How Multilateral Environmental Regimes Affect Policies for Forest Conservation and Ecosystem Services Provision:

THE CASE OF COSTA RICA

Master of Arts in Law and Diplomacy Thesis

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How Multilateral Environmental Regimes Affect Policies for Forest Conservation and Ecosystem Services Provision: the case of Costa Rica

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ABSTRACT

Costa Rica's success in promoting conservation policies has emanated from a strategic reading and adaptive capacity to multilateral environmental agreements (MEAs) in combination with the collective action between the state and major actors in civil society and across the border. A strategic reading implies institutional changes from collective action and adaptability to feedbacks from the agents in the social and ecological systems. The policymaking process had a strong reaction to the international environmental agreement negotiations. Policies established from the 1970s to 1996 had ambiguous effects on development. There is clear evidence that forest conservation policies and institutional changes in the late 1980s were influenced by international agreements. Such changes fostered a development path that closely resembles the notion of sustainability; forest ecosystems services contribute to ecotourism, agriculture, energy sectors, and improvement of people's livelihoods. Further, national policy innovation had a spillover effect at the international level. Externally, actors in the global domain saw the Costa Rican experience as replicable or adaptable to other social and economic contexts, the international climate change agenda provides a fertile ground to experiment on how MEAs contribute to changes in domestic policy and how these regimes can also be influenced by successful policies. The REDD negotiations provide strong evidence that supports the idea of the emergence of a global ecosystem service regime which allows public, private, and international transaction to take place around ecosystem services. Such regime may also help give coherence to a global system of environmental governance..

CONTENTS

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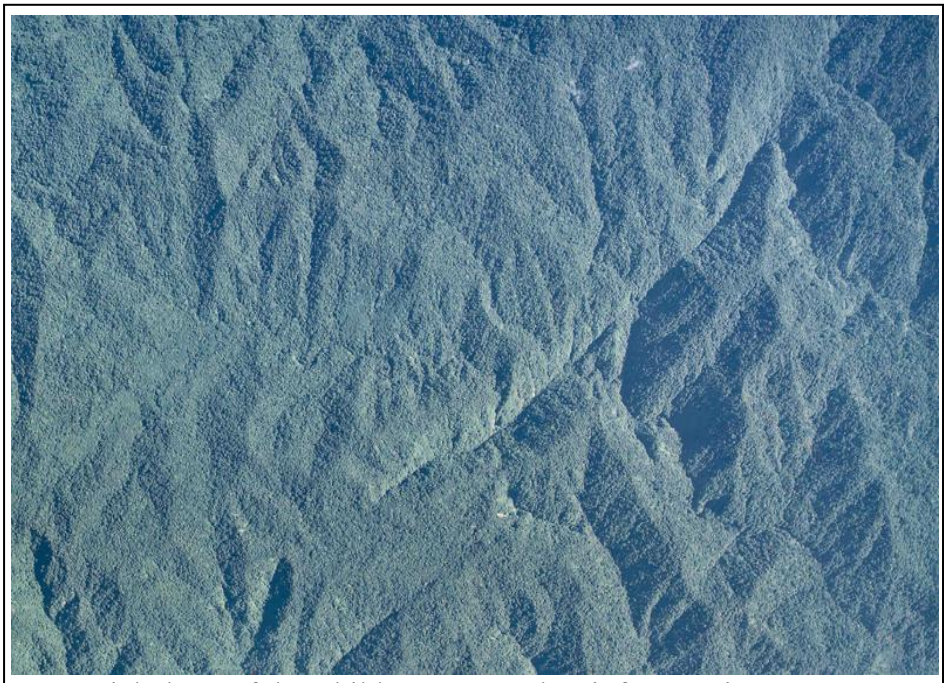
LIST OF TABLES AND FIGURES

ACRONYMS

CfRN	Coalition for Rainforest Nations
CI	Conservation International
CT Puerto Rico	Conservation Trust Puerto Rico
FDI	Foreign Direct Investment
FONAFIFO	National Forestry Financing Fund
GEF	Global Environmental Facility
IDA	Institute for Agrarian Development
INBio	National Biodiversity Institute
IPCC	Intergovernmental Panel on Climate Change
ITCO	Institute for Land and Colonization
MCL	Monteverde Conservation League
MINAE	Ministry of Environment and Energy
NSPA	National System of Protected Areas
PES	Payment of Ecosystem Services (Payment of Environmental Services)
RA	Rainforest Alliance
REDD	Reducing Emissions from Deforestation and Forest Degradation
SINAC	National System of Conservation Areas
SIReFOR	Forests Resources Information System
SPA	State Protected Area
TFCA	Tropical Forest Conservation Act
TNC	The Nature Conservancy
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum on Forests
USAID	United State Agency for International Development
WWF	World Wildlife Fund

How Multilateral Environmental Regimes Affect Policies for Forest Conservation and Ecosystem Services Provision: the case of Costa Rica

> "…here is a chimera, a new and very odd species come shambling into our universe, a mix of Stone Age emotion, medieval self-image, and godlike technology. The combination makes the species unresponsive to the forces that count most for its own long-term survival."
> "We need freedom to roam across land owned by no one but protected by all, whose unchanging horizon is the same that bounded the world of our millennial ancestors… only…teeming with life forms independent of us, it is possible to experience the kind of wonder that shaped the human psyche at its birth."
>
> E. O. Wilson
> The Creation: An Appeal to Save Life on Earth, pp. 10, 12.



Aerial photo of the Children's Eternal Rainforest private reserve

I. Introduction

This study revolves around three main questions: how multilateral environmental regimes affect policies for forest conservation and ecosystem services provision at the domestic level? Is there evidence to show these regimes are also affected by innovative policies that arise at the national level? What is the impact on sustainable development from policy innovation? These questions are analyzed by looking at the development of environmental policies and institutions in Costa Rica as a case study.

Multilateral environmental regimes are the result from international collective forces to coordinate actions around an issue. Such forces may be driven by states, organizations, mechanism, institutions, rules, and norms pertaining to the mater of interest. Sustainable development diplomacy is the framework that promises to facilitate a global institutional shift so that domestic policymaking can effectively address environmental problems across the globe[1]. Here sustainable development is the ability to improve social welfare (meeting human needs) without undermining the viability of life supporting systems. The forces among states, institutions, organizations, and interest groups are the key elements in the process of sustainable policymaking.

While environmental struggles do not operate in a single domain, restricted to the national level, diplomacy plays the pillar role of facilitating the process of negotiation in the international domain to address environmental problems or to promote opportunities to safeguard the environment. This work is an effort to show how sustainable development diplomacy works to improving a system of governance, to facilitate

[1] Hoogeveen and Verkooijen, 2010

coordination among global actors across the public and private spheres for environmental policymaking. By analyzing several policies about the provision of public goods, such as forests, this study shows there are many opportunities for sustainable development that arise from forest conservation.

The world's total area of forest was estimated to be nearly 4 billion hectares (ha) in 2005, in other words 30 percent of total land area is covered by forests; this corresponds to an average of 0.62 ha of forest per capita[2]. Until recently land covered with forest was not consider a type of land use; forestlands were thought of as idle lands to be dispose to satisfy human needs. Forests are the source of ecosystem services that provide many benefits to society such as water resource protection and regulation, erosion control, food, or aesthetics. Further, forestlands are so important for providing such services that even heavily degraded lands can be rehabilitated to a level in which the provision of ecosystem services can be restored through sustainable management techniques.

Another central service forests provide is climate change regulation. Forests work as global carbon dioxide sinks because they sequester carbon form the atmosphere. Over 30 percent of the global forest area is unmanaged primary forest. Usually, forest between 15 and 800 years old are positive net carbon sinks. It is estimated that half of the primary forests are located in northern temperate regions, these forest alone sequester between 0.8 and 1.8 gigatonnes of carbon per year or at least 10 percent of global net ecosystem

[2] FAO, 2005

productivity[3]. Today, in many countries is understood that forest conservation is crucial for human wellbeing. However, numerous countries still face many challenges that obstruct making forest conservation a universal principle. There have been numerous attempts to establishing a principle on forests conservation and their sustainable use. A landmark towards that goal was set in place in 1992 UNCED (Earth Summit) when Agenda 21, the Rio Declaration on Environment and Development, and the Statement of principles for the Sustainable Management of Forests were adopted by more than 178 governments. In 2007, after several years debating on the issues inherited from the Earth Summit, the UNFF came up with the Non-Legally Binding Instrument on All Types of Forests, which was adopted by the UN General Assembly on December 17. This instrument has explicit provisions on the linkages between forests conservation, ecosystem services, and sustainable development[4].

In spite of this collective accomplishment, worldwide deforestation continues at a disturbing high rate. According to FOA's 2005 Global Forest Resources Assessment nearly 13 million hectares are deforested per year. Moreover, the IPCC Fourth Assessment Report estimates that in 2004 forest emissions in terms of CO_2-eq contributed to 17.4 percent as a share of total anthropogenic greenhouse gases emissions. The report also states that reducing or preventing deforestation is the mitigation option with the largest and most immediate carbon stock impact in the short term. It is estimated that forests contribute over two thirds of global terrestrial net primary production. Thus,

[3] Luyssaert et al., 2008. They define net ecosystem productivity as the net carbon balance of forest including soils.

[4] Hoogeveen and Verkooijen op. cit. UNFF, 2010. See Resolution adopted by the UN General Assembly (Resolution 62/98) on 17 December 2007. In particular sections: V. National policies and measures paragraph 6 (a), (d),(f), (j), (k).

decelerating forest loss and restoring forest cover in deforested lands contributes to mitigate climate change.

Another consequence of deforestation is the decline in the provision of ecosystem services. The Millennium Ecosystem Assessment found that 15 out of 24 ecosystem services studied are being degraded. Ecosystem services have been a major focus for research in the past decade. As a result the notion of Ecosystem services is viewed worldwide as a working approach to forest conservation and habitat rehabilitation in support of human wellbeing.

Conservation of precious natural resources falls at the heart of sustainable development in its broadest sense. Costa Rica is known worldwide for its tradition of natural resources conservation. Despite being a developing country, it has achieved unprecedented success in promoting conservation policies which have impacted economic development; this contradicts the hypothesis that environment is an obstacle for development. This study tries to explain this outcome by examining the origins of the policies that caused the adoption of actions that moved the country onto a path towards sustainability.

The study examines two hypotheses related to conservation policies in Costa Rica. The first hypothesis suggests that between 1970 and early 1980s Costa Rica implemented policies that favor deforestation bustling to develop at a very high environmental cost but with little economic growth. The policies established from the 1970s to 1996 had ambiguous effects on development. However, policymakers adapted domestic policies to align them with the nascent global paradigm shift around the notion of sustainable

development. This global influence percolated into the domestic policymaking process that affected the social and ecological system[5] and moved the country towards sustainable development. There is clear evidence that forest conservation policies and institutional changes in the late 1980s were influenced by international agreements. A new domestic development model emanated from a strategic reading and adaptive capacity to multilateral environmental agreements in combination with the collective action between the state, civil society, and international actors. A strategic reading implies institutional adaptability to feedbacks from the collective action of the agents in the social and ecological systems. Internally, institutional innovation pushed the development path in Costa Rica closer to the notion of sustainable development; the benefits of ecosystems services from forest conservation contributed to forge the ecotourism, agriculture, and energy sectors.

The second hypothesis asserts that the evolution of domestic policymaking, as an adaptive response to global change, had implications that spillover from the national to the international level (a bottom-up approach from the state as primary actor to the global international system). Externally, actors in the global domain saw the Costa Rican experience as replicable or adaptable to other social and economic contexts. Two examples of such effect are: the REDD proposal in the climate change negotiations and adoption of the ecosystem service payment scheme in several countries around the world. This is strong evidence to suggest that forest conservation policies that foster

[5] Jervis, 1997 suggest that a system consists of a set of units or elements are "interconnected so that changes in some elements or their relations produce changes in other parts of the system, and… the entire system exhibits properties and behaviors that are different from those of the parts." p. 6. "In a system, the chain of consequences extend over time and many areas: The effects of actions are always multiple." p. 10.

development may be replicable or adaptable to other social and economic contexts at the global level.

There are many types of agents engaging in environmental negotiations at many levels: state-to-state; nongovernmental-nongovernmental, private-private (this includes firms and individuals). Why do agents in the global environmental arena engage in contractual agreements? The underlying assumption is that domestic policy is affected by multilateral environmental agreements because the benefits are greater than the cost of not cooperating; but this does not require the states to become part of the agreement.

Is there an effective way to address global deforestation? A second assumption is that environmental problems across the globe can be address through sustainable development diplomacy. As some claim that a *de facto* system of global environmental governance already exists[6] in which a new diplomacy becomes the key to providing the space for institutional shifts to take place. As long as there are opportunity gains from negotiations (or as long the costs of action to solve environmental problems can be reduce), then countries will seek cooperation and adapt national policies.

The evolution of environmental policymaking in Costa Rica presents an ideal case study to answers these questions. First, Costa Rica has a long history of political stability which matters for the institutions structure maturity. Second, Costa Rica is one of few of countries that have been able to reverse deforestation trends and where the forest recovery rate is positive. Third, Costa Rica has a strong integration with the international community and has ratified many of the existing multilateral environmental agreements

[6] Najam, Christopoulou, and Moomaw, 2004.

related to biodiversity, forest, trade, and climate change. Despite its lack of "power", the country plays an active role in setting the international agenda and many its proposals have been considered at international fora. Four, Costa Rica has set explicit policies for the provision of ecosystem services as a public good but a private regime has also come to exist in the country. Last, Costa Rica's development has brought positive results for human wellbeing, economic growth, and environmental sustainability. These are sufficient reasons that make the Costa Rican experience a strong case to determine the relation between multilateral environmental regimes and national policymaking, as well as to demonstrate how domestic innovative policies and institutional shifts can have an effect on multilateral environmental negotiations.

II. The Theory of Provision of Public Goods and its relation to Development

1. The Provision of Public Goods

Public goods have the intrinsic characteristic that their benefits are not limited to a particular agent (state, person or firm). This type of good is neither excludable nor rival; in other words no single agent can be prevented from enjoying a public good (excludability) and the enjoyment of the good by an agent does not reduce the ability of others to use it (rivalry). Conversely, private goods are both excludable and rival. As the provision of both types of goods is a major subject of study in economics, it is useful to look at some economic frameworks to analyze the provision of environmental goods and services. Non-rival consumption and non-excludable benefits set the basis to understand the effective provision of goods and services. Many public goods have characteristics of "privateness" and "publicness"; such characteristics may make exclusion possible. The rivalry of benefits component is also related to the preference of the agent that demands the goods and services; some agents simple do not derive any benefits at all from the provision of a particular good[7].

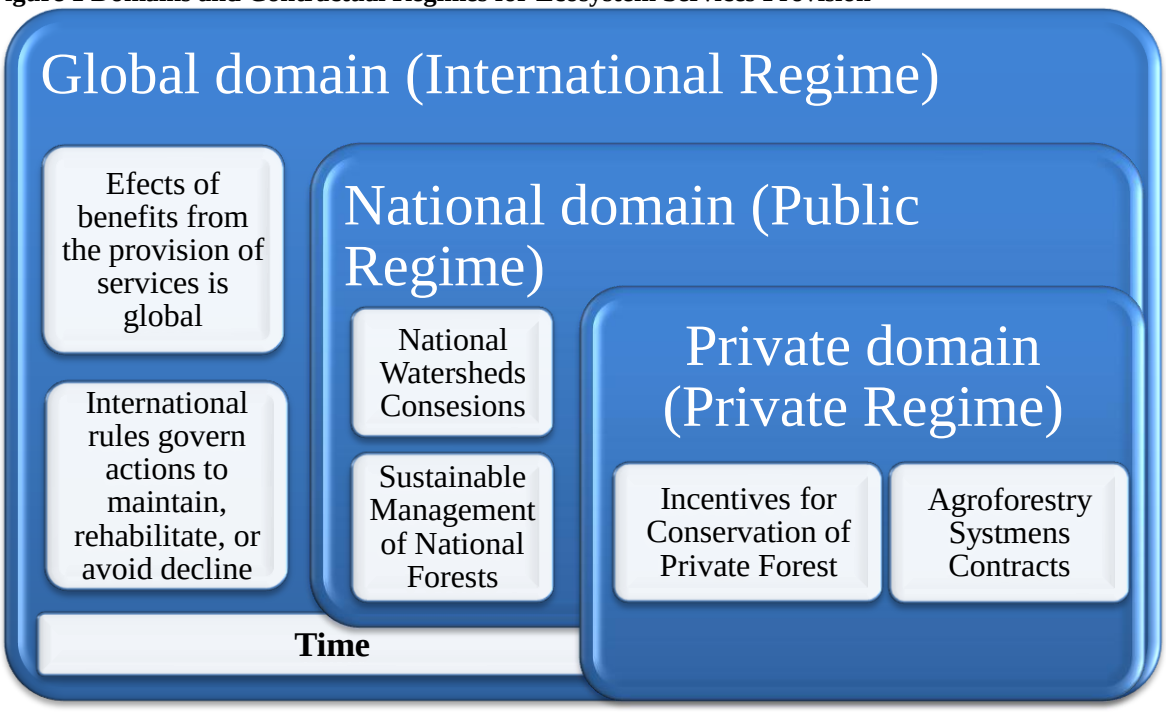
Space and time are two other dimensions to non-rival consumption and non-excludable benefits of environmental goods and services. For example, the protection of a migratory bird in country A does not exclude the benefit of enjoyment derive from a sight seen by a birdwatchers in country B. So, environmental policies in one country have a spatial spillover effect that make the provision of goods and services an issue of

[7] This section is largely build on the work by Kaul et al., 2003. The concepts of "privateness" and "publicness" are introduced in their work.

international importance. Similarly, the time dimensions refer to the ability of future generations to benefit (based on their preferences) from current action to maintain the sources that provide the goods and services. The conservation of forest today will derive benefits for some agent in the future. By analogy the provision of public and private "bads" follow the same characteristics describe above.

One last element to mention is that the interactions among the agents across dimensions determine the provision of goods and bads. Similarly, the lack of provision of goods and services or removal of bads can be resolve by collection actions from the agents. This is the source of sustainable development diplomacy and the roots of the effectiveness[8] of multilateral environmental negotiations.

Figure 1 Domains and Contractual Regimes for Ecosystem Services Provision



[8] Jervis, 1997 suggest that "Effective action is often made possible by employing multiple policies that constrain and work with the dynamics of the system." p. 291.

The model in figure 1 represents the scale and time dimensions of collective actions for the provision of ecosystem services. In this model actors participate in three domains, their decision-making may be restricted to a single domain, or could scale up or down to affect other domains. The characteristics of the good or service (public or private) and the type of ecosystem service determine the category of the regime in which the contractual provisions are undertaken. Just as decision-making cuts across domains, the contractual regimes can include provisions that work between regimes. This notation helps understand the provision of public and private goods and services at the local and global scales.

2. The Provision of Ecosystem Services as Public Goods

This section examines the implications of applying the legal and economic principles for implementing contractual schemes that recognize social benefits derived from the provision of ecosystem services. The analysis is based on the institutional crafting for creating ecosystem services contractual regimes. Ecosystem services or environmental services comprise a series of natural capital inputs employed (directly or indirectly) by the constituents of both social and natural systems; the usage of these services is essential to bringing human wellbeing and to supporting the functioning and resilience of the systems[9].

In a comprehensive examination of definitions and classification of ecosystem services for decision making, Fisher, B., Turner, R. K., and Morling, P. (2009) suggest

[9] Harris, J. M. (2006) provides a useful approach on ecological economics concepts and categories of values.

that if services from ecosystem functions and processes do not benefit humans, then this are not services. This study deviates from this partial and liner understanding of ecosystem services. Rather, it considers the dual role of the elements of the ecosystems as intrinsic providers and beneficiaries too. Moreover, the study highlights the principle of the interconnection of the social system and the natural system affecting one another. For example, human activities are rapidly degrading the faculty of natural capital to generate ecosystem services, this in turn affects human wellbeing; human actions can restore some of this faculty too. Ecosystem degradation can impact those sectors of the market that are depended on them but also opportunities for innovation towards a more sustainable economy[10]. This generally accepted notion is sufficient proof of the interconnection between the social and the ecological systems.

Furthermore, all human societies ultimately benefit from ecosystems services provided by natural capital. Some benefits to humans and firms are more direct and easier to measure such as forests products, prevention of erosion, hydropower, potable water availability, and recreation. Conversely, indirect usages—more subtle benefits from natural systems—contribute to our wellbeing, too. For example, the existence of a particular habitat for a winter migratory species a person enjoys seen back in the springtime. This example illustrates that as much as humans obtain benefits from ecosystems, in the natural system are other users of ecosystem services as defined above, and that this usage is essential for an adequate function of the overall system and ultimately for society's welfare.

[10] Hanson, C., J. Finisdore, J. Ranganathan, and C. Iceland (2008).

The definition and classification of ecosystem services is desirable and necessary for adequate policy decision-making[11]. But to fully integrate ecosystem services in the social system and the market it is helpful to look at contractual structure of the regimes. This study identifies three types of contractual ecosystem services regimes based on the model presented in Figure 1: (i) public regime deals with services to providing public goods, (ii) a private regime that is strictly concerned with private transactions negotiated around environmental services, and (iii) a global regime which is governed by the rules of international agreements. These regime types assumed, first, a formal recognition that the services from ecosystems have economic, ecological and cultural values; second, the primary resource (natural capital) from which the service is derived is possess or owned by an individual, entity, or agent who has entitlement to negotiate the services the final use of the service. Third, benefiting from the service require a transaction cost to any agent involved in the contractual transaction.

A policy program instituting contractual regimes will fail if these issues are not first addressed. The lack of awareness or lack of formal recognition of the service and benefits from ecosystems is the most fundamental failure in a regime. Before the rules and policies that give the structure of the regime to work in the social system, first is necessary the formal recognition of the benefits from ecosystem services. Furthermore, although the specific aspects of the contract depend on social and cultural context, resource location[12], and usage, the underlying principle for a sound negotiation is the

[11] For detailed analysis on definition and classification of ecosystem services see Costanza, R. (2008); de Groot, R. S., Wilson, M. A., & Boumans, R. M. J. (2002); Fisher, B., Turner, R. K., & Morling, P. (2009).
[12] Turner, R. K., Adger, W. N., and Brouwer, R. (1998).

exclusive right of ownership of the service being transacted or the mean through which the service is provided. Ownership does not imply exclusive capacity of benefiting and utilizing the service but it takes away from others the right to transact the services. This is similar to the notion of "privateness" and "publicness" already described. The power to negotiate some form of compensation[13] relates to the capacity level of excluding others from benefiting and employing an ecosystem service that range from absolute capacity to null capacity. This is more than physical capacity to utilize the resource, it is reliant on the existence of institutions, rules, and norms that support the ecosystem contractual regimes.

While ecosystem services for providing public goods can easily go unobserved or be undervalued, the private regimes face an additional constraint if property rights are not well defined. Much of the success of implementing ecosystem service contracts depends on a clear identification of the right to transact the service as well as the compensation scheme. For long-term contract the stability in the functioning of the systems that provides the resource is fundamental. If the transaction cost of a contract is higher than the benefits, than changes are that short-term contracts are not worthwhile pursuing. Similarly, because the holders of the resource that supply the service are usually suspicions of legal constrains and limitations attached to an ecosystem service contract, launching a new regime that does not clearly define its boundaries, will cause resistance to engaging in contracts among stakeholders.

[13] The form of compensation is not limited to a monetary value, it includes other forms of compensation, even some not yet identified.

The key for a regime to be effective revolves around low transaction costs, clearly defined rights, and protection by a functional legal and institutional system to enforce the rules of the contract. The fragility of the regime is strengthen with cooperation, and collective action among the parties involved and a true believe that the service provide is valuable. The fact that Costa Rica has all of these factors in place while many other developing countries do not may account for the profound differences in the outcomes of forest conservation.

3. Development and underdevelopment

Some development theories focus on the structure of the international system, the world economic market, and class divisions within countries as critical aspects to explain underdevelopment. Some arguments of the structural theory suggest that countries in the international system are polarized in the developed and developing countries (the North and the South; rich and poor countries). This division creates a structural blockage in which integration into the world economy facilitates or hinders economic growth and development. However, economic integration in the form of trade and capital investment improves infrastructure in poor industrialized countries while inhibiting economic growth in those countries not fully integrated in the global system[14].

It is claimed that this form of integration often induces industrialized countries to specialize in their exports. In most cases these countries only exports a few agricultural commodities that initially bring economic benefits but they are inimical to further

[14] Delacroix and Ragin, 1981 p. 1312

development. In an effort to avoid underdevelopment some countries developed import substitution industries as a means to reduce importation of goods, increase exports, and to generate employment[15]. In addition, these countries create institutions that promote the use of resources unsustainably; sometimes unintentionally.

Specialization of production led to an unequal exchange of commodity exports and capital, which conditioned productivity between the industrialized and developing countries. Higher productivity in developed countries is the result of their specialization in capital-intensive and skilled labor activities, whereas the structural outcome for underdeveloped countries is their specialization in unskilled labor-intensive activities with lower productivity.

In relation to the world market, it is argued that developed countries are less vulnerable to world economic shocks than developing countries because small economies are price-taker in the world markets. In an effort to allocate products in accordance to world demand, the prices of their primary commodities undergo a relative decline and this vicious circle is aggravated by fluctuations of primary product prices in the intentional market.[16]

A more elusive yet important argument focuses on class divisions. It suggests that developed capitalist countries are able to appropriate the surplus generated through the exploitation of the labor and extraction of natural resources of underdeveloped countries because of the complicity or ineptitude of the elites of these countries. Furthermore, local elites who have control over the means of production of primary export commodities are

[15] Cardoso and Helwege, 1992 p. 58
[16] Delacroix and Ragin, op. cit. p. 1315

indifferent to welfare improvement of other groups hence they have no incentives the overall improvement of their countries. Under development in this perspective is a historically induced, structural condition of the world capitalist economy.[17]

Finally other explanations for differences in income between rich and poor nations focus on scarcity of capital and on institutions. In the first place, the lack of productive resources per capita makes developing countries poor.[18] Neoclassical economists see benefits in openness to capital inflows in the form of foreign direct investment, because it enhances national income over time. Foreign capital helps invest in projects that otherwise cannot be finance with local savings and local production. Capital inflows build the productive capacity of the economy and increases welfare. It brings better technology, technical assistance, and promotes competition in foreign markets. However, foreign investment is criticized for creating an enclave economy because little investment takes place in primarily commodity products that have very little stimulus to the rest of the economy.

Secondly, with respect to institutions it is argued that, "great differences in the wealth of nations are mainly due to differences in the quality of their institutions and economic policies."[19] Poorer countries lack an incentives structure to enhance productive cooperation. This structure of incentives has to consider not only sound economic policies, but also sound institutional arrangements. In other words development requires a legal system that enforces contract compliance and protects property rights, and the

[17] Delacroix and Ragin, op. cit.; Olson, 2000
[18] Olson, 1996 p. 5
[19] Ibid, p. 19

political structures and constitutional provisions to encourage public participation or collective action.

The problem of development and underdevelopment branched off to the debate on sustainable development, which incorporated the environment, institutional arrangements and public participation as new aspects of development. The next section outlines the emergence of this new way of thinking.

4. The Sustainable Development Discourse

The first antecedent of international awareness on the conditions that affect development can be traced back to the 1972 report of the Club of Rome. The report concluded that if the present trends growth in population, consumption, pollution, and resources depletion continue unchanged, "the limits to growth on this planet will be reached sometime within the next one hundred years".[20] The report stated that a healthy environment and abundant resources are necessary but not sufficient conditions for growth; social problems may hinder development as well. Recent scientific discoveries are confirming that current consumption pattern of natural capital (converting raw material into manufactured products and waste) is at a faster rate than what nature is capable to assimilate.[21]

The concept of sustainable development was put in the international mirror by the World Commission on Environment and Development which defines it as the ability to ensure humanity "meets the needs of the present without compromising the ability of

[20] Meadows, et al., 1974, p. 24.
[21] Daly, 1996, p. 49.

future generation to meet their own needs."[22] This concept raised many important philosophical and practical questions about the future of environment and development in the world. Hence these reports turned the issue into a political problem at international and domestic levels.

The links between environment and development has been a central issue in international negotiations. In 1972 the Stockholm Declaration on Human Environment launched an action plan for international cooperation to reduce adverse environmental effects of development activities while accounting for states' sovereignty. The Montreal Protocol of 1987 set in place a reduction and elimination schedule of the use of substances that deplete the ozone layer.

The debate on whether or not unsustainable uses of natural resources would bring future negative consequences for humanity spread in three directions: the apathetic, the optimist, and the pessimist. Each group brought up its own views and arguments on how the environmental-development issue should be approximated.

In this sense, the apathetic group believes that "There are no problems, and there will be even fewer of them in the future". This group actively ignores scientific evidence of ongoing environmental degradation effects on human societies. Based on some of these findings, the optimist group relied on technology and science to deal with environmental problems. They acknowledge there are some problems in current development trends, but as they say "we can tinker here and there, install some compact fluorescent light bulbs, support mass transit and get by […] economic growth, new

[22] World Commission on Environment and Development, 1997 p. 8

technology, and human inventiveness in general will lead us inevitably on to the broad sunlit uplands of a forever better, richer and more populous road." Finally, the pessimistic group has a catastrophic view in which the world is "in deep trouble, and getting out of it will require not merely new technology but also fundamental social, political, and economic transformation."[23]

The reemergence of sustainable development in the Convention on Climate Change and the Rio Convention on environment and development in 1992, pushed states to set new commitments to reduce and eliminate unsustainable patterns of production and consumption.[24] These protocols and reports provide guidelines and institutional frameworks for dealing with development issues that affect the environment both at the national and international level.

Most definitions of sustainable development consider that sustainability transcends human generations since development is not a fixed state, in harmony, but a dynamic process that revolves around different dimensions that are interconnected and affects future outcomes. In general the definitions of sustainable development consider the limits imposed by the present state of technology, knowledge, social organization, and the ability of the biosphere to absorb the effects of human activity.

Accordingly, the level of technological development is related with environmental sustainability. The current state of knowledge limits human capacity to find effective policies to solve development problems now. Social sustainability requires countries to

[23] Prugh, Costanza, and Daly, 2000 p. xi. The authors named these groups as the Alfred E. Newman Camp, the Technocratic Optimist Camp, and the Jeremiah Camp.
[24] See Guruswamy, et al., 1999; Hunter, Salzman, and Zaelke, 2002

have strong institutions as a necessary condition. Strong institutions depend on viable and active governments and on civic collaboration through public participation.

Effective answers to human problems are more likely to come with ample citizen participation. However, with the solution of one problem new issues emerge, then, new solutions have to be made. Given the nature of human progress, the world's political, ecological and cultural conditions make sustainability inherently a dynamic "stage" with no permanent solutions. Hence sustainable development "must encourage the perpetual hearing, testing, working through, and modification of competing visions *at the community level*."[25]

In the last 30 years the issue of sustainable development has captured much attention in developing countries in relation to political implication they have to confront and the practical applicability (or the lack thereof) of sustainability[26]. A major question is whether or not reaching higher levels of development is a realistic possibility. Sustainability of development imposes a big challenge for domestic politics because it demands more citizen participation and this can generate several situations. For example, citizens can either participate or be indifference to activism, effective citizen engagement and activism strengthen sustainable policy making, lowers the cost of action, and increases awareness. Although the lack of consensus can lessen the chance to reaching sustainable goals but in situations where actors have moved beyond the point of gridlock, the outcomes becomes more sustainable, that is in terms of effectiveness in time.

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[25] Prugh, Costanza, and Daly, 2000 p. xiv

[26] In recent years with new issues emerging, sustainable development has become important as a discourse in the developed countries. For example, the climate change agenda and certain agriculture systems of productions have provided good arguments for advocating sustainability in the developed world.

Overall, the specific effects of sustainable development in the developing world remain unclear. Most of the debate today is considerably focus on economic growth and development. The next section looks at differences between development and growth and presents other elements part of the debate but considered essential to sustainability.

5. The three Dimensions of Sustainability

Given the different dimensions on sustainable development is necessary to consider it in three specific fields, which are known to be: environmental sustainability, economic sustainability, and social sustainability. Each field has specific goals that should be addressed separately by different disciplines, yet the three fields are interconnected by a main goal: development.

The concept of sustainability primarily pinpoints tendency into the future in the development process. Long-term environmental sustainability "is therefore *not* a phenomenon that will emerge on its own from the economic development process, but rather requires focused attention on the part of governments, the private sector, communities and individual citizens."[27]

Environmental sustainability is a function of five components: the state of the environmental systems (air, water, ecosystems, soil); the stress on those systems in the form of pollution and exploitation levels; human vulnerability to environmental change (health and nutrition); the social and institutional capacity to cope with environmental challenges; the ability to respond to the demands of global collective efforts to conserve

[27] World Economic Forum, 2002 p. 1

international environmental resources (atmosphere and oceans). Thus, environmental sustainability is define as "the ability to produce high levels of performance on each of these dimensions in a lasting manner"[28]

Development is seen a fundamental human right which requires among other things good governance. In this sense development should not be a limited definite state for any country, but economic output over a period of time might constrained by many factors. Sustainability will be achieved only when development supplants growth. Here growth "results when the output of an economy grows because more land, labor, capital, and entrepreneurial talent are devoted to the production process and/or because the productivity of these factors of production rises".[29]

Consequently, economic growth and development are two different things; economic growth means increase whereas development means expand, bring out potentialities capabilities to advance from a lower to an advance state. A government pursuing sustainable development must recognize the finite nature of resources on the country and acknowledge that "sustainable growth" is contradictory.[30]

While economic sustainability and environmental sustainability share the same goal, they differed in the field action, the former is more focused on human needs and the latter is concern with maintaining natural capital. Economic development intends to reduce the inequality gap between the rich and the poor. This is often thought as enriching the poor rather than undertaking redistribution. Making the distinction between

[28] World Economic Forum, 2002 p. 5
[29] North, 1997, p. 13.
[30] Goodland and Daly, 1996

development and economic growth helps to think in terms of four types of capital: (1) Human made capital (manufacture products, infrastructures, technology, etc.); (2) human capital (knowledge, information, and investments in education, health, and nutrition); (3) natural capital (all renewable and nonrenewable resources, crops, and non-manufactured goods); (4) social capital (social structures, laws, and institutions, and values).

What remains to address is social sustainability. Social sustainability is reached through systematic community participation in a strong civil society. It depends on social and human capital. It seeks improvement of human welfare and social capital by the use of natural capital, human made capital and by ensuring wastes balance are not exceeded. Some of the concerns about social sustainability relate to health, freedom, education, and peace.

III. Forest Conservation and Ecosystem Services Provision in Costa Rica

1. General setting

Costa Rica is known worldwide for its tradition of natural resources conservation. Its condition of being a developing country has not prevented it from achieving success in promoting conservation policies with positive impacts economic development. Yet, it is also important to consider the influence of international forces in promoting development through economic growth, as well as increasing people's awareness of the importance of natural resources for environmental sustainability. Costa Rica's success puts in evidence that environmental and conservation policies do not need to be an obstacle for development.

Costa Rica is classified as a mid-upper income economy and one of the less indebted countries in the region.[31] Nonetheless, current international debt represents a major challenge for the economy. The country is experiencing steady GDP growth particularly between 2000 and 2007. This is the result of a transformation of the economic structure from being an agricultural economy to an economy of services and technology. Still agriculture products such as ornamentals, pineapple, bananas, coffee play a major role in exports. The percentage of agriculture value added to GDP has range from 9.46 in 2000 to 7.29 in 2008. High-technology exports in 2000 represented 51.64 percent of manufactured exports in 2000. Overall GDP almost doubled from US$ 15.95 billion in 2000 to US$29.83 billion in 2008; this year GDP grew almost 3 percent (see Table 1).

[31] World Bank Development Indicators

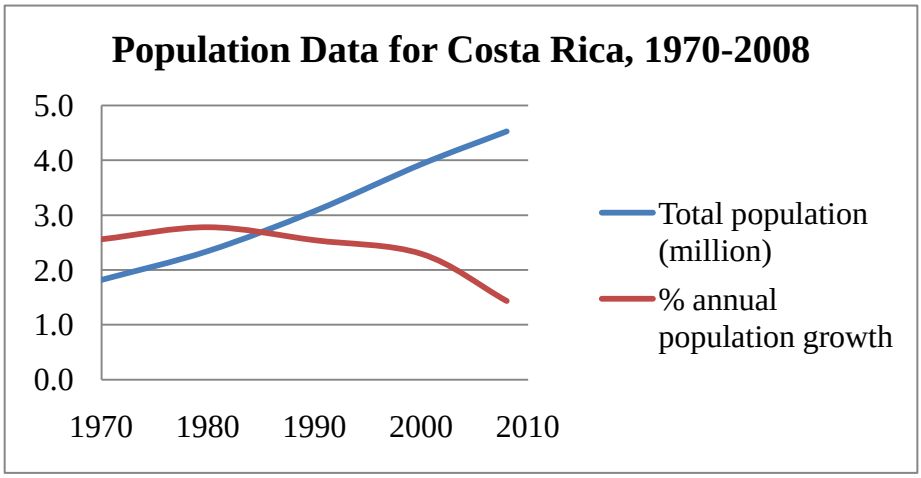
Table 1 General Economic Data for Costa Rica, 1970-2008

	1970	1980	1990	2000	2005	2006	2007	2008
GDP (current bullion US$)	0.98	4.83	7.40	15.95	19.96	22.53	26.27	29.83
GDP growth (annual %)	7.50	0.75	3.90	1.80	5.89	8.78	7.80	2.94
Agricultural land (% of land area)	36.35	49.28	55.62	56.11	56.70	..	..	..
Agriculture, value added (% of GDP)	..	..	12.27	9.46	8.73	8.97	8.71	7.29
Exports of goods and services (% of GDP)	28.22	26.48	30.22	48.62	48.50	49.13	48.81	46.03
High-technology exports (% of manufactured exports)	..	..	..	51.64	37.98	44.66	..	..

Source: World Bank World Development Indicators

Population growth rate is decreasing since the 1980s. In general population has been growing at a 2.5 percent rate. After 2003 there is a tendency for population to grow at slower rate. In 2003 the rate was 1.92 and it decreased to 1.43 for 2008.

Figure 2 Population growth in Costa Rica



Source: World Bank Development Indicators

As a consequence, in an effort to reverse environmental deterioration, the countries managed to create political institutions and promote policies towards environmental sustainability using different strategies that revolve around their political regimes. Nevertheless, the implementation of environmental policy conflicts in many

instances with economic reforms. For example, agriculture, forestry, and livestock sectors are affected by stringent environmental policies. The way in which these sectors are reconciled to promote economic growth and improve quality of life differs between countries. Similarly, the political actors that participate in the process vary at the national and international level.

2. The Impact of Agriculture on Development

Agricultural development is an important variable in explaining environmental impacts in Costa Rica. Traditionally the main commodities have been livestock, sugar, coffee, and bananas. The production of these commodities caused major environmental disruption and forest destruction. However, over the past twenty years, tourism development and other services activities have taken over the historic role agriculture has played in the economy and in shaping the landscape.

While to some degree the agriculture expansion that took place in Costa Rica during the 1960s and the 1970s contributed to its economic growth (see Table 1), it also contributed much to the transformation to the landscape. Increasing agricultural production depended on making land available through intensive deforestation, opening country-roads to access remote areas. Economic growth was based on clearing the land for logging, cattle farming, and production of coffee and bananas.

As access to rural regions were open, more people moved to further areas looking for land to till. Soon, land tenure turned into a public problem as people invaded idle lands under state or private ownership. By the 1960s, squatting became a big social

problem forcing the government to declare all the "empty" lands as state property by passing the Law of Land and Colonization in 1961. This law created the Institute for Land and Colonization (ITCO) as the institution in charge of land redistribution; later in 1976 its name changed to Agricultural Development Institute (IDA)[32].

The government presumed land settlement problems ended with the creation of this institute and the Land law but it actually intensified them. The institute imposed tax sanctions on uncultivated property, bought land from private owners whose land had been invaded and redistributed to small farmers granting them the respective property title. Thus, sanctions by the Land Law were rather an incentive for squares and owners of idle land; landowners would be able to cash the land that wasn't productive enough by letting squatters to invade it. Eventually, the institute turned into a real-estate business although its intention was to encourage agricultural production. By 1983, the institute had redistributed around 800,000 hectares of land to 22,000 farm families.[33]

In the course of the last thirty years economic growth in Costa Rica is shifting from agricultural commodities to other production activities. The following section explores what forces have altered recent economic growth and how they have impacted environmental sustainability.

[32] This was not a simple change in name, ITCO's transformation to IDA created a whole new way of thinking about land and land-use change. Nonetheless, IDA's role as a land policymaking institution is waning.
[33] Augelli, 1987 p 16.

3. Institutional Foundation of Environmental Services Regimes

Ecosystem service contracts in Costa Rica are strictly linked to property rights, specifically rights relevant to land ownership and management, the main sources of services are forest habitats and only very recently watersheds were explicitly recognized as sources. The development of a public environmental service payment regime as is structured today, seeks to incentivize forest management and watershed protection, but before reaching maturity it had to undergo a series of changes from its original configuration in 1969 when the first incentives were created by law. The first private contract that explicitly negotiated an environmental service was established in 1998 between a conservation organization and a hydroelectric company. This innovative contract set the stage for the notion of the private environmental service payment regime.

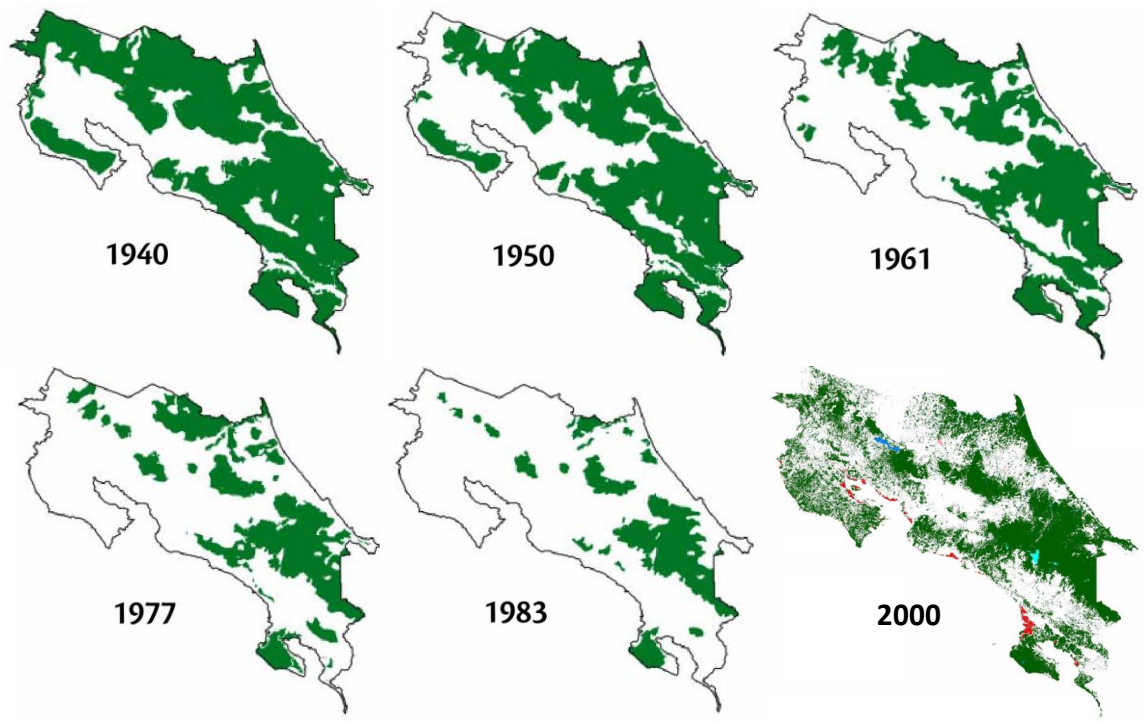
Extensive forest cover habitat dominated the landscapes in Costa Rica in the 1940s and early 1960s. During this period more than 50% of the territory had some type of forest. Most forest land gave way to coffee and sugarcane plantations as well as cattle ranching in the central and northwestern parts of the country. Similarly, banana plantation exacerbated deforestation in the Caribbean and southwestern regions. The figure 6 below, illustrates the aggressive changes in the landscape since 1940, forest land started to decreased drastically in 1961 and reaching a high level of forest loss in the 1980s. Policy measures created to halt deforestation started to be implemented soon after and positive impacts are visible by 2000.

Since their origins the contractual scheme of these regimes revolved around land ownership or its possession. Consequently, is important to highlight three historical

issues which help understand the institutional development for contract regimes. First, it is important to notice that a great percentage of the land in the country still does not hold a formal property title. This has vast implications not only for the subject matter of this study but also for the implications the doctrine of property rights has for economic development, conservation policies, and institutions.

Figure 3 Changes in Forest Cover, 1940-2000

Deforestation and changes in landscape in Costa Rica between 1940 and 1983



Note: Forest cover data by year: 1961 (53.0%); 1977 (31.1%); 1983 (26.1%); 1997 (40.4%).
Source: Adapted from SIReFOR.

The issues of land titling and large land tenure were addressed during the 1961 land reform. A major policy implication of the reform was all the land without formal

property title became State land. The land reform also encouraged land squatting across the country fueled by other social movements. Squatter would settled in properties that seemed to be not possessed by anyone but also on private property; it was commonly argued that land with forest was idle or abandoned waiting to be till; massive squatter mobilization became a substantial problem for land holders and the government. As it illustrated in the section on "Impact of Agriculture on Development", land squatting was incentivized by another institution—the Institute for Land and Colonization (ITCO) eventually named Institute for Agrarian Development (IDA), which was in charge of land distribution and land purchases. Thus, land acquisition and redistribution was, and still is, possible through eminent domain. However, based on its rules and organization the IDA indirectly promoted possessing idled, abandoned, or unoccupied land. Squatters gained and could claim rights over the land by virtue of adverse possession. One of several typical forms for demonstrating occupation of the land was through turning forest into pasture, a plantation, or a subsistence farm. Similarly, other legislation related to forest management and conservation hampered the acquisition of a land property title within State Protected Areas. The land reform did not bring much change because the process to resolve land conflict in Agrarian District Courts took enormous time and efforts, in many cases obtaining the actual land title, clearing up restriction, and resolving disputes withstand years.

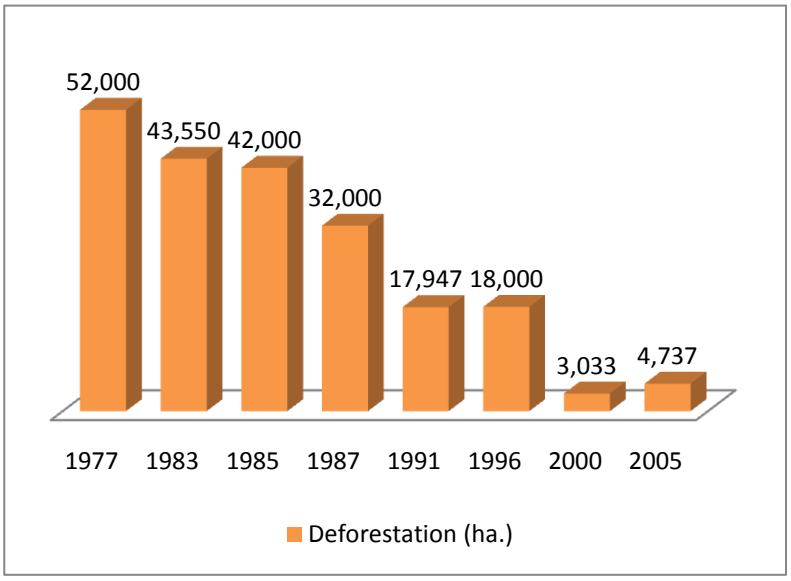
A second issue is adverse possession rights. These rights are well protected under current agrarian law and several environmental statutes. Under the Agrarian Law and the Law of Possessory Information, a claim for property title has as a necessary condition an

actively, peacefully, and uninterrupted occupation of the land for over 10 consecutive years. Possession rights are acquired through occupation and use of the land but this must be confirmed and documented; clear and well demonstrated occupation can lead to land titling. Traditionally possession is demonstrated by virtue of some land use that inevitably implied forest conversion into some production activity. Before a land title is granted, adverse possession turns into virtual ownership of the land enabling the land holder to exercise many of the benefits typically associated with full ownership that a titled confers. In many cases land possession rights have override a title ownership on the same property because it was demonstrated that the possession rights were gain earlier than the date of issuing the title. The existing legal frameworks and institutions in Costa Rica enable landowners to enjoy the benefits of the environmental services contracts.

The third issue is that tourism investments, real estate development, and environmental services payments encouraged massive land titling claims through adverse possession rights more effectively than land reforms. Consequently, these social and economic trends put a lot of pressure to drastically reduce land squatting behavior in the country, in principle because most of the land is no longer idle or abandon (event if forest is present). Forest conservation has been implicitly granted the category of land use under the public environmental services regime[34]. Forest conservation as "land use" is also customarily recognized and inherently a part of ecotourism activities.

[34] Forest land as a form of land use may seem reasonable and obvious today, especially if someone is not accustomed to traditional forms of land use. I was first exposed to this legal interpretation of land use in 2004 by my colleague Marco Retana Mora, Legal Advisor of the Monteverde Conservation League.

Figure 4 Deforestation in Costa Rica since 1977 to 2005



Source: SIReFOR, 2009

The notion of forestry incentives was first established in the 1969 Forestry Law to foster reforestation activities and to promote the incipient forest industry[35]. These incentives were not put in practice until 1979 under an Executive Order enacted that year. Consequently the incentives took form primarily as significant tax deduction on rent and as protection by the State from land squatters. However, both institutions which goal was to increase reforestation created pervasive incentives and encouraged rapid natural forest habit conversion into other forms of land use; to an extent they promoted the establishment of some forest plantations.

The graph on deforestation above shows the amount of hectares (ha.) of forest cut per year. The data for 1987 shows a significant decline in deforestation perhaps due to

[35] Forestry Law No. 4,465 from 1969 and Executive Decree 9495-AH from January 1979.

change in forest management patters; the slide increase in 2005 is presumably caused by illegal logging.

This scheme of incentives was radically changed by the new 1996 Forestry Law No. 7,575 and other environmental legislation some of which have character of International Law.

4. Environment, Development, and the Debt Crisis

The evolution of institutions and policies for forest conservation and the ecosystem payments regimes have also direct ties to Costa Rica's international debt. The debt crisis helped forest conservation in at least one way; that is with the conversion of the debt into protected areas. This international multilateral (and bilateral) mechanism is known as debt-for-nature swaps[36]. With this mechanism indebted countries were relieved of their debt in exchange for commitments to invest in local conservation initiatives. Most swaps were targeted at protecting tropical forests for their global contribution to climate stability and local economic improvement. The debt crisis is turned into an opportunity for many countries to protect forest (see table on Debt for Nature Swaps).

The US government has been particularly active in engaging with other governments, NGOs, and individual in making debt-for-nature swaps for tropical forest conservation. In 1998 the U.S. enacted the Tropical Forest Conservation Act (TFCA),

[36] For extended descriptions of the debt-for-nature swaps mechanisms see Hansen, 1989; Visser and Mendoza, 1994; Portier, 1991; Deacon and Murphy, 1997; Potier, 1991;
Sarkar and Ebbs, 1992; US Congress. Tropical Forest Conservation Act of 1998

through which eligible developing countries can engage in negotiations reduce their bilateral debt.

One of the setbacks of debt-for-nature swaps is the pressure on local currency. Beneficiary governments must come up with some amount of matching funding to invest in conservation programs. These funds must be invested in supporting local nongovernmental organizations and communities managing conservation programs. Usually beneficiary governments come up with the funds by borrowing additional funds, by donations from international NGOs or other governments, or by printing local currency. Whatever the source of these funding may be, their inflow in the domestic economy creates a lot of pressure on local currencies.

Since the 1970s the state has played an active role in regulating the economy in Costa Rica. This is reflected in protective policies that halted the expansion of local production sectors, and in the regulation of the national financial sector. The country was highly dependent on external financial assistance in order to fulfill its development goals. However, it is argued that the large number of social services the state provides increases the current fiscal burden the country faces today.

One of Costa Rica's most pressing economic problems is the fiscal deficit of the central government and the public sector. The deficit grew from 3.2 percent of the GDP in 1999 to 3.8 percent of the GDP in 2000. Servicing public debt interest and expenses accounts for 30 percent of the government total budget. The high cost of social services

and poor collection of taxes limits government's capacity to investment in infrastructure.[37]

The debt crisis caused real interest rates to rise, making international debt payments unmanageable. The country experienced unbalance of payments forcing it to further indebtedness. In order to solve the economic crisis the World Bank and the International Monetary Fund strategy was the implementation of Structural Adjustment Programs. Adjustment Programs made financial assistance available, but conditioned to the adoption of economic and fiscal reforms aim at assisting to solve the debt problems.

Most structural programs of international financial institutions required governments to reduce tariffs, the liberalization of prices, opening up the state financial market, and the brake of state monopolies. These measures were proposed to reduce the state intervention in the economy, to diversified the local production and stimulate the export sectors. The objectives were macroeconomic stability and realignment of the economy to speed up growth. Proponents of Adjustment Programs admitted their potential harmful environmental effects, as one of their intentions was increase exports they tended to exacerbate deforestation and the exploitation of natural resources.[38]

During the 1980s economic crisis world financial institutions started to implemented structural adjustment programs aiming at eliminating structural market distortions and improving efficiency in production sectors. The state progressively opened up the financial system and just recently with the adoption of the CAFTA-D agreement important monopolistic enterprises (primarily telecommunications) have

[37] Mesa Lago 2000
[38] Jakobeit, 1996 p. 132; Panayotou and Hupé, 1996

opened up to market competition; the electricity market is still a state monopoly but electricity production is starting to liberalize.

Yet, advocates of adjustment claimed that environmental protection was not part of the objectives of these policies and argued that in the long-run adjustment could indirectly bring positive environmental impacts with the use of cleaner technologies. Thus, negative environmental impacts could be mitigated in the future with appropriate environmental policies.[39]

Structural Adjustment policies were a priority objective, both for developing countries and international financial institutions, over sustainable development despite its importance in the international political agenda. [40]Sustainability was left on the side to deal with in the future, something that change in the 1990s after the 1992 Rio Convention.

The government strategy to solve the debt crisis was to attract foreign investment and to promote nontraditional exports. Initially, nontraditional exports major activities were still agricultural products such as ornamental plans, flowers, pineapple, citrus, and other fruits but eventually the sector expanded to technology products.

[39] Panayotou and Hupé, 1996 p. 59
[40] Ibid p. 55

Table 2Exports and Imports in Costa Rica in US$ millions

		Exports			Imports
Year	GDP per capita	Tradicional	Non-tradicional	Total	Total
1991	2,284.20	...	...	1,899.30	2,308.40
1992	2,655.50	837.70	1,547.50	2,385.20	2,949.00
1993	2,893.60	858.00	1,767.50	2,625.50	3,514.90
1994	3,093.10	948.10	1,930.10	2,878.20	3,788.40
1995	3,345.50	1,187.20	2,288.70	3,475.90	4,089.50
1996	3,296.10	1,103.10	2,655.30	3,758.40	4,326.80
1997	3,485.00	1,049.20	3,156.30	4,205.50	4,969.60
1998	3,740.10	1,142.70	4,382.90	5,525.60	6,238.70
1999	4,096.40	969.40	5,693.00	6,662.40	6,354.60
2000	4,044.50	877.70	4,972.00	5,849.70	6,388.60
2001	4,009.20	733.40	4,275.50	5,005.90	6,564.30

Source: Estado de la Nación: Compendio Estadístico, 2001.

The government policies were very successful in encouraging diversify production sectors. Although, coffee has been the base of economic growth throughout the history of Costa Rica, it started to lose importance as the production of other agricultural commodities became more profitable. In the early 1990s coffee producer lose income and many farms were abandoned as a result of two major backlashes: a dramatically dropped in world prices and crop deceases. Soon the sectors started to lose government protection benefits, incentives were reduce and the price of production material (fertilizer, machinery, etc.) increased. Other production sectors became more relevant for the economy, namely bananas and tourism (see Table 3).

Table 3Economic Output by Products in Costa Rica

Year	Coffee	Bananas	Meat	Forest Products	Tourism
1986	391.9	216.8	69.8	6.9	…
1987	334.5	228.6	62.5	9.0	…
1988	316.4	221.1	55.8	19.5	…
1989	286.2	284.4	51.9	19.6	…
1990	245.4	315.0	48.6	17.4	…
1991	263.6	380.9	69.3	13.5	330.6
1992	203.2	482.9	44.0	20.4	431.1
1993	201.8	536.5	66.5	27.0	577.4
1994	407.6	561.0	50.9	33.3	625.7
1995	417.3	680.2	43.6	38.3	659.6
1996	385.4	631.1	42.2	48.8	688.6
1997	402.3	577.3	28.3	…	719.3
1998	409.4	667.5	24.0	…	883.5
1999	288.7	623.5	27.2	…	1,036.1
2000	272.0	546.5	30.7	…	1,229.2
2001	161.8	516.0	25.5	…	1,277.6
2002	166.2	478.9	20.1	…	

Source: Watson, et al., 1998; Estado de la Nación: Compendio Estadístico, 2002.

The establishment of environmental regulations during the past thirty years is the result of collective action (sometimes expressed in clashing politics) of interest groups trying to gain over one and other the necessary space to accomplish their agendas but in many cases working in cooperation to achieve common interest as well. Often conservation groups and production sectors differed in the fundamental importance of environmental legislation. These groups fear that depending on how the law was finally adopted, their goals would've been better accomplished without legislation at all. For production sectors some laws imposed great economic burden and limitations and for the conservation groups the laws were not thought enough.

5. Environmental Policies in Costa Rica

Costa Rica's natural forests were severely affected by development policies implemented during the past fifty years. Several land reforms were aim at expanding agriculture to stimulate rural development. Other policies intended to incentivize new forms of production and market diversification. While these actions contributed to some degree of economic growth, an unintended consequence from their implementation were reflected by severe natural habitat destruction. Negative impacts on the environment brought up concern among nature conservation circles that started to lobby with government official to define new conservation policies to address this problem. This is the root of the conflicts between the productive sectors and conservation groups. This was not a direct conflict that is easily perceived, it was rather a subtle struggle which can be trace in the development of new institutions and policies during more than thirty years.

The government had tried to thrust the conservation of land in the 1970s but it was a feeble effort and not a real environmental strategy; although it is ease to establish a direct parallel of the actions in Costa Rica with the incipient move to addressing environmental issues globally. The official institution in charge of conservation is the Ministry of Environment and Energy (MINAE)[41] and under its direction the National System of Conservation Areas (SINAC) oversees all the state protected areas (SPAs). In its efforts the government managed to acquire more than 1.2 million ha that are state protected land, which is roughly 24.1 percent of the country. The table below shows the amount of hectares protected by the state and the total of hectares protected in private

[41] MINAE is now named MINAET ("T" for Telecommunications) as the state monopoly of telecommunications had to be broken with the CAFTA-DR.

lands through the payment of incentives between 1991 and 2001. A recent study stated that between 1996 and 1997 about 40 percent of the land in Costa Rica had forest cover but not all the land belong to the state. About 16.4 percent is declared state land and the remaining 23. 6 percent is private property.[42]

Table 4 Protected Area in Costa Rica in Hectares

Year	Total	Under Forest Incentives
1991	1,094,414	17,296.60
1992	1,094,414	15,755.90
1993	1,094,414	17,725.80
1994	1,094,414	28,068.80
1995	1,591,809	60,922.90
1996	1,602,420	…
1997	1,266,395	108,188.20
1998	1,306,251	58,131.00
1999	1,366,957	67,643.60
2000	1,310,301	...
2001	1,295,893	…

Source: Estado de La Nación: Compendio Estadístico 2002.

Despite this positive results state protected land in Costa Rica is potentially at risk given the financial status of the land. More than 44 percent of the land under state protection has not been paid, this accounts for approximately US$ 599.8 million. In 1996, 17 percent of the land in National Parks and 46 percent for Biological Reserves was still private property[43]. This helps to visualize the long term potential vulnerability of the Costa Rican conservation areas and the low state capacity to finance conservation programs like the SPA system (see the next table).

[42] Calvo, et al. 1999, p. 20
[43] Murillo, 2000 p. 12; Red Costarricense de Reservas Naturales, 1998, p. 5

Table 5 Financial Status of State Protected Areas in Costa Rica			
Management Status	Hectares	State Owned	Unpaid
National Parks	567.941	85%	15%
Biological Reserves	23.300	54%	46%
Protected Zones	157.097	24%	76%
Forest Reserves	282.660	26%	74%
Wildlife Refuges	175.466	41%	59%
Wetlands and Mangroves	76.177	88%	12%
Total	1.282.641	56%	44%
Source: Murillo 2000.			

The establishment of conservation policies and environmental regulations in Costa Rica can be divided in three stages corresponding to the prevailing conditions of the time. Accordingly, between the 1950s and early 1970s national agricultural development was the priority. The policies and laws enacted in this stage encouraged massive deforestation, the establishment of cattle farms, and agricultural development; for example the creation of ITCO took place in this stage. The first state protected area created in the country was Cabo Blanco in 1965[44]. Overall the creation of SPAs during this period was incipient.

A second stage between early 1980s to early 1990s, in this stage the national conservation movement had a very strong connection with many international environmental initiatives. Several leaders (local and from abroad) initiated substantial conservation efforts to consolidate the system of SPAs[45]. Also, the growing tourist sector became economically important which contributed to meet government's conservation goals. However, people in the forestry and agricultural sectors saw the new

[44] The initiatives taken by Olof Wessberg and Karen Mongensen, a Scandinavian couple that resided in the area, helped to protect Cabo Blanco from the rapid deforestation that was about to destroy one of the last remnants of forest in the region. See Evans, 1999.
[45] See Evans op. cit. and Fournier, 2000 for detailed studies on the historic development of the conservation movement in Costa Rica and the role of the conservation leadership on this effort.

environmental regulations as a threat to their economic interests and felt the sectors would be undermined by the changes taken place at the national level.

Finally, the effects of economic crisis in the 1990s forced Costa Rica to adjust its development policies. The government's agenda was to stimulate economic growth while implementing sustainable development strategies. At the end of this period conservation actions suffered major backlashes as international aid was diminishing and economic growth became the state's priority. In this stage private conservation began to play a more important role.

The conservation leadership who in the past lobbied for the creation of conservation areas was not longer involved in state conservation activities and the new leadership was not strong enough to continue the task.[46] They had to confront different challenges: low self-esteem in the National Parks service staff, budget constraints, tedious bureaucracy, the lack of political support at higher government levels, and so forth. The economic situation and the debt crisis deeply weaken the state system of protected areas.

Nevertheless, private conservation efforts flourished by virtue of international transfer of funds and eco-tourism. Table 10 shows the increasing importance of tourism for the Costa Rican economy. Between 1991 and 2001 the number of tourist increased from 500,000 to more than one million and income increased nearly by four times reaching US$1,277.6 million in 2001 (see the following table).

[46] Wallace, 1992 p. 182

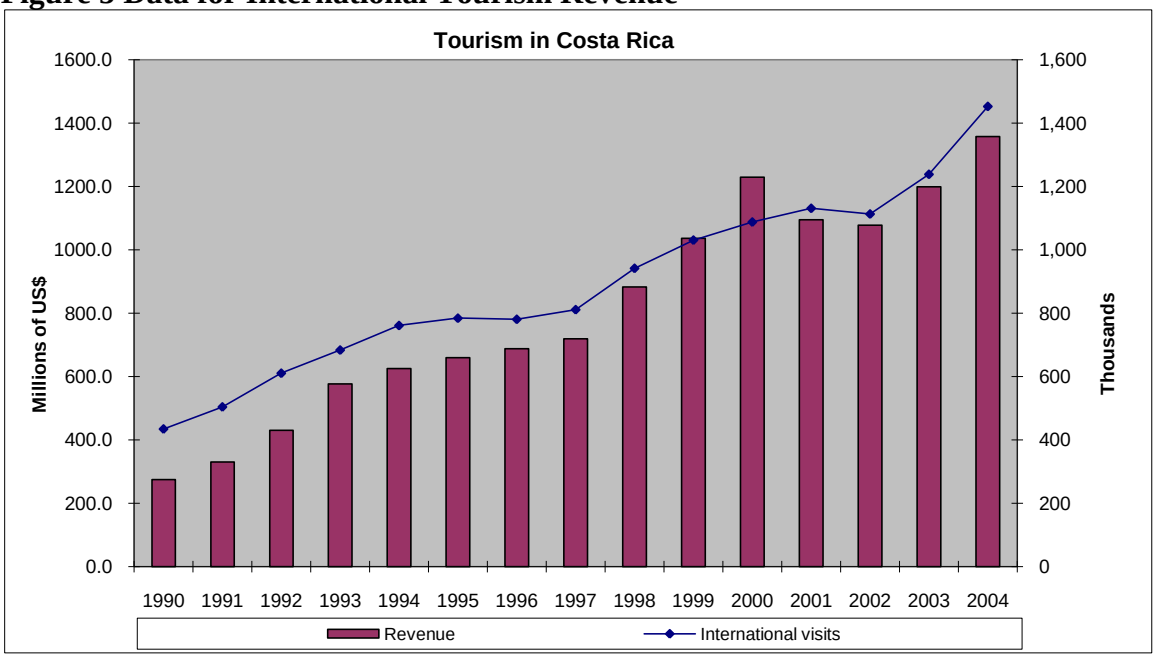
Table 6 Tourism Revenues in Costa Rica

Year	Visitors	US$ Millions
1991	505,000	330.6
1992	611,000	431.1
1993	684,000	577.4
1994	762,000	625.7
1995	785,000	659.6
1996	781,000	688.6
1997	811,000	719.3
1998	942,000	883.5
1999	1,031,000	1,036.1
2000	1,088,000	1,229.2
2001	1,131,000	1,277.6

Source: Estado de la Nación: Compendio Estadístico 2002

The following figure shows the growth in revenue in millions of US$ and international visit to the Costa Rica between 1990 and 2004. The small decrease in 2001-2002 may be explained by the security threats from international terrorist events in the US and Spain.

Figure 5 Data for International Tourism Revenue



Source: Estado de la Nación, 2008

While these events pushed Costa Rica to take the first steps in conservation, the international conservation efforts that really influenced local endeavors were the "second generation" of environmental laws. The "second generation" of international environmental law incorporated large amounts of financial resources from developed countries for environment and development initiatives in the developing countries.

For example, the Debt for Nature Swaps, the United Nations Development Program (UNDP), the Multilateral Fund of the Montreal Protocol, and the initial US$2 billion budget of Global Environmental Facility (GEF) paved the road for the government and private conservation organization to initiate conservation programs in the 1980s and 1990s.

Local conservation organizations also started to capture international aid to promote private conservation of forest. Both, state agencies and private organizations were buying land and given incentives for conservation.

Besides that, private conservation initiatives in Costa Rica contributed to protect large extensions of forestland playing an important economic and political role. Forestlands outside state protected areas are important because they also provide a series of environmental services for society. Private forest functions as buffer zones between the natural and the developed areas. They play a role as biological corridors allowing the movement of species from one place to another, and also they protect water resources, among other services.[47]

[47] Forman, 1997

The international financial assistance was crucial to overcome increasing the economic cost of conservation programs in a way that the government was able to transfer resources to other social programs. Financial resources were scarce in Costa Rica for any environmental initiative but the conservation leadership was very successful at bringing foreign money to the country for conservation. Also, private actors were able to finance environmental programs through the development of ecotourism, like the government, many organizations took advantage of the debt for nature swaps program.

Debt for nature swaps linked the issue of debt with environmental sustainability in developing countries. By built on the experience on debt-for-equity exchanges, indebted countries that would adopt conservation programs to safeguard their natural resources and biodiversity would benefit from reductions to their foreign debt.

One-way debt swaps works is when a commercial bank sells at a lower cost or donates the debt title of a country to the private organization. This amount is reduced from the debt of a country engaged in a nature swap. The private organization negotiates with the government of the debtor country the conversion of the donation into domestic currency and an amount to be used in financing conservation projects. Some of the world known private organizations that negotiated debt swaps were Conservation International, The Nature Conservancy, and the World Wildlife Fund.

The second generation of debt for nature swaps had similar goals, but these were negotiated between governments. Developed countries would write off public bilateral

debt in exchange for environmental commitments from developing country debtors. Second generation swaps significantly reduced greater amounts of debt.[48]

Table 7 Debt for Nature Swaps, 1987-1994 (US$ Millions)

Country	Year	Amount	Cost	Face Value	Conservation Funds	Purchase Price %	Redemption Price %	Leverage PP/RP	Organization
Bolivia	1987	1	0.1	0.65	0.25	15.4	38.5	2.5	CI
Ecuador	1987	1	0.35	1	1	35.4	100	2.8	WWF
Costa Rica [a]	1988		5	33	9.9	15.2	30	2	The Netherlands
Costa Rica	1988	13.95	0.92	5.4	4.05	17	75	4.4	Nat. Park Fund.
Costa Rica	1989		3.5	24.5	17.1	14.3	69.8	4.9	Sweden
Costa Rica	1989		0.78	5.6	1.68	14	30	2.1	TNC
Ecuador	1989	27.78	1.07	9	9	11.9	100	8.4	WWF/TNC/MBG
Costa Rica	1990		1.95	10.75	9.6	18.2	89.3	4.9	Sweden/WWF/TNC
Dominican Rep.	1990	10.18	0.12	0.58	0.58	19.9	100	5	CT Pto. Rico/TNC
Costa Rica [b, c]	1991		0.36	0.6	0.54	60	90	1.5	RA/MCL/TNC
Mexico[d]	1991		0.18	0.25	0.25	72	100	1.4	CI
Mexico[d, e]	1991		0	0.25	0.25	0	100	n.a.	CI
Jamaica	1991		0.3	0.44	0.44	68.6	100	1.5	TNC
Guatemala[c]	1991	1.57	0.08	0.1	0.09	75	90	1.2	TNC
Mexico	1992		0.36	0.44	0.44	80.5	100	1.2	CI/USAID
Guatemala	1992		1.2	1.33	1.33	90	100	1.1	CI/USAID
Brazil	1992		0.75	2.2	2.2	34	100	2.9	CI
Panama	1992		7.5	30	30	25	100	4	CI
Bolivia [f]	1992	36.73	0	11.5	2.76	0	24	n.a.	WWF/CI
Total		91.21	24.4	136.9	91.21				

Notes: **a** Includes $250,000 donation from Fleet National Bank of RI. **b** WWF contributed $1.5 million to this deal on top of the swap. **c** Purchase of CABEI debt. **d** Total amount of program is $4 million. **e** Debt donated by Bank America. **f** Debt donated by JP Morgan.

Source: Adapted from WWF, 2003

Costa Rica was a perfect candidate for debt for nature swaps, "commercial banks had lost confidence in its ability to pay, and as a consequence, prices of commercial debt

[48] Jakobeit, 1996 p. 128

tittles from Costa Rica had plummeted on the secondary market, to below 15 percent of face value."[49]

Debt for nature swaps were at one time very attractive as high inflations rates and effects of Structural adjustment Programs resulted in budget cuts for conservation efforts. However they carry some the negative outcomes of reducing state autonomy as the government of a debtor country cannot use the money in investments; swaps increase inflation since the central bank has to print local currency. Also, it is not clear if the discount redeemed with the external debt is large enough to offset the extra interest cost incurred on domestic debt issued as a counterpart.[50]

Every bit of international transfer funds was critical for nature protection and for social services. In moments of economic crisis the government would relocate donations for conservation and use them in other things such as paying salaries or building infrastructure, even some funds mysteriously disappeared. This led the conservation leadership to create an organization detached from the central government that could receive international donation. Fortunately, a new law passed in 1977 gave nonprofit organizations tax exemption. Thus was created the National Park Foundation with a board of five members, most of them active conservation leaders. The Foundation got its first donation of US$300,000 in 1981 from the Caribbean Conservation Corporation and nearly US$6,000 from World Wildlife Fund.[51]

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[49] Jakobeit, op. cit. p. 135; Umaña, 1991
[50] Cardoso and Helwege, 1992 p. 130-131
[51] Wallace, 1992 p. 100

Some of the most important local organizations are: the Neotropica Foundation, the, the Monteverde Conservation League, the Tropical Science Center, and the Organization for Tropical Studies and the National Institute for Biodiversity (INBio).

Costa Rica has an extensive network of private preserves with 102 members protecting more than 58,000 hectares of forest, which is nearly 1.1% of the total territory.[52] The Children's Eternal Rainforest is the biggest private preserve, owned by the Monteverde Conservation League, which bought nearly 22,000 hectares through donations from children around the world.

It is worthwhile mentioning the role of the INBio as they run an interesting research initiative. INBio works in four different areas: 1) Developing the national inventory of biodiversity, primarily in state protected areas. 2) Biodiversity prospecting, that is, the extraction of biochemical components for potential uses in cosmetics, agroindustry, biotechnology and pharmaceutics. 3) Management of information related to collected organism. 4) Social outreach and transmission of knowledge and education. This institution has been an important actor in attracting foreign funds for its programs. However, is not clear to what extend these founds have benefited the conservation of natural resources.[53]

Environmental policies in Costa Rica are focused in solving the most relevant environmental problems in the country: air and water pollution, adequate management of agrochemicals, and waste disposal. The government is strictly monitoring vehicles and

[52] Bach Weithaeuser, 2002 p. 10
[53] Murillo Ulate, 2002 pp. 32-33

gas stations to reduce to air pollution by gas emission. Other agencies carry several studies on soil pollution by chemicals and implementing zoning plans.

The government has created a great body of laws point toward balancing economic growth and improving environmental sustainability, the most important environmental legislation include the Environmental Law, The Wildlife Conservation Law, the Biodiversity Law, and the Forestry Law.[54] Some of these laws combine a conservation principle with economic activities. For example, The 1996 Forestry Law No. 7575 declares that owners of land under natural forest regeneration, private natural forest or plantations could enjoin environmental services payments.

The services recognized by law are: mitigation of gas emissions that contribute to green house effect, protection of water sources, biodiversity protection, and scenic beauty for tourist purpose. Any forest areas of two hectares or bigger could receive the incentives for forest protection and one hectare or bigger for reforestation incentives. In all cases landowners cannot register more than 300 hectares to benefit from these incentives, save for indigenous preserves that could register up to 600 hectares.[55] (see the next table).

Table 8 Incentive Payments per Hectare over 5 years

Incentive	Amount US$[a]
Establishment of Forest Plantations	565.26
Forest Protection	220.75
Forest Management	344.51

Note: [a] Total payment over five years. Source: FONAFIFO, 2001.

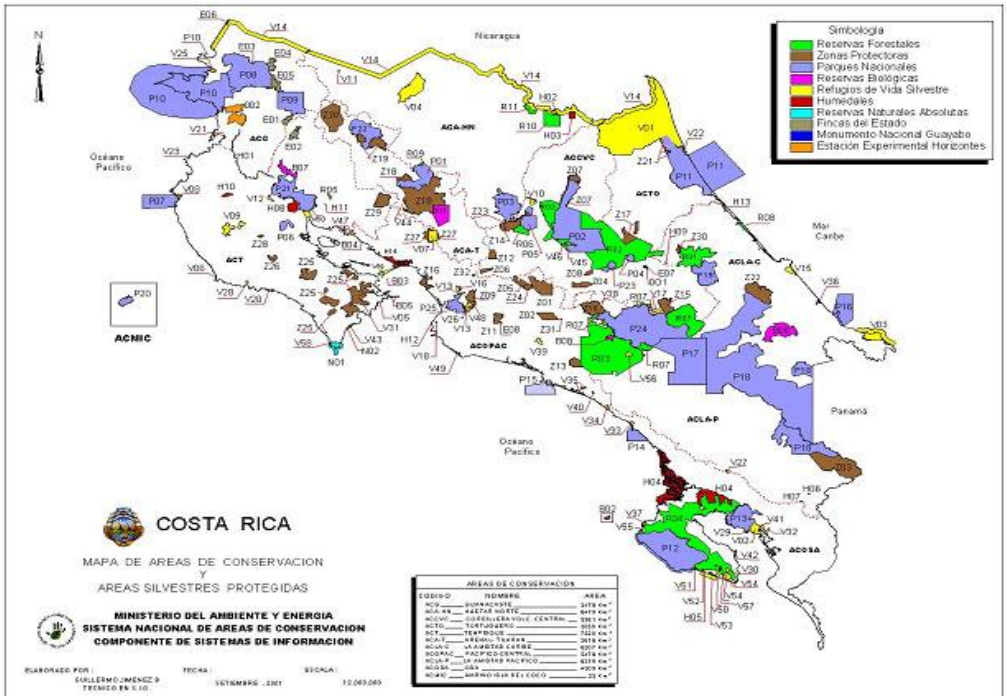
[54] Zeledón, 1996; 1998
[55] FONAFIFO, 2001 p. 4

6. Forest Trends in Costa Rica

A study done by FONAFIFO (2007) concludes that since the year 2000 the country continues a trend of forest cover recovery. Between 2000 and 2005 the percentage of forest cover was estimated to be 48%, excluding mangrove swamps, moors, and forest plantations. Here is important to highlight that 45% of the forest cover area (1,118,995 ha.) is protected by the State's System of Protected Areas (SPA) as national parks, international parks, biological reserves, and other management categories. The remaining 55% (1,341,344 ha.) of the total forest land is privately owned. The study goes on to stressing that during this period of time the annual rate of forest recovery was 0.66% and the rate of forest loss was only 0.09% (i.e. a net recovery rate of 0.61%). Furthermore, between 1997 and 2005 the total area of privately owned forest that was part of the public program of Payment for Environmental Services (PES) was 451,500 ha.; this is the equivalent of 18% of the total national forest covered area or 34% of the forest outside SPAs[56].

[56] Fondo Nacional de Financiamiento Forestal, 2007

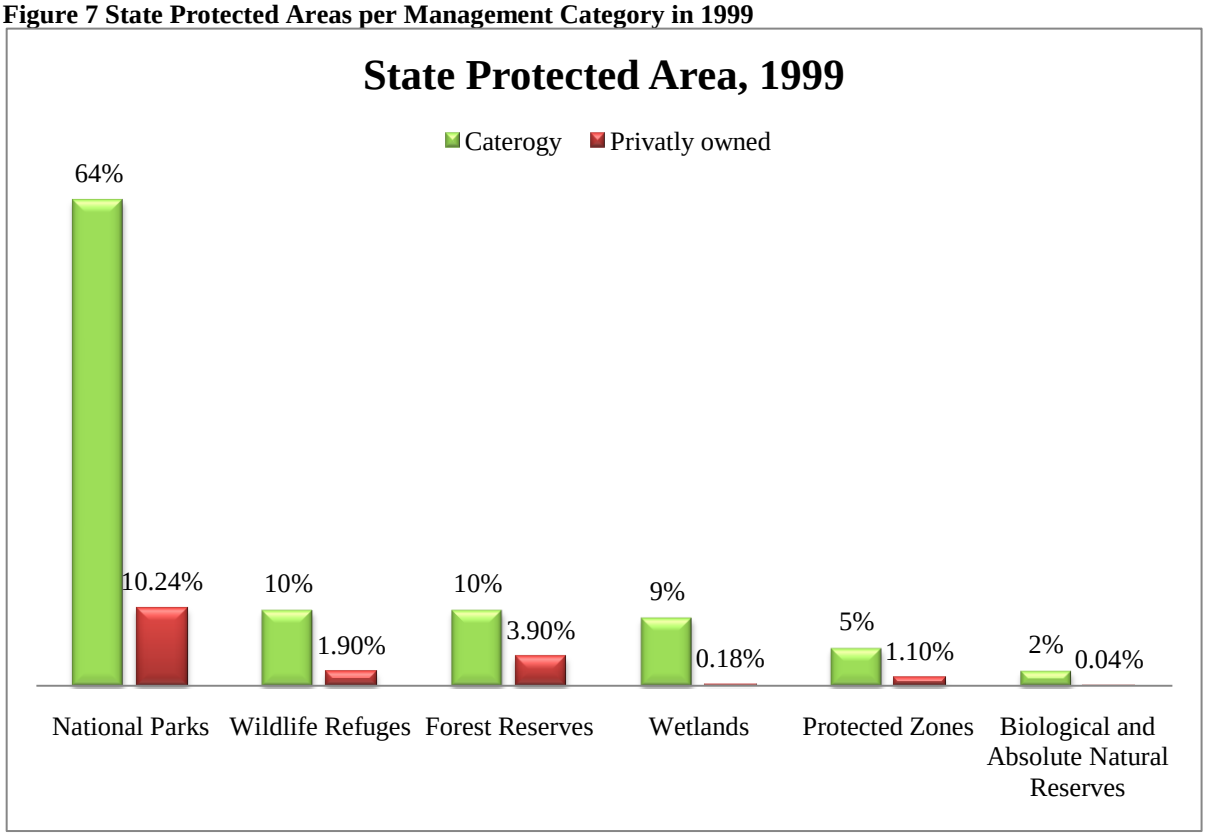
Figure 6 Map of State Protected Areas



Source: SIReFOR

These data shows that after 1997 there is at least one variable effecting the deforestation rate in the country—namely the PES program—which provides an economic incentive to private land owners in exchange for conserving existing forest or let degraded land to regenerate. This raises two important issues about the trends of forest conservation in Costa Rica. On the one hand, the existence of the PES program alone does not fully explain the positive net annual forest recovery rate between 2000 and 2005 in lands not included in the program which amount to 889,844 ha. On the other hand, the fact relatively large areas of forestlands remain outside the SPAs prior the PES program was launched in 1997 requires deeper analysis.

Figure 7 State Protected Areas per Management Category in 1999



Source: SiReFOR, 2009

First, it is necessary to demonstrate if there is a pattern in the amount of forest area prior 1997. During the late 1970s and the 1980s Costa Rica's deforestation rate was among the highest in the world[57]. Some studies report that only 17% of country's total area was covered with closed forest in 1983 compared to the 29% in1991[58]. Between 1987 and 1997 forest loss was estimated at a rate of 12,000 ha. per year compared to 9,100 ha. a year between 1997 and 2000. This marks a steady trend towards a decline in

[57] According to Sánchez-Azofeifa, Harriss, and Skole, 2001, Costa Rica was ranked by the United Nations Food and Agricultural Organization as the fifth country in the world with the highest annual percentage rate of deforestation, with an estimated rate of 3.2 percent between 1976 and 1980. (see also FAO. 1993. Forest Resources Assessment 1990 - Tropical countries. FAO Forestry Paper No. 112. Rome).
[58] Sader and Joyce, 1988; Sánchez-Azofeifa op. cit.

deforestation[59]. Thus, this provides strong evidence the country switched from a clear tendency of drastic forest degradation towards a more sustainable management of the land starting in the late 1980s.

Figure 8 Road construction work trough forestland in Costa Rica

Second, changes in the deforestation pattern may be have been caused by several factors interacting among each other such as access to forestlands and the adoption of new technologies. The deforestation process is accelerated by opening roads or improving waterways facilities to access forestlands. In the case of Costa Rica most of the forest remnants were located on steep mountain slopes with poor accessible conditions or harsh climate patterns that lowered the risk of forest encroachment[60]. Similarly, the availability of new technologies (e.g. starting with the hatchet, moving to

[59] EOSL-CCT-FONAFIFO, 2002
[60] Sader op. cit.; Rosero-Bixby and Palloni, 1996; Sánchez-Azofeifa op. cit.

the chainsaw, the portable sawmill, and then the bulldozer) for the conversion of forest to agricultural land, pastureland or for the industrialization of timber production introduced a new scale or magnitude in the capacity of forestland conversion. The accelerated process was driven by a higher demand for land or forest product as consequence of economic development.

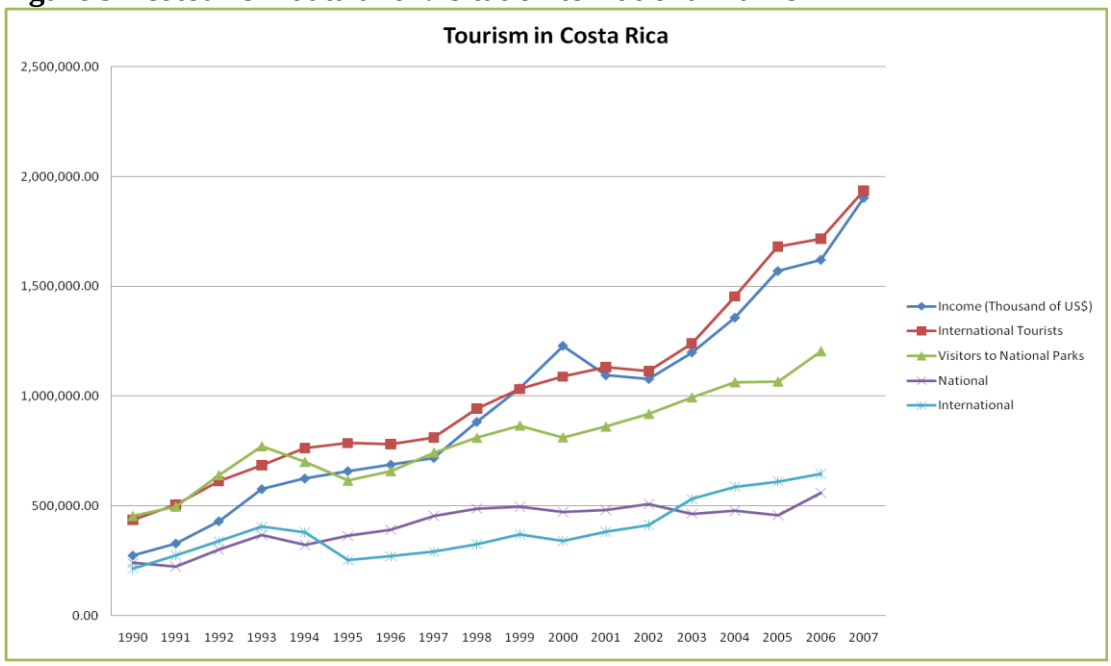
These were not the only relevant causal forces of changes in forest patterns. The adoption of new policies started to reverse the deforestation trend during the late 1980s. Several policies were established with the explicit goal of promoting forestry programs and natural resource conservation, some of which are linked to international agreements; these policies are discuss in a different section. It suffices to highlight here that regulation played a key role in forest management outside SPAs, either to incentivize reforestation or to limit deforestation. Also other policies intended to diversify the economy had an indirect effect on forestlands and land use change. The generalization of these explanations is subject to empirical testing in other latitudes. Nevertheless, these provide good insights which can help guide further research in many different contexts in and outside Costa Rica.

For example, there is a direct correlation between the decline in the international price of meat and forest cover. On the one hand, the decrease in the demand for meat lessened the pressure to converting natural forest into lands for livestock grazing. On the other, natural forest regeneration took place in thousands of hectares of pasturelands which were left of idle after the compression of the international meat market. Similarly,

new linkages in agricultural production efficiency and agroforestry systems emerged as an economic alternative to cattle ranching.

Other policies aimed at strengthening a rapidly increasingly ecotourism sector and provided new economic platform to keep forest standing especially in rural areas. Last, the effects of land reform policies played a more important role than population growth in Costa Rica. The following figure shows how the number of international visitor began to decrease visitation to the national parks after 1993 when nearly all visitors from abroad visited SPAs. A new trend emerges in the composition of national park visitation. For example, in after 1994 more national tourist visited national parks than international visitors. This could be an indicator of Costa Rican's being more aware of the importance of SPAs. This also indicates the private market of nature reserves and ecotourism activities start to become an important alternative for tourist in general.

Figure 9 Ecotourism data and Visitation to National Parks



Source: Estado de la Nación. 2008

IV. The Emergence of a System of Ecosystem Service Governance

1. Public regime: the Case of the FONAFIFO

The 1996 Forestry Law created a new institution, the National Forestry Financing Fund (FONAFIFO), to oversee all the forest related incentives and with it an innovative public ecosystem service regime was created. The organization also finance producers, through loans or other financial mechanisms, to encourage forest plantation, reforestation and other activities in the forest sector (nurseries, agroforestry systems, rehabilitation of deforested areas, industrialization of forest resources, etc.). The 1996 Forestry Law legally recognizes the benefits from four services provided by ecosystems:

i. Mitigation of emissions of greenhouse gases (fixation, reduction, sequestration, storage and absorption).

ii. Protection of water for urban, rural or hydroelectric uses

iii. Protection of biodiversity for conservation and sustainable use, scientific and pharmaceutical research and breeding, and for the protection of ecosystems and life forms.

iv. Natural scenic beauty for tourism and scientific.

This autonomous and fully decentralized fund is able to engage in any type of legal transaction to fulfill its mandate. The financial resources to support the fund's programs come from the State budget; forestry tax revenues; loans between the World Bank and the Government of Costa Rica; and contributions from the German Government through the KfW Bank. Other funding comes from agreements signed with

local state and private corporations[61] as well as international partners (including governments) concerned with environmental protection, reforestation, and the adequate management of important water resources for human consumption, hydroelectric generation, and biodiversity.

In 1997 FONAFIFO launched an innovative public regime program of environmental service payments (ESP) to incentivize private protection and recovery of ecosystems and resources that provide the following environmental services: (i) mitigation of greenhouse gas emissions (GHGs); (ii) water protection for urban, rural or hydroelectric uses; (iii) protection of biodiversity for its conservation, for its sustainable, scientific and pharmaceutical uses, for research and genetic improvement; (iv) protection of ecosystems, life forms, and natural scenic beauty for tourism and scientific purposes[62].

Table 9 Scheme of Payment for Environmental Services in a Public Regime

Incentive for Forest Protection

Year	**Years under Contract**	**Amount per year**	**Total per contract**
1997-2004	5	US$40	US$200
2005-to present	5	US $64	US$320

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Source: FONAFIFO, 2009

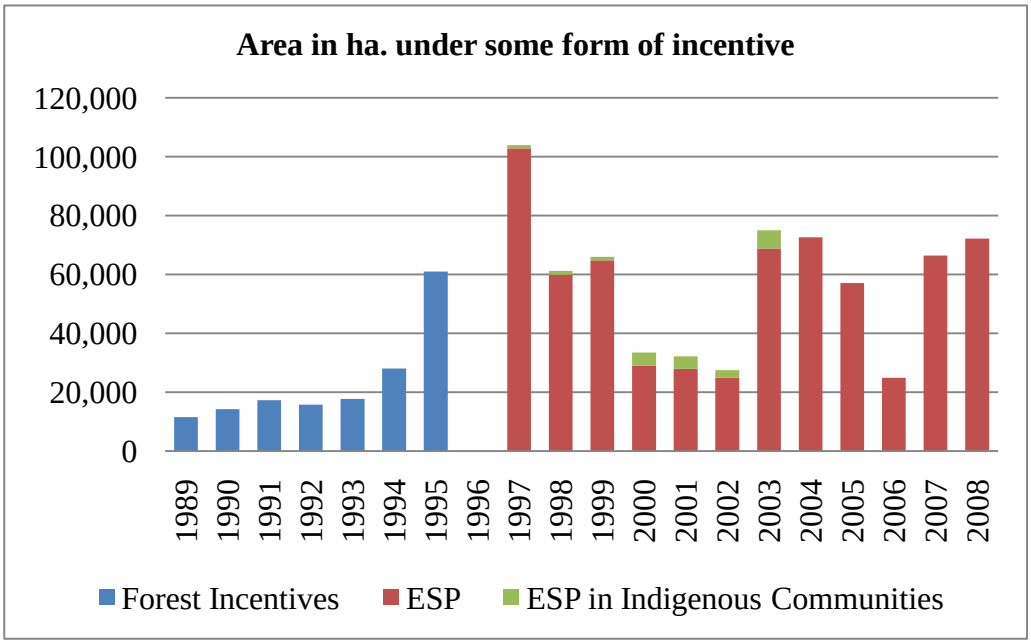
The program started by paying US$40 per hectare per year during a five year contract for a total of US$200, the amount was increased to US$64 in 2005 for a total of US$320 per hectare in five years. In exchange the land holder committed to not to cut the

[61] Currently agreements are held with Energía Global S.A., Hidroeléctrica Platanar S.A. and from Environmental Services contracts signed with the National Power and Light Company (Compañía Nacional de Fuerza y Luz- CNFL) and Florida Ice & Farm.
[62] Forestry Law 7575, Article 3, in Zeledón, R. (1996) and (1999).

forest and to protected against unnatural interventions (cattle let free ranging or grazing, artificial fires, selective logging). In order to maximize the number of beneficiaries, every year any person or entity can only file for a maximum of 300 ha. within a 5 km radius. The table below summarizes the payment scheme.

After more than a decade of experience there is enough evidence (see graph above) that suggest this public environmental service regime has been accepted by the population. This means, beneficiaries trust the government imposing restrictions on their land for short periods of time. The challenges ahead for the regime are the long run financial sustainability of the fund to continue the payments program, increase the number of hectares under the program, and a scientific assessment of the impacts on natural capital from private protection and ecosystems recovery.

Figure 10 Total Area under Conservation incentives

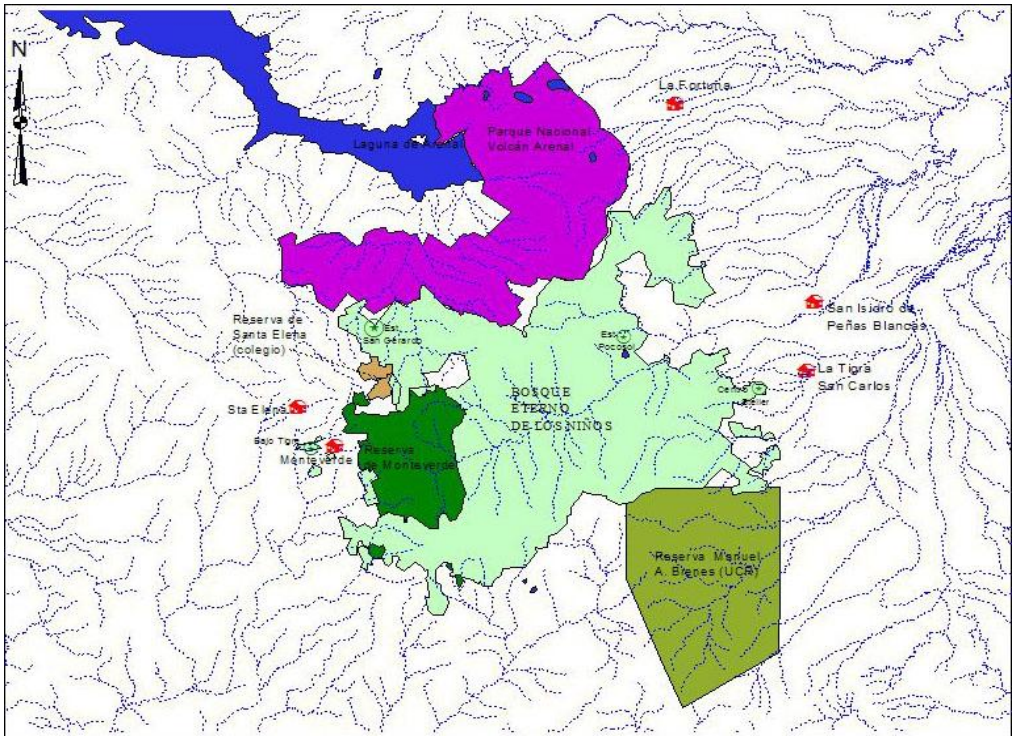


Source: FONAFIFO, Estado de la Nación.

2. Private regime: the Case of the Monteverde Conservation League

The Monteverde Conservation League (MCL) is a membership based, nonprofit, private organization dedicated to conserve, preserve, and rehabilitate tropical ecosystems and their biodiversity. It was established in 1986. The primary project of the MCL has been the acquisition of land in order to conserve it. Through its efforts and with help from children, adults, schools, and organizations from more than 44 around the world, it has succeeded in creating the largest private reserve in Costa Rica: The Children's Eternal Rainforest (Bosque Eterno de los Niños or BEN). The extension of this nature reserve is over 22,500 hectares and is located on a mountainous range surrounded by many towns and small villages. The BEN is very rich in biodiversity and water resources. Together with other reserves in the area it forms a large protected complex and holds two of the most visited tourist destinations in the country: the Arenal Volcano to the north and the Monteverde Cloud Forest to the west.

Most of the lands of the protected complex do not have clear land title. The situation is not different for MCL as only about two thousand hectares of the BEN have land title. Thus MCL faces many conflicts over its land: illegal hunting, poaching, extraction of wildlife, are just a few examples. However, the biggest challenges come from pressures to exploit its rich water and geothermal resources, both from public and private companies.



Source: Monteverde Conservation League. Map of the BEN in light green.

MCL engaged in two battles against two private hydroelectric companies that claimed ownership of small portions of land located right at the boundary of the BEN along three rivers banks (La Esperanza, Peñas Blancas, and Agua Gata). The first conflict took place in 1996 with Inversiones La Manguera (INMAN) Co. The second against CONELECTRICAS Hydroelectric Consortium started 2007. The details of the struggles are not described here but both dealt with land use rights to build water diversion canals for their respective hydroelectric projects. INMAN claimed nearly two hectares of the BEN on La Esperanza river where as CONELECTRICAS claimed half a hectare on the Peñas Blancas River and about 3,000 m^2 on the Agua Gata River.

Superficial land use rights were the basis for a negotiation that recognized the ecosystem service of water resource protection in the upper watersheds of the rivers that

flowed out of the BEN. The negotiations led to signing two environmental services contracts that stipulates: the watershed as the source of the services; the relative stable and clean water flow as the benefits to the hydroelectric companies; and the cost set at US$10 per ha. per year and linked to the size of the watershed area within the BEN. The cost for the service was negotiated based on the principle of willingness to pay (the company) and willingness to accept (MCL). Also, the contract grants the companies certain land use rights for the constructions and maintenance of the canal over a period of time (99 years for INMAN and 38 years for CONELECTRICAS).

Formulas used to calculate the annual payment of environmental services for two hydroelectric companies:

ACM-INMAN Contract:

$$3{,}000 \text{ ha.} \times \text{US\$}10 \times \frac{\text{Gr}}{\text{GP}} \times \frac{\text{Ts}}{\text{Ti}}$$

Gr: real generation in a semester (GWh)
Gp: projected electricity generation (28.82 GWh)
Ts: actual electricity sale price in a period $/KW
Ti: estimated government payment for electricity ($0.0556/KW)

ACM-CONELECTRICAS Contract:

$$10{,}207 \text{ ha.} \times \text{US\$}10 \times 0.5$$

Note: the US$ value is technically US$5 per ha. year. A potential payment from a State hydroelectric project on the same watershed is pending negotiations.

3. International regime: the case of REDD

The idea of Reducing Emissions from Deforestation and Forest Degradation (REDD) in developing countries was proposed at the UNFCCC COP11 in 2005 by Papua

New Guinea and Costa Rica on behalf of the Coalition for Rainforest Nations (CfRN). The idea was to explicitly address climate change mitigation by preventing greenhouse gases emissions from deforestation; this is another proof of the strong link between ecosystem services from forest conservation and development. Later during the COP12, a proposal from Brazil expanded the REDD concept by focusing on the financing, capacity building, and technology transfer for countries that voluntarily reduce deforestation departing from a predetermined based line. Thus, in December 2007 a comprehensive proposal was adopted during the COP13 under the Bali Road Map; this is now known as the REDD+[63].

Several international conservation organizations such as WWF, CI, and TNC are starting to establish REDD projects in countries with abundance of forest. Also, the UN has its own program. The UN-REDD Program is aimed at promoting an economic balance in the sustainable management of forests to enhance the benefits developing countries can derived from the economic, environmental, and social goods provided by forests while contributing to reductions in greenhouse gas emissions.

The UN-REDD fund consists of a total portfolio of US$54.21 billion of which US$37. 44 billion have already been approve and US$15.82 billion have been transferred to participating entities. Access to the fund is limited to the United Nations organizations that are part of the Multi-Donor Trust Fund (MDTF), or formulate a Joint Program (JP). Any entity requesting funds must sign a standard memorandum of understanding (MOU)

[63] UNFCCC, 2007

with the administrative agent. Current UN organizations that have signed the MOU (UNEP, UNDP, and FAO) can solicit funds for REDD initiatives.

The UN-REDD fund provides the needed financial resources to implement programs and projects that significantly reduce global green house gases emissions from deforestation and forest degradation. The immediate goal is "to assess whether carefully structured payment structures and capacity support can create the incentives to ensure actual, lasting, achievable, reliable and measurable emission reductions while maintaining and improving the other ecosystem services forests provide."[64]

[64] UN REDD Program Fund, 2009

V. Conclusions

Developing countries might be able to reach higher levels in living standards by implementing policies towards sustainability. Although economic growth is necessary to enhance quality of life, framing policies in terms of the three pillar of sustainable development is the best approach for developing countries. This principle highlights the interconnection between the social and the ecological systems. Given the current state of knowledge and technology, development cannot continue undermining the viability of life supporting systems. Development priorities must consider the benefits of providing ecosystem services in the long run. This is the connection between the economic pillar and the environmental pillar of sustainability. The social and institutional aspects of development lie within the social system, the third pillar of sustainability.

While several policies Costa Rica adopted during 1970s caused a drastic decline in forest cover with severe negative consequences for the environment, it has been demonstrated in this study that a quick reaction to change let the country improved its development trajectory. Other developing countries struggling to find an effective strategy for development could take a closer look at the Costa Rican experience.

The global interconnectedness has been beneficial for Costa Rica, it is not entirely clear how other countries are able to take advantage of environment multilateral negotiations to revert air and water pollution, the loss of biodiversity, forest resources and ecosystems service decline. As this case shows a possible answer to this question is that the complexity of this issues demand dynamic institutional innovation and adaptation at the national level.

Certainly, the experiences of Costa Rica show the process of economic growth and the market do not by themselves induce sufficient and well-timed mechanisms for sustainability. It is clear that politics and institutions matters in achieving development. Sustainable development requires collective action from government, the private sector, civil society, and the individual citizens to work together on finding solutions.

The Costa Rican leadership wisely took advantage of the benefits of foreign aid, debt for nature swaps, and the financial resources available with the Structural Adjustment reforms in order to lessen the pressure on forest resources that were induced by a faulty economic growth model prior during the 1990s. Part of the solution was incentivizing the production sectors to take care of the environment and regulating land use changes. Institutional reform was a gradual process correlated with the government and private capacities for investments in improving sustainability. A lot of such investment came from international financial resources that were well utilized. External financial resources were crucial for economic growth and conservation of forest lands. Although debt for nature swaps carry a high risk of inflation (as in many cases, local currency has to be printed to honor conservation commitments) they had a positive net effect in the country. This was possible with clear and clever policymaking and institutional innovation that was adapted to new opportunities arising from global negotiations on environmental and development.

Another linkage between conservation and the development comes from ecotourism. The development of this sector helped secure the forest while improving economic conditions in the country. Direct and indirect revenues from the ecotourism

sector helped finance important government programs in education, health, and forest conservation. The spillover effects of tourism development on other activities are reflected in increases in local production, reduction of unemployment, and increases wages and consumption. Also, ecotourism contributes with environmental sustainability by increasing awareness about the need to protect forests.

Some of these features could work in managing global forest resources. However, as this study suggests, global forest resources require policies to mobilize financial sources from governments, international cooperation, and private actors (business and individuals). If the provision of ecosystem services from forest management is legally recognize as global public goods, monumental financial resources can be generated to maintain the forest standing and stop deforestation at the global scale. First, it is necessary the establishment of institutions, policies and rules that recognize the benefits from ecosystem services in fostering development. So far the best options are the various REDD schemes that exists. Nonetheless, this is not a sufficient condition. Institutions and policy effectiveness require strong collective action from actors in the different domains of environmental affairs (global, national, and private).

Costa Rica's successful in coming closer to achieving a sustainable development path is closely related to the benefits derived from forests conservation. Despite some pitfalls during the 1970s and early 1980s, it has reached a mid-upper income level, its people enjoy moderate degree of health and nutrition and high literacy levels. The country went through a difficult process to reverse the environmental damage caused on forest but in doing so it found the path to sustainability. This also helped in the social

stability the country enjoys today. Social stability, people's level of education and conservation initiatives set the conditions for ecotourism development and attracted investors in other economic sectors such as technology. Also Costa Rica was very successful in encouraging private initiatives that help to reduce the cost of conservation policies.

Certainly the process of sustainable development does not end and Costa Rica faces new challenges. On the one hand, private conservation organizations constantly struggle to finance their operations; protecting forest does not come without costs. On the other hand, the consolidation of the state protected areas is still a work in progress. First, the government has not capacity to expand the state protection to key areas with great biological importance. Second, the financial situation of SPAs is precarious and current infrastructure condition need severe improvement in many of them. Moreover, there are many properties in the SPA that remain to be paid to the original owners. Thus, promoting conservation with private landowners seems to be the best strategy now.

Just as in the past, multilateral environmental negotiations may be the driver to overcome the new problems the conservation sector faces today. The existing REDD programs are promising options for international forest protection. The REDD provision in the Copenhagen Accord of the UNFCCC[65], which are still pending international adoption, are positive signs of the emergence of an international regime for ecosystem service provision. Every country will have to innovate in their institutional set up to take

[65] UNFCCC, 2009.

advantage of the political importance of climate change and sustainable development at the international level.

It has been demonstrated that the development process in Costa Rica is deeply influenced by international forces. In this view, the degree of involvement in shaping the global environmental governance system has been positive for the country. Economic performance has benefited from the integration of trade in commodity markets and foreign investment. Costa Rica has been able to move away from mismanagement of its forestlands to fully integrate forest conservation as part of the development process.

The implementation of new policies decreased environmental vulnerability and foster human wellbeing. This has been driven by the collective work of interest groups and the state which is base on the understanding that the transformation of natural resources into goods and services for society must not exceed nature's capacity to sustain life. This is the base of sustainable development. What follows are some of the lesson learned from this study:

1. The effectiveness of multilateral environmental agreements is dependent on how they are able to affect policies and their implementation at the national level. As these regimes do not exist in a vacuum, and interconnectedness of environmental mega-trends becomes more evident at the international level, the regimes also start adapting to feedbacks from the responses at the national level. This is how the emergent system of global environmental governance is coming about; this puts in evidence that the system is being shaped by all dynamic actors in the different environmental domains. The history of ecosystem services payments

linked to REDD is a good example of a maturing framework for global forest governance. The Costa Rica case shows how by focusing on institutions (rather than merely on organizations) and by stimulating changes in the structures of rights and rules, the key actors are able to work collectively across their domains and break the space where solutions to environmental problems arise.

2. Interconnectedness facilitates adaptability in the social and economic systems. This results from the lessons learned by some actors from a strategic reading of activities taking place across the systems. For example, actors in the forest ecosystem services domains learn to identify the opportunities arising from multilateral environmental agreements. These actors are purposeful too, in other words, once the opportunities for dealing with environmental change are identified, they bring to the negotiation table new ways to take advantage of the issues and then push the agenda towards sustainable solutions.
3. Conservation policies in Costa Rica were driven by the strong leadership and the works of collective action. Policymakers turned conservation programs as a priority. The cost of implementing new conservation actions was reduced by taking advantage of the global environmental trends.
4. The environmental policies adopted in Costa Rica in the past thirty years were an opportunity investment to secure its natural capital. Forest protection was the basis to attract substantial financial resources in the form of debt-for-nature swaps that helped supporting state and private conservation initiatives.

5. Similarly, forest protection in turn enabled a very profitable ecotourism sector to develop. Both forest and ecotourism had an unintended positive effect on each other. On the one hand ecotourism helped expand conservation of forest outside the SPAs (in moments when the government had no capacity to do it directly). On the other hand, forest helped consolidate the ecotourism sector across the country.
6. This study shows that contractual regimes that recognize social benefits derived from ecosystems do not neatly followed a specific valuation methodology for calculating the cost of the service. However, evidence from existing regimes suggest that clearly expressing the principles of ecosystem services in the contracts play an important role for a successful negotiation. The Costa Rican experiences of environmental services contracts, both public and private, illustrate the relevance of institutions in crafting a global ecosystem services regime. A close look at the institutional development that created basic conditions for launching a contract regime helps identifying similar patterns in other countries where ecosystem services contracts may be implemented.
7. The climate change negotiation on REDD could use some of the elements of the existing ecosystem services contractual regimes in Costa Rica. With the REDD proposal the world is closer than ever to a global ecosystem services regime. REDD policies linked to ecosystem services must consider the opportunity costs of forest conservation and the costs of incentives in addition to the contractual transaction costs. There is a large degree of costs variation across countries[66] and

[66] Nathalie and Bishop, 2009.

across domains (the costs of forestlands, competing land uses, valuation of ecosystem services and their markets, policy and regulation enforcement, just to mention some). In this sense the identification of comparative advantages in policy implementation is unavoidable. What matters than is the establishment of general principles and rules in the multilateral environmental governance system to help guide the decision making for all actors. Thus, to be competitive countries have to learn to be efficient in adapting institutions to the new macro-trends.

8. Global negotiations should focus on the actors who provide goods across domains (global, national, public, or private). This means the reduction of the provisions of "bads" is can be neutralized by the provision of goods that contribute to the realization of sustainable development. This idea is similar to the one that proposed by Moomaw, 2007 that the best way for addressing climate change, is to thinking about it in terms of development rather than treating it as a pollution problem[67]. The lessons from the Costa Rica case show this also true for dealing with ecosystem services from forests, not as an obstacle but rather for their contribution to development.
9. Following this logic, policies that promote the conservation of natural capital play a dual role of increasing the provision of public goods and services and fostering sustainable development. Forest conservation as a type of land use must be protected with clearly defined property right but this is not sufficient to guarantee

[67] Moomaw, 2007.

their sustainability in the long-run. Landowners must be able to transact the services the forest provides with other parties at national and international levels.

These lessons provide sufficient evidence to show that multilateral environmental regimes have a direct effect in policymaking for forest conservation and ecosystem services provision in Costa Rica. The stimulus of the negotiations and their outcomes can drive institutional innovations at the domestic level. Further, active participants in multilateral environmental negotiations can influence the global system by proposing policies which provide opportunities or suggest solutions to global problems, or ways to follow a sustainable development path.

In examining the development of policies between 1970 and early 1980s, this research shows that Costa Rica implemented policies that favor deforestation bustling to develop at a very high environmental cost while achieving little economic growth; thus these policies had ambiguous effects on development. A clearer path towards sustainability was brought about by a strategic alignment of domestic policymaking with a nascent global paradigm shift around the notion of sustainable development. This alignment had a positive effect on the social and ecological system. On the one hand, starting in late 1980s deforestation rates started to decrease and forest cover increased. The economic system benefited with the collective activations that stimulated new sectors in the economy such as tourism and technology. -the evolution of domestic policymaking, as an adaptive response to global change, had implications that spillover from the national to the international level (a bottom-up approach from the state as

primary actor to the global international system). Similarly, play a major role in pushing the REDD proposal in the climate change negotiations; this proposal incorporates several features of the country's ecosystem service payment program; there are now several of such programs in different countries which follow the Costa Rica model.

Further, this dynamic helps to show that a system of global environmental governance does indeed exist. The effectiveness of the system is increased by the processes of sustainable development diplomacy. As long as there are opportunity gains from negotiations and as long the costs of acting to solve environmental problems can be reduced, then countries will seek cooperation. These lessons should help illuminate how institutional change can help the process of sustainable development in other countries. Certainly, these lessons are also important for the Costa Rican policymakers.

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