae*, *Parathesis aurantica*, and *Parathesis congesta*. Agriculture and selective logging activities have led to imbalances in genetic and phenotypic quality in remaining organisms of some species. The El Salvador National Biodiversity Strategy issued in April 2000 confirms this picture of continuing pressures threatening the country's remaining biodiversity.

16. Nevertheless, valuable biodiversity remains. For example, 17 of the 23 endemic species of birds reported in northern Central America are still found in El Salvador. A concerted effort by all major stakeholders (from local to global) is needed to ensure the long-term viability of many wildlife species and improve ecological functions such as soil conservation, biodiversity connectivity, water quality, hydrological cycles, and carbon sequestration.

17. Because land scarcity makes a traditional approach based primarily on expanding protected areas infeasible, ways have to be found to ensure the preservation of biodiversity within agricultural landscapes. As with water services, however, land users typically have little or no incentive to take biodiversity conservation into consideration.

18. Providing payments for environmental services (PES) offers a potential remedy to some of these problems. Such payments can encourage land users to change behavior if the payments exceed the opportunity cost of other land uses. Service users could be willing to pay the fees if they are less than the value of the benefits they receive. If these conditions are satisfied, then PES mechanisms hold out the

promise to be more efficient than traditional command-and-control approaches (Pagiola and Platais forthcoming). At the same time, because there is a high correlation between areas of rural poverty and locations of key environmental resources (Nelson and Chomitz 2002), payments can also help reduce poverty by providing additional income for low-income households (Pagiola and others 2005).

Government Strategy

19. Rural development and poverty alleviation through improved natural resources management and biodiversity conservation are priorities for the Government of El Salvador. The government is developing a national environmental policy and strategy, with broad citizen participation, that would consolidate the regulatory and legal framework and support implementation of measures aimed at watershed recovery, reforestation, decontamination, clean production, management of ecosystems, and biodiversity conservation. The government's strategy focuses on:

- Combating land degradation through changes in land use, particularly on hillsides.
- Improving water resources management.
- Improving biodiversity conservation by consolidating and improving management of the national system of protected areas.
- Promoting public participation and widespread government involvement (through sector ministries) in the design and implementation of a decentralized, participatory environmental management strategy, and building local capacity in the process.

20. A core element of the government's strategy is to develop environmental service markets that would compensate landowners for making land use changes that produce external benefits for downstream populations and indirect benefits for the wider society. This initiative would be complemented by enhanced efforts to conserve biodiversity in and around priority protected areas. Specific elements of this strategy include:

21. **Combating land degradation.** The link between agricultural practices on hillsides and environmental degradation has clear implications for land use: farmers must be induced to adopt sustainable agricultural systems that favor the production of environmental services while also allowing them to increase their food security and incomes.

22. Land uses can provide a variety of environmental services ranging from regulation of hydrological flows to biodiversity conservation and carbon sequestration. Table 1.1 illustrates the varying impact of different land uses on erosion, for example. However, land uses that provide such services are rapidly being displaced by uses that do not. A key reason is that land users typically receive no compensation for environmental services they generate for others.

Table 1.1: Soil Erosion under Different Land Uses

<i>Land use</i>	<i>Slope (degree)</i>	<i>Erosion (t/ha/year)</i>
Slash and burn	35	92
Extensive grazing using fire	37	87
Conservation tillage	34	26
Shade coffee	37	19
<i>Quesungual</i> agroforestry (dispersed trees and mulch)	38	18
Low montane wet forest	32	20

Source: L. Alvarez, 2002. Proyecto Lempira Sur. FAO.

23. **Improving water resources management:** In addition to reducing land degradation and restoring ecosystems, the adoption of more sustainable land-use management practices provides people with various water-related benefits. The key to stable water flows is not tree cover per se, but rather soil cover. Dense forests or woods that capture tropical rains allow water to penetrate the soil while also protecting against direct evaporation. This reduces peak flows during the rainy season and increases minimum flows during the dry season (base flows). Soil erosion is also controlled, ensuring healthy streams upriver and reducing sedimentation downstream.

24. In contrast, the pine forests common to the Lempa watershed provide little soil coverage and are prone to forest fires, making them a major natural source of soil erosion. Land use based on mulch, such as shade coffee systems, can actually provide tropical rainfall management comparable to low montane wet forests (Table 5). Trees, and especially deep-rooted trees, are essential to the system because they help anchor loose soils and control erosion, particularly in periods of extremely heavy rainfall. Shallow-rooted pine trees are not as helpful in controlling erosion, as shown in studies of landslides caused by Hurricane Mitch. Hence land-use systems that combine mulch and native dry forest hardwoods offer a frontline defense against flooding and landslides.

25. The government's strategy to improve water resources management also includes efforts to improve delivery of water services and promote water conservation by creating a more efficient institutional framework and eliminating perverse incentives. Large water subsidies built into the tariff structure have provided strong disincentives for water users to conserve, particularly in urban areas. They have also prevented ANDA from covering their operating costs and improving the quality and extension of water services.

26. Fortunately, the policy and institutional framework is improving. On the supply side, the government is permitting ANDA to decentralize administration of the national water supply system by granting concessions to private companies and municipalities. To date ANDA has signed agreements with several municipalities in Usulután and with the Asociación de Empresarios y Vecinos de la Zona Industrial de La Laguna (ASEVILLA).¹¹ Continued progress is expected with IDB financing.

27. On the demand side, new regulations permit ANDA to set rates that cover capital, operational, and maintenance costs, including the cost of protecting water sources. The government recently modified the structure and level of water tariffs for human consumption to reduce domestic subsidies.¹² The tariff is based on ANDA's total costs per cubic meter of water billed. Each water bill includes a fixed charge plus a base tariff multiplied by measures of (i) basic consumption up to 20 cubic meters, (ii) mean consumption, and (iii) consumption exceeding 40 cubic meters.

28. Currently there is no charge for environmental protection, but under the new regulations ANDA could invest in watershed conservation, including contributions to a Fund of Payments for Environmental Services, and include those costs in the tariff structure used for calculating water bills.

29. **Improving biodiversity and critical ecosystems conservation.** El Salvador has taken various actions to address biodiversity loss, including (i) signing the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1987 and the Convention on Biological Diversity (CBD) in 1994; (ii) developing a Biodiversity Strategy and a National Strategy for the Conservation and Protection of Sea Turtles; and (iii) legally establishing the System of Protected Natural Areas of El Salvador (SANP) through the Ley del Medio Ambiente in 1998.

30. Under this legal framework, MARN has issued national policies for natural protected areas, forestry, and use of marine and coastal resources. MARN has identified 125 fragments of well-conserved natural areas that may be incorporated into the SANP. To date, three of these areas have been legally established:

Parque Nacional El Imposible, Parque Nacional Montecristo, and the Área Protegida Laguna El Jocotal. Each of the areas has a management plan approved by MARN. The government is also coordinating and working with a number of NGOs to help conserve the country's biodiversity, including SalvaNatur, which manages Los Volcanes as well as El Imposible—the country's largest national park—under an agreement with MARN. Outside of SANP, the remaining natural areas in El Salvador are isolated patches, some as small as 1 hectare, others as large as 5,000 hectares. The long-term viability of these areas largely depends on their integration into the MBC.

Table 1.2. Legally Protected Areas in El Salvador

	<i>Montecristo</i>	<i>El Imposible</i>	<i>Laguna El Jocotal</i>
<i>Legal status</i>	Executive Decree, 1987	Executive Decree, 1989	Legislative Decree, 1996
<i>Hectares</i>	1,973	2,985	1,571
<i>Location</i>	Metapan, Santa Ana. Part of a Biosphere Reserve	San Francisco Menendez and Tacaba, Ahuachapan	El Transito, San Miguel
<i>Biodiversity characteristics</i>	Largest cloud forest in country, with 40 percent of its amphibians and 36 percent of reptiles in danger of extinction	Richest area of biodiversity in the country. One of the region's few areas of protected Pacific forests, containing almost 400 different tree species, more than 500 butterfly species, and 30 mammal species, most of which are threatened or endangered	RAMSAR site since 1998. Contains some of the largest flocks of water birds in the country and serves as a refuge to migratory water birds. Offers one of the last remaining habitats for otters in the country
<i>Management plan</i>	Designed and in operation, jointly created with the governments of Honduras and Guatemala under the Trifinio Plan	Designed and implemented jointly with MARN and the NGO SalvaNatur	Designed and implemented jointly with NGOs
<i>Current sources of financial support</i>	European Union, UNESCO, Japanese International Cooperation Agency, IDB, PAES, Spanish Cooperation Agency	IUCN, SalvaNatur, CARE, Spanish Cooperation Agency	MARN, Spanish Cooperation Agency, IUCN

31. At the regional level the project and the government's strategy to conserve biodiversity is consistent with consolidation of the MBC Project and with the Central American Forestry Strategy (CCAD 2002) Both initiatives propose to halt degradation of natural ecosystems in part by capturing benefits derived from goods and services they provide to generate income and employment for rural people. With respect to implementing the regional forestry action plan in El Salvador, priority is being given (with FAO support) to the Los Volcanes and Jaltepeque-Jiquilisco areas, with the Ministry of Agriculture and Livestock (MAG) in charge of productive efforts and MARN in charge of conservation programs.

Decentralization and Participation in Environmental Management

32. The project's conceptual framework was formulated during the previous administration, based on its national environmental policy and its "Alliance for the Future" program. The Alliance program called for a decentralized and participatory environmental management strategy where policies and norms are set by MARN and implemented by different sectors, local authorities, and civil society. The environment

became an even more important priority under the Saca administration, which took office in 2004. The proposed project supports two of the eleven work areas defined in the new government's "País Seguro" (Safe Country) plan, including "Agricultural Development: Expanding the Chain of Value," and "Environment: Legacy for Future Generations." One of the specific goals is short-term implementation of a PES system. The strategic plan gives MARN responsibility for environmental protection and MAG responsibility for implementing a PES system.

33. To support this approach, several recent initiatives have been undertaken to strengthen the legal, policy, and institutional framework for environmental management:

- In 1997, the Environment Secretariat was transformed into MARN, thereby giving it the status and visibility needed to better perform its mandate. The legislative assembly approved the national environmental law on May 4, 1998. Subsequent government initiatives, with targeted support from bilateral and multilateral programs, have helped consolidate the new environmental law by supporting development of specific environmental regulations.
- Important partnerships and policy initiatives have been established to mainstream environmental and natural resources management issues in development plans. For example, the Minister of Environment presides over a new Committee for Territorial Development, which includes key sector ministries such as Agriculture, Public Works, and Finance. The ultimate aim of this Committee is the development of a Land-Use Master Plan (Plan de Ordenamiento Territorial).
- Environmental Compensation Executive Decree 50 (2004) defines MARN's role as (i) internalizing the economic values related to environmental services into public and private sector decisionmaking (e.g., hydrological services, including maintenance of water quality and hydrological stability; biodiversity conservation; and climate change mitigation); (ii) establishing market-based environmental protection instruments (e.g., user fees, application of the polluter pays principal, certification of production processes); and (iii) further defining an enabling framework for regulation of environmental services. The executive decree promotes the use of market-based mechanisms to stimulate improved natural resource management in El Salvador.
- Efforts to transform MARN into a more efficient and results-oriented organization include a recently prepared Organizational Structure Manual based on an analysis of the ministry's strengths and weaknesses in addressing national environmental issues and participating in international environmental conventions and initiatives. In this context, new job descriptions were prepared and salary levels established that are compatible with other government offices. Special attention was paid to strengthening MARN's Administrative Unit to improve the ministry's financial management capacity. A new Administrative Procedures Manual provides clear rules on internal procedures.

34. A core element of the government's strategy is to develop environmental service markets to give land owners incentives to adopt land use practices that provide more benefits to other stakeholders, including the private sector, municipalities, and society as a whole, both local and global.

Payment for Environmental Services Fundamentals

35. The payment for environmental services (PES) approach is based on two main principles: that those who provide valuable environmental services should be compensated, and those who benefit from these services should pay for them (Pagiola and Platais, forthcoming). PES programs promise to be more efficient than traditional command-and-control approaches by steering resources to the situations where the cost of achieving environmental goals are lower and the gains are higher. Moreover, linking payments to service providers with fees for service users gives the users a strong incentive to ensure that their money is spent effectively and to request changes in the program if it is not. These characteristics also

make PES programs likely to be sustainable, because they depend on the self-interest of the affected parties, and not on philanthropy or the whims of donors.

36. In general, putting PES into practice in a specific watershed involves four broad, overlapping steps: (i) identifying and quantifying the environmental services involved; (ii) developing financing mechanisms that capture some of the benefits obtained by services users; (iii) developing compensation mechanisms to pay the service providers; and (iv) developing the institutional structure to implement these mechanisms. In principle, a PES program that brings together the suppliers of an environmental service and the users of that service should last forever, or at least for as long as the environmental services are required. Should payments end, the incentive to continue with the land uses that provide the services would also end, and land users would likely revert to the land uses that they had employed prior to the establishment of the PES program. PES programs, therefore, cannot be one-time activities. This has important implications for the design of the mechanism.

37. There has been considerable experimentation with PES approaches in recent years, particularly in Latin America. Two countries have created nationwide PES programs. Costa Rica led the way with its

Table 1.3: Examples of National and Local PES Programs in Latin America

<i>Program</i>	<i>Who pays?</i>	<i>What services do they want?</i>	<i>What do they pay for?</i>	<i>Who is paid?</i>
<i>National programs</i>				
Costa Rica PSA	Costa Rican society, through earmarked energy tax Water users GEF, on behalf of global community Carbon buyers	Water services Biodiversity conservation Carbon sequestration Scenic beauty	Conservation of native forest and reforestation	Private land users: <ul style="list-style-type: none"> • in biodiversity priority areas (GEF funding) • in specific watersheds (water user funding)
Mexico PSAH	Water users, through allocation of funds from water rates	Protecting water supplies	Avoiding deforestation	<i>Ejidors</i> in priority watersheds
<i>Subnational programs</i>				
Heredia, Costa Rica	Water users, through additional fee	Protecting the town's water supplies	Misc. conservation activities	Private landowners and protected areas in watersheds serving the town
Quito, Ecuador	Water utility and electric utility, by allocating part of the current revenues	Protecting the town's water supplies	Misc. conservation activities	Private landowners and protected areas in watersheds serving the town
Cauca Valley, Colombia	Local municipalities Irrigation water user associations	Protecting water supplies	Misc. conservation activities	Private landowners in sub-watersheds
Yamabal, El Salvador	Local municipality	Enhancing recharge of water sources	Land uses that promote infiltrations	Private landowners in recharge area of aquifer

Source: Pagiola and Platais, forthcoming

Pago por Servicios Ambientales (PSA) program, under which land users can receive payments for specified land uses, including new plantations and conservation of natural forests (FONAFIFO 2000; Pagiola 2002). The PSA program is supported by a Bank loan and GEF grant under the Ecomarkets program. By 2004, over 300,000 hectares of land were enrolled in the PSA program. In 2003, Mexico created the Payment for Hydrological Environmental Services program (PSAH), which pays for the conservation of forests in hydrologically critical watersheds using revenue from water charges (Bulas 2004). The Bank provided technical assistance to the development of this program.

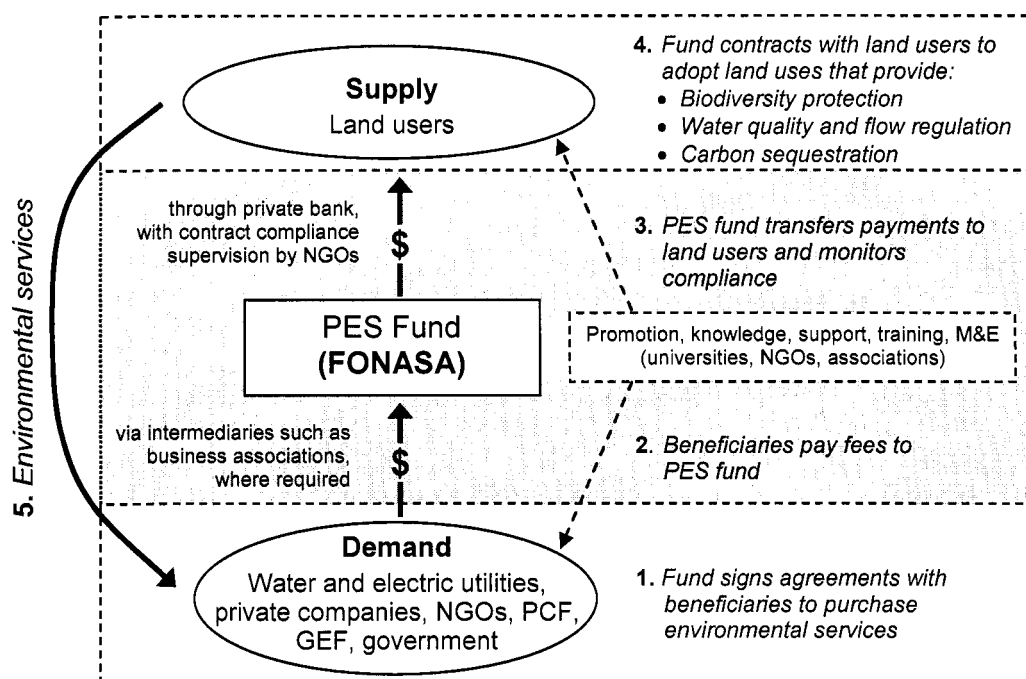
38. There have also been many smaller initiatives at the scale of individual watersheds (Pagiola and Platais, forthcoming). Many municipal water supply systems have adopted PES approaches to protect their water supplies. They range in size from several million people in Quito, Ecuador, to 3,800 people in Yamabal, El Salvador. Irrigation water user groups (in Colombia’s Cauca valley, for example) and hydroelectric power (HEP) producers (in Costa Rica, for example) are also paying to conserve the watersheds that supply them with water. Experiences worldwide indicate that environmental service payment systems can function under a wide range of conditions (see Table 1.3 for examples).

A System of Payments for Environmental Services for El Salvador – The Proposed Project

39. This project would focus on reducing land degradation, conserving remaining forested areas, promoting the reversion of marginal agricultural areas to forest, and encouraging more sustainable land use in agricultural areas.

40. A key component of the project is the creation of environmental service markets that would provide financial incentives to hillside farmers and other land users for adopting sustainable agricultural and other productive practices that would produce positive environmental externalities (GOES 2004). The project would create a framework for the application of PES approaches on a decentralized basis, responding to local needs and conditions in particular watersheds. The basic structure of the PES mechanism is illustrated in the figure below.

System of Payment for Environmental Services



41. This PES scheme would be piloted in priority areas in at least two watersheds that provide and enhance hydrological services to downstream users and contribute to biodiversity conservation. The pilot experiences would lead to a field-tested design of an institutional framework that could be applied to other areas of El Salvador that have similar resource management problems. Out of 14 conservation areas in El Salvador, a total of 5 pilot sites have been identified as viable pilots. The project would start in two areas (Lago Coatepeque–Los Volcanes and Jaltepeque–Jiquilisco) and expand to others based on experience and lessons learned from the initial sites.

42. El Salvador does have limited experience with local, self-organized environmental services markets. Several local communities have implemented such systems to solve specific problems: the small town of Yamabal (Morazán), for example, pays small farmers to protect its water source and enhance its recharge, while San Francisco de Menendez (Ahuachapán) contributes to the conservation budget of El Imposible National Park, in which its water source is located. Three localized systems that are functioning are described in Table 1.4. Further demonstrating the strong national interest in PES, the Mesa Permanente de Servicios Ambientales was established in 2000, as a forum linking the main stakeholders (MARN and other government agencies, national and local NGOs, representatives of interested local communities, academics) to analyze and promote private initiatives and projects related to the use of PES. The development of PES programs for El Salvador is based on initial lessons from these and other countries in Latin America.

Table 1.4: Characteristics of Some Local PES Initiatives in El Salvador

<i>Variable</i>	<i>Lago Coatepeque</i>	<i>Volcán San Salvador</i>	<i>Yamabal</i>
Environmental services	Scenic beauty, water quality	Scenic beauty, improved water infiltration	Dry season water supply
Who pays for the environmental services?	Owners of property around the lake	Local bank and members of the Chamber of Commerce	Households connected to municipal water supply system
Who is receiving the payments or incentives?	Maize and bean farmers on the hillsides above the lakes	Private landowners in the San Salvador Volcano area, part of the San Salvador aquifer watershed	Land users in recharge area of town's water supply
What land use systems are being promoted?	Conservation agriculture technologies	Reforestation, shade coffee, fruit trees	Conservation practices that promote infiltration
Implementing agency	FUNDACOATEPEQUE	Fundación Construcción Ambiente; Asociación Amigos del Volcán San Salvador	Municipal government

43. **Demand for Environmental Services.** An important lesson of PES programs worldwide is that they should begin from the demand side of the problem by understanding what services are important to service users in a particular area. The long-term sustainability of PES in any area depends on the continued willingness of these services users to pay. The principal beneficiaries of environmental services include domestic water supply systems, HEP producers, irrigation systems, fishers, recreational water users, riparian populations, and others. Some of these users are in the private sector, while others are represented by local or national public agencies. As noted, some of these service users have already demonstrated a high willingness to pay by actually paying into PES programs. Others remain to be convinced that doing so would be in their interest. The project will work with such service users to (i)

identify their needs; (ii) determine whether a PES approach would be appropriate; (iii) determine what kind of upstream land use changes would be required to address their needs; and (iv) develop appropriate financing mechanisms to capture the service users' willingness to pay. Table 1.5 summarizes the main service users at the pilot sites. In addition, the global community as a whole is a "service user" at each site; as noted below, the pilot sites have been selected in part for their potential importance to biodiversity conservation.

Table 1.5: Potential Demand for Environmental Services at Pilot Sites

<i>Site</i>	<i>Potential local environmental service purchasers</i>
Jaltepeque–Jiquilisco	<ul style="list-style-type: none"> • Water consumers, hospitality business sectors (e.g., hotels), fishing businesses, and irrigators.
Los Volcanes–Lago Coatepeque	<ul style="list-style-type: none"> • Downstream users, including water consumers, hospitality business sectors (e.g., hotels), and irrigators. • Lakeshore property owners who have already demonstrated a high willingness to pay, FUNDACOATEPEQUE

44. Cofinancing by Buyers of Environmental Services. FONASA will not initiate payments to service providers in a given PES scheme unless (a) an agreement is in place for the relevant service users to eventually take over the entire payment burden, including reimbursing FONASA for the transaction costs of running the PES mechanism; and (b) initial payments from service users have been received. Initially FONASA may use funding from the Bank loan or the GEF grant, as applicable, to match payments made by local service users. The contribution of service users to payments made to service providers will always be at least 50 percent and will gradually increase to 100 percent over a period of no more than 5 years. Ultimately having service users pay 100 percent is the only way to ensure sustainability; an initial subsidy from project funds can be useful to jumpstart the process and to help overcome initial resistance due to weak data and/or unfamiliarity with the approach, but this subsidy will be phased out quickly to avoid creating perverse incentives.

45. Integration of GEF funds and PES payments. GEF funds will be fully integrated in the PES system and used to finance the biodiversity services related to all the different land uses, taking into account location specific differences. In general, GEF funds will help (i) pay the upfront costs of establishing PES systems, as this will help create a sustainable mechanism to generate environmental services, including globally important environmental services; and (ii) contribute to actual payments when that is desirable (the global benefits justify such intervention) and necessary (e.g. because there either are no national payments or they are insufficient to justify land use change by themselves). GEF resources will be particularly important where land use changes require substantial up-front investments in tree planting, which is likely to make agricultural landscapes considerably more hospitable to biodiversity. In general, use of GEF resources will complement those made by local service users, who will ultimately carry the burden of the payments over the long term. In those cases where local service payments are insufficient to induce the desired land use change, but biodiversity benefits would be substantial, the project will seek to develop sustainable long-term financing arrangements (e.g. using endowment funds).

46. Supply of Environmental Services. Environmental services are generated by particular land uses, and so depend on the decisions made by land users. In El Salvador, this usually means small farmers, most of them poor. The project will work with such land users and organizations representing them to (i) identify land uses that respond to the needs of service users, are compatible with the land users' farming systems and objectives; (ii) agree on appropriate payments for land users who adopt the desired land use

changes; and (iii) develop mechanisms to contract with those who wish to participate, monitor compliance, and make payments.

47. **Land use modalities.** The provision of environmental services depends on the land uses that are undertaken. PES programs in Costa Rica and Mexico focus on forests. Forests will also be included in the El Salvador PES program. However, given the much higher pressure on land in this country, focusing on forests alone would be unrealistic. Thus, other land use modalities were identified that contribute to provision of environmental services such as hydrological services or biodiversity protection, while allowing agricultural production to continue, based on FAO research in the region, and studies conducted during project preparation. The GEF-financed Regional Silvopastoral Project in Colombia, Costa Rica, and Nicaragua and Hillside Agriculture project in Oaxaca, Mexico, have both demonstrated that silvopastoral and agroforestry practices, which mix trees in productive pastures and cropland, can bring substantial biodiversity and carbon sequestration benefits (see Annex 18).

48. Three broad categories of potential uses can be distinguished, as shown in Table 1.6. Each category of land use and each specific use within a category generates a different mix of services and has different implications in terms of cost and their insertion into farming systems. The choice of specific practices to be promoted in any given case will be made depending on local conditions, the needs of service users, and the preferences and constraints of land users, in consultation with all affected stakeholders. In most cases, a ‘menu’ of choices will be developed, from which land users who wish to participate can choose. The specific menu will differ from case to case.

Table 1.6: Potential Land Uses for El Salvador’s PES Program

<i>Land use</i>	<i>Main environmental services expected</i>
Forests (by conserving existing forest or by restoring tree cover through reforestation or natural regeneration)	Biodiversity protection, carbon sequestration, regulation of water flows and quality, reduction of environmental vulnerability to landslides, scenic beauty.
Mixed systems combining trees and agricultural production (agroforestry, silvopastoral practices, shade coffee, live fences)	Regulation of water flows and quality, reduction of landslide risk, scenic beauty, carbon sequestration, biodiversity protection.
Cultural practices in agricultural land (mulching, low tillage, live barriers, conservation works)	Regulation of water flows and quality, reduction of landslide risk.

49. **Landholder incentives to participate in PES.** Farmers are induced to participate in a PES program when they receive payment for the environment services they produce. The payment must be sufficient to compensate them for the difference in net returns they would obtain from the new land use compared to the net returns they obtain from their current land use. It is important to note that this payment will, in almost all cases, have to be provided on a continuing basis, not only for a few years. Experience in Costa Rica and elsewhere has demonstrated that land users do respond to such payments by changing their land uses. In the GEF-financed Regional Silvopastoral project, for example, the environmental service index of PES recipients increased by 0.19/ha, compared to 0.001/ha in a control group.⁵ Likewise, the index increased by 0.26/ha among PES recipients in Costa Rica, compared to and 0.09/ha in the control group, and by 0.17/ha among PES recipients in Nicaragua, compared to 0.12/ha in the control group.

⁵ The environmental service index was developed to estimate the expected impact of different land uses on biodiversity conservation and carbon sequestration in the GEF-financed Regional Integrated Silvopastoral Ecosystem Management Project. Its value ranges from 0.0 (degraded pastures and monoculture annual crops) to 2.0 (primary forest).

50. A key element in the design of the system is to select a suitable level of payment. If the level of payment is too low farmers will not be induced to change current land use practices. If the level of payment is too high, service users will be unwilling to pay and the system will not be financially sustainable. The project will have differentiated payments across pilot sites and to some degree within pilot sites. Specific details will be included in each contract. Some payment differences may well be operationalized in geographic targeting, e.g. at site A the project might offer to pay x for practice y, but only particular areas (e.g. riparian zones or steep slopes) might be eligible for that. As in the Silvopastoral project, the project would pay more when the expected services are greater (which depends on both specific practice and location). The project will experiment with payments for specific land use, no matter whether they had already been adopted earlier or paying for incremental change alone. This will be site specific lessons learned will be assess to know what works and what does not.

51. Based on the information collected at some of the pilot sites, some preliminary examples of the levels of payments necessary to induce farmers to adopt particular land uses were estimated:

- Protection of existing forest: US\$35–80/ha/yr. Demand has been estimated at 4,800 hectares or 40 percent of total contracts.
- Reforestation by natural regeneration: US\$40–80/ha/yr over a five-year period, followed by a lower payment to maintain the reforested areas in subsequent years. Demand has been estimated at 2,400 hectares or 20 percent of total contracts.
- Agroforestry (400 trees/ha or 3,000 trees/farm): US\$40–100/ha/yr (or US\$0.10–0.50/tree/yr). Demand has been estimated at 2,400 hectares or 20 percent of total contracts.
- Reforestation: US\$240–260/ha/yr (trees suitable for firewood production) or US\$160–200 (trees suitable for timber production) over a five-year period, followed by a lower payment to maintain reforested areas in subsequent years.

In a situation where ecosystems have already been highly degraded, as in El Salvador, payments need to be higher than they are in Costa Rica. Costa Rica has focused its PES program largely on protecting ecosystems in good condition. To do this, it needs to offer a payment sufficient to dissuade land users from switching to their next best alternative. But in El Salvador, land users have already switched. To induce them to switch back to a more environmentally sustainable land use requires offering a payment that not only compensates them for the difference in income, but also for the cost of making improvements (e.g. the cost of planting trees).

52. **Engaging all stakeholders.** The focus of this project requires a high level of community participation at the local level. Specifically, the success of the project will depend on the articulation of relationships at the local level between the rural farmer, the community, and the municipality. The project is designed to ensure mechanisms for participation of local stakeholders connected with the selected pilot sites and buffer zones, including municipal governments, private businesses, and local NGOs. For some proposed sites, local civic organizations are well organized and connected and could from the beginning provide excellent counterparts for the proposed intervention strategies. Other proposed sites would need greater investment at the beginning of project implementation to build capacity at the community level for effective participation in the project. At the national level, the project would work with civil society through the Mesa Permanente de Servicios Ambientales.

53. An important element that would be incorporated into the project is a targeted communication strategy that would be adapted to local conditions and based on an assessment of stakeholder attitudes, knowledge, beliefs, and governmental/institutional capacity to disseminate knowledge (see project Component 2 for details).

54. **Ensuring strong link to poverty alleviation goals.** Many land users, particularly in marginal areas such as upper watersheds, are poor. Thus, a critical dimension of creating markets for environmental services concerns its impact on the poor. These links are being considered during project preparation to identify and design the pilot markets, focusing on:

- Documenting the extent to which the poor are likely to be affected (for example, what proportion of potential service providers are poor) in the selected pilot sites
- Identifying the various potential mechanisms through which the poor might be affected, either positively or negatively
- Monitoring whether land use changes implemented by land users, such as converting land from productive use to conservation, negatively affects farmers who are landless or who lease farmland, and design mitigation measures if such impacts are observed.
- Developing guidelines, drawing on other country experiences, for piloting environmental service markets in the selected sites that aim to maximize positive impacts on the poor and avert potential negative impacts.

Annex 2: Major Related Projects Financed by the Bank and/or Other Agencies
EL SALVADOR: Environmental Services Project

Sector Issue	Project	Latest Supervision (PSR/ISR) Ratings (Bank-financed projects only)	
		Implementation Progress (IP)	Development Objective (DO)
World Bank/GEF			
Agricultural sector reform	Agricultural Sector Reform and Investment Project (PRISA) (P07167)	S	S
Land administration	Land Administration Project (P07174)	S	S
Biodiversity	Promotion of Biodiversity Conservation within Coffee Landscapes (GEF medium-size grant) (P056914)	S	S
Other Development Agencies			
Environmental and watershed management (IDB)	Program to Support National Environmental Management in El Salvador (PAES)		
Water management (IDB)	Modernization and Reform of the Water Resources Sector		
Sustainable Development (IDB)	Design of a Program for Sustainable Development of <i>Bajo Rio Lempa</i>		
Biodiversity conservation (UNDP)	Institutional and Technical Strengthening of MARN Enabling Activities for Biodiversity; Trifinio project		
Biological corridor (UNDP/GEF)	Mesoamerican Biological Corridor		
Biodiversity management (UNDP/GEF)	Strengthening National Capacities for Biodiversity Management		
Watershed management (IUCN)	Integrated Watershed Management for a Sustainable Water Supply in Benefit of the Local Population and Ecosystems in the <i>El Imposible-Barra de Santiago</i> Geographic Unity		
Natural resources management (USAID)	Management and Rational Use of Hydrological Resources		
Environment protection (DANIDA)	Protection and Conservation of Coastal Ecosystems in the Gulf of Fonseca		
Mangrove Forests and Damps Conservation/ Restoration (AECI)	Support to the Integral Management of Mangrove Forests and Coastal Damps		
Projection of Natural Areas (AECI)	Support to Management of the <i>Complejo Andes-Volcanes</i> Protected Areas		
Protection of Natural Areas (AECI)	Support to the Implementation of the Management Plan of Damps of the Eastern Coastal Plain		
Protection of Natural Areas (AECI)	Support to the Implementation of the Management Plan of the <i>Complejo Los Volcanes</i> Natural Protected Area		
Conservation of Natural Areas (AECI)	Conservation and Management of the Natural Protected Area <i>Laguna El Jocotal</i>		
Conservation of Natural Areas (Ramsar Agreement)	Restoration of the Natural Habitats of <i>Cerrón Grande</i> for its Conservation and Rational Use in El Salvador		

Annex 3: Results Framework and Monitoring
EL SALVADOR: Environmental Services Project

PDO/Global Environment Objective	Outcome Indicators	Use of Outcome Information
<p>Project development objectives are to (i) establish legal, institutional, and financial arrangements to pilot mechanisms of payment for environmental services, (ii) document links between land use changes and water services improvements and biodiversity conservation, (iii) define good practices to replicate, scale up, and sustain PES programs; and (iv) strengthen the capacity of MAG, MARN, community associations, and NGOs to support long-term development of environmental service markets in El Salvador.</p>	<p>PES mechanisms designed for at least two sites for contracting (buying and generating) environmental services in priority areas, including functioning M&E systems.</p> <p>At least 12,000 hectares under environmental service contracts that contribute to biodiversity conservation as demonstrated by specific indicators for vegetation cover, land use practices and habitats restoration.</p> <p>Institutional arrangements for facilitating PES mechanisms management and learning established, properly staffed, and resourced to continue beyond the EOP to replicate and scale up PES program.</p> <p>MARN and FONASA use state of the art techniques and procedures to monitor data on implementation and impacts of the pilot PES mechanisms: vegetation cover, land use practices, landform, ecosystems and habitats, in the dimensions of composition, structure and function, water discharge, sediment production and transport, biochemical oxygen demand (BOD) and total suspended solids.</p>	<p>YR1-YR4: determine if operational manual for PES system needs to be adjusted to refine market instruments. YR4 feed into strategy for replicating PES.</p> <p>YR1-YR3: Low implementation levels may indicate ineffective institutional arrangements or poor selection of land uses promoted by the PES system. YR4-YR5 feed into strategy for replicating PES program.</p> <p>YR1-YR5: Assess whether institutional arrangements are sufficient to establish and maintain PES program. Make adjustments as needed.</p> <p>YR1-YR5: Monitoring institutional capacity to design and implement methodologies to measure the impact of land use changes on environmental services. Adjust institutional strengthening activities if needed.</p>

	<p>Twenty percent participation of women landowners and women's organizations in payment for environmental services.</p> <p>MARN and FONASA use the information to evaluate and draw conclusions on (i) the links between land use changes and environmental services, (ii) buyers' responses, (iii) community acceptance of the PES mechanism, and (iv) sustainability of the mechanism measured by the ratio of payments from local buyers of ES and FONASA's operational costs.</p>	<p>YR1-YR5: Assess whether targeting milestones are being accomplished and make adjustments.</p> <p>YR1-Y5 results of monitoring all indicators to feed into strategy for replicating PES program.</p>
<p>The global environment objective of the project is to enhance and protect biological diversity and preserve important forest and protected ecosystems</p>	<p>Increased biodiversity conservation in the project sites measured by indicators of landform, ecosystems and habitats, in the dimensions of composition, and structure.</p> <p>Increased water services in pilot watersheds measured by reduction of sediment production and transport, biochemical oxygen demand (BOD) and total suspended solids.</p> <p>Reduction in erosion rates, sediment transport and suspended solids in selected watersheds.</p>	<p>YR3-YR5: Monitoring of land use changes impact on biodiversity to assess effects.</p> <p>YR3-YR5: Monitoring of water quality impacts from land use changes. Used to adjust types of land use changes and volume of changed needed to generate increased water quality.</p> <p>YR3-YR5: Assess land use changes on reduction in erosion rates and water sediment transport to understand level of land use intervention need to reduce soil degradation.</p>

Intermediate Results (One per Component)	Results Indicators	Use of Results Monitoring
<p>Component One: MARN develops a system of contracts for environmental services in pilot sites.</p>	<p>Component One : FONASA legally established PES program is operational in each pilot area Contract compliance monitoring established.</p>	<p>Component One: YR1-YR4: Evaluate institutional arrangements for implementation of component and operational manuals for PES program. YR5 feed into strategy for replicating PES program. Project monitoring assessment; determine adequacy of incentives for land use change and willingness to pay for ES on a continuing basis.</p>
<p>Component Two: MAG, MARN, Local Communities, and NGOs have institutional capacity to establish and maintain partnerships within the government, the private sector and civil society that support long term environmental service markets.</p>	<p>Component Two: 60-80 percent of stakeholders aware of the importance of environmental services. Methodologies developed, tested and implemented to identify and assess environmental services needs of private sector and assessment of land owners environmental services function to provide service. 15 NGOs with capacity to provide TA to ES contract holders.</p>	<p>Component Two: YR1-YR2: Determine effectiveness of capacity building activities and MARN message to project partners. YR3-YR4: Use results to improve message to project partners. FY05: Use results to feed strategy for replication in future projects. Y1-Y5: Assess capacity to assess environmental services needs of private sector and design of effective land use changes to produce desired change. Make adjustments in designs as needed.</p>
<p>Component Three: National project coordination unit established, operational, and endowed with capacity to plan and implement programs and projects for markets for environmental services.</p>	<p>Component Three: PCU and FONASA staff selected, trained and evaluated annually according to transparent criteria as defined in the Operation Manual.</p>	<p>Component Three: Y1-Y5: Annually assess functioning of project human resources in implementing project activities and make necessary adjustments.</p>

	<p>Methodologies to assess biodiversity and water services improvements in small watersheds developed, tested and operational.</p> <p>Semiannual learning workshops held with project beneficiaries to review learning's and identify good/replicable practices.</p> <p>Specific recommendations made for best land uses to improve water services, and/or enhance habitats to sustain higher biodiversity for replication strategy of PES program.</p>	<p>Y2-Y5: Assess whether methodologies are effective in measuring impact of land use changes on environmental services.</p> <p>Y1-Y5: Assess whether lessons are being learned and used to improve PES program..</p> <p>Y1-Y5: Confirm that mechanisms are functioning to monitor impacts of land uses and environmental services.</p> <p>Y1-Y5: Assess whether learning's are being used to replicate PES program</p>
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Arrangements for results monitoring

1. The project would be guided by semiannual learning reviews of project results to coincide with Bank supervision missions on which basis MARN/FONASA and the Bank would identify specific measures to: (i) address any areas of implementation weaknesses; and (ii) adapt project design to ensure objectives are met. These measures for improvement would be reflected in the MARN/FONASA quarterly learning reports and their proposal for the forthcoming year's Annual Implementation Plan including project budget. It is expected that MARN/FONASA would involve third party, independent evaluators for environmental contract monitoring and use the National Land Studies Service (SNET—an independent agency of MARN) and other third party evaluators to perform technical biodiversity, carbon sequestration, and water quality impact studies.

2. Institutional issues: Monitoring and evaluation of project outcomes/results (both intermediate and end of project) will be coordinated by the Project Coordination Unit (PCU) and FONASA. Trained staff from specialized agencies and NGOs will have the responsibility to collect and analyze field data, while MARN, MAG, and the PCU will archive and distribute relevant and timely information to assist in effective decisionmaking for project management.

3. The monitoring and evaluation process will function as a mechanism for assessing project impacts and as a day-to-day management tool. An M&E system will be developed to provide accountability and to strengthen the capacity of MARN and FONASA for planning and monitoring of overall project activities. The M&E system will also support the project supervision process by ensuring that baseline and follow-up data for the key performance indicators are collected and made available on an ongoing basis and at strategic times including project start-up (underway before project effectiveness), midterm review and project closing. A baseline study will be carried out at inception, and follow-up evaluations at both midterm and project closing. Site-specific baselines studies will be performed before work begins in the pilot area. Site-specific follow-up evaluations will be carried out to measure impacts of land use changes on anticipated environmental services. Specific project implementation monitoring data will be

provided on agreed upon report formats, included in the operations manual, and will be required for the twice-yearly supervision missions. MARN will develop the project monitoring system that would record the financial and procurement management, planning, physical implementation, performance of local technical assistance, and development objective indicators from the project's Results Framework.

4. The PCU will also monitor the financial management for the project as a whole. Financial information on inputs, outputs, budgeting, treasury, accounting, and audits would be monitored. The project will send to the Bank quarterly financial management and procurement reports. Monitoring and processing of procurement of services, goods, works, and sub-projects would be carried out by the PCU. The annual planning processes would be monitored with specific indicators on planning performance defined in the Results Framework. The physical implementation of the project would be monitored based on the specific outputs and monitoring indicators for the project components as defined in the Results Framework. Information from the monitoring system would be analyzed by project management and disseminated according to the project's communication strategy to appropriate stakeholders. The project would provide the Bank with progress reports every quarter and an update on legal covenants compliance every six months.

5. **Data collection:** The PCU will coordinate collection of component results indicators. Data for monitoring and evaluation of Component 1, Design and Establishment of Environmental Services Markets, will come from the geographic information and statistical reports from NGOs acting as PES transaction intermediaries. These NGOs will also monitor contract compliance from farmers in the pilot watersheds areas and from the external annual audits.

6. **Semiannual Evaluations.** A key objective of the project is learning how to implement an effective PES program in El Salvador. Semiannual learning workshops are planned to coincide with supervision missions to identify and discuss lessons learned during project implementation with project stakeholders and beneficiaries. The PCU will submit quarterly reports on lessons learned and plans for incorporating those lessons into future activities.

7. **Midterm evaluation.** The Bank's supervision team, together with a team of external reviewers and key stakeholders, will conduct a midterm evaluation of project execution. It will be conducted no later than three years after of the first disbursement. The external review will focus on (i) progress in achieving project outcomes, (ii) institutional arrangements for project implementation, (iii) operational manual[s] for payments for environmental services mechanisms, (iv) effectiveness and suitability of the monitoring system, and (v) review of both the project implementation plan and general project operation manual. In preparation for the MTR the PCU will prepare reports on the key elements of the PES system: (i) perceptions from key stakeholders; (ii) assessment of institutional arrangements and recommendations; (iii) scientific lessons from the links between land use and environmental services; and (iv) progress on biodiversity conservation.

8. **Final Evaluation.** A final evaluation will be conducted in the last semester of project execution. The key objectives of the final evaluation will be to (i) assess attainment of the expected project results, (ii) use the results to design a strategy for replication in future projects, and (iii) design a strategy for mainstreaming future PES programs.

Arrangements for Results Monitoring

Outcome Indicators	Baseline	Target Values					Data Collection and Reporting			Responsibility for Data Collection
		YR1	YR2	YR3	YR4	YR5	Frequency and Reports	Data Collection Instruments		
PES mechanisms designed for at least two sites for contracting (buying and generating) environmental services in priority areas;	None	---	1	1			Yearly project reports	MTR and Impact Evaluation Studies	Project Coordination Unit (PCU)	
At least 12,000 hectares under environmental service contracts that provide environmental services in biodiversity conservation and/or water services.	None	---	2,400	4,800	4,800	---	Quarterly and Annual project implementation reports	Project management information system	MARN/PCU	
Institutional arrangements for facilitating PES mechanisms management and learning established, properly staffed and resourced to continue beyond the EOP to replicate and scale up PES program.	None	20%	40%	60%	80%	100%	Quarterly and Annual project implementation reports	Project management information system	MARN/PCU/FONASA	
MARN and FONASA use state of the art techniques and procedures to monitor implementation and impacts of the pilot PES mechanisms: vegetation cover, land use practices, landform, ecosystems and habitats, in the dimensions of composition, structure and function, water discharge, sediment production and transport, biochemical oxygen demand, and total suspended solids.		50%	100%				Annual project reports	Reports	MARN/SNET/FONASA	

Twenty percent participation of women landowners and women's organizations in payment for environmental services.	Baseline	10%	12%	15%	18%	20%	Annual Beneficiary Assessments	Studies	MARN/FONASA
Increased biodiversity conservation in the project sites measured by indicators of landform, ecosystems and habitats, in the dimensions of composition, and structure.	Baseline			MTR		EOP	Site specific evaluations	Specialized surveys	SNET
Increased water services in pilot watersheds measured by reduction of sediment production and transport, biochemical oxygen demand (BOD) and total suspended solids.	Baseline	50%	80%	80%	100%	100%	Site specific monitoring design	Continuous monitoring and Studies	SNET
Reduction in erosion rates, sediment transport and suspended solids in selected watersheds.	Baseline			MTR		EOP	Site specific evaluations	Studies	SNET
MARN and FONASA use the information to evaluate and draw conclusions on (i) the links between land use changes and environmental services, (ii) buyers' responses, (iii) community acceptance of the PES mechanism, and (iv) sustainability of the mechanism measured by the ratio of payments from local buyers of ES and FONASA's operational costs.				MTR		EOP	Special reports for MTR and EOP assessment	Studies	MARN/FONASA

Results Indicators for Each Component												
Component One : FONASA legally established	---	100%							YR1 Annual project implementation report	Records in MARN/PCU	MARN/PCU	
	---	1	1						Quarterly and Annual project implementation reports	Project management information system	MARN/FONASA/PCU	
			100%	100%	100%	100%	100%		Quarterly and Annual project implementation reports	Project management information system	MARN/FONASA/PCU	
Component Two : 60-80 % of stakeholders aware of the importance of environmental services. Methodologies developed, tested and implemented to identify and assess environmental services needs of private sector and assessment of land owners environmental services function to provide service.		60%	75%	80%	80%	80%	80%		Beneficiary Assessments	Studies	MARN/FONASA	
	---	50%	100%	100%	100%	100%	100%		Annual project reports	Project management information system	MARN/FONASA	
		40%	70%	100%	100%	100%	100%		Yearly report for each project area	Survey	MARN/PCU	
Component Three: PCU and FONASA staff selected, trained and evaluated annually according to transparent criteria as defined in the Operation Manual.		PCUFONASA Staffed	Eval	Eval	Eval	Eval	Eval		Annual performance evaluation for PCU and FONASA staff		MARN/FONASA	

	---	Developed	Test	Test	Op	Annual project reports, MTR, EOP	Studies	MARN/FONASA
Methodologies to assess biodiversity and water services improvements in small watersheds developed, tested and operational.	---							
Semiannual learning workshops held with project beneficiaries to review learning's and identify good/replicable practices.	---	2	2	2	2	Project reports		MARN
Specific recommendations made for best land uses to improve water services, and/or enhance habitats to sustain higher biodiversity for replication strategy of PES program.	---					Annual project reports	Semi-annual learning workshops	MARN/FONASA and key stakeholders

Annex 4: Detailed Project Description

EL SALVADOR: Environmental Services Project

Background:

1. El Salvador, the smallest country in Central America, has the largest population density in Latin America. Due to increasing population pressure and the potential threat to the country's already overexploited natural resource base, the Government of El Salvador has developed a strategy to conserve and sustainably use its rich natural resource base for the national development and environmental conservation agendas. The government's strategy focuses on:

- Combating land degradation through changes in land use, particularly on hillsides;
- Improving water resources management;
- Improving biodiversity conservation by consolidating and improving management of the natural protected areas system; and
- Promoting public participation and widespread government involvement (through sector ministries) in the design and implementation of a decentralized, participatory, environmental management strategy and the building of local capacity in the process.

2. A key element of the strategy is to develop environmental service markets as an incentive for land owners to adopt land use practices that would produce benefits to other stakeholders including private sectors, municipalities, and both local and global society as a whole. The development of markets for environmental services is based on lessons from existing initiatives in Lago Coatepeque and Yamabal in El Salvador and in other countries of Latin America. To achieve the goal for developing the environmental service markets, the Government of El Salvador, through the Ministry of Environment and Natural Resources (MARN), requested support from the World Bank and the Global Environmental Facility (GEF).

3. The objective of the El Salvador Environmental Services Project is to pilot the establishment of market mechanisms for payments for environmental services that would provide a body of experience and learning to replicate an effective PES program in other areas in El Salvador. The project is expected to generate significant national benefits, primarily in the form of improved water resource management. Because of El Salvador's unique forest and mountain ecosystems, including mangroves and critical ecosystems within the context of the Mesoamerican Biological Corridor, the project is also expected to contribute significant global environmental benefits.

4. The direct beneficiaries of project activities include farmers and community members, women, small landholders, NGOs, the private sector, and municipalities in the targeted sites.

Components:

Component 1: Design and Implement a Program of Payments for Environmental Services (\$8.976 million, of which \$2.472 million from GEF).

5. The main objective of this component is to support the development of environmental services markets in which (i) land users who adopt or maintain land use practices that generate valuable local, national, and global environmental services would receive payments for doing so, and (ii) service users pay for the improved services they receive. To achieve this objective, this component will design and implement an environmental services fund (the Fondo Nacional de Servicios Ambientales, FONASA), create several mechanisms that would implement the PES approach in two to five priority watersheds, and develop procedures to replicate the approach more widely.

6. The PES program administered by FONASA will be implemented through individual PES mechanisms established in target sites. This follows the lessons of other PES efforts, which indicate that PES mechanisms need to be adapted to site-specific conditions to be efficient. While following broad guidelines set by FONASA, the details of individual mechanisms will therefore differ in terms of the specific services they seek to generate, the land uses they support, the payments they offer for maintaining those land uses, and the specific contractual arrangements with participating land users. The project would support the provision for enhancing biological diversity and/or encouraging changes in land use practices that generate global environmental benefits. Overexploitation of critical ecosystems will be reduced in the project sites, including buffer zones and corridors of global significance. The GEF resources will be utilized for supporting these provisions for the achievement of the project's global environment objective. A clear set of criteria is being developed to assess eligible activities, the expected benefits, and the level of payments for these activities.

7. FONASA operations will be guided by an Operations Manual, which will specify the procedures for assessing the applicability of the PES approach at potential sites and guide the actual development of individual PES mechanisms at the selected sites. Site selection will be based on factors such as the likely national and global environmental benefits that would be generated, the presence of service users willing to pay for the services they seek to obtain, the willingness of land users to change their land use practices in exchange for suitable compensation, and the existence of institutions that can help implement a PES mechanism. An initial version of this manual will be prepared prior to the beginning of implementation, but it is expected that the manual will be revised frequently during implementation to incorporate lessons learned.

8. The main outputs of this component include (i) FONASA legally established and functioning; (ii) PES mechanisms functioning at between two and four individual sites, with service users paying into FONASA, which will in turn pay land users that adopt eligible land use practices, and with appropriate contracting, technical assistance, and compliance monitoring measures in place; (iii) the operational manual for the program has been improved, allowing replication of the approach at additional sites; (iv) providers of technical assistance meet the demand of the market while ensuring that there is monitoring of compliance by environmental services providers with the terms of their contracts.

9. Key inputs for the success of this component include (i) providing the necessary resources for FONASA to implement the activities; (ii) providing adequate resources to design and implement the operational manual; (iii) selecting and training competent TA providers; and (iv) establishing a technical and financial control system and a field monitoring system.

10. Based on these pilot experiences, an analysis will be carried out during project years three and four to create a replication strategy for widespread development of environmental services markets in the country.

Sub-Component 1.1: Creation of Payments for Environmental Services Fund (FONASA) (\$0.940 million, of which \$0.244 million from GEF)

10. The aim of this sub-component is to create a management structure for the Environmental Services Fund (FONASA). The three key outputs are the selection, in a transparent manner, of a local bank to administer FONASA, signing the contract with the administrator, and appointment of members of the Board of Directors and its Executive Director along with supporting staff. Members of the Board will be representatives of major stakeholders including MARN, MAG, NGOs, the private sector (ANEP), a farmers association, and a water association. A clear set of criteria would be defined for the selection of the Board along with its roles and responsibilities and their terms of service.

11. For the smooth functioning of the Board and FONASA, a small staff will be hired to support the Executive Director, including natural resources management and promotion/public relations specialists. To ensure the credibility of FONASA and accountability to the services buyers who pay into FONASA, one of the key responsibilities of the Executive Director is to ensure that all the environmental services and technical assistance contracts have been implemented on the ground as per the signed contracts and that the resulting impact on environmental service generation is closely monitored. Although direct monitoring of compliance with environmental service contracts is continuously carried out by the technical assistance staff, NGOs, and other contracted parties, accountability rests with the Executive Director.

Sub-Component 1.2: Design of a System of Payments for Environmental Services (\$0.220 million, of which \$0.110 million from GEF)

12. The aim of this sub-component is to establish the detailed design of the PES mechanisms at each pilot site and the continuous updating of FONASA's operational manual based on lessons learned. The outputs of this sub-component would ensure that each of the land use modalities—agroforestry, forest management, conservation, reforestation, afforestation, and sustainable agricultural production systems—are defined for each site including level of payments by modality for all the project sites. Furthermore, activities under this sub-component are designed to provide precise information about priority areas within each project site, including the costs and benefits of environmental services and level of payment.

Sub-Component 1.3: Functioning of the System of Payments for Environmental Services (\$1.575 million, of which \$0.577 from GEF)

13. The activities under this sub-component are designed to ensure that the system of payment for environmental services is functioning for the buyers and sellers of the environmental services to enter and/or exit the market. Since no market exists at the beginning of the projects, some of the activities envisaged under this sub-component will ensure that awareness has been raised so as to “level the playing field” at the beginning of project implementation for small, medium, and large land users to participate in the market. Care must be taken to ensure that the market is not dominated by any particular stakeholder group that could distort the market and create barriers for marginalized groups to enter and/or exit the market. Care must also be taken that perverse incentives are not created that lead service users to expect FONASA to fully finance environmental service provision without their contribution.

14. Technical assistance (TA) providers are one of the key stakeholders in ensuring that potential land users are aware of these new incentives. They will assess eligibility and facilitate the process for the land users to contact the FONASA administrator to enter into an environmental service (ES) contract. They also will monitor compliance with the terms of ES contract by the land users. A monitoring mechanism will be established by the Executive Director of FONASA to conduct technical audits to ensure that the ES and TA contracts have been implemented on the ground as per the signed contracts. Any breach of the contract by a TA provider will result in termination of the contract and suspension of the TA license.

Sub-Component 1.4: Expansion and Replicability the System of Payments for Environmental Services (\$0.66 million, of which \$0.33 million from GEF)

15. To expand the system of payments for environmental services to the national level, semiannual learning workshops are planned with project beneficiaries and stakeholders to identify and evaluate which aspects of the PES program are functioning well and could be considered best practices and which need to be improved or discontinued. Additionally, a comprehensive assessment of the project will be carried during years three and four of project implementation to assess lessons learned and to devise a replication

plan to expand the system at the national level. The analysis will also draw lessons from other similar programs in the region and make specific recommendations to ensure the financial sustainability of the program. During years two and three an endowment fund will be design for long-term financing of global biodiversity conservation benefits for which there is not local demand. The model for this fund would be the Mexico and Peru Conservation Funds. It is anticipated that this fund would be capitalized by donations from bilaterals and international NGOs. Studies will also be conducted to design a carbon finance program as part of the PES program.

Sub-Component 1.5: Environmental Services Fund (FONASA) (\$5.581 million, of which \$1.210 million from GEF)

16. The output of this sub-component, along with the activities envisaged in the other sub-components described above, is establishment of the environmental services fund (FONASA). The fund would provide IBRD and GEF co-financing at the beginning of the project for private sector contracts that need initial support to demonstrate the value of the system and foster confidence in the PES program. It is envisioned, based on analysis of initial demand, that beneficiaries of the environmental services would provide at least US\$2 million to the fund during the project. A critical rule of the fund is that the share of payments being financed by service users at any given site will always be at least 50 percent, with this share gradually increasing according to an agreed schedule until service users are fully responsible for paying service providers plus the costs of operating the PES mechanism itself (the latter being capped at a specific percent of the flow of funds).

Component 2: Institutional Strengthening (\$2.990 million, of which \$1.775 million from GEF)

17. The objective of this component is to strengthen the capacity of national institutions (MAG, MARN), community associations, NGOs, and academic institutions to support long-term development of environmental service markets in El Salvador. This component coincides with GOES strategy to promote intersectoral approaches and strengthen the participation of civil society in environmental management. MARN will carry out activities to create an enabling environment for the development of a market of environmental services in El Salvador, identify financial sources for the program, and consolidate FONASA.

18. A key outcome from this component will be to create awareness among project stakeholders of the importance of environmental services, how they benefit from them, and how they can participate in the program of payments for environmental services to obtain a continuous supply of them.

19. As part of the institutional strengthening, MARN/PCU, SNET, FONASA, MAG, and municipalities will be provided with equipment and training to assess global environmental benefits generated through the ES contracts.

Sub-Component 2.1: Equipment (\$0.315 million, of which \$0.129 million from GEF)

20. The objective of this sub-component is to provide MARN, SNET, and MAG with the required resources to carry out their activities. It includes the acquisition of basic office equipment, vehicles, hydrologic and biodiversity monitoring equipment, and other goods that will strengthen their capacity to carry out the rest of the activities of this component. MARN will provide the office space and communications services to the unit. The incremental resources from GEF will be used to acquire both goods and equipment.

Sub-Component 2.2: Training, Awareness Raising, and Capacity Building (\$0.948 million, of which \$0.624million from GEF)

21. This sub-component will allow MARN to organize annual workshops and field trips for training, raising awareness including through technical publications and local and international dissemination, and capacity building for MARN, MAG, the FONASA Board, municipalities, and NGOs involved in the development of the PES program. Given that these organizations will be the main agencies involved in implementing the project, it is necessary to train them on topics related to environmental services markets and expose them to ES systems developed or under development in other countries. Training will also be provided on managing both projects and programs.

Sub-Component 2.3: Identification of Potential Buyers of Environmental Services (\$0.550 million, of which \$0.319 million from GEF)

22. This sub-component will focus on providing financial sustainability to the program of payments for environmental services in El Salvador. The process of market development implies identifying the ES, estimating its production function, quantifying its value, identifying potential beneficiaries, and negotiating ES purchase agreements with them. The process requires conducting studies to identify the demand for the ES, gather basic information on their supply (source and quantity), value them, conduct benefit/cost analysis to persuade potential buyers to enter the PES program, and prepare proposals to be presented to potential ES buyers. GEF resources assigned to this sub-component will be used to conduct the above mentioned activities, and they will be complemented with GOES and IBRD resources. By the end of the project it is expected that MARN and FONASA will have capacity to continue this process of market development.

Sub-Component 2.4: Promotional Campaign (\$0.440 million, of which \$0.275 million from GEF)

23. An important part of market development is to raise awareness at all levels of society about the importance of the environmental services and about how a PES system works. It is necessary to gain ample support of the general population of the country. Although El Salvador's environmental sector is aware of the importance and functioning of a market for environmental services, it is also necessary to reinforce this knowledge. The campaign will be oriented at gaining support from the general population, the public and private sector, water supply utilities, electricity utilities, and other private and public sector agencies that benefit from environmental services. In addition, the campaign will be oriented at promoting incorporation of land users into the PES program. The incremental resources from GEF will be used to design the campaign, prepare printed and audiovisual materials, and implement the campaign. MARN personnel will provide general guidelines for the design and implementation of these three activities.

Sub-Component 2.5: Strengthening Technical Assistance Providers (\$0.737 million, of which \$0.429 million from GEF)

24. Technical assistance (TA) providers are one of the key stakeholders in ensuring that potential land holders are aware of new incentives, assessing eligibility, and facilitating the process for the land users to contact the FONASA administrator to enter into environmental service (ES) contracts. They also are responsible for monitoring compliance by land users with the terms of the ES contracts. Land users participating in the PES program will need technical assistance to implement the contract signed with FONASA. Activities will be carried out to strengthen the capacity of the TA providers to ensure that land users receive appropriate assistance. Training of the TA providers will be contracted in three phases: (a) evaluation of their technical and administrative capacity, (b) design of the training program, and (c) implementation of the training. It is expected that training will be conducted during the first and second

year of the project. MARN will provide the technical support to design the training and GEF resources will finance the training itself.

Component 3: Project Management and M&E (\$2.554 million, of which \$0.752 million from GEF)

25. This component focuses on project management mechanisms including monitoring and evaluation (M&E) plans to implement the project. The component envisages supporting new and existing institutional entities and mechanisms at the national level for overall project coordination and supervision and would help to strengthen the effectiveness and quality of project operations. In addition, a strong monitoring and evaluation mechanism will be in place to measure performance at various project milestones including on-the-ground monitoring of environmental services contracts and monitoring of the impacts of land use changes on environmental services.

26. The component will finance costs for consultant services and equipment to carry out managerial, financial, and technical coordination through a Project Coordination Unit (PCU). PCU staff will include a coordinator, administrative assistant, accountant, and procurement specialist. A summary of project management activities and functions divided between the three subcomponents—Human Resources, Planning, and Monitoring and Evaluation—is provided below. A more detailed description on functions, responsibilities and associated procedures is found in the project implementation plan and operations manual.

Sub-Component 3.1: Human Resources (\$0.516 million, of which \$0.259 million from GEF)

27. Qualified personnel and a stable team are key factors for project success. The PCU and FONASA are expected to implement a rigorous system of personnel selection, evaluation, and performance incentives. Selection of personnel will be carried out by a private firm contracted for this purpose. The firm will create the short list, interview, evaluate, and nominate the candidates to be confirmed by MARN for the PCU and by the FONASA Board for the FONASA staff. Annual performance evaluations would be conducted by external firms based on benchmarks for each position included in the terms of reference. While the project is fully integrated, one key capacity to be developed in MARN and FONASA is the ability to monitor the global environmental benefits of the payment for environmental services program.

28. The administrative staff in the PCU will carry out the overall financial management functions of administering and controlling project financial flows. Detailed financial operation procedures are provided in the operations manual which defines the processes for budgeting, accounting, treasury, internal control, and auditing. During preparation, consultants will be hired to design and install a project management information system. The Project's Plan of Accounts would be broad and flexible enough to accommodate the needs of the government's budget and audit agencies and the Bank.

29. Standard World Bank Financial Management Reports (FMRs) would be generated from this system and sent to the Bank on a quarterly basis. The PCU would coordinate annual budgeting with the Ministry of Finance to ensure timely release of counterpart funds. The PCU would operate the project's IBRD and GEF Special Account. The Bank would approve the private accounting firm and terms of reference used for auditing the project's annual financial reports, which would be presented within four months after the end of the accounting period.

30. *Procurement.* The PCU would process all procurement carried out during the project. Detailed procurement procedures are included in the operations manual. These procedures include how each type of procurement will be evaluated and selected with associated evaluation tables and methodology. Contract management arrangements for each type of contract are also defined. A procurement information system, as part of the project management information system, will be installed in the PCU, which will

allow for coordination and timely exchange of procurement-related information and generation of the Procurement Management Reports on a quarterly basis.

Sub-Component 3.2: Planning (\$0.625 million, of which \$0.011 million from GEF)

31. Annual implementation plans (AIPs) would be prepared by the PCU and FONASA. The plans would reflect the activities, goals, and objectives of each component and the planned outputs, including the financial and human resources needed to complete the plans. The AIP will be the principle tool for coordination between MARN, the PCU, and FONASA. AIPs would have to be presented before the new budget year begins. These plans would analyze how much of the previous plan was actually accomplished and recommend changes to correct shortfalls, if justified. The annual operating plans would be approved by MARN and the FONASA Board.

Sub-Component 3.3: Monitoring and Evaluation (\$1.412 million, of which \$0.483 million from GEF)

32. In view of the innovative nature of the project approach, special attention will be paid to establishing a rigorous monitoring and evaluation system. The envisioned M&E system will consist of six modules: (i) a computerized monitoring system that will continuously track progress on a set of process indicators and feed into management's decisionmaking in almost real time; (ii) environmental services contract compliance; (iii) a beneficiary assessment module, which will provide on an biannual basis the target group's perceptions and reactions about project progress; (iv) global environmental benefits module that includes impact evaluations, which will quantify in statistical terms the impact and global benefits that can be attributed to the project ; (v) site-specific pilot monitoring to assess what other types of land uses can generate similar environmental services being sought by purchasers; and (vi) auditing and supervision missions, which will review the technical and fiduciary aspects at least every six months, and more often if required.

33. Given the pilot nature of the project, an intensive monitoring effort will be conducted to ensure that learning is abundant and internalized on both the physical land uses being undertaken (and their effectiveness in generating the desired services) and on institutional arrangements. Specific mechanisms for monitoring quality and quantity of water, sedimentation, biodiversity, and carbon sequestration will be developed to monitor and clarify links between land uses and environmental services.

34. *Project Management Information System (PMIS)*. As part of preparation, a PMIS would be prepared and installed in the PCU. The system would consist of planning, financial, procurement, human resources, evaluation, monitoring, risk management, and communications modules. Some of the modules would be designed specifically for the project and others would utilize off-the-shelf software and standard databases, word processing, and spreadsheet packages. The project must have the system installed and operational as a Condition of Effectiveness.

35. *Risk Management*. the PCU would be responsible for defining and implementing the risk management mechanism for the project. This would include processes and tools for (i) identifying and describing internal and external potential risk events; (ii) quantifying the probability and impact of potential risks; (iii) preparing a risk response plan that defines potential risk mitigation measures; and (iv) risk response control that focuses on monitoring potential risks, regularly updating the risk management plan, archiving outdated risks, adding new ones, and continuing the cycle from risk identification through risk mitigation. The PCU coordinator would carry out risk management functions by working with the technical specialist and other team members to update and present the risk management plan at the coordination unit's regular meetings.

35. *Communications*. Given the project's approach, a specific communication strategy and program will be developed. A communications audit will be carried out as part of project preparation and a communication strategy acceptable by the Bank will be prepared by a specialized consultant. The strategy

supports a communication program to (i) disseminate information about the project's objectives, implementation strategy, and eligibility criteria; (ii) establish a two-way channel to motivate stakeholders and ensure ownership by beneficiaries; and (iii) build a mechanism for dialogue and exchange of information between stakeholders. The communications strategy will provide inputs for execution of Sub-Component 2.2: Training, Awareness Raising, and Capacity Building.

Annex 5: Project Costs
EL SALVADOR: Environmental Services Project

Component Cost Summary (US\$ '000)

Component and/or Activity	Local	Foreign	Total
1. Design and Implement a System of Payments for Environmental Services	8,176.0	800.0	8,976.0
1.1 Creation of Payments for Environmental Services Fund (FONASA)	855.0	0.0	855.0
1.2 Design of a System of Payments for Environmental Services	0.0	200.0	200.0
1.3 Functioning of the System of Payments for Environmental Services	1,450.0	0.0	1,450.0
1.4 Expansion and Replicability of System of PES	0.0	600.0	600.0
1.5 Environmental Services Fund Contingency	5,255.0	0.0	5,255.0
	616.0		616.0
2. Institutional Strengthening	2,890.3	100.0	2,990.3
2.1 Equipment	186.5	100.0	286.5
2.2 Training, Awareness Raising, and Capacity Building (Training on ES to MARN, MAG, FONASA Board, municipalities, and NGOs)	862.0	0.0	862.0
2.3 Identification of Potential Buyers of Environmental Services	500.0	0.0	500.0
2.4 Promotional Campaign	400.0	0.0	400.0
2.5 Strengthening Technical Assistance Providers	670.0	0.0	670.0
Contingency	271.8		271.8
3. Project Management and M&E	2,253.6	300.0	2,553.6
3.1 Human Resources	470.0	0.0	470.0
3.2 Planning	617.5	0.0	617.5
3.3 Monitoring and Evaluation	1,028.4	300.0	1,328.4
Contingency	137.7		137.7
Total	13,320.0	1,200.0	14,520.0

Annex 6: Implementation Arrangements

EL SALVADOR: Environmental Services Project

1. The Ministry of Environment and Natural Resources (MARN) will be the project executing agency, with responsibility for overall management, supervision, coordination, technical and fiduciary control, and monitoring and evaluation of the grant and loan. Direct implementation will be provided by a Project Coordination Unit within MARN's Department of Natural Resources.
2. In the first year of implementation, the project will establish the National Fund for Environmental Services (FONASA) within the existing Fondo Ambiental de El Salvador (FONAES)⁶ to play the central role in establishing and operating the Program of Payments for Environmental Services (PES). FONASA will carry out the PES program in collaboration with MARN, nongovernmental organizations (NGOs), and the Ministry of Agriculture (MAG) under a series of subsidiary agreements and contracts. Other actors will include the municipalities, universities, and local community associations and cooperatives, which will participate in and support the PES program.
3. The institutional framework for the project will be legally defined by a subsidiary agreement between the Ministry of Finance, the Ministry of Foreign Relations, and MARN. Once FONASA is created a subsidiary legal agreement will be signed between MARN and FONASA for execution of Component 1 (Design and Implementation of a System of Payments for Environmental Services). The agreement would include (a) legal agreements between GEF/IBRD and the Government of El Salvador; and (b) a memorandum of understanding between MARN and FONASA that will specify operational arrangements for each institution in each pilot project area. FONASA is expected to assume greater responsibility as its institutional capacity is strengthened and at the end of the project will take over all functions of the PCU regarding the ongoing operation of the PES program.

Institutional Analysis

4. **Ministry of Environment and Natural Resources.** MARN was created by Presidential Decree No. 27 (May 1997) and ratified by Environmental Law No. 233. Its responsibilities and functions are to formulate, plan, and execute environmental and natural resources policies and legislation; promote active participation by all sectors in the sustainable use of natural resources and the environment; and collaborate with the Ministry of Foreign Relations in handling issues of international cooperation related to the environment and natural resources. MARN has the authority to enter into legal contracts, including the creation of sinking and trust funds. The ministry is headed by a Minister, Vice Minister, Executive Director, and three General Directors. MARN is divided into three departments: Natural Resources, Citizen Participation, and Environmental Management. As of December 2004, MARN had 220 staff.
5. Activities of the three departments are:
 - a) Natural Resources. Enhancement, management, and protection of El Salvador's natural resources. The department is divided into four divisions: Physical Resources, Biological Resources, Mangrove Systems, and Protected Areas.
 - b) Citizen Participation. Facilitating links between civil society, municipalities, autonomous institutions and NGOs, and governmental organizations to conserve the environment and promote

⁶ FONAES is an autonomous agency linked to MARN that was created in 1994 to obtain domestic and international financial resources for promoting the rational use of funds for environmental projects. The government decided that the synergies between a PES program and FONAES warranted creating FONASA inside FONAES instead of creating a separate stand-alone entity.

sustainable development. The department is divided into three divisions: Environmental Education, Gender, and Environmental Complaints.

- c) Environmental Management. Environmental evaluations and monitoring of the Agreements and Protocol Units and the environmental information system. This department has one division, Environmental Evaluation.

6. Ministry of Agriculture and Livestock (MAG). The Ministry for Agriculture and Livestock was created by Executive Decree No.24 of April 18, 1989, published in Official Gazette No. 70, Volume 303. It directs, coordinates, and controls execution of government activities related to agriculture, forestry, fishing, and livestock. MAG has 1,877 staff and is headed by a Minister, Vice Minister, and Presidential Commissioner for Agriculture. It includes four advisory offices (Policy and Strategy; Agricultural Planning; Legal Counsel; and Internal Audits) and five centralized operational directorates (Plant and Animal Health; Forest, Watershed, and Irrigation Management; Fishing and Aquaculture; Agricultural Economics; and Agribusiness).

7. Activities of the four advisory offices are:

- a) The Policy and Strategy Office develops and implements sector policies and strategies based on national and international macro- and microeconomic trends in agriculture, forestry, and fishing.
- b) The Agricultural Planning Office carries out institutional planning, advises the various offices of MAG on the planning, formulation, and implementation of projects and institutional development, and conducts monitoring and oversight of the proposed objectives and goals.
- c) The Legal Counsel's Office advises the Minister, Vice Minister, and other ministry officers as needed.
- d) The Internal Audit Office exercises internal control of the Ministry's administrative, financial, and management systems.

8. Nongovernmental Organizations. The goals and structure of NGOs varies according to their founding charters. They are associations or foundations that do not seek to directly profit their members, founders, or managers. They are authorized by the Interior Ministry, facilitated by the "Law on Nonprofit Associations and Foundations" contained in Legislative Decree N° 894 and its respective regulations. They may act at the national, regional, municipal, or local levels. There have been 5,464 NGOs registered in El Salvador since 1934. MARN has identified 70 NGOs that work in the environmental field and 26 that have specific activities in the potential project area.

9. Universities. El Salvador's universities are regulated by the Law on Higher Education contained in Legislative Decree N° 522 and by the Ministry of Education through the National Directorate on Higher Education. This is a special system that contains the general principles for organization and operation of the National University as well as for private universities and official and private technical institutes. This framework encompasses three functions: teaching, scientific research, and social outreach. El Salvador currently has a national university, 26 private universities, 6 specialized institutes, and 9 technical institutes. In 2001 there were 1,589 students registered in six recognized major courses of study in the fields of agriculture and environment.

10. Agricultural Associations and Cooperatives. These are special organizations governed by regulations contained in the Special Law on Agricultural Associations in Legislative Decree No. 221, which grants the Ministry of Agriculture and Livestock authority to provide legal, administrative, and financial advice for creating agricultural associations and cooperatives to develop and conduct activities related to land ownership for the benefit of their members. They are legal entities administered by a Board of Directors that is elected by a general assembly of the members. Their activities are determined and regulated by their charters.

11. **Community Associations.** Community Associations are based on a declaration of interest by a group of at least 25 citizens establishing a purpose for the association. Legal standing or recognition is granted by the municipality through the mayor or an authorized representative, which allows the association to raise funds and execute agricultural, infrastructure, tourism, environmental, and other types of projects. These activities are governed by the statutes creating the association, which include stipulations defining the type of organization, its area of operation, formation of its board of directors, and their rights, responsibilities, and obligations.

Implementation Arrangements

12. **Project Coordination.** The project would finance the creation of a Project Coordination Unit (PCU) within MARN's Department of Natural Resources that would include a project coordinator, administrative assistant, accountant, and procurement specialist. The accountant and procurement specialist will report to the project coordinator but will also support the development of FONASA's administrative capacity and will be physically located in MARN's Institutional Financial Unit to help it build administrative capacity for managing World Bank-financed projects. The PCU would also receive assistance from appropriate specialists on MARN's staff.

13. Activities under Component 1, Design and Implementation of a System of Payments for Environmental Services, would be executed by FONASA. The Board of Directors for FONASA would include MARN, MAG, a local NGO, a farmers association, a water association, and a private business association, each of which would have one permanent member and a deputy assistant on the Board, with the permanent member from MARN serving as Chairman. The board would oversee FONASA in terms of policy, planning, and technical operations.

14. FONASA will be legally established to exist indefinitely, or at least as long as there are funds to be administered. FONASA would have an Executive Director, administrative assistant, secretary, natural resource management specialist, and promotion/public relations specialist. While the staff would initially be financed by the project, financing for all of FONASA's recurring costs would gradually be shifted to a service fee on environmental services contracts that would not exceed a specific percentage (to be determined) of contract amounts.

15. FONASA's functions would include processing environmental service contracts with private land users, signing environmental services purchase agreements with the private and public sector, preparing reports, and contracting NGOs to support land users implementing ES contract agreements and to monitor compliance of participants in the program. FONASA will plan and conduct detailed feasibility studies to identify areas suitable to establish PES systems, collect lessons learned, identify barriers and bottlenecks, and promote policies and government actions to lift them. Tasks associated with contracting environmental services in the selected pilot watersheds will be outsourced, including promotion, land user identification, requirements review, and compliance monitoring. The Executive Director will act as secretary to the FONASA Board. FONASA will contract with a Salvadoran bank to create an account and manage the resource flows of the fund that will be financed by the IBRD loan, GEF grant, private sector environmental services purchase agreements, licensing fees, grants from other donors, and counterpart funds transferred from MARN. These implementation arrangements would be precisely defined in the Operations Manual and subsidiary agreement and memorandum of understanding between MARN and FONASA satisfactory to the Bank.

16. During project execution, a proposal will be prepared for converting part of the available fund resources into an endowment to provide sustainable, long-term financing in addition to the ongoing income received from ES purchasing agreements.

17. MAG will enter into a subsidiary agreement with MARN for project implementation. MAG would provide technical specialists from the Environmental Unit and the National Center for Agricultural and Forest Technology (CENTA) to support implementation of activities in Component 2, Institutional Strengthening (Training, Awareness Raising, and Capacity Building Activities for NGOs acting as market intermediaries and TA providers, Promotional Campaign, and Strengthening Technical Assistance Providers).

18. The PCU would be responsible for establishing FONASA, overseeing activities in Component 1 (Design and Implementation of PES System), and executing Component 2 (Institutional Strengthening) and Component 3 (Project Management and Monitoring and Evaluation).

19. *Nongovernmental organizations (NGOs) and universities* would be contracted to participate in project promotion, monitoring, provision of technical assistance to individual landowners, and to analyze data collected by the monitoring system to define links between land use changes and the provision of selected environmental services. The NGOs and universities would be prequalified by FONASA based on legal status, scope and extent of local activities, and capacity to provide technical assistance in building awareness of PES, assessing proposals for PES, assisting in the preparation of management plans for qualifying proposals, certifying contract provisions, facilitating contracts between landowners and FONASA, and monitoring the compliance of contracts (with farmers, municipalities, communities, and land users). NGOs and universities would be given help in assessing their technical assistance capacity and designing and implementing training programs to strengthen that capacity.

20. *Associations and cooperatives* carry out collective activities for the benefit of their members. As legal entities they have the right to carry out a range of activities as long as they conform to the purpose for which they were created. Associations and cooperatives could be vehicles to promote participation in the PES system by small land users, as well as play complementary roles in accordance with their legal mandate and existing institutional capacity.

21. *Community Associations*. The activities of community associations are based on the statutes creating the association, which include stipulations defining the type of organization, its area of operation, formation of its board of directors, and their rights, responsibilities, and obligations.

Project Organizational Structure

22. **Management**. The highest authority in the project would lie in the Minister of MARN and the FONASA Board. The Minister of MARN would approve the project's Annual Implementation Plans (AIPs) and budgets and ensure, via the PCU, that the project is executed according to the Project Implementation Plan, AIPs, and Operations Manual. The FONASA Board would approve the FONASA annual implementation plans and budgets and oversee the execution of Component 1 activities.

Functioning of FONASA

23. One of the main features of the project is the creation of a National Environmental Services Fund (FONASA). FONASA will act as a facilitator and financial mechanism between service users and service providers, taking payments from service users and channeling them to service providers in such a way as to generate the services desired by the service users. FONASA will be established by the PCU in MARN and funds assigned to it will be deposited in a Salvadoran bank that will process the resource flows of the Fund. FONASA may sign environmental service purchase agreements with any interested service users, including private companies and public organizations in El Salvador and international organizations. Contracts between these service buyers and FONASA will specify how the funds they provide are to be used within the context of the PES program.

24. The FONASA Board would serve as custodian of the funds. FONASA Board will also be responsible for defining and monitoring policy directives designing transparency and accountability strategies, as well as anticorruption codes. Under the supervision of the FONASA Board, an Executive Director and staff would be responsible for accounting, administering, and investing the funds assigned to the fund. The selected bank, through a payment order from the FONASA or its designee, would be responsible for making the payments to landholders that have signed and complied with contracts for the production of environmental services. As FONASA becomes self-sustaining, recurring cost for personnel and operating cost would be paid for directly from the environmental service contracts.

25. The contracted bank would operate a multiple account, entitled "Environmental Services," with sub-accounts for each source of financing under terms and conditions approved by MARN and the funding agency in question.

Operation of FONASA

26. FONASA's recurring costs should be capped at a specific percent of the total amount paid in environmental service contracts. The Fund's Executive Director, under the supervision of the Board, will be responsible for implementing all activities under Component 1 of the project, including all agreements with international, private, or public agencies for purchase of environmental services. The Executive Director will supervise preparation of the operational manuals for each pilot or permanent PES mechanism, process environmental service contracts with private land users to be signed once authorized by FONASA Board, promote environmental services purchase agreements with international, private, and public sector agencies, prepare compliance reports for each financing source, and set up auditing mechanisms for FONASA.

27. The PES program administered by FONASA will be implemented through individual PES mechanisms established at each target site. This follows the lessons of other PES efforts, which indicate that for PES mechanisms to be efficient they must be adapted to site-specific conditions. Therefore, while individual mechanisms will follow broad guidelines set by FONASA, they will vary in terms of the specific services generated, land uses supported, payments offered, contractual arrangements made with participating land users, and implementation arrangements used. Separate manuals would be prepared describing the rules for each PES mechanism, including eligible land uses and management activities, the levels and timing of payments for each land use, priority areas within selected pilot sites, maximum area for each type of contract and land use, special types of contracts to promote participation by different types of landholders, administrative steps in processing ES contracts with the landholders, and compliance monitoring systems.

28. The Executive Director of FONASA will communicate with MARN through the Director of the Department of Natural Resources. The Executive Director's duties as secretary of the Board shall include:

- a) Handle relations and communications with MARN and convene regular meetings of the FONASA Board;
- b) Formally submit recommendations made by MARN and/or other funding agencies for approval by the FONASA Board;
- c) Keep an up-to-date record of agreements and decisions of the FONASA Board;
- d) Keep MARN duly informed regarding applicable policies and other measures pertaining to the management of funds, contractual modalities of the ES system, and monitoring;
- e) Promote the use of market instruments to finance FONASA and increase El Salvador's forest cover;
- f) Submit periodic statements for the sub-accounts to the FONASA Board. These statements will be accompanied by an external audit report and specific recommendations for dealing with any problems that may have been noted.

Main Elements of the Financing Mechanism

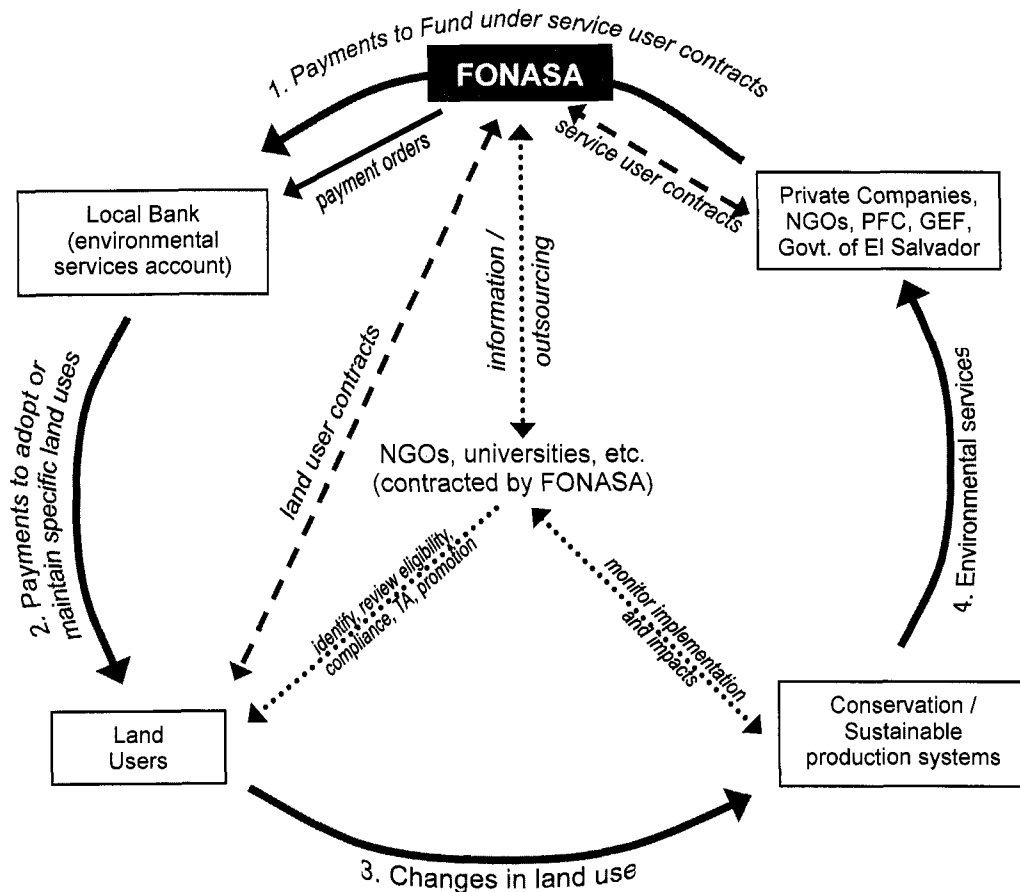
29. The diagram below provides an overview of the PES program. The financing mechanism is based on the principles of transparency, effectiveness, relevance, efficiency, and sustainability.

Operational Guidelines for the Financing Mechanism

30. FONASA may obtain financing from different sources and shall be governed by its own regulations. The FONASA Board must approve the regulations, which must include a detailed description of management and operational aspects, contractual modalities, management of sub-accounts by the bank, and the monitoring, operating, audit, and evaluation system.

31. If MARN and/or the FONASA Board should at any time decide that a full or partial payment for services provided by the bank was made for an ineligible expenditure, or that it was not supported by the evidence provided, the bank will immediately reimburse the amount in question to FONASA. Likewise, any interest earned by individual sub-accounts will be reinvested for the purposes set forth in the agreement.

32. The bank shall (a) use FONASA resources solely and strictly for the established purposes of the Fund, (b) administer those resources effectively and efficiently in accordance with the terms of the relevant agreement, (c) provide timely account information as requested by FONASA, the FONASA Board, or MARN, and (d) make suggestions and recommendations on financial, legal, and operational matters relating to the progress and results of the sub-accounts in general and of the Fund in particular.



Guidelines for FONASA

- FONASA will act as a financial mechanism between service users and service providers, taking payments from service users and channeling them to service providers in such a way as to generate the services desired by the service users.
- FONASA will work with the stakeholders involved to establish individual PES mechanisms in specific areas where (a) important national and global environmental benefits would be generated, (b) service users are willing to pay for the services they seek to obtain, (c) land users are willing to change their land use practices in exchange for suitable compensation, and (d) local institutions exist that can help implement the mechanism.
- FONASA will never initiate payments to service providers in a given PES mechanism unless (a) an agreement is in place for the relevant service users to eventually take over the entire payment burden, including reimbursing FONASA for the transaction costs of running the PES mechanism, and (b) initial payments from service users have been received.
- Initially FONASA may use funding from the Bank loan or the GEF grant, as applicable, to match payments made by local service users. Service users will always contribute at least 50 percent of the financing for payments made to service providers, and will gradually increase this share to 100 percent over a period of five years.
- Service users will also gradually assume the operating costs of FONASA itself, including staff costs, through a fee on all environmental services contracts. FONASA's budget will be capped at a percentage (to be determined) of the flow of funds it is managing.
- Funds provided by local service users will be employed for purposes agreed with those users. A contract will be signed with the service users participating in a given PES mechanism that indicates the specific geographic areas in which their funds will be spent and the specific activities that will be eligible for financing. The contract will include the stipulation that these areas and activities may be modified by mutual agreement between the service users and FONASA. These contracts will typically run for five years and will be renewable.
- FONASA will periodically report to service users on how the funds are used and on the degree to which this use has generated the specific services desired by the service users.
- In cases where multiple service users are affected by a given PES mechanism, FONASA will never initiate payments in that mechanism unless an agreement is in place among all service users on how the costs will be allocated among them, or unless a subset of users who wish to participate specifically agrees to implement the mechanism without the participation of all users and to share all costs among participating users only.
- The eligibility of specific land use changes for inclusion in a specific PES mechanism will be determined at each site based on the capacity of land uses to provide the services desired by service users at that site.
- Payment levels to service providers will be decided on a case-specific basis in consultation with representatives of the service providers. The payment level will take into consideration the expected benefit of each land use change to the service users and the opportunity cost that service providers face in making the changes.
- Both the menu of eligible land uses and the payment levels offered will be subject to periodic revision based on monitoring of the mechanism's results and in consultation with all stakeholders.
- On all of these points, agreement of service users who pay for the system will be necessary.
- Participation by service providers will always be voluntary. There will also be procedures for them to end their participation, subject to the specific terms of the contract they signed (for example, contracts with significant up-front payments may require a longer commitment).

Criteria for Use of GEF Funds

33. GEF resources would support activities that contribute to global benefits such as preserving biological diversity, preventing desertification, reducing the emission of greenhouse gases, and decreasing the negative impacts of climate change. GEF resources would only be applied to promoting, facilitating, encouraging, and compensating for land use changes that contribute to global benefits and for the likely establishment of sustainable PES systems in El Salvador.

34. Geographic focus (criteria 1). MARN has defined 15 “Conservation Areas,” which encompass groups of protected areas, their buffer zones, and the biological corridors that link them. GEF resources would be used in areas that support conservation of globally important biodiversity, taking into account both the biodiversity they contain and their link to the MBC/ES. These include Bahía de Jiquilisco, Trifinio, El Imposible–Barra de Santiago, Alto Lempa, Nahuaterique, Alotepeque–La Montañona, and Apaneca–Lamatepec.

35. Activities supported (criteria 2). Within the selected areas, GEF resources can be used to support land user implementation of a variety of activities with the potential of contributing to enhanced biodiversity conservation and carbon sequestration (for example conserving or reestablishing native forest or complex production systems such as agroforestry and silvopastoral systems). Land use systems will be classified according to their potential contribution to global benefits. The 28 land use classifications already defined for similar projects in Colombia, Nicaragua, and Costa Rica will be used as a guideline and modifications will be made if justified. The specific list of eligible activities would be developed for each case based on local conditions, the costs of alternative approaches, and the expected benefits. The list would subsequently be revised at regular intervals based on the results of the impact monitoring. Project resources would not be available for illegal crops nor for purchases of agrochemicals classified as IA, IB, or II by the World Health Organization.

36. Co-financing. In general, GEF resources would be used to complement payments made by local service users in areas meeting criteria 1 and for activities selected under criteria 2.

37. The objective is to have payments by local service users eventually take on the entire burden of payments to service providers. Where necessary, adjustments would be made to criteria 1 and 2 to help achieve this objective.

Annex 7: Financial Management and Disbursement Arrangements

EL SALVADOR: Environmental Services Project

Summary Conclusion of Financial Management Assessment

1. On the basis of the assessments performed, the financial management team presents the following conclusions:

- (i) The executing agency, MARN, will be responsible for managing the fiduciary aspects of the proposed project, through a Project Coordination Unit (PCU), located within MARN.
- (ii) Overall, MARN has limited capacity with respect to financial management (limited staffing and financial management system) and does not have extensive experience in managing projects financed by the World Bank. Thus the need to hire an Accountant for the management of accounting and financial reporting information of the proposed project, with appropriate experience.
- (iii) Assuming that MARN carries out the proposed action plan presented in this assessment, especially with regards to staffing, it would have in place adequate financial management arrangements that meet the Bank's minimum fiduciary requirements to manage the specific financial activities of the proposed project.

2. **Standard requirements/agreements.** It was agreed (1) that two separate Special Accounts, denominated in USD, will be opened in Banco Central, to specifically manage IBRD and GEF funds; (2) that, at least at the beginning, the project will use transaction-based disbursements; (3) that each quarter MARN will prepare the Financial Monitoring Reports (FMRs) to be submitted to the World Bank; and (4) that annual project financial statements will be audited in accordance with International Standards on Auditing issued by the International Federation of Accountants (IFAC), by independent auditors and in accordance with terms of reference (TORs), both acceptable to the World Bank.

Implementing Arrangements

3. The executing agency for the proposed project will be MARN ("Ministerio de Medio Ambiente y Recursos Naturales"). Project implementation will be carried out by MARN through a Project Coordination Unit (PCU), located within MARN's Department of Natural Resources (Dirección General de Patrimonio Natural—DGPN). MARN will have overall financial and accounting responsibility for the proposed project, including (i) maintenance of accounting records, (ii) processing disbursements, (iii) preparation of project financial statements in accordance with World Bank guidelines, (iv) management of bank accounts, (v) management of financial information systems, (vi) preparation and submission of quarterly Financial Monitoring Reports (FMRs), and (vii) preparation and submission of withdrawal applications.

4. Activities under component 1 (design and implementation of a system of payments for environmental services) would be executed by FONASA. FONASA will be created by MARN during the first year of the project and include a Board. FONASA will be legally constituted, in such a manner that it will have an indefinite term and will last while there are funds to be administered. Its function will include processing environmental service contracts with private land users, signing purchase agreements with private and public service users, preparing reports, managing payments to contracted participants and monitoring compliance of participants in the PES system. FONASA will be under the umbrella of FONAES.

Staffing

5. As indicated above, MARN will create a Project Coordination Unit (PCU) to manage the proposed project. At a minimum, the staff of the PCU should include a project coordinator, administrative assistant, procurement specialist, and an accountant with sufficient experience working with projects financed by

international agencies or donors. The procurement specialist and the accountant would report to the project coordinator but be located within the UFI (MARN's central financial unit).

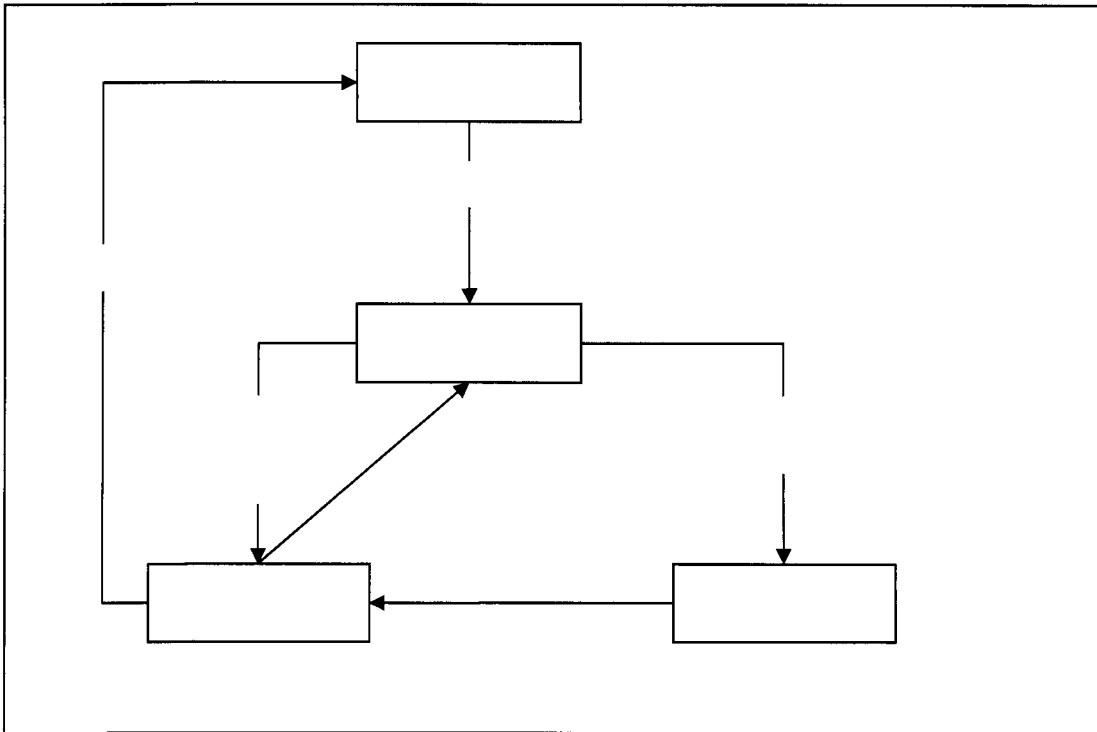
6. After its creation, FONASA would assume the responsibility of managing resources flows for the PES system. Therefore, MARN will need to determine the specific responsibilities to be handled by FONASA and hire the staff required, including the necessary financial management staff. No disbursement for ES Contracts will be authorized until FONASA has been created, staffed, and the operational manual adopted.

Flow of Funds

7. Project funds will be managed by the executing agency (MARN), with fund transfers from Treasury (DGT) utilizing the same mechanism used by local funds.

8. Under this mechanism, two separate Special Accounts in U.S. dollars, for IBRD and GEF funds, will be established by the borrower in Banco Central de Reserva. The borrower will, therefore, operate the Special Accounts and be responsible for the management of this account. The World Bank will, upon request, make an authorized allocation in each of the Special Accounts. Replenishments of the Special Accounts will be made, at least at the beginning, using a traditional disbursement method (transaction-based procedures, monthly submission of Statements of Expenditures – SOEs). Once the preparation of required reports has been established and reviewed by the Bank's team, the disbursement method could be changed to report-based procedures (based on the quarterly submission of Financial Monitoring Reports – FMRs).

9. MARN will also open two separate operating accounts in a commercial bank to facilitate local payments. Transfers to the operating accounts would be made from the Special Accounts, on the basis of requests prepared by MARN, supported by commitments.



10. For the management of component 1, FONASA will enter into a contract with a Salvadoran commercial bank to manage resource flows for the PES system. This account will be fed by IBRD and GEF funds. Funds assigned to FONASA will be transferred from the Special Accounts and deposited into FONASA's account (based on contract commitments). The selected bank will operate an account entitled "Environmental Services" with a view to setting up several sub-accounts for each source of financing. The selected bank, through a payment order from the FONASA Board or its designee, will be responsible for making payments to land users that have signed contracts for the production of environmental services

11. MARN will be responsible for accounting for the total advance and the submission of bank statements and documentation for both accounts.

Accounting and Reporting

12. *Segregation of duties.* MARN's organizational structure and established procedures support an adequate segregation of procurement, payment, and recording activities. The authorization to execute a transaction will be the main responsibility of the Project Coordinator and/or Technical Officers. Procurement activities will be the main responsibility of the procurement unit. And, the recording of the transaction will be the main responsibility of the Accountant.

13. *Budgeting.* A budget will be prepared at the beginning of each year. The borrower will be responsible for compiling a comprehensive budget for the project. Typically, the annual budget would include:

- An annual work plan classified by major goal/objectives, including physical and financial programs.
- A budget (broken down at least quarterly) specifying detailed expenditures by major component, category, and source of funds.

14. *Payment and operation of bank accounts.* MARN will be responsible for project disbursement to vendors. The process is expected to be as follows:

- The Project Coordinator and Procurement Officer review the invoice (generally against a PO or contract) and review necessary approvals from the Technical Officers.
- The approved invoice and payment request is received by the Accountant for processing.
- The Accountant reviews the information and prepares a check request.
- The check request is submitted to Treasury for processing (including authorized signatories).
- Once the authorized signatures have been obtained, the check is delivered to the vendor.
- Documentation is filed appropriately and transaction recorded into the computerized accounting system.

15. Bank account reconciliations will be prepared at MARN on a monthly basis.

16. *Environmental Services Payment System.* Component 1 of the project will support the pilot of a payment system for environmental services. Under the pilot, it is expected that land users will be contracted and receive an incentive payment for adopting or maintaining land uses that generate valuable ecosystem services. Therefore, a contract (typically of 5 years, renewable) would be established between FONASA and the farmer with a specified list of activities and payment amount. Payments will be made based on the contract and evidence of compliance by the farmer. A monitoring system will be established to ensure contract compliance by program participants. FONASA will be responsible for executing this component. Implementation arrangements will be precisely defined in the Operations Manual and subsidiary agreements.

17. *Information Technology (IT) Systems.* Assuming that government systems are used, project funds will be captured in the integrated financial management system (SAFI). There will, however, be a need

for the implementation of a basic financial system for the purposes of aggregating information from SAFI on a component basis (for financial monitoring to the Bank) and preparing withdrawal applications on the basis of disbursement categories.

18. **Safeguard over assets.** Assets acquired using project funds will be in the custody of the respective organizations. The borrower will keep a detailed subsidiary ledger (asset register) of equipment acquired. The accounting system does not allow for tracking of assets purchased. Therefore, the asset register will have to be kept separately from the accounting system. The amounts in the register will be reconciled monthly against the respective account balances. And, at least one annual physical inspection of the assets will be undertaken by PCU staff, preferable with the participation of external auditors.

19. **Internal Audit.** MARN has an internal audit department, which generally does not audit internationally funded projects, as they are audited by external independent auditors. For this project, the use of external independent auditors (as described below) will contribute to ensuring that the resources are used for the purpose intended.

20. **Reporting.** The borrower will be responsible for producing the Financial Monitoring Reports (FMRs) on a quarterly basis to be submitted to the Bank, for monitoring purposes at the beginning and possibly for disbursement purposes, once the system for producing FMRs has been tested. FMRs will include a narrative outlining the major project achievements for the quarter, the project's sources and uses of funds, a report presenting expenditures by sub-component, a physical progress report, a procurement report, and a procurement table. In addition, to meet disbursement requirements, FMRs will also include: (i) Special Account Activity Statement (including a copy of the bank statement); (ii) Summary Statement of Special Account Expenditures for Contracts subject to Prior Review; and (iii) Summary Statement of Special Account Expenditures for Contracts Not subject to Prior Review. FMRs should be submitted to the Bank no later than 45 days after the end of the reporting period.

21. The annual financial statements will include the project's sources and uses of funds, a report presenting expenditure by sub-component, the schedule of SOEs presented during the year and a reconciliation of the Special Account. These reports will be prepared by the borrower and made available to the auditors after the end of the fiscal year.

22. MARN will create a financial management procedures manual as part of the operations manual. The operational manual will clearly establish financial management policies and procedures in accordance with International Accounting Standards.

Audit Arrangements

23. The annual audited project financial statements will be provided to the Banks within six months of the end of each fiscal year and also at the closing of the project. The contract for the audit awarded during the first year of project implementation may be extended from year-to-year with the same auditor, subject to satisfactory performance. The cost of the audit will be financed from project resources.

24. The audit policy of the World Bank, as documented in "Guidelines: Annual financial reporting and auditing for World bank-financed projects," will be applicable to the project. This means that a single audit opinion covering (i) project financial statements, (ii) special account statements, and (iii) adequacy of supporting documentation maintained by MARN in respect of expenditures claimed for reimbursement via SOE procedures and eligibility of such expenditures for financing under the respective Loan/Grant Agreement will be required. Included in the scope of the audit will be the audit of FONASA.

25. In addition to the audit opinion, the auditors will have to present the management letter, covering (i) weaknesses noted by the auditors in the internal control systems of the project, (ii) cases of application of

inappropriate accounting policies and practices, (iii) issues regarding general compliance with broad covenants, and (iv) any other matters that the auditors consider should be brought to the attention of the borrower.

Disbursement Arrangements

26. Withdrawal from the loan/grant will be made, at least at the beginning, using transaction-based disbursement procedures. Once the preparation of required reports has been established and reviewed by the Bank's team, the disbursement method could be changed to reports-based procedure (based on the quarterly submission of FMRs). During implementation, MARN will (a) sustain satisfactory FM arrangements to be verified through supervision missions, (b) submit FMRs consistent with the agreed form, content, and due date, and (c) submit acceptable audited financial statements by their due date. If MARN does not continue to meet these criteria, the method will remain or be changed back to transaction-based disbursements only (provided the World Bank does not suspend disbursements because of non-compliance with the obligation to maintain an adequate FM system). Under the transaction-based disbursement method, the SOE thresholds would be consistent with the procurement prior review thresholds.

Financial Management Action Plan

No.	Action	Product/Indicator	Responsible	Deadline
1	PCU and UFI Staffing	Finalize the TORs for key staff of the PCU	MARN	Negotiations
2	Financial Monitoring Reports	Finalize the FMR format	MARN	Negotiations
3	External auditors contract process	Finalize audit TORs	MARN	Effectiveness
4	Operational manual preparation	Operational Manual approved and ready for implementation	MARN	Effectiveness
5	IT system available	Implementation of simple financial management system	MARN	Effectiveness
6	PCU Staffing	Contract signed with key staff of the PCU and UFI	MARN	Effectiveness
7	External auditors contract process	Contract signed	MARN	3 months after Effectiveness
8	Establishment of FONAFA	Define implementation arrangements (including additional staff) and include in Operations Manual	MARN	First year of implementation

Supervision Plan

27. During project implementation, the Bank will review the project's financial management arrangements in two main ways: (i) review the project quarterly financial management reports, periodic financial information of MARN, and annual audited financial statements and auditor's management letter; and (ii) during the Bank's missions, review the project's financial management and disbursement arrangements to ensure compliance with Bank requirements. Accredited financial management specialists will assist in the supervision process

Allocation of Loan/Grant Proceeds

<i>Categories</i>	<i>Amount (US\$ thousands)</i>		
	<i>IBRD</i>	<i>GEF</i>	<i>Total</i>
1 – Goods	377.5	252.0	629.5
2 – Consulting Services	2,581.7	2,626.2	5,207.9
3 – Training	295.0	567.0	862.0
5 – ES Contracts Payments	1,155.0	1,100.0	2,255.0
6 – Operating Costs	140.0	0.0	140.0
7 – Unallocated	425.8	454.8	880.6
8 – Front End Fee	25.0	0.0	25.0
Total project costs	5,000.0	5,000.0	10,000.0

Annex 8: Procurement Arrangements

EL SALVADOR: Environmental Services Project

A. General

1. Procurement for the proposed project would be carried out in accordance with the World Bank's "Guidelines: Procurement Under IBRD Loans and IDA Credits" dated May 2004, "Guidelines: Selection and Employment of Consultants by World Bank Borrowers" dated May 2004, and the provisions stipulated in the Legal Agreement. The various items under different expenditure categories are described in general below. For each contract to be financed by the Loan/Credit, the different procurement methods or consultant selection methods, the need for pre-qualification, estimated costs, prior review requirements, and time frame are agreed between the Borrower and the Bank in the Procurement Plan. The Procurement Plan will be updated at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.
2. **Procurement of Works:** No works are expected to be procured under this project.
3. **Procurement of Goods:** Goods procured under this project would include basic office equipment, vehicles, etc. The procurement will be done using the Bank's Standard Bidding Documents (SBDs) for all ICB and National SBD agreed with or satisfactory to the Bank. Contracts for goods estimated to cost above US\$25,000 per contract and all direct contracting will be subject to prior review by the Bank.
4. **Procurement of Non-consulting Services:** Non-consulting services to be procured under the project are related mainly to training activities and promotional campaigns which, based on the estimated amounts of less than US\$25,000 per contract, will be procured using shopping procedures. A standard request for quotations will be developed and included in the Operations Manual. Non-consulting services estimated to cost less than US\$100,000 but more than US\$25,000 will be procured through National Competitive Bidding (NCB) using SBD agreed with or satisfactory to the Bank. Non-consulting services contracts estimated to cost above US\$25,000 per contract and all direct contracting will be subject to prior review by the Bank.
5. **Selection of Consultants:** Individual consultants and firms to provide training to the communities, carry out studies, prepare strategic plans, prepare physical and financial project monitoring systems, carry out auditing of the project account, etc. Short lists of consultants for services estimated to cost less than US\$200,000 equivalent per contract may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines. Consulting services (firms) estimated to cost above US\$50,000 per contract, individual consultant services estimated to cost above US\$25,000 and all single-source selection of consultants will be subject to prior review by the Bank.
6. **Operating Costs:** Operating costs that would be financed by the project include office furniture, PCU staff, link organizations' support staff supporting project implementation, and office equipment.
7. The procurement procedures and SBDs to be used for each procurement method, as well as model contracts for works and goods procured, are presented in the Project's Operations Manual.

Prior Review Thresholds

8. The proposed thresholds are as follows:

<i>Expenditure category</i>	<i>Contract value threshold^a (US\$ thousands)</i>	<i>Procurement method</i>	<i>Contracts subject to prior review</i>
Goods	>150	ICB	All (tender documents and evaluation reports)
	150 ≥ <50	NCB	All (tender documents and evaluation reports)
	≤ 50	Shopping	First two each calendar year (request for quotations and evaluation reports). All contracts above \$25,000.
Non-consulting services (incl. training)	>150	ICB	All contracts above US\$25,000
	150 ≥ <25	NCB	
	≤ 25	Shopping	
Consulting (firms) ^a	>100	QCBS	Whole process for each contract above \$50,000 and all single source contracts
	100 ≥ <50	QCBS/LCS/CQ	
	≤ 50	LCS/CQ	
Consulting (individual) ^a		Section V in the Guidelines	All cases above US\$25,000 and all single-source contracts
Direct contracting			All cases regardless of the amounts involved
Agreements			All cases regardless of the amounts involved All cases identified for prior review in the procurement plan All cases not included in the procurement plan, regardless of the amounts involved All terms of reference for which Bank no objection is required All processes that, due to their complexity or nature, the task manager decides must have the Bank's no objection

9. The thresholds will be reviewed when the implementing units gain experience in Bank's rules and regulations. All single-source selection of goods and works, regardless of the amount of the contract, will be subject to prior review by the Bank.

B. Assessment of the agency's capacity to implement procurement

10. Procurement activities will be carried out by the Ministry of Environment and Natural Resources (MARN) through a Project Coordination Unit (PCU), located within MARN. Although the PCU will be responsible for coordinating the activities of the project, it has been decided that to promote institutional strengthening the procurement function will be integrated within the organizational structure of MARN. The procurement team, composed of a procurement officer and a procurement assistant, will be integrated within the procurement unit of MARN (UACI), with a direct link to the PCU. The Project Operations Manual will include, in addition to the procurement procedures, the SBDs to be used for each procurement method, as well as model contracts for works and goods procured.

11. An assessment of the capacity of MARN to implement procurement actions for the project has been carried out by Luis Prada, procurement specialist, on September 2004. The assessment reviewed the

organizational structure for implementing the project, the volume and complexity of procurement actions for the new project as well as the new arrangements by which the procurement function is being integrated into MARN's relevant central financial unit (UFI). Although MARN has no previous experience implementing World Bank projects, considering that procurement under this project is not complex or complicated, it has been decided that the PCU will carry out all procurement actions. If any complex procurement arises, it is recommended that an independent consultant be hired to assist the PCU during the critical stages of the procurement process.

12. The overall project risk for procurement is HIGH.

C. Procurement Plan

13. The Borrower, at appraisal, developed a procurement plan for project implementation that provides the basis for the procurement methods. This plan was agreed between the Borrower and the Project Team on May 20, 2004 and is available at MARN as well as from the project team. It will also be available in the project's database and in the Bank's external website. The Procurement Plan will be updated in agreement with the Project Team annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

D. Frequency of Procurement Supervision

14. In addition to the prior review supervision to be carried out from Bank offices, since the overall risk assessment has been rated as HIGH, it is recommended that procurement supervision should take place every six months during the first year of the project and once a year thereafter and to reassess the capacity of the PCU to carry out procurement after one year in order to review the prior review thresholds.

E. Action Plan

15. The following actions are recommended to address major weaknesses identified by the Bank and to increase the capacity of MARN and the PCU in particular for implementing procurement:

Procurement Cycle Management: The Procurement Plan was finalized and approved prior to negotiations. Completion of the Operations Manual is a condition of effectiveness. Standard bidding documents for all procurement methods must be prepared for use by the project and should be based on the Bank's SBDs. During project launch, the PCU staff concerned should be trained in the use and application of the SBDs. A system for monitoring procurement must be implemented prior to effectiveness. Increased supervision by the Bank is recommended during the initial stages of project implementation. Since Contract Administration is considered a weak area in the project, close supervision and monitoring is recommended.

16. **Organization and Functions:** It has been agreed that a procurement officer with relevant Bank procurement experience will be hired prior to effectiveness. Since internal manuals and instructions do not exist, priority should be given to preparing the Operations Manual. This is a condition for effectiveness.

17. **Support and Control Systems:** Since no auditing procedures are in place, the audit requirements must be established in coordination with financial management. Technical and administrative controls must be established and implemented and included in the operations manual. MARN must immediately enforce the fraud and corruption provisions in the Bank guidelines and SBDs. Anticorruption clauses must be included in all bidding documents.

18. **Record Keeping:** Proper record keeping will have to be ensured and a check list included in each file to permit verification that all relevant information is included. As the volume of procurement increases, it will be necessary to define a physical area to keep all records and files of the procurement processes under the project.

19. **Staffing:** The PCU will be strengthened with the hiring of a dedicated procurement officer with relevant experience in Bank procurement and possibly a procurement assistant. It is recommended that to the extent possible, training courses in Spanish be identified for the procurement officer to attend. The PCU is considered to have the capacity to carry out the procurement function in an effective manner.

Attachment 1

Details of the Procurement Arrangement Involving International Competition.

1. Goods, Works, and Non-consulting Services

(a) List of contract Packages that will be procured following ICB and direct contracting:

1	2	3	4	5	6	7	8	9
Ref. No.	Contract (Description)	Estimated Cost	Procurement Method	P-Q	Domestic Preference (yes/no)	Review by Bank (Prior / Post)	Expected Bid-OpeningDate	Comments
	None							

(b) ICB Contracts estimated to cost above US\$150,000 per contract and all direct contracting will be subject to prior review by the Bank.

2. Consulting Services

(a) List of Consulting Assignments with short-list of international firms.

1	2	3	4	5	6	7
Ref. No.	Description of Assignment	Estimated Cost	Selection Method	Review by Bank (Prior / Post)	ExpectedProposals SubmissionDate	Comments
	None					

(b) Consultancy services estimated to cost above US\$50,000 per contract for firms, US\$25,000 for individuals, and single-source selection of consultants (firms and individuals) regardless of the contract amounts will be subject to prior review by the Bank.

(c) **Short lists composed entirely of national consultants:** Short lists of consultants for services estimated to cost less than US\$200,000 equivalent per contract may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines.

Annex 9: Project Economic & Financial Analysis and Sustainability & Replicability

EL SALVADOR: Environmental Services Project

A. Economic and Financial Analysis

1. The main component of the project aims to induce land use changes that provide increased levels of environmental services that bring both national benefits (primarily water services, and in some cases landscape benefits) and global benefits (increased biodiversity conservation and carbon sequestration).

Demand for services

2. **Demand for water services.** The main national service the PES program is expected to help generate is improvements in water services. Depending on the nature of local service users, this may take the form of improving water quality (by reducing contamination and/or improving natural filtration), reducing sediment loads, increasing dry season water flows, or reducing the risk of flash flooding. Evidence in the country and throughout the region shows considerable demand for such services. A contingent valuation study undertaken by PRISMA in the San Salvador Metropolitan Area in 2001 found that 58 percent of households were willing to pay for watershed conservation to preserve the capital's water supply, with a median willingness to pay of US\$5.90/household/month (US\$10.20 among higher-income households and US\$3.50 among lower-income households). More concretely, there are already three examples of municipal water supply systems that are paying for protection of their water sources: San Francisco Menéndez, Tacuba, and Yamabal. In Tacuba this has taken the form of an explicit additional fee added to water bills; in San Francisco Menéndez and Yamabal part of the existing revenue stream from current water fees is dedicated to this purpose. In effect, these municipalities consider conserving water sources part of their water system's operations and maintenance costs. More broadly, the experience of Costa Rica shows that a broad range of water users, including private and public hydropower producers, bottlers, municipal water supply systems, and irrigation users are willing to pay to conserve the watersheds from which they obtain their water (see Table 9.1).

Table 9.1: Payments for Watershed Conservation by Water Users in Costa Rica

<i>Firm</i>	<i>Type of user</i>	<i>Watershed</i>	<i>Contract area (ha)</i>	<i>Payment (US\$/ha/yr)</i>
Energía Global	Hydropower producer	Río Volcán	2,493	12
		Río San Fernando	1,818	12
Platanar SA	Hydropower producer	Río Platanar	1,800	15/30
CNFL	Hydropower producer	Río Aranjuez	5,000	42
		Río Balsa	6,000	42
		Río Laguna Cote	900	42
Florida Ice & Farm	Bottler	Río Segundo	1,000	45
Heredia ESPH	Municipal water supply			22
Azucarera El Viejo	Irrigation, sugar mill	Acuífero El Tempisque	550	42
La Costeña SA	Irrigation	Acuífero de Guanacaste	100	42

Source: FONAFIFO data

3. **Demand for water services at Lago Coatepeque.** Studies undertaken during project preparation show that the main water uses in Lago Coatepeque are:

- **Domestic water use.** The two main groups of domestic water users are (a) the water systems that serve population centers, and (b) the more than 500 vacation homes along the lakeshore. The first group comprises 13 systems serving about 18,700 people and using an estimated 818,000 m³ of water annually. There are also 5 systems of public standpipes and wash areas. These systems draw their water from the lake using electric and diesel pumps. They are administered by local water boards and community organizations. Users pay monthly fees that range from US\$3 to US\$11 per household, depending on the system. In the second main group, the vacation homes, each home operates its own pump to draw water from the lake for domestic use, landscape irrigation, and other uses. Data on their water use is hard to obtain, but a 2004 study by FUNDE estimated it at about 12.5 m³/home/day, resulting in a total estimated use of about 2 million m³ of water annually.
- **Recreational use.** There is substantial recreational use of the lake, both by the owners of the holiday homes and by a small but growing tourism industry.
- **Fishing.** There is a small artisanal fishing industry in the lake, with about 500 fishers. Most fishers are part-time. Many are organized in an association, ADESCOY PESQUERA.

4. For all of these uses, water quality is a critical consideration. Water quality is affected by inadequate land use practices. Production of basic grains on steep slopes is resulting in erosion and contamination of runoff by agrochemicals. Changing these land uses to less erosive practices could significantly reduce water quality problems.⁷ Water quality concerns are already leading some businesses to have clean water trucked in from Santa Ana, at a cost of US\$2.50/m³.

5. Demand for water services in Jatepeque-Jiquilisco. There is very substantial water use in the Jatepeque-Jiquilisco area, both for domestic use and for irrigation. Because of the coastal location of this area, however, water supplies originate far outside it, making a PES approach to addressing them impractical at this stage.

6. Demand for landscape services. Jatepeque-Jiquilisco has a small but growing ecotourism industry. This industry derives its attractiveness from the natural ecosystems in the area, particularly the mangrove forests—both as places to visit and for their role in attracting birds and other species that tourists like to see. There are no precise statistics on either the number of ecotourism businesses or the number of visitors. Studies carried out during preparation identified eight major clusters of ecotourism activity in the area. Participants include private sector business, cooperatives of local people (including a cooperative of women fishers that offers boat trips in the Bay of Jiquilisco and food services), and some local government initiatives. In addition to landscape services, this sector also depends on water quality—all cited dumping of solid waste and untreated effluent into coastal waters as major problems.

7. Demand for other services. Jatepeque-Jiquilisco also has an important fishing industry, including both commercial and artisanal fishers. There are 24 commercial trawlers based at Puerto El Triunfo, for example, and 23 at Puerto Barillas. There are an estimated 3,100 artisanal fishers in the Jiquilisco area, and about 2,800 in the Jatepeque area. Artisanal fishers land about 200,000 kg of fish annually, with an estimated sale value of about US\$330,000. Fisheries in the area have been affected by a significant decline in fish stocks. This is thought to be caused in part by clearing and degradation of mangrove habitats, which serve as nurseries for many fish and shrimp species. The extent of these links have not been well documented but is widely thought to be important, including by the fishers themselves.⁸

⁷ It is important to note, however, that water quality is also affected by other problems, including the lack of treatment of effluents from poblados and vacation homes and a variety of other sources. Fully addressing water quality problems will thus require a PES approach to be complemented by other measures.

⁸ As with water quality in Lago Coatepeque, fish stocks are also affected by a variety of other problems, including overfishing and inappropriate fishing practices (including, in some areas, dynamite fishing). Here too, fully addressing problems will require PES approaches to be complemented by other measures.

Supply of services

8. Land users often find that land uses that provide environmental services are less profitable to them than other land uses. Unsurprisingly, they usually adopt those land uses that are most profitable from their own perspective, irrespective of whether they generate environmental services for others or not. Inducing them to adopt land uses that bring benefits to others thus requires compensating them, at a minimum, for the difference in net returns they will receive with the new land uses compared to those they would have received under their most profitable private alternative.⁹ A comparison of net returns under current land uses to those of land uses that are more desirable from an environmental service perspective provides an estimate of the cost required to induce the desired land use changes.

9. Studies were undertaken at both pilot sites to estimate the opportunity cost of switching from current land uses to alternative land uses that would provide higher levels of environmental services. At both sites, the main current land that requires changing is “basic grains”: maize followed by beans, after which livestock is grazed on the crop stubble. This production system has low productivity and generates high levels of erosion as it leaves land bare at the onset of the rainy seasons. Water infiltration rates are low, resulting in flood risk in the wet season and water scarcity in the dry season. It also has low levels of biodiversity and stored carbon. A variety of alternatives would provide higher levels of environmental services.¹⁰ In Lago Coatepeque-Los Volcanes, the main concern is to improve water quality in the lake. Therefore, a variety of measures that would reduce runoff and erosion were considered.¹¹ Because of the proximity to the Los Volcanes protected area complex, measures were examined that were also hospitable to biodiversity. In the Jatepeque-Jiquilisco area, the main land uses considered were land uses that emphasized providing a more hospitable habitat for biodiversity, in keeping with the global biodiversity importance of the area. Water problems originate largely outside the area, so this aspect was not emphasized in selecting alternative land uses. At both sites a mix of alternatives were selected, some with potentially very high levels of environmental services, such as pure conservation uses, and some that mix continued productive activities with more environmentally friendly features. At each site, the program’s approach will be to offer participating land users a menu of choices from which they might pick those that best fit their preferences, constraints, and livelihood strategies. Given the very high land pressure in El Salvador, pure conservation uses are unlikely to be widely attractive. Payments offered will be commensurate with expected environmental service benefits.

10. The estimated costs and benefits of current land uses at both sites can be estimated based on data collected from local land users. Estimating the costs and benefits of alternative land uses was more problematic. Almost by definition, these are practices that are little used in these areas—if this were not the case, there would be no need for an intervention to encourage their adoption. Data on yields, costs of production, and returns for alternative practices are available from a variety of sources, including MAG (primarily CENTA); studies of potential pilot sites carried out by FUNDE; background studies carried out

⁹ This is necessary, but may not be sufficient. Other obstacles may prevent land users from adopting PES-supported land uses even if the payment makes them attractive. For example, they may lack the technical skills required to implement the new practices, may not have access to necessary inputs, or they may lack financing to cover necessary investments. PES payments may thus need to be complemented by technical assistance or other forms of support.

¹⁰ The measures shown are based on an initial analysis. The actual measures used in the program may differ, based on more extensive analysis.

¹¹ Substantial parts of the Lago Coatepeque watershed are under shade-grown coffee; as this land use system provides both good protection to soil and a good habitat for biodiversity, it does not need to be changed, although it may be desirable to add erosion-reducing measures such as live barriers in particularly vulnerable areas.

by FAO; and available reports from PAES, PRISMA, and other agencies. All of these data reflect national averages, however, making it difficult to arrive at realistic estimates of returns at the pilot sites.

11. Using available data, an illustrative scenario was constructed to examine the potential cost to land users of a typical 1 hectare farm of switching to alternatives that would provide higher levels of environmental services, and hence the minimum payments that would be required to induce them to do so. Tables 9.2 and 9.3 illustrate the proposed changes. Current production, shown in Table 9.2, involves producing “basic grains”: maize followed by beans, after which livestock is grazed on the crop stubble. This production system has low productivity, and generates high levels of erosion as it leaves land bare at the onset of the rainy seasons. Water infiltration rates are low, resulting in flood risk in the wet season and water scarcity in the dry season. It also has low levels of biodiversity and stored carbon.

Table 9.2: On-site Costs and Benefits of Current Land Use

	Units	Year											
		0	1	2	3	4	5	6	7	8	9	10 and subsequent	
Land use													
Basic grains	ha	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Revenue													
Maize	US\$	378	378	378	378	378	378	378	378	378	378	378	378
Beans	US\$	560	560	560	560	560	560	560	560	560	560	560	560
Pasture	US\$	94	94	94	94	94	94	94	94	94	94	94	94
Total revenue	US\$	1,032	1,032	1,032	1,032	1,032	1,032	1,032	1,032	1,032	1,032	1,032	1,032
Costs													
Maize	US\$	371	371	371	371	371	371	371	371	371	371	371	371
Beans	US\$	500	500	500	500	500	500	500	500	500	500	500	500
Pasture	US\$	8	8	8	8	8	8	8	8	8	8	8	8
Total costs	US\$	879	879	879	879	879	879	879	879	879	879	879	879
Net returns	US\$	153	153	153	153	153	153	153	153	153	153	153	153
PV (50 yrs, 10%)	US\$	1,672											

Note: Based on data broadly illustrative of conditions encountered in hillside areas of El Salvador; results are not meant to represent any specific site.

12. Table 9.3 shows a possible alternative land use, which involves planting 0.1 hectare of tree crops and introducing conservation measures (grass barriers, water infiltration ditches (*acequias*), and grass cover crops) on the remaining area of annual crops.¹² These changes would be introduced over 5 years. The tree crops could be fruit trees such as mango and avocado (as in the example), timber trees, or various native species in areas where biodiversity conservation is particularly important. This alternative would provide much higher levels of water services by facilitating infiltration and reducing erosion. It would also provide a more hospitable environment for biodiversity and higher levels of carbon sequestration. The biodiversity benefits are not as favorable as from natural forest, of course, but nevertheless are better than what is provided by current land uses.¹³

¹² This particular alternative is an expensive one, as it involves practices with substantial up-front costs (planting trees, doing conservation landscaping). It thus provides a worse-case example for the analysis.

¹³ As described in Annex 18, substantial recent research demonstrates that agricultural landscapes with trees, such as those in the proposed alternative, have substantially higher biodiversity levels than landscapes with annual crops alone.

Table 9.3: On-site Costs and Benefits of Alternative Land Use

	Units	Year										
		0	1	2	3	4	5	6	7	8	9	10 and subsequent
Land use												
Basic grains	ha	0.94	0.88	0.82	0.76	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Avocado	ha	0.01	0.02	0.03	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Mango	ha	0.01	0.02	0.03	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Vetiver	ha	0.01	0.03	0.04	0.05	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Brisantha	ha	0.01	0.03	0.04	0.05	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Ditches	ha	0.01	0.03	0.04	0.05	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Total	ha	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Revenue												
Maize	US\$	356	333	311	289	266	266	266	266	266	266	266
Beans	US\$	527	494	461	428	395	395	395	395	395	395	395
Pasture	US\$	88	83	77	72	66	66	66	66	66	66	66
Avocado	US\$	0	0	0	13	31	56	86	116	133	144	150
Mango	US\$	0	0	0	11	30	59	102	144	176	199	211
Total revenue	US\$	971	910	849	812	789	842	915	987	1,036	1,070	1,089
Costs												
Maize	US\$	349	327	305	283	261	261	261	261	261	261	261
Beans	US\$	471	441	412	382	353	353	353	353	353	353	353
Pasture	US\$	8	7	7	6	6	6	6	6	6	6	6
Avocado	US\$	16	21	25	32	41	36	41	47	50	51	51
Mango	US\$	8	13	16	24	33	36	41	47	50	51	51
Vetiver	US\$	31	33	35	38	40	11	11	11	11	11	11
Brisantha	US\$	5	7	9	12	14	11	11	11	11	11	11
Acequia estab	US\$	48	60	71	82	94	57	57	57	57	57	57
Canavalia ensiformis	US\$	104	98	91	85	78	78	78	78	78	78	78
Total costs	US\$	1,039	1,007	971	944	920	848	858	871	876	878	878
Net returns	US\$	-68	-96	-122	-132	-131	-5	57	116	160	192	211
PV (50 yrs, 10%)	US\$	673										

Note: Based on data broadly illustrative of conditions encountered in hillside areas of El Salvador; results are not meant to represent any specific site

13. Comparison of Tables 9.2 and 9.3 shows that switching to the alternative land use practices would not be financially attractive to land users. Although in the long term the alternative would be slightly more profitable for land users, these benefits are offset by the high initial investments required. Land users, therefore, would not spontaneously adopt the alternative.

14. The minimum value of payments required to induce adoption of the proposed alternative is given by the difference in profitability between the current and the alternative land uses; that is, about US\$1,000/ha in present value terms in this particular example.¹⁴ (Again, this is only an example—in many ways a worst-case example—and not an indication of what average payments under the project will be.) This could be structured as a payment of about US\$200/ha/yr in the first 5 years, followed by an additional payment of about US\$25/ha/yr in subsequent years. The high initial payment would be required to cover the high cost of the initial investment required to plant tree crops and establish conservation measures. The later on-going payment would be required to avoid land users abandoning the conservation measures: they would likely not abandon the tree crops (which are profitable once established) but they would very

¹⁴ All estimates are over a 50-year time horizon, using a 10% discount rate.

likely abandon the conservation measures (which add costs and reduce the effective cultivated area) unless they had the incentive of an on-going payment.¹⁵ Payments at other sites would vary, depending on local conditions and on the specific land use practices being promoted so as to generate the environmental services desired in those cases. For comparison, Costa Rica's PES program pays US\$538 over 5 years for reforestation, and then an additional US\$42/year to maintain the resulting plantation. The higher cost here reflects the higher opportunity cost of land in densely populated El Salvador.¹⁶ As another example, the Regional Integrated Silvopastoral Ecosystem Management Project currently being implemented in Colombia, Costa Rica, and Nicaragua would pay about US\$400–600 over 4 years for this kind of land use change; here too, the change would be made in lower opportunity cost land (degraded pastures) than is assumed here.

Matching supply and demand

15. Lago Coatepeque-Los Volcanes. Studies conducted during preparation indicate that about 1,500 hectares in the Lago Coatepeque area would need to be converted to improved land uses. Of these, about 300 hectares are on particularly steep slopes. The opportunity cost of forgoing basic grains production in this area is likely to be low, but the cost of planting trees relatively high. The rest of the area has much shallower slopes. Less substantial land use changes would be required to reduce erosion and runoff. Assuming that payments of US\$1,000/ha (in present value terms) would be required on the steep slopes and US\$500/ha would be required on shallower slopes, the total cost would be about US\$900,000, or about US\$90,000/year on average (although, as discussed earlier, payments would need to be higher in the early years, and lower in later years). If this cost had to be borne solely by the owners of vacation homes, it would come to about US\$160/home/year—not an unreasonable fee, considering these villas are valued at over US\$100,000 each (moreover, if improved water quality results in higher property values, this expense would likely be easily recovered). Increasing the monthly fees paid by households connected to local water systems by US\$1 (from current levels of US\$3–11/household/month) would generate about US\$30,000 to US\$50,000 a year; thus, in principle, these water systems alone could cover about half the payment requirements. Funding could also be generated from the local tourism industry. The biodiversity importance of the Los Volcanes protected areas complex, part of which is found in the western part of the watershed, makes part of the watershed eligible to receive support from GEF. Even in the absence of solid data on willingness to pay, it seems clear that reasonable fees on local water users and others would easily cover the funding requirements of the payments required to induce land use change.

16. Jatepeque-Jiquilisco. The Jatepeque-Jiquilisco pilot site was selected in large part because of its extremely high importance for biodiversity conservation. This site is much larger than the Lago Coatepeque site, and the area requiring conservation is also correspondingly larger, covering between 20,000 hectares and 60,000 hectares depending on criteria for prioritization. There is also a need for funding to help protect mangrove areas. The problem in this area is that the potential for water-based payments is low. Although there is considerable concern over water issues in the area, and incipient efforts to address it, the causes of water problems originate largely outside the area. Any payments made to address these water problems would not help address biodiversity conservation needs at the site. The tourism and fishing industries are both potential sources of financing, as is the shrimp farming industry. As the tourist industry is highly fragmented, negotiating payment agreements with individual operators would be impractical, and would face severe free-rider problems. A more promising approach would involve negotiating with representatives of the industry for standard fees to be applied to tourism

¹⁵ Indeed, one of the existing small-scale PES schemes in El Salvador, in Yamabal, pays farmers to maintain conservation measures that had been subsidized by another project but that the farmers had then abandoned.

¹⁶ The payment should not be compared to the \$42/ha/year paid under the forest conservation contract in Costa Rica and similar payments in Mexico's PSAH program, as these payments are for conserving existing forest (and so require no investments) on land with low opportunity costs.

throughout the area (for example, per night fees for lodging, or fees per boat trip). No data are available on the number of visitors or other variables that would allow estimating the revenue that such fees would generate, however. The figures are probably relatively low at present, but likely to rise over time as the industry develops. The artisanal fishing industry is unlikely to be able to generate much funding; a 1% tax on the value of landed fish would only generate some US\$3,000 annually, for example. The shrimp industry could provide substantially greater flows. A US\$100 fee per hectare of shrimp ponds would generate US\$50,000 annually based on the current area, and substantially more if more ponds are constructed (shrimp ponds are being constructed in areas once used for salt production, not by converting natural habitat). Considerably more work will be required to explore the potential of payment agreements with these service users; there have not been any previous efforts to develop payment systems with the fishing and shrimp industries, so there is little experience on which to base estimates. Overall, it seems clear that, at least in the short and medium term, conservation payments in this area will rely largely on GEF resources. This creates a challenge in terms of long-term sustainability. The project will explore various mechanisms to address this challenge, including the creation of an endowment fund.

Cost-effectiveness analysis

17. A full cost-benefit analysis of the project would require that the value of the services generated be estimated, which is complex both because of the difficulty of quantifying the level of services provided and because of the difficulty of estimating their value—particularly in the case of global services. As in the case of the earlier Costa Rica Ecomarkets Project, therefore, a cost-effectiveness analysis is undertaken.

18. A traditional conservation approach to these watersheds would typically involve placing the entire area under conservation, with no uses being permitted. This would be financially costly, as it would require buying land outright from current landowners. It would also be economically costly, as it would entirely forgo the benefits from current land use practices. In the example shown in tables 9.2 and 9.3, the present value of the economic cost of a pure conservation strategy would be about US\$1,700/ha: the value of the forgone net benefits of current land uses. This would also be the financial cost of a pure conservation strategy, as it is the minimum price at which land users are likely to be willing to sell their land.

19. A PES approach, on the other hand, would be less costly because it would not fully displace existing land uses, and would add alternative income-generating activities. It would, however, require both initial investments and ongoing maintenance costs. A payment would be required to induce land users to change land use, but the PES payment itself is a transfer that has no economic cost. From the economic perspective, the key result here is that adopting the alternative would provide higher levels of environmental service at a substantially lower cost compared to a pure conservation approach: US\$1,000/ha, rather than US\$1,700/ha.¹⁷

20. The pure conservation approach would probably provide greater levels of environmental services than the alternative proposed here. It is not clear, however, that the additional benefits would be worth almost doubling the cost. Even if they were, the point is largely moot as a pure conservation approach would be politically infeasible. It would also be financially more difficult, as the entire amount would be needed up front, whereas a PES approach spreads the financial burden over many years.

¹⁷ In a celebrated example, New York City found that a PES program to protect the watershed from which it draws its water would cost about US\$1.5 billion, compared to the US\$6–8 billion cost of a filtration plant. As in El Salvador, a pure conservation strategy would not have been politically feasible.

21. A cost-effectiveness analysis is appropriate if the higher levels of environmental services generated are either required for legal or social reasons (for example, to meet minimum water quality standards, as in the New York City case) or if they can be assumed to be greater in value than the cost of generating them. The analysis in Table 9.2 provides a lower bound estimate of the value of environmental services necessary to justify the land use change, in this case about US\$1,000/ha, or about US\$100/ha/yr. To this should be added the per hectare operating costs of operating the PES mechanism.¹⁸ It certainly would not be safe to assume that any randomly selected hectare of land in the country would provide services of this value. The pilot cases, however, have been selected on the basis of the importance of downstream water uses and/or their importance for biodiversity conservation (by providing buffer zones to PAs, or corridors between them). Any subsequent expansion of the PES program to other areas would likewise need to target areas of high potential service value.

22. **Sensitivity analysis.** As noted, these estimates are intended to be illustrative. Specific results will vary according to the particular conditions encountered at each project site, and on the particular land uses needed to generate the desired environmental services. In general, the numerical results are sensitive to the assumed cost of implementing the different measures, to the assumed profitability of the tree crops, and to the discount rate, but the qualitative results are quite robust.

- If tree crops are more profitable than assumed here, there may be no need to intervene. However, it would take a 50% increase in tree crop profitability to make the alternative financially preferable to land users. In fact, the assumed profitability of tree crops is probably too high; transport difficulties would likely make them less profitable at many sites than assumed here. Every 10% reduction in the profitability of tree crops would increase the required payment by about US\$200/ha.
- If conservation measures were cheaper, or if alternative approaches that achieved the same result at lower cost could be identified, the need for payment would likewise decline.
- The results are robust to changes in the discount rate: only at discount rates below 2% would the alternative be more profitable for land users than current practices.

B. Project Sustainability and Replicability

23. Designing long-term sustainability of the PES program has been a central objective throughout preparation, drawing on lessons learned from other PES programs, notably in Costa Rica. Project interventions that would contribute to achieving sustainability include:

- Establishing appropriate programs and institutional mechanisms that will operate beyond the end of the project; and
- Ensuring that PES mechanisms are only implemented in areas with demonstrated demand for services, so that payments from service users fully finance both payments to participating service providers (land users) and the operating costs of the program.

24. Sustainability builds on the strong demand for environmental services in El Salvador as much as in other countries. Experience in other countries has shown that there is a strong demand for these services by both the national and the international communities. In Costa Rica, for example, a wide range of water users (private and public hydropower producers, bottlers, municipal water supply systems, irrigation) are paying for conservation of the watersheds from which they obtain their water, as well as for the administrative costs of the Costa Rican PSA program. In El Salvador itself, there are already three examples of municipal water supply systems that are paying for protection of their water sources: San

¹⁸ It is difficult to estimate what these costs would be at this stage. They will likely be relatively high during the period of the project itself, given the need to establish the payments system, the inevitable inefficiencies associated with the learning process, and the small initial area covered, but diminish markedly in later years. In Costa Rica, transaction costs are less than 5% of payments made.

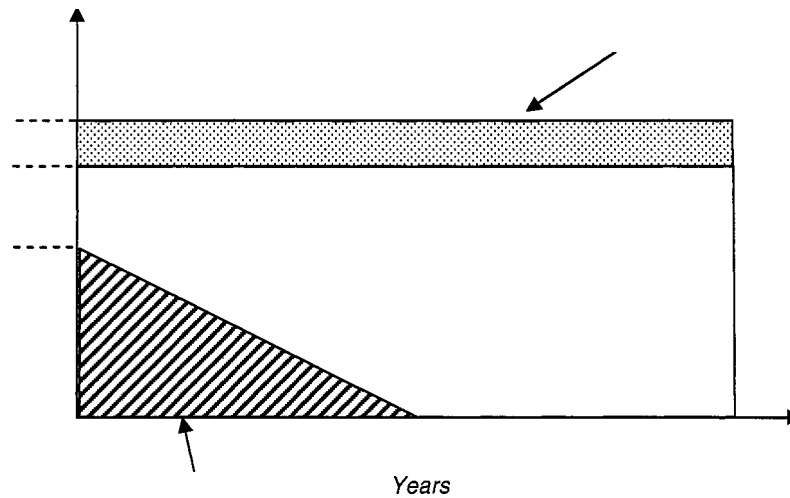
Francisco Menéndez, Tacuba, and Yamabal. Studies in the Lago Coatepeque pilot area have shown substantial potential demand for improved water services, from both the many holiday homes that are located on the lake shore and from the 13 water systems that serve local *poblados*. CEL and other national entities are in discussions with MARN about using FONASA as a means to help protect the watersheds they depend on. As to global environmental services, there is a large demand in the international community for biodiversity conservation, supported in particular by the GEF partners.

25. A key output of the project is the establishment of a functioning environmental fund (Fondo Nacional de Servicios Ambientales—FONASA.) that is designed to address an important cause of environmental problems, i.e., that many of the benefits of particular land uses are to people other than those who decide on land use. Because of this problem, land users usually ignore these additional benefits when they make their land use decisions, and as a result these benefits are often lost. FONASA creates a mechanism to address this market failure. It is designed to act as an intermediary between the users of environmental services (including local uses such as water services and global services such as biodiversity conservation). FONASA itself has no financing requirement except for its own administrative costs. It is not a fund in the strict sense but a fiduciary instrument to channel payments from one party (service users local, national, and international) to another party (the service providers.)

26. By its very nature, FONASA's funding will come from the service users who desire to obtain improved services or protect the services they receive. Payments made, in the long term, will come entirely from the service users. The rules under which FONASA will operate prevent it from implementing any local PES mechanism until a signed agreement has been reached with local service users for them to ultimately (within a maximum of 5 years) be fully responsible for paying the full amount of the payments to service providers, plus the administrative costs of the mechanism. Moreover, service users must contribute substantially to the payments from the start. In other words, FONASA will not make any payments until there is demonstrated demand, with money on the table.

27. As noted earlier, the operational costs of FONASA will be borne by the service users themselves, not by government budget. Because of the relative lack of experience with this approach in El Salvador, and because FONASA being a new institution does not yet have a track record, it will likely be necessary to provide some initial support (co-financing) to PES mechanisms. The proposed rules for FONASA will limit this support to a maximum of 50% of total payments in the first year of implementation, and declining in the following years until it reaches 0% in the fifth year (see graph below.) Funding for this support will come from the loan, and (in areas with high biodiversity) the GEF grant. The need for such support is likely to decline substantially in new areas, as both the mechanism and FONASA itself demonstrate their ability. This has been the experience in Costa Rica: the first water users to sign contracts with FONAFIFO for watershed conservation only paid \$10 out of the \$40 that FONAFIFO paid to service providers. Since about 2000, however, all new contracts have seen service users pay the entire amount of the payment to service providers, plus additional fees to cover FONAFIFO's administrative costs.

Graph: Share of Payments by Service Users and Other Sources Under FONASA Contracts for Water Services



28. The design of FONASA has taken full advantage of lessons learned from the experience of other countries, especially as regards sustainability. Costa Rica's PSA program, for example, has been justly celebrated, but faces significant sustainability concerns and continues to depend primarily on funding from an earmarked tax. The design of FONASA avoids the problems Costa Rica is facing by being based explicitly on service user demand from the very beginning. Indeed, Costa Rica is now trying to follow exactly this approach of developing agreements with specific service users to try to overcome its sustainability issues. Mexico is also moving in this direction, having started with a program that was fully funded from the central government budget. El Salvador's FONASA program has more explicitly incorporated sustainability concerns in its design than any previous PES program anywhere in the world.

29. Once a mechanism such as FONASA is in place, experience in other countries has shown that it can facilitate action in many related areas. Access to carbon markets, for example, will be easier once there is in place a mechanism to induce changes in land use and monitor their results.

30. The PES system will serve three types of demand for environmental services to be financed from different sources of funding:

- a) Global demand, consisting mainly of biodiversity conservation and management services (this is the case of most of the environmental services provided in the site of Jaltepeque-Jiquilisco). This demand will be financed through the earnings of an endowment fund capitalized in part with potential proceeds of the GEF grant and in part through the contributions of other bilateral or multilateral funding agencies or international NGOs.
- b) National demand consisting mainly of water services of national scope to be financed inter alia from licensing fees (Decree No. 50), electric energy payments (CEL), and water charges (ANDA).
- c) Local demand (which will constitute the bulk of the demand to be served) financed through the establishment of contracts between service users and service providers.

31. All payments under the PES systems will be made through FONASA, which will act as an intermediary between service users and service providers, taking payment from service users and channeling them to service providers in such a way as to generate the continued flow of services desired by the services users. The proceeds of the IBRD loan and the GEF grant will be used also to establish the PES mechanism and help finance its operations for the first five years. This kind of support will not be required after this initial period since the system will have been experimented with and will be fully functional.

32. The above system will be financially sustainable to the extent that all payments are made either through the local markets from users to providers of services or through permanent autonomous mechanisms (other external sources that will generate their own funding requirements.) Payments under (b) and (c) above are sustainable to the extent that they do not involve direct payments from the Government's budgets, but rather a continued flow of payments on the part of service providers under predetermined contractual obligations monitored and enforced by FONASA. These service providers (mostly small land users) will be given the right incentives in terms of suitable monetary compensation to permanently change their land use practices for more environmentally friendly practices. These payments will be maintained as long as they are required for land users not to revert to their initial practices. Payment under (a) will be sustainable since the endowment fund that will finance biodiversity services is expected to be capitalized to such a level that it will generate its own revenues, eventually covering all the payments required to conserve El Salvador's biodiversity of global value.¹⁹

33. The sustainability of payment flows from service users depends on their being satisfied that they are receiving the services they are paying for. The project's activities are designed to ensure this as much as possible. FONASA can only make payments to service providers for activities agreed by the service users who are paying. There will be a strong monitoring system to document the extent to which service providers are complying with their contracts and the extent to which services are being generated. With these elements in place, experience has shown that payments can be sustainable. In Costa Rica, for example, water users who first signed contracts with FONAFIFO in 1997 and 1999 have since renewed their contracts. The sustainability of the mechanism also depends on the service users trusting the institutions involved to serve their interests and to do so efficiently. FONASA builds on the experience of other countries by establishing an independent institution with clear, transparent rules.

34. There is a specific sustainability challenge in those areas where local services are insufficient to generate enough funding to pay for the needed land use change, but where this change will be desirable for biodiversity conservation. When services are mainly local, they can generate a continuous flow of resources to support the needed payments. Payments made by water users, or by the ecotourism industry, will be continuous. However, it is not possible to arrange a similar continuous flow of funds when the benefits being sought are primarily global. The project recognizes this explicitly and is exploring a series of approaches to address it, chief among them being the creation of an endowment fund, which will convert short-term funding into a continuous funding stream. There have been very successful experiences with such endowment funds in Mexico, Peru, and Bolivia, for example, and Colombia is creating such a fund. It is important to bear in mind that this specific sustainability issue only affects a small portion of the situations that FONASA will address.

35. The PES system is predicated on the willingness of services providers (mostly land users) to participate in the PES program and on their actual capacity to produce the environmental services demanded by service users. Capacity building activities through education, training and awareness-raising activities that will promote replication of project lessons and transfer of experience will be provided to

¹⁹ Another global service that could be financed under the same mechanism is carbon sequestration using the proceeds of carbon certificates issued under the Kyoto Prototype Carbon Fund arrangements.

farmers participating in the PES program. This will ensure their continued participation in project implementation and maintain the momentum of implementation of the PES scheme. Land users will also receive technical support from the extension and research services of the Ministry of Agriculture (as well as other government institutions, NGOs, etc.) so that they have the technical capacity to effect the changes, as well as assistance in getting access to the varieties of annual, semi-perennial, and perennial forest/tree crops required for the establishment of the new farming systems.

36. It is important to consider the alternatives to the PES approach. El Salvador has very serious environmental problems. Degradation of its water supplies, in particular, poses grave threats to economic activity (hydropower generation, irrigation, industry, tourism, fishing) and to social welfare (lack of water and low quality of water for domestic use). The PES approach will allow some of these important problems to be addressed sustainably using funding from beneficiaries. Lacking such a mechanism, the cost of addressing these problems will fall entirely onto the government budget. It is for this reason, among others, that so many countries are moving to develop and implement PES programs. Costa Rica and Mexico have developed nationwide PES programs, while Ecuador and Colombia have decentralized programs.

37. As evidenced by the above, the following key features will enhance the probability that project interventions be sustainable:

- By the end of the project, funding for the payments that FONASA makes to service providers in pilot areas implemented under the project will come entirely from the service users. These same payments from service users will also cover FONASA's administrative costs in these areas.
- PES mechanisms will only be implemented in areas in which there is demonstrated local demand: demonstrated with money on the table. This promotes both *efficiency* (resources are spent where the benefits justify it) and *sustainability* (payments are only made where the funding source exists).
- Replication of the approach to new areas will follow the same principles: they will only be implemented where there is demonstrated demand. There will be no new payments until there are corresponding new funding sources.
- Some initial support from sources other than the service users (loan, GEF grant, central government budget) will likely be necessary in the pilot areas. By design, this need is limited in both amount (maximum 50% in first year, declining over time) and time (maximum 5 years), and can be made reimbursable if so desired. The need for such support will decline substantially over time, as demonstrated by experience elsewhere.
- The PES approach will allow important environmental problems to be addressed using funding from beneficiaries. Without it, the financial burden will fall entirely on the government budget.

Annex 10: Safeguard Policy Issues

EL SALVADOR: Environmental Services Project

Summary of Environmental Assessment

1. The project is expected to be overwhelmingly positive from an environmental perspective. The development objectives are (i) to establish legal, institutional and financial arrangements to pilot mechanisms of payment for environmental services, (ii) to document links between land use changes and water services improvements and biodiversity conservation, (iii) to define good practices to replicate, scale up, and sustain PES programs; and (iv) to strengthen the capacity of MAG, MARN, community associations, and NGOs to support long-term development of environmental service markets in El Salvador. The global environment objective of the project is to enhance and protect biodiversity by preserving important forest and protected ecosystems. This would be done by piloting a market-based system to contract environmental services. This approach will be accomplished through the development of a market-based system to contract environmental services in priority areas, and to consolidate, expand and restore critical ecosystems in the production landscape.

2. Based on the scope of project activities and their anticipated impacts, the project has been classified as a Category “B”, requiring a limited environmental assessment (EA) focused on the key project issues. The EA evaluated the project’s potential to result in positive and negative impacts, either directly, indirectly, or cumulatively. Based on its findings, the EA recommended specific activities to mitigate minor negative impacts and enhance several positive ones. These recommendations are described in the Environmental Management Plan, which will be part of the Operational Manual.

3. In addition to identifying potential project impacts, the EA evaluated the project’s potential to trigger other safeguard policies, including Forests (OP 4.36), and didn’t find that any of these policies are triggered.

Biodiversity, sustainable ecosystem management, and environmental services

4. The proposed project seeks to design and implement a system of payment for environmental services that supports biodiversity and sustainable ecosystem management policies and strategies. The multidisciplinary approach will support valuation of the environmental services being introduced into the market guaranteeing their sustainability within the context of the El Salvador Mesoamerican Biological Corridor.

5. El Salvador is small and densely populated. Only 26.5 percent of its 21,000 km² are covered by natural vegetation, of which only 7 percent is densely vegetated. The remaining 19.5 percent is sparsely vegetated (including bush, scrub, chaparral, and morral). Forest cover is found on approximately 10.8 percent of the territory, with shade coffee covering an additionally 8.5 percent (176,500 hectares). Almost half of the land in the country is considered steeply sloped (greater than 15 degrees), which is reflected in the underutilization of soils.

6. As a result, El Salvador’s landscape is highly fragmented with only isolated patches of natural habitat, which limits the long-term viability of many plant and animal species. These factors are coupled with high deforestation rates and inappropriate agricultural practices, which together generate severe consequences for ecosystem stability and the sustainability of environmental goods and services, including biodiversity. Capturing environmental services and incorporating them into local, national, and global markets will drive demand for their preservation and restoration, thereby helping the country

explore an untapped source of funding for conservation. This is considered to be a critical part of promoting sustainable development in El Salvador.

7. Despite these significant threats, El Salvador is part of the Mesoamerican Biodiversity Hotspot as identified by the Critical Ecosystem Partnership Fund, and maintains an impressive diversity of species in an area little larger than Massachusetts. The country is home to 1,477 vertebrate species (27 percent of which are threatened), including 532 bird species,²⁰ 140 species of reptiles and amphibians, and 800 species of butterflies. El Salvador also has an estimated 7,000 native plant species, including more than 1,000 species of trees and 380 species of orchids. This high biodiversity persists despite the fact that El Salvador retains little of its original vegetation. The last remaining forests, including wetlands and mangroves, are vital stopovers for hundreds of thousands of migratory birds, including high percentages of the breeding populations of several species of North American songbirds. Stopover habitat for migrant birds is critical in light of the 7 percent decline of North American migratory birds over the past 10 years. With careful protection, management, and rehabilitation, these last remaining forested areas could play an important role in the conservation of biological diversity in Central America and help to protect and expand El Salvador's carbon sinks.

8. The Government of El Salvador, in an effort to further biodiversity conservation, has developed a strategy to prioritize 15 conservation units built on the biological corridor concept, which encompass most of the country's protected areas and natural habitats. The conservation units use the country's 118 natural protected areas as "nuclei," and surrounding private lands as "buffer zones." The specific approach to consolidate these areas is not yet known, but clearly it must target the primary threats to biodiversity: habitat destruction and the loss of natural resources stemming from deterioration in the quality of life for local populations (NBSAP 2000). In concert with the Land Administration Project, the proposed project aims at contributing to this strategy by developing and piloting mechanisms for biodiversity conservation. Specifically, the land projects would demarcate all protected areas, resolve land tenure in those lands and adjacent private lands (buffer zones), and test regularization of residents in protected areas (nuclei). The proposed project would assess the provision of PES as incentives for biodiversity-friendly land use in adjacent private lands (buffer zones).

9. Consequently, the two GEF-supported projects would address the root causes of biodiversity loss in El Salvador by developing and piloting a methodology for consolidating priority protected areas, and creating a market and fund for PES to improve management of buffer zones. The PES strategy is expected to add value to existing natural habitats and support improved quality of life for local residents both by providing an alternative income source and mitigating environmental pollution related to habitat destruction. Additionally, the project will promote this strategy in areas critical to the protection of regionally and globally significant biodiversity, including identification and support for conservation-friendly income generating activities for those residents. Through these activities, the project aims to increase forest cover in the buffer zones of conservation and protected areas. It is anticipated that as this cover grows the corridors will effectively link this important genetic pool to that of the MBC/ES. Additionally, by strengthening the legal and institutional framework and capacity for natural resources management, the project directly contributes to the long-term protection and conservation of globally significant biodiversity.

SITE SELECTION

10. Site selection has been conducted based on a rigorous evaluation of environmental and economic criteria, including biodiversity importance. The process and criteria used, as well as descriptions of the ecological importance of the sites are described in Annex 18.

²⁰ Seventeen of the 23 endemic species of birds reported in northern Central America are still extant in El Salvador.

11. Hydrological Resources. Many of the endemic and threatened species found in El Salvador's remaining natural habitats are highly dependent on water, both in montane forests such as La Montaña, riparian habitats throughout the country, and the biodiversity-rich mangroves like those in Jiquilisco–Jaltepeque. At the same time, the absence of a strong water management framework has not adequately prevented large-scale destruction and deterioration of these critical water-dependent habitats, which in turn has important implications for social development and poverty. The proposed project provides market-based incentives for offsetting habitat destruction in these important areas, thereby contributing to their conservation and restoration.

12. Given the importance of the integrity of water-based habitats to biodiversity conservation, social development and poverty alleviation, the project has been developed to emphasize a watershed focus. As mentioned, current land use practices have contributed to a number of water resource management problems affecting both water quantity (scarcity during the dry season and flooding during the wet season) and quality (high silt loads, contamination from agrochemicals, etc.) (U.S. Army Corps of Engineers 1995). As a result, fresh water supplies are considered severely threatened, affecting humans and other water-associated plant and animal species. Many municipal water systems now rely on safer groundwater sources (as compared to river water), but depletion and contamination of these sources is also becoming a problem. It is anticipated that addressing these issues by emphasizing a model to promote water conservation and protection will reduce environmental vulnerability, increase productivity, and promote sustainable resource use.

13. Land degradation. The project would emphasize reduction of land degradation, reversion of marginal agricultural areas to forest, and encourage more sustainable land use in agricultural areas. Toward this end activities will be promoted for sustainable agriculture, agroforestry, and shade-grown coffee. It is considered that these practices maintain both a high level of environmental services important for biodiversity conservation as well as agricultural production important for poverty alleviation, through a strategy that minimizes tradeoffs between economically productive land use, biodiversity conservation, and environmental services.

14. Biodiversity. In situ biodiversity conservation plays a critical role for globally significant plant and animal resources, for local communities through the various economic goods and services provided, and for local and regional populations dependent on ecosystem stability. The project will focus on two priority pilot sites (Lago Coatepeque/Los Volcanes and Jiquilisco–Jaltepeque) and will later expand to an additional three sites (Rio Gualabo, La Montaña and Cinquera,), with the aim of bringing at least 12,000 hectares of private and public land under environmental service contracts that contribute to biodiversity conservation within these areas.

Strengthening conservation on private lands

15. The National Strategy on Biological Diversity identified “the establishment of the National System of Protected Natural Areas” as one of the priority actions to be carried out in the country. Execution of this activity is the responsibility of MARN, which in addition must ensure that management of the Protected Natural Areas is carried out in an effective manner and in accordance with the guidelines of the CBD and corresponding national legislation. Based on this vision, the National Protected Areas System (SANP) will be enforced to promote the integration of protected areas into a larger framework for sustainable development managed as conservation units, as mentioned above.

16. Toward this aim, the project promotes the national biodiversity and protected areas strategies through establishment of mechanisms to improve management of conservation units, namely the private lands that form buffer zones (see above). Specifically, project activities provide incentives to protect and recover the

integrity of critical natural habitats, restore degraded ecosystems in adjacent lands, and establish ecological corridors that integrate the natural protected areas (nuclei) and surrounding natural (often altered) habitats (buffer zones) within larger, ecosystem-based conservation units. Consequently, these conservation areas will in time be administered as part of a broader landscape through the encouragement of management systems that promote adoption of environmentally sound productive practices on private lands that are intended to generate and provide compensation for environmental services. This landscape approach is critical for linking protected area planning and management with other relevant environmental and land policies, as well as to local economic and social development priorities. Ultimately, this holistic planning and management view is necessary for social, ecological, and economic stability at the landscape level.

17. As mentioned above, this project will coordinate closely with the GEF Land Administration Project by promoting incentives for private lands bordering the protected areas that will be strengthened through that project (see Annex 17). It is envisioned that this complementary approach will result in a much-enhanced SANP with private lands adopting biodiversity-friendly measures due to the incentive presented by the payment for their existing environmental services.

18. Environmental Sustainability. A key component of the project is establishment of eligibility criteria for activities to be promoted. These activities and the criteria to be used in their evaluation are being finalized based upon the experience available in El Salvador and other countries in the region, such as Costa Rica and Honduras. The specific criteria used in each site will be selected based on its particular characteristics, including the potential for provision of environmental services under sustainable production levels.

19. The project also includes the establishment and implementation of a strong monitoring and evaluation system that will enable adaptive management (e.g. utilizing monitoring results to quickly make adjustments where necessary) and also emphasizing learning lessons so as to enable future replication of the model.

20. With the intention of guaranteeing long-term environmental sustainability, the project will (i) strengthen local capacity by introducing new land use practices locally adapted to improve productivity and family income, (ii) establish the necessary institutional framework by creating locally adapted procedures and rules for the payment for environmental services systems, and (iii) foster a national enabling environment favorable to the expansion of the program to other sites.

21. The activities developed in the project will have positive environmental impacts and improve the bio-physical and socioeconomic conditions of direct (environmental service providers and beneficiaries) and indirect (regional, national, and global) participants. Ultimately it is expected that the project will improve rural livelihoods by providing a mechanism through which environmental externalities are internalized in participants' day-to-day decisions related to land management.

Annex 11: Project Preparation and Supervision
EL SALVADOR: Environmental Services Project

	Planned	Actual
PCN review	06/15/2000	03/06/2003
Appraisal	04/18/2005	4/18/05
Negotiations	04/25/2005	4/22/05
Board/RVP approval	06/01/2005	
Planned date of effectiveness	01/15/2007	
Planned date of midterm review	06/15/2009	
Planned closing date	02/15/2012	

Key institutions responsible for preparation of the project: Ministry of Environment and Natural Resources (MARN)

Bank staff and consultants who worked on the project included:

Name	Title	Unit
Mark Austin	Sr. Operations Officer	LCSER
Stefano Pagiola	Sr. Environmental Economist	ENV
Dinesh Aryal	Operations Analyst	LCSER
Paula Freitas	Operations Analyst	LCSER
Luis Prada	Procurement Specialist	LCOPR
Fabienne Mroczka	Financial Specialist	LCOAA
Alejandro Deeb	Sr. Hydrologist (Consultant)	LCSER
Ann Jeannette Glauber	Consultant	LCSER
Peter Brandriss	Sr. Program Assistant	LCSER
Edgar Ortiz	Forestry Specialist (Consultant)	LCSER
Gunars Platais	Sr. Environmental Economist	LCSER
Theresa Bradley-Fiscella	Sr. Private Sector Development Specialist	CICIC
John Kellenberg	Sector Leader	LCSES
Ian Cherrett	Land Management Specialist	FAO/CP
Norman Piccioni	Agriculture Specialist	LCSER
Juan Martinez	Social Specialist	LCSES
Fabiola Altimari	Country Lawyer	LEGLA
Carolina Sanchez	Team Assistant	LCSES
Joseph Formoso	Sr. Finance Officer	LOAG1
Esteban Brenes	Consultant	LCSER
Armando Guzman	Consultant	LCSER
Richard Arias	Consultant	LCSER
Arsenio Rodriguez	Consultant	LCSER

Bank funds expended to date on project preparation:

1. Bank resources: US\$ 18,000
2. GEF resources: US\$ 310,000
3. Trust funds: US\$ 680,000
4. Total: US\$ 1,008,000

Estimated Approval and Supervision costs:

1. Remaining costs to approval: US\$175,000
2. Estimated annual supervision cost: US\$ 75,000

Annex 12: Documents in the Project File
EL SALVADOR: Environmental Services Project

1. Government's project document
2. Detailed project cost tables
3. Procurement Plan
4. Participatory Social Analysis
5. Economic Analysis
6. Incremental cost analysis
7. Institutional analysis
8. Financial analysis
9. Economic and financial assessment
10. Environmental assessment
11. Monitoring plan
12. Institutional arrangements
13. Social and Gender evaluation
14. Analysis of the juridical and institutional framework for a PES system
15. Development of the Executive Decree for the constitution of the Trust
16. Base Line of the pilot sites for ESP
17. Base Line of the conservation areas
18. Hydrologic study of the pilot sites
19. Environmental economic study of the pilot sites
20. Harvesting and information systematization of the pilot sites

Annex 13: Statement of Loans and Credits
EL SALVADOR: Environmental Services Project

Project ID	FY	Purpose	Original Amount in US\$ Millions					Cancel.	Undisb.	Difference between expected and actual disbursements	
			IBRD	IDA	SF	GEF	Orig.			Frm. Rev'd	
P064919	2003	SV JUDICIAL MODERNIZATION PROJECT	18.20	0.00	0.00	0.00	0.00	18.02	6.58	0.00	
P067986	2002	SV-EARTQUAKE EMERGENCY REC. & HEALTH SER	142.60	0.00	0.00	0.00	0.00	139.86	-2.74	0.00	
P050612	1998	SV EDUCATION REFORM	88.00	0.00	0.00	0.00	0.00	14.04	14.04	14.04	
P041680	1998	SV SECONDARY EDUCATION	58.00	0.00	0.00	0.00	0.00	12.47	12.47	0.00	
P007164	1997	SV PUBLIC SECTOR MODERN	24.00	0.00	0.00	0.00	0.00	7.62	7.62	0.00	
P007174	1996	SV LAND ADMINISTRATION	50.00	0.00	0.00	0.00	0.00	3.88	3.88	-0.96	
Total:			380.80	0.00	0.00	0.00	0.00	195.89	41.85	13.08	

EL SALVADOR
STATEMENT OF IFC's
Held and Disbursed Portfolio
In Millions of US Dollars

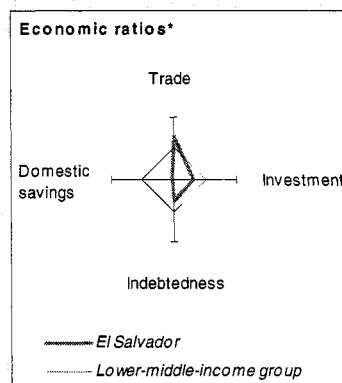
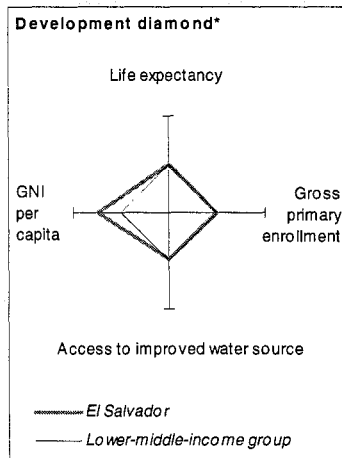
FY Approval	Company	Committed				Disbursed			
		IFC				IFC			
		Loan	Equity	Quasi	Partic.	Loan	Equity	Quasi	Partic.
	AFP Crecer	0.00	1.20	0.00	0.00	0.00	0.78	0.00	0.00
2001	CAESS/EEO	43.44	0.00	0.00	70.90	30.02	0.00	0.00	48.54
2002	CALPIA	0.00	2.00	0.00	0.00	0.00	1.99	0.00	0.00
1997/00	CESSA	0.00	0.37	0.00	0.00	0.00	0.37	0.00	0.00
1998/03	CUSCATLAN-ES	0.00	0.00	15.00	0.00	0.00	0.00	15.00	0.00
2004	Metrocentro	25.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00
1998	SEF Baterias	1.29	0.00	0.00	0.00	1.29	0.00	0.00	0.00
1999	SEF IMACASA	0.00	0.20	0.00	0.00	0.00	0.20	0.00	0.00
Total portfolio:		69.73	3.77	15.00	70.90	41.31	3.34	15.00	48.54

		Approvals Pending Commitment			
FY Approval	Company	Loan	Equity	Quasi	Partic.
Total pending commitment:		0.00	0.00	0.00	0.00

Annex 14: Country at a Glance

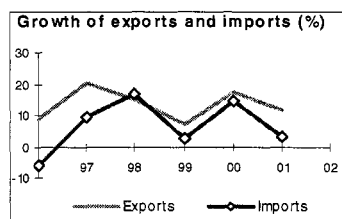
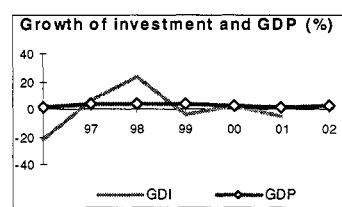
EL SALVADOR: Environmental Services Project

POVERTY and SOCIAL	El Salvador	Latin America & Carib.	Lower-middle-income		
2002					
Population, mid-year (millions)	6.5	527	2,411		
GNI per capita (Atlas method, US\$)	2,080	3,280	1,390		
GNI (Atlas method, US\$ billions)	13.6	1,727	3,352		
Average annual growth, 1996-02					
Population (%)	2.0	1.5	1.0		
Labor force (%)	3.2	2.2	1.2		
Most recent estimate (latest year available, 1996-02)					
Poverty (% of population below national poverty line)					
Urban population (% of total population)	62	76	49		
Life expectancy at birth (years)	70	71	69		
Infant mortality (per 1,000 live births)	31	27	30		
Child malnutrition (% of children under 5)	12	9	11		
Access to an improved water source (% of population)	77	86	81		
Illiteracy (% of population age 15+)	20	11	13		
Gross primary enrollment (% of school-age population)	109	130	111		
Male	12	13	11		
Female	107	128	110		
KEY ECONOMIC RATIOS and LONG-TERM TRENDS					
	1982	1992	2001	2002	
GDP (US\$ billions)	3.4	6.0	13.7	14.3	
Gross domestic investment/GDP	13.2	13.5	16.0	..	
Exports of goods and services/GDP	22.8	16.1	28.9	..	
Gross domestic savings/GDP	7.5	2.2	2.0	..	
Gross national savings/GDP	6.7	13.1	14.4	..	
Current account balance/GDP	-6.9	-5.6	-1.5	..	
Interest payments/GDP	13	13	12	14	
Total debt/GDP	42.4	38.0	34.1	..	
Total debt service/exports	13.6	12.5	6.4	..	
Present value of debt/GDP	33.4	..	
Present value of debt/exports	76.4	..	
	1982-92	1992-02	2001	2002	2002-06
<i>(average annual growth)</i>					
GDP	2.1	3.8	1.8	2.3	3.0
GDP per capita	0.8	1.6	-0.1	0.4	1.1



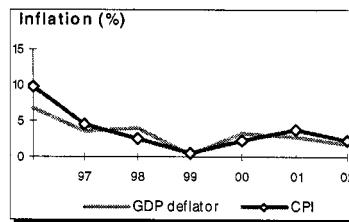
STRUCTURE of the ECONOMY

	1982	1992	2001	2002
<i>(% of GDP)</i>				
Agriculture	32.6	14.2	9.5	..
Industry	22.2	29.6	29.7	..
Manufacturing	16.6	23.8	23.0	..
Services	45.2	56.2	60.8	..
Private consumption	76.7	88.4	87.9	..
General government consumption	15.8	9.4	10.0	..
Imports of goods and services	28.5	32.4	42.9	..
	1982-92	1992-02	2001	2002
<i>(average annual growth)</i>				
Agriculture	0.6	0.8	-2.1	..
Industry	2.5	4.9	5.0	..
Manufacturing	2.6	5.0	4.2	..
Services	2.5	4.3	1.2	..
Private consumption	4.2	4.3	0.2	..
General government consumption	-2.9	2.7	1.1	..
Gross domestic investment	6.9	3.4	-5.3	..
Imports of goods and services	6.0	9.8	3.3	..



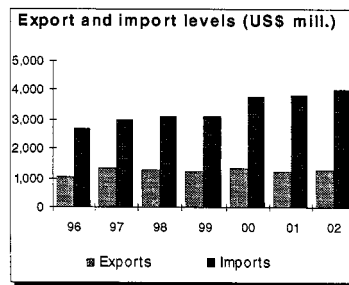
PRICES and GOVERNMENT FINANCE

	1982	1992	2001	2002
Domestic prices				
<i>(% change)</i>				
Consumer prices	11.9	11.2	3.8	2.2
Implicit GDP deflator	9.3	8.8	2.7	1.7
Government finance				
<i>(% of GDP, includes current grants)</i>				
Current revenue	116	..
Current budget balance	0.1	..
Overall surplus/deficit	-4.0	..



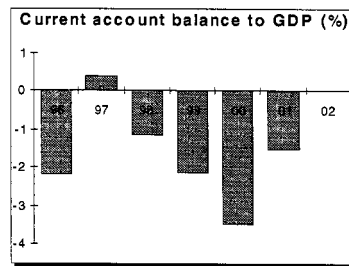
TRADE

	1982	1992	2001	2002
<i>(US\$ millions)</i>				
Total exports (fob)	..	597	1,249	1,304
Coffee	..	151	15	..
Cotton	..	45	70	..
Manufactures	..	380	1,042	1,046
Total imports (cif)	..	1,699	3,866	4,049
Food	..	417	1,098	..
Fuel and energy	..	128	169	..
Capital goods	..	431	900	1,003
Export price index (1995=100)	..	85	57	58
Import price index (1995=100)	..	89	82	82
Terms of trade (1995=100)	..	74	70	70



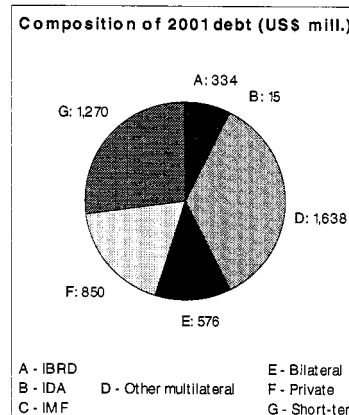
BALANCE of PAYMENTS

	1982	1992	2001	2002
<i>(US\$ millions)</i>				
Exports of goods and services	851	1,137	3,977	..
Imports of goods and services	1,059	2,079	5,892	..
Resource balance	-208	-942	-1,915	..
Net income	-119	-97	-264	-311
Net current transfers	94	708	1,968	2,056
Current account balance	-233	-331	-211	..
Financing items (net)	309	391	392	..
Changes in net reserves	-76	-60	-181	48
Memo:				
Reserves including gold (US\$ millions)	..	501	1,741	1,890
Conversion rate (DEC, local/US\$)	2.6	8.4	8.8	8.8



EXTERNAL DEBT and RESOURCE FLOWS

	1982	1992	2001	2002
<i>(US\$ millions)</i>				
Total debt outstanding and disbursed	1,443	2,263	4,683	..
IBRD	105	182	334	..
IDA	27	22	15	..
Total debt service	129	234	384	..
IBRD	12	27	48	..
IDA	1	1	1	..
Composition of net resource flows				
Official grants	117	223	147	..
Official creditors	193	112	160	..
Private creditors	56	-15	406	..
Foreign direct investment	-1	15	268	..
Portfolio equity	0	0	0	..
World Bank program				
Commitments	0	0	0	..
Disbursements	11	11	50	..
Principal repayments	5	13	25	..



Annex 15: Incremental Cost Analysis

EL SALVADOR: Environmental Services Project

Overview

1. The global environment objective of the proposed project is to enhance and protect biological diversity and preserve important forest and mountain ecosystems. The development objective of the proposed project is to support the development of markets for environmental services which will be provided by private landholders. This would be accomplished through the development of a market-based system to contract environmental services in priority areas, and to consolidate, expand, and restore critical ecosystems in the production landscape. It would promote the conservation and sustainable use of El Salvador's natural ecosystems, including critical watersheds and buffer zones of priority protected areas within the context of Meso-American Biological Corridor – El Salvador (MBC/ES). The project directly supports the implementation of Environment Law (1998) and Environmental Compensation Executive Decree 50 (2004), which promote the use of market-based mechanisms to stimulate improved natural resource management in El Salvador. The project aims to achieve these objectives through:

- the establishment of institutional and financial arrangements (creation of an environmental services fund, provision of technical assistance, and the signing of environmental services contracts with local providers) to pilot a program of payment for environmental services (PES) that will lead to the protection of globally important biodiversity, through the conservation and sustainable use of high priority critical ecosystems; and,
- strengthening the capacity of national institutions (MAG, MARN), community associations, NGOs and academic institutions to support long-term development of environmental service markets in El Salvador.

2. The GEF alternative intends to achieve this objective at a total incremental cost of approximately US\$ 5 million.

Context and Broad Development Goals

3. El Salvador is the smallest country in Central America. Because of its mountain terrain, the country faces tremendous challenge in its economic development. The same mountain terrain, however, provides El Salvador with a rich natural resource base and endemic biological diversity. Much of its natural resources, in particular forests, have been depleted and/or in degraded state due to the country quest for economic development and long political turmoil.

4. El Salvador emerged from a 12-year civil war in 1991. Since then, the country has made remarkable progress in consolidating peace and democracy. After implementing a number of economic reforms, El Salvador now places 24th out of 155 countries in the Index of Economic Freedom. Inflation, interest rates, and business uncertainty have fallen. The overall poverty rate fell by over 27 percentage points between 1991 and 2002, and extreme poverty was halved.

5. Although a relatively small country (an area of 21,000 km²), El Salvador is endowed with rich natural ecosystems that result from its tropical location and a combination of unique ecological factors, including the presence of volcanic soils and its isolation from the Atlantic Central American moist forests. It hosts several types of forest, ranging from dry forests (1,000 mm of rainfall per year) to montane evergreen or cloud forests (more than 4,000 mm of precipitation) to mangrove forest along the coastal wetlands. The central chain of volcanoes forms a series of ecological "islands" with their own endemic species, especially in the northern mountain range.

6. Despite widespread degradation, the country still maintains significant globally important biodiversity. The few patches of forest that remain in El Salvador still maintain a high degree of endemism and provide

critical functions to the country's biological diversity, to the Mesoamerican Biological Corridor (MBC/ES), and to the hydrological and ecological cycles of the country, including to the mangrove forest area in the Pacific coast. The country's ecosystems host unique and endemic biological diversity of national, regional, and global significance, including 1,477 species of vertebrates, including 532 bird species; an estimated 7,000 native plant species, including more than 1,000 species of trees; 140 species of reptiles and amphibians; and 800 species of butterflies. 17 of 23 endemic species of birds reported in north Central America, are still found in El Salvador.

7. Nevertheless, the country's remaining biodiversity is in severe jeopardy. Half of the bird species and 27 percent of the vertebrates are either threatened or at risk of extinction (World Bank, 2001). The IUCN—World Conservation Union's Red List of threatened species in El Salvador includes 11 critically endangered species, 15 endangered species, and 30 vulnerable species, some of which are endemic to El Salvador, such as *Abronia montecristoi*, *Hampea reynae*, *Parathesis aurantica*, and *Parathesis congesta*. Several species of orchids, trees, birds, mammals, and butterflies have not been reported during the last ten years, according to MARN. Agricultural activities and selective logging have led to imbalances in genetic and phenotypic quality in remaining organisms. The isolated patches of forests no longer provide corridors for biodiversity dispersal or seasonal movements, decreasing the long-term viability of many wildlife species. The Critical Ecosystem Partnership Fund, funded partly by GEF, the World Bank, Conservation International and others, has identified El Salvador as one of the countries in the Mesoamerican Biodiversity Hotspots.

8. Thus, while substantial biodiversity of global importance remains, without a concerted effort, the long-term viability of many wildlife species and ecological functions such as species survival and diversity, biodiversity connectivity, and carbon sequestration will be severely constrained. With careful protection, management and rehabilitation, these last remaining forested areas could play an important role in the conservation of biological diversity in Central America and help to protect and expand El Salvador's carbon sinks. Stopover habitat for migrant birds is critical in light of the 7 percent decline of North American migratory birds over the past 10 years. Land scarcity makes a traditional approach based primarily on expanding protected areas infeasible, however. Ways have to be found to ensure the preservation of biodiversity within agricultural landscapes.

Government Strategy

9. As a signatory to the Convention on Biological Diversity, the United Nations Framework Convention on Climate Change and the United Nations Convention to Combat Desertification, the government of El Salvador has committed to sustainable natural resource management to promote its economic development agendas without deteriorating its resource base.

10. El Salvador effort to systematically promote sustainable management of its natural resources without deteriorating its environment received a fresh start through strengthening the legal, policy, and institutional framework, including: transforming the Environment Secretariat into the Ministry of Environment and Natural Resources (MARN) in 1997, and passing the National Environmental Law in 1998. It has set in motion important partnerships and policy initiatives to mainstream environmental and natural resources management issues in its development plans. Partnering and integrating efforts on the part of MARN with other government agencies, local governments, NGOs, private sector and other civil society organizations is a key implementation instrument. A similar strategy also exists for the Ministry of Agriculture (MAG).

11. With the new administration taking office in 2004, the environment became an even more important topic as evidenced in the president's inaugural speech, and the new government work plan entitled, "País Seguro" (Safe Country). Two of the eleven lines of work defined in this work plan are: Agricultural Development: Expanding the Chain of Value, and Environment: Legacy for Future Generations. One of the specific goals is short-term implementation of a system of Payments for Environmental Services (PES). To this end, the government established the Environmental Compensation Executive Decree 50 in October 2004,

which promote the use of market-based mechanisms to stimulate improved natural resource management in El Salvador.

12. The law and Environmental Compensation Executive Decree 50 (2004) defines the role of MARN as: (i) to internalize the economic values related to environmental services into public and private sector decision-making (e.g., hydrological services, including maintenance of water quality and hydrological stability; biodiversity conservation; and climate change mitigation); (ii) to establish market based environmental protection instruments (e.g., user fees, application of the polluter pays principal, certification of production processes); and (iii) to further define an enabling environment services regulatory framework.

Proposed Project

13. The proposed El Salvador Environmental Services Project provides market-based incentives to conserve natural resources and critical ecosystems. These incentives provide landholders new opportunities to use their lands and land use practices that help maintain habitats that are critical to sustain rich, globally-important biological diversity, as well as help maintain biological corridors. By rewarding private landowners that maintain forest cover, the project envisages creation of a market where producers and sellers of environmental services can freely participate in market transactions. The market will provide incentives to land holders who “produce” environmental services and values that are important at local, national, and global levels.

14. The proposed project directly supports the Government of El Salvador’s broad development strategy which focuses on reducing poverty through human capital investment, reactivating the economy and speeding up insertion in the global economy, improving public services and justice administration, and ensuring environmentally sustainable development. In particular, the proposed project supports the implementation of Environment Law (1998) and Environmental Compensation Executive Decree 50 (2004). The proposed project contributes to these goals by helping MARN and other key governmental agencies to develop PES markets and creating economic incentives for landholders to change land uses that contribute to conservation of globally significant critical ecosystems and biodiversity. Specifically, the proposed project would focus on sites that have been identified as globally significant areas, buffer zones and corridors that bridge areas of global significance. GEF financing will ensure that critical ecosystems within the MBC-El Salvador and other globally significant conservation areas will be covered through this innovative market mechanism.

15. The proposed project design is fully consistent with the provisions of the Convention on Biodiversity, with the GEF Operational Strategy and specifically with its Operational Programs 3 (Forest Ecosystems) and 4 (Mountain Ecosystems). Indeed, it will support the conservation of rich biological diversity in forest and mountain ecosystems of global significance and addresses the Programs’ objectives of ensuring the sustainable use of biodiversity by combining production, socio-economic and biodiversity goals. Furthermore, the project is consistent with the GEF Strategic Priority 2 of biodiversity focal area – Mainstreaming Biodiversity in Production Landscapes and Sectors; and GEF Strategic Priority 4 of biodiversity focal area – Generation and Dissemination of Best Practices for Addressing Current and Emerging Biodiversity Issues. The project would integrate biodiversity conservation in agriculture; forestry; fisheries; tourism; as well as other production systems and sectors. The project emphasis would facilitate the mainstreaming of biodiversity within production systems, and developing market incentive measures.

16. For selecting project intervention sites, seven were analyzed to determine which had the strongest potential for developing pilot environmental services markets. Based on a set of criteria including institutional framework, hydrology and other biophysical conditions, land-use practices, potential supply and demand for ecosystem services, global environmental benefits and socioeconomic factors, four potential sites have been selected: Lago Coatepeque, Rio Gualabo, Jaltepeque-Jiquilisco and Los Volcanes (Map 1). A summary of the assessment of each site is provided in Annex 18.

Baseline Scenario

17. Rural development and poverty alleviation through improved natural resources management and biodiversity conservation is a priority for the Government of El Salvador. The Government's strategy focuses on (a) combating land degradation through changes in land use, particularly on hillsides; (b) improving water resources management; (c) improving biodiversity conservation by consolidating and improving management of the national system of protected areas; (d) promoting public participation and widespread government involvement (through sector ministries) in the design and implementation of a decentralized, participatory environmental management strategy and the building of local capacity in the process. A core element of the government's strategy is to develop environmental service markets as an incentive to owners of moderately to steeply sloping fields to make land use changes that would produce direct global benefits, and local benefits for downstream inhabitants and water users and indirect benefits for society as a whole. Although there are local initiatives involving payments for environmental services in El Salvador, such as the programs set up in Lago Coatepeque, Río Gualabo and San Salvador, pilot projects should be set up to demonstrate the usefulness of these programs and to fine tune their implementation. In addition, MARN needs to establish an effective dialog with the private sector and public organizations (e.g. water and power utilities) that benefit from environmental services, in order to gain their support and ensure financial sustainability of an ESP program.

18. **Scope.** Under the baseline scenario, the Government of El Salvador –including MARN, MAG, FIAES, and Banco Multisectorial de Inversiones- is mobilizing resources to combat natural resources degradation trends and promote the conservation of the county's endemic biological diversity. Government resources directly allocated for forest conservation include:

- program administration expenditures by MARN – US\$ 0.8 million;
- activities to support local initiatives and to develop a nationwide ESP program – US\$ 1.2 million;
- activities relating to watershed management and sustainable agriculture at the national level – US\$ 17.7 million, and
- protection and management of protected areas – US\$ 5.2 million, including government and bilateral cooperation with EU countries.

19. In addition, the local private sector, NGOs and municipalities in El Salvador –such as SALVANATURA and FUNDACOATEPEQUE-- are investing resources in water conservation and management and improving management of specific protected areas.

GEF-financed projects.

20. A concerted effort has been made in Central America, with strong support from GEF, to promote biodiversity conservation in the region. All Central American countries have prepared their National Biodiversity Strategy and Action Plan (BSAPs) which have identified a high degree of overlap between rural development and biodiversity conservation. In addition, the project is designed as an integral part of the Mesoamerican Biological Corridor (MBC) and would complement the regional UNDP/UNEP/GEF/CCAD/GTZ/DANIDA program aimed at consolidating the Corridor. It also builds on the GEF/UNDP Climate Change Enabling Activity by strengthening El Salvador's capacity to participate in international carbon markets and by protecting and expanding carbon sinks through the restoration of landscapes and protection of El Salvador's remaining natural forests. The GEF mid-size program on Promotion of Biodiversity Conservation within Coffee Landscapes (Project ID 56914), the Trifinio Project (UNDP) and the IDB program to support national environmental management in El Salvador (PAES) are among the most important GEF, WB or UNDP environmental projects in El Salvador.

21. **Costs.** Total expenditures under the Baseline Scenario for the project are estimated at US\$ 24.6 million. This amount covers the following: (i) activities designed to encourage farmers to introduce agroforestry on their farms and to establish forest plantations, in alliance with the Ministry of Agriculture (MAG), Banco Multisectorial de Inversiones (second tier development bank), and international cooperation agencies, totaling US\$ 19.9 million; (ii) MARN management and administration of SANP, as well as activities aimed at

developing partnerships with the private sector to improve the conservation and management of critical areas in alliance with local and international cooperation agencies totaling US\$ 3.3 million; (iii) administration, field supervision and other activities carried out by the Government of El Salvador, totaling US\$ 1.4 million.

22. **Benefits.** Implementation of the Baseline Scenario would result in (i) a limited dialog between MARN and the private sector and other governmental institutions on how to organize a national system of payments for environmental services to halt environmental degradation and biodiversity loss, (ii) limited evaluation of local experiments with programs involving payments for environmental services, and (iii) ineffective protection and management of existing protected areas. Under the Baseline Scenario, El Salvador would continue to finance many poorly coordinated local projects on forest conservation, sustainable agricultural practices and management of protected areas. Thus, in the absence of financing from the Global Environment Facility, it is unlikely that a national system of ESP would develop. It would not be possible to target the protection of specific areas or corridors within national segments of the MBC/ES through an ESP program, and the financial support of GOES and the private sector would be limited.

Global Environmental Objective

23. The GEF Alternative will support the conservation and sustainable management of forest ecosystems in El Salvador through explicitly targeting resources for conservation easements in critical ecosystems within the MBC-El Salvador, including forests, degraded forest lands and other critical conservation areas which have high biodiversity values, provide important services for watershed protection and/or present crucial environmental services for the functioning ecosystems at the landscape level. As a result of changes to environmentally responsive land use practices on privately owned lands in these areas, it is expected that habitat quality and species richness will be maintained. Furthermore, investments in institutional strengthening of public-sector institutions and non-governmental organizations, as well as mobilization of investments to support sustainable development and biodiversity conservation would support the long-term sustainability of a national system of payments for environmental services in El Salvador.

24. **Scope.** The GEF Alternative will build on the Baseline Scenario by supporting: (a) the design and implementation of a system of payments for environmental services in selected pilot areas including areas of high biodiversity value and which are important for watershed protection and other environmental services through the creation of an environmental services fund, provision of technical assistance and the signing of environmental services contracts with local providers; (b) institutional strengthening of the national government, municipalities, local communities, non-governmental organizations and private-sector actors involved in the development of a system of payments for environmental services which will enhance ongoing conservation efforts; and (c) support the management of the environmental services system with a strong emphasis on monitoring and evaluation in collaboration with other ongoing initiatives (Protected Area management plans, Protected Area Component of the Land Administration Project).

25. **Costs.** The total cost of the GEF Alternative is estimated at US\$ 29.6 million, broken down as follows: (i) design and implementation of a system of payments for environmental services.– US\$ 23.82.4 million (GEF financing - US\$ 3.92,5 million); (ii) institutional strengthening – US\$ 4.15.1 million (GEF financing - US\$ 0.81.8 million); and (iii) project management and M & E – US\$ 1.72.1 million (GEF financing - US\$ 0.30.7).

26. **Benefits.** Implementation of the GEF Alternative will protect important forest ecosystems and species dependent upon intact forests. Benefits generated from the project would include those classified as “national”, i.e., increased local participation in management of environmental resources and reduction of activities that lead to deforestation and ecosystem degradation, increased hydrological services to local and sub-national consumers, improved institutional capacity within public-sector institutions and civil society to support ecosystem conservation, and economic benefits from the adoption of sustainable agriculture and forest conservation practices. Project efforts to restore landscapes and protect critical remaining natural forests would help to protect remaining biodiversity, restore ecosystems and expand carbon sinks in El Salvador.

27. Sustained global benefits that will be generated through the project intervention include the conservation of forest ecosystems which support a large number of endemic plant and animal species; outreach to and involvement of local communities and local institutions in biodiversity conservation; enhancement of El Salvador's capacity to manage, restore and monitor its remaining biodiversity, including the numerous species endemic to the country and the region, and to participate in international carbon markets. The generation of a landscape mosaic of private and public protected areas managed at different levels of conservation intensity will allow for the realization of continuing role in conserving the pathways of migratory birds, thus reducing their stress when crossing the Central American isthmus and connecting El Salvador's biodiversity to the Mesoamerican Biological Corridor (MBC).

Incremental Costs

28. The difference between the cost of the Baseline Scenario (US\$ 24.6 million) and the cost of the GEF Alternative (US\$ 29.6 million) is estimated at US\$ 5 million. This represents the incremental cost of achieving global environmental benefits related to biodiversity protection through conservation easements on privately owned lands in buffer zones and interconnecting biological corridors as part of the Mesoamerican Biological Corridor in El Salvador.

Incremental Cost Matrix

Component Sector	Cost Category	US\$ Million	Domestic Benefit	Global Benefit
1. Design and Implementation of a System of Payments for Environmental Services.	Baseline	19.9	Environmental services contracting system piloted in at least two project sites in El Salvador to enhance hydrological services for the supply of water for human consumption, irrigation and/or energy production and to help stabilize hillsides so as to reduce sedimentation and the risk of landslides.	
	With GEF Alternative	22.4		Support the protection of habitat of endemic and migratory species by reducing the pressure on the priority areas in the project sites through the payment of environmental services. Conservation of biological diversity and of pathways of migratory birds, through the payment of environmental services. Increased water quality in pilot watersheds measured by reduction on Biochemical Oxygen Demand and suspended total solids – mg/l through environment friendly land

				<p>uses including agriculture practices.</p> <p>Conservation of forest, forestation and re-forestation in critical areas to promote biodiversity conservation and carbon sequestration.</p> <p>Reduction in erosion and improvement in soil quality through environmental friendly agriculture practices.</p> <p>Creation of a patchwork of biodiversity friendly land use that will allow for the development of biological corridors within the country and with the MBC.</p>
	Incremental	2.5		
2. Institutional strengthening.	Baseline	3.3	Increased public and private sector capacity to design, implement and manage a payment for environmental services program.	
	With GEF Alternative	5.1		Strengthening of institutional and technical capacity of the national government, municipalities, local communities, non-governmental organizations and private-sector actors involved in the development and implementation of a national environmental services program to understand, promote and assess activities that generate global environmental benefits.
	Incremental	1.8		
3. Project management and M&E.	Baseline	1.4	Increased management capacity of natural resources management agencies (including MARN) and non-governmental organizations.	
	With GEF Alternative	2.1		<p>Effective management of investments and project monitoring aimed at long-term conservation and sustainable use of globally significant biological diversity.</p> <p>Communication and dissemination strategy in operation.</p>

				Monitoring system to track changes in biodiversity, land use and socio-economic factors applied to project participants and non-participants and to conduct ex-post analyses of factors affecting the success of pilot projects.
	Incremental	0.7		
Totals	Baseline	24.6		
	With GEF Alternative	29.6		
	Incremental	5.0		
Component Sector	Cost Category	US\$ Million	Domestic Benefit	Global Benefit
1. Design and Implementation of a System of Payments for Environmental Services.	Baseline	19.9	Environmental services contracting system piloted in at least two project sites in El Salvador to enhance hydrological services for the supply of water for human consumption, irrigation and/or energy production and to help stabilize hillsides so as to reduce sedimentation and the risk of landslides.	
	With GEF Alternative	23.8		<p>Support the protection of habitat of endemic and migratory species by reducing the pressure on the priority areas in the project sites through the payment of environmental services.</p> <p>Conservation of biological diversity and of pathways of migratory birds, through the payment of environmental services.</p> <p>Increased water quality in pilot watersheds measured by reduction on Biochemical Oxygen Demand and suspended total solids – mg/l through environment friendly land uses including agriculture practices.</p> <p>Conservation of forest, forestation and re-forestation in critical areas to</p>

				<p>promote biodiversity conservation and carbon sequestration.</p> <p>Reduction in erosion and improvement in soil quality through environmental friendly agriculture practices.</p> <p>Creation of a patchwork of biodiversity friendly land use that will allow for the development of biological corridors within the country and with the MBC.</p>
	Incremental	3.9		
2. Institutional strengthening.	Baseline	3.3	Increased public and private sector capacity to design, implement and manage a payment for environmental services program.	
	With GEF Alternative	4.1		Strengthening of institutional and technical capacity of the national government, municipalities, local communities, non-governmental organizations and private-sector actors involved in the development and implementation of a national environmental services program to understand, promote and assess activities that generate global environmental benefits.
	Incremental	0.8		
3. Project management and M&E.	Baseline	1.4	Increased management capacity of natural resources management agencies (including MARN) and non-governmental organizations.	
	With GEF Alternative	1.7		<p>Effective management of investments and project monitoring aimed at long-term conservation and sustainable use of globally significant biological diversity.</p> <p>Communication and dissemination strategy in operation.</p> <p>Monitoring system to track changes in biodiversity, land use and socio-economic factors applied to project participants and non-participants</p>

				and to conduct ex-post analyses of factors affecting the success of pilot projects.
	Incremental	0.3		
Totals	Baseline	24.6		
	With GEF Alternative	29.6		
	Incremental	5.0		

Annex 16: STAP Roster Review

EL SALVADOR: Environmental Services Project

STAP REVIEW FOR:

EL SALVADOR ENVIRONMENTAL SERVICES PROJECT PROPOSAL (World Bank-GEF)

Overall appraisal

This is an innovative project eventually leading water consumers to pay for the supply (quality and quantity) to upstream farmers. Upstream farmers are expected to receive payments for changing their land use practices towards more conservation-oriented ones. Payment for Environmental Services (PES) would allow conservation and restoration activities in production landscapes. The system was designed to self sustain and replicate after project completion. If successful, the project could become an example of such arrangements in areas with high levels of land degradation such as El Salvador.

A few clarifications and adjustments may help tightening it up.

1. Global Benefits and Regional Context

The proposal states that “the global environment objective of the proposed project is to enhance and protect biological diversity and preserve important forest and mountain ecosystems” and it “will lead to the protection of globally important biodiversity”. However, El Salvador is well known for its high levels of land degradation, deforestation and relatively low biodiversity levels. The proposal will support activities in buffer zones of protected areas (PAs) and corridors, complementing a sister WB project demonstrating conservation in PAs. The case for GEF support would be strengthened if proponents were to: i) provide lists of ecosystems and critical species at each one of the demonstration sites, nuclei as well as buffer zones and corridors, ii) show maps at an appropriate scale indicating the geographical relationships between each one of the project areas, existing PAs, and other major conservation areas within the Mesoamerican Biological Corridor (MBC), iii) give indications of the tree species to be used in ecosystem restoration.

If conservation and restoration are going to play large roles, the project could also have global benefits in Integrated Watershed Management, typically an OP12 benefit, and carbon sequestration. Proponents may want to quantify these results.

2. Scientific and Technical Soundness of the Project

The linkages between biodiversity/threats/PES/ and reduction of threats, needs to be addressed as directly as possible in the main text. Currently information is somewhat dispersed in the main text and in annexes. The sites differ and it would help the reader to see, in a matrix perhaps, the reasons for the selection of each site (what is unique about the site or what does it represent), the threats to biodiversity or tree cover, the agreed “management objectives”, the types of activities to be promoted, the services to be gained and indicators of impact (increments in the cover of native trees, for example) at the end of the project. In the current text it is difficult to see how all these critical variables relate to each other. For example, on pages 5-7 Table 1 (land uses, environmental services), Table 2 (levels of payments) and Table 3 (demand for services) are not easily connected. Some services such as tourism and fisheries are not mentioned in the tables and actually little throughout the text. What would happen at Lago Coatepeque, currently under a PES system, is also unclear. Having a very systematic approach could help future replication.

The reviewer could not find calculations of opportunity costs related to increasing the cover of native trees. The financial analyses in the document submitted are for small patches with scattered trees, or some fruit trees and mostly agricultural changes using introduced species. It would help understand the emergence of global benefits and PES, especially hydrological services, if financial analyses included native species and substantially increasing the cover of native trees.

Proponents seem to be confident that the manual with expected hydrological improvements after land use changes, and expected fees for PES at all sites will be prepared early during project execution. The manual would also show that PES is financially and ecologically feasible with the proposed land use changes. It would help the reader to have access to summary information of direct experience gained during project preparation leading to these conclusions. Proponents may want to add a matrix to the main text indicating for each site the expected overall land use changes, expected payment for environmental services and how these cover opportunity costs.

The reader would also benefit from having a better idea about timings. As mentioned in the text, environmental services are strongly site-linked. That is, some *in situ* calibration is needed for the impacts of land use changes on environmental services (particularly at very low tree cover), and willingness to pay for those changes. The proposal indicates that the manual to be elaborated within project execution time will provide all needed information. How long would it take to prepare such a manual? Presumably calibration would be a prerequisite and it may take a couple of rainy seasons. How long will it take to train ministries, NGOs, PCU, FONASA staff, and all participants? When will training occur? Will it be possible to have results on cover changes and PES after the third execution year?

3. Fit within the context of the goals of the GEF

The project fits well within OP3 (Forest Ecosystems) and SP2 (incorporating BD conservation into the production landscape). Proponents may want to expand on the impacts on tourism and fisheries.

The project also fits within the Land Degradation Focal Area and, if benefits are calculated, within OP12 (Integrated Ecosystem Management)

4. Regional context

The project fits will allow greater connectivity within the Central American Region and thus fits well within the context of the MBC. Appropriate maps will allow readers to see linkages between demonstration areas and major biodiversity centers in the MBC.

5. Replicability

Results should be replicated within the MBC and elsewhere. By providing examples of PES in degraded areas, it will show how to obtain these benefits in non-forested ecosystems.

6. Sustainability

The system should be financially sustainable after project completion. Payments for services should largely cover running costs for the whole system. However, it would help if proponents could prepare a table containing the expected running costs (including salaries, monitoring, training, etc) and how GOES and PES would cover them after project completion.

7. Stakeholder involvement

The document indicates adequate participation during project preparation and during its execution.

8. Capacity building.

The project improves capacities at the systemic levels (creating the legal framework for the operation of PES, improving awareness about benefits of the system) and at institutional and individual levels by training of ministries, NGOs to run and replicate the system.

9. Innovativeness

PES is not new. The innovation is to use PES to restore ecosystems in a very poor area and to protect globally significant biodiversity through strengthening buffer zones and corridors.

10. Miscellaneous comments.

- Performance Indicators could be more precise and ambitious. For example, to have only two functional markets working at completion is not much, considering that Lago Coatepeque and Río Gualabo already have PES. The proof that markets are working is that payments have been repeatedly done and that concurrent land use changes can be shown, rather than having papers showing establishment and contracts signed. Having only 12,000 ha under contracts at completion is rather modest considering that the target is almost 2.5 million ha and that total current forest cover is around 250,000 ha.
- The current document does not mention much about how farmers in El Salvador meet the conditions for PES contracts. For example, is land tenure an issue at the pilot sites?
- To avoid confusion the reviewer suggests renaming subcomponent 1.5 “Capitalization of the Fund”.
- There are still many typos in the text.

Dr. Eduardo R. Fuentes
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January, 2005.

Response to STAP REVIEW FOR:

**EL SALVADOR
ENVIRONMENTAL SERVICES PROJECT PROPOSAL
(World Bank-GEF)**

STAP

Overall appraisal

This is an innovative project eventually leading water consumers to pay for the supply (quality and quantity) to upstream farmers. Upstream farmers are expected to receive payments for changing their land use practices towards more conservation-oriented ones. Payment for Environmental Services (PES) would allow conservation and restoration activities in production landscapes. The system was designed to self sustain and replicate after project completion. If successful, the project could become an example of such arrangements in areas with high levels of land degradation such as El Salvador.

A few clarifications and adjustments may help tightening it up.

1. Global Benefits and Regional Context

The proposal states that “the global environment objective of the proposed project is to enhance and protect biological diversity and preserve important forest and mountain ecosystems” and it “will lead to the protection of globally important biodiversity”. However, El Salvador is well known for its high levels of land degradation, deforestation and relatively low biodiversity levels. The proposal will support activities in buffer zones of protected areas (PAs) and corridors, complementing a sister WB project demonstrating conservation in PAs. The case for GEF support would be strengthened if proponents were to:

STAP

i) provide lists of ecosystems and critical species at each one of the demonstration sites, nuclei as well as buffer zones and corridors,

World Bank response:

World Bank:

i) This information is now reflected in Annex 18.

STAP

ii) show maps at an appropriate scale indicating the geographical relationships between each one of the project areas, existing PAs, and other major conservation areas within the Mesoamerican Biological Corridor (MBC),

World Bank:

ii) Maps indicating the sites relative to protected areas and the conservation areas they are a part of have been prepared and are in Annex 20.

STAP

iii) give indications of the tree species to be used in ecosystem restoration.

World Bank:

iii) Tree species that will be used for ecosystem restoration will be determined during implementation. Criteria have been prepared for the use of GEF funds to ensure, inter alia, that activities undertaken in high biodiversity areas are compatible with the needs of these areas, for example in their selection of appropriate species.

STAP

If conservation and restoration are going to play large roles, the project could also have global benefits in Integrated Watershed Management, typically an OP12 benefit, and carbon sequestration. Proponents may want to quantify these results.

World Bank:

Annex 18 includes discussion of some of these possible additional benefits. The project has a strong learning approach and, therefore, its design includes a major monitoring effort which will contribute including in quantification of these results.

STAP**2. Scientific and Technical Soundness of the Project**

The linkages between biodiversity/threats/PES/ and reduction of threats, needs to be addressed as directly as possible in the main text. Currently information is somewhat dispersed in the main text and in annexes. The sites differ and it would help the reader to see, in a matrix perhaps, the reasons for the selection of each site (what is unique about the site or what does it represent), the threats to biodiversity or tree cover, the agreed "management objectives", the types of activities to be promoted, the services to be gained and indicators of impact (increments in the cover of native trees, for example) at the end of the project. In the current text it is difficult to see how all these critical variables relate to each other. For example, on pages 5-7 Table 1 (land uses, environmental services), Table 2 (levels of payments) and Table 3 (demand for services) are not easily connected. Some services such as tourism and fisheries are not mentioned in the tables and actually little throughout the text. What would happen at Lago Coatepeque, currently under a PES system, is also unclear. Having a very systematic approach could help future replication.

World Bank:

The text has been sharpened with an eye to addressing these linkages as directly as possible within the context of the project.

It should be noted that Coatepeque does not have a PES in place. They have paid into FONAES (a national environmental fund) for activities such as demonstration plots, public laundry installations, and water capture tanks.

STAP

The reviewer could not find calculations of opportunity costs related to increasing the cover of native trees. The financial analyses in the document submitted are for small patches with scattered trees, or some fruit trees and mostly agricultural changes using introduced species. It would help understand the emergence of global benefits and PES, especially hydrological services, if financial analyses included native species and substantially increasing the cover of native trees.

World Bank:

The economic and financial analysis (Annex 9) is based on a 'typical farm' and the alternative examined includes a variety of land use changes, including relatively substantial increase in tree cover on part of the farm.

STAP

Proponents seem to be confident that the manual with expected hydrological improvements after land use changes, and expected fees for PES at all sites will be prepared early during project execution. The manual would also show that PES is financially and ecologically feasible with the proposed land use changes. It would help the reader to have access to summary information of direct experience gained during project preparation leading to these conclusions. Proponents may want to add a matrix to the main text indicating for each site the expected overall land use changes, expected payment for environmental services and how these cover opportunity costs.

World Bank:

One of the main objectives of the project is to assist the GOES in establishing the appropriate mechanism for a PES scheme to work. These schemes are site specific and the manuals to be developed will necessarily have this specificity. Preparation work has paved the way with background studies but the fine tuning will happen during implementation.

Summary tables of preparatory work for each of the sites can now be found in Annex 18.

Annex 9 includes a discussion of expected demand for services at the two pilot sites, the expected costs of the land use changes necessary to provide those services, and an examination of the extent to which payments from service users can be expected to cover these costs. Similar analyses would be conducted at other sites prior to work being undertaken there.

STAP

3. Fit within the context of the goals of the GEF

The project fits well within OP3 (Forest Ecosystems) and OP2 (incorporating BD conservation into the production landscape). Proponents may want to expand on the impacts on tourism and fisheries.

The project also fits within the Land Degradation Focal Area and, if benefits are calculated, within OP12 (Integrated Ecosystem Management)

World Bank:

Fisheries, particularly shrimp fishing, is an important industry in El Salvador. Working in the Jaltepeque-Jiquilisco coastal area will allow for the project to explore the linkage between mangrove management and shrimp population sizes.

Tourism is also an important industry in this region and supporting the ministry's initiative of land use planning is contemplated as part of project activities.

STAP

4. Regional context

The project fits will allow greater connectivity within the Central American Region and thus fits well within the context of the MBC. Appropriate maps will allow readers to see linkages between demonstration areas and major biodiversity centers in the MBC.

World Bank:

Maps in Annex 20 explore this spatial representation of pilot sites in relation to the countries conservation areas and within the context of the MBC.

STAP

5. Replicability

Results should be replicated within the MBC and elsewhere. By providing examples of PES in degraded areas, it will show how to obtain these benefits in non-forested ecosystems.

World Bank:

This is one of the important areas to be explored by the project. As it is a pilot project whose implementation will be phased by targeting two project sites in the beginning. Lessons from the two initial sites will be incorporated in the implementation of project in subsequent sites. The lessons from the project will be widely circulated including to the MBC countries in the region.

STAP

6. Sustainability

The system should be financially sustainable after project completion. Payments for services should largely cover running costs for the whole system. However, it would help if proponents could prepare a table containing the expected running costs (including salaries, monitoring, training, etc) and how GOES and PES would cover them after project completion.

World Bank:

Annex 9 includes a detailed discussion of the sustainability of the PES program following completion of the project. The running costs of the program would be expected to be covered from part of the payments made by service users, as is the case in the Costa Rica PES program.

STAP

7. Stakeholder involvement

The document indicates adequate participation during project preparation and during its execution.

STAP

8. Capacity building.

The project improves capacities at the systemic levels (creating the legal framework for the operation of PES, improving awareness about benefits of the system) and at institutional and individual levels by training of ministries, NGOs to run and replicate the system

STAP

9. Innovativeness

PES is not new. The innovation is to use PES to restore ecosystems in a very poor area and to protect globally significant biodiversity through strengthening buffer zones and corridors.

STAP

10. Miscellaneous comments.

- *Performance Indicators could be more precise and ambitious. For example, to have only two functional markets working at completion is not much, considering that Lago Coatepeque and Río Gualabo already have PES. The proof that markets are working is that payments have been repeatedly done and that concurrent land use changes can be shown, rather than having papers showing establishment and contracts signed. Having only 12,000 ha under contracts at completion is rather modest considering that the target is almost 2.5 million ha and that total current forest cover is around 250,000 ha.*

World Bank:

A more detailed indicator table has been developed and can be found in Annex 3 (Results Framework and Monitoring). Ultimately, success will be measured in the long term through a sustainable landscape which internalizes the environmental services it provides in the local, national and global markets.

STAP

- *The current document does not mention much about how farmers in El Salvador meet the conditions for PES contracts. For example, is land tenure an issue at the pilot sites?*

World Bank:

The GOES has been regularizing land tenure in the country through a World Bank project. It is estimated that 65% of the privately held land is now regularized. The remainder is currently being worked on. Tenurial rights in mangroves and protected areas will be the subject of a complementary initiative of the Land Administration project and is a priority for GOES.

STAP

- *To avoid confusion the reviewer suggests renaming subcomponent 1.5 “Capitalization of the Fund”.*

World Bank:

The text of the subcomponent has been clarified to avoid confusion. However, the “Capitalization of the Fund” does not seem appropriate for the title of the sub-component.

STAP

There are still many typos in the text.

World Bank:

These have been improved.

Annex 17: Coordination Between the El Salvador Protected Areas/Land Administration and El Salvador Environmental Services Projects

EL SALVADOR: Environmental Services Project

1. The two IBRD/GEF-supported projects in El Salvador— – the Protected Areas and Land Administration project (P092202) and the Environmental Services project (P064910)— – contribute to the protection of globally significant biodiversity through different yet complementary approaches aimed at countering differing root causes of biodiversity loss. The Protected Areas and Land Administration Pproject focuses on consolidating two priority protected areas (one Nnational Ppark/Natural Protected Area and one protected mangrove forest; the specific areas have not yet been selected) through a pilot program to develop and implement management plans that regularize communities in those areas, subject to use restrictions emphasizing the sustainable use of protected area resources. The Environmental Services Pproject provides incentives to landowners living in protected area buffer zones and other environmentally sensitive lands to sustainably manage their lands.
2. Consequently, both projects, in conjunction, support the GOES's government's strategy to further biodiversity conservation through the prioritization of 15 conservation units, comprising most of the country's protected areas (e.g. El Salvador's "Natural Protected Areas," corresponding to IUCN Category II), building upon the biological corridor concept. The conservation units constitute "nuclei", comprising the country's 118 natural protected areas serve as the "nuclei" of the conservation areas, and while surrounding private lands that comprise theserve as their "buffer zones.". The specific approach to consolidate these areas is not yet known, but it must and will target the primary threats to biodiversity: habitat destruction, and the loss of natural resources, which both stemming from and exacerbate the deterioration in the quality of life for of local populations (NBSAP, 2000). In concert with the Land Administration Pprojects, the proposed project aims at to contributing contribute to this conservation strategy by developing and pilot testing mechanisms for biodiversity conservation. Specifically, the land projects would demarcate all protected areas, resolve land tenure in those lands and adjacent private lands (buffer zones), and test regularization of residents in protected areas (nuclei). The proposed project would provide PES as an incentive for biodiversity-friendly land use in adjacent private lands (buffer zones). To the extent possible, the projects will be conducted in the same conservation areas, so as to maximize biodiversity conservation impact.
3. The following matrix shows how both projects target different types of lands within priority Conservation Areas: the Environmental Services project does not work within strict protected areas but only in the buffer zones of those areas as well as in mangroves, which are subject to a different degree of legal protection (corresponding to IUCN Category VI); the Protected Areas and Land Administration project, on the other hand, will work in one Natural Protected Area and one mangrove.
4. Likewise, the approaches and activities supported by the two projects are different yet complementary. The Environmental Services project provides payments to landowners, whose land use practices contribute to the conservation and restoration of lands supporting globally significant biodiversity. This market-based mechanism is intended to promote biodiversity-friendly land use in areas critically important for conservation, yet outside the national protected areas system.. In contrast, the Protected Areas and Land Administration Pproject supports the consolidation of the pilot areas (nuclei), including demarcation, resolution of legal status, development and implementation of management plans, capacity building, and institutional strengthening for those areas— – in short, the direct infrastructure and capacity investments to enable their sustainability. Only using mechanisms targeting both private and public lands can MARN realize their Conservation Area -based strategy.
5. While both projects support MARN, they have been carefully designed to ensure complementarity and avoid duplication, both in terms of specific activities and implementation arrangements. With regards to activities, special attention will be paid to the institutional strengthening/capacity building and legal framework aspects of both projects to prevent redundancy and promote synergy. Likewise, the

implementation arrangements for both projects are designed to maximize MARN's technical and administrative capacity, while mainstreaming GEF activities within MARN's portfolio and staffing. Specifically, project management/administrative aspects for the Land Administration Project are being primarily handled by the highly experienced land agency (CNR, who is just finalizing preparation of its second IBRD loan), but are incorporating MARN experts into the team so as to build MARN's own capacity to develop and implement projects; technical aspects will be managed by existing MARN staff. The implementation unit for the Environmental Services Project comprises two administrative staff who will be part of MARN's existing administrative unit, plus a few technical people to oversee FONASA. Thus, implementation arrangements for both projects are in no way duplicative.

Project	Activity	Location of Investments		
		Protected Area (Nucleus) ²¹	Mangrove (Nucleus and Private Lands) ²²	Buffer Zone (Private Lands)
Protected Areas and Land Administration	Demarcation	X	X	X*
	Legal Consolidation	X	X	X*
	Management Plan Development	X	X	
	Management Plan Implementation	X	X	
	Cadastral/Registry	X	X	X*
	Institutional Strengthening/Capacity Building	X	X	
	MARN Legal Framework	X	X	
Environmental Services	Environmental Service Payment Contracts		X	X
	Institutional Strengthening/Capacity Building		X	X
	Environmental Service Payments Legal Framework		X	X

* Through partially blended IBRD loan

²¹ IUCN Category II.

²² IUCN Category VI.

Annex 18: Pilot Site Selection Criteria, General Expected Environmental Benefits Generated by the Project and Summary Description of Pilot Sites

El Salvador: Environmental Services Project

1. This annex presents the following three sections: (i) criteria for selection of pilot sites selection criteria; (ii) overview of general expected environmental benefits to be generated by the project; and (iii) summary descriptions of project pilot sites (two selected to initiate project activities and three additional potential sites).

Section 1: Criteria for Selection of Pilot Sites Selection Criteria

2. Pilot sites were selected based on a series of criteria designed to capture local, regional, and global biodiversity and environmental service benefits. Three principal criteria were used to select potential project areas: the presence of important national benefits, particularly in terms of water services; the presence of important global benefits, particularly in terms of biodiversity conservation; and local interest in the approach. The initial list of potential sites was selected from priority Conservation Areas,²³ which in turn comprise all of the critical biodiversity areas in the country. This list of priority Conservation Areas was evaluated relative to the project-specific criteria (including the national, global, and local benefits described above) during an initial desk review carried out from January to March 2002, resulting in the selection of seven potential sites for further analysis. In April and June, 2002, a multidisciplinary team carried out a detailed field analysis of each site.

3. The field analysis of the seven sites evaluated a suite of site-specific characteristics and ranked the sites from highest to lowest priority (see Table 1). The characteristics evaluated included: biodiversity (and importance of biodiversity at national, regional, and global scale), hydrology, and other biophysical conditions; current land-use practices, site location relative to other national, regional, and globally important biodiversity (to encourage local biological corridors); institutional framework; socioeconomic factors; potential supply and demand for ecosystem services, and likelihood that the development of an ecosystem service market could induce land use changes, in turn promoting the establishment of local biological corridors. As Table 1 shows, sites were ranked from a value of 1 (representing the highest potential for, and fewest restrictions to, for the establishment of a PES program) to 7 (representing the least potential for establishing a PES program). The results of this analysis prioritized three areas as potential pilot sites, Lago Coatepeque, Río Gualabo, and Cinquera, and four other areas as potential future project sites, La Montañona, Cerro Conchagua, Río Grande San Miguel, and La Palma San Ignacio.

²³ The Protected Areas System of El Salvador (SANP) comprises 136 protected areas that are embedded within 15 Conservation Areas (*Áreas de Conservación*), defined as "lands containing protected areas, buffer zones, and biological corridors, functioning in an integrated manner and managed with an ecosystem focus so as to promote sustainable development" (*Ley de Áreas Protegidas*). Specifically, the Conservation Areas are ecosystem-based management units that include all of El Salvador's protected areas and mangroves as well as their buffer zones.

Table 1. Initial Pilot Sites for PES Implementation

<i>Indicator</i>	<i>Areas</i>						
	<i>S. Miguel</i>	<i>Gualabo</i>	<i>Concha-Guagua</i>	<i>Cinquera</i>	<i>L. Coatepeque</i>	<i>S. Ignacio La Palma</i>	<i>Montaña Nonaona</i>
Awareness	+1	+2	+1	+2	+2	+2	+2
Social Organization	+2	+2	+2	+2	+2	+2	+2
Local Mgmt Capacity	+1	+2	+2	+3	+2	+3	+3
Socioeconomic conditions	+1	-1	+2	-1	+2	¿?	-1
Legal Conditions	¿?	-2	¿?	-2	+2	-2	-2
Attitudes	+1	+1	-1	+2	+1	+2	+2
Need /Urgency	+3	+3	+3	+3	+2	+3	+3
Relevance	-1	+3	-2	+2	+3	+1	+2
Economic Equity	-2	-1	-2	+2	+3	-2	+2
Social Capital	¿?	¿?	¿?	+2	¿?	+2	+2
Simplicity of scheme	-1	+1	+2	-2	+3	-2	-2
Gender Equity	-2	+1	-1	-1	-2	-2	-1
Total points	4	11	6	10	20	7	12
Ranking	7	3	6	4	1	5	2
(¿?) Insufficient data to estimate the indicator. Legend (definition being sent): +3 Positive low contribution, +2 Positive medium contribution, +1 Positive high contribution, -1 Negative low restriction, -2 Negative medium restriction							

4. The list of potential sites was expanded in December 2002 to include two additional areas, Apaneca-Illamatepec Lamatepec (Los Volcanes) and Jaltepeque-Jiquilisco, because of the importance of globally significant biodiversity supported in those areas. The criteria used to select these two new additional areas were: percentage of Conservation Area protected within the SANP, provision of nationally, regionally, and globally important environmental goods and services, presence of priority species for conservation, presence of priority ecosystems, private sector activity in biodiversity friendly activities, and capacity of local organizations and communities (see Table 2).

Table 2. Matrix for Selection of Conservation Areas for El Salvador Environmental Services Project

Criteria/Conservation Area	Value	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Alotepeque-La Montaña	Alto Lempa	Apameca-Lamatepec (Los Volcanes)	Jaltepeque	Jaltepeque/Bahía de Jiquilisco	Costa del Bálsamo	El Imposible-Barra de Santiago	El Playón	Golfo de Fonseca	Los Cóbano	Nahuaterique	San Vicente Norte	Tecaza-San Miguel	Trifinio	Volcán Chingo
Participation in Private Sector	5	4	4	5		5	2	4	1	2	3	3	1	3	4	3
Local Capacity	5	3	3	4		5	2	4	2	5	3	3	2	2	2	1
Area of SANP in the Conservation Area	5	1	1	3		5	2	3	2	3	2	1	1	3	3	1
Environmental Goods and Services	5	4	5	5		5	3	5	5	4	4	3	3	4	5	4
Presence of priority species for conservation	5	3	4	5		5	4	5	2	4	4	4	2	4	5	3
Presence of priority ecosystems	5	2	4	5		4	4	5	3	5	4	4	3	5	5	3
Total	30	17	21	27		29	17	26	15	32	22	18	12	21	24	15
Priority Ranking		11	6	2		1	12	3	10	5	8	9	14	7	4	13

5. In January 2005 the Government of El Salvador, in collaboration with a World Bank mission selected two initial pilot sites from the list of six potential sites. The two pilot sites selected include the combination of Lago Coatepeque and Los Volcanes, which were consolidated into one site because they are within the same Conservation Area, and Jaltepeque-Jiquilisco, which comprise two adjacent Conservation Areas. The other three potential sites to which the project may expand, based on their ranking, are Río Gualabo, Cinquera, and La Montaña (see Map in Annex 20).

6. The Los Volcanes/Lago Coatepeque and Jaltepeque-Jiquilisco pilot sites support two of the 15 most important priority conservation areas in El Salvador, which in turn supports globally and regionally significant biodiversity. Specifically, El Salvador's location along the Pacific Coast supports a variety of largely dry and semi-humid tropical ecosystems, punctuated by a highly active seismic and volcanic backdrop. These conditions have led to a number of isolated habitat patches, which are of important regional significance. This is especially true for mangroves, such as Jaltepeque-Jiquilisco, which comprise the largest expanse of mangroves in the country (47,800 ha), and one of the largest in the region. This area supports a number of globally significant species, such as four species of nesting sea turtles and 278 species of birds (many of which nest in the area). Several of these species are globally and regionally threatened. Likewise, Los Volcanes/Lago Coatepeque supports a number of threatened species at the northern extent of their range where they are in danger of being relegated to isolated patches (e.g. *Dactilortyx thoracicus*, *Aulacorhynchus prasinus*, and *Troglodites rufociliatus*).

7. Likewise, the selected initial pilot areas provide support to the conservation of two very different critical ecosystems, both of which are critical components of El Salvador's portion of the Mesoamerican Biological Corridor. Los Volcanes/Lago Coatepeque is a volcanic complex comprising several active and dormant volcanoes ranging from 500 to 2,381 meters above sea level. Located in the departments of Sonsonate and Santa Ana in the eastern part of the country, the area is part of the area known as the Recent Volcanic Chain (*Cadena Volcanica Reciente*), a range comprising 14 geologically young volcanoes (between 250 and 2,000,000 years old) extending from Los Volcanes at the western extreme to El Imposible National Park at the eastern edge. Consequently, these ecologically important areas are linked by a volcanic corridor, enabling the movement of species from park to park through expanses of shade-grown coffee and montane tropical forests. The Conservation Area includes several protected volcanoes and the protected Lago de Coatepeque, however the surrounding watershed—which is home to 21,000 people—is an unprotected buffer zone with no effective restrictions on land use. The project will specifically target these buffer zones to stimulate land use that is compatible with the management of the Lago Coatepeque/Los Volcanes.

8. Jaltepeque/Jiquilisco comprises the mangrove expanse at the mouth of the Lempa River, the largest river in El Salvador, which drains a trinational watershed (shared with Honduras and Guatemala). This area, found midway along the Pacific Coast in the departments of La Paz and Usulután, represents a completely different critical ecosystem. This mangrove forest supports a 593 riparian and marine animal species, including 24 mollusk species, 6 species of shrimp, 13 amphibians, 38 reptiles, including several in danger of extinction, 133 fish species, 278 birds (including 14 breeding colonies of birds such as the *Cochlearius cochlearius*, considered threatened at the national level, and the only breeding colony for marine birds in Central America), 4 species of sea turtles, and habitat for the threatened spider monkey (*Ateles geoffroyi*). In addition to the large expanse of mangroves, this 94,952 ha area supports 24 protected areas ("nucleos"; remnant humid forest patches), the smallest of which is only 8 ha. It also supports about 345,000 people, many of whom live in and around the mangroves and remnant forest patches. The project will specifically target people living in the buffer zones of these areas to encourage land uses that are compatible with the management of the mangroves and humid forest patches.

9. Consequently, both areas provide crucial environmental services, including conservation of regionally significant biodiversity, maintenance of hydrologic cycles, minimization of catastrophic floods by regulating water flows, and conservation of soil integrity on steep slopes. In addition, they also generate important global benefits by serving as crucial habitats for migratory bird species, by containing important levels of endemism, and by sequestering carbon. A summary sample of the potential national and global benefits for each site is provided in Table 3.

Table 3. Initial Pilot Sites for PES Implementation

<i>Site</i>	<i>Potential national benefits</i>	<i>Potential global benefits</i>
Los Volcanes/Lago Coatepeque	<ul style="list-style-type: none"> • Water recharge of aquifers serving western part of country • HEP • Ecotourism • Fisheries • Domestic water supply • Tourism, ecotourism 	<ul style="list-style-type: none"> • Very diverse habitats including cloud forest and paramo ecosystems • 10 critically endangered species • Support the consolidation of a local biological corridor formed by the Volcanoes of Santa Ana, Izalco, and Lago Coatepeque PAs • Endangered avifauna • Help consolidate MBC/ES and buffer zone of Apaneca-Lamatepec PA
Jaltepeque-Jiquilisco	<ul style="list-style-type: none"> • Industrial and artisanal fishing 	<ul style="list-style-type: none"> • Unique mangrove forest • High species diversity with endangered

<ul style="list-style-type: none"> • Key shrimp habitat • Aquaculture • Tourism, ecotourism • Water filtration 	<ul style="list-style-type: none"> (birds) and critically endangered species (reptiles) • Important resting ground for intercontinental bird migration; coastal avifauna nesting grounds • Help consolidate Biological Corridor Omega, or the Golfo Complex
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Section2: Summary of General Expected Environmental Benefits Generated by the Project

1. Payments will be provided for land use activities that promote biodiversity, such as agroforestry, forest management and conservation, reforestation, afforestation, and sustainable agricultural production systems. These activities generate valuable local, national, and global environmental benefits other than biodiversity such as improving water quality and quantity, and maintaining or enhancing carbon sequestration and biodiversity. The specific list of land uses eligible for payments at any given site will be determined on a case-by-case basis, depending on the specific services being sought. In each case, it is envisioned that the project would develop a menu of options that all contribute to generating whatever specific services might be desired at that location, from which land users can select. Payments would be proportional to the expected contribution made by each eligible land use to service generation; land uses that are expected to provide higher levels of service will be paid more. This is similar to the approach adopted in the GEF-supported Regional Integrated Silvopastoral Ecosystem Management Project (RISEMP) currently being implemented in Colombia, Costa Rica, and Nicaragua.

Biodiversity benefits

2. From a biodiversity perspective, maintaining or re-establishing native forests or natural habitats would clearly bring the highest benefits. This will be one of the options offered to land users, with a high payment commensurate with the high expected benefits. Most native forest outside protected areas has already been lost, however, and given the extraordinarily high land pressure in El Salvador it would be unrealistic to expect widespread conversion of agricultural land back to forest. It is more likely that participating land users will choose to adopt some of the intermediate land uses in the menu, which combine increased use of trees with continued agricultural production (agroforestry and silvopastoral systems). This has been the experience of the RISEMP project, for example. Mechanisms at any given site may also support activities such as shade-grown coffee that support high biodiversity levels but are being abandoned due to low coffee prices. It should be noted that the adoption of sustainable agricultural methods in buffer zones of priority protected areas (such as the project pilots sites) would represent a significant improvement in biodiversity conservation in El Salvador and the MBC, of which these sites are a part. These activities are substantially more biodiversity friendly than existing traditional agricultural methods.

3. The increased complexity of agroforestry and silvopastoral systems relative to traditional annual crops and pastures means they often bring important biodiversity benefits. These take two main forms. First, they tend to support much higher species diversity than traditional annual crops and pastures. Second, they help connect protected areas by providing habitat corridors linking “nuclei”, or natural protected areas, and facilitating the movement of organisms and genes among these hotspots.

4. Agroforestry and silvopastoral systems have been shown to play a major role in the survival of wildlife species by providing scarce resources and refuge; to have a higher propagation rate of native

forest plants under these scattered trees; and to provide shade for grazing animals, and shelter for wild birds (Harvey and Haber, 1999). Food availability for wild birds is high in agroforestry and silvopastoral systems, and the complex structure of the vegetation provides a more adequate nesting substrate and better protection against predators than other agroecosystems. Silvopastures and other agroforestry systems also harbor a larger and more complex assemblage of invertebrates than monoculture pastures (Dennis and others, 1996). Similarly, shade-grown coffee has been shown to harbor high levels of biodiversity—particularly avian biodiversity (Perfecto and others, 1996; Moguel and Toledo, 1999; Greenberg, 1996). Indeed, GEF has supported the Promotion of Biodiversity Conservation within Coffee Landscapes Project in El Salvador to promote shade-grown coffee systems, as well as a similar project in Mexico's Chiapas region.

5. The table below, prepared for the GEF-supported RISEMP project, summarizes the expected biodiversity benefits of various land uses encountered in Central America in the form of an index. The biodiversity conservation index was scaled with the most biodiversity-poor land use (annual crops) set at 0.0 and the most biodiversity-rich land use (primary forest) set at 1.0. Within this spectrum, the points given to each specific land use were set by a panel of experts, taking into consideration factors such as the number of species (of plants, birds, small mammals, and insects), their spatial arrangement, stratification, plot size, and fruit production. Higher scores were given to land uses that have greater potential to maintain the original biodiversity of the region.

Table 1. Indices of global environmental benefits expected from common land uses
(Points per hectare, unless otherwise specified)

<i>Land use</i>	<i>Biodiversity index</i>	<i>Carbon sequestration index</i>
Annual crops (annual, grains, and tubers)	0.0	0.0
Degraded pasture	0.0	0.0
Natural pasture without trees	0.1	0.1
Improved pasture without trees	0.4	0.1
Semi-permanent crops (plantain, sun coffee)	0.3	0.2
Natural pasture with low tree density (< 30/ha)	0.3	0.3
Natural pasture with recently-planted trees (> 200/ha)	0.3	0.3
Improved pasture with recently-planted trees (> 200/ha)	0.3	0.4
Monoculture fruit crops	0.3	0.4
Fodder bank	0.3	0.5
Improved pasture with low tree density (< 30/ha)	0.3	0.6
Fodder bank with woody species	0.4	0.5
Natural pasture with high tree density (> 30/ha)	0.5	0.5
Diversified fruit crops	0.6	0.5
Diversified fodder bank	0.6	0.6
Monoculture timber plantation	0.4	0.8
Shade-grown coffee	0.6	0.7
Improved pasture with high tree density (> 30/ha)	0.6	0.7
Bamboo (<i>guadua</i>) forest	0.5	0.8
Diversified timber plantation	0.7	0.7
Scrub habitats (<i>tacotales</i>)	0.6	0.8
Riparian forest	0.8	0.7
Intensive silvopastoral system (>5,000 trees/ha)	0.6	1.0
Disturbed secondary forest (> 10 m ² basal area)	0.8	0.9
Secondary forest (> 10 m ² basal area)	0.9	1.0
Primary forest	1.0	1.0
New live fence or established live fence with frequent pruning (per km)	0.3	0.3
Wind breaks (per km)	0.6	0.5

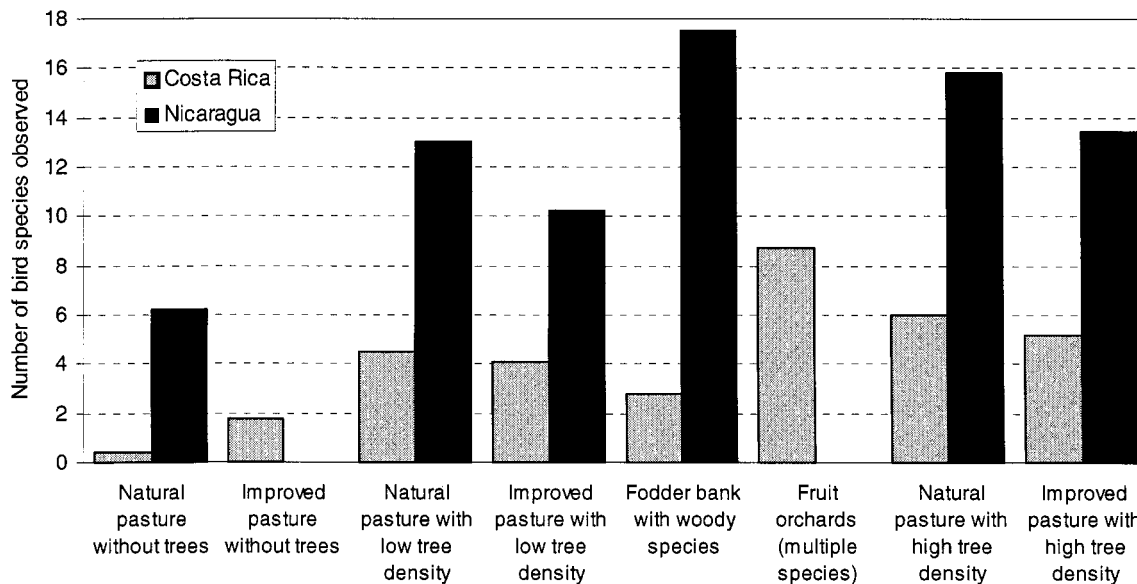
Notes: Prepared for the GEF-supported *Regional Integrated Silvopastoral Ecosystem Management Project* (RISEMP) currently being implemented in Colombia, Costa Rica, and Nicaragua

6. In agricultural landscapes characterized by the fragmentation of the natural habitats, agroforestry and silvopastoral systems can serve as biological corridors, helping to connect remaining habitats. This role is expected to be particularly important in El Salvador, where the remaining natural habitats and the protected areas are highly fragmented and isolated. The pilot sites have been specifically selected for their importance in this regard. It is expected that these corridors would provide adequate habitat for wildlife while facilitating seed dispersal and the regeneration of the native vegetation (Saunders and Hobbs, 1991).

7. The figure below shows initial data from biodiversity monitoring efforts undertaken in the Costa Rica and Nicaragua sites of the GEF-supported RISEMP project. These results show that land uses which include trees harbor higher levels of biodiversity than land uses without trees. The observed diversity of bird species (shown below), as well as the number of individuals (not shown), is higher in land uses with

trees, and higher yet when the tree density is higher. Similar results are being obtained for other indicators (vegetation, ants species, butterfly species).

Figure 1. Number of bird species observed in different land uses at the Costa Rica and Nicaragua RISEMP project sites.



8. By providing alternative sources of fuelwood and other wood products, agroforestry and silvopastoral systems can also help reduce pressure on remaining natural habitats. Likewise, some measures that might be supported through the PES program, such as improved land management, might have limited direct benefits for biodiversity, but help reduce pressure on remaining natural habitats by maintaining yields.

9. Although no studies on the relationship between land use and biodiversity have been conducted to date at the project sites themselves, the results above are based on a wide and growing body of research conducted throughout the region, and indeed throughout the world (selected references are listed below). Based on this wide body of evidence, it is expected that the project sites would generate important biodiversity benefits through conversion of land uses from traditional agricultural practices to more diversified and sustainable methods (i.e. from those uses with low biodiversity index to high, see Table above).

10. Additional global environmental benefits will be generated through improved carbon sequestration as a result of project activities. Again, forested land uses would provide the greatest such benefit, but agroforestry and silvopastoral systems are also capable of fixing significant amounts of carbon in the soil under the improved pastures and in the standing tree biomass (Fisher and others, 1994). Research in Colombia (Ramirez, 1997), Panama, and Costa Rica (CATIE, 1999; Pfaff and others, 2000) has shown that soils under silvopastoral systems have significantly higher carbon content than in soils under traditional agricultural systems. Additional carbon is sequestered within the trees found in such systems, which can represent a significant pool. Moreover, grass-based pastures tend to sequester most of the carbon in the deeper part of the soil profile (between 40 and 100 cm depth), thus making it less prone to oxidation, and hence loss (Fisher and others, 1994; Beinroth and others, 1996). The likely carbon sequestration benefits of a range of different land uses encountered in Central America are summarized in

Table 1 above. Given these likely benefits, the project will explore options to obtain carbon finance, from the BioCarbon Fund or other sources, to complement existing funding sources.

Water benefits

11. In El Salvador, as in many developing countries, water services are of primary concern, as they have important national impacts. Water needs are high and growing, for human well-being and for economic activity. At the same time, water services provide potentially the most sustainable application of the PES approach, as water needs will clearly continue indefinitely. If water users can be persuaded of the importance of appropriate land management to protecting and improving the water services they use, a continuous flow of financing can be generated.

12. Depending on the mix, number, and relative importance of downstream uses, different types of water services will be particularly important in each case. In turn, this will have implications for the preferred upstream land uses. Where dry season water flows are of primary importance, land uses with high infiltration and low evapotranspiration would be preferred. Conversely, where minimizing the risk of flooding is the primary objective, land uses that maximize both infiltration and evapotranspiration would be preferred.

13. Forests and other land uses are widely believed to provide a variety of hydrological services. The evidence, however, is often far from clear (Bruijnzeel, 1990, 2002, 2004; Calder, 1999; Chomitz and Kumari, 1998; Hamilton and King, 1983). This is partly a reflection of the diversity of conditions encountered: hydrological services, for example, depend on the rainfall regime, on the type of soil and vegetation, and on topography. Changes in land use can have multiple, often contradictory impacts, making the net impact on water services hard to determine. Deforestation can reduce infiltration, for example, but also reduce water use through evapotranspiration. The net impact of these changes (both in total and within a year) depends on the balance between these effects.

14. This kind of uncertainty is much less pronounced in El Salvador than in most other countries, however, because forest cover has already been largely lost, and most current land uses are particularly ill-suited to providing water services. Typical 'basic grains' production systems generate high levels of erosion as they leave land bare at the onset of the rainy seasons. Water infiltration rates are low, resulting in high flood risk in the wet season and water scarcity in the dry season, while high water runoff also increases contamination by agrichemicals and manure. Converting such land uses to the land uses supported by the project can confidently be expected to generate improvements in water services, although it is not usually possible to estimate the precise magnitude of the expected improvement. Monitoring will be important to document the extent of the improvement. A well-designed monitoring system can also provide useful information that will allow an improved understanding of the links between specific land uses and water services, thus easing the task of implementing PES programs based on water payments in the rest of the country and throughout the region.

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Section 3: Summary Description of Two Selected and Three Additional Potential Pilot Sites

LAGO DE COATEPEQUE / LOS VOLCANES COMPLEX

General Information	<p>The Lago Coatepeque watershed and lake have a total approximate area of 67 km² and 26 km², respectively, and are home to 21,590 people.</p> <p>The Lake sits within the Los Volcanes complex (54 km², supporting 16,748 inhabitants), the largest set of natural protected areas inside the priority Apaneca-Lamatepec Conservation Area. This Conservation Area includes ten dispersed natural protected areas (corresponding to IUCN Category II), nested into the 452 km² conservation area (supporting 118,756 inhabitants) and each surrounded by private lands. The Los Volcanes National Park is one of the areas identified as a priority for conservation in El Salvador. With elevations that range from 500 to 2,381 meters (1642 to 7812 feet) above sea level, it is made up of state, municipal, and private lands that comprise the volcanic massif of Santa Ana, Izalco, and Cerro Verde in the states of Sonsonate and Santa Ana. It forms part of what is known as the great landscape of the recent volcanic chain, an outstanding geographic trait of central-western El Salvador. This mountain range is made up of 14 geologically young (from 250 to 2 million years old) dormant volcanoes, some with fumaroles, from the Cerro Grande de Apaneca volcano to the Coatepeque Lake caldera. Los Volcanes National Park is located at the eastern end of this mountain range while El Imposible National Park is found at the western end; the mountain range forms a biological corridor between both natural areas, allowing the movement of species along its 30 km (19 miles) of shade coffee farms and highland forests. IT is for this reason that the areas were defined as of critical importance for biodiversity conservation and as supporting strong opportunities necessary for a successful ES payment program.</p>
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<p>Socioeconomic characteristics</p>	<p>Lago Coatepeque The lake is under pressure from recreational development along its shores, unregulated fishing and water use, and unsustainable land use practices in the watershed. There is high disparity in terms of income and property values between hillside agricultural producers on the slopes surrounding the lake and the wealthier lakeside residents. Lakeside property owners have organized in response to threats to the lake's environmental, recreational, and aesthetic values. Coffee farmers in the upper watershed and villa owners on the lakeside are better organized than the smallholders in the middle watershed areas who mostly grow basic grains.</p> <p>Productive activities in the area are mainly coffee plantations, basic grains, tourism, and fishing. Monthly household incomes in the three municipalities located inside the watershed area range from less than US\$17 to US\$343. However, in the urban areas of the municipality of Izalco, where people sell artisanal products as well as doing agricultural work, incomes can be as high as US\$472.</p> <p>Los Volcanes Complex. One-third of the population is economically active, and the estimated monthly per capita household income in the area is \$147. The main productive activity is agriculture, mainly coffee plantations, which employ about 1,900 people. Other significant land uses include cultivation of corn and beans and grazing of livestock. The production, price, and profitability of basic products have improved as a result of increasing domestic demand.</p> <p>Children in the Apaneca-Lamatepec Conservation Area generally have access to primary education at least through the sixth grade and 68 percent of the population is literate. There is one secondary health center per 6,000 people and rural inhabitants are usually within 5 to 19 kilometers from a hospital in nearby urban areas. There are 1,544 km of paved and dirt roads and potable water reaches 73 percent of households. Access to potable water is substantially lower in the upper and middle watersheds than near the lake. Around 53 percent of households use pit latrines, but most properties located along the lake have septic systems. Rural households along the lake do not have garbage collection services.</p>
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Biophysical characteristics	<p>Los Volcanes, with its highly diverse terrain ranging from 500 to 2,381m in altitude, is considered one of the most diverse areas in the country in terms of both natural and altered habitats, supporting habitats such as hot sulphur springs, barren lava flows, vegetated lava flows, paramo, and cloud forests, as well as other montane forests, coffee plantations, and pasture. These diverse habitats form a complex system that is more stable because of its variation, interconnection, and extension, offering better opportunities in the long run for conservation of its natural resources, products, and environmental services. It is also part of the MBC and linked with El Imposible Park, another highly important place for biodiversity at the regional and global level.</p> <p>One rare bird found in the area is the rock wren (<i>Salpinctes obsoletus</i>), which hops about the hardened lava flows of Izalco Volcano. Other wildlife species found in the reserve include the collared anteater (<i>Tamandua mexicana</i>), ocelot (<i>Leopardus pardalis</i>), coyote (<i>Canis latrans</i>), black hawk eagle (<i>Spizaeus tyrannus</i>), and the emerald toucanet (<i>Aulacorhynchus prasinus</i>).</p> <p>Within the Lago Coatepeque area, priority species include:</p> <ul style="list-style-type: none"> (a) Plants—<i>Pouteria zapota</i>, <i>Manilkara zapota</i>, <i>Mangifera indica</i>, <i>Anacardium occidentale</i>, <i>Brosimum alicastrum</i>, <i>Simarouba glauca</i> (b) Amphibians and reptiles—<i>Atropoides nummifer</i>, <i>Cerrophidion godmani</i>, <i>Sceloporus malachiticus</i>, <i>Norops sp.</i> (c) Birds—<i>Spizaetus tyrannus</i>, <i>Sialia sialis</i>, <i>Aulacorhynchus prasinus</i>, <i>Amazona auropalliata</i> (d) Mammals—<i>Odocoileus virginianus</i>, <i>Canis latrans</i>, <i>Sciurus deppei</i>, <i>Coendou mexicanus</i>, <i>Nasua narica</i>, <i>Puma concolor</i>. <p>Many of the same species are found within the adjacent Los Volcanes National Park, as well as the bird species <i>Buteo swainsoni</i> and the plants <i>Ficus insípida</i> and <i>Curatella americana</i>. Also, the area includes two very rare habitats at the national level, ten endemic and two restricted species of birds, and one critically endangered species of reptile.</p> <p>The Apaneca-Lamatepec Conservation Area spans 5 of the country's 11 hydrographic regions. It is the largest and most important source of water in the western part of the country. The water is used inside and outside the conservation area for human consumption, irrigation, hydropower generation, fishery production, and tourism. One of the hydrographic basins (Río Lempa) and its sub-basins alone represent 68 percent of El Salvador surface water.</p> <p>Lago Coatepeque is a closed system in a volcanic caldera fed by rain and underground sources. Problems cited by lakeside residents include erosion, sedimentation, and agrochemical contamination. The land in areas used for grain production is being rapidly degraded. Annual average precipitation of about 1,800 mm is the only significant source of water recharge in the system. However, evapotranspiration removes about 1,200 mm of that rainfall, on average. Current conditions indicate a notable reduction in net water resources in the area, reflected by a decrease in lake levels.</p>
Problem Analysis	Low infiltration capacity, real evapotranspiration, surface water runoff, landslides, water contamination, deforestation / threats to natural habitats.

Threats to biodiversity	Forest conversion for agricultural production, conversion from shade coffee to traditional methods, high erosion generated by poor land use practices. Over-fishing. Unregulated shoreline development and tourism. Improper solid waste and sewage management. Poor water management. Bordering and aquatic vegetation. Endangered avifauna. Highly endangered and threatened flora species. Refugee to various subspecies of birds endemic to the volcanic mountains
What environmental services would be supplied?	Improved biodiversity conservation through the promotion and expansion of sustainable agricultural techniques and crops. Improved water quality and quantity for lakeside residents to be used for human consumption, recreation, tourism, fish habitat values and irrigation. Risk mitigation and prevention (flood control, landslide prevention). Preservation and expansion of scenic views. Carbon sequestration; and biological research.
How will they be provided?	Maintaining and expanding shade coffee systems on existing coffee plantations and converting hillside slash-and-burn grain producers to agroforestry systems of dispersed trees and mulch.
Who could supply the services?	In the Lago Coatepeque watershed, small-scale grain producers. In the area of Los Volcanes, owners of intact parcels of natural habitat, forests, and coffee plantations including departmental, municipal, cooperative, and private owners.
Who could pay for the services?	In Lago Coatepeque, lakeshore property owners (who have already demonstrated a high willingness to pay), communities living inside the watershed, recreational properties and tourism businesses, and fishermen. In the Los Volcanes Complex area, urban populations within the area's hydrographic basins, carbon buyers for climate change mitigation, farm owners who want to join the national recognition program for contributing to conservation, large and small businesses that offer services in the surrounding areas, ecotourists and visitors to natural areas, plantation owners who choose to join the timber certification program.
What are the other potential environmental impacts?	Improved quality of surface water flowing into the lake, reduced erosion and sedimentation, reduced air pollution, and increased biodiversity from adopting more habitat-friendly agroforestry practices. Reduced evapotranspiration that would increase the net water supply in the system. Increase of forest cover improving erosion control and soil conservation and humidity, leading to greater infiltration, subsurface flows, and recharge of aquifers around the lake area. Conservation of existing natural habitats. Maintenance or improvement of forest coverage in coffee plantations. Maintenance of forest cover in existing forest plantations as well as creation of new plantations. Increase capture of water benefits, climate and soil stabilization, and better conditions for biodiversity conservation.

<p>What is the institutional framework available?</p>	<p>Viability of the initiative has been demonstrated by the fact that some beneficiaries and a reliable foundation (FUNDACOATEPEQUE) are already in place and prepared to facilitate implementation. Other associations, such as ASACMA and SALVANATURA, could also play a role in the program.</p> <p>Several other actors already active in Los Volcanes could be allies in the process as well, from governmental institutions to civil society organizations to private sector (e.g. Grupo Roble).</p>
<p>Any social aspects of concern?</p>	<p>In Lago Coatepeque the disparity in socioeconomic status, culture, and power between the providers and consumers must be considered in negotiations. Potential providers need to be better organized. Not all lakeside property owners are aware of or involved in the existing payment initiative. There is a sizable population of laborers living close to the lake who lack basic infrastructure.</p>

JALTEPEQUE-JIQUILISCO

<p>General Information</p>	<p>Comprises 1,134 km² located in the priority Jaltepeque-Bajo Lempa and Bahía de Jiquilisco Conservation Areas, supporting 344,733 people distributed among the municipalities of Usulután (IDH 0.724), Concepción Batres, Jiquilisco (IDH 0.672), Jucuarán, Puerto El Triunfo, San Dionisio, San Luis La Herradura, Santiago Nonualco (IDH 0.685), San Pedro Masahuat, Zacatecoluca (IDH 0.695), and Tecoluca.</p> <p>The area, which includes the entire mouth of the Rio Lempa (the largest and most important river in El Salvador) includes 24 natural protected areas (“nuclei”), most of which are still not consolidated as well as the second largest expanse of mangroves in the country..</p>
<p>Socioeconomic characteristics</p>	<p>Monthly per capita income is \$319 in Jiquilisco and \$305 in Jaltepeque. Infant mortality is about 40 per thousand live births in urban areas and almost 60 per thousand in rural areas. Urban areas have good access to health facilities, education, and transport infrastructure, but services and infrastructure in rural areas are in very poor condition. Improper management of solid wastes and sewage both in urban or rural areas is a serious problem.</p> <p>Mixed agricultural production systems cover 25,574 hectares in Jiquilisco and 12,444 hectares in Jaltepeque. Most agriculture uses traditional, nonmechanical methods, but also involves excessive use of agrochemicals for pest control. Production systems concentrate mainly in basic grains, cattle, birds and pigs, as well as low-irrigation crops and some fruits. Extensive cattle ranching contributes to high rates of erosion. In terms of forest management, extraction concentrates on the red mangrove, which is used for general construction. Other extractive activities focus on species used for commercial firewood or charcoal production.</p> <p>Other economic activities are industrial and traditional fishing, aquaculture (shrimp and bivalve mollusks), salt production, and tourism. There are clear indications that fishing activities in the Jaltepeque area have led to a decline in fish populations, which is aggravated by conflicts over fishing rights between industrial and artisanal fishermen, unregulated or illegal fishing, and other factors. Tourism in Jaltepeque generates income but has been developed with no coordination, regulation, or management, and has contributed significantly to degrading coastal resources in the area. In the Jiquilisco area tourism has been developed mostly through isolated, local initiatives with no clear promotion or management, leading to environmental problems such as waste and sewage accumulation, disruption of sea turtle laying and hatching by building too close to the beach, disruption of sea bird nesting, and landscape deterioration. The rapid conversion of mangroves through illegal deforestation and fill operations constitutes a globally important threat.</p>
<p>Biophysical characteristics</p>	<p>Biodiversity: The two conservation areas support at least 593 fauna species, including 24 mollusks, 6 shrimp, 13 amphibians, at least 38 reptiles (including 7 endangered and 7 critically endangered species), at least 133 fish, 278 birds (some of which are endangered), and 43 species of mammals. The remaining areas of forest in Jiquilisco help preserve endangered populations of Central American spider monkey.</p> <p>It is one of the nation’s most important coastal zones, with 14 nesting colonies of several different bird species. It has the second largest nesting colony of <i>Cochlearius cochlearius</i>, which is critically endangered at the national level, and includes the only nesting colony of shore birds in Central America, on the San Juan de Gozo Peninsula. This also is a nesting area for the four species of sea turtles found in the country: <i>Lepidochelys olivacea</i>,</p>

	<p><i>Eretmochelys imbricata</i>, <i>Dermochelys coriacea</i>, and <i>Chelonias agassizi</i>.</p> <p>The most extensive mangroves in the country (47,762 hectares) are located in Jaltepeque-Jiquilisco. The mangroves are a highly productive ecosystem, providing food, habitat, and reproduction zones for most aquatic species, including the ones that sustain artisanal and industrial fishing.</p> <p>The Jiquilisco area has 165 species of trees and bushes including some endangered species, such as caoba (<i>Swietenia humilis</i>). There is a predominance of red mangrove (<i>Rhizophora racemosa</i>), however, 16 other species of mangrove can be found, including <i>Avicennia bicolor</i>, <i>A.germinans</i>, <i>Conocarpus erectus</i>, <i>Laguncularia racemosa</i>, <i>Rhizophora harrizini</i>, and <i>R. mangle</i>. Also, the subarea has 84 species of micro-algae, 5 of which are part of shrimp larvae (<i>Cyclotella stylum</i>, <i>Cylindrotheca closterium</i>, <i>Skeletonema costatum</i>, <i>Thalassionema nitzschioides</i>, and <i>T. graviora</i>); and an exotic one (<i>Pseudonitzschia pungens</i>). The Jaltepeque area has 128 species of trees and bushes. Various mangrove species can be found, including <i>Rhizophora mangle</i>, <i>R. racemosa</i>, <i>Laguncularia racemosa</i>, <i>Avicennia germinans</i>, <i>Conocarpus erectus</i>, and <i>Avicennia bicolor</i>.</p> <p>The Jiquilisco area encompasses a high number of hydrographic basins. The main 21 basins in the area cover 64,718 hectares. The Jaltepeque area covers 7 hydrographic basins with a total area of 28,362 hectares.</p>
Problem Analysis	Habitat degradation, decrease in forest cover, mangroves overexploitation, unbalanced water cycles, erosion, floods, droughts, fires, water contamination.
Threats to biodiversity	Forest conversion for shrimp farming, salt production, livestock production, tourism, subsistence farming and house plots, and chemical-dependent aquaculture. Improper solid waste and sewage management. Over-hunting and –fishing. Improper water management resulting in salinity pattern alterations. Endangered avifauna, nesting and concentration areas of migrating and resident birds, nesting area of marine turtles, highly endangered and threatened flora species, rich variety of habitat, spider monkey populations.
What environmental services would be supplied?	Biodiversity protection through promotion of sustainable and appropriate agricultural practices, and conservation of existing mangrove forests. Improved water quality and quantity through erosion control, reduced agrichemical and water use. Risk prevention and mitigation (flood control, sediment capture),.
How will they be provided?	Development of diversified and appropriately scaled agricultural practices with the application of proper productive systems, which would help ensure resource sustainability. Conservation practices through natural vegetation, with the objective of creating natural reserves for wildlife protection.
Who could supply the services?	Local entities such as agricultural and fishing cooperatives, private organizations, or private firms.
Who could pay for the services?	Surrounding communities (small farmers, artisanal fishermen, aquaculturists, employees, and others); business entities involved in agriculture, cattle raising, fishing, aquaculture, and tourism; tourists

<p>What are the other potential environmental impacts?</p>	<p>Replacing current agricultural practices with more environment-friendly ones; strengthening and managerial consolidation of the six proposed protected areas; conservation and sustainable use of biodiversity, protection of forests and endangered and vulnerable species; continued mitigation of erosion, sedimentation, and flooding risks; improvement of environmental and infrastructure conditions inside the protected areas focused on public use and environmental education; maintenance and proper management of living laboratories for scientific research in terms of landscapes, ecosystems, species, and genetic diversity; biodiversity conservation, soil stabilization and regeneration, pest control, biomass and nutrient generation, water pumping and filtration.</p>
<p>What is the institutional framework available?</p>	<p>Social structure is very rich and complex, mainly focused on community organization. There are several NGOs working in the area, as well as projects and development initiatives supported through international cooperation.</p>
<p>Any social aspects of concern?</p>	<p>Conflicts for use and access to fishing activities, and illegal fishing. The land tenure situation is complicated, including issues of land programs for former guerrillas and army members that have generated several conflicts. (This issue is being addressed through the Land Administration IBRD/GEF operation). Sixty-three percent of property owners are smallholders (smaller than 3 manzanas), 25 percent are beneficiaries of agrarian reform, and 12 percent are large producers.</p>

RIO GUALABO

<p>General Information</p>	<p>Located inside the Nahuaterique Conservation Area, which is part of the upper Grande de San Miguel River watershed. The 27 km² area comprises 3,743 people in the municipalities of Yamabal, Guatajiagua, and Sensembra.</p> <p>The Gualabo River is one of four micro-watersheds in the Cerro Cacahuatique water complex. The micro-watershed's altitude is between 200 meters and 1,300 meters above sea level. The river's surface water flows 18 km.</p>
<p>Socioeconomic characteristics</p>	<p>One of the poorest regions in El Salvador. Nutritional needs are unmet for a large part of the population. Monthly household income in the three municipalities of the micro-basin is less than US\$172) in most cases. However, in the urban area of Guatajiagua municipality, where part of the population is involved in commercial cattle raising and other commercial businesses, household income can exceed US\$571.</p> <p>Illiteracy in the municipality of Guatajiagua is 70 percent, significantly higher than in Sensembra (10 percent) and Yamabal (20 percent). Urban areas in the three municipalities have access to electricity, but the municipality of Sensembra is the only one with sanitary sewage systems (70 percent) and only Guatajiagua has household garbage collection (50 percent). All three municipalities have access to drinking water networks in the urban areas, although in rural areas only 26 percent of households have the same access.</p> <p>Most agriculturalists are smallholders, producing coffee, corn, beans, and sorghum; with an average farm size of 2.45 hectares. However, farms vary widely, from small parcels of 0.35 hectares to coffee plantations larger than 28 hectares, including cooperatives and large cattle ranches. Small parcels are dedicated mainly to basic grains and cattle grazing in the middle and lower basin areas, while the high basin area is mainly dedicated to coffee plantations.</p>
<p>Biophysical characteristics</p>	<p>The watershed covers 132 km², 35 percent of which is forested. A large volume of water passes through this watershed, and the hydrologic features are well monitored.</p> <p>The Cerro Cacahuatique complex is home to various endangered and critically endangered species of flora and fauna.</p> <p>The upper basin, above 1,200 meters, is characterized by slopes greater than 30 percent. The middle basin, between 300 and 1,200 meters above sea level, has slopes between 10 and 30 percent. The lower basin, below 300 meters, typically has slopes of less than 5 percent. This subdivision allows the distinction of the three different zones in terms of their agricultural use and hydrological cycle in the basin, allowing for projections of measures aimed at conservation and better use of water resources.</p>
<p>Problem Analysis</p>	<p>Water scarcity, water quality, conflicts for water use, decrease in soil fertility, erosion, fires.</p>
<p>Threats to biodiversity</p>	<p>Forest conversion for cattle ranching, grain and coffee production. Improper solid waste and sewage management. Poor water management. Endangered and threatened flora and fauna species. Refuge to various endemic fauna species, endemic habitat.</p>

What environmental services would be supplied?	Biodiversity conservation through shift from traditional agricultural practices to shade-grown coffee and quesungual agroforestry. Regulated and improved water flow for managed irrigation systems for cattle pastures. Risk prevention and mitigation.
How would they be provided?	Changing agricultural practices from traditional systems to shade grown coffee and quesungual agroforestry.
Who could supply the services?	Upstream agricultural producers, cattle ranchers, and other communities inside the watershed.
Who could pay for the service?	Downstream ranchers and farmers using irrigation, who would benefit from a better-managed system. Communities living within the Gualabo river basin. Irrigation associations and private irrigators, cattle associations and private cattle ranchers.
What are the other potential environmental impacts?	Managed irrigation, increased flows, reduction in sedimentation, reduced burning resulting in improved biodiversity conservation and air quality.
What is the institutional framework available?	The majority of the lower watershed exists within a single municipality, simplifying institutional arrangements. Stakeholders are located close together, the NGO presence is strong, and organizations have the capacity to provide extension services. Producers are ready to change, but strong technical support is necessary.
Any social aspects of concern?	Many downstream consumers in this area are extremely poor and would be unable to pay, and the goal instead is to target more affluent ranching and farm irrigators as consumers of this service. There are conflicts related to water access between upstream and downstream users. Eighty percent of the land lacks legal tenure, but 89 percent of people consider themselves landowners.

LA MONTAÑONA

General Information	Located in the Alotepeque-La Montañona Conservation Area, it comprises 477 km ² in the municipalities of Chalateno (IDH 0.697), Comalapa, Concepción Quezaltepeque, El Carrizal, La Laguna, Las Vueltas, and Ojos de Agua, supporting 55,089 people.
Socioeconomic characteristics	<p>Large, fairly homogeneous rural population consisting mostly of subsistence producers. This area is characterized by traditional hillside slash-and-burn systems, subsistence agriculture, and serious losses of soil and soil fertility associated with high rates of poverty and malnutrition.</p> <p>The main production systems are based on basic subsistence grains, mostly grown for household consumption, and on natural pasture for extensive cattle raising. Together, agriculture and livestock account for 86 percent of the total area. Tourism is seen as an additional activity linked to forest conservation, which is guided by a Forest Management Plan that allows for community forest use. Other small-scale production systems include cultivation of vegetables and fruits.</p>
Biophysical characteristics	Part of the MBC, the area includes three main watersheds, the Rio Azambio (73 km ²), Rio Tamulasco (102 km ²), and Rio Chacahuaca (61 km ²). Overall, 9.7 percent of original forest in the area remains. Natural resources and original montane forests are in an advanced state of decline. Pine forests are under serious threat from the Central American pine bark beetle. Most land use is agroecological systems, dense forests mainly composed of pine groves and oak. There is abundant bird life and other fauna, including <i>Odocoileus virginianus</i> , <i>Procyon lotor</i> , <i>Oryctolagus cuniculus</i> , and <i>Dasyus novemcinctus</i> .
Problem Analysis	Unbalanced water cycles, decrease in infiltration, high erosion levels, water contamination.
Threats to biodiversity	Forest conversion for grain, subsistence and livestock production. Improper solid waste and sewage management. Poor water and agrochemical management. Endemic flora species, germoplasm bank, forest cover.
What environmental services would be supplied?	Biodiversity conservation through promotion of community forest management, agroforestry, etc. Regulation of water generation for domestic consumption, irrigation, cattle raising, power generation, recreation,. Sediment control, disaster prevention, improvement of scenic views, carbon sequestration, and wood products.
How would they be provided?	Community and private pine tree management and the large-scale adoption of quesungual agroforestry and other forms of silviculture.
Who could supply the services?	Upstream agriculturalists.
Who could pay for the service?	Seven downstream communities (including the departmental capital) and the electricity consumers from two hydroelectric dams.

<p>What are the other potential environmental impacts?</p>	<p>Regulation and improvement of water resources for consumption, decreased sedimentation, reduction of air pollution and recovery of biomass due to adoption of nonburning agroforestry systems, and the conservation of biodiversity, including several unique pine species found in only a few places in El Salvador.</p>
<p>What is the institutional framework available?</p>	<p>La Montaña boasts both ample water supplies and a strong institutions capable of leading a PES program. However, creating a demand-side market would require time-consuming institutional and normative changes, especially for the management of the hydroelectric facilities.</p>
<p>Any social aspects of concern?</p>	<p>The watershed is divided among multiple communities, introducing potential organizational difficulty. The greatest potential at this site lies in its high levels of organization and capacity to foster local consciousness of how ecosystem management impacts water flows.</p>

CINQUERA

General Information	Located inside the 941 km ² Valle del Alto Lempa Conservation Area, and part of the Embalse Cerrón Grande buffer zone. It comprises the municipalities of Cinquera, Suchitoto, Tejutepeque, Jutiapa, and Tenancingo supporting 42,024 inhabitants.
Socioeconomic characteristics	Traditional production systems such as slash-and-burn grain production and extensive cattle ranching dominate the area. As a conflict zone during the 1980s, Cinquera had been largely depopulated, but since the peace was signed in 1991 there has been population influx that has pushed back agricultural frontiers and placed increasing pressure on the land. Many small and medium-size landholders lack land tenure, but social organizations are at work and local authorities are well aware of the problem. The Cinquera area spans the Cutumayo and Sirena river subbasins, in which there is substantial forest cover as well as pasture and cultivation of basic grains.
Biophysical characteristics	Fifty percent of the land in the site area has been undergoing natural forest regeneration for the past 15 years. These forest areas are considered part of the Mesoamerican Biological Corridor (MBC/ES). The forest has been included as part of the Cerrón Grande buffer zone due to its unique native species, including 21 species of reptiles, 139 birds, 38 mammals, 10 amphibians, and 130 native trees.
Problem Analysis	Water quantity and quality, decrease in soil fertility, Sedimentation, erosion.
Threats to biodiversity	Forest conversion for slash-and-burn farming, cattle production. Improper solid waste and sewage management. Endemic species, overexploitation of natural resources, flora and fauna genetic property.
What environmental services would be supplied?	Conservation of biodiversity through improved agricultural practices. Regulation of water flows for irrigation, and improved hydroelectric generation on the Rio Lempa (where dams are currently operating at only a small percentage of capacity). Improved water quality for fishing and drinking water. , and b Erosion and sediment control, and promotion/restoration of scenic landscapes.
How would they be provided?	The introduction of more sustainable agricultural practices including Quesungual agroforestry systems (dispersed trees and mulch).
Who could supply the services?	Upstream agricultural producers.
Who could pay for the service?	Downstream users, including water consumers, irrigators, and hydroelectric plants.

<p>What are the other potential environmental impacts?</p>	<p>Regulated and improved water flow, increased water quality, diminished erosion and sedimentation, improved air quality from reduced burning, and benefits to biodiversity.</p>
<p>What is the institutional framework available?</p>	<p>In general, the area has a high capacity for local organization, a sense of ownership and collective action, and well-established projects working in rural development, including PAES, which promotes agroforestry and soil conservation. Upstream interest in service provision already exists, but downstream awareness is much lower.</p>
<p>Any social aspects of concern?</p>	<p>The area under traditional forms of agriculture is rapidly expanding, largely due to land programs for war veterans that offered support for the occupation of unclaimed land. Like in most of El Salvador, the land tenure situation is complex and must be accounted for in the legal framework of the program. However, the parallel IBRD Land Administration project is currently defining tenure in this area. It is defined by lack of an inventory of owners and titling. In addition, there are conflicts related to use of forest lands by some owners, which generate hesitation from local organizations and from other owners who are willing to preserve the resources.</p>

Annex 19: Detailed Lessons Learned

EL SALVADOR: Environmental Services Project

1. The key lessons learned from other GEF co-financed projects and other relevant non-GEF projects (listed in Annex 2), has enriched the design of the proposed project, including:

Payment for Environmental Services

2. Though the creation of systems of payments for environmental services is relatively a new approach, considerable number of initiatives have flourished since the last decade that have provided valuable lessons. Some of these initiatives include Costa Rica Eco-market project, a regional Silvo-Pastoral project in Central and South America, and El Salvador Shade-grown Coffee project, all supported by GEF and the World Bank. In addition, the proposed project has gleaned lessons and recommendations from a number of publications including from the World Bank, the Food and Agricultural Organization of the United Nations (FAO), the Forest Trend and the Institute for International Environment and Development (IIED)²⁴. Some of these lessons include:

- *Flexibility in project approach:* It has widely been shown, that environmental services are very site specific and consequently the administrative mechanism should be sufficiently flexible to adapt to the different needs that transpire across the country. Payment scheme, for example, should be site specific. A site targeted scheme will be much more cost effective and less expensive than an undifferentiated payment system that pays everyone the same. A balance, however, needs to be found between the efficiency advantages and the higher costs of more accurate targeting.
- *Identification and quantification of the demand for environmental services:* Project design must start with the demand side analysis and in facilitating the creation of the market. It is essential to identify who the beneficiaries and service providers are, what the level of charges should be, what the willingness of downstream users to pay for this service is, and what the minimum payment level is that is sufficient to induce landholders to change their land use practices.
- *Benefits from alternative activities must equal or exceed the opportunity cost:* One of the premises of the market incentive is that environmentally friendly activities must yield equal or more benefits than the opportunity costs. Profitability at the farm level is key for the success of alternative land use practices.
- *Make payments continuous and open-ended.* Land users should receive payments as long as they comply with the stipulated land use and management activities in their contract. The benefits being sought will generally be enjoyed year after year, as long as appropriate land uses are maintained.
- *Economic Cost-Benefit analysis needs to be clearly presented and made available to decision makers:* In the case of El Salvador coffee, though yields per hectare were lower for shade coffee than for sun coffee or monoculture plantations, production costs were also lower because shade coffee required

²⁴ The list of publications include: a) Pagiola et. al., 2004. “*Paying for Biodiversity Conservation Services in Agricultural Landscapes*”. World Bank; b) Chomitz et. al., 1998. “*Financing Environmental Services: The Costa Rican Experience*”. World Bank; c) Scherr et. al. 2002. “*Making Markets Work for Forest Communities*.” Forest Trend; d) Johnson et. al. “*Developing Markets for Water Services from Forest: Issues and Lessons for Innovators*.” Forest Trend, World Resources Institute, and the Katoomba Group; and e) Landell-Mills and Porras. 2002. “*Silver Bullet or Fools’ Gold?: A Global Review of Markets for Forest Environmental Services and their Impact on the Poor*.”. IIED.

less fertilizer, pesticides, and fungicides. Lower production cost and multiple use of land (e.g., coffee, timber/firewood and non-timber products) may generate more profit per hectare.

- *Remove regulatory and information barriers:* Reducing excessive regulatory barriers would provide opportunity for landowners to participate in the market. Furthermore, to “level the playing fields”, access to information, that discriminate small landholders to participate in the market need to be removed.
- *Piloting the scheme before scaling up:* It is important to initiate work at reasonable scale such as tens of thousands of hectares before scaling it up to hundreds of thousands of hectares. The knowledge from the pilot experiences should be shared with all the stakeholder groups and applied in the design of scale up program.
- *Country ownership:* Political “buy-in” is an important aspect and must be attained at the highest levels. Analysis that can substantiate discussions with the economic cabinet have proven instrumental in furthering the environmental agenda and should also be a part of the strategy of the program. Furthermore, early identification of supporting local partners (e.g., NGOs) including their capacity is important for promoting participation and strengthen ownership at the local level. It will strengthen the institutional sustainability.
- *Amenable and effective extension system is necessary:* An extension system is not only vital to help farmers and other stakeholders (e.g., fishermen) adapt their agriculture and harvest practices but also to raise awareness about the importance of sustainable management of natural resource base.
- *Monitoring and Evaluation:* Monitoring and evaluation is an integral part of project design. It must include the establishment of a baseline, as well as the socio-economic and environmental impacts of the project.
- *Inclusion of agricultural land use systems in PES schemes:* PES schemes need to consider all types of land use including agriculture, forests, pastures and infrastructures.

Biodiversity Conservation and Sustainable Use in Productive Landscape

3. One of the most important lessons learned from projects supported by GEF includes the importance of stakeholder participation and ownership involving local populations and institutions (e.g., local government, community and sectoral organizations, NGOs) in project design and implementation in order to ensure long-term conservation of biodiversity in protected areas, as well as in the production landscape. As such, the design of the El Salvador project includes technical assistance for local NGOs and associations to support forest conservation activities carried out by small landowners, and rural women’s organizations. Consultations have taken place in priority areas to strengthen local participation in the project.

The experience of projects throughout the MBC and other SANP projects with buffer zone communities indicates the importance of:

- Clearly defining the roles of the project and the communities in project administration, decision making, and implementation in order to avoid creating false expectations or leaving ambiguities which cause implementation delays;
- Providing a strong administrative and coordinative capacity supported by adequate technical assistance and, initially, close implementation supervision;
- Limiting the project focus so that the activities are targeted and limited to those appropriate to the social context and current institutional capacity;
- Strengthening the institutional sustainability include building capacity of the executing entity, strengthening public-private partnerships and building capacity within partner organizations to implement co-management arrangements;

- Ensuring that adequate monitoring and evaluation system is in place. Project activities include developing mechanisms to monitor biodiversity impact and protected area management effectiveness; and
- Ensuring financial sustainability.

MAP SECTION

