



THE WORLD BANK

1818 H Street, N.W.
Washington, D.C. 20433, U.S.A.
Telephone: 202-477-1234
Facsimile: 202-477-6391
Telex: MCI 64145 WORLDBANK
MCI 248423 WORLDBANK
Internet: www.worldbank.org
Email: books@worldbank.org



WORLD BANK OPERATIONS EVALUATION DEPARTMENT



Costa Rica: Forest Strategy and the Evolution of Land Use

Costa Rica Forest Strategy and the Evolution of Land Use

Evaluation Country Case Study Series



ISBN 0-8213-4764-0

The World Bank



OPERATIONS EVALUATION DEPARTMENT

ENHANCING DEVELOPMENT EFFECTIVENESS THROUGH EXCELLENCE AND INDEPENDENCE IN EVALUATION

The Operations Evaluation Department (OED) is an independent unit within the World Bank; it reports directly to the Bank's Board of Executive Directors. OED assesses what works, and what does not; how a borrower plans to run and maintain a project; and the lasting contribution of the Bank to a country's overall development. The goals of evaluation are to learn from experience, to provide an objective basis for assessing the results of the Bank's work, and to provide accountability in the achievement of its objectives. It also improves Bank work by identifying and disseminating the lessons learned from experience and by framing recommendations drawn from evaluation findings.

THE WORLD BANK OED EVALUATION COUNTRY CASE STUDY SERIES

FORESTRY

Brazil	Forests in the Balance: Challenges of Conservation with Development
China	From Afforestation to Poverty Alleviation and Natural Forest Management
Costa Rica	Forest Strategy and the Evolution of Land Use
India	Alleviating Poverty through Forest Development
Indonesia	The Challenges of World Bank Involvement in Forests

POST-CONFLICT RECONSTRUCTION

Bosnia and Herzegovina
El Salvador
Uganda



Costa Rica

Forest Strategy and the Evolution of Land Use

Evaluation Country Case Study Series

Ronnie de Camino
Olman Segura
Luis Guillermo Arias
Isaac Pérez



Copyright © 2000
The International Bank for Reconstruction
and Development/THE WORLD BANK
1818 H Street, N.W.
Washington, D.C. 20433, U.S.A.

All rights reserved
Manufactured in the United States of America

The opinions expressed in this report do not necessarily represent the views of the World Bank or its member governments. The World Bank does not guarantee the accuracy of the data included in this publication and accepts no responsibility whatsoever for any consequence of their use. The boundaries, colors, denominations, and other information shown on any map in this volume do not imply on the part of the World Bank Group any judgment on the legal status of any territory or the endorsement or acceptance of such boundaries.

The material in this publication is copyrighted. The World Bank encourages dissemination of its work and will normally grant permission promptly. Permission to photocopy items for internal or personal use, for the internal or personal use of specific clients, or for educational classroom use is granted by the World Bank, provided that the appropriate fee is paid directly to the Copyright Clearance Center, Inc., 222 Rosewood Drive, Danvers, MA 01923, U.S.A., telephone 978-750-8400, fax 978-730-4470. Please contact the Copyright Clearance Center before photocopying items. For permission to reprint individual articles or chapters, please fax your request with complete information to the Republication Department, Copyright Clearance Center, fax 978-750-4470.

All other queries on rights and licenses should be addressed to the Office of the Publisher, World Bank, at the address above, or faxed to 202-522-2422.

Cover photo credit: Photo taken by Dr. Donald Perry. Dr. Perry is the originator, founder, and developer of the Rain Forest Aerial Tram, which is located in Costa Rica. Information about his company may be obtained by e-mail: habitats@lynnet.com.

ISBN 0-8213-4764-0

Library of Congress Cataloging-in-Publication Data has been applied for.



Printed on recycled paper.



Table of Contents

Foreword	vii
Acknowledgments	xi
Acronyms	xiii
Summary	xvii
PART I: THE FORESTS AND FOREST SECTOR IN COSTA RICA	
1. Deforestation, Reforestation, and Natural Forests	1
Deforestation Since the 1950s	1
The Nature of Land Use Changes	7
Protected Areas	11
Reforestation Incentives	14
Management of Natural Forests	20
Forests as a Resource	21
2. The Compatibility of Incentives:	
The Evolution of Costa Rican Policy	25
The Inactive Forest Sector (1960–78)	25
The Reactive Forest Sector (1979–90)	28
A Change of Attitude: Moving Toward an Active Forest Sector (1991–98)	32
PART II: THE WORLD BANK AND COSTA RICA	
3. Institutions and Organizations	35
The Evolution of Forest Legislation	35
The Evolution of Institutions	39

The Evolution of Organizations	44
The Main Features of the Development	45
Does the World Bank Forest Strategy Make Sense in Costa Rica?	46
4. The Capacity for Innovation: The Underlying Principle	49
Payment for Environmental Services	49
Biodiversity	56
Other Innovative Initiatives	59
A Fragile System	61
5. Role of the World Bank	63
Structural Adjustment Loans (SALs)	64
Influence of the World Bank after 1991	69
Loans after the 1991 Forest Project	73
A Judgment of World Bank Activities	78
The Conceptual Influence of the World Bank and Costa Rica	82
6. Conclusions	85
What Makes Costa Rica Different?	85
The Dominant Vision of Economic Development	87
Two Directions Influencing Process	88
Achieving Sustainable Development	88
Is the Model Replicable?	89
Annexes	93
A. Supplemental Tables	93
B. The 1991 Forest Strategy	96
C. Description of Costa Rican Forestry Organizations	98
D. Assessment of Loans from the World Bank	101
E. Stakeholder Comments on Costa Rica Case Study	113
Endnotes	119
Bibliography	125

Boxes

Box 1.1. Bank Forest Strategy: The 1991 Forest Paper and the 1993 Operational Policy Directive	2
Box 1.2. The Operations Evaluation Department Review of the 1991 Forest Strategy and its Implementation	3
Box 1.3. The Costa Rican Network of Private Reserves	14
Box 1.4. CODEFORSA: An Organization of Small- and Medium-Size Farmers	17
Box 1.5. Payment for Environmental Services	19
Box 5.1. Principal Goals of Structural Adjustment Programs I (1985), II (1989), and III (1993)	65

Tables

Table 1.1. Land Use and Land Use Changes in Costa Rica, 1979–92	5
Table 1.2. Forest Cover in Costa Rica, 1996–97	6
Table 1.3. Land Use Changes in Costa Rica, 1979–92	7
Table 1.4. Land Use Change by Region, 1979–92	8
Table 1.5. Land Use Change in Costa Rica by Region in Hectares, 1979–92	9
Table 1.6. Net Change in Forest Area, 1987–97	10
Table 1.7. Net Forest Area Change by Conservation Area	10
Table 1.8. Forest Cover by Conservation Area	14
Table 1.9. Forest Cover by Protected Area Categories	15
Table 1.10. Reforested Area in Costa Rica until 1998	15
Table 1.11. Variation in the Participation of Different Groups in Forest Policy Decisions	18
Table 1.12. Beneficiaries of Production and Environmental Services Compensated with PSAs	18
Table 3.1. The Evolution of Forest Legislation, 1969–98	36
Table 3.2. Effects of Forest Sector Laws 4465, 7032, 7174, and 7575	40
Table 3.3. Results of Incentives for the Forest Sector, 1979–97	42
Table 3.4. Investments in Incentives for the Forest Sector, 1979–97	43
Table 4.1. Ranking of Environmental Services of Different Land Uses	50
Table 4.2. Total Economic Values of Costa Rican Forests, 1993	51
Table 4.3. Rough Estimates of Environmental Values of Primary Forests	52

Table 4.4. Findings of the CCT Study on the Value of Environmental Services: Recommended Compesatory Payments in US\$/year/ha	53
Table 4.5. Payments and Payment Distribution for Environmental Services	53
Table 4.6. Known Species in Costa Rica	56
Table 5.1. Operations of the World Bank in Costa Rica 1957–99	64
Table 5.2. Summary of Policies for Livestock Development and its Impact on Natural Forest, 1954–94	68
Table 5.3. World Bank Credits Impacting the Environment and Rural Areas	69
Table 5.4. Annual Payments per Hectare	76
Table 5.5. Results of the Sale of Wood Futures by the FUNDECOR/IFC Project	76
Table 5.6. Summary Evaluation of the Implementation of the 1991 Forest Strategy in Costa Rica	79

Figures

Figure 1.1. Deforestation in Costa Rica by Maximum Land Use Potential, 1966–89	4
Figure 1.2. Change in Area, 1979–92 (ha)	5
Figure 1.3. Forest Land in Costa Rica	12
Figure 1.4. Evolution of the Protected Areas in Costa Rica	13
A. Costa Rica Protected Areas by Management Category, 1998	
B. Evolution of the Protected Area System in Costa Rica	
Figure 1.5. Evolution of Livestock and Forest Exports	21
Figure 1.6. Percentage Participation in Agricultural GDP (average, 7 years)	22
Figure 1.7. Potential Wood Production and Carbon Sequestration per Year of Costa Rican Forests	23
Figure 1.8. Protected Areas and Tourism in Costa Rica, 1990–97	24



Foreword

This case study is one of six evaluations of the implementation of the World Bank's 1991 Forest Strategy. This and the other cases (Brazil, Cameroon, China, India, and Indonesia) complement a review of the entire set of lending and nonlending activities of the World Bank Group (IBRD, IDA, IFC, and MIGA) and the Global Environment Facility (GEF) that are pertinent to the Bank Group's implementation of the forest strategy. Together these constitute inputs into a World Bank Operations Evaluation Department (OED) synthesis report entitled *The World Bank's 1991 Forest Strategy and Its Implementation*. This forest strategy evaluation was carried out under the overall direction of Uma Lele.

The purpose of each of the six country studies has been to understand the implementation of the 1991 Forest Strategy in Bank operations and to obtain the views of the various stakeholders in the country about the involvement of the Bank. In doing so, the study team has not only examined the Bank's forest program but also endeavored to place the Bank's activities in the broader context of what the country and other donors have been doing in the forest sector. Therefore, each country study examined the overall development of the country's forest sector. While this naturally includes environmental impacts on forests, such as degradation, biodiversity loss, and deforestation, it also encompasses the economic uses of forests, including the management of forest resources for production, the role of forest development in poverty alleviation, and the impacts of forest research and development.

The evaluation of the Bank's performance in these studies, as always in OED studies, seeks to judge whether the Bank has "done the right things" and "done things right." Here, OED also seeks to judge whether the Bank has lived up to the commitments made in its 1991 Forest Strategy. The case studies do this by examining how the Bank, using the various lending and nonlending instruments at its command, has interacted with the sector's development processes, with other donors, and with the broader government objectives of economic growth, poverty alleviation, and environmental sustainability. Thus, the studies focus on policy in the post-1991 period, but they also recognize that the Bank does not operate in isolation from its historical interactions with a country and its needs. These interactions include the Country Assistance Strategies or their predecessors, Economic and Sector Work, as well as all investments in all sectors and all policy dialogue that is pertinent to the Bank's actions and their outcomes in the forest sector. Together, these activities constitute the Bank's implementation of its forest strategy in a country.

The important questions these country studies address are as follows:

- How have the forces of development effected change in the country's forest sector?
- Did the Bank's 1991 Forest Strategy make a difference to its forest strategy in the country, or was this strategy largely a result of the Bank's historical relationship with the country, the needs articulated by the government, or a combination of both?
- Regardless of how the Bank's forest sector strategy evolved, how consistent was it with the Bank's 1991 Forest Strategy?
- How consistent was the country's own forest policy/strategy with the Bank's 1991 Forest Strategy?
- Was the Bank's overall and forest sector strategy in the country relevant to the country's needs in the forest sector, as identified by the country?
- Were the Bank's overall and forest sector activities effective from the viewpoint of the intentions of its 1991 Forest Strategy?
- Were the Bank's activities efficient?
- Did the Bank's activities achieve policy and institutional development pertinent to forest sector management?
- Are the Bank's impacts likely to be sustainable?

- What impact has the Bank's overall and forest sector strategy for the country had on forest cover and quality, poverty alleviation, and other key issues? What are the prospects for future Bank-country interactions in the forest sector, and for outcomes in the sector?

Gregory Ingram
Director
Operations Evaluation Department
The World Bank

Director-General, Operations Evaluation Department: *Mr. Robert Picciotto*
Director, Operations Evaluation Department: *Mr. Gregory Ingram*
Task Manager: *Ms. Uma Lele*



Acknowledgments

The OED Review of *The World Bank's 1991 Forest Strategy and Its Implementation*, of which this study is a part, was conducted under the direction of Uma Lele. The study was prepared by Ronnie de Camino with contributions from Olman Segura, Luis Guillermo Arias, and Isaac Pérez. World Bank data base for the evaluation was developed by Syed Arif Husain, a member of the OED Forest Strategy Evaluation Team. William Hurlbut provided editorial support. The report has benefited from comments on earlier drafts by Robert Picciotto, Gregory Ingram, Wendy Jarvie, Osvaldo Feinstein, and Luis Ramirez of OED. The study team is also grateful for review and comments received from staff in other units of the World Bank: Jean Louis Blanchez, Mark Cackler, Ken Chomitz, Luis Constantino, Robert Kirmse, Nalin Kishor, Thomas Lovejoy, Dennis Mahar, John Redwood, and Thomas B. Wiens. The team is especially grateful to James Smyle, Martin Raine, and John Kellenberg of the Regional Unit for Technical Assistance in Costa Rica. Special thanks as well to Alvaro Umana (INCAE), a former member of the inspection panel, for his comments on the country case study.

This review has benefited from field visits by country authors and Bank staff and comments and discussions with a wide range of in-country stakeholders including NGOs, government officials and individuals in the private sector. The study was also discussed at OED's Forest Strategy Review Workshop on the Preliminary Review of *The World Bank's 1991 Forest Strategy and Its Implementation* Report, held in Washington, D.C., on January 27th and 28th, 2000. In addition, com-

ments were received from a web-based consultation on the OED forest strategy review. The study team extends its sincere thanks to Amos Bien of the Asociación Red Costarricense de Reservas Naturales; Jose Luis Salas Zuniga; and Keith Openshaw. All stakeholders that sent comments recognize the important contribution that the World Bank has made to the national forest sector policy process in Costa Rica, although the Bank has not lent in the sector until year 2000. Stakeholders also stress the importance of the Bank and other countries learning from the Costa Rican experience. Commentators also stress the key role of forest associations and NGOs in bringing about a change in the forest sector in Costa Rica. Comments from the private sector stress the need to recognize ecotourism as a major economic force in forest conservation in the economy, as well as its socioeconomic importance for forest-based communities. Detailed comments received from the stakeholders are attached as Annex E.

The report was produced as part of the OEDPK publication series by a team under the direction of Elizabeth Campbell-Pagé (Task Manager). Caroline McEuen (editor), Kathy Strauss and Aichin Lim Jones (graphics and layout), Diana Qualls (editorial assistant), and Juicy Qureishi-Huq (administrative assistant) comprise the publishing team.



Acronyms

AGDP	Agricultural gross domestic product
ASCONA	Costa Rican Nature Conservation Association (<i>Asociación Costarricense para la Conservación de la Naturaleza</i>)
CACM	Central American Common Market
CAF	Certificate of Forestry Payment
CAFA	Certificate of Forestry Payment in Advance
CAFMA	Certificate of Payment for Natural Forest Management (<i>Certificado de Abono Forestal para Manejo</i>)
CANAIMA	National Chamber of Timber Industries (<i>Cámara Nacional de Industriales de la Madera</i>)
CAT	Tax Credit Certificate (<i>Certificado de Abono Tributario</i>)
CATIE	Agronomical Tropical Center for Research and Education
CBD	Convention on Biodiversity Development
CCB	Forest Conservation Certificate
CCF	Costa Rican Chamber of Forestry (<i>Cámara Costarricense Forestal</i>)
CCT	Center for Tropical Science, University of Costa Rica (<i>Centro Científico Tropical</i>)

CENPRO	Center for the Promotion of Exports and Investments (<i>Centro para la Promocion de las Exportaciones y de las Inversiones</i>)
CET	Common external tariff
CFN	National Forestry Council (<i>Consejo Forestal Nacional</i>)
CIEDES	Center for Sustainable Development Studies (<i>Centro de Estudios para el Desarrollo Sostenible</i>)
CINDE	Costa Rican Coalition for Development Initiatives
CNP	National Production Council
CNPR	Costa Rican Network of Private Reserves
CODEFORSA	Commission for Forestry Development in San Carlos
CPB	Certificates of Forest Protection (<i>Certificado de Protección de Bosques</i>)
CST	Certificate for Sustainable Tourism
CTO	Carbon Tradable Offset Certificate
DFID	Department for International Development (U.K.)
ECODES	National Strategy for Conservation through Sustainable Development (<i>Estrategia Nacional de Conservación para el Desarrollo</i>)
FCCC	Framework Convention on Climate Change
FONAFIFO	National Forest Fund
FSC	Forest Stewardship Council
FUNDECOR	Foundation for the Protection of the Central Volcanic Mountain Chain (<i>Fundación de Cordillera Volcánica Central</i>)
GDP	Gross domestic product
GEF	Global Environment Facility
GTZ	German Agency for Technial Cooperation (<i>Deutsche Gesellschaft fuer Technische Zusammenarbeit</i>)
ICE	Costa Rican Institute of Electricity
ICT	Costa Rican Institute for Tourism (<i>Instituto Costarricense de Turismo</i>)
IDB	Inter-American Development Bank
IFC	International Financial Corporation (World Bank)
IMF	International Monetary Fund

IMN	National Meteorological Institute (<i>Instituto Metereológico Nacional</i>)
INA	National Training Institute (<i>Instituto Nacional de Aprendizaje</i>)
INBio	National Institute on Biodiversity (<i>Instituto Nacional de Biodiversidad</i>)
INBITTA	Total Biodiversity Inventory Project
INCAE	Central American Business Administration Institute (<i>Instituto Centroamericano de Administración de Empresas</i>)
ISO	International Standards Organization
ITCO	Institute of Lands and Colonization
ITTO	International Tropical Timber Organization
IUCN	International Union for the Conservation of Nature
JI	Joint implementation
JUNAFORCA	Small Farmers' National Forestry Board (<i>Junta Nacional Forestal Campesina</i>)
MINAE	Ministry of Environment and Energy
MINEX	Ministry of Exports
MIRENEM	Ministry of Natural Resources, Energy, and Mines
NAFTA	North American Free Trade Agreement
NPV	Net present value
OCIC	Costa Rican Office for Joint Implementation
ODA	(former) Overseas Development Agency (U.K.)
ONF	National Forestry Office (<i>Oficina Nacional Forestal</i>)
PAP	Protected Areas Project
PFP	Private Forestry Project
PROCOMER	Ministry of External Trade (<i>Promotora de Comercio Exterior</i>)
PSAs	Payment for Environmental Services (<i>Pago de Servicios Ambientales</i>)
SAP	Structural Adjustment Program
SGS	<i>Société Generale de Surveillance</i>
SETENA	National Environmental Technical Secretary
SINAC	National System of Conservation Areas (<i>Sistema Nacional de Areas Protegidas</i>)

TSC	Center for Tropical Studies, University of Costa Rica
UNCED	United Nations Council on Environment and Development
UNEP	United Nations Environment Program
USAID	U.S. Agency for International Development
US\$M	U.S. dollar millions
WRI	World Resources Institute



Summary

Costa Rica was once one of the most deforested countries in the world. Today it is a pioneer in reforestation, forest management, and forest protection policies. This Operations Evaluation Department report describes the evolution of Costa Rican forest policies since the 1950s, and focuses on internal and external influences, particularly those of the World Bank.

The main change in Costa Rican land use since 1950 has been the transformation of forests into pastures and farmland. The predominant vision of development and economic growth was linked with agro-export production, which supported the expansion of agriculture and cattle ranching. In the 1980s, however, Structural Adjustment Programs (SAPs) introduced by the World Bank reduced the profitability of agriculture and cattle ranching in marginal forest lands. SAPs, along with Costa Rican policies that created special conservation areas and promoted reforestation and forest management, have significantly reduced rates of deforestation.

This evolution of Costa Rica's forest policies would have been impossible without a strong system of governmental and nongovernmental organizations capable of adapting to new situations. The forest sector in Costa Rica has evolved from an inactive sector without private organizations, technology, or specialized education, to a proactive sector with multiple organizations that lobby effectively for forest sector measures. The Costa Rican government contributed to the evolution of

several private forest sector associations. Many new public sector agencies were developed to handle forest issues, often in creative ways. Contrary to the command-and-control structure that typifies many government agencies, the government now works to facilitate private sector participation in and responsibility for forest management.

Costa Rica may not yet have a completely integrated forest sector model, but it does provide a framework that may inspire other countries to innovate. However, all countries must consider their own conditions when adopting new policies and implement reforms at their own pace.

Influence of the World Bank

The World Bank has influenced Costa Rican forest policies, although this influence has primarily been in conceptual and methodological areas and in the provision of seed money. The SAPs, which supported policy changes in agriculture, and the Bank's 1993 Forest Sector Review of Costa Rica probably have had the greatest impact.

The 1993 review introduced many ideas that have influenced Costa Rican policy or that the Costa Rican government is now considering: (1) The review calculated that about 66 percent of the benefits of Costa Rica's forests are enjoyed globally, and stated that the global community should compensate Costa Rica for conserving, managing, and planting forests; (2) It calculated the total value of Costa Rica's forests and an average dollar value per hectare; (3) It suggested improving the financial management of national parks as a means of protecting biodiversity; (4) It recommended deregulating harvesting in forest plantations and the import and export of forest products; (5) It argued that subsidies for natural forest management are justified; (6) It suggested reorienting incentives to protect environmental values; and (7) It called attention to issues such as ensuring that natural forest management is compatible with conservation objectives, establishing criteria for forest protection, and allocating institutional responsibilities in the Conservation Areas.

The Bank has taken almost no significant action until now to provide funding for forest activities, largely because it has been divided about which strategies to adopt in relation to the Biodiversity and Climate Change Conventions. The Bank supported a small loan to Costa Rica for the sale of wood futures, which improves the cash flow of small landowners for planting new tree species and managing natural forests. The Global Environment Facility (GEF) and the Bank together funded the Biodiversity Resources Development Project to demonstrate

that increased knowledge and information about particular species enhance their value and the marketability of biodiversity services. The Bank also funded the Ecomarkets project to develop the market for environmental services and consolidate the Payment for Environmental Services model that Costa Rica has implemented since 1997. The Bank lending program has also been limited by a shortage of counterpart funds for externally supported projects.

Costa Rica's Influence

Costa Rica is one of the few countries in Latin America to promote reforestation through incentives such as tax credits, direct payments, and subsidized loans that have benefited landowners, large and small. Among the important steps Costa Rica has taken are the following:

- The Natural Resources Administration has merged the administration of forest and protected area activities into one unified organization.
- It has successfully developed a National System of Protected Areas that has a minimum of infrastructure and an institutional presence in each region of the country.
- The National Forest Fund was established to handle financial issues for forests and natural resources.
- Important legislation has been passed to protect the nation's forests, including the Environment Law, the Biodiversity Law, and the Forest Law.
- The "polluters pay" principle was introduced through the establishment of a tax on fossil fuels to pay for environmental services.
- Many efforts have been made to protect biodiversity and generate income from it.
- The Costa Rican Office of Joint Implementation was established to trade carbon emissions in the international market and Carbon Tradable Offset Certificates were developed that could serve as a model for trading other environmental services.
- The government instituted a national system to certify good forest management practices.
- Costa Rican forest owners have strong organizations that give them technical support for reforestation, forest management, and forest conservation. In recognition of this, Costa Rica has delegated much responsibility for forest management and conservation to private landowners.

Costa Rican forest policy is a mix of international policies and strong national ideas. This mix has not resulted in a perfect forest model, but certainly in one that deserves support. To ensure such support, it is important to create more opportunities for mutual understanding and learning between Costa Rica and the World Bank.

PART I: THE FORESTS AND FOREST SECTOR IN COSTA RICA



1

Deforestation, Reforestation, and Natural Forests

This case study is one of six such in-depth supporting studies for an Operations Evaluation Department (OED) review of the implementation of the World Bank's 1991 Forest Strategy (box 1.1). Costa Rica was chosen for analysis because it once was one of the most deforested countries in the world. Today it is a pioneer in policies to support forest use and forest services. This report describes the evolution of Costa Rican forest policies since the 1950s, focusing on internal and external influences, particularly the World Bank (box 1.2).

Deforestation Since the 1950s

In most of Latin America, land use change is highly sensitive to both internal and external policies concerning forests. This is especially true in Costa Rica, where land use change has reflected forest policies for the past 40 years. However, this situation may be changing. The country's land use changes may no longer be a reliable gauge of policy impacts even though the country's deforestation and reforestation rates are still far from stable.

Costa Rica had one of the highest deforestation rates in the world in the 1980s. Estimates range from deforestation of 3.6 percent of the land in 1986 (Leonard) to between 4 percent and 7.6 percent in 1990 (WRI). Studies during the 1970s and 1980s showed forest fragmentation and a deforestation rate of 30,000 hectares (ha) to 50,000 ha per year. In the past five years, however, the deforestation rate has fallen

Box 1.1. Bank Forest Strategy: The 1991 Forest Paper and the 1993 Operational Policy Directive

The 99-page World Bank publication *The Forest Sector: A World Bank Policy Paper* was published in September 1991. This paper (henceforth referred to as the 1991 forest paper) represented the initial comprehensive statement of a new direction for the Bank's forest strategy. A two-page Operational Policy directive (OP 4.36, produced in 1993) reflected the policy content of the paper, and a Good Practices summary (GP 4.36) provided operational direction to Bank staff. The 1991 forest paper, the OP, and the GP are together the subject of OED's evaluation.

In today's Bank terminology, the 1991 forest paper sets out a Bank strategy and the OP defines the policy. The 1991 forest paper gave guidance on policy directions, programmatic emphases, and good practice, and it specified principles and conditions for Bank involvement in the forest sectors of its client countries. It was the first instance of significant outside stakeholder participation in the formulation of a Bank sector strategy, and it is this document which the public considers the embodiment of the new direction for the Bank's forest strategy. Both the Bank's Board and civil society were referring to this document, as well as OP 4.36, when they asked OED for an independent evaluation of the Bank's forest policy. Although the Foreword for the 1991 forest paper was signed by then Bank President Barber Conable, the Board was not asked to, nor did it, comprehensively approve the 1991 forest paper. However, it did discuss the paper and endorse specific aspects of it.

The Board-endorsed principles contained in the 1991 forest paper included the ban on financing commercial logging in primary tropical forests; incorporation of forest sector issues into the general policy dialogue and country assistance strategy; and promotion of international cooperation, policy and institutional reform, resource expansion, and forest preservation. The endorsed principles also included the statement that "in tropical moist forests the Bank will adopt, and will encourage governments to adopt, a precautionary [sic] policy toward utilization. . . . Specifically, the Bank Group will not under any circumstance finance commercial logging in primary tropical moist forests. Financing of infrastructural projects . . . that may lead to loss of tropical moist forests will be subject to rigorous environmental assessment as mandated by the Bank for projects that raise diverse and significant environmental and resettlement issues. A careful assessment of the social issues involved will also be required" (p. 19). The Board also approved a specific section on conditions for Bank involvement.

Both the 1991 forest paper and the OP emphasize that the Bank will not finance commercial logging in primary tropical moist forests, and in addition, the 1993 OP adds that the Bank "does not . . . finance the purchase of logging equipment for use in primary tropical moist forests" (para. 1a). The OP also states that "in areas where retaining the natural forest cover and the associated soil, water, biodiversity, and carbon sequestration values is the object, the Bank may finance controlled sustained-yield forest management" (para. 1f). The 1991 paper, however, had stressed a lack of agreement on what constitutes sustainable forest management and offered three different definitions of it. However, all definitions of sustainable forest management typically include management of forests for *multiple uses* as distinct from timber production alone, to which logging normally refers. Although this provision in the OP to finance forest management under controlled sustained-yield conditions allows forest management under specific conditions (and the drafters of the OP thought this introduced some flexibility for the Bank), a survey indicates that the staff have not considered the OP to be flexible on this point. The Bank will need a clearer policy if its future lending and non-lending activities are to address issues of improved forest management relative to current logging practices in many countries, which this report argues often tend to be environmentally destructive and socially inequitable. What constitutes "sustainable" forest management will, in all likelihood, remain unresolved and specific to each location.

Based on the larger policy statement, the OP also states that "the Bank distinguishes investment projects that are exclusively environmentally protective . . . or supportive of small farmers . . . from all other forestry operations." It goes on to say that projects in the latter category "may be pursued only where broad sectoral reforms are in hand, or where remaining forest cover in the client country is so limited that preserving it in its entirety is the agreed course of action" (para. 1c). The main report for this study finds that the Bank could more usefully and proactively work with stakeholders sympathetic to reforms in borrowing countries in ensuring that reforms are in hand, rather than wait for them to occur before getting engaged in the forest sector.

Box 1.2. The Operations Evaluation Department Review of the 1991 Forest Strategy and Its Implementation

OED's review of the Bank's 1991 Forest Strategy¹ has been undertaken to assess Bank experience in the forest sector—particularly since 1991—to gauge its policy intentions, implementation, and impacts. The review also examines whether the Bank's strategy remains relevant and can embrace a strategy attuned to the current realities of the forest sector. In addition to briefing the Bank's Board of Executive Directors, the review will be used as an input to an ongoing Bank-wide review of its forest sector activities being lead by the Bank's Environmentally and Socially Sustainable Development Network (ESSD).

Costa Rica is important because despite, or perhaps because of, its small size and even smaller forest cover (only 1.2 million hectares) it has been at the forefront in developing innovative approaches to conservation. The Bank has financed no forest projects or forest component projects in Costa Rica. Agricultural lending has also been minimal, with only one project worth US\$41 million. Although the Bank's financial presence in this sector has been minimal, it has been analytically very active, perhaps with considerable early involvement in the design of "green" strategies.

Several questions stand out:

- What explains Costa Rica's innovative approach? What is it about its leadership and stakeholders has made such innovation possible?
- How sustainable are these approaches financially and institutionally?
- What role has the Bank played?

All of the case studies in this review consist of two parts—the first focusing on the extent and causes of changes in the forest sector, and the second on how the entire set of Bank instruments has interacted with the processes of the changing forest cover, and with what impact.

To the extent possible, the performance of the Bank has been assessed based on outcomes and impacts. Six classes of outcome are considered:

- Improvement in country policies and strategies with direct and indirect impacts on forests
- Institutional development including improvement of the legal framework, a redistribution of roles between the public and private sectors, and participatory approaches to decisionmaking
- Improvements in technologies
- Capacity building and human capital formation
- Improvement in the incentive structure
- Improved information, monitoring, and evaluation systems.

1. The strategy is summarized in Annex B.

dramatically. This paper attempts to explain the changes that have occurred, although there are difficulties comparing land use changes over different periods because of differences in land use studies.

Only three studies used aerial photographs or satellite images to compare Costa Rican land use over time. The University of Costa Rica's Center for Tropical Studies/World Resources Institute calculated deforestation rates between 1966 and 1989, focusing on the depreciation of

Costa Rican natural resources and national accounts.¹ The National Meteorological Institute/Ministry of Environment and Energy/United Nations Environment Programme study (IMN/MINAE/UNEP 1996) compared photographs and images from 1972 and 1992.² The TSC/Center for Sustainable Development Studies/National Forest Financing Fund study (TSC/CIEDES/FONAFIFO 1998) compared satellite images from 1986–87 to pictures from 1996–97.³

The TSC/WRI study was one of the first to consider how natural resource use affects national accounts. The authors concluded that Costa Rica’s deforestation rate was about 46,500 ha/year from 1950 to 1962, 48,800 ha/year from 1963 to 1973, and 31,830 ha/year from 1974 to 1989 (figure 1.1 shows total deforestation from 1966 to 1989). Forest cover diminished from 55 percent in 1970 to 42 percent in 1989. It is impossible to be more precise in these assumptions because of differences in the studies’ results. For example, Sylvander (1977) estimates a 40.9 percent forest cover in 1970, rather than the 55 percent forest cover cited in the TSC/WRI study. One reason for this difference may be that the TSC/WRI study considered secondary forests and other studies did not.

The IMN/MINAE/UNEP study concluded that the deforestation rate of natural forests reached 23,000 ha/year from 1979 to 1992 (table 1.1 and figure 1.2). There was a notable decrease in deforestation between

Figure 1.1. Deforestation in Costa Rica by Maximum Land Use Potential, 1966–89

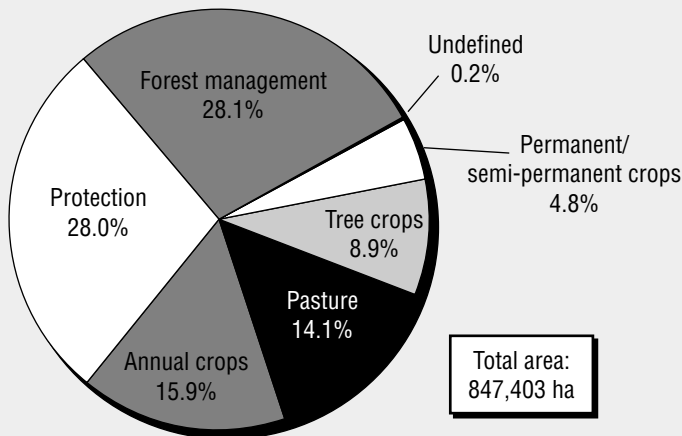


Table 1.1. Land Use and Land Use Changes in Costa Rica, 1979–92

Land use category	Area in 1979 (ha)	Area in 1992 (ha)	Area of change (ha)
Natural forests	2,086,208	1,294,896	-791,312
Pastures	827,861	1,543,115	715,254
Fallow areas	288,103	228,663	-59,440
Burnt areas	--	9,826	9,826
Swamps and humid areas	118,779	102,833	-15,946
Infrastructure	14,929	22,458	7,529
Waters	29,530	49,547	20,017
Harvested natural forests	365,003	481,320	116,317
Secondary forests	876,319	704,467	-171,852
Mangroves	64,542	51,361	-13,091
Mixed uses	89,925	116,612	26,687
Seasonal crops	93,128	131,000	37,872
Permanent crops	254,185	369,184	114,999
Total	5,108,420	5,105,283	-3,140

Source: IMN/MINAE/UNEP 1996.

1974–79 and 1979–92. However, the study’s deforestation calculations did not include a 171,852 ha decrease in the area of secondary forests.

Due to the varying results of these studies, MINAE and FONAFIFO decided in 1997 to document changes in forest cover and deforestation rates. TSC and CIEDES conducted this study, entitled “Survey of Forest Cover in

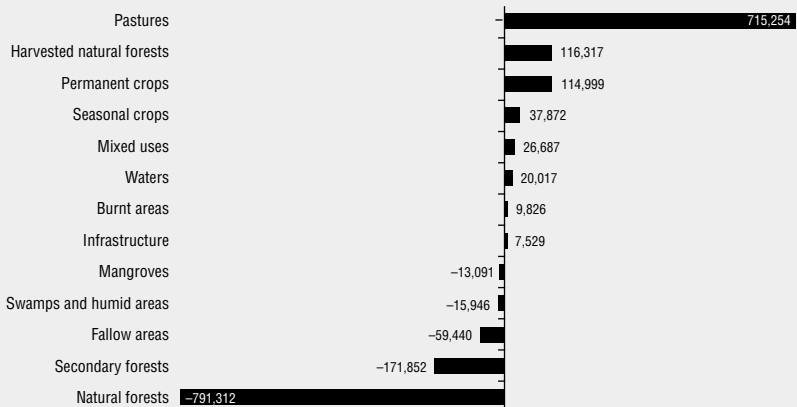
Figure 1.2. Change in Area, 1979–92 (ha)

Table 1.2. Forest Cover in Costa Rica, 1996–97

Cover type	Area (ha)	Percent of total area
Natural nondeciduous forests	1,885,782	36.92
Deciduous forests	126,884	2.48
Mangroves	40,848	0.80
Highlands	9,973	0.20
Total	2,063,487	40.40

Source: TSC/CIEDES/FONAFIFO 1998.

Costa Rica, 1986/87–1996/97.” The study attempted to determine the extent and distribution of forest cover and identify changes that occurred between 1987 and 1997 by evaluating deforestation, natural regeneration, and reforestation. Using NASA’s Pathfinder methodology

for tropical deforestation, the study proposed four categories of forests: primary forests, intervening forests, secondary forests, and forest plantations whose density and crown cover could be determined by the method.⁴ The TSC/CIEDES researchers concluded that the deforestation rate reached about 16,500 ha/year between 1986/87 and 1996/97. They also concluded that forests covered 40.5 percent of the land in 1996/97 (table 1.2).

Based on these three studies, we assume the following:

- The deforestation rate between 1979 and 1989 was less than 31,000 ha/year.
- The deforestation rate after 1986 was less than 23,000 ha/year.
- Costa Rica’s deforestation rate decreased from about 46,500 ha/year in 1950 to approximately 16,000 ha/year in 1997.
- Due to the TSC/WRI study, the importance of secondary forests is being recognized for the first time. Secondary forests comprise between 390,000 ha (TSC) and 700,000 ha (IMN).
- Secondary forests grew at a rate of 13,000 ha/year from 1986–87 to 1996–97. But from 1978 to 1992, deforestation also occurred in secondary forests at a rate of 12,000 ha/year.
- Reforestation was encouraged through government incentives and reached a total of about 140,000 ha between 1979 and 1997.
- Before 1986, there was a net loss in annual forest cover. After 1986, the yearly increase in forest cover was about 20,000 ha/year and the deforestation rate was 16,000 ha/year; therefore, the net gain in forest cover has been approximately 4,000 ha/year.
- Since the reforestation rate in the past decade was greater than the rate when reforestation incentives were first instituted in 1979 (around 10,000 ha/year), the net gain in forest cover in the past 20 years has been about 7,000 ha/year.

The Nature of Land Use Changes

The main changes in Costa Rican land use since 1950 have been in the transformation of forests to pastures and farmland. In the past decade, official information about these changes has been highly controversial. In the late 1980s, the Ministry of Natural Resources, Energy and Mines (MIRENEM) declared that the deforestation rate had fallen to 22,000 ha/year. In 1993, the same ministry announced that the rate was only 4,000 ha/year.

According to the TSC/WRI study, total deforestation between 1966 and 1989 was 847,403 ha, or 36,800 ha/year (table 1.1). As the study documents, only 291,703 ha of the total were converted from forests to farmland or to pastures with suitable soil. When land use is changed to soil suited to the new use, this could be called “appropriate” or “convenient” deforestation.

The IMN/MINAE/UNEP study details the nature of these changes between 1979 and 1992 (table 1.3). Of the 1,064,327 ha that changed use (20.8 percent of the country’s land area), 322,515 ha (6.3 percent) were transformed from natural forests. Annually, 23,000 ha of natural forests were converted to pastures.

The conversion of secondary forests (458,225 ha, or 9 percent of the land area) to other uses has been the greatest change by far, although this was not considered deforestation, as the land had been used for pastures or crops. Total deforestation of natural and secondary forests from 1979 to 1992 was 780,740 ha, or 15.29 percent of the total area. This figure corresponds to a deforestation rate of 1.18 percent per year.

Regional differences are illustrated in table 1.4 and table 1.5. Liberia, San

Table 1.3. Land Use Changes in Costa Rica, 1979–92

From	To	Area change (ha)	Percent of area change
Natural forests	Pastures	322,515	6.3
Secondary forest	Pastures	401,828	7.9
Secondary forests	Seasonal crops	13,324	0.3
Secondary forests	Permanent crops	43,073	0.8
Permanent crops	Pastures	30,516	0.6
Permanent crops	Secondary forests	14,158	0.3
Seasonal crops	Pastures	22,892	0.4
Pastures	Permanent crops	61,696	1.2
Pastures	Seasonal crops	33,420	0.7
Pastures	Secondary forests	105,490	2.1
Seasonal crops	Secondary forests	12,415	0.2
No change		4,041,989	79.2
Total		5,103,316	100.0

Source: IMN/MINAE/UNEP 1996.

Table 1.4. Land Use Change by Region, 1979–92

Land use	San Carlos		Barra	Nicoya	San José		Limón	Quepos	Talamanca	Golfo
	Liberia	San Carlos			José	José				
Natural forests	-31,852	290,518	-11,781	-48,763	-44,709	-128,300	-52,911	-114,736	-67,741	
Pastures	124,207	167,674	1,830	42,849	56,831	58,368	74,476	169,352	19,668	
Fallow areas	7,858	-18,315	-138	12,305	-26,007	-6,802	-14,996	7,524	-20,868	
Burnt areas	2,092	--	--	7,734	--	--	--	--	--	
Swamps and humid areas	-1,502	-9,343	1,524	-1,592	--	-2,143	--	-868	-2,021	
Infrastructure	497	--	--	559	6,016	65	1	128	266	
Waters	-6,600	-1,061	--	--	-442	26,469	--	--	-144	
Harvested natural forests	-13,065	100,476	2,722	-17,384	-58,478	17,533	15,425	25,083	43,995	
Secondary forests	-92,533	30,528	5,364	-48,212	24,453	-17,435	-23,398	-78,693	28,073	
Mangroves	--	--	--	-232	-1,620	--	-7,222	-1,604	-2,412	
Mixed uses	4,979	4,032	--	-598	34,301	585	-1,272	-14,196	-1,144	
Seasonal crops	1,137	444	76	11,330	4,001	17,862	4,291	473	-1,742	
Permanent crops	2,993	13,896	760	41,471	5,800	33,422	4,923	8,825	2,909	

Source: IMN/MINAE/UNEP 1996.

Table 1.5. Land Use Change in Costa Rica by Region in Hectares, 1979-92

From	To	Liberia	San Carlos	Barra	Nicoya	San José	Limón	Quepos	Talamanca	Golfo
Natural forests	Pasture	31,572	85,861	1,793	13,632	30,525	40,899	44,044	56,198	8,991
Secondary forests	Pasture	88,140	65,151	685	70,263	42,820	17,992	14,540	93,910	8,328
Secondary forests	Seasonal crops	2,756	197	98	2,547	1,285	2,898	453	2,676	412
Secondary forests	Permanent crops	5,712	1,846	0	9,117	6,786	13,905	829	2,481	2,396
Permanent crops	Pastures	3,225	0	0	5,803	6,696	10,343	1,548	2,130	770
Permanent crops	Secondary forests	282	0	0	1,146	7,911	2,353	0	741	1,725
Seasonal crops	Pastures	3,640	0	0	6,601	1,320	1,555	3,350	3,385	3,041
Pastures	Permanent crops	1,222	1,748	0	29,865	14,062	11,739	2,217	630	393
Pastures	Seasonal crops	1,939	0	0	14,428	7,091	6,101	1,456	408	1,998
Pastures	Secondary forests	20,913	7,064	0	26,220	34,752	2,868	2,043	6,609	5,023
Seasonal crops	Secondary forests	136	0	0	776	8,289	208	817	91	2,097
No change		368,488	446,818	77,111	450,400	987,108	492,123	205,052	695,777	319,113
Total		528,025	608,685	79,867	630,617	1,148,646	611,984	276,349	865,036	354,288
Percent of change		30.2	26.6	3.2	28.6	14.1	19.6	25.8	19.6	9.9

Source: IMN/MINAE/UNEP 1996.

Table 1.6. Net Change in Forest Area, 1987–97

Parameters	Area (ha)	Percent of total area
Total area covered by the study	1,608,459	31.49
Deforestation	164,245	3.22
Recovery	126,873	2.48
Net loss	37,372	0.74

Source: Survey of Forest Cover in Costa Rica. TSC-CIEDES 1998.

Carlos, Nicoya, and Quepos experienced a change in the use of 25 percent to 30 percent of their land from 1979 to 1992. Barra and Golfito have only experienced a change in the use of 3 percent to 10 percent of their land in the same period.

Liberia and Nicoya, both in the Guanacaste Conservation Area, have lost areas of natural forests, and harvested natural and secondary forests.

The last TSC/CIEDES study (1998) discusses the most relevant aspects of the changes in forest cover from 1987 to 1997. Of the 1,608,459 ha of forest studied,⁵ 164,245 ha were deforested and converted to other uses, and 126,873 ha were secondary forests and forest plantations. These changes resulted in a deforestation rate of 16,400 ha/year and a net loss of 3,737 ha/year (table 1.6). Deforestation and recovery rates differed according to the Conservation Area (table 1.7).

The study concluded that the area suffered a net loss of 3,737 ha per year. However, this number does not reflect the country's total deforestation

rate. A 63,442-ha area of caducifolious forest was not included, and 32,500 ha that were reforested from 1995 to 1997 were not in the image comparison. The final balance reflects an annual deforestation rate of 16,400 ha/year, and an annual reforestation rate of 22,282 ha/year, with a net positive annual balance of 5,857 ha/year.

Costa Rica's forested areas are increasing annually, largely because of reforestation and the re-

Table 1.7. Net Forest Area Change by Conservation Area

Conservation area	Change in coverage		Percentage of change
	Recovery of area (ha)	Loss (ha)	
Guanacaste	9,000	3,571	+1.6
Arenal-Huetar Norte	18,726	29,946	-2.7
Tortuguero	10,449	24,249	-4.6
Arenal-Tilarán	6,508	8,946	-1.0
Tempisque	565	4,644	-0.5
Cord. Volc. Central	19,272	28,728	-1.7
Amistad Caribe	9,707	37,377	-3.9
Pacífico Central	32,883	8,593	+4.4
Amistad Pacífico	6,848	9,672	-0.5
Osa	12,733	8,656	+0.9
Total	126,873	164,245	-3.2

Source: Survey of Forest Cover in Costa Rica. TSC-CIEDES 1998.

generation of secondary forests in abandoned pastures. The quality of forest cover and the state of biodiversity (defined as the number of different species and their relative frequency) are more controversial. Deforestation continues, and the increased area of plantations and secondary forests has less environmental value than that of natural forests. Continued forest recovery depends on multiple factors, including the effectiveness of reforestation incentives, development of a clear definition of secondary forest policies, fewer incentives for agriculture, and the persistence of low prices for cattle and traditional crops.

However, the area of privately owned forests that are used for wood production has been greatly reduced. According to the National System of Conservation Areas (*Sistema Nacional de Areas Conservación*, SINAC), there were about 250,000 ha of privately owned production forests in 1997. Of this amount, only 50,000 ha were virgin forests. Wood production from natural forests has also decreased, especially during 1997–98, when several sawmills closed and many of the remaining mills were under-supplied. This situation forced sawmills that traditionally processed logs with large diameters to use logs with smaller diameters from plantations, secondary forests, and residual forests. As a result, the timber milling industry is pressing for large new investments from the National Financing System. However, this system, as well as international and bilateral financing institutions, are reluctant to lend funds to forest industries.

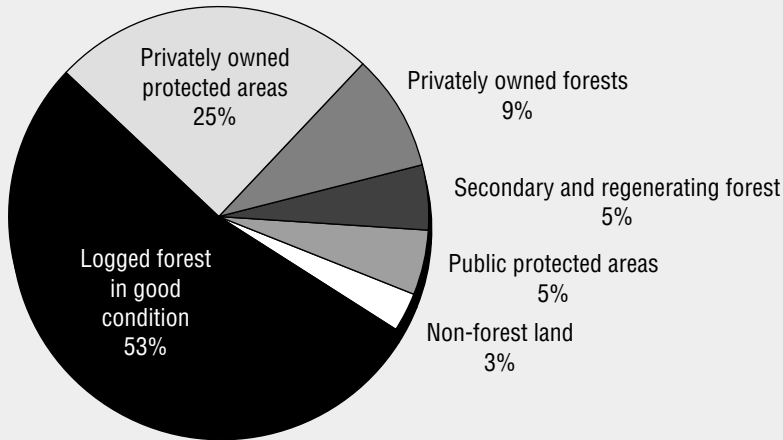
Protected Areas

According to the IMN/MINAE/UNEP study, about 49.6 percent of the country is forested (table 1.2). Watson et al. (1998) provides a lower estimate of 46.8 percent, shown in figure 1.1. This difference of 140,000 ha could be the reforested area. Protected areas encompass 30.1 percent of the land.

Figure 1.3 and figure 1.4 show the evolution of the protected areas system. We deduce from Figure 1.3 that 1,537,000 ha have varying levels of protection. There are 1,287,000 ha of public protected areas, 44,026 ha of private reserves belonging to the Costa Rican Network of Private Reserves (CNPR), discussed below, and 205,974 ha of other kinds of natural forests that may be protected through private ownership.⁶

Costa Rica's protected areas system has been an important factor in reversing deforestation and is a practical approach to protecting biodiversity. At first, the public system provided the only land protection; later, with private sector interest, the system became a mixture of public and private

Figure 1.3. Forest Land in Costa Rica



Sources: Solorzano et al. 1991.

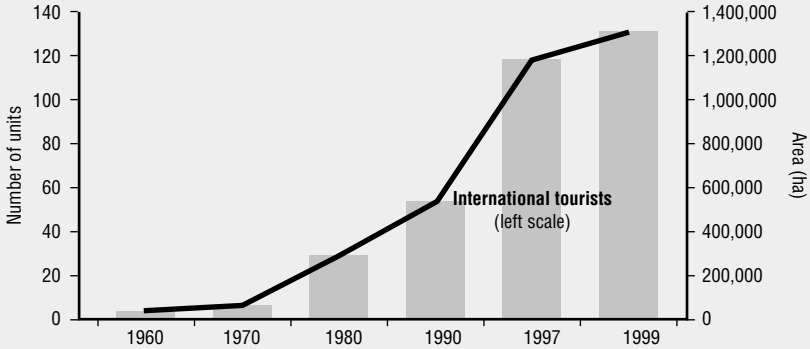
reserves. The protected areas system has grown from two public protected areas of about 2,500 ha in 1955 to more than 120 protected areas, totaling over 1.2 million ha in 1998⁷ and encompassing about 24.8 percent of the land (figure 1.4 shows the evolution of the protected areas system).

The first steps to develop the protected areas system were taken in the early 1900s. Poas Volcano entered the system in 1913, and the summits of all volcanoes were declared national parks in 1955. Passage of the 1969 Forestry Law provided a more solid foundation for establishing and managing protected areas. In the 1970s, the focus shifted from protecting areas of scenic, historic, and cultural value for recreation and national pride to protecting representative examples of biological resources and ecosystems for scientific reasons. Many more areas were added in the 1970s and again in the 1990s. By the late 1980s, about 7.9 percent of the country was protected. This figure grew to 16.8 percent by 1990, 23.8 percent by 1997, and 24.8 percent by 1999.

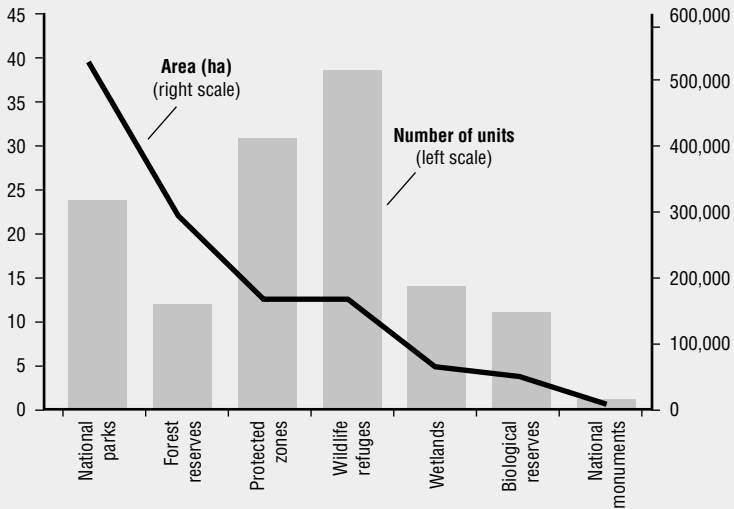
Private sector participation grew rapidly between 1980 and 1999, illustrated by the creation of Costa Rican Network of Private Reserves (CNPR) in 1996, with 44,026 ha of land (Alfaro 1998; see box 1.3). The total area that is protected is still small, but the initiative is growing. According to the network, it has a total land area equal to 5 percent of

Figure 1.4. Evolution of the Protected Areas in Costa Rica

A. Costa Rica Protected Areas by Management Category, 1998



B. Evolution of the Protected Area System in Costa Rica



the national territory, or approximately 250,000 ha (figure 1.3) between current and potential affiliates (up to 200,000 ha may be declared private reserves). Much of this area is used for ecotourism.

MINAE divided the country into 11 Conservation Areas (10 on the mainland and one on Coco Island), which administer all protected areas and production forests. The Conservation Areas of Amistad Caribe,

Box 1.3. The Costa Rican Network of Private Reserves

CNPR is a nongovernmental organization (NGO) whose mission is to defend the interests of private sector owners of natural forests. The organization's existence is a clear market signal since it implies a demand for forest conservation initiatives and increases the supply of protected sites.

The network has 74 members, who are concerned about deforestation and the use of secondary forests. Some wish to promote sustainable wood production in these areas; other members want to protect them. Members include other NGOs, education centers, environmentalists who own forests (some of whom are dedicated to ecotourism), and private owners of small and medium-sized properties. The network's goal is to preserve 250,000 ha of land. Toward that end, CNPR is trying to consolidate forest conservation incentives created by the government.

Source: Personal communication with Marín (CNPR) and Alfaro 1998.

Tortuguero, and Cordillera Volcánica Central showed the highest percentages of forest cover, Arenal-Huetar Norte and Pacífico Central the lowest (table 1.8). Distribution of forest cover is important in the conservation strategy of each area because of the relative value of each hectare.

Forest cover corresponds to 824,091 ha of protected area and 1,193,021 ha in private ownership. Most Costa Rican forest is on private property. The country's protected areas system comprises 126 units out of 411

protected areas in Central America (30.6 percent). Costa Rica is the only country that has legally declared all proposed units. table 1.9 shows the area under different categories of protection according to the classification of the International Union for the Conservation of Nature (IUCN).

Table 1.8. Forest Cover by Conservation Area

Conservation area	Total area (ha)	Forested area (ha)	% of forested area
Guanacaste	347,090	112,177	32.3
Arenal-Huetar Norte	659,398	163,371	24.8
Tortuguero	304,261	153,456	50.4
Arenal-Tilarán	248,201	96,645	38.9
Tempisque	742,227	281,045	37.9
Coord. Volc. Central	566,162	251,928	44.5
Amistad Caribe	722,846	451,187	62.4
Pacífico Central	547,588	160,992	29.4
Amistad Pacífico	528,162	175,209	33.2
Osa	420,819	165,971	39.4
Total	5,086,755	2,017,112	42.0

Source: Survey of Forest Cover in Costa Rica. TSC-CIEDES 1998.

Reforestation Incentives

Almost no reforestation occurred in Costa Rica before specific incentives were introduced that yielded re-

forestation of more than 147,000 ha (table 1.10). Agriculture and cattle farming received multiple incentives that fueled a trend toward land use for these purposes and away from forests. Forests, and especially forest plantations, benefited when incentives for agriculture and cattle ranching diminished and meat prices fell.

The first step toward reforestation was the deduction of reforestation costs from income taxes. This incentive, which lasted from 1979 to 1985, was directed mainly toward business and large landowners. Although the incentive did lead to increased knowledge about some tree species and reforestation techniques, it was highly inefficient because taxpayers

Table 1.9. Forest Cover by Protected Area Categories

Protected area by category	Forest area (ha)	Percent of total area
Wildlife refuges	88,865	1.7
National parks	363,654	7.2
Protected zones	117,832	2.3
Forest reserves	224,044	4.4
Humidity zones	7,330	0.3
Biologic reserves	22,256	0.4
Other	111	
Total	824,091	16.3

Source: Survey of Forest Cover in Costa Rica. TSC-CIEDES 1998.

Table 1.10 Reforested Area in Costa Rica Until 1998

Year	Without incentives (ha)	With incentives (ha)	With payment of environmental services ^a				
			Global	Individual	Own resources	Total	TOTAL
1979–89	1,592	36,312	0	0	0	0	37,904
1990	3,298	11,598	0	0	0	0	14,896
1991	5,428	11,297	0	0	0	0	16,725
1992	4,191	12,843	0	0	0	0	17,034
1993	3,555	12,690	0	0	0	0	16,245
1994	1,767	13,451	0	0	0	0	15,218
1995	2,494	10,575	0	0	0	0	13,069
1996	1,066	0	0	0	0	0	1,066
1997	900 ^b	0	2,868	2,272	0	5,140	6,040
1998	876 ^b	0	3,713	4,238	786	8,737	9,613
Total	25,167	108,766	6,581	6,510	786	13,877	147,810

a. Need a field verification for plantations in 1998.

b. Area estimated through personal interviews with H. Arce (Ston Forestal) and L. Sage (Consultora y reforestadora).

Source: Costa Rica 1996, MINAE 1996, FONAFIFO 1998, RNT 1998. Table prepared by Romero, J.C. 1999. *Mitigación de los Gases con Efecto Invernadero por Medio de la Actividad en Terrenos de Propiedad Privada en Costa Rica*. Consultoría FONAFIFO/OCIC.

who used the incentive tried to write off the costs of many items that seemed unjustified and because the cost per hectare was high. Only about 24 percent of the current planted area was reforested through tax deductions.

The second step in the reforestation effort was the creation of a direct incentive, the Certificate of Forestry Payment (CAF). The CAF was awarded to those farmers who reforested their properties, transferring the incentive from wealthier taxpayers to farmers. The government fixed a standard reforestation price per hectare. At first, the standard was high enough to allow people interested in planting trees to buy land and plant it. Because the amount of the CAF in local currency was maintained with only small variations over time, the amount in real terms diminished through inflation and currency devaluation. The CAF allowed reforestation of 26 percent of the area covered by plantations and was available to any farmer.

The Secretary of Finance and the forest sector authorities had difficulty negotiating the annual allocation of funds to reforestation and the value of the incentive per hectare. Many companies already had been planting trees without any incentive. Indeed, by 1998, private national and foreign companies had reforested 17 percent of the planted area. Their incentive was future exemption from income taxes at the time of harvest. These companies concentrated their efforts on precious woods like teak. The CAF incentive permitted more equal access to public funds, giving the private sector good reason to organize itself for yearly negotiations on the amount of money to be allocated and the level of the incentive.

The third step of development, in which the CAFs were granted under special conditions (CAFAs) to small farmers, represented a major conceptual change in reforestation incentives. First, the incentive was paid before reforestation so that small farmers had enough money to cover the costs of tree planting activities. Second, small farmers had to organize into associations to gain access to the incentive. The CAFAs helped improve farmer associations and made the incentives available to lower-income forest owners (see box 1.4 for an example). This system permitted reforestation of 23 percent of the planted area and represents many farmers nationwide.

Gradually, organized groups began to replace individual agents in the forest sector. The private sector organized the Costa Rican Chamber of Forestry (*Cámara Costarricense Forestal*, CCF), to which the most influential forest firms belong; the National Chamber of Timber

Box 1.4. CODEFORSA: An Organization of Small and Medium-Size Farmers

The CAFAs, reforestation incentives in advance for small farmers, and Payment for Environmental Services (discussed below) have supported the development of landowner associations like AGUADEFOR in Guanacaste; *Fundación de Cordillera Volcánica Central* (FUNDECOR) in central Costa Rica; and APAIFO, PROUDESA, and CODEFORSA in the Huetar Norte Region.

CODEFORSA, the Commission for Forestry Development in San Carlos, was founded in 1983. The organization has more than 1,000 members, who are small and medium-size farmers and forest owners. CODEFORSA has a team of 12 forest engineers who assist members with technical problems, the management of 34,000 ha of natural forests, and reforestation efforts. By 1997, CODEFORSA members had reforested 7,800 ha.

CODEFORSA provides multiple services to its members:

- Conducting feasibility and development studies for forest sector projects
- Offering legal and financial services to facilitate the approval of applications for forest permits and access to Payment for Environmental Services (discussed below)
- Producing quality plants for reforestation
- Preparing forest management plans for natural forests and plantations
- Providing technical assistance for natural forest management and reforestation
- Supervising forest management and planting
- Providing training and conducting forest research.

Source: Alfaro, M., 1998. El manejo de bosques naturales y la reforestación en la zona norte de Costa Rica: El caso de CODEFORSA.

Industries (*Cámara Nacional de Industriales de la Madera*, CANAIMA), which includes approximately 50 associations; and the Farmers' National Forestry Board (*Junta Nacional Forestal Campesina*, JUNAFORCA), which includes small rural forest owners. Table 11 shows the appearance of these organizations from pre-1950 to 1997.

The last stage in the development of reforestation incentives again radically changed the concept of support for forest development. By the end of 1995, the third Structural Adjustment Loan from the World Bank (discussed in Chapter 5) cancelled many subsidies, including CAFs, CAFMAs, and Certificates of Forest Protection (*Certificado de Protección de Bosques*, CPBs). After the collapse of subsidies, Costa Rica's forest policy changed to Payment for Environmental Services (*Pago de Servicios Ambientales*, PSAs), which compensate landowners for the "services" that forests provide to the national and global community (beneficiaries are identified in table 1.12). Forest Law 7575 defines four environmental services for which forest owners should receive compensatory payments:

Table 1.11. Variation in the Participation of Different Groups in Forest Policy Decisions

Stakeholder group	Before			
	1950	1950–70	1970–90	1990–97
Central government	•	•	•	•
Business unions			•	•
Forest industries		•	•	•
Loggers		•	•	•
Multilateral funding institutions			•	•
Commercial agriculture	•	•		
Large forest owners	•	•	•	
Universities	•	•	•	•
Environmental NGOs		•	•	•
Local governments		•	•	•
Organizations of small forest owners			•	•
Small forest owners		•	•	•
Bilateral donors			•	•
Ecotourism businesses			•	•
Regional projects			•	•
Forest product consumers	•	•	•	•
Indigenous communities			•	•
National community (public opinion)		•	•	•
International community			•	•
Land settlers	•	•	•	

Source: Watson et al. 1998.

Table 1.12. Beneficiaries of Production and Environmental Services Compensated with PSAs

Kind of service	At local, national, and regional levels		
	At the farm level	At local, national, and regional levels	At the global level
Sequestration of carbon and conservation of carbon stocks			•
Water for different uses (e.g., human consumption, irrigation, energy)	•	•	
Scenic beauty and recreation (tourism and ecotourism)		•	•
Biodiversity (pharmaceutical purposes, chemical purposes, genetic improvements)		•	•
Sustainable production of wood and non-wood products	•		

Source: IMN/MINAE/UNEP 1996.

Reducing greenhouse gas emissions (by fixing, reducing, binding, storing and absorbing them), protecting water for urban, rural or industrial use, protecting biodiversity to conserve it and ensure its sustainable use for scientific and pharmaceutical purposes, and protecting ecosystems, forms of life, and natural beauty for tourism and scientific purposes. (Article 3, paragraph K)

One-third of the tax on fossil fuels goes to forest owners, who may invest the payment in reforestation, management of natural forests, or forest protection. In 1997 and 1998, these funds were invested in reforesting 13.9 percent of the total planted area. The concept of paying for environmental services is very advanced, but we should stress that it is in its early stages. More comments on PSAs are presented in box 1.5.

In summary, government incentives have evolved from tax subsidies to direct subsidies for large landowners and indirect incentives for foreign investors to democratization of the incentive system. Thus incentives are made accessible to smaller landowners, and finally to PSAs, which changed the public subsidy to a transfer payment from the urban private sector to the rural private sector.

Box 1.5. Payment for Environmental Services

- Payment for Environmental Services still is not well understood by Costa Rican citizens, members of government, or bilateral and multilateral organizations.
- The Secretary of Finance allocates only US\$7 million/year for the forest services payment from an annual yield of US\$30 million from fossil fuel taxes.
- Since most Costa Ricans are unaware of the real meaning of the tax, they do not pressure the government to allocate the full amount to forests. Most support comes from those who plant, manage, and protect forest lands.
- For ease of implementation, the value of the PSA for reforestation is similar to that of the CAF: a sum about equal to reforestation expenses during the first five years.
- Payment is made only once for planting and forest management activities. In reality, forests provide environmental services as long as they are standing. The payment should be an annual amount corresponding to the flow of benefits or a one-time payment corresponding to the net present value (NPV) of the flow of benefits.
- The policy is fragile because it depends on the influence of various parties, such as forest owners and conservationists, and because the allocation of funds can vary. Today, funds can be directed toward reforestation, forest management, and conservation, or for conservation alone. The funds collected through the tax are managed by FONAFIFO, but the Finance Ministry decides how funds are spent.
- Some international organizations,¹ as well as some traditional economists, argue that PSAs are only another subsidy. However, PSAs provide compensation using the “polluters pay” principle through the fossil fuels tax.

1. No matter what the reasoning, multilateral and bilateral funding agencies prefer to accept a subsidy (with all its negative connotations) over an incentive that pays the price for environmental services.

There are no calculations for the potential of plantations as a resource. However, the 147,810 ha planted probably could produce at least 1.5 million cubic meters of raw material for the industry, sequester about 500,000 tons of carbon annually, and maintain a stock of 10 million of tons of carbon over a 20-year rotation.⁸

Management of Natural Forests

In most countries, subsidies begin with incentives for agriculture and cattle ranching. The consequences are known: deforestation, loss of fertility, loss of profits, and abandonment of the land. Today, the trend is to create incentives for forest preservation. Reforestation and forest management incentives have been questioned because they can cause market distortions. Costa Rica is one of the few countries in Latin America that has successfully developed incentives for forest management.

Before developing forest management incentives, Costa Rica tried to improve forest use. Many improvements were introduced in Huetar Norte and the Central Range through technical assistance projects funded by various sources, such as the German Agency of Technical Cooperation (GTZ), the United States Agency for International Development (USAID), the Department for International Development (DFID) of the United Kingdom, the Agronomical Tropical Center for Research and Education (CATIE), and through the efforts of interested owners and owner organizations. Improvements included the following:

- Simplified guidelines yielded better management plans.
- Timber inventories, harvest planning, harvesting and logging technologies, and design of logging roads all improved.
- Forest owners and government authorities provided better control of harvesting and timber transport.
- Post-harvest silvicultural interventions (timber production and forest improvements, such as first-time planting) were introduced. These included vine cutting and thinning for the selection of better tree species.
- Forest farmers formed large associations, which provided technical assistance and simplified the paperwork needed to apply for incentives.

Until 1993, forest sector incentives were oriented solely toward plantations. After these improvements, however, the government began to provide financial support for natural forest management through Certificates of Payment for Natural Forest Management (*Certificado de Protección de Bosques*, CAFMA), instituted in 1994. Like CAF and CAFA, CAFMA is a title of nominative value in national currency, which

may be traded or used to pay national or municipal taxes or tariffs. CAFMAs supported the preparation of forest management plans and the implementation of silvicultural treatments. In 1997, the CAFMA system evolved into PSAs, which also cover the cost of the forest management plan or silvicultural treatments.

Forests as a Resource

The added production potential of the forest in standing timber can be estimated at 3.7 million cubic meters per year, although the country's wood production is currently only 800,000 cubic meters per year. Therefore, only 22 percent of the production potential is being used. However, natural forests are overexploited, secondary forests are unexploited, and trees on forest plantations are still too young to harvest. The government seems unaware that by harvesting only the current production potential, wood production could increase more than four times.

Some Costa Ricans may still believe that the income potential of cattle farming is high, but as figure 1.5 shows, the export of wood and wood products is beginning to overcome exports from the cattle farming sector. The agricultural gross domestic product (AGDP) of livestock is still higher than the GDP of the forest sector (figure 1.4, Annex table A-3), but the growth potential of forests and forest activities is much greater. However, cultural support for cattle ranching is difficult to separate from agricultural policies and impedes support for the forest sector.

It will be several years before the forest industry has the capacity to process annual wood growth and a market is developed for the produc-

Figure 1.5. Evolution of Livestock and Forest Exports

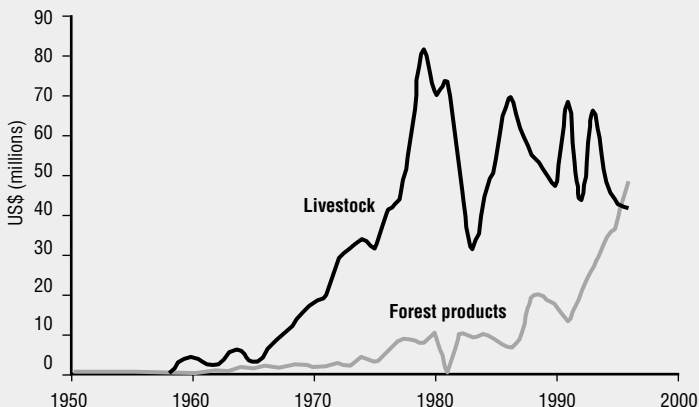
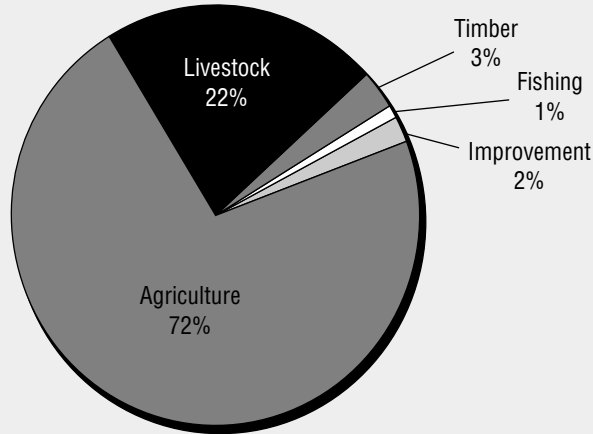


Figure 1.6. Percentage Participation in Agricultural GDP (average, 7 years)

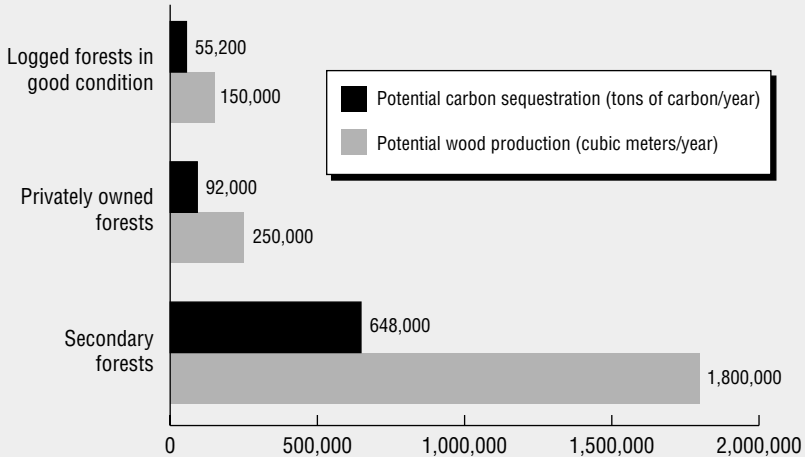
Source: Central Bank of Costa Rica.

tion increase. Costa Rica may need to invest for another 15 years to create a well-developed forest sector. Costa Rica also has been a pioneer in the development of carbon markets, in which carbon stock and carbon sequestration are sold as products, although the country is far from selling its carbon sequestration potential. The potential wood production and carbon sequestration of the natural forests are shown in figure 1.7. Carbon sequestration could be as high as 37.5 million tons of carbon.⁹ The capacity of this market depends on the willingness of the largest emitters of greenhouse gases to fulfill their obligations under the 1992 Framework Convention on Climate Change (FCCC). Nevertheless, Costa Rica has estimated this capacity to prepare for the time when carbon credits can be traded in the global market (figure 1.7). The carbon market is discussed in more detail in Chapter 4.

The potential of the Conservation Areas is difficult to measure. They provide the majority of the infrastructure for agriculture, livestock, water production, energy production, and tourism. The exact value of the forests for ecotourism is not known, but they undoubtedly contribute to Costa Rica's tourist income.

Ecotourism may be one way to balance economic and environmental goals for the forest sector. Ecotourism can provide income to Costa

Figure 1.7. Potential Annual Wood Production and Carbon Sequestration of Costa Rican Forests

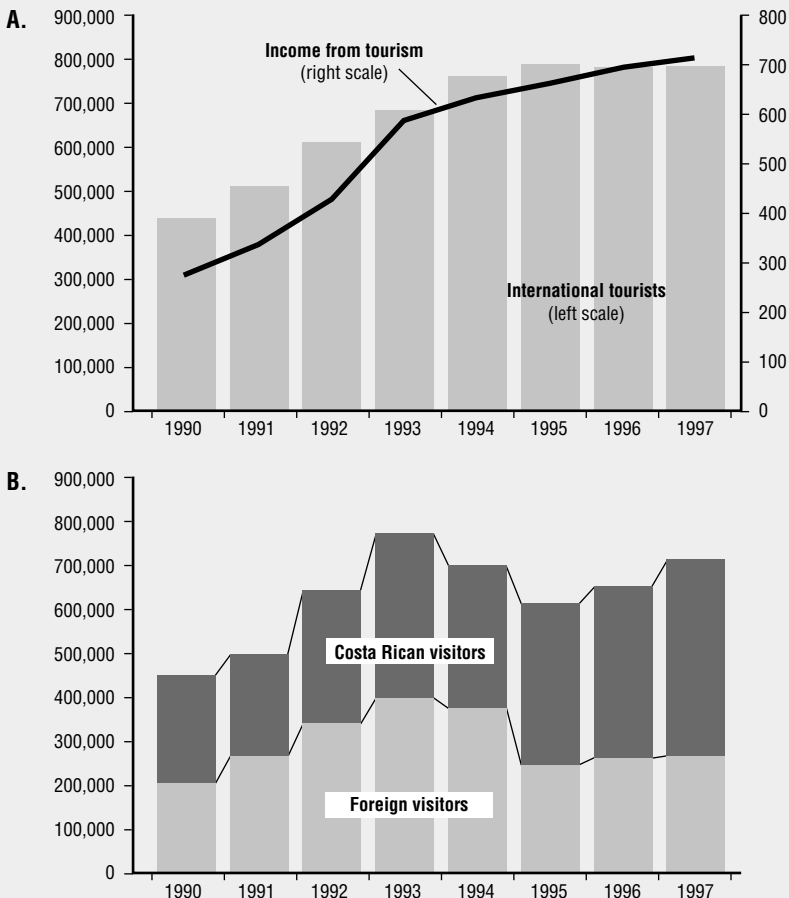


Ricans at local, regional, and national levels, and prevent deforestation and forest degradation. Policies favoring ecotourism have been developed since 1994. They include the General Plan for the Land Use on Coastal Zones, the Master Plan for Developing Tourism in the Papagayo Gulf in Guanacaste, and the Plan for Marketing and Promoting Tourism for Costa Rica. The National Training Institute (*Instituto Nacional de Aprendizaje*, INA) has developed courses for hotel management and services. The Daniel Oduber Airport in northern Costa Rica (near Liberia in Guanacaste) opened for international flights and a new dock was constructed in Puerto Caldera (Punta Arenas province) for cruise ships. Brochures were published in several languages promoting Costa Rica's national parks. Ecotourism received another boost when President Clinton visited the Braulio Carrillo National Park in 1997.

According to the Costa Rican Institute for Tourism (*Instituto Costarricense de Turismo*, ICT),¹⁰ Costa Rica received 435,000 international visitors in 1990 and earned US\$275.2 million in tourist income. In 1997, the country had 787,000 visitors, who generated US\$714.1 million in income. Between 1990 and 1997, 38 percent of tourists visited the country's national parks, indicating the importance of forests for ecotourism. In 1994, the entrance fee for the national parks was raised

from approximately US\$1–15 per foreign visitor. As a result, the number of visitors declined significantly in 1994 and again in 1995, although it stabilized in 1996 (figure 1.8). Despite the reduction in visits from 1993 to 1995, the income to national parks has increased. In 1990, there were 453,033 national and international visitors to the parks, while in 1997, there were 715,104 (figure 1.8). Tourists stayed approximately 11.3 nights during 1996, and 11.9 nights in 1997, and spent an average of US\$108–110 daily (MIDEPLAN 1997). There are no studies clarifying the net amount of income generated by tourism or the amount of tourist income that remains in Costa Rica.

Figure 1.8. Protected Areas and Tourism in Costa Rica, 1990–97





2

The Compatibility of Incentives: The Evolution of Costa Rican Policy

Economic development models directly and indirectly influence land use. A country's vision of its development and economic growth is very important to the forest sector. Legal and institutional frameworks, economic policies, and technological change are associated with specific priorities and therefore with different types of land use decisions. This section describes the dominant visions and macro-models of development, as well as property rights, legislation, sectoral policies, and incentives since 1960.

The Inactive Forest Sector (1960–78)

Titling laws passed in the 1930s and 1940s, the growing population (which increased from 860,000 people in 1950 to 1.73 million people in 1970), and the introduction of chain saws and herbicides caused massive deforestation in Costa Rica. It has been estimated that forest cover declined by 16 percent during this period, from 72 percent of the total land area in 1950 to 56 percent in 1970.

During the 1960s and 1970s, government policies and economic interactions supported linking development to agriculture, cattle ranching, and other “basic” activities, which contributed to deforestation.¹¹ During these years, politically powerful large ranchers' associations lobbied successfully for government support of livestock farming and against restrictions on converting forests to farmland (Edelman 1992). In the

1970s, cattle ranchers and crop farmers who expanded their lands were the principal cause of deforestation (Cleaver et al. 1992). Pastures increased in area from 0.8 million to 2.2 million ha from 1950 to 1984. In Latin America as a whole, the main cause of deforestation has been the change in land use from forests to pastures and farmland.

Many farmers did not even use the trees that were cut down as forests were converted to pastures and farmland. Farmers often did not use adequate production practices to grow export crops, causing over-exploitation of the soil. Forest land was undervalued and the value of forest resources reduced to the price of the timber. Since timber was abundant, no improvements were made in practices to increase the efficiency or productivity of industrial activities related to this raw material.

The increase in demand for beef in the 1960s and 1970s was an important reason for the expansion in cattle ranching. Cattle production also has some inherent comparative advantages over other land uses, including forestry: little starting capital is required, there is easy access to markets even in areas without roads, it provides a yearly income, and cattle can be used as collateral for loans. Other factors reduced the attractiveness of forest products: it is a long time between harvests, for example. Protections for the forest industry reduced the value of standing timber. The banking system offered no loans for forest projects. Trees and forests were not accepted as collateral for loans. Forest sector institutions were weak and had limited ability to provide technical assistance. The processing of forest harvesting permits was time consuming and difficult.

Through government policies and loan support from multilateral and bilateral agencies, cattle ranchers received benefits such as guaranteed prices, loan increases, and soft loans. Between 1970 and 1983, the real interest rate for livestock loans in Costa Rica was negative, sometimes reaching -10 percent.¹² During the same period, meat prices increased from 246 cents/kg in 1960 to 359 cents/kg in 1970, then fell to 265 cents/kg in 1980 and 215 cents/kg in 1985. This drop in prices encouraged subsidies for cattle farming and changes in land use that promoted deforestation.¹³ From 1956 to 1982, the livestock sector's share in total state loans rose from 13.8 percent to 23.3 percent, equal to 50 percent of total agricultural loans. The cattle sector's share has fallen drastically in recent years, but it still received 25 percent of the agricultural loans in 1989. Its share in AGDP has never exceeded 10 percent, and is only 6 percent of agricultural exports.¹⁴

National legislation also indirectly contributed to deforestation through the late 1970s. Costa Rican laws allowed farmers to gain the right to own forest land if they could show that they had made improvements to their farms. Improvements included clearing the forest and developing crop plantations (like sugar cane), or preparing the land for agricultural production. In response, many farmers cleared as much forest land as they could in order to claim ownership and later sell it. To stem the tide, the Institute of Lands and Colonization (ITCO) assumed responsibility in 1962 for allocating land from national reserves of “unused” public lands. However, from 1950 to 1960, there was a dramatic shift in land ownership. In 1950, public lands that were predominantly natural forest represented 65 percent of territory; the remaining 35 percent was privately owned. In the 1960s, this ratio was reversed: by 1973, public lands represented 40 percent, and private ownership accounted for 60 percent of the total land area.

Development Models

The country’s development models have emphasized an orientation toward external markets since independence in 1848, but especially after 1945, when new agro-export products (*desarrollo hacia fuera*) were introduced, including sugar, beef, and cocoa. (Coffee was the first export product in the nineteenth century, followed by bananas.)

The development model was modified in the 1960s, partly as a result of the world price reduction in coffee and bananas. The idea was to encourage an import substitution model (*desarrollo hacia adentro*) in Central America by increasing industrialization through a union of five countries in the Central American Common Market (CACM). The union supported free trade within the countries and an agreement on a common external tariff (CET) on imports from third parties. Import substitution faced problems from the beginning, and Costa Rica was the most reluctant to participate, only joining the union after three years. By the end of the 1970s, industrialization still had not taken off despite protection. Intraregional trade was declining as a proportion of total trade, the growth rate of the gross domestic product (GDP) was declining in all five countries (Bulmer-Thomas 1988), and political instability in the region had negatively impacted the common market.

This import substitution model was supported mainly by production from the agricultural sector. Trade barriers were built into all five countries’ industrial sectors, which depended heavily on imported capital goods and parts and fossil fuels. Migration from rural to urban areas

due to industrial concentration in urban centers also contributed to environmental problems through conversion of forests to farmland for subsistence agriculture. The technological and institutional arrangement was partially transformed and several structures were created to support the industrial sector.

Technology used in the forest sector from 1950 to 1970 was imported, and in some cases tended to support deforestation as a means of promoting economic development. The efficiency of machinery, tractors, and other tools was associated with the rate of forest clearing and growth in agricultural output, not with efficient timber milling, forest conservation, or causing the least harm to natural resources.

The educational infrastructure matched the country's vision of development. Schools of agriculture, technical schools, and universities were designed to train and produce the technicians and professionals needed for agricultural and livestock development. Using environmentally friendly methods of production was not stressed. On the contrary, education tended to emphasize means of achieving the maximum yield from the land, without consideration for forest preservation.

The Reactive Forest Sector (1979–90)

Due to the failure of the import substitution model and the Latin American debt crisis, Costa Rica changed its development model through several structural adjustment programs. The new model emphasized non-traditional exports to non-CACM countries. Because of problems the CACM was facing, economic growth today depends mostly on the performance of these exports and the tourist sector, recently included in the model.

Elimination of subsidies and preferential programs changed production patterns, although bananas and basic grains remained relatively important to national programs. In 1987, bananas represented 24 percent of agricultural GDP, second only to coffee (26 percent). Bananas comprised 20 percent of total exports and earned US\$228.6 million in 1988. Between 1973 and 1984, banana plantations decreased in area from 35,000 to 22,000 ha, partly due to exchange rate overvaluation, poor weather conditions, labor conflicts, and black sigatoka disease. In 1986, banana production expanded at a rate of 2,000 ha/year and the banana growing area shifted from the South Pacific to the Atlantic region. By 1993, an additional 5,000 ha would be transformed into banana plantations at the forests' expense. A cut in export taxes in 1989 and an export subsidy of US\$0.3 per box of bananas encouraged some land conversion

in the margin. Basic grains grown for internal consumption also were important beneficiaries of National Production Council (CNP) subsidies. In 1983, the rice subsidy was 2.5 times the CIF price, beans 1.4 times, sorghum 1.3 times, and corn 1.2 times. These policies were abandoned with structural adjustment reforms.

Deforestation continued on all types of land, primarily for raising livestock on land that was poorly suited for this use. The upward trend in the deforestation rate leveled off in 1985, when markets for beef and dairy products became less favorable, subsidies were eliminated,¹⁵ and a timber shortage increased the demand for (and price of) wood. These factors created an incentive to manage forests better. Less public support for livestock loans and agricultural colonization, and more secure property rights allowed landowners to protect their property without having to deforest it. These factors have checked the expansion of pastures and croplands.

Government policies in general and economic policies in particular have affected the use of forest resources. Export-led growth strengthened the non-traditional export production model. International agencies such as the World Bank, the International Monetary Fund (IMF) and the Inter-American Development Bank (IDB) provided funding to support the model and link it to international trade without considering the environmental impacts. National legislation and presidential decrees created fiscal and other incentives to encourage productive activities. For example, several ministries and government offices provided technical and organizational support for exports and imports, as well as loan opportunities from the national bank system, preferential interest rates, insurance schemes, subsidies, and tax exemptions for certain agricultural activities.

Promotion of the production and export of non-traditional products led to changes in fiscal policies and institutional reform. There has been a shift to ad valorem taxes and a lowering of the CACM's Common External Tariff, as well as unilateral duty exoneration on imported inputs for non-traditional exports. Additionally, Tax Credit Certificates (*Certificados de Abono Tributario*, CATs) were introduced in 1970 that linked export values and offset tax liabilities. (The certificates were closed to new applicants in 1996.) The exchange rate also converted from a fixed to a flexible rate to encourage export growth. Institutional reforms included providing training programs for workers and businesses through organizations such as the National Training Institute (*Instituto Nacional de Aprendizaje*, INA), the Central American Business Admin-

istration Institute (*Instituto Centroamericano de Administración de Empresas*, INCAE), and public universities. New organizations, including the Center for the Promotion of Exports and Investments (*Centro para la Promoción de las Exportaciones y de las Inversiones*, CENPRO), the Costa Rican Coalition for Development Initiatives (CINDE), and the Ministry of Exports (MINEX) were established. CENPRO and MINEX later became the Ministry of External Trade (*Promotora de Comercio Exterior*, PROCOMER).

The agricultural sector again became a foundation for a new development model. However, important changes were introduced, influenced by international demands for environmental protection, the national debate on the environmental impacts of expanding banana plantations, urban waste problems, the social and economic impacts of agrochemical contamination and residues, and increased awareness among Costa Ricans of the country's high deforestation rate.

The introduction of reforestation incentives in 1979 coincided with a new sensitivity to environmental issues in Central American public administration. In 1974, Venezuela created the first ministry in Latin America to protect the environment, the Ministry of Environment and Natural Renewable Resources, which became a model for many other countries. In Costa Rica, the Arias Sánchez administration established MIRENEM (the Ministry of Natural Resources, Energy and Mines) in 1986. MIRENEM was the first ministry of its kind in Central America and the Caribbean. This agency designed a National Strategy for Conservation through Sustainable Development (*Estrategia Nacional de Conservación para el Desarrollo*, ECODES). In 1988, incentives were introduced to increase the participation of small and medium-sized farmers, who did not necessarily have to pay taxes but were interested in reforestation. Members of the forest sector formed political organizations (table 1.11), which have the power to lobby for reforestation and other incentives.

Due to the political influence of farming organizations since 1970, the following fiscal incentives favoring the forest sector have evolved:

- **Income Tax Deduction (1979):** Through the income tax deduction introduced in 1979, the government promotes plantation forests to obtain the raw material the country needs in order to prevent the destruction of natural forests. Although this incentive was intended to be extensive and motivate landowners, most of Costa Rica's rural population was excluded since only large landowners pay income taxes. When the incentive was instituted, reforestation technologies were not well developed. There also was not enough knowledge

about nursery management of exotic and native species, or about reforestation techniques and silvicultural management. The quality of the first areas planted using this incentive was generally poor.

- **Soft Credits (1983):** In 1983, the National Banking System and a program known as COREMA AID-032 established soft loans for reforestation with an 8 percent interest rate and a ten-year grace period. Payment periods are as long as 30 years, depending on the species planted. Currently, four trusts are in effect.
- **Forest Payment Title (*Certificado de Abono Forestal*, CAFs, 1986):** The current forest payment title, established in 1986, aims to distribute resources for forest activities democratically. CAFs are tax-exempt nominative titles with which any type of tax may be paid. The titles are accessible to all landowners and can be negotiated in the marketplace. Therefore, forest owners not paying taxes can benefit from this incentive. Through the CAFs, the knowledge of tree species, reforestation, and forest management techniques improved, and farmers were more motivated to plant trees. As a result, the quality of reforested areas improved.
- **Fund for Municipalities and Organizations (1986):** Forest Law 7032 established a tax on forest activities and allocated 20 percent of the amount collected from the exploitation of timber to regional organizations and municipalities. These funds may be used to implement reforestation projects, manage watersheds, establish nurseries, promote the extension and development of forests, and build infrastructure like forest roads.
- **Forest Advance Payment Titles (*Certificados de Abono Forestal por Adelantado*, CAFA 1998):** CAFAs were created in 1988 because small landowners were unable to invest in reforestation and wait for the payment of titles. The amounts are paid before reforestation activities are conducted, but recipients must be organized into farming associations. The Department of Forest Development for Farmers (*Departamento de Desarrollo Forestal Campesino*) was instrumental in organizing small farmers for forest development purposes.
- **Fund for Forest Development (1998):** This fund was created from Costa Rica's CAFA revenues and Dutch and Nordic revenues from debt-for-nature swaps to support forest activities among small farmers. The fund covered 35 percent of reforestation costs. Farmers funded 15 percent of operations through valorization of their own labor. CAFAs covered the remaining 50 percent. Once a

reforestation project concluded, the farmer paid the loan back to a revolving fund managed by a community organization in order to continue supporting further reforestation activities.

Opinions vary as to the success of these fiscal incentives. Some believe that reforestation failed. Although the country reforested nearly 140,000 ha by 1995, it does not have enough wood to supply the national market, which requires approximately one million cubic meters of wood annually. This judgment is unfair since new forests need several years to enter into full production. Some analysts estimate that each reforested hectare should produce approximately 25 cubic meters of wood per year, but this figure is exaggerated because growth rates fluctuate between 10 and 40 cubic meters depending on the tree species and quality of the site. Other analysts suggest that although the plantations were not entirely successful, especially between 1979 and 1985, some producers did not intend to take the timber to market. Many small and medium-sized farmers were more interested in the long-term environmental benefits of reforestation, and viewed the trees like money in the bank, to be spent in the future when required.

A Change of Attitude: Moving Toward an Active Forest Sector (1991–98)

The national debate on conservation and development grew before the 1992 United Nations Conference for Environment and Development (UNCED). These discussions, the ECODES initiative, and international opinion favoring the participation of the country in the UNCED conference influenced the policies of the Calderon Fournier Administration (1990–94). The government proclaimed “*Hacia un Nuevo Orden Ecológico de Cooperación Internacional*” — “Let us move toward a new ecological order of international cooperation” (Calderon Fournier 1990). As one step in this direction, the Ministry of Natural Resources, Energy, and Mining was established.

Since 1992, cattle and timber production and other activities traditionally associated with deforestation are no longer central to the Costa Rican economy. During the early 1980s, beef exports provided 6 percent to 8 percent of Costa Rica’s foreign exchange earnings; now they account for less than 2 percent of those earnings. During the same period, the contribution of livestock to the country’s GDP fell from 2.3 percent to 1.7 percent (Masis and Rodríguez 1994). The real value of forest production, based on natural forests, fell by 50 percent between 1976 and 1985 (Cleaver et al. 1992).

At the same time, economic sectors that stand to benefit from policies promoting reforestation have become more important. Thanks partly to government subsidies and tax exemptions, tourism has evolved from a marginal activity only a few years ago to one that generated US\$685 million in 1994 and almost US\$1 billion in 1998, about one-quarter of the country's foreign exchange income (Noguera 1995). Tourism is now the country's primary source of foreign exchange earnings. Since approximately 75 percent of the 400,000 tourists who came to Costa Rica in 1992 visited the national parks, foreign tourists are key to the industry's viability (Boyce et al. 1994).

After CAFMA was instituted in 1996, the Figueres Olsen Administration (1994–98) proclaimed support for a sustainable development model. The four elements of the model are participatory democracy, social investment, macroeconomic balance, and alliance with the environment (Figueres Olsen 1996). The administration sought to continue with structural change in the economy but pay more attention to social and environmental issues.

Discussions about important changes in natural resource management laws began in the 1990s. Environmental Law No. 7554, approved in October 1995; Forest Law No. 7575, approved in April 1996; and the first Biodiversity Law, approved in 1997, were signs of change in the national vision.

Environmental Law No. 7554 was designed to prevent or reduce exploitation of the environment. It created a National Environmental Technical Secretary (SETENA) to approve environmental impact assessments and a National Environmental Controller. It also transformed the Ministry of Environment, Natural Resources, and Mines into the Ministry of Environment and Energy.

Forest Law 7575 resulted from a discussion with forest sector organizations. This law introduced incentives for forest preservation, rather than simply forest management and reforestation. The Forest Conservation Certificate (*Certificado de Conservación del Bosque*, CCB) compensated forest owners for part of the environmental services the forest provided as long as timber had not been exploited for two years before the application and would not be exploited for at least 20 years. The CCB also included other important incentives to assure property rights and property tax exemptions for owners of forested land. The law deregulated forest plantations by eliminating the need for permits for harvesting planted trees. It also created the National Forestry Office (*Oficina Nacional Forestal*) and FONAFIFO to finance programs for develop-

ment of the forest sector, and the Forest Law also included the revolutionary concept of Payment for Environmental Services.

The Biodiversity Law (7788) created rules and procedures for prospecting biodiversity in the country (bioprospecting) and legally established SINAC in 1998. Administratively, SINAC includes the National Council of Conservation Areas, the Executive Department, the Conservation Areas, the Regional Councils, and the Local Councils. The National Council, Regional Councils and Local Councils provide the structure and the opportunities for citizen participation. Due to recent approval of Forest Law 7575, this structure has been implemented in only a few Conservation Areas.

SINAC's purpose is to improve the government's ability to respond to the increasing demand in Costa Rica for natural resource protection. All 11 Conservation Areas are governed under the same development and administrative strategy. Public and private activities are interrelated and solutions are found in collaboration with the government and the public. SINAC was established with the following objectives:

- Concentrate the three previous directorates (*Dirección de Vida Silvestre, Sistema de Parques Nacionales and Dirección General Forestal*) into one institution to achieve a unified policy.
- Transfer most of the public servants to the regions.
- Delegate decision making to the Conservation Areas.
- Share decision making with other stakeholders through the Regional Environmental Councils.

Despite these legislative changes, the forest sector is still not very important to the national economy, and therefore is often not considered a priority. The forest sector represented approximately 2 percent of the Costa Rican GDP in 1997. Silvicultural activity accounted for an average of 5 percent of the AGDP between 1990 and 1996. Timber and improvements provided on average only 0.0085 percent of the total GDP between 1990 and 1996. Timber accounted for 3 percent and forest improvements 2 percent of the AGDP in the same period, as shown in figure 1.6 and Annex table A-3.

There seem to be many more opportunities for innovation and increasing competitiveness in the forest sector, especially with greater knowledge about forest management and commercialization of forest products and services. But for Costa Rica to benefit from these opportunities, its institutional framework must change.



3

Institutions and Organizations¹⁶

The Evolution of Forest Legislation

The evolution of land use depends not only on policies but also on the public's attitude toward the forests. These attitudes are formalized in different laws, according to the relative power of interest groups. A brief description of four forest laws follows. This section summarizes the evolution of legislation from 1969 to 1998 (table 3.1). Eight aspects of that legislation are considered: the role of government, participation of the private sector, the role of forest professionals, promotion of changes in land use and concessions, regulation of plantations and agroforestry systems, the forest industry, forest taxes, and instruments to promote reforestation.

Role of the Government

Law 4465 (1969) assigned to the government the function of declaring and managing national parks and wildlife reserves; conserving soil, watersheds, and catchment areas; establishing and monitoring research plots; growing plants in nurseries; and preparing studies on forest industries, wood and forest product exports and imports, reforestation of demonstration plots and farms, and natural forest use.

Law 7032 (1986) and Law 7174 (1990) enhanced regulations regarding forests and private plantations. A centralized Forestry Institution with 10 technical departments was created to oversee the complex procedures of planting, managing, cutting, and transporting forest prod-

Table 3.1. The Evolution of Forest Legislation, 1969–98

Subject	Law 4465 (1969)	Laws 7032 and 7174 (1986, 1990)	Law 7575 (1996)
Role of government	Diversification of functions: – National parks and wildlife – Soil conservation – Catchment areas – Forest research – Nurseries – Industry, external trade – Reforestation – Forest use	Excess paperwork and procedures Greater emphasis on forestry (seeds, control, and financing)	Institutional flexibility Specialization in government functions Delegation of responsibilities to other entities: FONAFIFO, ONF, municipalities, and Regional Councils
Participation of the private sector	No participation National Forestry Council established (G/P=6/1) ^a	Little participation, but National Forestry Council included (G/P=7/3)	Stronger participation through the National Forestry Office (G/P=0/9)
Role of forest professionals	Forest management plan conducted by a forest professional	Management plans prepared by a forest professional are duly registered	<i>Regentes forestales</i> have legal responsibility and provide supervision of forest plans
Change in land use and concessions	Allowed	Allowed with limitations	Prohibited
Plantations and agroforestry systems	Deregulated	Highly regulated	Deregulated
Industry	Protected	Protected and regulated	Deregulated
Forest tax	Collected at the industrial site by the Public Treasury	Collected by the Forestry Directorate	Collected at the industrial site by the Public Treasury
Promotion instruments	Tax reduction	Certificate of Forestry Payment (<i>Certificado de Abono Forestal</i>)	Payment for Environmental Services

a. G/P=Government/private participation.

ucts. A strong legal department handled administrative procedures. These complicated procedures were eliminated by Law 7575 (1996), which delegated responsibilities to the regional forestry administrations (FONAFIFO, the National Forestry Office [*Oficina Nacional Forestal*, ONF], municipalities, and Regional Environmental Councils) and resulted in greater institutional flexibility. Changes are still being made, but decentralization and regionalization has led to a more democratic process.

Role of the Private Sector

The National Forestry Council (*Consejo Forestal Nacional*, CFN) was created by Law 4465 with the participation of only one private sector representative. Law 7032 assigned more representation to the private sector and its participation in the CFN, whose function is to advise the CFN minister on reforestation incentives.

Law 7575 created ONF, a public, nongovernmental entity formed exclusively by representatives of the private sector, including all landowners, landowner organizations, environmental NGOs, and the forest industry. ONF's main function is to recommend strategies and policies for forest development and to support the National Forestry Administration in promoting forest development.

Role of Forest Professionals

In the first Forest Law (1969), no special qualifications were required for preparing a forest management plan or initiating legal procedures in the Forestry Directorate. There were only a few forest professionals then and the technical aspects of forest exploitation were simple. Under laws 7032 and 7174, forest management plans must be signed by a registered forest professional.

To prepare and implement a management plan for natural forests, Law 7575 requires that a Forest Manager (*Regente Forestal*) be hired, a registered forest professional. The Forest Manager needs special training to supervise forest operations (*Regencias*), and generally has the public's trust, like lawyers and medical doctors. The government and the Union of Professionals oversee the fair practice of the *Regente*.

Land Use Changes and Concessions

Laws 4465 and 7032 allowed the felling of timber and liquidation of forests on private lands to create pastures and farmland. The government also could grant concessions on public lands for forest exploitation. Law 7575 does not permit changes of use in privately owned forests or concessions on public lands. If the law is implemented fully, the amount of the country's forested land could only be increased by reforestation and regeneration of pastures and agricultural lands to secondary forests. An appropriate control mechanism is vital to the law's success.

Regulation of Plantations and Agroforestry Systems

Law 4465 deregulated plantations and agroforestry systems, requiring no permit to establish or harvest plantations and trees in farms. Laws 7032 and 7174 introduced a strong control over trees no matter their

location. The regulation of plantations introduced uncertainty among private landowners about their ability to use their trees as they liked.

Law 7575 also deregulated plantations and trees in agroforestry systems. Owners of plantations or trees in an agroforestry system can harvest their timber without a permit. They can also transport the products with a certification that the wood comes from a plantation. The new law eliminates uncertainties about ownership and the use of forest products. Landowners are also free to decide about future land use of the planted area after harvesting.

The Forest Industry

Law 4465 strongly protected the forest industry by implementing a customs fee on imported wood products and tax exemptions, and prohibiting the export of roundwood. The same protection continued in Laws 7032 and 7174, but the government now intervenes in the industry by regulating the installation of new wood processing plants, which provides more protection to existing industries. For example, the industry must demonstrate that a proportion of its logs was supplied by its own forests and that no new sawmills were built.

Law 7575 deregulated the forest industry, allowing anyone to establish a new industrial plant. Industrial plants also can import roundwood to supply their wood needs. In a sense, the forest industry still enjoys protection because forest owners are not permitted to export roundwood.

Collection of the Forest Tax

The Forest Tax is the Forest Administration's source of income. Under Forest Law 4465, the tax was first collected by the Public Treasury Ministry, but later by the General Directorate of Forestry. The tax is collected at the industrial site.

Instruments to Promote Reforestation, Forest Management, and Conservation

Law 4465 created the system of deducting reforestation expenses from income taxes. In this system, companies paying income tax could deduct all expenses incurred in reforestation investments from the amount of the tax. Generally, owners of forests and lands appropriate for reforestation did not have access to this incentive because they were not taxpayers.

Law 7032 changed this system by creating the CAF. The system was later complemented by CAFAs, CAFMA, and, in 1995, by the creation of the Certificate for Forest Protection, known as CAFMA-2000. The move from taxes to certificates for plantations and later to certificates

for forest management and conservation made the promotion of forestry possible for all kinds of stakeholders and forest types.

In summary, Laws 4465, 7032, and 7174 have had both positive and negative effects on the forest sector (table 3.2). The laws have generated distortions, such as insecurity about land use changes and how landowners may use their trees. They do not adequately encourage investments in forestry or forest industries. They also have created inefficiency in the forest industry, assigning a low value to forests as an economic resource. On the other hand, these laws gave government a clear role in the administration of the sector, created a new set of instruments to promote reforestation, and established the National Parks System.

The evolution of Costa Rica's forest laws may indicate that the country has stopped using legal sanctions as the main instrument to end the misuse of forest resources. Today, most agree that in addition to forest management, forest legislation must encourage stakeholder participation. The government must also develop more instruments that integrate the value of forest resources and market its products and services. Only in this way can the country guarantee sustainable forest development.

The Evolution of Institutions

Decentralization and Democratization

Reform has progressed more quickly in the forest and natural resources sector than in any other area of the Costa Rican government. The National System of Conservation Areas is a clear example of such reform. SINAC is legally defined as a "system of management and institutional coordination that is decentralized and participatory." SINAC's creation introduced sweeping changes in the organizational culture and structure of Costa Rica's forestry administration.

Culturally, the institution changed its focus to customer service. SINAC also has shifted from being the sole government actor with responsibility for forests to becoming a facilitator and promoter, assigning responsibilities to more specialized, nongovernmental organizations. Regarding structure, three directorates were merged, a decentralized forest administration was established, and the focus shifted from a functional orientation emphasizing technical assistance to a process orientation emphasizing inputs and products. These changes have allowed more efficient use of remaining forest resources, flattened the institutional structure, made that structure more democratic, and improved the quality of services provided in the Conservation Areas.

Table 3.2. Effects of Forest Sector Laws 4465, 7032, 7174, and 7575

Instruments applied	Effects on the forest sector	Results
Law 4465 (1969)		
Establishes that forest lands considered priorities by the Forestry Administration can be expropriated by the government and must be submitted by obligation to Forest Management	Discourages maintaining forest land. Creates uncertainty about using forest resources. Creates uncertainty and risk for investors.	Change of land use, no investment in forests
Permits changing forests to other land uses in settlement projects or in any agricultural or cattle private project whose plans imply eliminating forests	Many areas without an agricultural use were deforested	Change of land use
Too many functions were assigned to the General Forestry Directorate (research, forest nurseries, erosion control, watershed management, environmental education, industry studies)	Institutional efforts were dispersed. Forestry was not a priority	Government was unable to protect or conserve natural resources
Deducts reforestation costs from income taxes	Direct incentives were created only for plantations, companies and wealthy landowners, most of whom had no previous forest experience.	Discrimination in favor of plantations Discrimination against low-income farmers
	Limited access to small and mid-size private owners	
Protects the forest industry through advantages for concessions in forest reserves, tax exemptions, prohibition of exports of roundwood, and restrictions on forest product imports	Inefficiency in the forest industry Industries located far from forests	Low value placed on raw materials from forests High cost of transportation Loss of competitiveness of the forest industry
Laws 7032 (1986) and 7174 (1990)		
Authorizes the Executive to include farms considered necessary within the protected areas, or submit them to forest management	Discourages forests Creates uncertainty in the future use of forest resource	Change of land use No investment in forests
Extends the area of the protected zones	Creates uncertainty and risk for investors	
Allows strong intervention by the Forest Administration in the use of forest resources. Special permit to cut trees requires municipal approval	Creates insecurity about using forest resources Creates dependence on the good judgment of forest officials High costs of procedures	Illegal timber felling Corruption
Establishes a tax on stumpage and a reposition guarantee of 20% of the stumpage value for each cubic meter authorized	Legal forest exploitation becomes more expensive	Illegal felling Tax evasion Corruption
Establishes CAF as a direct incentive for reforestation	Cutting trees in natural forests is discouraged initially	Reforestation was conducted on poor lands not suited for planting Initial change of land use from forests to plantations
Maintains protection for the forest industry, adding stringent requirements for establishing new industries	Inefficiencies in forest industries continue	Difficulties establishing new industries Increase in illegal sawmills Illegal sawing
Law 7575 (1996)		
Forbids changes in use of forested land	Uncertainty about land use and land tenure continues	Banned species are illegally exploited
Allows restrictions on harvesting forestry species		Forests are cleared to convert to create agroforestry systems
Forbids export of squared timber and roundwood		

Decentralization also has meant the transfer of personnel and logistical resources to different regions. The Conservation Areas manage their own budgets and personnel. They implement all procedures regarding permits for concessions and management of protected areas, private forests, and plantations. They also rank projects eligible for PSAs and allocate PSA payments.

Democratization has been an active principle in the reshaping of SINAC, evident in the public's participation in the protected areas, the buffer zones and private forests. Although public participation was present in Costa Rica's forest policy before SINAC, such participation was one of SINAC's defining principles.

The Organic Environmental Law (*Ley Orgánica del Ambiente*) of 1995 further promoted public participation by creating Environmental Regional Councils. Law 7575 assigned new responsibilities for natural resources to the councils. The Biodiversity Law of 1998 established the basic objective of "promoting active participation in all social sectors concerning conservation and the ecological and sustainable use of biodiversity in order to obtain social, economic and cultural sustainability."

Evolution of the Financial System

Reforestation incentives established in 1979 have been an important instrument in counteracting the effects of deforestation and environmental degradation, but not deforestation itself. Later, these incentives also addressed forest management (1992) and forest protection (1995).

The first generation of incentives (1979–80) allowed income tax deductions for all reforestation investments. This system was not very successful or fair, and led to the reforestation of only 35,000 ha. The system changed in 1986 with Forestry Law 7575, which established an indirect incentive to support private investments, commonly known as Article 87. Many foreign and some domestic companies benefited from investing in forest projects under this law, which exempted capital inputs from national and import taxes. Such companies include Ston Forestal, Bosques Puerto Carrillo, Buen Precio, Flora and Fauna, and Macori.

The directed Forestry Credit is another instrument used to finance the development of the forest sector. Executive Decree 1986 created the Forestry Financing Department within the General Directorate of Forestry in 1990. This department formed the basis for FONAFIFO in 1996. Funds came from different sources, such as the national budget, the forest tax, and donations from the USAID (U.S. Agency for Interna-

tional Development) and ODA (then the Overseas Development Agency of the United Kingdom). Forest activities financed by loans from FONAFIFO include reforestation projects, bridge loans for temporary funding, loans for nurseries, forest management, forest industries, technical studies, log extraction, equipment, working capital, agroforestry systems, and seed establishment and management. FONAFIFO has become the bank of the forest sector, with various mechanisms and areas of investment. From 1996 to 1998, FONAFIFO funded at least 700 operations for about 1,534 million colones, or approximately US\$8 million.¹⁷

More than 22,000 small and medium-size forest landowners, with a total area of 279,000 ha, benefit from forestry incentives and from PSAs. Of the total, 145,000 ha correspond to reforestation, 102,000 ha to forest protection, and 32,000 ha to forest management (table 3.3). Government investment in these incentives from 1979 to 1997 totaled approximately US\$100 million, while support of private investments under Article 87 reached at least US\$32.8 million. Payments for three years of PSAs totaled US\$14 million. The total investment during this period reached at least US\$132 million (table 3.4). Foreign direct investment in the forest sector of Costa Rica is the most important in the Central American region. While there are no reliable data on the exact amount of investment, its scale can be estimated based on the investment in forest plantations. Foreign companies (Flora and Fauna, Macori, Bosques Puerto Carrillo, Ston Forestal) have established about 22,929 hectares of forest plantations with direct foreign investment. Ex-

cluding the value of land and associated industrial development, the total investment in the plantations through 1997 is US\$32.8 million.

Table 3.3. Results of Incentives for the Forest Sector, 1979–97

Type of incentive	Area (ha)
Deduction from income	35,597
CAF (Certificate of Forest Payment)	38,086
CAFA (Certificate of Forest Payment in Advance)	33,818
CAFMA (Certificate of Forest Management)	22,120
DFD (Forestry Development Fund)	12,789
Credit (granted by FONAFIFO)	2,800
CPB (Forest Protection Certificate)	22,199
Article 87	16,072
PSA (Payment for Environmental Services)	95,546
Total	279,017

Source: FONAFIFO 1998.

Benefits of the Incentives Program and the PSA

Through 1996, investments in forestry incentives and the PSA amounted to US\$130 million and covered an area of 290,000 hect-

ares. The investments include reforestation, forest management, and conservation of forest, but there are no reliable data on the financial, economic, social, and environmental benefits of the investments. It is possible, however, to estimate the economic value of reforestation using the Gmelina species. Gmelina covers more than 60 percent of the planted area, and the calculation considers the potential commercial volume produce by such plantations made until 1998, which will be harvested around 2010. By that time there will be an accumulated volume of 9.8 million cubic meters of wood. At the 1999 market price for standing wood, the total value for the owners would be US\$117 million.

Another value indicator is the Payment for the Water Environmental Service. The first such payment—US\$10 per hectare per year for reforestation, forest management, and protection of the Río Volcán watershed—was made by the private hydroelectric company (*Energía Global*). The second project was negotiated with the *Compañía Nacional de Fuerza y Luz* for US\$40 per hectare per year for five years in the Río Aranjuez watershed. Negotiations are currently under way for several other projects with prices around US\$40. A total of 200,000 ha are subject to this incentive, so at the current market price, 75 percent of that area could yield an annual payment of US\$40/ha/year for five years. This means a total of US\$8 million per year and a total of US\$40 million in five years. Finally, if the 147,000 ha planted by the private sector sequesters 500 thousand tons of carbon per year, and if we assume a price of US\$10 per ton (as in the case of Noruega-Costa Rica), the planted area would be worth a total of US\$5 million. If the tree crop is rotated every 20 years, there would be a stock of 10 million tons of carbon with an approximated value of US\$100 million.

Table 3.4. Investments in Incentives for the Forest Sector, 1979–97

Type of incentive	Amount (US\$M)
Deduction from income	40.4
CAF (Certificate of Forest Payment) and CAFA (Certificate of Forest Payment in Advance)	45.6
CAFMA (Certificate of Forest Management)	4.8
FDF (Forestry Development Fund)	6.8
Credit (granted by FONAFIFO)	2.2
CPB (Forest Protection Certificate)	1.2
Article 87	32.8
PSA (Payment for Environmental Services)	14.0
Total	146.8

Source: FONAFIFO 1998. The amounts invested are greater, since government funds granted and through FONAFIFO after 1990 do not cover all costs.

The Evolution of Organizations

The Public Sector

The General Directorate of Forestry was created in 1969 to manage forests, national parks, and wildlife. Parks and wildlife later came under the management of two other agencies: the National Parks Service, established in 1973, and the Wildlife General Directorate, established in 1987.

The General Directorate of Forestry was located within the Ministry of Agriculture until 1987, when it moved to MIRENEM. MIRENEM evolved into MINAE in 1995. Also in 1995, the three directorates—Forestry, National Parks and Wildlife—were consolidated into SINAC. Once Forestry Law 7575 was approved, FONAFIFO, ONE, and the Regional Environmental Councils were created and included in the National Forestry Administration.

The Private Sector

The National Forestry Council (*Consejo Forestal Nacional*, CFN) was formed in 1969 under Law 4465 by six members of the public sector and one member of the private sector. The Forest Law of 1986 increased the number of private sector representatives to three. The National Forestry Council is the first body to allow private sector participation, although the body serves as an advisory group to the minister and has no decisionmaking power. Therefore, the private sector organized other associations, such as *Aserraderos Unidos* for the timber milling industry, *Cámara Nacional de Industriales de la Madera* for forest industries generally, and *Cámara Nacional Forestal* for foresters and some industrial groups. During this period, unification of the sector was still not successful and the division between industry and foresters continued.

Due to multiple conflicts between the public and private sectors, a Mixed Commission of the Public and Private Sector (*Comisión Mixta Sector Público, Sector Privado*) was established in 1993 by Executive Decree 22513-MIRENEM. The objective of the commission is to provide a permanent place for dialogue, coordination, and analysis of forest development. As a way to improve the coordination of private sector members, the Costa Rican Forestry Chamber (*Cámara Costarricense Forestal*, CCF) was created in 1994.

Small forest farmers began to form their own organizations. In September 1991, they held the First National Rural Forest Congress (*Primer Congreso Nacional Forestal Campesino*), where JUNAFORCA was es-

established. JUNAFORCA and CCF organized the private sector into two well-defined groups. Forestry Law 7575 was discussed and approved in 1996 with input from these groups. ONF also includes CCF and JUNAFORCA representatives.

Organizations Affecting the Forest Sector

The organizational base of the forest sector is very wide. The current government has a vision in which all organizations play a complementary role in forest management. The groups that have the most impact on forest development are SINAC, ONF, FONAFIFO, CCF, JUNAFORCA, the Regional Environmental Councils, the Costa-Rican Office of Joint Implementation (*Oficina Costarricense de Implementación Conjunta*, OCIC), and the Agronomists College (*Colegio de Ingenieros Agrónomos*). OCIC is responsible for international marketing of environmental services. The Agronomists College provides control and sanctioning of the Forest Regents. A detailed description of each organization is provided in Annex C.

Role of Indigenous People and Women

The forest activities of women and indigenous people are not yet fully recognized in Costa Rica. The main reason for this is that their work primarily supplements household incomes and is not translated immediately into products going to the market. With the growing interest in bioprospecting and the development of nursery plantations, however, the knowledge and labor of indigenous people and women is increasingly valued.

The Main Features of the Development

Costa Rica has applied a more consistent forest policy in the past 20 years. Today, this policy is much more comprehensive and innovative than forest policies in other Central American countries.

- Costa Rica has a financial system to encourage reforestation of plantations and management and conservation of natural forests. Other Latin American countries, including Chile, Brazil, and Panama, have only provided reforestation incentives, which function like subsidies.
- Costa Rica has moved from a “command-and-control” forest strategy to deregulation of harvests and delegation of responsibility for forest management and conservation to private owners.

- Costa Rica may be the first country to include certification in its Forestry Law. The National Certification System, discussed below, establishes standards for good forest management. These standards eventually could be used as standards for international recognition by the Forest Stewardship Council (discussed further in Chapter 4), which establishes criteria for sustainable forest management.
- All Costa Rican landowners have access to forestry incentives and environmental services payments, including carbon credits. Such incentives are ongoing rather than provided on a project-by-project basis, like debt-for-nature swaps, whose success depended on the influence of international NGOs.
- Costa Rican forest owners have strong organizations that give them technical support for reforestation, forest management, and forest conservation. As a result, private sector participation in forestry initiatives is increasing.
- The Natural Resources Administration has merged the administration of forest and protected area activities into a unified organization, SINAC.
- Costa Rica is one of the leading countries in the effort to sell carbon credits in the global market.
- Costa Rica is negotiating the value of biodiversity. For example, the country is involved in bioprospecting initiatives with the international chemical industry to identify useful chemicals and ways to profit from the development of products. Costa Rica also is one of the few nations involved in marketing future valuable substances.

Details about some of the tools and mechanisms that have been developed in Costa Rica to support the forest sector are presented in section 4.

Does the World Bank Forest Strategy Make Sense in Costa Rica?

The World Bank forest strategy had little to do with the development of forest policy in Costa Rica. Bank operations in Costa Rica have been limited to a few initiatives, which although consistent with its 1991 forest strategy, had only marginal influence on the implementation of the country's forest policy and its development of policy tools. While the two policies share some common features, this is more a matter of the confluence of two visions than of any direct influence.

One of the main reasons for the 1991 forest strategy was the deforestation and forest degradation. As noted, deforestation in Costa Rica

has decreased in the past decade with the growth of an incentive system that gives value to plantations forestry, forest conservation, and forest management. The World Bank strategy emphasized the weak property rights in many countries as an incentive to cut trees. In Costa Rica, property rights are well established and the kind of feudal system (latifundio-minifundio) present in many other Latin American countries does not exist in Costa Rica. Almost all farmers own their land and the proportion of landless rural population is low. Costa Rica also does not have problems with timber concessions.

Through the implementation of its forest policy, Costa Rica is addressing many of the strategies for forest development included in the Bank's 1991 forest strategy:

- **Protecting forests:** Costa Rica developed a strong protected areas system that includes both public and private forest lands long before the Bank developed its 1991 strategy.
- **Forest zoning and regulation:** Land use planning has been done and most of the areas to be protected have already been declared as Protected Areas. Production forests have already been designed. A problem that exists is the intention of sectors of the country to increase permanently the areas under protection, creating uncertainty for the forest owners.
- **Correcting private incentives:** Many of the incentives for agriculture have been eliminated, in part because of the adjustment policies (Structural Adjustment Loans of the Bank) and because a system of forestry incentives was developed.
- **Reducing demand and increasing supply:** The 1991 World Bank forest strategy indicates that reducing demand for natural forest products and increasing the supply of wood from other sources would help to protect natural forests. In Costa Rica, the strategy has been to protect natural forests, to improve management of natural forests in order to maintain the supply from well-managed forests (Costa Rica has standards of forest management that are an obligation for all forest owners), and to reforest in order to increase the supply of wood for all purposes. Costa Rica has also increased interest in conserving and managing forests by developing a market for biodiversity (ecotourism and biodiversity utilization).
- **Strengthening forest institutions:** Costa Rica has introduced institutional reforms that decentralize the administration and delegate many functions and responsibilities to forest professionals. The system is in its first years of implementation and needs to be

adapted and corrected. Evaluation of the activities of the forest professionals is under way in order to improve the system.

The Bank has wide possibilities for future involvement in the forest sector of Costa Rica, including:

- Projects and initiatives to protect biological diversity
- Consolidation and expansion of the PSA system
- Continuation of reforestation efforts
- Application of knowledge that has been developed to improve plantations
- Incorporation of good forest management practices in the natural forests that are now producing wood in order to make the supply from natural forests sustainable
- As the supply from plantations increases, it will be necessary to invest in the development of the forest industry in order to make the supply effective.



4

The Capacity for Innovation: The Underlying Principle

Payment for Environmental Services

One weakness in the current PSA system is that fossil fuel tax revenues go through the Ministry of Finance due to the constitutional principles of “unique accounting” and “centralized tax collection” (*caja única*) that require tax revenues to be included in the national budget. The total amount collected through the tax for PSAs has never been fully budgeted for its original purpose. The amount allocated to PSAs can vary greatly depending on the government’s budget deficit.

Table 4.1 proposes a ranking for the relative importance of environmental services of different land uses. There is still much discussion about how great a contribution to the environment each type of land use (agroforestry, plantations, and secondary forests) provides. Protection of natural forests, natural forest management, and secondary forests have a similar ranking and receive higher marks than plantations and agroforestry systems. It is more important to compare alternative systems, such as pastures and agricultural crops, that score much lower in carbon sequestration, water quality and quantity, biodiversity, and scenic beauty.

Attempts have been made, some in Costa Rica, to assign a value to environmental services before they gain a value in the markets. The CCT/WRI study calculated the depreciation of the forests, soils, and fisheries in the national accounts. Many of the valued resources were products

Table 4.1. Ranking of Environmental Services of Different Land Uses

Forest management categories	Environmental services				Total
	Carbon fixation	Water	Bio-diversity	Scenic beauty	
Agroforestry	2	2	2	1	7
Tree planting (exotic or native species)	4	2	1	1	8
Secondary forests	3	3	2	3	11
Natural forest management	2	4	3	3	12
Protection of natural forests	1	4	4	4	13
Pastures	1	2	1	1	5
Agricultural crops	1	1	1	1	4

Note: Contribution to environmental services: 1=low, 2=moderate, 3=great, 4=very great. The authors developed this ranking system.

like wood, fish, and mangroves, but forests also received credit for preventing soil erosion and maintaining the capacity of soil to grow crops.¹⁸

In 1993, the World Bank prepared the Forest Sector Review for Costa Rica.¹⁹ The review is the first attempt by the Bank to calculate the total value of Costa Rican forests (table 4.2 shows the economic value of various forest activities according to the Bank).

- According to the Bank, the value of services can be calculated by discounting the flow of yearly rents and can be expressed as an annual rent value.
- Twenty-eight percent of the rent corresponds to market values (especially of wood) and 72 percent to non-market values.
- In the most pessimistic distribution of benefits, 66 percent of the environmental services of forests are enjoyed by the global community and only 34 percent by Costa Rica.
- The cumulative annual rent is US\$208 million, of which US\$137 million is enjoyed by the global community without compensation for Costa Rican farmers, and US\$71 million is received by Costa Rica.

The study has some weaknesses. First, it considers only 1.3 million ha of primary forests, while secondary forests, intervening forests, and plantations also provide environmental services. It also exaggerates the value of carbon sequestration. However, the study does highlight some important points: the value of environmental services is high, the global community receives the major benefits of these services,

Table 4.2. Total Economic Values of Costa Rican Forests, 1993

Product or service	Total value (US\$M)	Value per ha (US\$)	Value/ha/year (dollars at an 8% discount rate)	Base
Carbon sequestration	1,098	845	68	1.3 mil ha
Sustainable logging	403	620	50	650,000 ha
Existence and option value	383	295	24	1.3 mil ha
Ecotourism	272	209	16	1.3 mil ha
Hydroelectric power	36	207	17	174,227 ha
Pharmaceutical	3	2.3	0.2	1.3 mil ha
Urban and rural water	59	47	3.8	1.3 mil ha
Total	2,254	2,225	179	
Total market	403	620	50	28%
Total non-market	1,851	1,605	128	72%
Total Costa Rica	664	1,001	81	34%
Total Costa Rica	261	381	31	17%
Total World	1,612	1,224	98	66%

Source: World Bank 1993. Table A 4.1.

and owners of the resources that provide these services are not compensated for their full value.

The Bank issued another study at the same time that the Forest Sector Review was released²⁰ (table 4.3 presents rough estimates of environmental values from primary forests according to the study). The study arrives at a rent of US\$102 to US\$214 ha/year without considering the value of wood, and US\$170 to US\$282 ha/year by considering the value of wood. Although the values assigned by each study differ, both studies support the importance of payment for environmental services.

In 1996, MINAE commissioned the Costa Rican Tropical Science Center to conduct a study to obtain a scientific basis for assigning a value to environmental services. The center recommended payments for all four environmental services. The study distinguished between primary and secondary forests, departing from the assumption that secondary forests provide fewer environmental services than natural forests (table 4.4). However, the study did not reveal the criteria that are used to distinguish between primary and secondary forests, or how compensation should be calculated for reforestation, forest management, forest conservation, or agroforestry systems.

Table 4.3. Rough Estimates of Environmental Values of Primary Forests

Types of benefits	Average annual dollar value (per ha)
Hydrological benefits	
Urban water supply	2.3–4.6
Loss of hydroelectric productivity	10.0–20.0
Protection of agricultural lands	0.25–2.0
Flood control	4.0–9.0
Subtotal	16.55–35.6
Carbon sequestration	60.0–120.0
Ecotourism (recreation or non-consumptive values)	12.56–25.12
Future pharmaceuticals (optional value)	0.15
Transfer of fund (existing and optional values)	12.8–32.0
Total	102.2–213.7
Net present value (8%)	1,277.5–2,671.3

Source: Kishor and Constantino 1994.

On February 26, 1997, MINAE specified PSA amounts (table 4.4). The World Bank and CCT studies suggested fixing a quantity per hectare and year or a single payment for one full rotation or cutting cycle. Instead, MINAE fixed a payment for environmental services for a period of five years and as a percentage of the costs of establishing and managing different kinds of

forests. This amount is intended as a lump-sum compensation for all environmental services. This decision was made to avoid disrupting CAFs, CAFMAs, and CPBs. However, the system should change to a rent payment of a net present value payment to match practice with theory.

Why PSAs Were Introduced

PSAs were introduced in Costa Rica for five reasons. First, according to the Structural Adjustment Program, distortions introduced through subsidies such as CAFs, CAFMAs, and CPBs should be eliminated. Second, the goal of PSAs is not simply to lighten the burden on the public budget, but also to incorporate the “polluter pays” principle to shift the burden to the beneficiaries of environmental services. Table 3.4 shows that the government absorbed the entire burden, via the public budget, of promoting the forest sector. Subsidies were a necessary incentive for reforestation activities since the revenues from traditional forest products, especially wood, were largely insufficient to make these activities competitive with other types of land use. These subsidies reached US\$100 million between 1979 and 1996.

Third, subsidies had at least two negative consequences for the forest sector. They perpetuated the image of a poor sector—a deficit-plagued

branch of the economy dependent on uncertain and irregular state subsidies. They also encouraged a fixation on a single product, typically wood, valued in monetary terms, with a tendency to neglect other forest services. Subsidies also created dependency on the government.

Fourth, the analyses show that private landowners must be paid for environmental services to the national and international communities; otherwise, private landowners will mine the forests or convert their land to other uses.²¹

Finally, one goal of PSAs is to attach noticeably greater monetary value to environmental services, which hitherto have been largely ignored. The payments should have a positive effect on forest management: When a forest owner receives payment for environmental services, he will give greater consideration to managing his forests and be less inclined to change to other land uses.

Funding for PSAs

The 1996 Forestry Law, Article 69, allocates one-third of the revenues from the fossil fuels tax to PSAs. In 15 months, nearly US\$75 million in tax revenues were generated, but the promised one-third, or US\$25 million, has not yet been used for compensatory payments. Theoretically, the tax could yield up to US\$19.8 million annually. However,

Table 4.4. Findings of the TSC Study on the Value of Environmental Services: Recommended Compensatory Payments in US\$/yr/ha

Environmental service type	Primary forest	Secondary forest
Carbon sequestration	38	29.3
Water conservation	5	2.5
Biodiversity	10	7.5
Natural beauty	5	2.5
Total	58	41.8

Source: Carranza et al. 1996.

Table 4.5. Payments and Payment Distribution for Environmental Services

Measure	Amount (\$/ha)	Period (yrs)	Year				
			1	2	3	4	5
Reforestation	540	15	50%	20%	15%	10%	5%
Management	220	15	20%	20%	20%	20%	20%
Forest conservation	270	15	20%	20%	20%	20%	20%

Source: FONAFIFO 1998.

the Ministry of Finance negotiated with forest owner associations payments of only US\$6.5 million to US\$7 million. Forest owners and their associations are lobbying for full funding, but most other Costa Ricans are unaware of the problem and therefore have not pressed the government to change its policy. Because they pay with their own tax dollars for services that the global community enjoys, private forest owners have a right to compensation. (Forest owners currently receive the amounts shown in table 4.5 for environmental services.)

The resulting revenues are administered by FONAFIFO, jointly managed by the state and the private sector. The Forestry Law allows funding for PSAs from a tax on fuels and other petroleum derivatives, public funds for CCBs, and revenues from selling Carbon Tradable Offset certificates (CTOs) to international buyers under the Joint Implementation (JI) mechanism.

Joint Implementation

JI is a unified effort by industrialized and developing countries to curb global climate change. Through this mechanism, industrialized countries have agreed to reduce their greenhouse gas emissions in compliance with the Framework Convention on Climate Change and to finance carbon reduction measures (such as reforestation, forest management, and forest conservation) in developing countries. Parties to the convention may count the amount of carbon sequestered and emissions avoided toward their national emission reduction targets.

The Costa Rican Office for Joint Implementation (OCIC) believes that JI is the most important potential financing instrument for environmental services. A functioning administrative structure is already in place. It has enormous funding potential and involves financially strong international beneficiaries. However, the future of JI is uncertain. The pilot phase is not yet complete and information about the carbon quantities bound through JI are not yet reliable.

Under JI, Costa Rica is trying to negotiate payment for global services by buying CTOs, the only environmental services traded internationally. CTOs are financial instruments that can be used to transfer or sell greenhouse gas offsets in the international market. FONAFIFO, which is responsible for financing forest projects at the national level, disburses payments to forest owners, who then relinquish their right to market their forests' carbon sequestration. FONAFIFO also calculates the quantities of carbon bound by forest activities for OCIC. FONAFIFO

is trying to sell CTOs to countries and firms willing to compensate for their emissions through carbon sequestration activities.

The carbon market could yield between US\$6.5 and US\$13 million annually if the market begins to operate fully. However, success depends on progress made in the Climate Change Convention. The 1997 Conference of the Parties in Kyoto was promising because the parties accepted the forests as an efficient sequestration mechanism. However, lack of commitment by some countries exhibited at the 1998 Conference in Buenos Aires may hinder success.

Costa Rica signed a bilateral treaty with Norway in 1996 under JI to purchase carbon bonds for 200,000 tons of carbon at US\$10/ton, yielding US\$2 million for reforestation measures. These revenues already have been disbursed to forest owners. Another transaction with the government of the Netherlands reduces the equivalent of 500 tons of methane gas through anaerobic treatment of coffee waste and energy savings through biogas use. The Dutch government also financed reforestation of 78 ha, and will receive the corresponding CTOs for both investments (Castro et al. 1998).²²

The Center for Financial Products, Ltd. from Norway is negotiating with the Costa Rican government to purchase 1,000 CTOs for resale in secondary financial markets. The company also signed an exclusive contract with Costa Rica to broker 4 million tons of Costa Rican carbon over the next 20 years. In 1997, Costa Rica signed memoranda of intent with Switzerland and Finland to promote private investments in CTOs, and has received US\$500,000 from the World Bank (donated by Japan) to improve commercialization mechanisms for CTOs (interview with A. Gorbitz 1998). The carbon sequestration service may be viewed as a product innovation, but it must be accompanied by organizational and institutional innovations as well to make carbon sequestration a market commodity.²³

Improving the PSA System

Several changes would benefit the system. All revenues from the fossil fuel tax should go toward PSAs and the tax should be collected for an indefinite period (some people want to limit the tax to five years). An annual sum per hectare per year should be paid as long as the land remains under forest cover. OCIC should begin to recover the amounts paid to farmers for services received by the global community through the sale of carbon credits. The funds are then invested through FONAFIFO.

Even if this instrument receives global acceptance, other large forested countries such as Brazil could take Costa Rica's place as a partner to the industrialized countries. Due to this uncertainty, it would be better to tap many different sources of funding for PSAs rather than rely on JI revenues. A smoothly functioning administrative structure for JI would serve as a model for other national and international instruments to finance Costa Rica's forest sector. The country has a market-compatible instrument at its fingertips for controlling the consumption of primary resources via the prices charged for environmental services. Private sector consumers of environmental services, including waterworks, power plants, the tourist industry, and petroleum-processing companies, will likely pass on the additional cost incurred in paying for environmental services to the consumers of their products and services. The higher prices that result will encourage consumers to use these resources more carefully.

For this theory to work, however, certain problems must be addressed. First, the government could suspend payment of tax revenues to PSAs at any time. Therefore, the state's legal obligation to pay for these services must be clarified. Second, the Convention on Climate Change needs to support the payment of carbon credits by net emitters for carbon sequestration through JI projects. Finally, national and international compensation mechanisms must begin to function to maintain incentives for planting, managing and conserving forests.

Biodiversity

Biodiversity Defined

Smitinand (1995)²⁴ provides three categories of biodiversity. Genetic diversity is the variation of genes within species covering distinct populations of the same species or genetic variation within a population.

Species diversity is the variety of living organisms on Earth. Ecosystem diversity is the variability of habitats and biotic communities, including the variety of ecological processes within ecosystems.

Table 4.6. Known Species in Costa Rica

Variables in known species	Number		
	Mammals	Birds	Plants
All species	205	850	11,000
Endemic species	6	7	950
Endangered	8	10	456
Species by 10,000 km ²	120	496	6,421

Source: CCAD 1998. *Estado del ambiente y los recursos naturales en Centroamérica*.

Costa Rica has an extremely wide representation of plant and animal species and ecosystems, as shown in table 4.6. A total of 85,891 species have been identified in Costa Rica, representing 6 percent of the world's 1.4 million known species (CONABIO 1998).

The Value of Biodiversity

One of the main reasons for forest preservation, especially preservation of tropical forests, is their wide range of biodiversity. Biodiversity enhances the landscape and is part of the tourism infrastructure. According to Norton,²⁵ biodiversity has at least three types of value:

- *Commodity value*: Some species can be bought or sold in the marketplace.
- *Amenity value*: Many species improve our lives in non-material ways by providing services such as recreation.
- *Moral value*: Species are valuable in themselves, and their worth does not depend on their use.

Value also must be placed on the possibility of making a discovery that will make a species useful to humanity. Additionally, one species can be vital to the functioning of an entire ecosystem.

International biodiversity experts estimate that between 5 percent and 8 percent of the total world's biodiversity is found in Central American forests (INBio 1998). However, most landowners and countries do not view biodiversity conservation as having economic value. On the contrary, forest preservation incurs maintenance costs and the opportunity cost of not using the land for crops, pastures, or other income-producing uses.

Many species have been taken for free from tropical forests to produce new medicines and biotechnological improvements. The signatories of the Convention on Biological Diversity (CBD) in Rio de Janeiro in 1992 agreed on the need to change direction. These countries are working to protect biodiversity by using their resources more wisely. Several signatories are also negotiating bilateral agreements to protect biodiversity.

Using Biodiversity Wisely

The National Institute on Biodiversity (*Instituto Nacional de Biodiversidad*, INBio) argues that the best way to conserve biodiversity is to convert it into an instrument for sustainable human development.²⁶ Costa Rica's strategy for biodiversity conservation includes preserving representative samples of all species, learning more about biodiversity, and using plant and animal species in a sustainable way.

Many efforts have been made in Costa Rica to both protect biodiversity and generate income from it. Through tourism (the country's largest source of income since 1993), biodiversity is becoming marketable, which has led to increasing awareness in Costa Rica of the economic importance of preserving ecosystems. Moreover, knowledge about the value of the forest is spreading through contacts between Costa Ricans in the tourist industry and the tourists who visit the country. However, land preservation is expensive and it is not expected that tourism alone will generate enough income to cover the costs.

The other important method Costa Rica uses to market biodiversity is biodiversity prospecting. INBio was created in 1989 to implement this concept. Costa Rica's National Council on Biodiversity (CONABIO, 1998) estimates that approximately 83 percent of the country's have not yet been identified. INBio is researching these species and chemicals produced by plants, insects, and microorganisms that pharmaceutical, medicinal, and agricultural industries may use. Through biological prospecting activities, INBio has already been able to attract investments from the international business community. Companies such as Merck Pharmaceutical, BioCatalysis, Givaudane Roure, INDENA, AnalytiCon and the British Technology Group, Ltd. have contracted terms with INBio allowing these companies to benefit from biodiversity conservation and bioprospecting (INBio 1998). In turn, these agreements provide that INBio and the Costa Rican government will be paid if the pharmaceutical research leads to any new discoveries.

In another interesting approach to biodiversity prospecting, INBio is training and working with parataxonomists. Parataxonomists live in rural areas and in communities in the buffer zones of the protected areas. They have traditional knowledge about local biodiversity that is enhanced through special training. Parataxonomists retain knowledge about biodiversity in their communities and their work with INBio provides them with a way to earn a living.

Introducing biodiversity conservation into the economy requires organizational and institutional adaptations. Protecting biodiversity through the national park system demanded additional legislation to reduce uncertainty about land use. The Biodiversity Law is helping build trust and cooperation between the government and private landowners, promotes using indigenous knowledge about biodiversity, and established rules for conflict management in the appropriation of biodiversity. Although this law places Costa Rica far ahead of other

countries in biodiversity protection, the public must be better informed if biodiversity is to be considered part of the country's natural capital, and thus part of the capital of the national economy.

Other Innovative Initiatives

Watershed Management

According to MINAE, hydroelectric power generated nearly 86 percent of electricity in Costa Rica in 1991, and the country plans to increase hydroelectric use. However, such an increase will be possible only if forest resources—and especially forest vegetation in water catchment areas—can be preserved. Forests are essential for regulating the water flow in watersheds, without them fluctuations can be very large. Dry periods alternate with heavy rain periods during which, due to the absence of vegetation, soil erosion can increase, causing silt to build up in the watershed and the artificial lakes behind dams.

Therefore, it makes good sense financially to involve the electric power industry in conserving forest resources. The Costa Rican Institute of Electricity (ICE), run largely by the state, has a monopoly on the country's electricity supply. ICE likely will pass the costs of forest conservation on to consumers by raising prices and using the additional revenue to manage watersheds. As with the fuel tax, higher prices may provide an additional incentive for consumers to save energy.

Through a recent initiative, *Energía Global de Costa Rica S.A.*, a private hydroelectric company, signed a contract with FUNDECOR, an NGO for farmers in the watershed, and FONAFIFO. Under the contract, the company pays US\$10 per hectare per year to landowners in the Río Volcán and Quebrada Volcancillo Watersheds to protect or reforest the areas where the company's hydroelectric project is located (FUNDECOR-*Energía Global S.A.* 1997). Admittedly, the project is small compared to other hydro projects that may be developed in Central America. However, by financing watershed management through fees on electricity consumption and water use, the initiative may become an important precedent for future development. FUNDECOR will monitor the project and maintain a relationship with the landowners. FONAFIFO will handle the financial records and pay landowners once it has received approval from FUNDECOR. The total amount of this contract ranges from US\$1 million to US\$1.2 million.

Forest Management and Certification

National and international pressures forced a shift in forest policy from timber extraction and concessions for timber exploitation to certification of good forest management and custody of forest products. At the international level, environmental NGOs mounted a mass media campaign against international trade of tropical wood, supposedly the main cause of deforestation. The International Tropical Timber Organization (ITTO) also published criteria for the Evaluation of Sustainable Management of Tropical Forests in 1992. These guidelines are designed to maintain world trade patterns in tropical woods despite pressure from environmentalists, but also to promote sustainable management practices in accordance with international environmental agreements.

At the national level, certification of good forest management and wood products has emerged as an important and innovative option in guaranteeing forest management. Other products had been certified for a long time. The objective was to establish a system for ecological labeling of timber that would allow consumers to identify and purchase products from well-managed forest units. A third party verifies and provides written certification that a product, process, or service complies with specific requirements designed to protect the environment. Costa Rica is one of the first countries in the world that includes certification of sustainable management practices in its forest law.

Another NGO initiative developed for forest management is the Forest Stewardship Council (FSC), whose goal is to promote responsible environmental management of forest resources that is socially beneficial and economically viable. Companies that want to assure consumers that their forest management and their production processes comply with environmental requirements volunteer for certification. Important principles promoted by FSC are respecting national legislation and international accords; clarifying property rights of resources; respecting rights of indigenous, peasant, and other groups living within or close to forested areas; respecting the rights of local workers and adjacent communities; and planning all operations that will ensure forest sustainability.

Initiatives to establish the National Certification System are well underway, and should be completed in 1999. National certification will function as a quality control mechanism for forestry operations at low cost to entrepreneurs, who will only have to comply with new regulations. A National Certification Commission has been appointed by the government with representatives from universities, research centers, and

forest projects. The commission will approve criteria and indicators for the sustainable management of natural forests and plantations. Another committee also has been appointed to define criteria for the sustainable management of secondary forests. The commission must approve the committee's recommendations. Terms for accrediting companies and organizations that want to become certifiers have already been published. Once the certification groups are accredited, implementation of the national certification process can begin. These criteria will affect all of the country's forest management plans. Certification will be voluntary but the control over certified forest management units will be reduced as will the paperwork for permits and incentives for forest management.

Costa Rica already has six out of eight of Central America's certified projects: Flora and Fauna, FUNDECOR, PORTICO, Ston Forestal, American Tree Farm, and TUVA Foundation (De Camino and Alfaro 1997). The other two projects are in Panama and Honduras. Guatemala also is beginning to certify community concessions.

The processes to establish principles, criteria, and indicators for sustainable forest management are not limited to the FSC. The Helsinki and Tarapoto processes include countries that subscribe to the Amazon Treaty, and Lepaterique includes the Central American countries. After the UNCED Conference in 1992, the International Standards Organization (ISO) also decided to devise a series of norms (ISO 14000) for environmental management instruments in order to modify company practices.

A Fragile System

Costa Rica has developed an innovative and comprehensive system for forest management and conservation that may serve as a model for other countries. However, the system is in its nascent stages. Some problems requiring resolution follow.

- Sustainable development is still not an official national objective. The government does not give decisive support to forest management and conservation because it has not fully internalized the importance of the forests to production, exports, employment, and a sound environment. At the same time that environmental authorities are proposing advanced solutions for assigning value to forests, they are fighting internally for a clear commitment from the government to fund forest development. True success depends largely on the government's long-range commitment to forest policies. If the government assigns less value to the forest sector, it could greatly affect consolidation of these patterns. For example,

an important opportunity will be missed if the government reduces its support for PSAs before it is possible to consolidate a market mechanism for them in the international trade of CTOs. The work conducted by forest organizations and the forest supervisors depends largely on this payment system. The strategic function of organizations such as FONAFIFO, OCIC, and SINAC also would be at risk.

- As in many other countries, Costa Rica has not defined its forest sector needs or the necessary steps for forest conservation. Forestry should be a long-term activity but in Costa Rica, it is managed with day-to-day strategies. The country needs to define how much land should be used for plantations, secondary forests, and natural forests, and how much of the natural forest should be used for production and conservation. The size of the protected areas system and of the forests' direct production system needs to be defined.
- There is a trend in government favoring conservation over production, with increasing restrictions on producers. For example, the reserve of commercial volume that must remain standing after harvest has increased and certain species have been excluded from production without scientific support. There is a need for a clear land use plan that defines the purpose and destiny of the land. In this way, producers can work in areas designated for production without worrying about new constraints or changes in regulations.
- A positive perception of the current system needs to be transferred to—and empowered by—the public. The public is not familiar with PSAs as financial transfers from companies to private land-owners, and it is largely unaware that it is financing forest management and conservation through the fossil fuel tax. The public must be better informed so that citizens demand that the full amount of the tax be allocated to forestry measures.



5

Role of the World Bank

The policies of multilateral and bilateral agencies have strongly influenced national forest sector policy in Costa Rica. Forest sector activities have never been considered an economic alternative for most bilateral- and multilateral-funded projects.²⁷ A typical rural development project created incentives for developing the infrastructure of farms and food crops. Between 1950 and 1987, the World Bank approved loans for six rural development projects for Costa Rica—five for agriculture and one for rural roads (table 5.1). About two-thirds of the loan amount went to agriculture and one-third to rural roads. Between 1963 and 1980, other agencies in addition to the World Bank, such as the Inter-American Development Bank and USAID, also financed agriculture and rural development projects that directly supported beef production for export, thereby stimulating deforestation.²⁸

Since 1957, the Bank has approved 44 loans to Costa Rica for a total of US\$1,081.40 million (table 5.1), an average of US\$26 million per project. Structural adjustment, the public sector, and pensions have received four loans for US\$400 million, or 36.7 percent of the total. Electricity, communications, roads, and transportation have received 18 loans for US\$386 million, or 35.4 percent of the total. Agriculture has received six loans for US\$100.5 million, or 9.2 percent of the total. Environmental and forest sector projects began in 1998; they will receive two loans for US\$27 million, or only 2.5 percent of the project portfolio.

The figures shown for the loans are not large but are impressive enough for a small country like Costa Rica. Between 1987 and 1993,

Table 5.1. Operations of the World Bank in Costa Rica, 1957–99

Sector	Number of projects	Loans (US\$M)
Imports	2	6.50
Industry	3	26.50
Electricity, communications	10	182.40
Roads and transportation	8	203.60
Agriculture	6	100.50
Education	2	29.20
Mining and oil	1	3.00
Water	2	52.00
Exports	1	25.20
Structural adjustment	3	280.00
Health	2	42.00
Environment, forestry	2	27.00
Pensions	1	100.00
Public sector	1	20.00
Total	44	1,081.40

the rates of nominal protection for corn and beans were 41 percent and 31 percent, respectively, and the rate for logs was -50 percent. Although there are no figures for live-stock, they were surely positive.²⁹

The emphasis of World Bank, IMF, and IDB policies has changed during the past 20 years. Trade liberalization obliged governments to eliminate distortions in their policies. Most projects financing subsidized agricultural loans, tariffs, and tax reductions,

flexible exchange rates, and flexible interest rates have ended. Liberalization indirectly reduced the pressure for deforestation, but lower profits on annual crops have caused farmers to clear more forest land.

Structural Adjustment Loans (SALs)

Central America is following the international trends of globalization, free trade, and financial liberalization. The Latin American countries also are trying to access the North American Free Trade Agreement (NAFTA) to change external funding through loans and donations to more intensive commercial trade. In a move to create conditions that will intensify trade, the World Bank created Structural Adjustment Programs (SAPs), which have been present in the Costa Rican economy since the 1980s.

SAPs aim primarily to introduce financial stability, correct macroeconomic imbalances, and restore confidence in the economy. Other objectives are to introduce further policy reforms and support the country's productive capacity. Natural resource and forest considerations are notoriously absent, and only the "tico-style adjustment" (*ajuste a la tica*)³⁰ tries to counterbalance this absence with a defined natural resources policy.

The financial crisis of the 1980s and government mismanagement left Costa Rica with large budget and trade deficits, high inflation, and low levels of savings and investment. To remedy this situation, the first SAP was introduced during the 1982–86 Costa Rican administration, the second during the 1986–90 administration, and the third during the 1994–98 administration. Structural Adjustment Loans (SALs) were US\$80 million in 1985, US\$100 million in 1987, and US\$100 million in 1994 (table 5.1). Over 40 percent of World Bank loans have been SALs since they were introduced in 1983 (box 5.1).

Before the SALs, agricultural policies focused on guaranty prices, subsidies for agrochemicals, preferential interest rates, free technical assistance, and crop insurance. These incentives and other practices, such as the condoning of debts due to loss of agriculture production (e.g., Law FODEA), encouraged people to expand production systems, especially cattle ranching, to forested areas. Consequently, deforestation rates reached 30 and 40 thousand hectares per year. Meat exports grew from 1.6 percent in 1950 to 10.3 percent in 1984, with an average price of US\$2.6 per kilo.

Box 5.1. Principal Goals of Structural Adjustment Programs I (1985), II (1989), and III (1993)

In international trade

- Introduce a flexible exchange rate
- Reduce tariffs
- Eliminate taxes on non-traditional exports

In the financial system

- Maintain positive real interest rates
- Reduce losses of the monetary authority
- Introduce policies to modernize the national financial system, including the insurance and pension systems
- Liberalize the interest rate in the financial market

In agricultural production

- Introduce policies that achieve more efficiency in basic grain production for international markets

In public administration

- Reduce public expenditures
- Privatize subsidiary companies of the state-owned corporation CODESA
- Increase in government income through new taxes and improved efficiency in tax collection
- Maintain a constant real wage

Source: Segura et al. 1996.

The SALs introduced important changes in economic policies by the mid-1980s. For instance, they eliminated subsidies in the interest rates, eliminated price guarantees, privatized some state-owned companies, and forced cutbacks in government spending to control budget deficits. Bank credit for cattle decreased and meat exports fell to less than 8 percent, which coincided with a decrease of international meat prices to US\$2.1 per kilogram in 1994.

The indirect consequence of these structural adjustments for the forest was that deforestation rates decreased to about 18,000 hectares per year in the early 1990s, a trend that continued until 1997. In that year, a positive balance was achieved, influenced by the growth of secondary forest in land that had been abandoned or was previously used for agriculture.

Until 1996 it was necessary to clear land in order to have it titled, a practice that was further encouraged by the fact that only crops and animals on that land could be used as a guarantee for bank credit. This situation changed with the passage of Law 7575, which allows the use of forest as collateral.

Economic policies during the 1970s and 1980s had a clear anti-forest bias:

- With the original model of development, urban-based industry was protected and the agricultural sector produced the food necessary for city inhabitants and for exports; migrations from the rural to the urban areas were prevented insofar as was possible.
- To ensure such a role for the agricultural sector it was subsidized via guaranteed prices, preferential interest rates, insurance, subsidies on agrochemicals, and the State purchase of total production.
- Land distribution and titling was linked to the clearance of forest in such a way that deforestation was institutionalized as common practice.
- Economic policies encouraged productive activities in the rural area that concentrated on agriculture and cattle ranching and discouraged forest sector development.

The SALs, therefore, have helped to eliminate the anti-forest bias through new economic policies. The new model of development, also supported by the World Bank, promotes liberalization of the markets and exports of non-traditional agro-export products. This model introduced another set of policies that includes elimination of quota restrictions for imports of basic grains and beans, lowering of tariffs for imports, and the creation of incentives and subsidies (such as CATs, *Certificados de Abono Tributario*), to encourage the new export sector. Some of the export crops were produced in deforested areas (e.g., bananas

in the Atlantic region); these exports also require intensive use of chemical inputs. The final balance between SALs and the environment is complex, multifaceted, and generally indirect. Table 5.2 shows the probable impact of livestock policy on natural forests.

Assessing the impact of the SALs on the environment is complicated by the fact that the SALs have changed over time. They have evolved from the early 1980s when SALs neglected social and environmental impacts, to the recognition of social impacts in the mid-1980s, to the incorporation of social concerns and recognition of environmental impacts in the late 1980s, and finally to the consideration of complementarities and compensatory policies for social and environmental concerns in the 1990s. Although the policy changes wrought by the SALs have been important, however, they still have not explicitly assessed the relationship between the environment and the national economy. This is in part due to the hybrid policy process in Costa Rica and in part due to national politics, which includes interest group lobbying that modifies the agenda. It appears now that the pace of policy reforms has slowed and the innovations have ended. Two things will therefore be important in the future: First, further research is needed into the environmental impacts of the SALs, and second, environmental (and forest) considerations need to be explicitly included in future Bank loans, since even the Program Completion Reports of SAL I and II (Loans 2518 and 3005-CR) do not have a section for this purpose.

Bank loans for the agricultural sector have likewise not explicitly considered forest or environmental areas, or when they did (indirectly), they were linked to other macroeconomic or broad sector policy reforms. The Export Financing Fund (FOPEX) and other funds available for exports (e.g., Export Development Loan [Loan 2274-CR]), though sufficient for other activities, have not been promoting forest sector activities and lending systems. In other cases, loans that may indirectly benefit the forest sector (e.g., Agricultural Sector Investment and Institutional Development [Loan number 3447-CR, signed in 1992]) have been terminated because of the country's failure to comply with effectiveness conditions and critical delays in legislative procedures. Loan 3447-CR considered research in agriculture, land use classification, soil erosion programs, demarcation of national parks and reserves, land titling and settlement conditions for 23,500 parcels of land and technology transfer for small farmers. However, the loan was conditioned on the elimination of quota restrictions on the import and export of basic grains and beans, establishment of a maximum 20 percent tariff

Table 5.2. Summary of Policies for Livestock Development and its Impact on Natural Forest, 1954–94

Period	Policies for cattle production	Deforestation effects	Final results
1954–78	<p>Development of cattle production and meat for international markets</p> <p>Bank credit (an average of 22 percent of total agriculture credit). It reached close to 60 percent.</p> <p>Interest rate between 8 and 12 percent on average.</p> <p>Meat consumption in the USA market was growing. Exports to USA where above 95 percent of total during this period.</p> <p>Exports went from 4.6 percent in 1950 to 10.3 percent in 1984.</p> <p>Market prices stable at US\$2.6 per kilo.</p>	<p>Deforestation rates of 30–40,000 hectares per year.</p>	<p>Conversion of forest to pastures. The change was from 600,000 hectares of pastures in 1954, up to 1.7 million hectares in 1974.</p> <p>Deforestation of 847,000 hectares, from which 57 percent become pastures.</p>
1979–94	<p>Meat production in crisis. Herd reduction and abandon of pastures in many parts of the country.</p> <p>Percentage of credit for cattle ranching decreased within the agriculture loans load. From 34.3 percent in 1983 went down to 7 percent in 1994.</p> <p>Increase on real interest rate. From -7.8 percent in 1980 to 16.4 percent in 1990.</p> <p>Meat exports to USA decreased 13 percent. From 90 percent in 1990 to 86 percent in 1994. Total meat exports went down to less than 8 percent.</p> <p>International prices of meat decreased 15 percent, from US\$2.5 in 1986 to US\$2.1 per kilo in 1994.</p>	<p>Deforestation decreased to an average of 18,000 ha per year. It reached 8,000 hectares per year at the end of the period.</p>	<p>The herd and the pasture areas decreased. Pasture areas went from 2.4 million hectares in 1984 to two million in 1994.</p> <p>Secondary forests increased from 229,000 in 1984 to 425,000 hectares in 1994.</p>

on the import of basic grains and beans, and elimination of price controls on basic grains and beans. In this case, the Bank linked highly important specific investments related to natural resources management and social improvement to objectives more attuned to dealing with macroeconomic policies. In the end, neither objective was achieved.

Influence of the World Bank after 1991

Before 1991, there was no World Bank activity in Costa Rica's forest sector (table 5.1 and table 5.3). Since 1991, a total of US\$368 million in World Bank projects have been directed to Costa Rica. Of these, only two (with INBio and FUNDECOR) were related to biodiversity or forests after 1991, for a total of US\$7.5 million. Only in 1993 did the Bank prepare a Forest Sector Review. In 1996, the International Financial Corporation (IFC) of the World Bank Group established a small program for the sale of wood futures with FUNDECOR. INBio's Biodiversity Resources Development Project was established in 1998. There is a new Ecomarkets project under discussion with the Bank, the GEF, IFC, and the Prototype Carbon Fund.

Consistent with the Forest Sector Review and the Bank's emphasis on multisectoral approaches, in-depth forest sector reviews were conducted in other countries after 1991.³¹ Through 1994, the Bank conducted nine forest sector studies, compared with 15 before 1991. The reviews concluded that undervaluation of forests, a poorly regulated private sector, unwise promotion of alternative land uses, and macroeconomic policies have had significant impacts on forest resources. The Bank increased its review in countries demonstrating these effects, strengthening the case for policy reform and institutional change.

The Costa Rican Forest Sector Review confirmed many ideas, concepts, and policy proposals already under discussion, although it did contain some biased

Table 5.3. World Bank Credits Impacting the Environment and Rural Areas

Credit	Year	Amount (US\$M)
Agricultural credit	1968	3
Agricultural credit	1972	9
Agricultural credit and rural development	1977	18
Rural roads	1980	30
Agriculture	1985	3.5
Atlantic agricultural development	1987	26
Agricultural sector investment	1992	41
Biodiversity	1998	7
Ecomarkets	2002	20
Total		157.5

opinions and misconceptions. The paper also introduced many important ideas that influenced Costa Rican policy.

The Bank offered strong support for PSAs. The review said clearly that is difficult to capture the value of environmental benefits provided by forests. However, because the majority of these services are enjoyed globally, “The World should pay for the environmental benefits that Costa Rica produces.” The paper also provided figures that calculate the value of the 66 percent of the benefits that are global. From only 1.3 million ha in Costa Rica, the world accrues benefits of US\$119 million to US\$286 million. The report proposed a fee for hotels that profit from public reserves and devising contracts for pharmaceutical research that use biological resources. Further, it stated that the only mechanisms for identifying carbon sequestration values are grants from bilateral organizations, private sector and international NGOs, GEF funds, and debt-for-nature swaps (none of which are market mechanisms). The report also recommended transferring a minimum of US\$62 million to Costa Rica annually. The need for compensation still exists, and the measures suggested by the report are still considered “gifts” from the developed countries and not compensation for environmental services.

The Bank suggested improving the financial management of national parks as a means of protecting biodiversity. The report also proposed increasing entrance fees to the parks with higher fees for foreign tourists. Costa Rica adopted this recommendation. The price differential has been controversial, but the government reasons that foreign tourists can pay higher entrance fees if Costa Ricans are paying higher taxes to protect the forests. The increased fee has also yielded greater income for national parks.

The review recommended deregulating harvesting in forest plantations and the import and export of forest products, including logs. Both recommendations were adopted, although logs were exempted. This exception may reduce Costa Rican log prices due to foreign competition, especially for pine and other fast-growing species from the natural forests.

The Costa Rican government is considering several other ideas from the Forest Sector Review:

- The study confirmed that incentives for agriculture and pastures and the lack of incentives for forestry have been a principal cause of deforestation.
- The review accepted subsidies for natural forest management and suggested that they should be increased. The paper and related documents prepared by the Bank favored CAFMAs and calculated

a reasonable level of subsidy, considering the current CAFMA level. Depending on the interest rate, the subsidy could range from US\$779 to US\$781 per ha per crop rotation, with an annual equivalent of US\$117 to US\$156 per ha.

- The Bank suggested reorienting incentives to protect environmental values. Landowners who sign a management agreement should receive protection against expropriation and squatters, priority forest land titling and demarcation, protection against fires and pests, and compensation up to US\$50 per year. The forest law included most of these suggestions, although the amount of compensation is much lower.³²

The review called attention to issues such as obtaining funds for administering the system, ensuring that natural forest management is compatible with conservation objectives, establishing criteria for forest protection, and allocating institutional responsibilities in the Conservation Areas.

However, the document also included some biased opinions and misconceptions. First, the Bank strongly emphasized environmental protection over development, but the objective for developing countries should be sustainable development. Some analysts expect an exponential increase in wood exports when 150,000 ha of trees planted on plantations become mature, more than doubling the country's supply of industrial wood.³³ Large investments in expanding the forest industry are needed to make these exports possible, but the Bank put no emphasis on these vital production issues.

The Bank also views plantation subsidies as subsidies for private commercial activities that are environmentally insensitive and yield lower biodiversity or carbon sink benefits than natural forests. However, private commercial activities are necessary for a developing country, especially when they are compatible with the environment and promote social equity. The statement is biased, and fails to consider the important role of plantations in improving land use and increasing wood production. Moreover, plantations are not environmentally insensitive if the land was used for pastures or agricultural crops in forest soils. Plantations are more efficient carbon sinks than secondary, intervening, and primary forests. This kind of misconception should not appear in a World Bank document.

The Bank also mistakenly states that plantation subsidies will “forego [*sic*] the opportunity of maintaining or growing again a natural forest.” However, plantation incentives are not to blame for deforestation of natural forests. The lack of support for these forests is due to the lack of

incentives for them and to the abundance of incentives for other land uses, including agriculture and plantations.

It would be better for Costa Rica to invest in incentives for existing secondary forests than to change subsidies from plantations to natural forest regeneration. The government is trying to develop a balanced strategy for supporting plantations, forest management, and conservation. Both plantations and management of secondary forests need to be promoted under the objective of sustainable development. Forest plantations are highly profitable—even more profitable than cattle ranching at interest rates up to 15 percent. Indeed, since 1996, wood exports have outstripped exports of meat. With incentives, plantations have higher border prices than cattle up to an interest rate of 20 percent.³⁴ Therefore, reforestation is an attractive alternative to cattle farming in forest soils.³⁵

The Bank also recommended buying land from private owners, including farmers, cattle ranchers and communities, to protect biodiversity reserves. But such land purchases are another way of sending people away. Theoretically, it is the easiest way, but it does not promote sustainable development. The buying of private land excludes the possibility of integrating people into the management of protected areas, which has benefits for them. Costa Rica usually declares a protected area without consulting the public. Once declared, the land has many legal use restrictions and prices diminish as a result. This policy creates a competitive advantage for land purchasers who want to protect the environment and disadvantages for landowners. Low prices mean that farmers cannot recover by purchasing another area equal in size and potential. Landowners are obliged to leave the area once the contract is signed, but often, the land is not completely paid for or farmers receive no payment at all. Many farmers are forced to migrate to the cities, where farmers face an uncertain future. Allowing landowners in biodiversity reserves to exchange their land for land of a similar quality in similar conditions would be more socially acceptable. Another option is to allow private landowners to manage the reserves and share in the profits.³⁶

The Forest Sector Review presented a much more interesting set of policy recommendations than the Bank had previously developed. The document has had a positive impact not only Costa Rica but also on other Central American countries. However, World Bank biases reflected in the document reinforce some of the problems already present in the Bank and in its traditional country policies. The document shows that the Bank does not give priority to the forest industry.

The review's recommendations for protecting biodiversity reserves also leave great doubt about sustainability, efficiency, and institutional development in the forest sector. Instead of creating opportunities for the local and international economy by recommending initiatives favoring biodiversity protection, tourism, research, and other forms of community participation, the Bank recommended environmental protection measures alone. Because this alternative is economically inefficient and socially inequitable, it will be difficult to sustain in the long run.

The Bank has so far omitted natural forest management from its policies and financing practices. The "Forest for Life Initiative" between the World Wildlife Fund and the World Bank targets good forest management and certification of 100 million ha. This initiative could provide an opportunity to promote sound forest management in natural primary forests using certification as a monitoring tool.

Loans after the 1991 Forest Project³⁷

The Conservation Area Management Project: A Failed Attempt

The Conservation Area Management Project (CAM) was proposed to protect Costa Rica's biodiversity, balance the country's resource needs with global demands for biodiversity preservation, and help curb deforestation. CAM was never approved, but was expected to begin with a US\$70 million investment. The last version considered an investment of only US\$23.2 million, including a US\$15 million loan from the World Bank.

The natural resource management, institutions, and policies components of the proposed project contained the following elements:

- Identification and establishment of the boundaries of key protected areas
- Description of physical and economic characteristics of the country's natural resources through cartography and geographic information systems
- Improvement of forestry technology in forest plantations
- Analysis of sectoral policies and institutions to improve MINEREM's decisionmaking ability

CAM proponents believe that it was technically qualified. The project was a priority for the natural resource authorities and satisfactory to the Bank, which even selected CAM as an example for Latin America. Nonetheless, the Bank and the Costa Rican government failed to approve the project, for the following reasons:

- When CAM was proposed, many approved loans with bilateral and multilateral funding institutions were not executed.

- The government decided to curtail external loans, but made an exception with the CAM project in order to maintain a relationship with the Bank. However, the government wanted a small project that did not jeopardize counterpart funds or significantly increase an already heavy loan portfolio. On the other hand, the Bank pressed the government to support a large project that would be interesting to the Bank and the division in charge. This difference in perspective and a lack of understanding by Bank middle managers for the Costa Rican viewpoint was one of the main reasons the project was not approved.
- The Bank was concerned about conditions for implementing the project, such as approval in the National Assembly and the availability of counterpart funds.
- The formulation of the project by two different teams caused problems. INBio, which was in charge of project development, prepared the first draft with local consultants. The next draft was prepared by INBio again, but with more participation from Bank specialists.
- The project formulation was funded with a Project Development Fund (PDF) from Japan. Other projects wanted access to the PDF, diminishing the resources for project formulation. This appeared to reflect an unclear definition of internal priorities by the World Bank.
- The project apparently did not have enough internal support. INBio is not a government agency and MIRENEM and the Ministry of Science and Technology had secondary roles in the negotiations. The government never completely endorsed the project.
- The Bank did not accept fiduciary funds to manage the project. These funds should have been managed by communities and local organizations and not by MIRENEM.

The IFC and Sales of Wood Futures (1996)

A major problem in forestry is irregular cash flow. On plantations, income is earned only with commercial thinning and the final harvest. For natural forests, income is produced only once in each cutting cycle, which varies in Costa Rica from 15 to 25 years.

In response, FUNDECOR³⁸ developed a system to buy wood in advance from a forest management unit. The objectives of the system are threefold: Enable the owners of natural forests and young plantations to earn income before the year of the harvest, make money available quickly to improve the cash flow of landowners and reduce the risk of

land use changes, and avoid agreements between farmers and loggers that are unfavorable to farmers.

To fund the system, FUNDECOR asked for a loan from the IFC. The GEF provided US\$500,000 in loans through the IFC and the system was ready to operate in 1996. The IFC disbursement is placed in the Interfin Bank in a fiduciary fund. The Interfin Bank formalizes all sales contracts and makes payment to forest owners.

Wood futures are sold to fund natural forest management and reforestation activities. FUNDECOR pays between US\$75 and US\$125 per ha for forest management as a down payment for sales to the foundation of all the stumpage (the total volume of standing timber) authorized by the Conservation Area in the forest management plan. The amount of the down payment per hectare depends on the location of the forest, the volume of the effective harvest per hectare, and the proportion of semi-hard and soft woods in the inventory.

Before the harvest, FUNDECOR offers the wood in an open auction to get the best price possible. The loggers receive information about the volume of the harvest and the tree species it includes. The conditions of the sales contract are also established. Once the sale is finalized, the logger can begin harvesting the trees under the supervision of FUNDECOR, which requires low-impact logging methods. FUNDECOR then pays the owner for the full amount of the sale and discounts the advanced down payment, charging an annual interest rate of 11 percent.

Advance wood sales from plantations or reforestation activities are conducted differently. These agreements permit the sale of 40 to 80 cubic meters of standing wood, or 20 percent to 40 percent of the harvest. The price per hectare depends on the age of the forest before the harvest (the forest must be at least three years old), the ease of accessibility, and the proportion of semi-hard and soft woods. The age of the forest also determines the number of annual advances to the farmer (table 5.4 shows the payment schedule under different conditions). The agreement establishes conditions for the quality, diameter, and length of logs. It is assumed that the rotation age is 15 years. The owner of the plantation is responsible for delivering the sold wood the year of the harvest.

The project has benefited 39 forest owners with an approximate area of 1,100 ha and an investment of around US\$300,000. Table 5.5 presents the results in detail. Until 1999, farmers received around 60 percent of the funds. The project is very innovative, but it currently has a limited effect. More funds should be allocated to such initiatives, starting with a pilot project and moving to full-scale projects throughout Costa Rica.

Table 5.4. Annual Payments per Hectare

Age of the forest in years	Number of annual payments	Buying 20% of the stumpage		Buying 40% of the stumpage	
		Minimum amount (US\$/ha)	Maximum amount (US\$/ha)	Minimum amount (US\$/ha)	Maximum amount (US\$/ha)
3	9	46.3	70.7	92.6	141.5
4	8	55.3	84.5	110.6	168.9
5	7	67.0	102.4	134.0	204.8
6	6	82.9	126.6	165.7	253.2
7	5	105.3	160.9	210.6	321.7
8	4	139.2	212.7	278.4	425.4

The Biodiversity Resources Development Project (1998)³⁹

In 1994, INBio initiated the Total Biodiversity Inventory Project (INBITTA) in the Guanacaste Conservation Area to create an inventory of all plant and animal species. INBio asked Canada, Norway's Development Agency (NORAD) and Holland to participate, but the project was too complicated and, at a cost of US\$80 million to US\$90 million, too difficult to fund. INBITTA was replaced by the Biodiversity Resources Development Project at a cost of US\$11 million. The project was funded by INBio, which contributed US\$4 million, and the GEF, which contributed US\$7 million. The GEF funded the project because it addresses all three objectives of the Convention on Biological Diversity: conservation, sustainable use, and equitable benefit sharing.

The overall objectives of the project are to demonstrate that increased knowledge and information about particular species enhance their value

Table 5.5. Results of the Sale of Wood Futures by the FUNDECOR/IFC Project

Type of operation	Number of farmers	Area (ha)	Amount of commitments (\$)	Amount/hectare (\$/ha)
Natural forest management	19	836.42	124,096.50	143.70
Tree planting, small farmers	9	29.94	17,070.95	570.17
Tree planting, mid-size farmers	11	201.25	153,563.80	763.05
Total	39	1,094.61	294,731.25	--

and the marketability of biodiversity services. Specific objectives include developing a framework for undertaking a biodiversity inventory of priority subgroups in priority conservation areas, collecting and cataloguing activities related to the inventory, developing and testing potential applications based on the inventory, and strengthening the institutional capacity of INBio.

Eco-Markets: A Project under Formulation

The intent of the proposed Ecomarkets project is to preserve natural ecosystems of Costa Rica by developing national and global markets for environmental services such as the protection of biological diversity, greenhouse gas mitigation, and provision of hydrological services.⁴⁰ The project intends to assist in formulating mechanisms for international marketing and sale of Certified Emissions Reductions produced by small renewable energy projects in light of growing energy demands in Costa Rica as well as in the neighboring countries. The project will also assist in the implementation of environmental policies in the forest and energy sectors by helping to strengthen the offices within the Ministry of Environment and Energy (MINA E) as well as local and regional nongovernmental organizations responsible for the execution, promotion, supervision, and monitoring of the Environmental Services Payment Program.

Costa Rica's innovative efforts to achieve environmental goals through sustainable use of forest ecosystems requires the development of commercially viable activities, based upon the environmental services provided by the forests. Therefore, the project will assist in developing markets, attracting financing and investment, and consolidating the institutional framework for the following:

- Payments for environmental services at the global level for the mitigation of greenhouse gases, through the development of renewable energy projects and projects promoting forest conservation, regeneration, and reforestation
- Payments for environmental services at the global level relating to the conservation of biodiversity in privately owned buffer zones surrounding the protected areas which can serve to protect the Costa Rican portion of the Mesoamerican Biological Corridor
- Payments for environmental services at the local level for the hydrological services provided by forest ecosystem such as the protection of water quality and hydrologic stability in watersheds where small hydroelectric projects are operating or planned.

The Support Role of RUTA

The World Bank has also assisted Costa Rica through RUTA (Rural Technical Assistance for Agriculture), which provides technical support to ministers of agriculture in Central American countries. The role of RUTA, which is funded by the World Bank, bilateral donors, the IDB, and multilateral and regional donors, is to facilitate and advise in institutional development, project preparation, project implementation, and international trade issues. It has supported the formulation of the Conservation Area Management Project (CAM) and Ecomarkets. It has also supported the IICA in its request for GEF funding to support organic production for indigenous populations in the Talamanca region.⁴¹

A Judgment of World Bank Activities

The design paper for OED Review of the Bank's 1991 Forest Strategy and its Implementation defines the criteria to be used in evaluating World Bank forest activities in the case study countries: relevance, efficacy, efficiency, sustainability, institutional outcomes, and credibility. The analysis in this section is the perspective of the authors, not of the Bank, and is based on their assessment of the Costa Rica experience. The evaluation is summarized in table 5.6.

Relevance

The SALs were relevant insofar as they contributed to the elimination of an anti-forest bias in national policy. On the other hand, no analysis was made of the possible consequences for pollution and deforestation for certain land conversions. These contributions notwithstanding, the impacts of SALs cannot be isolated from the complementary actions of the Government of Costa Rica, which simultaneously implemented forest policies that gave value to the forests and helped to reduce deforestation. The Bank's 1991 forest strategy may have been relevant to the identification of tropical countries with forest problems, but it has not necessarily been relevant to the selection of appropriate actions and tools for addressing those problems. Deforestation, forest degradation, and the growing demand for forests and trees are problems in many developing countries, but that demand goes beyond what is required to meet basic needs. Demand for industrial wood is also growing beyond what can readily be met by trees grown on a sustainable basis in temperate forests. The production capacity of forests (natural and planted) in tropical developing countries is capable of meeting both basic and industrial wood needs. The developing and tropical coun-

Table 5.6. Summary Evaluation of the Implementation of the 1991 Forest Strategy in Costa Rica

	1991–94	1994–99
Strategy Implementation		
Did the Bank forest strategy for the country change from the pre-1991 period? ^a	No	Yes
Was change attributable to the 1991 Forest Strategy? ^a	No	Partly
Was the Bank's post-1991 forest strategy for the country responsive to the needs articulated by the country? ^a	No	Yes
Consistency of Bank strategy		
Was the Bank strategy consistent with the CAS? ^b	Partly	Partly
Did the country have a forest policy consistent with the Bank's policy? ^a	Partly	Partly**
Did the Bank follow the principles of its involvement in the sector?^b		
Multisectoral approach	Partly	Partly
International cooperation	Negligibly	Partly
Policy reform	Partly	Partly
Institutional reform	Partly	Partly
Preserving natural forests	Partly	Mostly †
Resource expansion and intensification	Negligibly	Partly
Were participatory approaches implemented? ^a	Negligibly	Partly
Was the 1991 Strategy implemented? ^b	Partly	Partly
Nature of Bank Interactions		
The forest sector strategy was implemented through: ^b		
Policy dialogue	Partly	Partly
Lending to forest sector	n/a	Partly
Lending to forest-related sectors	Partly	Partly
Forest conditionality in adjustment lending	n/a	n/a ^{††}
Bank application of safeguards	n/a	n/a
Bank Outcomes		
Bank's forest sector strategy from country perspective: ^c		
Relevance	Negligible	Modest
Efficacy	Modest	Modest
Efficiency	Modest	Modest
Is the impact of the Bank strategy in the country sustainable? ^a	Uncertain	Modest
The Bank's Impact ††		
Did the country improve its forest cover? ^a	Yes	Yes
Did the country improve the way it addresses forest sector issues? ^b	Mostly	Predominantly
What degree of impact did the Bank strategy have on the poor? ^c	n/a	n/a
Relevance for Future Strategy		
Does the Bank's 1991 Forest Strategy seem relevant from the perspective of the country? ^d		
	No	No
Is there government demand for Bank involvement in the forest sector? ^a	Unclear	Yes
Is there demand from NGOs, the private sector, and professionals for Bank ^a involvement in the forest sector?	Unclear	NGOs:Yes Private sector:Yes
How was the country's forest policy embedded in its overall growth and poverty alleviation strategy? ^e	Poorly	Poorly

a. Ratings choices: Yes, No, Not Applicable, and Unclear.

b. Ratings choices: Predominantly, Mostly, Partly, Negligibly, Not Applicable, and Unclear.

c. Ratings choices: High, Substantial, Modest, Negligible, Adverse, Substantially Adverse, and Unclear.

d. Ratings choices: Substantially, Partly, Negligibly, No, and Unclear.

e. Ratings choices: Very Well, Well, Poorly, Very Poorly, Unclear.

*The table may not be definitive for Costa Rica, where there are no World Bank forest projects and only a small loan from the IFC with GEF funding and proposed GEF funding for the Biodiversity and Ecomarkets projects.

** The country strategy includes the promotion of natural forest management in private forests.

†† There was no SAL after 1991, but the country followed a kind of SAP policy.

‡ Since there are almost no Bank credits in the period, the Bank impact is much more conceptual than physical.

‡‡ The country conducted its own policy. A Bank sector study helped to build policy, but 1991 forest strategy did not. It is therefore difficult to attribute impact to the Bank.

tries have huge areas of degraded land and other areas suitable for reforestation that have advantages over temperate forests. For example, growth rates for tropical *Gmelina* are much higher than for temperate pines and hardwoods. The World Bank forest strategy focuses too much on conservation and too little on the costs and benefits of forest uses.

The major problem Costa Rica has faced has been finding ways to give forests higher value (for conservation and production, planted and natural) in comparison with land uses like agriculture and pastures, which had been the main cause for the conversion of forests and heavy deforestation. The innovative solutions developed by Costa Rica demonstrate that incentives can be adjusted in a way that promotes management of natural forests. The Costa Rica Forestry Sector Review prepared by the Bank even offers a justification for such incentives. Surely there must be trade-offs between conservation and production, but incentives need to be created that promote both. Not encouraging sustainable forest management can be counterproductive and create a pressure for deforestation. Small forest farmers in Costa Rica have responded to incentives for both conservation and management, and it is fair to leave the decision to them if both uses can be environmentally sound.

Efficacy

The World Bank review of the forest sector in Costa Rica was particularly effective in helping to focus the country's forest policy and encouraging institutional reform, the valuation of the forest resources and the conception of PSAs, and the inclusion of incentives for natural forest management. However, the World Bank underplayed its support for an experiment with futures markets for wood that developed a tool to make forest use (plantations and natural forest management) more financially attractive. The activity could have had more impact had it been scaled up. The efficacy of GEF funding for the Biodiversity Resources Development Project remains to be seen, but its innovations are clearly an investment in learning lessons and an opportunity for Costa Rica to consolidate its biodiversity policy implementation. The same is true of the Ecomarkets project, which is expected to contribute to putting value on environmental services and developing market mechanisms for those services.

Efficiency

For the Bank and GEF, the investments in Costa Rica have been small in comparison with the learning they have generated for the Bank and

for the country. The “experiments” to support the Costa Rican initiatives are serving as tests to probe the efficacy and efficiency of innovative tools. To optimize the efficiency of those initiatives, it is important to bring the experiments to full implementation. Environmental services, including biodiversity, renewable energy production and carbon sequestration could be services with huge markets that could give value and conserve and increase the forest cover in many countries through a market mechanism, as the Bank has long argued. But again, is important to have an objective view of the environmental services provided by plantations, forest management, and forest conservation, and to provide hard data that is not stakeholder biased for future developments through both the Biodiversity and the Ecomarkets projects. At a low cost, the Bank and the GEF can learn much about something that could have an enormous potential if well handled.

Sustainability

Because the Bank’s 1991 forest strategy was largely irrelevant in Costa Rica, there is no government “ownership” of the strategy. Sustainability is therefore not an issue.

The SALs unleashed many changes in Costa Rica, but any positive changes that have occurred (decrease in deforestation and increase in forest cover) are due to the sequence of institutional changes and policy reforms of the country. As already noted, the SALs paid little attention to environmental issues and the impacts of the loans on the environment have still not been analyzed. While the structural changes brought about by the SALs are themselves sustainable, nothing can be said about sustainable impacts on the forest sector.

It is difficult to say how sustainable the payments for environmental services will be. It is important for the balanced development of Costa Rica that a wide PSA policy succeed. Such an outcome would also be good for the Bank because it would provide a success story to help it argue in favor of markets for such services. The futures market for wood is still too small to be a complementary tool to the PSA. It needs to grow to a national scale and Costa Rica and the IFC both need to make an effort to reach this level.

Institutional Outcomes

It could be argued that the Bank has made conceptual contributions to the treatment of biodiversity and environmental services in Costa Rica, and through the Biodiversity and Ecomarkets projects can do much more.

The Bank has the analytical capacity to deal with those issues, but it apparently has insufficient capacity to absorb and learn from good practices in forest management. The Bank should be recruiting forest specialists who have worked with the private sector in Costa Rica and elsewhere, or should expose their forest specialists to the practical experience of managing forests with small and big farmers and with communities.

Costa Rica has substantial experience in forest management in the northern region and in the Central Volcanic Range with support of the government, bilateral projects, and training and research centers. Good forest management for some institutions has become routine. Similar experience is also available in Brazil, Guatemala, Honduras, and Bolivia and in countries outside the Latin American region. It seems that many stakeholders are overemphasizing the failures and underemphasizing the successes of forest management. The Bank must also learn from the good experiences and take practical steps toward good forest management and certification.

Credibility

The Bank is perceived as an effective player in forest-related issues in Costa Rica because it has supported and provided conceptual inputs to many of the innovations that were pioneered in Costa Rica. But this kind of credibility is easier to attain than credibility based on ventures that try to verify models and strategies on a larger scale.

The Bank is also effective in working with bilateral donors and NGOs in Costa Rica. It is not as effective at understanding the views of private forest farmers and private people.

The Costa Rica experience shows that a comprehensive policy that discourages conversion of forests, encourages preservation where necessary, and promotes natural forest management can be successful. A similar approach could improve the forest strategy of the Bank.

The Conceptual Influence of the World Bank and Costa Rica

World Bank Influence

The most important influence of the World Bank on the Costa Rican forest sector was changes in agricultural policies that ultimately reduced deforestation, allowed natural forest management, forest conservation, and management of secondary forests and forest plantations. The second most important influence was the Forest Sector Review. Some parts of the review have helped support many of the radical changes that Costa

Rican policy has brought to forestry at home and abroad. The Forest Sector Review and supporting documents had the following impacts:

- They clarified and evaluated direct and indirect benefits of the forest.
- They established that an important proportion of the forests' benefits are global.
- They supported incentives for natural forest management.
- They supported experimental innovations.
- They handled biodiversity issues in a non-traditional way by supporting the Biodiversity Resources Development Project.
- They supported the Ecomarkets project.
- They supported the creation of OCIC and CTO trading.

The Costa Rican Influence

It is impossible to determine whether developments in forestry and natural resource management in Costa Rica have similarly influenced the Bank. However, the following changes in Costa Rican forest policies have been innovative and could serve to widen the Bank's perspective:

- The country's forest law has evolved since the 1960s into a comprehensive environmental code that includes the Environmental Law, the Biodiversity Law and the Forest Law.
- The Conservation Areas System has guaranteed the protection of a large proportion of the country's natural forests.
- A wide-ranging system of incentives for forest activities has evolved, beginning with reforestation.
- SINAC changed from a strongly centralized, command-and-control administration that separated responsibilities for forests, protected areas, and wildlife, to a decentralized and democratic organization that delegates decision making and budget authority to the regions with participation from citizens and communities.
- Farming organizations have been strengthened through incentives for small farmers that transferred technology from the government to the private sector.
- The "polluter pays" system was introduced through establishment of a fossil fuels tax to pay for the environmental services of forests.
- FONAFIFO specializes in the financial issues of forests and natural resources, disbursing PSAs, providing credits, etc.
- OCIC trades CTOs in the international markets and solicits funding for the conservation, management, and reforestation of more than 2.5 million ha.
- INBio assigns a value to biodiversity.

- The National Certification System provides national criteria for the management of forest plantations, secondary forests, and natural forests. Proper implementation of the system could help decentralize administrative control of forest activities.
- Responsibility for forest management has been transferred to private owners by the *Regentes*, foresters responsible to the government for application of government ordinances.
- The invention of CTOs could serve as a model for trading other environmental services.
- Ecotourism has benefited from many of these policies.

A Possible Role for the World Bank in Costa Rica

The World Bank could have a much more active role in the development of the forest sector in Costa Rica. The Bank could give important support in several areas:

- **Forestry industry:** As of 1998, more than 147,000 hectares of trees had been planted in Costa Rica, most of them between 1988 and 1995. This suggests that between 2000 and 2005, it will be necessary to increase installed processing capacity more than five times. This will require increased investments in the timber milling and drying industry of approximately US\$60 million. This investment does not include secondary wood processing, which would make the figure much larger.
- **Purchase of future wood:** An important limitation to reforestation in Costa Rica has been the lack of cash flow for small and medium farmers who reforest and after the fifth year, when the forest incentives have been fully disbursed, do not have any more income from the forest planted. To solve this problem, some small and medium farmers are cutting high-quality trees that are easier to sell in the market and leaving the worst trees for the future harvest and thereby decreasing the profitability of the plantation. The IFC-FUNDECOR project, which addressed this problem, has concluded with a very positive experience. A new project of this kind, under FONAFIFO, is needed to extend the experience to the whole country.
- **Accelerate and approve the Ecomarkets project:** Ecomarkets would provide the support necessary to fortify the financial strategy that the country is trying to consolidate. In the third component, the Prototype Carbon Fund (*Fondo Prototipo de Carbono*), it would be advisable to include not only mitigation through renewable energy production, but also through forest activities.



6

Conclusions

What Makes Costa Rica Different?

Costa Rica is an exception in many senses. It is a democracy, with many of the problems of an imperfect system, but with a long tradition. It is one of the few countries in the world that used its “Peace Dividend” to fund sustainable development. In 1948, the Costa Rican Constitution prohibited an army. The absence of a military budget has allowed the government to channel more funding into education, health and communications.⁴²

In 1993, Costa Rica was ranked ninth among developed nations in the rank of the Human Development Index (HDI)⁴³ and forty-second in the world. Some of the indicators that support this ranking include a life expectancy of 74.9 years and a literacy rate of 92 percent. Ninety-seven percent of Costa Ricans have access to health services, 94 percent to treated water, and 97 percent to sanitation. Unlike many other Central American nations, Costa Rica is not mired in poverty and the government has the leisure to turn its thoughts to formulating policies that support sustainable development.

Costa Rica has other characteristics that make it exceptional in the region. Property rights in forested areas are very secure compared to other countries. In addition, the entire population has access to education, which has contributed to a strong capacity for analysis, coordination with others, and enterprise. It has also allowed social mobility and created a large middle class, which participates actively in policymaking

processes. Furthermore, these characteristics have allowed the country to be relatively successful in solving problems such as the presence of a large expatriate community, which brings different cultural and institutional behavior. Another feature of Costa Rica is its mixture of easy access and institutionalized peace, which helps attract large groups of tourists, especially from the United States and Europe. Together, these elements (and many others) interact to create a “learning economy” in which innovations for economic development can thrive.

Some of the features that have provided the basis for positive forest sector development in Costa Rica include the following:

- Land ownership is clear in most cases. Private forest ownership is well established.
- Costa Rica has many long-standing and innovative training, research, and information dissemination institutions and projects. The University of Costa Rica, the National University and the Instituto Tecnológico of Costa Rica offer degrees in forestry and biology. CATIE has an internationally renowned research program in natural forest management and a graduate program in natural resources and forestry. INCAE has a graduate program in the administration and management of natural resources. NGOs like INBio, FUNDECOR, the Scientific Tropical Center, and the Organization of Tropical Studies make important contributions to the forest sector.
- Technologies are available to plant, conserve and manage forests. Bilateral projects, such as PROSIBONA and TRANSFORMA of COSUDFE, COSEFORMA of GTZ, and DFID of the United Kingdom have promoted improved natural forest management among farming associations. There have been reforestation projects with farmers for many years.
- There are many well-trained professionals in forestry and natural resource management. There are more than 500 forest engineers and a similar number of biologists in the country, and many of the professionals in natural resources have graduate degrees.
- There are many organizations of forest owners at local, regional and national levels, including JUNAFORCA, COSEFORMA, AGUADEFOR, and APAIFO. These associations give technical advice in forest management and reforestation to their members and represent them in the policy dialogue.
- Costa Rica has a legislative framework that supports forestry and the will to track its development with serious tools. The country

has a project to monitor the state of the nation's sustainable development and has published five reports on the subject since 1994. The report analyzes social equity and social integration; economic opportunities, stability and solvency; harmony with nature; strengthening of democracy and good government; and primary relations, social relations and values. The report also analyzes the contributions of natural resources and forests to sustainable development.⁴⁴

The Dominant Vision of Economic Development

Costa Rica has transformed from a country with runaway deforestation in the 1950s to one of the world's foremost pioneers in reforestation, forest management, and forest protection. The predominant vision of development and economic growth in Costa Rica has been linked until recently with agro-export production, which has affected legal and institutional frameworks, economic policies, and land use decisions. The agro-exports model of the 1960s and 1970s was replaced by the import substitution model in the late 1970s. Since the 1980s, the promotion of non-traditional products has dominated the country's economic performance. Structural Adjustment Programs in the 1980s have greatly reduced deforestation pressures (although not for environmental reasons), but globalization and trade liberalization policies may have increased deforestation pressures because of the lower price of crops.

Through these economic development models, forestry has evolved from an inactive sector without private organizations, technology, or specialized education, to a proactive sector with multiple organizations that lobby for reforestation, forest management, and protection incentives, innovative financing instruments, and possibilities for trading forest services and products in the international market. The Costa Rican government contributed to the evolution of many forestry organizations, and promoted reforestation through incentives such as tax credits, direct payments and subsidized loans. In the past few years, civic organizations have become interested in forest conservation and natural forest management and reforestation. The Costa Rican public, too, has become more aware of environmental issues. Foreign funding agencies are also providing financial support and technical assistance for conservation and forestry projects.

Two Directions Influencing Process

The World Bank has had some influence on the forest sector in Costa Rica. Structural Adjustment Policies, though not directly aimed at forestry, have had an indirect impact. The Bank's Forest Sector Review included concrete ideas on issues such as valuation of forest services, forest policies, and incentives for natural forest management. Several small but important programs financed by the Bank also have influenced forestry. These include a small loan for the sale of wood futures, the GEF and World Bank Biodiversity Resources Development Project, and the Ecomarkets project currently in preparation.

Costa Rica probably has influenced forestry policies at the Bank and in other countries through the efforts it has made to protect its forests. The government rapidly developed incentives for reforestation, forest management, and preservation. The National System of Protected Areas was created. Legislation passed with at least three laws linked to forestry. The "polluters pay" principle was introduced to compensate carbon emissions with forest projects. PSAs were created. INBio was established to conduct biodiversity prospecting. OCIC was established to trade carbon emissions. CTOs were developed for trading carbon internationally. A national system to certify forest management was developed. The government has promoted ecotourism.

Achieving Sustainable Development

Sustainable development will not be achieved without institutional and policy changes toward more environmentally friendly production and better distribution of benefits. Important changes should be introduced in consumer habits, technologies, and methods of organization. In short, an entire institutional movement toward sustainable development should be introduced in the governing system of Costa Rica. To accomplish this, there is a need for continuous learning about new technologies, organizations, and policies. Such learning is acquired through interaction with international organizations such as the World Bank and with other countries, but also within the sector and through market mechanisms. The Bank should be open to developing policies supporting sustainable forest development rather than forest preservation alone. Costa Rica needs support now more than ever for developing a productive and environmentally sustainable forest sector that may provide alternatives for the country's long-term development.

Alternative options for managing biodiversity and other forest services are also needed. Property rights generally are not well defined in

relation to the need for production and innovation, especially in forested areas. This lack of clarity causes problems since the structure of property rights affects both the allocation of resources and the distribution of wealth in the economy. The solution to the problem is not simply to apply a receipt of “clearly defined and implemented property rights.” A good definition of property rights for natural resources (including forest services) as well as macroeconomic balance is important for sustainable development, but it is not the solution. A more socially acceptable practice would be to introduce biodiversity management on private lands or let landowners share the profits of management and the potential profits of future discoveries. Other common property alternatives also may be feasible.

Forest lending instruments and incentives are urgently needed for forest management. These could include longer-term financial alternatives and cooperative alternatives among NGOs, the private sector,⁴⁵ and financial institutions like FUNDECOR. Encouraging the use of standing forests as collateral for loans and selling futures in timber may be good options for developing forest plantations and forest management.

Costa Rican forestry policy is a mix of internationally influential policies and strong national ideas. This mix has not resulted in the best forest model, but it is certainly one that deserves support. Traditional recommendations that eliminate all forest incentives and institutional strengthening that emphasizes environmental priorities and traditional property rights will only close off potential alternatives to sustainable development. It is important to create opportunities for mutual understanding, as the Bank and Costa Rica are doing.

Is the Model Replicable?

Costa Rica may not yet have a completely integrated forest sector model, but it does provide a framework that may inspire other countries. However, all countries must consider their own conditions when adopting new policies and implement reforms at their own pace. In fact, other countries also have “learning economies,” based on their own unique characteristics, that allow the emergence of innovations. Care should therefore be taken to allow free adaptation of imported innovations tailored to the specific characteristics of each country. In other words, innovations are the result of a dynamic process of interaction between some basic elements rather than the sudden emergence of new ideas.

“Champions” of innovation are also important. In Costa Rica, a few strong leaders who knew the importance of environmental consider-

ations in economic processes and policies happened to come together and legitimize their ideas just as the World Bank was starting its initiatives. These leaders facilitated and optimized policy learning.

Sustainable Development as a National Objective

The basic conditions that are present in Costa Rica are difficult to replicate in other countries. In 1994, the Costa Rican government declared sustainable development to be a national objective. The majority of policies during the past five years have not been favorable to sustainable development, but the dialogue that followed the declaration has made many decision makers aware of its importance. Countries that want to improve the quality of their development would benefit from a similar dialogue.

Dividends from Peace

Considering its size, Costa Rica has made large investments in education, health care, communications, and natural resources using money once spent on the military. Many Latin American countries are poor and politically unstable due to the lack of resources and often to the destabilizing role of the military. These problems have been evident in countries such as Paraguay, Venezuela, Argentina, Chile, Honduras, and Guatemala. Some people favor changing the military's role, allowing it to become proactive in forestry and natural resource issues and assist in technical training. The international community should consider dismantling the armies (at a pace that allows reallocation of retired soldiers) as seriously as it considers the protection of biodiversity.

The Protected Areas System

Costa Rica has successfully developed a protected areas system that has a minimum of infrastructure and an institutional presence in each region. The system's value to the country is not questioned. Many Latin American countries have a protected areas system on paper, but many of these areas are deforested or in the process of becoming deforested. Other countries could replicate Costa Rica's system with an income generation policy and by delegating administration partially or fully to third parties.

No Discrimination between Forest Uses and Forest Owners

The country's philosophy regarding forestry is to assign all forest soils and forest types a value, and to let the owners decide which strategy of sustainable management to apply. There is no emphasis either on conservation or on industrial use, and incentives are available to all kinds of farmers and communities. Other countries generally only have reforestation incentives.

Payment for Environmental Services

Many countries could find internal means, such as Costa Rica's fossil fuel tax, of paying forest owners for environmental services. The World Bank and the Regional Development Banks should act as intermediaries to market those countries' CTOs. Costa Rica is proposing in the Ecomarkets project that the Bank and other financial institutions receive CTOs as payment for loans and that countries should receive CTOs for payment of its international debt. Certification would then have a practical value at the global level.



Annexes

A. Supplemental Tables

Table A.1. Forest Cover in Costa Rica by 1997

Type of cover	Area (ha)	Percent of total area
Forest	1,885,782	36.92
Caducifolius forest	126,884	2.48
Mangrove swamps	40,848	0.80
Paramo	9,973	0.20
Total	2,063,487	40.40

Source: Survey of Forest Cover in Costa Rica. TSC-CIEDES 1998.

Table A.2. Area Balance, 1987–97

Parameters	Area (ha)
Net loss for the period	37,372
Caducifolius forests not included (50%)	63,442
Reforested area 1995–97	32,500
Net gain in forest cover	58,570

Source: Survey of Forest Cover in Costa Rica. TSC-CIEDES 1998.

Table A.3. Contribution of Silviculture to Agriculture Sector GDP at Current Prices, 1990-96

Areas	1990		1991		1992		1993		1994		1995		1996	
	Colones	%	Colones	%	Colones	%	Colones	%	Colones	%	Colones	%	Colones	%
Agriculture	56,248	66.86	85,636.9	70.67	106,394	70.89	12,535	71.70	166,028	75.55	199,139	76.56	226,017	76.03
Livestock	19,094	22.70	23,837.3	19.60	30,468.8	20.30	34,314	19.60	35,801	16.20	42,200.3	16.20	4,528	15.20
Fishing	2,562.5	3.05	2,839.8	2.34	3,354.9	2.24	3,614	1.07	4,976.9	2.26	6,777.8	2.60	1,177	3.96
Silviculture	6,216	7.39	8,962	7.30	9,860.5	6.57	11,495	6.58	12,959	5.90	11,974	4.60	1,421	4.78
Timber	3,736.4	4.44	5,457.3	4.50	6,271	4.10	7,926	4.53	9,378	4.27	6,741	2.59	8,221	2.77
Improvement	2480.5	2.95	3,404.7	2.80	3,589	2.39	3,569.6	2.04	3,581	1.60	5,233.2	2.00	5,990	2.00
AGDP	84,121.9	100	121,176.1	100	150,079	100	219,766.4	100	219,766.4	100	260,093	100	297,281.5	100

Source: Central Bank of Costa Rica.

Table A.4. Area Under Natural Forest Management, December 1998

Year	Forest incentives	Payment of environmental services	Total
1994	6,407	0	6,407
1995	8,587	0	8,587
1996	0	0	0
1997	0	8,449	8,449
1998 ¹	0	9,436	9,436
Total	14,994	17,885	32,879

1. Needs field verification.
Source: FONAFIFO 1998.

Table A.5. Private Areas Under Forest Conservation, December 1998

Year	Forestry incentives	Payment of environmental services	Total
1995	17,024	0	17,024
1996	0	0	0
1997	0	94,484	94,484
1998 ¹	0	43,560	43,560

1. Needs field verification.
Source: FONAFIFO 1998.

Table A.6. Biodiversity in Costa Rica: Species Density by Taxonomy

Main divisions	No. of species described in the world	Expected no. of species in Costa Rica	No. of species already identified in Costa Rica
Virus	1,500	8,000	125
Monera	8,276	26,350	213
Fungi	62,150	65,000	845
Algae	26,900	4,350	513
Plantae	248,428	12,117	10,979
Protozoa	30,800	8,000	670
Animalia (invertebrates)	991,693	376,960	70,139
Animalia (vertebrates)	43,259	2,983	2,407
Total	1,413,006	503,760	85,891

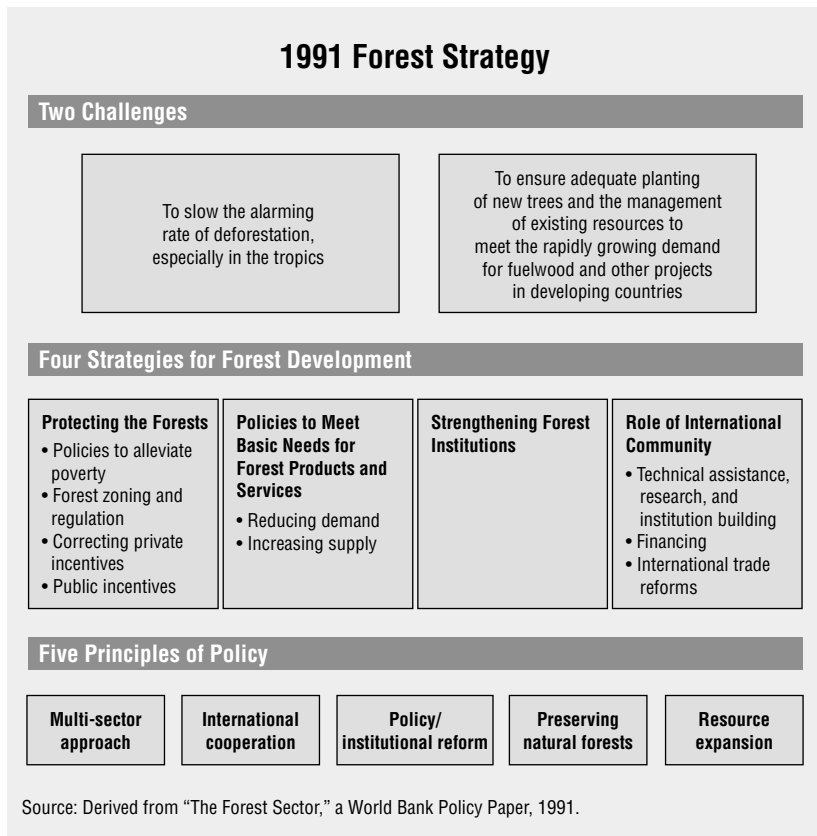
Percent of the total expected to be identified in Costa Rica: 17.05
Percent in the world also identified in Costa Rica: 6.08
Percent of biodiversity expected in the world that is expected in Costa Rica (13–14 million species): 3.6–3.9
Source: INBio 1998. *Estudio nacional de biodiversidad.*

B. The 1991 Forest Strategy

The World Bank forest strategy sought to address rapid deforestation, especially of tropical moist forests, and inadequate planting of new trees to meet the rapidly growing demand for wood products. These twin challenges were the consequence of five forces:

- *Externalities* that interfered with the free interplay of market forces with the potential to bring about socially desired outcomes
- Strong *incentives* to cut trees
- Weak *property rights* in many forests and wooded areas
- High private *discount rates* among those encroaching on the forests
- Inappropriate government *policies*, particularly concession arrangements.

The Bank's strategy therefore promised to promote the conservation of natural forests and the sustainable development of managed forestry resources. The strategy it outlined consisted of policies to alleviate poverty,



forest zoning and regulation, correction of private incentives, and public investments. The strategy also proposed reducing demand through investments in research and technology, increasing the supply of essentials through farm forestry, and increasing market efficiency. Government policies and programs, the strategy said, should aim to change the incentives and institutional structures that lead to excessive deforestation and inadequate tree planting and prevent the use of good practices in forest management. Under the strategy, international cooperation and assistance were to ensure that global externalities were internalized locally, and the efforts of governments and international organizations were to be coordinated.

Five principles were elucidated to underpin Bank involvement in the forest sector:

- Adopt a *multisectoral approach* in the design and implementation of forest operations.
- Support *international cooperation* in the formulation and adoption of legal instruments conducive to sustainable forest development and conservation.
- Promote *policy reform and institutional strengthening* by helping governments to identify and rectify market and policy failures that encourage deforestation and unsustainable land use.
- Finance operations that lead to socially, environmentally, and economically sustainable *resource expansion and intensification*.
- Support initiatives that *preserve intact forest areas*.

Fulfilling this commitment required five things of Bank-financed projects:

- Adoption of policies and an institutional framework consistent with sustainability and a participatory approach to the management of natural forests
- Adoption of comprehensive and environmentally sound conservation and development plans based on a clear definition of the roles and the rights of the key stakeholders including local people
- Basing commercial use of forests on adequate social, environmental, and economic assessments
- Making adequate provisions to maintain biodiversity and safeguard the interests of forest dwellers, particularly indigenous peoples
- Establishing adequate enforcement mechanisms.

C. Description of Costa Rican Forestry Organizations

The National System of Conservation Areas (Sistema Nacional de Areas de Conservación, SINAC)

SINAC is the government institution responsible for forest administration according to Forestry Law 7175. The General Directorate of Forestry, the National Parks Directorate, and the Wildlife Directorate were merged to form SINAC. It is comprised of 11 Conservation Areas and a central coordinating unit. SINAC is highly decentralized. Its functions are conducted through the Conservation Areas, and each area has responsibility for decision making and for defining its own priorities. The areas are defined by an Area Manager, who coordinates with a Technical Committee and a Regional Environmental Committee. One of SINAC's most important duties is to provide customer service.

The National Forestry Office (Oficina Nacional Forestal, ONF)

ONF is a nongovernmental public entity created by law. ONF is comprised of nine members. Two represent small forest producer organizations, two represent other forestry organizations, two represent the wood industry, one represents wood merchants, one represents artisans and furniture manufacturers, and one represents environmental groups. ONF's strategic objectives are to propose forest policies, promote the value of the forest, negotiate financial resources for development of the forestry sector, and support the actions of the forestry organizations.

The National Fund of Forestry Financing (Fondo Nacional de Financiamiento Forestal, FONAFIFO)

FONAFIFO was created by Law 7575 to finance forest management, reforestation, natural regeneration, forestry nurseries, and recovery of damaged areas through PSAs. FONAFIFO is also authorized to create other funding mechanisms that provide and accept credits for these activities and for industrialization and marketing of forest products. FONAFIFO's Board of Directors is composed of five members: two private sector representatives, one MINAE representative, one Ministry of Agriculture representative, and one representative of the National Banking System. FONAFIFO works with the National Banking System to allocate and manage its funds.⁴⁶

FONAFIFO also allocates the funds of the fossil fuel tax. In just two years (1996–98), the Fund already has provided for the reforestation of 14,000 ha, forest conservation of 138,044 ha, and forest management of 17,885 ha.

The Costa Rican Office of Joint Implementation (Oficina Costarricense de Implementación Conjunta, OCIC)

OCIC was created in 1995 through a cooperative agreement among MINAE, the Coalition of Development Initiatives (*Coalición de Iniciativas de Desarrollo*, CINDE), the Foundation for the Development of the Cordillera Volcánica Central (*Fundación para el Desarrollo de la Cordillera Volcánica Central*, FUNDECOR), and the Costa Rican Association of Electricity Producers (*Asociación Costarricense de Productores de Electricidad*, ACOPE). CINDE is a private sector organization in charge of attracting investments to the country. FUNDECOR manages natural resources in the Central Volcanic Mountain Chain. ACOPE is an organization of private energy producers, many of whom depend on the flow of water from the forests. OCIC is the Costa Rican office in charge of international sales of environmental services. OCIC promotes forest management and conservation projects, and negotiates the sale of carbon credits for FONAFIFO.

The Regional Environmental Councils (Consejos Regionales Ambientales)

The Regional Environmental Councils were created by Organic Environmental Law 7554 (*Ley Orgánica del Ambiente* No. 7554) and fall under MINAE's jurisdiction. The councils provide regional assistance for analysis, discussion, and control of activities, programs, and projects concerning environmental matters. The Regional Councils are formed by the provincial governor, one municipal representative, one representative of environmental organizations, one representative from each Development Council operating in the region, one representative of student government, and one representative from the private sector. The Forestry Law allows the councils to authorize the felling of trees in agricultural lands (up to five trees per hectare but not more than 20 trees per property). The councils also are authorized to issue certificates of origin for the transportation of wood. The councils are not yet fully functional, but they illustrate the democratization and decentralization of decision making at the regional level.

The Agronomists College (Colegio de Ingenieros Agrónomos)

The Agronomists College manages the Forestry Regents. According to Law 7575, only a Forestry Regent may execute a Forestry Management Plan, for which the Regent has legal authority. The relationship between the Regents and the Agronomists College is defined by Organic Law 7221 of the Agronomists College. Forestry Law 7575 assigns 2 percent of the total Forestry Tax to the college.

The Costa Rican Forestry Chamber (Cámara Costarricense Forestal, CCF)

CCF was formed in 1994 to promote the modernization and conversion of forest industries, support new business opportunities to expedite access into the international market, and formulate and negotiate policies with the Costa Rican government. The chamber now has 110 members—105 companies, which include forest owners, tree planters, loggers, merchants, and industries; and five regional forestry organizations, which include farmers. CCF is structured by subsectors: large-scale reforestation, forest management, primary transformation, secondary transformation, and consulting services. Each subsector has two representatives on the Board of Directors.

The National Rural Forestry Board (Junta Nacional Forestal Campesina, JUNAFORCA)

JUNAFORCA was created in 1991 to represent the organizations of small, rural forestry producers in order to obtain their participation in natural resource management and use. JUNAFORCA members include 56 grassroots organizations and five regional forestry organizations, with a total of 21,773 forestry producers at small and medium-sized forestry industries. The Board of Directors is formed by 12 members, who represent all of the country's regions. JUNAFORCA is also represented in the ONE.

D. Assessment of Loans from the World Bank

The Conservation Area Management Project: A Failed Attempt at a Forestry Project

Project Summary

The rationale for the Conservation Area Management Project (CAM) is based on the need to balance Costa Rica's resource needs with global demands for protecting biodiversity. CAM's primary objective was to support policy and institutional reforms to improve the management and conservation of Costa Rica's natural resources through SINAC.

At the national level, the project sought to strengthen the ability of key institutions in the forestry sector to quantify, manage, and analyze the country's natural resources. At the regional level, the project aimed to improve the management, infrastructure, and relationship with rural communities outside the protected areas. Had the project been successful, it could have provided important support for consolidating SINAC, its knowledge base, and its capacity for policy design and implementation.

CAM's formulation coincided with a declaration by the Costa Rican government to join the Global Sustainable Pilot Project. Through this project, the government agreed to avoid further resource degradation by promoting greater community participation, designing environmentally sound and financially viable production systems based on modern technology, promoting sustainable use of natural resources, protecting biodiversity, eliminating "perverse" policies, and modernizing public and private natural resource management systems.

The project proposed many of the ideas supported by the World Bank's Forestry Sector Review.⁴⁸ Before the review was completed, Costa Rica requested Bank support to prepare and implement a natural resource management and conservation project. The scope of the project varied considerably during its preparation because SINAC was created, which changed institutional conditions, and because external lending was sharply curtailed due to the country's high debt and low implementation capacity. The government declared that the moratorium would not apply to this project, but its size was greatly reduced.

CAM was expected to attract a US\$70 million investment, but ultimately attracted US\$23.2 million, with US\$15 million from the World Bank. The Bank chose to back the project for several reasons. First, SAL III supported decentralization of government institutions, environmental management in selected areas, and private sector development.

(CAM focused on the first two objectives, but not the last.) The project also aimed to help the government achieve two objectives: implement policy and institutional reforms in the forestry sector, and attain significant environmental gains through biodiversity preservation and sustainable management and protection of natural resources. The project also promised greater financial self-sufficiency for SINAC and financial benefits to rural populations that participated.

The natural resource management, institutions, and policies component of the proposed project contained four elements: identification and establishment of the boundaries of key protected areas, description of physical and economic characteristics of the country's natural resources through cartography and geographic information systems, improvements in reforestation technologies in forest plantations, and analysis of sectoral policies and institutions to improve MINEREM's decision making capacity. The Tempisque Conservation Area component addressed management and protection of natural resources in this area by the local population.

Commentary

The consultants who prepared this study feel that CAM placed too much emphasis on the environmental dimension, rather than the economic dimension, of sustainable development. For example, the project did not include management of natural forests for wood production, which is consistent with the Bank's forestry strategy.

Reasons for Failure

There are many different views about why CAM was aborted before it was submitted to the National Assembly in Costa Rica.

- Technically, the project was of high quality. The Bank even selected it as an example of a first-rate project in Latin America. However, the perception of people involved in preparing the project is that neither the Bank nor the government was really interested in supporting it.
- One of the supporting studies conducted during CAM's formulation was an analysis of project execution in Costa Rica.⁴⁸ The study found that many of the existing credits had not been executed, at a large cost to the country. The government had a project portfolio of US\$1.6 billion with disbursement problems and interest of US\$16 million to US\$20 million. This problem made it difficult for the government to accept a large loan from the Bank.

- A change in concept and strategy during the project's formulation created some difficulties. These changes were due in part to the government's desire to maintain a relationship with the Bank. The government scaled down funding for the project because it did not want to jeopardize funding from other sources or aggravate its loan portfolio problems.
- On the other hand, the Bank was pressing the government to accept as large a loan as possible so that the project would be of interest to the Bank, particularly the division in charge. Middle management at the Bank did not understand Costa Rica's perspective, which is one of the main reasons the project failed.
- The Bank was concerned about conditions for implementing the project, such as approval by the National Assembly and the availability of counterpart funds from the government.
- INBio, in charge of project formulation, prepared a first draft with local consultants. A second draft was prepared in coordination with INBio, but with more participation from Bank specialists. The change in authors resulted in a change of orientation and methodologies.
- The project was funded by a Project Development Fund (PDF) from Japan. Other projects funded by the Bank also wanted access to PDF funds, diminishing resources for project preparation. The Bank's definition of internal priorities was unclear between this and other projects in Central America.
- The project did not have enough internal political support. INBio was not a governmental agency, and MIRENEM and the Ministry of Science and Technology played secondary roles. INBio only informed the ministries about the project, and the government never had a sense of political responsibility for it.
- There were conceptual and strategic differences between the World Bank team in the field and in Washington, D.C., perhaps because the Bank also was undergoing internal reform. The feeling among the Costa Rican counterparts is that the environment within the World Bank was not favorable.
- The Bank did not agree with some of the solutions proposed by the government. For example, the Bank opposed a suggestion to create a fiduciary fund in the country's financial system to manage the project because the proposal was to be executed not by MINAE but by communities and local organizations. The bank wanted more involvement from MINAE than from those who would implement the project.

- Although the government initially tried to make an exception to the moratorium on new projects, the Ministry of Finance decided to honor the moratorium in this case.

IFC and the Sale of Wood Futures (1996)

FUNDECOR Activities

Forest owners are well organized in Costa Rica. There are more than 56 grassroots organizations and five regional organizations that together serve around 22,000 forest farmers. Small farmers belong to JUNAFORCA, CODEFORSA, AGUADEFOR, APAIFO, PROUDES and FUNDECOR are highly efficient regional organizations that operate in different areas of the country.

FUNDECOR is a foundation created to promote the conservation and rational use of forest resources within the Conservation Area of the Volcanic Central Range (ACCVC).⁴⁹ Although it is not an association for farmers, FUNDECOR began with the support of an AID project that continued to operate through a trust fund. The foundation also provides technical assistance and forestry advice to a group of 120 owners of natural forests and 230 farmers who are reforesting. About 75 percent of the farmers are members of the Sarapiquí County Agriculture Center (CACs), a local organization of small farmers.

A 1992 FUNDECOR analysis of the ACCVC found 112,945 ha of natural forests and a high deforestation rate of 6 percent per year from 1986 to 1992. FUNDECOR immediately initiated agreements for reforestation and natural forest management. Activities were financed first with incentives and later with PSAs. The foundation aims to involve 1,900 forest owners, manage 20,500 ha of natural forests and 10,570 ha of secondary forests, and reforest 5,500 ha with native species.

Farmers with FUNDECOR support applied improved management practices through low-impact logging and small-scale reforestation with native species. To develop negotiations and funding sources further, FUNDECOR allowed the group of farmers to be certified for good forest management of natural forests and reforested areas. The *Société Generale de Surveillance* (SGS) already has certified properties totaling more than 15,000 ha under the FSC system. FUNDECOR has been involved in many innovative activities and frequently has served as a pilot organization for them. In one innovative project, FUNDECOR forged agreements on watershed management with two power plants in the region. The energy company pays US\$10 per ha per year to forest owners in the watersheds. The funds are channeled through FONAFIFO.

In the heart of the protected areas, FUNDECOR activities include the following:

- Manage concession services, especially for tourists (e.g., operation of cafeterias and souvenirs stores, and clean up of protected areas).
- Manage and maintain the borders.
- Provide training, equipment, and facilities.
- Maintain the infrastructure of the national parks.
- Finance surveillance and protection.

In the buffer zones, FUNDECOR activities include the following:

- Support the ACCVC in controlling deforestation, harvesting, and reforestation in the region.
- Provide environmental education.
- Support reforestation with native species.
- Provide PSAs to farmers for reforestation, forest management, and conservation activities.
- Certify the forests and plantations by SGS under the FSC system.
- Certify the carbon stocks and carbon sequestration of forests certified by SGS.
- Auction wood harvested through management plans.
- Manage the sale of wood futures to improve the cash flow for forest management.

National activities include support of the Costa Rican Office of Joint Implementation (OCIC).

The Sale of Wood Futures

One of the major problems in forestry is irregular cash flow. Income for plantations comes with commercial thinning and the final harvest. Farmers who manage natural forests earn income from them once each cutting cycle, which can vary from 15 to 25 years. PSAs help improve the cash flow, but by themselves are not enough.

To improve the situation, FUNDECOR developed a system to buy the wood of a forest management unit before the harvest. The International Financial Corporation of the World Bank Group loaned US\$500,000 to FUNDECOR in 1996 to fund the sale of wood futures. All sales contracts are formalized and funds to forest owners disbursed through the Interfin Bank.

The objectives of selling wood futures are threefold: to design a model for a future market for wood that provides income to owners of natural forests and young plantations before the year of the harvest; make money

available to farmers quickly, thereby improving their cash flow and reducing the risk that they will change their land use; and avoid agreements between farmers and loggers that are unfavorable to farmers. Futures may be sold on wood from managed natural forests and reforested areas.

Natural Forest Management

FUNDECOR pays between US\$75 and US\$125 per ha as down payment for selling standing timber to the foundation. The wood to be sold is included in the forest management plan and authorized for harvesting by the ACCVC. The amount of the down payment per hectare depends on the location of the forest, the volume of the effective harvest per hectare, and the proportion of semi-hard and soft woods in the inventory. With this system, FUNDECOR offers an alternative to intermediaries—in this case loggers—that buy wood at low prices and undefined terms, and generally work against the economic interests of the farmer.

Once the sale is formalized and just before the next harvest, FUNDECOR offers the wood in an open auction to obtain the best price possible. The loggers receive the necessary information about the volume of the harvest and species harvested. The conditions for the contract are also established. Once the sale is finalized, the logger can begin harvesting under FUNDECOR's supervision. FUNDECOR then pays the owner the full amount of the sale and discounts the advanced down payment with an 11 percent annual interest rate. The yield of the fiduciary fund for the money deposited by FUNDECOR is 8.5 percent.

Reforestation

Selling the wood from plantations in advance of a harvest is more complex. The agreement permits the sale of 40 to 80 cubic meters of standing wood, corresponding to 20 percent to 40 percent of the harvest. The price per hectare depends on the age of the forest before the harvest (the trees must be at least three years old), the forest's accessibility, and the proportion of semi-hard and soft wood. The age of the forest also determines the number of annual advances the farmer receives. Table 34 illustrates different payment schedules.

The agreement establishes conditions for the quality, diameter, and length of logs. The plantation owner assumes responsibility for delivering the sold wood after the harvest. The average rotation period is 15 years. If the wood is not harvestable in that time, the term of the agreement can be lengthened, but the volume of the harvest must increase by 5 percent per year.

IFC Loan Conditions

IFC/FUNDECOR Loan Agreement 7327 was signed in June 1996. The agreement aims to protect biodiversity and reduce greenhouse gas emissions. The general conditions of the agreement follow:

- There is a 5 percent accomplishment fee on the amount of approved projects.
- FUNDECOR places the IFC disbursements in the national bank system and receives interest from the funds.
- FUNDECOR receives a maintenance fee of 0.5 percent for supervision and reporting.
- The interest rate on the loan is 2.5 percent.
- FUNDECOR can use 50 percent of the recovered funds to pay the loan.

IFC Loan Results

In two years of operations, the fund has benefited 39 forest owners with an approximate area of 1,100 ha and an investment of about US\$300,000. In early 1999, farmers received 60 percent of the funds. Also, trees were accepted as collateral for advanced payments for the first time, reflecting great progress in the value placed on forests.

It was difficult in the first year to convince forest owners to join the system. Owners now see that it functions well. FUNDECOR gained the farmers' trust when the first farmers received advances and FUNDECOR paid them the exact amount that was due.

Due to the sale of wood futures, farmers have received 11 percent to 30 percent higher prices for their wood and no longer depend on individual loggers. As a result, farmers are taking more responsibility for forest management.

Comments

Selling wood futures is a highly innovative form of financing forest operations and improving the ability of forests to compete with pastures and agriculture in forest soils. The sale of wood through auctions has also given farmers, through FUNDECOR, more power to negotiate prices with loggers and sawmill operators.

The system has great potential and should be applied wherever there is a guarantee of good forest management and high forest quality. Also, other organizations such as FUNDECOR can take similar responsibilities at a regional level, including APAIFO and CODEFORSA in the northern region, and CACH in Guanacaste. Administrative duties could be shared or transferred to FONAFIFO, which is responsible for financing forestry sector activities.

The system should benefit management of natural forests and plantations equally. Financing for reforestation is possible with trees three years of age; therefore, income is provided 12 years before the harvest. Income is provided only one year before the harvest of natural forests. Forest owners with approved forest management plans could receive cash advances at least five years before the harvest. This would assist owners of natural forests, who are more likely to change land use than owners of plantations.

IFC/FUNDECOR has developed a mechanism that could be used in other countries and that could be generalized in Costa Rica with more funds. Under the designated loan conditions, the risk of expanding operations in Costa Rica is not very high.

The sale of wood futures complements PSAs. Farmers have access to both mechanisms, especially if they are supported by an FSC forest certification. When the national certification mechanism is operating, it could guarantee generalization of the system.

The Biodiversity Resources Development Project (1998)

Background on Biodiversity Issues in Costa Rica⁵⁰

Costa Rica is in the forefront of biodiversity conservation and management. Figures 1.1 and 1.2 and tables 1.7 and 1.8 document the evolution and the importance of protected areas in the country. Through INBio, Costa Rica is trying to assign a value to biodiversity, which is associated with tourism, now the most important source of income in foreign currency. In 1997, 59 percent of foreign tourists visited the national parks.

Biodiversity is not only valuable for the country, but also to the global community. For these reasons, the government has articulated the following strategy: establish large areas for conservation, assess biodiversity in the conservation areas, and integrate the sustainable use of biodiversity into the intellectual and economic fabric of society.

The National Institute for Biodiversity (INBio), a nongovernmental, nonprofit organization, was established in 1989 to assess biodiversity. INBio developed a strategy to inventory biodiversity, began integrating collections of samples, and put information about biodiversity into an easily accessible format for public use. INBio and SINAC formed several working groups to discuss sustainable development of biodiversity in Costa Rica. Both institutions agreed that inventory activities should be based on community demand and cover a range of ecosystems and geographic locations.

The biodiversity inventory began in 1994 and has assessed biodiversity in most of the Conservation Areas. The project's overall objectives are to demonstrate that increased knowledge and information about particular species will enhance the value and marketability of biodiversity services. Specific objectives include developing a framework for a biodiversity inventory of priority subgroups in priority Conservation Areas, collecting and cataloguing activities related to the inventory, developing and testing potential applications, and strengthening the institutional capacity of INBio.

The project group selected four taxonomic groups that cover a wide spectrum of species and a broad range of niches and habitats: Hymenoptera, Coleoptera, Diptera, and Fungi. Because species in each group are represented at national and international levels, this information will be relevant to other countries. Species in these groups are expected to have many uses. The five Conservation Areas were chosen because of their high level of biodiversity, significance for the region, and importance for Costa Rica and Mesoamerica.

The GEF provided US\$7 million and INBio US\$4 million to fund the project. The GEF offered funding because the project addresses all three objectives of the Convention on Biological Diversity: conservation, sustainable use, and equitable sharing of benefits. Although the project document makes many references to the consistency of the project with the Convention and GEF objectives, the document does not mention how the project coincides with the Bank's forestry strategy (it would be useful for all World Bank and GEF projects to do so). The project will test methodologies and provide lessons and applications that can be applied worldwide, particularly in countries that share species with Costa Rica.

INBio has developed innovative approaches for large-scale inventories. One of the most interesting and helpful strategies has been the training of parataxonomists, who come from the communities around the Conservation Areas and collect and prepare biological specimens. By 1997, INBio had trained 61 parataxonomists, 20 technicians, and 25 curators; collected two million specimens; and identified an average of ten new species a month. INBio has also developed a computerized biodiversity information management system that is easy for the public to access.

INBio has been a pioneer in using the knowledge it has obtained through the inventory. The institute has initiated bioprospecting projects with several pharmaceutical companies, such as Merck Pharmaceutical and Bristol Myers Squibb. INBio has also developed bio-literacy projects in schools, created multimedia products to educate Costa Ricans, ex-

perimented with the use of wild species in integrated pest management, and supported tourism in the Conservation Areas through better knowledge of flora and fauna.

Some of the expected benefits of the project follow:

- Cost-effective methodologies for conducting biodiversity inventories
- Recommendations for the use of indigenous knowledge and sharing of benefits
- An inventory of four major taxonomic groups, including species that occur widely in Central and South America
- Rapid training methodologies for parataxonomists, technicians and curators
- Legal, contractual and financial models for revenue-generating and non-revenue-generating uses of the biodiversity in the inventory.

Background for the Project

Inventorying national biodiversity is a huge task. Eighty-three percent of species still need to be described. INBio has developed efficient methods for conducting a lower-cost inventory than first envisioned. Expanding the work of collecting, cataloguing, and identifying species would demand greater resources and managerial and technical capabilities.

INBio approached the GEF and other donors for funds to strengthen its institutional capabilities. The Norway Development Agency (NORAD), Canada and Holland provided a total of US\$13.2 million in grants, of which US\$4.7 million supports collecting and cataloguing activities of four species included in a project with the GEF. The remainder goes toward increasing training of parataxonomists and other specialists, improving infrastructure, expanding management systems, finding new ways to use biodiversity to increase revenue-generating opportunities, and increasing awareness about the contribution of biological resources to sustainable development. The GEF also provided US\$283,000 for a PDF grant for a project that would help INBio implement its biodiversity strategy.

Comments about the Project and the World Bank's Participation

INBio's original intention was to fund INBITTA, the Total Biodiversity Inventory in the Guanacaste Conservation Area, but an inventory of all taxonomic groups would have cost between US\$80 million and US\$90 million. INBio had already appealed to Canada, NORAD and Holland for funding. Given the enormity of the task, however, the World Bank did not support INBITTA.

Therefore, INBio changed its focus from traditional inventories of biodiversity to an inventory more oriented to the needs of the Conser-

vation Areas. INBio proposed concentrating on certain subgroups of four taxonomic groups. INBio also proposed another major change. Instead of considering only the Guanacaste Conservation Area, INBio proposed inventorying four other areas to obtain a wider representation of biodiversity in the country. INBio further proposed expanding the objectives to include the concept of sustainability and the use of biodiversity for commercial and non-commercial applications with participation from communities around the Conservation Areas. Despite some opposition, especially from the Bank, INBio finally convinced Holland, NORAD, and the Bank to support the revised project. The Bank's reaction was a positive signal that it can be flexible. The Bank also seems to have used its experience with the INBio project to be more flexible with other clients.

Initial Progress

It is still too early to evaluate the project, which is in the first of seven years. However, there are some interesting signs of progress:

- Three complementary projects are running with Canada, Holland, and NORAD. There is a Donor's Committee and also permanent monitoring by missions that review (rather than control) the projects, and give recommendations for their improvement.
- There is an agreement between INBio and SINAC to establish the terms of cooperation in the five Conservation Areas. A coordinating committee was established with representatives from INBio, SINAC, and each Conservation Area.
- An INBio/SINAC workshop was conducted to start the project. Participants suggested inventorying the areas owned by farmers, especially secondary forests, which are an important forest resource. They also suggested including the workshop's deliberations on social demands in the decision making process, and sponsoring meetings to discuss major issues like integrating scientific and social components into the inventory. Including secondary forests and landowners who are managing their forests for wood production is very realistic. This practice should be applied in the project more extensively, but also should serve as a lesson for the GEF in future projects.
- INBio is very concerned about including social demands in the Biodiversity Inventory, and has instituted annual workshops to determine these demands. One seminar has been conducted in each Conservation Area with the participation of more than 100 stake-

holders. Participants tried to identify the need for information about the selected taxonomic groups and establish priorities for taxonomic subgroups to be included in the inventory. The stakeholders in the Conservation Areas want to see how the project helps them and then propose funding for small projects of particular interest.

- The seminars have resulted in several small projects, including a harvest and post-harvest study of hanging wool lichens in forests, creeping lichens, and lichens growing in berry plants; identification and use of Royal Palm in Costa Rica's South Pacific; nesting of the Lora turtle; and fishing of green clams in Río Tempisque.

E. Stakeholder Comments on Costa Rica Case Study

Remarks by Alvaro Umana (INCAE), former inspection panel member, from the OED Forest Strategy Review Workshop, January 2000, Washington, D.C.

Until two generations ago, Costa Rica has always been a forest rich country. These two generations have squandered our nation's wealth. Today, two-thirds of Costa Rica has forest potential and only one-third has forest cover. At least we have made the turn-around. It might take 200 years to restore the situation at the rate of 700 acres per year which the OED Costa Rica study cites. We will have to increase this effort even more. Costa Rica is a small country but we do have a very open country, and many studies and publications exist about Costa Rica and that is why one always hears about Costa Rica's deforestation. One, however, hears less about the efforts and the experimenting that has been going on with forestry and incentives over the last thirty years. This effort has largely been paid for by the Costa Rican government, with some support from the U.S., the Dutch and the Swedes on debt-swaps.

Our efforts in forestry started with a system of fiscal incentives for reforestation that ran for about 15-16 years. This was very costly because only the people that pay taxes would plant trees to make deductions from their income tax. The government had to stop this because the finance ministry could no longer bear the burden—a burden that they did not know exactly how to calculate because they did not know how much people were going to deduct. We changed this to a system of reforestation for small peasants when I was minister and realized that this, too, was a mistake. We should have supported forest management instead.

We financed a lot of this with debt-swaps. We created the forestry fund and set up the basis for what later became our present system, known as payment for environmental services. The most important lesson we have learned is that we have to change the perception of the forest owners as to the value of the forests—command and control doesn't work. The only way that forest owners will keep the forests is if they see they have something of value in the standing trees. Our system of incentives has to move in that direction.

As to the history of Bank involvement, there was an agricultural loan that promoted cattle raising in the 1970s. During the 1970s also, the Bank financed the largest hydroelectric project in Costa Rica. I have publically mentioned many times that it was a huge mistake that there

was no investment in watershed management. Once the President of the World Bank, Mr. Conable, said in our conversation that it was not the World Bank that did not want to finance watersheds, as we had believed but the Costa Rican utility that did not want to take the loan to include the watershed. The good thing is that the Bank has changed its policy and now hydro-electric projects do consider the watershed as an integral part.

When I was minister, I also challenged the World Bank's country director for Central America and Mexico to do something in the agriculture and forestry sectors and that is how the 1993 forest review came about and that is when the Bank started to play a more important role in Costa Rican forest policy because the Bank's forest review was forward-looking and it supported Costa Rica's position. There has been support from an IFC loan and GEF and also support for certification. The Bank made a donation to Costa Rica for an international SGS certifier to certify 16 million tons of carbon which have now been certified. I think the case study provides excellent data. It is very detailed and has good institutional analysis.

The biggest problems are with interpretation. I think it is very important, when one analyzes incentives, to determine who pays and who benefits. We need to dwell a little bit more on this. Also, the best sequence is not from an inactive to a reactive to a proactive sector, but rather more in terms of how the systems of incentives themselves have changed. In the so-called inactive period prior to 1978, as described in the study, Costa Rica was not inactive. Everyone was actively cutting trees! The government was promoting land colonization and the bank was lending for cattle. I used to tease our foresters by telling them that they are experts in cutting because that is what everyone did.

We had a rapid evolution of loss and incentives in the last years and ended up with a system of payment for environmental services. These incentives are financed by a 5 percent tax on fuels. From an economic viewpoint, it internalizes the emissions of fuels because the tax is used for planting trees or supporting forest incentives. The problem is that the finance minister never met the 5 percent target. He is spending about 2 percent. Still it provides the conditionality that Costa Rica needs to market its carbon under the CDM or the climate change convention. The Bank has played a much more influential role since 1993 because it had been present since then and not on the wrong side as it had been until then. Now with the forthcoming Ecomarkets loan from the Bank related to a prototype carbon fund operation, there is a possibility to experiment and innovate further.

Remarks by Red Costarricense de Reservas Naturales

We are quite concerned about some fundamental errors of conception and bias in this document. Specifically:

1. There is no recognition of biodiversity and management differences between primary and secondary forests.
2. There is an almost complete ignorance of:
 - Private sector conservation efforts (although they are briefly mentioned in passing), which now conserve as much as 5% of Costa Rica's total area
 - Ecotourism as an extremely important economic force in forest conservation and in Costa Rica's economy in general, as well as its socioeconomic importance in forest-based communities, and
 - Ongoing and growing efforts to develop non-timber forest products as community-based and industrial incentives for conservation.
3. The document is written almost entirely from the point of view of commercial forestry as it was practiced many years ago.
4. The document is penetrated by a consistent bias against conservation, even by the private sector.
5. There is no differentiation between conservation stakeholders (NTFP users and prospectors, ecotourism, private reserves, community watershed protection, community reserves, forest landowners in general, etc.) versus exploitation stakeholders (commercial timber industry).

The presence of the World Bank and Bank Group related activities in Costa Rica in general has been very low, but especially in forestry. The only activities have been the 1993 Forestry Sector Review, a small US\$0.5 million IFC loan with GEF funds, and the Biodiversity Resources Development Project, also funded by GEF. There is a new project under preparation—Ecomarkets that includes bank lending and GEF funds.

In 1993, an attempt was made to prepare a project for the implementation of a Conservation Area, but the project failed. The Bank and the Government of Costa Rica wanted to have a project in the environmental area. But by that time the Costa Rican government had frozen the loans portfolio because of the fiscal situation and the fact that many already granted loans to Costa Rica were not being used. Costa Rica wanted a small loan, and the Bank wanted a bigger loan. The negotiations failed.

Two SALs were granted in 1982 and in 1986. A third structural SAL was negotiated in 1994 but was not finalized. The policy of the country followed along the lines of the 1994 SAL nonetheless. There are no

clear conclusions of the effects of SALs on the forest cover, because some of the measures discourage deforestation and others encouraged it. But since the 1990s, deforestation in the country has decreased, mainly because of the lack of profitability and elimination of subsidies for alternative uses of the forests, and because the forest policy gave incentives for reforestation and natural forest management. The final result has been a net increase in the forest cover.

The diagnostic made by the Bank through its forest sector paper corresponded to a part of the forestry policy of the government of Costa Rica. The sector paper's emphasis was on conservation. It also concluded that the past agricultural policies were the mayor cause of deforestation in the country. The document supported many of the elements of the local forestry policy by making total forest value calculations showing that most of the benefits produced by forests were environmental services received to a large extent by the global community moreso than by Costa Ricans. The mentioned vision was an important argument for the later development of a system of payment of environmental services developed. Also, the Bank suggested some instruments of policy: increasing the income from the National Parks system, deregulation of forest plantations, support to incentives to natural forest management, and allocation of institutional responsibilities to Conservation Areas. Some views of the forestry paper show biases to conservation by a strong emphasis on environmental protection—an argument against forest plantations and buying land for protection (a tool that has many negative social connotations). Consistent with the forest policy of the Bank, the document made the omission not to emphasize production, while plantations will be producing important amounts of wood that need policy attention in the very near future. But the country itself has also not a defined policy on the industrial utilization of its plantations.

Costa Rica has on its own developed many innovative organizations, mechanisms, and tools to implement its policy without the financial participation of the Bank: completion of the legal tools for the environment, biodiversity and forest law, development of a decentralized administration of the Conservation Areas, development of the Payment for Environmental Services system to encourage forest and conservation activities through replacing subsidies by transference payments from the private to the private sector , developing mechanisms to negotiate carbon and biodiversity, and many others.

As far as conservation development is concerned, the GEF Biodiversity Resources Project is being implemented, which also uses many innovative elements developed previously by INBio. The Ecomarkets project is under formulation and will try to consolidate mechanisms like the CDM and the negotiation of carbon credits.

Even though Costa Rica has reversed its deforestation to a large extent and has developed creative tools to manage forestry and conservation, the system still needs consolidation to be sustainable. The Ecomarkets project could be instrumental to the consolidation of the sector by incorporating tools like CTOs.

It can be concluded, then, that since the financial presence of the Bank has been very low, Costa Rica has followed its own path to conserve and grow forests, with significant conceptual support from the Bank.

Remarks by Jose Luis Salas Zuniga

The Bank has supported mainly conservation activities in Costa Rica. As indicated by the document, the emphasis of Bank activities should change to the support of forest management, improvement of cash flows from reforestation projects, and helping bring about Ecomarkets project. This is consistent with the notion that forests that have higher value are more likely to be conserved. The document indicates that the Bank was relevant in the changes that took place in Costa Rica's forest sector, particularly with regard to the 1991 Forest Policy. Nonetheless, is important to clarify that several governments in Costa Rica carried out actions in support of forest sector development on their own over a long period of time. It is interesting that the Bank acknowledges that it failed to learn from the good forest and conservation management practices that took place in Costa Rica. At the same time, it is important to emphasize that the Bank and other agencies have now learned from Costa Rica. Nonetheless, the funding for Costa Rica has been small. It is important that Costa Rica gets more support and that the Ecomarkets project gets approved in order to strengthen institutional achievements to date as well as the environmental services payment program.

Generally speaking, the document is correct and acceptable. There are some small inaccuracies in figures and concepts. It is clear that the Bank with its policies influenced Costa Rica and that Costa Rica developed its own mechanisms to significantly favor conservation and forest management. These mechanisms have been used or could be used by the Bank in other countries.



Endnotes

Chapter 1

1. R. Solórzano et al. 1991.
2. IMN/MINAE et al. 1996. Evaluación del cambio de Cobertura de la Tierra en Costa Rica 1979-1992. San José, Cost Rica.
3. TSC et al. 1998. Survey of Forest Cover in Costa Rica using LANDSAT Images.
4. Primary forests are untouched by man. Intervening forests have been harvested at least once for timber production. Secondary forests result from the natural regeneration of abandoned pastures or farmland. Forest plantations are forests that result from planned reforestation of land that was occupied by pastures or crops.
5. The analysis of the change in forested area is partial (only 1,608,459 ha), the caducifolius forest of Guanacaste (126,884 ha) was excluded because it was impossible to compare, and 13 percent of the country showed only clouds and shadows when the image was taken.
6. As stated by M. Alfaro 1998 in *La conservación de los bosques privados a través de la Red Costarricense de Reservas Naturales*.
7. Y. Mena et al. 1998. Contains tables with the years that protected areas were established or declared and the respective areas, totaling 120 units and 1,212,299 ha. (Figure 7 in the same publication lists 131 units and 1,260,859 ha—the graphic lacks 11 units and 48,560 ha. However, the growth rates are correct.)

8. This calculation assumes a growth of 10 cubic meters/ha/year, a wood density of 0.45 grams/cubic meter, a 1.6 ratio of stem volume to total biomass, and a coefficient of 0.46 tons of wood/tons of carbon.

9. The calculations assume 120 cubic meters per ha per year of wood for all types of forests, and the same coefficients of wood density, volume conversion, and carbon content for secondary forests.

10. ICT is promoting a Certificate for Sustainable Tourism (CST) to denote the quality of tourist businesses. Currently, only hotels participate, but the project has great potential once it becomes well known nationally and internationally, and once other members of the tourist industry decide to participate.

Chapter 2

11. Although deforestation during this period took a heavy toll on forests, there also was progress in the other direction. The conservation movement began during the 1960s and 1970s. Costa Rica's first national park (Cabo Blanco) was created in 1963. The first forest law was approved in 1969, and included the establishment of SINAC. The first environmental nongovernmental organization, *Asociación Costarricense para la Conservación de la Naturaleza* (ASCONA), was created in 1972. The National University (*Universidad Nacional*) created the School of Environmental Sciences in 1973.

12. D. Kaimowitz 1996.

13. R. Trejos 1992.

14. The World Bank and the Inter-American Development Bank (IDB) have also supported Costa Rica's livestock sector in order to promote economic growth by increasing beef exports.

15. Until the mid-1980s, groups favoring subsidies for livestock were still influential. Under the influence of cattle ranchers, new laws were passed that allowed ranchers to reschedule and reduce their debts, and through those mechanisms obtain subsidies worth US\$49 million (World Bank 1994).

Chapter 3

16. By institutions, we mean the norms, routines, patterns of behavior, customs, and general attitude of the public toward forests. By organizations, we mean the agencies, offices, chambers, associations, communities, and other types of arrangements made to manage the forest.

17. It is impossible to establish the exact amount in dollars because the loans were granted at different times with different exchange rates.

Chapter 4

18. R. Solórzano et al. 1991.
19. World Bank 1993.
20. N. Kishor et al. 1993.
21. Ibid.
22. More important than the small area is the fact that the agreement amounts to official recognition by the Dutch government of the value of environmental services.
23. O. Segura 1999.
24. T. Smitinand 1995.
25. B. Norton 1988.
26. R. Gámez 1999.

Chapter 5

27. Protection of 215,000 ha of forests between 1979 and 1995 was internally funded. Reforestation incentives began mainly with Costa Rican funds. There were a few external funding sources, such as the Forestry Development Fund, which was financed partially through debt-for-nature swaps with the governments of Holland, Sweden and Norway. However, this fund only contributed to reforestation of 7.3 percent of the total land area by 1995.
28. C. Brockett 1988.
29. R. Stewart et al. 1994.
30. The adjustment reflects Costa Rican reality, but does not strictly follow World Bank instructions.
31. World Bank 1994.
32. Currently, PSAs per ha are US\$570 for reforestation, US\$348 for natural forest management, US\$222 for forest conservation, US\$222 for natural regeneration, and US\$222 for plantation management. These values are calculated with an exchange rate of 270 colones/U.S. dollar because the amounts are fixed in colones. Payments are in different percentages over five years until the total amount is reached. For example, for a plantation with one forest management activity and a rotation cycle of 20 years, the amount of the PSA is US\$39.6/ha/year. For forest management and a cutting cycle of 20 years, the amount is US\$17.4 ha/year. Both figures are lower than the amounts suggested by the World Bank.
33. V. Watson et al. 1998.

34. From 1979 to 1986, Costa Rican incentives were targeted to wealthier people, companies, and farmers through tax deductions (affecting 24 percent of the planted area of large landowners until 1998). In 1986 and 1987, incentives such as CAFAs were established for small landowners as well (affecting 49 percent of the planted area of all owners regardless of size). Plantation incentives are now accessible to all farmers.

35. N. Kishor et al. 1993.

36. R. Vieto et al. 1995.

37. For detailed documentation of each project, see Annex C.

38. FUNDECOR is a foundation created to promote the conservation and rational use of forest resources. FUNDECOR provides technical assistance and forestry advice to a group of 120 owners of natural forests and 230 farmers.

39. The analysis of the project is based on the 1998 GEF/World Bank project document. Costa Rica. Biodiversity Resources Development Project. Additionally, management personnel for the project were interviewed. The project's two Semester Bulletins were analyzed and discussed. Information and concepts were taken from a January 1999 lecture by Dr. Rodrigo Gámez, "Biodiversidad y la Agenda de Costa Rica," to the participants of the First International Workshop on Analysis and Design of Forestry and Natural Resources Policies.

40. Information about Ecomarkets was provided by the RUTA office, the OCIC and from RUTA who supports Ecomarket project formulation.

41. RUTA 1998.

Chapter 6

42. President Oscar Arias opposed, with difficulty, the U.S. policy in Central America (exemplified by the Iran-Contra affair) of overthrowing governments in the region that supported U.S. opponents. The result was peace in El Salvador and Nicaragua and an improvement of the situations in Honduras and Guatemala. Costa Rica's strategy for peace in the region received a boost when President Arias received the Nobel Peace Prize.

43. The HDI in 1993 was 0.852 for Costa Rica, 0.928 for Barbados, and 0.045 for Guinea.

44. Government of Costa Rica/UNDP 1997.

45. The "private sector" should not be understood solely as the large landowners, industries and corporations, but also the small forest owners, cooperatives, farmers' associations, and communities.

Annexes

46. Information from FONAFIFO.

47. World Bank 1991, 1998f.

48. R. Solórzano et al. 1995.

49. FUNDECOR is well known in Costa Rica. This information was obtained through interviews with Franz Tatenbach, the Executive Director, and the management staff, including Carlos Herrera, Gustavo Solano, and Gretel Vargas. Information also was obtained from G. Solano 1998; FUNDECOR 1998; and P. González et al. 1998.

50. Analysis of the project is based on the GEF/World Bank project document, 1998. Management personnel for the project were interviewed. The two Semester Bulletins of the project were analyzed and discussed. Information was also obtained from a lecture by Dr. R. Gámez in January 1999, *Biodiversidad y la Agenda de Costa Rica*, to the participants of the First International Workshop on Analysis and Design of Forestry and Natural Resources Policies.



Bibliography

- Alfaro, M. 1998. *La conservación de los bosques privados a través de la Red Costarricense de Reservas Naturales*. San José.
- Brockett, C. 1988. *Land, Power and Poverty, Agrarian Transformation and Political Conflict in Central America*. Boston.
- Bulmer-Thomas, Victor. 1988. "El Nuevo Modelo de desarrollo de Costa Rica." *Ciencias Economicas* 8(2): 51–66. San José, Costa Rica.
- Camino, Ronnie de and Marielos Alfaro. 1998. *Certification in Latin America: Experience to Date*. Network Paper. Rural Development Forestry Network, Overseas Development Institute. London.
- Cleaver, K., M. Munasinghe, M. Dyson, N. Egli, A. Peuker, F. Wencelius, eds. 1992. *Conservation of West and Central African Rainforests*. Conference on Conservation of West and Central African Rainforests, Nov. 5–9, 1990, Abidjan, Ivory Coast. World Bank Environment Paper. Washington, D.C.
- FUNDECOR interviews with Franz Tatenbach, the Executive Director, and the management staff, including Carlos Herrera, Gustavo Solano, and Gretel Vargas.
- FUNDECOR. 1998. *Proyecto de Compra de Madera por Adelantado para Plantaciones Forestales*. Depto. de Operaciones. San José.
- FUNDECOR. 1998. *The Costa Rican Experience with Market Instruments to Mitigate Climate Change and Conserve Biodiversity*. San José.

- Gómez, R. 1999. *First International Course on Analysis and Design of Forests and Natural Resources Policies*. University for Peace. San José.
- Gómez, R. 1999. "Biodiversidad y la Agenda de Costa Rica." Lecture to the participants of the First International Workshop on Analysis and Design of Forestry and Natural Resources Policies, University for Peace. San José.
- GEF/World Bank. 1998a. "Costa Rica: Biodiversity Resources Development Project." *GEF/World Bank Semester Bulletins*. Washington, D.C.
- . 1998b. *Costa Rica: Biodiversity Resources Development Project*. Report 17207-CR. Washington, D.C.
- González, P., C. Porras, and L. Aguilar. 1998. *La Compra de Madera por Adelantado: Una Nueva Visión de FUNDECOR*. Congreso Forestal Latinoamericano de IUFRO. Valdivia, Chile.
- Government of Costa Rica/UNDP. 1997. "Estado de la Nación en Desarrollo Humano Sostenible." *Informe 4*. Proyecto Estado de la Nación. San José, Costa Rica.
- IMN/MINAE/UNEP. 1996. *Propuesta Técnica de Ordenamiento Territorial con Fines de Conservación de Biodiversidad: Proyecto GRUAS*. Ministerio del Ambiente y Energía.
- IMN/MINAE, PNUMA, MAG, IGN, and DGF. 1996. *Evaluación del cambio de Cobertura de la Tierra en Costa Rica 1979–92*. San José.
- Kaimowitz, D. 1996. *Livestock and Deforestation. Central America in the 1980s and 1990s: A Policy Perspective*. CIFOR, GTZ, IICA, IFPRI. Bogor.
- Kishor, N., and L. Constantino. 1993. *Forest Management and Competing Land Uses: An Economic Analysis for Costa Rica*. World Bank LATEN Dissemination Note 7. Latin America Technical Department, Environment Division. Washington, D.C.: The World Bank.
- Mena, Y., and G. Artavia. 1998. *Parques Nacionales y otras áreas Silvestres Protegidas de Costa Rica*. SINAC/MINAE.
- Norton, B. 1988. "Commodity, Amenity and Morality. The Limits of Quantification in Valuing Biodiversity." In O. Wilson, ed., *Biodiversity*. Washington, D.C.: National Academy Press.
- Peuker, Axel. 1992. *Public Policies and Deforestation: A Case Study of Costa Rica*. Regional Studies Program Report 14. Latin America and the Caribbean Regional Office, Technical Department. Washington, D.C.: The World Bank.

- RUTA. 1998. *Progress Report: RUTA III and RUTA III Extended*. San José.
- Segura, Olman. 1999. "Competitiveness and Sustainability of the Forest Sector in Central America." Ph.D thesis.
- Smitinand, T. 1995. "Overview of the Status of Biodiversity in Tropical and Temperate Forests." In T. Boyle and B. Boonchoob eds., *Measuring and Monitoring Biodiversity in Tropical and Temperate Forests*. Proceedings of a IUFRO Symposium Held at Chiang Mai. Thailand.
- Solano, G. 1998. *De la Teoría a la Práctica*. Congreso Forestal latinoamericano de IUFRO. Valdivia, Chile.
- Solórzano, R., J. Burgos, and J. Echeverría. 1995. *Efectividad en la ejecución de proyectos*. Proyecto de Conservación y Manejo de Recursos Naturales en Costa Rica.
- Solórzano, R., R. de Camino, R. Woodward, J. Tosi, V. Watson, A. Vásquez, C. Villalobos, J. Jiménez, R. Repetto, and W. Cruz. 1991. *Accounts Overdue: Natural Resources Depreciation in Costa Rica*. CCT/WRI. San José, Costa Rica.
- Stewart, R., and G. Gibson. 1994. "El efecto de las políticas agrícolas y forestales sobre el ambiente y el desarrollo económico de América Latina" (Una síntesis de estudios de caso en Costa Rica, Bolivia y Ecuador). In Cortés, H. *Libro de lecturas del taller sobre reforma de políticas de gobierno relacionadas con la conservación y el desarrollo forestal de América Latina*. CIFOR, USAID, IICA, EPAT, BID, BM. Washington, D.C.
- Trejos, R. 1992. "El comercio agropecuario extraregional." In C. Pomareda, ed., *La agricultura en el desarrollo económico de Centroamérica en los 90*. IICA. San José, Costa Rica.
- TSC, CIEDES, and FONAFIFO. 1998. *Survey of Forest Cover in Costa Rica Using LANDSAT Images 1986/87-1996/97*. San José, Costa Rica.
- Vieto, R., and J. Valverde. 1995. *Efectos de las compras de tierras con fines de conservación*. RNT. Recursos Naturales Tropicales por en cargo de la Friedrich Ebert Stiftung. San José, Costa Rica.
- Watson, V., S. Cervantes, C. Castro, L. Mora, M. Solís, I. Porras, and B. Cornejo. 1998. *Costa Rica: Políticas exitosas para el Bosque y la gente*. TSC, IIED, JUNAFORCA. San José, Costa Rica.
- World Bank. 1998. "Forests and The World Bank: An OED Review of the 1991 Forest Strategy and Its Implementation." Design paper. Operations Evaluation Department (OED). Washington, D.C.

- . 1998. *Forests and The World Bank: An Operations Evaluation Department Study*. Operations Evaluation Department (OED). Washington, D.C.
- . 1994. *Review of the Implementation of the Forest Sector Policy*. Agricultural and Natural Resources Department Report 13850, Environment Department. Washington, D.C.
- . 1993. *Costa Rica: Forest Sector Review*. Agricultural Operations Division Report 11516 CR. Washington, D.C.
- . 1991. *The Forest Sector: Policy Document*. Washington, D.C.

Operations Evaluation Department Publications

The Operations Evaluation Department (OED), an independent evaluation unit reporting to the World Bank's Executive Directors, rates the development impact and performance of all the Bank's completed lending operations. Results and recommendations are reported to the Executive Directors and fed back into the design and implementation of new policies and projects. In addition to the individual operations and country assistance programs, OED evaluates the Bank's policies and processes.

OED publications can be read online at www.worldbank.org/html/oed.

How To Order OED Publications

Operations evaluation publications are available from the World Bank InfoShop.

Documents listed with a stock number and price code may be obtained through the World Bank's mail order service or from its InfoShop in downtown Washington, D.C. For information on all other documents, contact the World Bank InfoShop.

For more information about this series or OED's other evaluation publications, please contact Elizabeth Campbell-Pagé or the OED Help Desk for the OED catalog of publications.

Operations Evaluation Department
Partnerships & Knowledge Programs (OEDPK)
E-mail: ecampbellpage@worldbank.org
E-mail: eline@worldbank.org
Telephone: (202) 473-4497
Fax: (202) 522-3200

Ordering World Bank Publications

Customers in the United States and in territories not served by any of the Bank's publication distributors may send publication orders to:

The World Bank
P.O. Box 960
Herndon, VA 20172-0960
Fax: (703) 661-1501
Telephone: (703) 661-1580

The address for the World Bank publication database on the Internet is: <http://www.worldbank.org> (select publications/project info).

E-mail: pic@worldbank.org
Fax: (202) 522-1500
Telephone: (202) 458-5454

The World Bank InfoShop serves walk-in customers only. The InfoShop is located at:

701 18th Street, NW
Washington, DC 20433, USA

All other customers must place their orders through their local distributors.

Ordering by E-mail

If you have an established account with the World Bank, you may transmit your order by electronic mail on the Internet to: books@worldbank.org. Please include your account number; billing and shipping addresses; and the title, order number, quantity, and unit price for each item.

THE WORLD BANK OED EVALUATION COUNTRY CASE STUDY SERIES

FORESTRY

Brazil	Forests in the Balance: Challenges of Conservation with Development
China	From Afforestation to Poverty Alleviation and Natural Forest Management
Costa Rica	Forest Strategy and the Evolution of Land Use
India	Alleviating Poverty through Forest Development
Indonesia	The Challenges of World Bank Involvement in Forests

POST-CONFLICT RECONSTRUCTION

Bosnia and Herzegovina
El Salvador
Uganda

OPERATIONS EVALUATION DEPARTMENT

ENHANCING DEVELOPMENT EFFECTIVENESS THROUGH EXCELLENCE AND INDEPENDENCE IN EVALUATION

The Operations Evaluation Department (OED) is an independent unit within the World Bank; it reports directly to the Bank's Board of Executive Directors. OED assesses what works, and what does not; how a borrower plans to run and maintain a project; and the lasting contribution of the Bank to a country's overall development. The goals of evaluation are to learn from experience, to provide an objective basis for assessing the results of the Bank's work, and to provide accountability in the achievement of its objectives. It also improves Bank work by identifying and disseminating the lessons learned from experience and by framing recommendations drawn from evaluation findings.