ABSTRACT

McGINLEY, KATHLEEN ANN. Policies for Sustainable Forest Management in the Tropics: Governmental and Non-Governmental Policy Outputs, Execution, and Uptake in Costa Rica, Guatemala, and Nicaragua. (Under the direction of Frederick W. Cubbage.)

There is an incomplete understanding of governmental and non-governmental policy approaches for promoting sustainable forest management in the tropics, including the features of productive forest management that these policies address, how they are put into practice, and, ultimately, their overall impacts on tropical forest management. The fundamental questions examined in this research center on how and why governmental and non-governmental forest policies and their execution lead to, or fail to produce, the desired changes or improvements in target group behavior toward a greater understanding of policy’s contribution to the enhanced sustainability of managed tropical forests. This research used a theory-driven evaluation of governmental forest regulation and non-governmental forest certification in Costa Rica, Guatemala, and Nicaragua to determine how and why these policy approaches, their execution, and the context in which they are applied, lead to, or fail to produce, changes or improvements in forest owner and user behavior, towards a greater understanding of their effectiveness in enhancing the sustainability of managed tropical forests.

A comparative case study approach was implemented in Costa Rica, Guatemala, and Nicaragua. Semi-structured interviews and archival document analysis were the primary methods used. A total of seventy-eight key individuals from forestry agencies and forest certification programs, forest owners and managers, and local and regional forestry experts were interviewed from March to July 2007. Interview data was transcribed, coded, and analyzed. Primary archival and other secondary archival data from bureaucratic records and documents, related research, local newspapers, and other sources were used to verify the findings produced from the analysis of policy directives, instruments, and interviews.
This research enhanced understanding of policy approaches for promoting sustainable tropical forest management in several ways. First, it expanded knowledge of how and what aspects of tropical forest management are addressed by governmental forest regulation and non-governmental forest certification through related policy tools and directives. The research determined how governmental and non-governmental forest policy approaches for tropical forest management in Central America were put into effect, shedding light on how and why these policy approaches produced both intended and unintended results. The findings confirmed that sufficient resources and capacity for policy implementation were crucial for attaining policy objectives (see for example Lipsky 1980; Mazmanian and Sabatier 1983, 1989; Vogel and Kessler 1998), but that there were also innovative forest policy verification and/or enforcement arrangements that compensated for limited implementation resources and processes.

The results of this research explained the effects of forest policy approach and execution on forest policy uptake through an analysis of governmental and non-governmental forest policy adoption and compliance by forest owners and managers, and the inducements and constraints to policy uptake at the local- and larger- level policy contexts. Finally, the research provided insight into the similarities, differences, and overlap between governmental forest regulation and non-governmental forest certification in Costa Rica, Guatemala, and Nicaragua in terms of the forest management aspects addressed, the ways and means for putting policy into effect, and the associated policy adoption and compliance by forest owners and users. The research results provided important information for governmental and non-governmental decision- and policy- makers charged with finding viable solutions to forest degradation and deforestation in the countries of study, as well as in other countries and regions with important tropical forest resources.
Policies for Sustainable Forest Management in the Tropics: Governmental and Non-Governmental Policy Outputs, Execution, and Uptake in Costa Rica, Guatemala, and Nicaragua

by
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<th>FULL FORM</th>
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<tbody>
<tr>
<td>ACOFOP</td>
<td>Association of Forest Communities of the Peten (Asociación de Comunidades Forestales de Petén)</td>
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<tr>
<td>ADFOREST</td>
<td>Nicaraguan State Forest Administration (Administracion Forestal Estatal)</td>
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<tr>
<td>AFE</td>
<td>Costa Rican State Forest Administration (Administracion Forestal Estatal)</td>
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<tr>
<td>ANF</td>
<td>Guatemalan National Forest Agenda (Agenda Nacional Forestal)</td>
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<tr>
<td>BID</td>
<td>Inter-American Development Bank (Banco InterAmericano de Desarrollo)</td>
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<tr>
<td>CAF</td>
<td>Costa Rican Forest Credit Certificate (Certificado de Abono Forestal)</td>
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<tr>
<td>CAFMA</td>
<td>Costa Rican Forest Credit Certificate for Forest Management (Certificado de Abono Forestal para Manejo)</td>
</tr>
<tr>
<td>CATIE</td>
<td>Tropical Agronomy Center for Research and Teaching (Centro Agronomico Tropical de Investigación y Enseñanza)</td>
</tr>
<tr>
<td>CEMEC</td>
<td>CONAP Center for Monitoring and Evaluation (Centro de Monitoreo y Evaluación de CONAP)</td>
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<tr>
<td>CIA</td>
<td>Costa Rican Professional Association of Agronomy Engineers (Colegio de Ingenieros Agronomos)</td>
</tr>
<tr>
<td>CINCO</td>
<td>Center for Communication Research (Centro de Investigacion de Comunicacion)</td>
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<tr>
<td>CIP</td>
<td>Center for International Policy</td>
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<tr>
<td>CNCF</td>
<td>Costa Rica Nacional Forest Certification Commission (Comisión Nacional de Certificación Forestal de Costa Rica)</td>
</tr>
<tr>
<td>CODEFOSA</td>
<td>Commission for Forest Development of Sarapiqui</td>
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<tr>
<td>CONAP</td>
<td>Guatemalan National Council for Protected Areas (Consejo Nacional de Areas Protegidas)</td>
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<tr>
<td>CONAFOR</td>
<td>Nicaraguan National Forest Commission (Comisión Nacional Forestal)</td>
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<tr>
<td>CONESFORGUIA</td>
<td>Guatemalan National Council for a Sustainable Forest Management Standard (Consejo de Estandares Forestales de Guatemala)</td>
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<tr>
<td>CORFOP</td>
<td>Nicaraguan People’s Forest Corporation (Corporación Forestal del Pueblo)</td>
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<tr>
<td>DGF</td>
<td>General Forestry Administration (Direccion General Forestal)</td>
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<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>DIPRONA</td>
<td>Nature Protection Division of the Guatemalan National Police (Division de Proteccion de la Naturaleza)</td>
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<tr>
<td>ECTI</td>
<td>Costa Rican Strategy Against Illegal Logging (Estrategia Contra la Tala Ilegal)</td>
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<tr>
<td>ENGO</td>
<td>environmental non-governmental organization</td>
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<tr>
<td>FAO</td>
<td>Food and Agriculture Organization</td>
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<tr>
<td>FMU</td>
<td>forest management unit</td>
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<tr>
<td>FONAFIFO</td>
<td>Costa Rican National Forest Financing Fund (Fondo Nacional de Financiamiento Forestal)</td>
</tr>
<tr>
<td>FONADEFO</td>
<td>Nicaraguan National Forest Development Fund (Fondo Nacional de Desarrollo Forestal)</td>
</tr>
<tr>
<td>FORESCOM</td>
<td>Forest Services Community Enterprise (Empresa Comunitaria de Servicios del Bosque S.A.)</td>
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<tr>
<td>FUNDECOR</td>
<td>Foundation for the Development of the Central Volcanic Corridor (Fundacion de Desarrollo del Corredor Volcancio Central)</td>
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<tr>
<td>FSC</td>
<td>Forest Stewardship Council</td>
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<tr>
<td>FYDEP</td>
<td>National Agency for the Promotion and Development of the Petén (Empresa Nacional de Fomento y Desarrollo de Petén)</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>GFMP</td>
<td>general forest management plan</td>
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<tr>
<td>GIS</td>
<td>geographic information system</td>
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<tr>
<td>GNI</td>
<td>Gross National Income</td>
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<tr>
<td>GPS</td>
<td>Global positioning system</td>
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<td>Ha</td>
<td>hectares</td>
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<td>HDI</td>
<td>Human Development Index</td>
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<td>IADF</td>
<td>Institutional Analysis and Development Framework</td>
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<td>IFM</td>
<td>Independent Forest Monitoring</td>
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<td>Abbreviation</td>
<td>Full Name</td>
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<tr>
<td>INAB</td>
<td>Guatemalan National Institute for Forests (Instituto Nacional de Bosques)</td>
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<tr>
<td>INAFOR</td>
<td>Nicaraguan National Forestry Institute (Instituto Nacional Forestal)</td>
</tr>
<tr>
<td>IRB</td>
<td>North Carolina State University Institutional Review Board for Human Subjects Research</td>
</tr>
<tr>
<td>IRENA</td>
<td>Nicaraguan Institute of Natural Resources (Instituto de Recursos Naturales)</td>
</tr>
<tr>
<td>ITTO</td>
<td>International Tropical Timber Organization</td>
</tr>
<tr>
<td>JUNAFORCA</td>
<td>National Small-Farmer Forestry Board (Junta Nacional Forestal Campesina)</td>
</tr>
<tr>
<td>MAG</td>
<td>Costa Rican Ministry of Agriculture and Livestock (Ministerio de Agricultura y Ganadería)</td>
</tr>
<tr>
<td>MAGA</td>
<td>Guatemalan Ministry of Agriculture, Livestock, and Food (Ministerio de Agricultura, Ganadería y Alimentación)</td>
</tr>
<tr>
<td>MAGFOR</td>
<td>Nicaraguan Ministry of Farming and Forestry (Ministerio Agropecuario y Forestal)</td>
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<tr>
<td>MARENA</td>
<td>Nicaraguan Ministry of Natural Resources (Ministerio de Recursos Naturales)</td>
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<tr>
<td>MBR</td>
<td>Maya Biosphere Reserve</td>
</tr>
<tr>
<td>MINAE</td>
<td>Costa Rican Ministry of the Environment and Energy (Ministerio de Ambiente y Energía)</td>
</tr>
<tr>
<td>MIRENEM</td>
<td>Costa Rican Ministry of Natural Resources, Energy, and Mining (Ministerio de Recursos Naturales, Energía, y Minas)</td>
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<tr>
<td>NGO</td>
<td>non-governmental organization</td>
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<tr>
<td>OECD</td>
<td>Organization of Economic Cooperation and Development</td>
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<tr>
<td>ONF</td>
<td>Costa Rican National Forestry Office (Oficina Nacional Forestal)</td>
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<tr>
<td>PAF-CR</td>
<td>Costa Rican Forest Action Plan (Plan de Acción Forestal – Costa Rica)</td>
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<tr>
<td>PAF-G</td>
<td>Guatemalan Forest Action Plan (Plan de Acción Forestal – Guatemala)</td>
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<tr>
<td>PAF-Nic</td>
<td>Nicaraguan Forest Action Plan (Plan de Acción Forestal – Nicaragua)</td>
</tr>
<tr>
<td>PC&amp;I</td>
<td>Principles, Criteria, and Indicators</td>
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<tr>
<td>PNDF</td>
<td>Costa Rican National Forest Development Plan (Plan Nacional del Desarrollo Forestal)</td>
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PINFOR  Guatemalan National Program of Forest Incentives (Programa Nacional de Incentivos Forestales)

POA  plan operativo anual

PSA  Payment for Environmental Services (Pago por Servicios Ambientales)

RAAN  Northern Atlantic Autonomous Region of Nicaragua (Región Autonoma del Atlantico Norte)

RAAS  Southern Atlantic Autonomous Region of Nicaragua (Región Autonoma del Atlantico Sur)

SERENA  Natural Resources Secretariat (Secretaría de Recursos Naturales)

SFM  sustainable forest management

SINAC  Costa Rican National System of Conservation Areas (Sistema Nacional de Areas de Conservación)

UNDP  United Nations Development Programme

USAID  United States Agency for International Development

WWF  Worldwide Fund for Nature
1.1 Introduction

As tropical forests continue to be one of the most threatened ecosystems on Earth (Millennium Ecosystem Assessment 2005), it is no wonder that there is a broad range of public- and private-sector policy approaches to address deforestation and forest degradation in the tropics. These policy approaches can range from strict forest preservation, to governmental and non-governmental promotion of sustainable forest management, through to the creation of markets for the protection of forest-based environmental services (Sterner 2003). World-wide, only 12% of all forests are protected from exploitation through some type of legal reserve such as parks, integrated conservation units, biological reserves, or wilderness areas (FAO 2001). The balance of about 85% of the forests in the world, and in the tropics, must often be productively managed for timber or nontimber forest products, for tourism, or for environmental services, or protected through other governmental and non-governmental interventions to encourage retention and sustainability.

Improving the sustainability of tropical forest management for timber production is generally regarded as an essential component within larger multi-faceted strategies for reducing deforestation and degradation throughout the tropics (see for example: Kaimowitz, Byron, and Sunderlin 1998; Whitmore 1999; Pearce, Putz, and Vanclay 2003; for exceptions: Bowles et al. 1998). Accordingly, this research evaluated selected public- and private-sector policies for promoting or enhancing the sustainability of productive natural forest management in the tropics. Natural forests comprise by far the predominant forest area in the region. Other legal conservation and preservation measures are obviously important for retaining and protecting forests and forest resources as well, but sustainable timber management that provides benefits to forest owners is crucial, and the focus here.
Public sector policy for promoting sustainable tropical forest management generally encompasses the regulation of forest production through guidelines, rules, and/or restrictions that are traditionally carried out through a command-and-control approach, but which also may be promoted through fiscal subsidies, incentives or taxes, as well as education and technical assistance. Private-sector policy approaches to improving productive forest management typically include public awareness campaigns, knowledge transfer or exchange, direct investment in sustainable forestry, and the development of market structures that promote sustainable forest management (Cubbage, Harou, and Sills 2007). In particular, forest certification is a fairly new, non-governmental market-driven policy tool that promotes sound forest management through private-sector market-based incentives (Cashore, Auld, and Newsom 2004). It essentially encompasses a standardized process of evaluating and labeling wood products from well-managed forests, whereby the label provides information to buyers and permits recognition and reward of sound forest management (Nussbaum and Simula 2005).

Although governmental forest regulation and non-governmental forest certification comprise two key approaches for promoting sustainable forestry in the tropics, both are associated with shortcomings and perceived failures. Despite long-term efforts to advance governmental regulation of tropical forest management, this policy approach is often criticized for failing to curtail continuing rates of forest degradation and deforestation in the tropics (Meidinger 2003; Rametsteiner and Simula 2003; Cashore and McDermott 2004). These failures are often linked to poor enforcement, corruption, and weak legal systems (Hickey 2004; Contreras-Hermosilla 2002). A review of relevant literature further reveals that not enough is known about the aspects of forest management that are addressed through governmental forest regulation in the tropics (for exceptions see: Cashore and McDermott 2004), making it difficult to discern if policy failures are due solely to weaknesses in implementation structures and processes, or in part at least, to weaknesses in the regulatory policies themselves.
On the other hand, forest certification was initially promoted as an alternative non-governmental market-based policy approach for promoting sustainable forest management in the tropics to redress failures of government intervention and consumer boycotts in curtailing tropical deforestation (Bass et al. 2001). However, forest certification has not proved to be a far-reaching means, in and of itself, for improving forestry in the tropics (Gulbrandsen 2004; Meidinger 2003; Atyi and Simula 2002). It has been more than a decade since the inception of forest certification, yet less than five percent of the global total of certified forests are found in the tropics, which is slightly less than one percent of the total area of tropical forests worldwide (Cubbage, Frey, and McGinley 2006). Overall, while there is some empirical evidence of the improvements to forest management through certification (see for example: Bass et al. 2001; Newsom and Hewitt 2005; WWF 2005; Newsom, Bahn, and Cashore 2006), experience to date has led some to speculate that forest certification in the tropics may be significantly limited in its potential impacts and reach (see for example: Meidinger 2003; Rametsteiner and Simula 2003; Atyi and Simula 2002). Potential obstacles to broader certification of tropical forests include the inflexibility of certification standards that focus on the outcomes of, but not progress toward, sustainable forest management; potential conflict or incompatibility between certification standards and local, legal forest-related frameworks; certification’s failure to take into account local and broader land-use contexts; and the costs associated with the improvements required for conventional tropical forest management to meet certification standards (Atyi and Simula 2002). Yet, there is limited practical evidence of the obstacles and constraints to greater diffusion of tropical forest certification from the field.

1.2 Research Overview

Overall, we have an incomplete understanding of governmental and non-governmental policy approaches for promoting sustainable forest management in the tropics, including the features of forest management that these policies address, how the policies are put
into practice, and, ultimately, their overall impacts on tropical forest management. This research was developed to address these issues through a theory-driven evaluation of governmental forest regulation and non-governmental forest certification in Costa Rica, Guatemala, and Nicaragua. These countries have tropical forests that provide important resources and services at local, national, regional, and global levels. Moreover, they represent a range in local contexts, forest policy instruments, forest management and deforestation issues, and tropical forest management outcomes.

I collected and analyzed governmental and non-governmental forest policy directives and instruments, as well as conducted and analyzed semi-structured interviews with key forest policy actors in the three case study countries, to determine governmental and non-governmental forest policy elements and processes. A total of seventy-eight individuals from forestry agencies and forest certification programs, forest owners and managers, and local and regional forestry experts were interviewed over a four month period from March to July 2007. The interviewees were asked standardized questions in relation to their experiences with and perceptions of governmental forest regulation and non-governmental forest certification. Their responses were transcribed, coded, and analyzed. Archival and other secondary data from bureaucratic records and documents, related research, local newspapers, and other sources were used to verify the findings produced from the analysis of policy directives, instruments, and interviews.

This research enhanced our understanding of policy approaches for promoting sustainable tropical forest management in several ways. First, it expanded our knowledge of how and what aspects of tropical forest management are addressed by governmental forest regulation and non-governmental forest certification through related policy tools and directives. As noted by Cashore and McDermott (2004), we do not know enough about the approaches and the content of forest policy, particularly in developing countries, which is key to understanding the potential impacts of any policy (Mazmanian and Sabatier 1983). The results demonstrated that governmental regulation typically
includes a mix of tools (e.g. statutes, incentives, penalties) to promote sustainable forest management, that may even include non-governmental forest certification as a requirement for forest access. They also showed that governmental forest policy directives (e.g. laws, regulations) for tropical forest management in Central America are considerably comprehensive and rigorous\(^1\), particularly in terms of the planning, operational, and ecological aspects of forest management. Non-governmental forest certification directives (i.e. standards of forest management) are generally more comprehensive than regulatory directives, particularly with regard to the social and economic aspects of tropical forest management.

Second, the research unraveled the implementation process of governmental and non-governmental forest policy approaches for tropical forest management in Central America. An understanding of how policies are put into effect is essential for determining how and why a particular policy produces both intended and unintended results (DeLeon and DeLeon 2002; Barrett 2004). In addition to supporting the general premise that sufficient resources and capacity for policy implementation are crucial for attaining policy objectives (see for example Lipsky 1980; Mazmanian and Sabatier 1983, 1989; Vogel and Kessler 1998; O'Toole 2004), the results also demonstrated that there are innovative forest policy enforcement and/or verification arrangements that can compensate for limited implementation resources and processes. This contributes not only practical recommendations for tropical forest governmental and non-governmental policy-makers and stakeholders, but theoretical support for the potential of ‘smart regulation’\(^2\) approaches for promoting sustainable forest management in the tropics.

\(^1\) Comprehensive refers to policy that addresses a wide range of aspects related to the policy problem. Rigorous refers to policy that is increasingly prescriptive in its approach to the policy problem and which sets increasingly conservative thresholds on permissible impacts.

\(^2\) ‘Smart regulation’ was first conceptualized by Neil Gunningham, Peter Grabosky, and Darren Sinclair (1998) and centers on the premise that the use of multiple rather than single policy instruments, and an increased range of regulatory actors, will produce better environmental regulation.
Third, the research shed light on the effects of forest policy approach and execution structures, processes, and resources on forest policy uptake through an analysis of governmental and non-governmental forest policy adoption and compliance by forest owners and managers within the local and larger forest policy context. Increased knowledge of the inducements and constraints to tropical forest policy uptake (i.e. policy adoption and compliance) is critical to understanding better the potential and actual impacts and outcomes of sustainable forest management policies in the tropics (Contreras-Hermosilla 2002; Kaimowitz 2003). This research demonstrated that analysis of the dynamics of policy uptake produces a greater understanding of how and why policies intended to promote or enhance the sustainability of tropical forest management succeed or fall short of policy goals. The research also contributed to the study of policy implementation, in general, in its demonstration of the usefulness of incorporating focus on target group decision-making and the related, key drivers and impediments to policy uptake, which is seldom a specific focus in the related literature.

Finally, the research provided insight into the differences, similarities, and overlap between governmental forest regulation and non-governmental forest certification in Costa Rica, Guatemala, and Nicaragua in terms of the aspects of forest management addressed, the ways and means for putting these policies into practice, and, the associated adoption and compliance by forest owners and users. Combined analyses of these factors are largely missing from the literature. This research helped to fill that void, producing important information for governmental and non-governmental decision- and policy- makers who are charged with finding viable solutions to forest degradation and deforestation in the countries of study, as well as in other countries and regions with important tropical forest resources.

The remainder of this chapter introduces the key bodies of literature that informed the design of a theoretical framework to guide the research. It also outlines the related research questions that form the foundation of this dissertation. The next chapter
summarizes the literature relevant to this research. The third chapter conceptualizes and operationalizes the research variables, and describes the research design, methods, and analysis techniques. The final chapters present the data, findings and implications.

1.3 Research Approach and Theoretical Foundation

Policy generally encompasses the basic principles by which a government or private sector is guided, and may be considered a purposive course of action or inaction that an actor or set of actors takes to deal with a problem (Anderson 1984; Heidenheimer, Heclo, and Adams 1983; Dye 1992). Policy outputs are the formal directives, processes, and structures of government or private actors that encompass the means for implementing policy principles or goals. They are the first formal step toward policy implementation (Jones 1984; Mazmanian and Sabatier 1983; Birkland 2005). Policy implementation may be broadly considered “the process of putting policy into effect” (Barrett 2004: 252). Ultimately, knowledge of the extent to which policies are effectively crafted and put into effect contributes to greater insight into policy’s ultimate contribution to the attainment of policy goals.

The fundamental questions examined in this research center on how and why governmental and non-governmental forest policies and their execution lead to, or fail to produce, the desired changes or improvements in target group behavior toward a greater understanding of policy’s contribution to the enhanced sustainability of managed tropical forests. Given the nature of the basic questions driving this research, I selected a theory-driven approach to policy evaluation in my search for answers. Theory-driven policy evaluation is designed to better understand the progress toward and attainment of policy goals, providing insight into why policies succeed or fail and how they may be improved toward greater goal attainment (Rossi et al. 2004). This type of research is used to gain insight not only into policy outcomes, but also into the process of policy implementation.
by ‘unraveling’ and evaluating the elements and procedures associated with putting policy into practice (Van der Knap 2004).

An important first step in theory-driven evaluation research is to make explicit how and why policy intends to achieve the policy goals, which is followed by the identification and analysis of likely causal factors and/or alternative explanations for the policy outcomes (Chen and Rossi 1992). A basic review of governmental and non-governmental forest policies and related literature on policy approaches for influencing forest use (see for example: Cubbage, O’Laughlin, and Bullock 1993; Sterner 2003; Pearce and Willis 2003) reveal that governmental forest regulation and non-governmental forest certification both aim to change the behavior of the target group (i.e. forest owners and users) towards the greater overall sustainability of managed forests - the former primarily through intervention or a command-and-control approach and the latter through market-forces. Figure 1.1 demonstrates that forest management policies are expected to effect changes or improvements in forest user behavior that ultimately are expected to result in the enhancement of sustainable forest management.

![Figure 1.1 Basic Expected Relationship of Forest Policy, Target Group Behavior, and Forest Management Outcomes](image)

While Figure 1.1. demonstrates the expected association between forest policy, target group behavior, and the sustainability of forest management, theory-driven policy evaluation requires the identification of specific variables and their causal connections to better study and analyze how and why forest policies ultimately do or do not lead to better forest management. Therefore, I also turned to the political and policy sciences, which provide an array of theories and models for explaining how and why policy is made...
and how and why it works. These help us to understand the development, implementation, and outcomes of tools such as governmental forest regulation and non-governmental forest certification. Prominent theories include group theory, institutional theory, public choice theory, political systems theory, and the policy process model. “Each offers a different perspective on the principal determinants of decision-making within government and therefore on what people might regard as the major forces that shape the direction and content of public policies” (Kraft 2004: 70). In light of the research focus, I drew from theory and study on the policy process, policy implementation, adoption and compliance, and institutional development to guide the process of inquiry and analysis.

1.3.a The Policy Process
The policy process model incorporates valuable elements from many of the most prominent policy theories and models (Brewer and Clark 1994; Kraft 2004). It is based on the work of Harold D. Lasswell, who describes the policy process as a “social dynamic that determines how the good and bad in life are meted out – that is, who gets what, when, and how” (Lasswell 1950, cited by Clark 2002:5). Kraft (2004) depicts the policy process model in six stages, and in the following description I provide examples related to sustainable forest management (SFM). Nevertheless, not all of the stages necessarily occur in order, or at all, in every policy issue (Kraft 2004).

The policy process model encompasses: problem definition and agenda setting (e.g. forest degradation and deforestation and their rise to the political agenda); policy formulation (e.g. design and draft of policy goals for promoting SFM); policy legitimation (e.g. formal enactment of SFM policies through legislation); policy implementation (e.g. provision and assignment of forest administration resources and personnel, and the development of programs and directives for putting SFM policy into effect); policy and program evaluation (e.g. measurement and assessment of SFM policy effects and of
policy successes and failures); and policy change (e.g. modification of SFM goals in light of evaluation and new information) (Kraft 2004).

The policy process model also takes into account the broad relationships among policy actors within and across each stage of the process. Overall, it is very useful for understanding the flow of events and decisions in the policy process, as well as the interactions and outcomes of policy decisions (Ascher and Healy 1990). This model contributed to the research design and analysis by framing the context in, and process by which, governmental forest regulation and non-governmental certification arise, are applied, result in outcomes, and are evaluated and modified.

1.3.b Policy Implementation
As poor implementation and enforcement of governmental regulatory forest policy in the tropics is considered to be a major factor in its failure to significantly improve tropical forest use (see for example Meidinger 2003; Rametsteiner and Simula 2003; Hickey 2004), I also turned to theory and studies on policy implementation in the research design and analysis. The policy implementation literature is useful for understanding how and why both governmental and non-governmental policies may contribute to or fail to produce changes in target group behavior and ultimately, to the overall policy goal of enhancing the sustainability of managed tropical forests. “Learning from implementation problems can foster learning about better ways to structure policies to ensure that they have the effects that designers seek” (Birkland 2005: 181). While there is no consensus on a parsimonious theory of policy implementation in the related fields of study (O'Toole 2004), this research was not designed to prove or disprove any one theory or model of policy implementation. However, in its design I did draw significantly from the implementation literature in identifying and interpreting plausible variables and interactions that might induce or impede the contribution of forest policy to furthering sustainable forest management in the tropics. For example,
Mazmanian and Sabatier (1983)\(^3\) and Jones (1984)\(^4\) identify stages of policy implementation that may be positioned with the larger policy process model described above. Although policy implementation, as with the broader policy process model, is not thought to unambiguously proceed in distinct sequential stages, the models of implementation in the literature were particularly helpful in structuring and focusing my thinking about putting tropical forest policy into effect, as they represent “a good way of at least seeing how all the pieces of the process fit together” (Birkland 2005: 224). Additionally, I incorporated some of the key variables associated with policy implementation in my process of inquiry and analysis. These include, for example, the characteristics: of the policy and its goals, of the implementing agencies and their processes of verification or enforcement of policy compliance, of the policy target group itself, and of the implementation environment or context (Mazmanian and Sabatier 1983, 1989; Goggin et al. 1990; Winter 1990, 2003a).

1.3.c Understanding Policy Adoption and Compliance

The policy implementation literature focuses to varying degrees on target group compliance (see for example: Mazmanian and Sabatier 1983) and/or target group behavior (see for example: Elmore 1980; Winter 1990) in understanding the process of policy implementation and its ultimate success or failure. However, this focus does not sufficiently explain the inducements and constraints on the decisions of the policy target group in terms of policy adoption and compliance. And, an understanding of the motivations and incentives of the target group to adopt and comply with policy is essential for determining the causal links between policy, its execution, target group responses, and the ultimate policy outcomes.

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\(^3\) Mazmanian and Sabatier (1983) identify the policy implementation stages as: (1) policy outputs (decisions) of implementing agencies; (2) compliance of target groups with those decisions; (3) actual impacts and (4) perceived impacts of agency decisions; and (5) policy evaluation and revisions.

\(^4\) Jones (1984) identifies four types of policy implementation activities: interpretation of policy into directives; organization of units, resources and methods for executing a policy/directives; application of policy objectives and instruments; and monitoring of agency/implementer activities and outcomes.
To better understand how forest policy adoption and compliance are influenced by local level conditions, as well as by forest policy outputs, execution, and the larger forest policy context I turned to work by Elinor Ostrom and her colleagues (see for example Ostrom 1990; Ostrom, Gardner and Walker 1994) on institutional development. Their work permits a better understanding of the factors that affect target group decision-making and behavior, particularly in relation to target group policy adoption and compliance, which was defined for this research as ‘policy uptake’. For example, Ostrom (1990) describes individual actions as a function of both the attributes of the individual (i.e. attitudes and resources) and attributes of the decision situation (i.e. institutional rules, nature of the good, attributes of the community/larger policy system). These and other key variables and their interactions identified in the institutional development and analysis body of literature were helpful in guiding my research design and analysis.

1.3.d Towards a Theoretical Framework to Guide Inquiry and Analysis

Drawing from the literature on natural and forest resource policy, the policy process, policy implementation, and institutional development and analysis, I developed a theoretical framework that provides structure to the process of inquiry (Schlager 1999) (Figure 1.2). The development of a policy model or framework is essential to theory-driven policy evaluation, and is particularly useful for organizing and designing research by specifying the key variables of interest and their relationships (Chen and Rossi 1992).
Figure 1.2 Theoretical Framework of Sustainable Forest Management Policy Implementation
(Adapted from Kraft 2004; Mazmanian and Sabatier 1983; Jones 1984; Winter 1990; Ostrom et al. 1994)
As demonstrated in Figure 1.2, it is possible to integrate several theories of process and action that might otherwise be examined in isolation, towards a better understanding of policies for promoting sustainable tropical forest management. However, it should be noted, this research was not designed to test any one or group of policy-related theories, but draws from those mentioned above, and others, in building a theory-driven policy evaluation framework capable of uncovering new information and guiding my interpretation of the research findings and results. In so doing, the research framework also permitted an assessment of the efficacy of these theories as tools for identifying the key research variables and their interactions.

Figure 1.2 indicates that forest policy outputs, which encompass instruments, such as regulations, incentives, and education campaigns, and directives, such as laws, guidelines, and standards of good forest practice, are expected to have an impact on the execution of forest policy, which encompasses the organizational structure, processes and resources for putting policy into effect. Together, forest policy outputs and their execution are expected to have an effect on forest policy uptake, which encompasses the behavior of forest owners and managers (i.e. policy target group) and their decisions and actions related to policy adoption and compliance. These dynamics lead to intended and unintended forest policy outcomes by impacting and shaping the ecological, economic, and social realities, and ultimately the overall sustainability, of managed forests. The entire process is theoretically monitored and evaluated, leading to potential revisions in the original policy or policy outputs, that then may lead to changes throughout the system. Each component, as well as their relationships, are also influenced by the policy context, which encompasses macro-level socio-economic, socio-political, and environmental conditions. Additionally, policy uptake by the target group is influenced by internal and external factors that form the local or forest management unit level context. In sum, these key components are interconnected within a feedback system whereby forest policy outputs and their execution affect policy uptake, which
together impact the ecological, economic, and social aspects of managed forests – the policy outcomes, which are ultimately evaluated and may lead to policy revision.⁵

Each component of the framework can be considered a dependent variable in and of itself, yet each is also an input or independent variable for successive components. For example, forest policy outputs are logically dependent upon the larger policy context and other processes not encompassed in this framework (e.g. agenda setting, policy design/formulation). Alternatively, policy outputs influence the structures, processes, and resources for putting policy into effect. As with the models noted above, I do not suggest that the components in Figure 1.2 automatically proceed in distinct sequential stages. However, presenting the key components and their expected relationships in this manner helped to structure and focus my thinking about how to better understand policies for sustainable tropical forest management. The framework components and associated variables are conceptualized and operationalized in Chapter 3.

Identification of the variables and processes associated with governmental forest regulation and non-governmental forest certification through the theoretical framework presented in Figure 1.2 helped to shape the research presented here. Nonetheless, direct measure of the process in its entirety was outside the scope of the research timeframe and budget. Therefore, primary data collection focused on forest policy outputs, execution, and uptake, as well as the policy and forest management unit contexts. As such, in terms of the direct measurement of variables in this study, forest policy outputs and execution represent the research independent variables that together affect forest policy uptake by the target group, the research dependent variable. The policy and local contexts are considered intervening variables in this relationship. As such, where forests are not certified, regulatory forest policy uptake is a function of governmental regulatory forest policy outputs and their execution, as well as the contexts.

⁵ It should be noted that Figure 1.1 is a basic model forest policy and is not detailed enough to indicate the expected additional or intersected impacts of certification on forest management as compared to regulation alone. The actual differences and combined impacts will be examined in the detailed research.
of the forest management unit (FMU) and of the policy itself. Where forests are certified, forest certification policy uptake is a function of certification outputs and their execution, in addition to governmental forest policy outputs and their execution, as well as the contexts of the FMU and of the policies themselves (Figure 1.3). It should be noted that secondary data related to policy outcomes, evaluation, and revision were also collected to further understand the processes and results of governmental and non-governmental forest policies in Costa Rica, Guatemala, and Nicaragua.

$$\text{Regulatory Forest Policy Uptake} = f(\text{Regulatory Policy Outputs, Regulatory Execution, FMU Context, Policy Context})$$

$$\text{Certification Forest Policy Uptake} = f(\text{Regulatory Policy Outputs, Regulatory Execution, Certification Policy Outputs, Certification Execution, FMU Context, Policy Context})$$

**Figure 1.3 Forest Policy Uptake as a Function of Policy Outputs, Execution, and Contexts**

### 1.4 Research Questions and Hypotheses

Considering the state of knowledge on public- and private-sector policies for promoting sustainable forest management in the tropics, my overall research objective was to determine how and why governmental and non-governmental forest policies, lead to, or fail to promote forest policy uptake by the policy target group towards a better understanding of the effectiveness of governmental forest regulation and non-governmental forest certification in promoting the sustainability of managed tropical forests. Taking into account the variables and relationships presented in the theoretical framework (Figure 1.2), the following questions were addressed through data collection in Costa Rica, Guatemala, and Nicaragua:
1. What are the current governmental policy outputs in place for promoting sustainable tropical forest management, how are these executed, and what is the degree and range of associated policy uptake?

2. What are the current non-governmental policy outputs in place for promoting sustainable tropical forest management, how are these executed, and what is the degree and range of associated policy uptake?

3. Are there differences in forest regulatory and certification policy uptake? If so, what are they? And, can they be attributed to specific aspects of the policy outputs, execution, or the local and larger policy contexts? If so, what are those specific aspects?

4. Do governmental and non-governmental policy outputs and execution overlap? If so, in what ways? And, are there combined and/or cancelled effects on policy uptake that result from this overlap?

Through the analysis of data collected in relation to questions 1 – 4, and other primary and secondary data collected through the research process, the following questions are addressed in the overall findings and implications of this dissertation research:

5. How are forest regulatory policy outcomes, evaluation, and revision influenced by regulatory policy outputs, execution, and uptake; and/or influenced by the local and larger policy contexts?

6. How are forest certification policy outcomes, evaluation, and revision influenced by forest certification policy outputs, execution, and uptake; and/or by the local and larger policy contexts?
7. Are the outcomes, evaluation, and revision of regulatory forest policy and/or certification forest policy affected by their overlap? If so, how and to what effect?

These questions ultimately drove the development of my theoretical framework and a review of relevant literature that permitted me to develop a conceptual framework and operationalize the research variables in order to determine their answers. The literature reviewed for this research is presented in the following chapter and the conceptualization and operationalization of variables, along with the research methods are presented in Chapter 3. Chapter 4 describes the socio-economic, socio-political, and forest resource context in Costa Rica, Guatemala, and Nicaragua. Chapter 5 considers and compares the governmental forest policy outputs in place in each country. The execution of governmental forest policy outputs is discussed and analyzed in Chapter 6. Chapter 7 describes and compares the uptake of governmental forest management policy in the three case study countries, and discusses some of their outcomes, their evaluation, and resulting forest policy revisions. Chapter 8 presents and analyzes the non-governmental forest certification policy outputs in use in Costa Rica, Guatemala, and Nicaragua, as well as their execution and uptake by forest owners and users. The final chapter provides a summary discussion of the research, policy implications, and possibilities for future research.
CHAPTER TWO
LITERATURE REVIEW

This research draws from four broad bodies of literature: tropical forest studies, classic debates on natural resource policy, theories and research on governmental and non-governmental policy approaches to sustainable forest management, and the political and policy sciences. A review of their major tenets and key studies that relate more specifically to policy approaches for sustainable tropical forest management is presented. This chapter also highlights the major contributions of these bodies of literature to the research design and analysis, as well as the gaps in the literature that prompted this dissertation research. Finally, the literature review was instrumental in the conceptualization and operationalization of the research variables, some of which are noted here, and all of which are presented in the next chapter.

2.1 Tropical Forest Studies

Forests are essential to the health of the global environment, representing one of the most diverse and widespread ecosystems on Earth. Tropical forests, in particular, are highly valued for natural, cultural, and spiritual resources and for environmental services at local, regional, and global levels. They shelter nearly half of the Earth's biodiversity; capture carbon; protect water, food and soil resources; and provide timber and other forest products for consumption and commercial use (FAO 1995, 2001). Tropical forests have been used, cleared, regenerated, and even replanted for millennia. However, accelerated changes in tropical forests have occurred since about the 1960s, largely attributed to population and economic growth, the mechanization of extraction techniques, and increasing means for transportation (ITTO 2006).

According to the 2005 FAO Forest Resources Assessment, the Earth’s forested area is in decline, mainly due to the conversion of forests to agricultural lands (FAO 2005). While the rate of global deforestation is slowing (1990-2000: 0.22%/yr or 8.87 million ha/yr,
Between 2000 and 2005, Africa and South America experienced the largest net forest losses (21.87 million ha, 19.01 million ha, respectively). During the same time period, Central America had the highest average annual rate of deforestation (1.3%/yr), followed by Southeast Asia (1.0%/yr), Africa (0.6%/yr) and South America (0.5%/yr). Central America’s rate of deforestation is falling (1990-2000: 1.6%/yr, 2000-2005: 1.3%/yr), yet deforestation rates have increased in South America (1990-2000: 0.4%/yr, 2000-2005: 0.5%/yr) and Southeast Asia (1990-2000: 0.9%/yr, 2000-2005: 1.0%/yr) (FAO 2005).

The major processes associated with deforestation are largely anthropogenic, including clearing land for agriculture and livestock production, human settlement, commercial logging, mining, hydroelectricity projects, and military activities (see for example Kaimowitz and Angelson 1998; Allen and Barnes 1985; Bawa and Dayanandan 1997; Rudel and Roper 1997). Natural phenomena, such as fire and forest disease, can also cause considerable damage to large areas of tropical forest (FAO 1995), though these processes are generally considered part of the natural cycle of forest systems (see for example: Lugo 1988; Foster and Boose 1995; Cochrane and Shulze 1999). The challenge of reducing deforestation in the tropics is complicated by the fact that, in most cases, it results from a combination of social, economic, political, biophysical, historical, and other factors, indicating that rather than one single mechanism, a mix of policies and approaches is required (Geist and Lambin 2002; Chater 2003). Accordingly, policies aimed at curbing deforestation and forest degradation in the tropics range from strict preservation of undisturbed forest areas, to land-use policy reform, promotion of timber plantations, and regulation of forest use, through to market-based incentives for sustainable forest management.

In terms of forest protection, according to the 2000 FAO Forest Resources Assessment, 12.4% of the world’s forests were located within protected areas as classified by the IUCN (categories I-VI) in 2000 (FAO 2001). The 2005 FAO Forest Resources Assessment
(FRA 2005) documents forest protection somewhat differently than the 2000 Assessment\(^6\), reporting that 11.2% of the world’s forests in 2005 were found in areas where conservation of biological diversity is designated as the “primary forest function” and another 9.3% in areas whose primary designated function is soil and water conservation (FAO 2005). The FAO also reports that, in 2005, 38% of Central America’s forests were located in areas designated for biodiversity conservation and another 5% in areas designated for soil and water conservation (FAO 2005). Even if forest areas designated for biodiversity, soil, and water conservation are strictly and sufficiently protected, this leaves almost 80% of the world’s forests and 57% of Central America’s forests open to other uses, such as timber and non-timber forest production, recreation, and tourism. However, without other protections or sustained use, these forests could also potentially be destroyed or converted to other land uses, contributing to the continuing rates of tropical deforestation and forest degradation. Therefore, public- and private-sector actors have developed and promoted an array of policies for improving forest retention and use beyond strict preservation, including approaches intended to enhance the sustainability of forest management.

**2.2 Natural Resource and Forest Policy: Public- or Private-sector Solutions? Or Both?**

The range of policy approaches in practice for addressing natural resource and forest use can be linked in many ways to different sides of the classic debate on the allocation of public goods. In the purest sense, public goods are non-rival and non-excludable, benefiting the general population or the people in a polity\(^7\) (e.g. national defense, scientific knowledge) (Sterner 2003). In the real world there are few pure public goods. Natural resources can be considered a type of public good that exhibit some aspects of

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\(^6\) For FRA 2005, countries reported on forest area designated primarily for conservation of biodiversity, as well as primarily for conservation of soil and water resources, including areas outside protected areas. So the estimated area of forest designated for conservation of biodiversity, soils, and water is not necessarily equivalent to the area of forest in protected areas (FAO 2005).

\(^7\) Non-rivalry means that consumption of a good by one individual does not reduce its availability for consumption by others, non-excludability means that individuals cannot be excluded from the consumption of a good, and externalities are external costs (e.g. pollution) or benefits (e.g. technical advances) that are not included in the market price of the good. A polity is a group with an organized governance or a politically organized population (Sterner 2003).
non-rivalry and non-excludability, and which are typically associated with negative externalities (e.g. pollution, degradation, over-consumption). These characteristics move some to argue that government should intervene in the use of natural resources to offset associated negative externalities, while others suggest that market forces can be harnessed to achieve similar goals (Cubbage, O’Laughlin, and Bullock 1993; Sterner 2003). “Reconciling these positions poses a tremendous challenge for the development and implementation of effective policy. It is also a major factor leading to different policy approaches” (Wilson et al. 1999: 9).

Some public-policy advocates maintain that government intervention in the use of public goods is necessary because it can control for negative externalities, noncompetitive markets (e.g. monopolies) and imperfect (i.e. asymmetric) information. It is also argued that government intervention can take into account multiple civic values that go beyond ‘efficiency’ (Cubbage, O’Laughlin, and Bullock 1993; Sterner 2003; Pearce and Willis 2003). For example, modern-day forestry is generally seen as a multi-service activity that has the potential to produce or preclude both marketable and non-marketable benefits. “In principle, such multi-benefit forestry may justify [government] intervention because the private sector might not supply non-market benefits, or not supply them in ‘efficient’ quantities” (Pearce and Willis 2003: 19). Traditional government intervention in forest resources has often taken a ‘command-and-control’ approach that “defines in specific terms, permissible and prohibited conduct”, and aims to control owner or user behavior through, for example, restrictions, performance standards, and required technologies or practices (Toffelson 1998: 4). Other mechanisms employed by the state (i.e. government) to dissuade, prevent, promote, or enable desired behavior may include capacity building, symbolism, learning, and incentives (Schneider and Ingram 1990).

Some economists advocate that under the conditions of free competition and clearly defined property rights, a ‘free market’ is the most efficient mechanism for resource allocation. Proponents contend that economic mechanisms that harness the power of
markets offer a more cost-effective, flexible, and dynamic form of regulation than conventional government intervention (Austin 1999; Stanbury and Vertinsky 1998). The underlying premise for the use of economic instruments is that by placing a cost on negative externalities, these are then internalized to the decision-making process. Though a truly ‘free market’ only exists in theory (i.e. market failures occur in the presence of: public goods, common pool resources, poorly defined property rights, externalities, noncompetitive markets and imperfect information) (Pearce 1998), advocates of this approach are generally optimistic about the power of markets to effectively allocate natural resources (Wilson et al. 1999; Sterner 2003).

The state may use economic or market-based mechanisms to influence behavior through positive (e.g. subsidies) or negative (e.g. taxes) incentives that, for example, promote compliance with regulations or reduce negative externalities (Tollefson 1999; Sterner 2003). Other market-based mechanisms include non-governmental forest certification, an alternative, “non-state market-driven” approach intended to influence forest user behavior (Cashore, Auld, and Newsom 2004). Forest certification was developed as a private-sector effort to tap into “the market’s supply chain, rather than governments, for policy making authority” (Cashore and McDermott 2004: 11). It is intended to harness the market’s power to recognize and reward sustainable forest management, thus promoting improvements in forest management, and ultimately, decreases in the negative externalities associated with unsustainable forest practices.

While the discussion on governmental intervention versus market-based approaches to controlling natural resource use continues, neither approach in and of itself has produced overwhelming advances towards enhanced environmental protection (Gunningham, Grabosky, and Sinclair 1998; Blackman 2008). Moreover, others suggest that the debate should not be a question of “either/or”, but of finding the right mix of policy approaches and actors to achieve effective and efficient resource protection (see for example UNCED 1992; Gunningham, Grabosky, and Sinclair 1998; Fiorino 2006). In
their seminal work on ‘smart regulation’, Gunningham, Grabosky and Sinclair (1998: 10) suggest that we “move beyond the market-state dichotomy”, into a new era of environmental policy that “still involves government intervention, but selectively and in combination with a range of market and non-market solutions, and of public and private orderings.” The authors propose that in most cases, the use of multiple, complementary rather than single policy instruments, and a broader rather than limited range of regulatory actors, will lead to better, more effective, and more efficient environmental regulation (Gunningham, Grabosky, and Sinclair 1998). “By implication, this means a far more imaginative, flexible, and pluralistic approach to environmental regulation” (Gunningham 2005: 4).

As with the broader discussion on effective policy approaches for allocating environmental goods and services, many agree that tropical deforestation will not be solved through a single policy approach (see for example: Repetto and Gillis 1988; Kaimowitz, Byron, and Sunderlin 1998; Geist and Lambin 2002; Chater 2003). Yet, in developing countries, the debate over how best to allocate the public goods associated with forests and other natural resources is often further complicated by population pressures, severe welfare effects on environmental degradation, and the urgent need for efficient economic development (Allen and Barnes 1985; Bawa and Dayanandan 1997; Kaimowitz and Angelson 1998). Additionally, some contend that many developing countries lack the necessary resources to effectively implement market-based policy mechanisms, for the same reasons that they lack the ability to effectively manage more traditional ‘command-and-control’ approaches (e.g. forest regulations, which require monitoring, enforcement, sanctions, etc.), and that therefore, a non-governmental market-based policy approach may prove beneficial to further retention, production, and protection of tropical forests (see for example Meidinger 2003; Rametsteiner and Simula 2003; Cashore and McDermott 2004).
With regard to forests, “although there is broad agreement on the need to achieve sustainable forestry, there is considerable disagreement over which policy instruments should be deployed to promote this goal” (Tollefson 1999:4). There has certainly been significant study and analysis of public- and private-sector policy approaches that intended to enhance the sustainability of forest management, some of which is described in greater detail below. Nonetheless, it is apparent that additional information is required to better understand and identify the policy approaches and mixes that generate improved use and management of forests in tropical contexts. Thus, a major objective of this research is to contribute to this need for information.

2.3 Governmental Forest Regulation and Non-Governmental Forest Certification: Two Key Approaches for Enhancing Sustainable Forest Management

Sustainable forest management is a complex concept, “specifically designed to embrace and reconcile the different interests in forests” that include productive, ecological, economic, social, cultural, and spiritual forest values (Rametsteiner and Simula 2003: 88). Domestic and international policies concerned with sustainable forest management employ instruments ranging from traditional ‘command-and-control’ regulation to economic mechanisms that attempt to harness the power of market-driven incentives (Cashore and McDermott 2004). Yet, as Pearce (1998: 28) suggests, “while market mechanisms might be beneficially invoked for a range of forest values, they cannot eliminate altogether the need for regulation for some values such as the aesthetic appeal of landscapes and the cultural value of wilderness, which do not lend themselves well to economic instruments for forest management.” Given the importance placed on the potential, shortcomings, and even the necessity of governmental forest regulation and non-governmental forest certification to enhance sustainable tropical forest management, the discussion below and the research as a whole centers on these two policy approaches.

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8 According to the FAO (2006), sustainable forest management “aims to ensure that the goods and services derived from the forest meet present-day needs, while at the same time securing their continued availability and contribution to long-term development. In its broadest sense, sustainable forest management encompasses the administrative, legal, technical, economic, social, and environmental aspects of the conservation and use of forests.”
2.3.a. Governmental Forest Regulation

Governmental regulation of forest use is often “instituted to protect the long-term external values that are not provided well by markets and may be required... to prevent resource exhaustion, or to prevent externalities and market failures from leading to damage to other resources” (Cubbage, Harou, and Sills 2007: 18). Though there is a significant degree of variation in governmental forest regulation within and across countries (Cashore and McDermott 2004; Cubbage, Harou, and Sills 2007), in the most general sense, forest regulation typically “sets the minimum standard for forestry practices” and/or defines permissible and prohibited forest practices (Moffat and Cubbage 2001: 28). Regulations are often associated with voluntary or mandatory technologies, performance standards, and/or Best Management Practices, all of which may encompass guidelines for harvest plans; road construction; extraction; reforestation; and management of sensitive areas such as endangered species habitat, riparian zones, and steep slopes (Moffat and Cubbage 2001; Toffelson 1998; Louman, Quiros, and Nilsson 2001). As the values (e.g. aesthetic, cultural, spiritual, future) associated with forest ecosystems and their complexity (e.g. species composition, vertical structure) increases, the breadth and depth of forest management aspects addressed by regulations is also likely to increase (Gluck 2005; Cubbage, Harou, and Sills 2006).

Understanding the effectiveness of governmental forest regulation, and how and why it succeeds or fails to attain the related policy goals, is fundamental to better decisions on and applications of relevant policy tools and mixes related to sustainable forest management. Yet, this information is limited, and in particular for the tropics (Agrawal, Chhatre, Hardin 2008; Cubbage, Harou, and Sills 2006; Cashore and McDermott 2004). It is often suggested that failures of governmental forest regulation in the tropics are linked to poor enforcement, corruption, and weak legal systems (see for example: Contreras Hermosilla 2002; Hickey 2004; Cashore and McDermott 2004; Meidinger 2003; Rametsteiner and Simula 2003). However, “comprehensive conclusions about
the effectiveness of regulatory forest policy may be difficult to reach since it is difficult to collect data on implementation... which (in part) determines government policy effectiveness” (Cubbage, Harou, and Sills 2006: 19).

In an important study on governmental forest regulatory policy, Cashore and McDermott (2004) examine the content of forestry regulations from twenty developed and developing countries. They compare forest regulation stringency (i.e. “extent to which policies include substantive requirements prescribing specific forest practices” (p. 395)) according to key measures considered common to forestry regulations and important to the concept of sustainable forest management. These include management of riparian zones, clearcuts, road construction, reforestation, and annual allowable cut. While the authors do not attempt to qualify countries in terms of ‘good’ or ‘bad’ forest regulation, nor intend for the study to “stand alone as an evaluation of the effectiveness of the different regulatory approaches towards achieving environmental protection goals”, they do compare and rank forest policy stringency (Cashore and McDermott 2004: 3).

Cashore and McDermott (2004) find a wide range of variation in forestry regulation across and within the twenty countries, as well as across and within the eight developing countries. Forest regulations in developing countries were predominantly found to be much more ‘stringent’ than those from developed countries (e.g. riparian buffer zone requirements, clearcut size limits). The findings also demonstrate that the developing country case studies consistently exhibited perverse land-use policies, inadequately funded government institutions, and a severe lack of enforcement capacity, though policy implementation and enforcement were not systematically nor empirically examined. Moreover, given the large number of country case studies, the authors’ assessment of policy stringency is limited to the forest management aspects listed above and did not take into account, for example, economic or social aspects of forest management that might also be addressed by regulations for sustainable forest

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9 Mexico, Brazil, Chile, India, Indonesia, China, South Africa, and the Democratic Republic of Congo.
management and affect the degree of stringency and overall outcomes. Nevertheless, their objectives to improve the transparency of some key ecological aspects of global forest policies and the development of an analytical framework for comparing forestry regulations were particularly helpful in informing my study.

Other important research on governmental forest regulation in the tropics are connected to concerns over illegal logging (see for example: Contreras-Hermosilla 2002; Ravenel, Granoff, and Magee 2004; FAO/ITTO 2005; Tacconi 2007). Some suggest that the underlying causes that contribute to illegal logging include: a flawed or weak legal framework, insufficient enforcement capacity and information about forest resources and their use, and corruption in the public and private sector (FAO/ITTO 2005; Contreras-Hermosilla 2002). Measures promoted for improving forest law compliance and ultimately reducing illegal logging include participatory approaches to streamlining and simplifying forest policies and laws; clarifying and securing forest ownership and use rights; improving the collection, availability, and accuracy of forest-related data; and increasing the capacity and efficiency of public forest administration through, for example, enhanced means to detect and suppress forest crimes (FAO/ITTO 2005). The identified drivers of illegal logging and the proposed strategies for improving forest law compliance are obviously very important to governmental and non-governmental policy makers and other stakeholders, as well as to my research. Nonetheless, illegal logging research is essentially focused on direct regulation and the drivers that lead to its rejection and non-compliance, which may overlook other governmental and non-governmental policy tools that complement regulation, as well as important incentives for, or intervening factors in, forest policy adoption and compliance.

2.3.b. Non-Governmental Forest Certification
Forest certification, as a non-state market driven policy approach, is intended to influence consumer preference and create increased demand for forest products from sustainably managed forests, essentially providing market incentives for producers and
bypassing governmental intervention altogether (Cashore, Auld, and Newsom 2004). The basic process of certification encompasses independent, third-party assessment of the quality of forest management in relation to predetermined standards (e.g. requirements related to the management system). Though standards are diverse across and within different systems, in general, they are at least as stringent as local legal requirements and typically include standards that are more stringent than those set by public forest policy.\textsuperscript{10} Independent auditors assess forest management against the forest certification standards, and if management meets or exceeds those standards, the certifying body provides ‘written assurance’ that the management system or products conform to certification standards. Once the management system is certified, ecolabelling of sustainably-produced forest products is an additional option (Nussbaum and Simula 2005; Rametsteiner and Simula 2003).

Forest certification was established in response to growing concerns for tropical deforestation in the 1980s and 1990s, and as an alternative to ineffective government interventions, boycotts on tropical timber, and unsuccessful attempts to develop a globally agreed, binding agreement on sustainable forestry. Led by the World Wildlife Fund (WWF), an international coalition of environmental, social, and forest-sector groups founded the Forest Stewardship Council (FSC) in 1993 to establish standards for certifying “responsible forest management” (FSC 2006)\textsuperscript{11}. “The FSC offered an opportunity to expand the traditional stick approach of boycotts by offering carrots through markets” (Cashore, Auld, and Newsom 2004: 12). While the FSC was the first internationally recognized forest certification system, by 2006, there were numerous certification systems at global, regional, and national levels, and more than 300 million

\textsuperscript{10} For example, the Forest Stewardship Council (FSC) standards for certified forest management are developed by experts in the environmental, economic, and social aspects of forest management, from Northern and Southern countries. They are based on 10 principles of sustainability: (1) compliance with laws and FSC principles; (2) land tenure and use rights and responsibilities; (3) indigenous rights; (4) community relations and workers’ rights; (5) forest products and benefits; (6) environmental impact; (7) the forest management plan; (8) forest monitoring and assessment; (9) maintenance of high conservation value forests; and a specific principle on (10) plantations (FSC 2006).

\textsuperscript{11} The FSC (2006) recently changed their dialogue from “promotion of SFM” to “promotion of responsible forest management”, given the elusive nature of a globally agreed concept and definition of SFM.
hectares of certified forests under the nine major forest certification systems (Cubbage, Frey, and McGinley 2006)\textsuperscript{12}. However, though forest certification was developed as an alternative non-governmental policy approach for promoting sustainable forest management in the tropics, only about five percent of certified forests in 2006 were in the tropics, which is slightly less than one percent of the Earth’s tropical forest area.

Some have suggested that the potential for certification to promote wide-spread sustainable forest management in developing countries and throughout the tropics is limited (see for example: Rametsteiner 2002, Rametsteiner and Simula 2003; Meidinger 2003). Yet, many also agree that improvements in forestry practices are likely to follow forest certification and regular audits, and that there is a logical connection between certification and environmental improvement (see for example Rametsteiner 2000; Rametsteiner and Simula 2003; Gulbrandsen 2004; Mayers and Bass 2004). Moreover, a number of empirical studies have shown that certification of tropical forests produces significant, substantive, and measurable improvements throughout the management system (see for example Bass et al. 2001; WWF 2005; Newsom and Hewitt 2005). However, some maintain that the majority of certified forest operations “already had better-than-average forest management practices” or have benefited from substantial outside, long-term financial and technical support that is not feasible within the broader tropical forest context (Atyi and Simula 2002: 31).

Cited obstacles to wide-spread certification in the tropics include the inflexibility of certification standards and their potential conflict or incompatibility with local, legal forest frameworks; certification’s failure to take into account local and broader land-use contexts; the costs of improving conventional or traditional tropical forest management; and additional barriers for small landowners or forest communities without clear title or tenure (Atyi and Simula 2002; Meidinger 2003; Mayers and Bass 2004). Nonetheless,

\textsuperscript{12} Includes certified forests under the Programme for Endorsement of Forest Certification; Sustainable Forestry Initiative; FSC; American Tree Farm System; Canadian Standards Association; Certificación Forestal; Certificaçao Florestal; Malaysian Timber Certification Council; Australian Forestry Standard.
there is limited practical evidence of these obstacles and constraints, and much less evidence of potential solutions for greater diffusion of tropical forest certification from the field. Moreover, there are many unanswered questions about the intersection of non-governmental market driven approaches, such as forest certification, and traditional governmental forest regulation, and their combined effects on the sustainability of forest management (Cashore and McDermott 2004).

Though empirical studies that consider the interaction and combined effects of governmental forest regulation and non-governmental forest certification are scarce, a study by Johannes Ebeling (2005) addresses the ‘effectiveness’ of certification as a tool to compensate for poor environmental regulation. In his study, Ebeling (2005: 2) focuses on the obstacles that the FSC faces in achieving widespread adherence to its standards in the tropics, determining that “the success of forest certification – although it constitutes a market-based approach – depends on policy-related factors.” He suggests that though markets may provide incentives for improved forest management, government regulation is a key factor in determining the costs, and therefore the disincentives, of certification. This study is particularly informative in its description of some of the overlapping aspects of forest regulation and certification. However, the study limits its measure of the effectiveness of certification to the total area of certified forest, and approximates the effectiveness of regulation from the aspects that are regulated by the regulations themselves and the degree of enforcement. The study does not measure actual changes in target group behavior, factors that impact governmental and non-governmental forest policy adoption and compliance nor outcomes in the forest.

2.3.c Section Summary
Summing up the literature thus far, we know that governmental forest regulation and non-governmental forest certification both aim to change the behavior of the target group (i.e. forest owners and users) towards the greater overall sustainability of managed forests - the former primarily through a command-and-control approach and
the latter through market-forces. We also know the major theoretical constructs for how
and why these policy approaches aim to change target group behavior and enhance
forest sustainability, as well as some of the key observed and probable obstacles to
greater attainment of policy goals. However, with regard to this research and for a better
understanding of how and why forest policies ultimately do or do not lead to better forest
management, it was necessary to identify more specific variables and causal
connections associated with policy, its implementation, and its outcomes. For this, I
turned to the political and policy sciences, which provide an array of theories and models
for explaining how and why policy is made and how and why it works, which ultimately
helped me to design and carry out this research towards on a better understanding of
governmental forest regulation and nongovernmental forest certification in the tropics.

2.4. Theories on the Policy Process and Policy Dynamics
The political and policy sciences help us to understand the development,
implementation, and outcomes of tools such as governmental forest regulation and non-
governmental forest certification. Prominent theories include group theory, institutional
theory, public choice theory, political systems theory, and the policy process model.
“Each offers a different perspective on the principal determinants of decision-making
within government and therefore on what people might regard as the major forces that
shape the direction and content of public policies” (Kraft 2004: 70). Given the focus of
this study, I concentrated on theory and research related to the policy process, policy
implementation, policy adoption and compliance, and institutional development.

2.4.a. The Policy Process Model
Valuable elements from prominent policy theories and models are incorporated into the
policy process model (Brewer and Clark 1994; Kraft 2004). The policy process model is
based on the work of Harold D. Lasswell who describes the policy process as a “social
dynamic that determines how the good and bad in life are meted out – that is, who gets
what, when, and how” (Lasswell 1950, cited by Clark 2002:5). It identifies stages of the
policy process or cycle and takes into account the broad relationships among policy actors within and across each of those stages. While there are slightly different versions of the ‘stages’ of the policy process (see for example Jones 1984; Brewer and deLeon 1983, Clark 2002), Kraft (2004) describes the policy process in six stages.

According to Kraft (2004), the first stage of the policy process is **problem definition and agenda setting**. This encompasses how public problems are perceived and defined, the attention that they command from the public and policy-makers, and if they actually rising high enough on the political agenda to warrant action. Once a problem makes it to the political agenda, the search for solutions begins, which marks the second stage of the policy process: **policy formulation**. This stage includes the draft and design of policy goals and strategies for addressing or resolving a public problem. Formulation is followed by **policy legitimation**, or the mobilization of political support and the formal enactment of formulated policy through legal force or authorization. At this point, the policy (typically) proceeds to be implemented.

**Policy implementation** generally includes the establishment of institutional processes and provision of institutional resources for putting a policy or related program into action and often signals significant government activity in relation to a public problem. “Policy implementation is a crucial stage of the policy process because it is where one sees actual government intervention and real consequences for society” (p.88). Once policy implementation is underway, **policy evaluation** is likely to follow. During this stage, policies or related programs are evaluated to determine their contribution to policy goals and objectives, as well as their legitimacy or need. The final stage is **policy change or termination**, which responds to information from policy evaluation, but is also subject to changes in the political environment. This stage can result in the modification of policy goals and strategies, or the termination of the policy itself (Kraft 2004).
The policy process model is particularly useful for understanding the course of events, decisions, and actors in the policy cycle, as well as their interactions and outcomes (Ascher and Healy 1991; Kraft 2004). And, although the policy process model “posits a logical sequence of activities affecting the development of public policy”, the stages do not necessarily always occur, nor take place in order, nor is it always feasible to clearly draw a line between one stage and another (Kraft 2004: 77). For example, it may be difficult to separate implementation from evaluation, if as according to Pressman and Wildavsky (1973: xv) they are actually “opposite sides of the same coin, implementation providing the experience that evaluation interrogates and evaluation providing the intelligence to make sense of what is happening.” Yet, most agree the policy process model “is not a model in the strictest sense of the term, (but) it is a good way of seeing how all the pieces of the policy process fit together” (Birkland 2005: 224). As such, this model was helpful in the design and analysis of this research by framing the context in, and process by which, governmental forest regulation and non-governmental certification arise, are applied, produce impacts, and are evaluated and modified. Yet, given the focus of this research to better understand how and why governmental and non-governmental forest policies lead to, or fail to produce enhancements in the sustainability of forest management, I needed to know more about how policies are put into effect and their impacts on target group behavior, so I turned next to theory and study on policy implementation.

2.4.b Theories on Policy Implementation

After Harold Lasswell identified policy implementation as a stage in the policy process in the 1950s, it was not given much individual attention nor study until the 1970s (DeLeon and DeLeon 2002), beginning with the seminal work of Pressman and Wildavsky (1973) on the Economic Development Administration’s minority employment stimulus program in Oakland, California. Their study generally establishes the first of three generations of policy implementation research, which grew out of policy evaluation and the search for answers as to why and how policy succeeds or fails (Winter 2003a). The first generation
of implementation research principally sought to understand policy implementation through detailed case studies, each producing ‘lessons learned’, but collectively resulting in little generalized theory (DeLeon and DeLeon 2002).

A second generation of implementation research arose in the early 1980s, building on the first generation and producing analytical frameworks to guide implementation studies that largely focused on predictor variables such as the form and content of the policy itself, the resources available to implementing organizations, and the talents, motives, predispositions, and relationships of the people involved in policy implementation (Goggin et al. 1990). This second generation of implementation research also demonstrated significant divergence in the conceptualization of policy implementation through a top-down versus a bottom-up perspective (O’Toole 2000).

The ‘top-down’ perspective largely assumes a command-and-control approach to policy implementation that begins with an examination of the “goals and motivations of the highest level initiators of policy and then tracks the policy through its implementation at the lowest level” (Birkland 2005: 182). This approach focuses on finding the best ways to bring a policy to fruition and to achieve policy goals (see for example: Mazmanian and Sabatier 1983; Nakamura and Smallwood 1980). On the other hand, the ‘bottom-up’ perspective suggests that ‘street level bureaucrats’ are key to policy success (Lipsky 1980). The bottom-up approach begins by first “understanding the goals, motivations, and capabilities of the lowest level implementers and then follows the policy design upward to the highest level initiators of policy” (Birkland 2005: 185). The second generation of implementation research was “more sophisticated and consciously theoretic” than the first (DeLeon and DeLeon 2002: 470). Moreover, the common variables, as well as the missing links, between the diverging views (i.e. from the ‘top’ or the ‘bottom’) convinced some, that rather than taking one approach over the other, there was likely much more to be learned from a combined perspective (Goggin et al. 1990).
Goggin et al. (1990) were the first to propose a third generation of policy implementation research that combined many of the insights from both perspectives of second generation research. Through their work they aim to “shed new light on implementation behavior by explaining why that behavior varies across time, across policies, and across units of governments and by predicting the type of implementation behavior that is likely to occur in the future” (p.171). The authors develop a number of testable hypotheses that were focused on federal policies implemented at the state level, many of which were ultimately difficult to measure or test with any kind of precision (DeLeon and DeLeon 2002). Yet, they also demonstrate the usefulness of considering aspects from the top-down and bottom-up perspectives in identifying inducements and constraints to successful policy outcomes from above (e.g. federal level) and below (e.g. local level).

Other ‘third generation’ implementation research also focuses on synthesizing and integrating important variables and relationships from earlier work in the field, such as the Integrated Implementation Model proposed by Winter (1990). In his model, the author identifies policy formulation and design as independent variables that affect the policy implementation process, which he defines through organizational and inter-organizational implementation behavior, street-level bureaucratic behavior, and target group behavior, that together affect policy performance and outcomes. He frames these variables within and thus also considers the impacts of, the socioeconomic context. Additional work from third generation policy researchers recognizes the complex reality of policy implementation, and developed contingency theories, whereby different conditions produce different requirements for successful implementation strategies (see for example Matland 1995; Ingram 1990; Scheberle 1997). In the identification of contingencies, these implementation researchers demonstrate that there is no one single implementation strategy that fits all policy issues or contexts.

As can be gleaned from this brief sketch of implementation research, the related body of literature is both broad and deep. However, as O'Toole (2000: 267) observes “a
consensus is not close at hand, and there has been relatively little emphasis on parsimonious explanation” of policy implementation. A common definition of policy implementation in and of itself is hard to come by. Barret (2004: 252) provides one of the simplest notions of implementation as “putting policy into effect.” Jones (1984) goes a few steps further and describes policy implementation as the set of activities and resources directed towards putting a policy or program into effect. Ferman (1990) describes implementation as “what happens between policy expectations and (perceived) policy results.” O’Toole (2000: 266) suggests that it is “what develops between the establishment of an apparent intention on the part of government to do something, or to stop doing something, and the ultimate impact in the world of action.” Mazmanian and Sabatier (1983: 5-6) provide one of the most detailed definitions:

“Implementation is the carrying out of a basic policy decision, usually incorporated in a statute, but which can also take the form of important executive orders or court decisions. Ideally, that decision identifies the problem(s) to be addressed, stipulates the objective(s) to be pursued, and, in a variety of ways, ‘structures’ the implementation process. The process normally runs through a number of stages beginning with passage of the basic statute, followed by the policy outputs (decisions) of the implementing agencies, the compliance of target groups with those decisions, the actual impacts, both intended and unintended, of those outputs, the perceived impacts of agency decisions, and, finally, important revisions (or attempted revisions) in the basic statute.”

So, while there is no consensus on a parsimonious theory of policy implementation nor even a definition (O’Toole 2004), this research was not focused on proving or disproving any particular implementation theory or model, but rather drew from the implementation literature in identifying and interpreting plausible variables and interactions that might induce or impede the contribution of forest policy to furthering sustainable forest management in the tropics. These are presented in detail in Chapter 3.

In summarizing my use of the implementation literature in this research, it should first be noted that a top-down approach to policy implementation study is considered by some to be particularly useful when there is a dominant policy or program in place (see for
example: Sabatier 1986; Matland 1995; Birkland 2005), as is the case with both governmental and non-governmental policies for promoting sustainable tropical forest management. Nonetheless, the top-down approach may miss the importance of local dynamics to and their impact on implementation ‘success’ (DeLeon and DeLeon 2002). So, it was also important for me to consider what was happening at the policy delivery/recipient (‘bottom’) level (Elmore 1980).

In structuring this research and building a theoretical framework (Figure 1.2), I first considered the steps, processes, and means identified in models and studies of policy implementation. For example, Mazmanian and Sabatier (1983) identify the stages of policy implementation as: (1) policy outputs (decisions) of implementing agencies; (2) compliance of target groups with those decisions; (3) actual and (4) perceived impacts of agency decisions; and finally, (5) policy evaluation and revisions. Jones (1984) identifies a slightly different perspective on policy implementation that includes interpretation of policy into directives; the organization of units, methods, and resources for putting a policy/directives into effect; application of policy objectives and instruments; and monitoring of agency/implementer activities and outcomes. Winter’s (1990, 2003a) Integrated Implementation Model is described above. These were supplemented with additional lessons from the implementation literature, as well as from the other literature described in this chapter, all of which fed into the research design and analysis.

The implementation literature was also useful in identifying important variables and factors to consider in this research. For example, Mazmanian and Sabatier (1983) suggest that successful implementation is dependent upon transparent policy goals and outputs based on clear causal theories, sufficient agency resources and enforcement, hierarchical integration within and among implementing institutions, the diversity of and extent of change in target group behavior, and support for regulators. Moreover, bottom-up and combined perspectives also highlight the importance of many of these variables and factors for implementation success (DeLeon and DeLeon 2002), and provided
additional insight into the importance of target group behavior in understanding and even predicting policy success or failure (Elmore 1980; Winter 1990, 2003a, 2003b; Winter and May 2001, 2002).

In contrast, as Winter (2003b: 220) states, “very few implementation or political science studies focus on how citizens respond to public policies.” For the most part, when target group behavior is addressed in the policy implementation literature it is often linked to policy design and formulation, and/or to interactions and relationships with local level policy implementers. However, there is limited consideration of other factors that may intervene in target group policy-related decisions. As Elmore (1980, 1985) suggests, an understanding of the incentives that citizens face is important for policy that aims to change their ‘problematic’ behavior. Thus, to better understand these dynamics, and in particular, the inducements and constraints to target group policy uptake (i.e. policy adoption and compliance), I turned to work by Elinor Ostrom and others on institutional development and analysis.

2.4.c. The Institutional Analysis and Development Framework

The Institutional Analysis and Development (IAD) Framework focuses on the individuals who make decisions through a course of action and proposes that the policy process and its outcomes are impacted by: (1) the attributes of the physical world, (2) the attributes of the community within which actors are embedded, (3) the rules that create incentives and constraints for certain actions, and (4) interactions with other individuals (Ostrom, Gardner, and Walker 1994). Important aspects of this framework are the distinction of three levels of decision-making (i.e. operational, collective choice, constitutional choice), recognition of interactions and relationships between levels of decision-making, and identification of fundamental elements to use in the analysis of policy outcomes in any level (Ostrom 2007).
Regarding the levels of decision-making, at the operational level are day-to-day activities of resource owners and users that affect the world directly. The collective choice level is where decision-makers create rules to impact operational level activities. The constitutional level is where decision-makers determine how collective choice participants will be selected and the relationship among members of the collective choice body (e.g. voting rules, agenda setting power) (Ostrom, Gardner, and Walker 1994). In essence, constitutional choice outcomes affect collective choice decision-making, which, in turn, affects operational level activities. Actors may move among the different levels, seeking their best outcomes within a given set of rules or attempting to change collective or constitutional choice rules to their advantage (Schlager and Blomquist 1996).

The IAD Framework has been used to study many natural resource action arenas, including extensive application in forest systems. For example, the framework is an essential component of the International Forestry Resources and Institutions program at Indiana University and the University of Michigan, which is “designed to address knowledge and information gaps about how institutions affect the incentives of forest users that result in substantial levels of deforestation in some locations, and improving forest conditions in others” (Ostrom 2007: 49). Gibson, McKean and Ostrom (2000) examine the results of related program studies that implemented the IAD Framework in Bolivia, Ecuador, India, Nepal, and Uganda. These studies demonstrate that the attributes of the physical world, the action community, the rules that govern the system, and their interactions, help significantly to explain the variation in forest conditions, even in ecologically and politically similar areas.

Forest-related research employing the IAD Framework and the related key findings were particularly helpful to this research in identifying and understanding the factors that affect “the incentives confronting individuals and their resultant behavior” (Ostrom 2007:21). For example, Gibson, McKean and Ostrom (2000) find that rule enforcement
depends on supportive appropriators who agree on what rules they should follow and why; institutions are costly to create and maintain and thus can affect ebbs and flows in the action arena; and diverse members of local communities need to perceive that their benefits will outweigh their costs for institutions to be sustainable. These lessons were also incorporated into my research design, theoretical framework, and conceptualization of variables.

To conclude, in an effort to understand better governmental and non-governmental forest management policies for the tropics, my research was designed to ultimately bridge the gap between the insights from the body of literature on policy implementation and its focus on policies, processes, bureaucrats, implementers, and ultimate policy outcomes, and insights from the Institutional Analysis and Development literature and its focus on individuals and the incentives that impact their behavior and decision-making in relation to public policy. Essentially, it is the combination of these factors that result in policy uptake, which became the focus of my research, as well as my contribution to political sciences theory and to practical forest management policy applications.
3.1 Introduction

This research was intended to contribute to a better understanding of the effectiveness of governmental forest regulation and non-governmental forest certification in promoting sustainable tropical forest management, through an examination of how and why these governmental and non-governmental forest policies, and the associated processes, lead to, or fail to promote forest policy uptake by forest owners and users. Sustainable tropical forest management policy was the unit of analysis, represented by governmental and non-governmental forest policy processes. A theory-driven evaluation of these two forest policy approaches was carried out in Costa Rica, Guatemala, and Nicaragua through a comparative country case study approach. These countries were selected for their range of local contexts, forest policy instruments, and tropical forest management outcomes. An analysis of key forest policy characteristics was facilitated through the use of semi-structured interviews, archival documentation and secondary data.

3.2 Theory-Driven Policy Evaluation and a Conceptualization of the Research Variables

To determine how and why governmental forest regulation and non-governmental forest certification lead to, or fail to promote forest policy uptake by forest owners and users, it was important to select an appropriate approach to research. Based on the nature of the research objective and questions, the research design was grounded in policy evaluation. Considering the complexity of policy approaches for promoting sustainable tropical forest management, the choice of qualitative and quantitative methods and triangulation of evidence offer powerful tools for understanding better forest policies and their impacts on the sustainability of forest management (Cashore, Auld and Newsom 2004). From this perspective, theory-driven evaluation and case study methods were a logical fit for this research.
Theory-based policy evaluation research focuses on unpacking the theoretical or logical sequence by which a policy intervention brings about intended or unintended changes (Davies 2003; Patton 2004). This method aims to “surface the theoretical underpinnings of a policy” and use theories that can be drawn from social science knowledge, prior research, policy documents and people, and logical reasoning to help structure the research” (Weiss 1997:504). It also “aims to describe the actual mechanisms that are related to good outcomes” (Weiss 1997:504). Making explicit the theoretical constructs of how and why policy intends to achieve the policy goals, and identifying the likely causal factors and/or alternative explanations for the policy outcomes is key to theory-driven policy evaluation and is facilitated by the development of a causal model or theoretical framework (Chen and Rossi 1992).

Figure 3.1 represents the theoretical framework developed for this research that drew from a review of relevant literature (see Chapter 2). It demonstrates that policy outputs and their execution are expected to have an effect on policy uptake by the target group that, together ultimately lead to intended and/or unintended policy outcomes, all of which is theoretically evaluated and may lead to potential revisions in the original policy. This process takes place within the larger policy context, which can have intervening effects on the process as a whole. In addition, forest policy uptake may be affected by intervening factors at the local or forest management unit (FMU) level.

The theoretical framework presented in Figure 3.1 formed the conceptual basis for data collection and analysis. Drawing from the literature review, the framework variables were characterized or ‘conceptualized’, as described below. This was a necessary step towards the development of a plan for data collection and evaluation, which is also briefly described with the description of variable conceptualization, and in greater detail in the remainder of this chapter.
Figure 3.1 Theoretical Framework of Sustainable Forest Management Policy Implementation
(The black dashed circle indicates variables measured through primary data collection. The gray dotted circle indicates variables examined through secondary data collection)
3.2.a Policy Outputs

**Policy outputs**, one of the two research independent variables, were classified by **policy directives** and **policy instruments**, which were further characterized through subsets of additional variables. **Policy directives** are the formal written outputs of government or private actors that express the means for implementing policy principles or goals. They are traditionally expressed through **laws, regulations, rules, norms, and standards of good practice** (Anderson 1984; Birkland 2005), and are thus categorized in this research. A comprehensive understanding of forest policy statements or directives is essential for a more comprehensive understanding of potential and actual policy outcomes (see for example: Repetto and Gillis 1988; Conteraras-Hermosilla 2002; Cashore and McDermott 2004; Mazmanian and Sabatier 1983; Goggin et al. 1990).

In addition to a description and analysis of the key components of forest policy directives, I also searched for a more systematic way to understand and compare the range of forest management issues that are addressed by governmental and non-governmental **policy directives** (e.g. legality of forest operations, conservation of forest biodiversity, mitigation measures, financial analyses) within and across case study countries. Therefore, I turned to the literature on “smart regulation” (Gunningham, Grabosky, and Sinclair 1998), forest regulatory “rigor” (Cashore and McDermott 2004), and non-state governance of sustainable forestry (Cashore, Auld, and Newsom 2004). From this literature, it is evident that an understanding of the **policy structure** for addressing particular policy issues is also important.

**Policy structure** refers to the **level of compulsion** (discretionary, non-discretionary), the **approach** (prescriptive, process-based, performance-based), and the **thresholds** that the directive employs. With regard to the **level of compulsion** of written policy, mandatory directives are non-discretionary. Voluntary directives are discretionary. In terms of the **policy structure approach**, a prescriptive policy identifies a preventive action or
prescribes an approved technology to be used in a specific situation (Gunningham, Grabosky, and Sinclair 1998; Bluff and Gunningham 2003).\(^{13}\) It generally requires little interpretation on part of the duty holder, offers administrative simplicity and ease of enforcement, and is most appropriate for problems where effective solutions are known and where alternative courses of action are undesirable. However, a prescriptive policy may also inhibit innovation or discourage adaptive management. A process-based policy identifies a particular process or series of steps to be followed in pursuit of a management goal.\(^{14}\) It typically promotes a more proactive, holistic approach than prescriptive-based policies. Challenges associated with process-based policies include complicated oversight, compliance ‘on-paper’ rather than on the ground, and an over-reliance on management systems. Performance-based policy specifies the management outcome or level of performance that must be met, but does not prescribe the measures for attainment.\(^{15}\) It allows the duty holder to determine the means to comply, permits innovation, and accommodates changes in technology or organization. Performance-based policies do not specifically promote nor preclude continuous improvement, and enforcement may require intensive monitoring, analysis, and related resources (Gunningham, Grabosky, and Sinclair 1998; Bluff and Gunningham 2003).

Taking into account these characteristics of policy directives, and building from work by Gunningham, Grabosky, and Sinclair (1998), Bluff and Gunningham (2003), and Cashore and McDermott (2004), I developed an analytical approach for studying the content of forest policy directives (Figure 3.2). Policy content simply refers to the aspects of tropical forest management that specifically regulated or standardized in policy directives. In this research, forest policy directives were considered to be increasingly comprehensive as the addressed operational, ecological, economic, and

\(^{13}\) Example of non-discretionary prescriptive standard: Harvest intensity cannot exceed 60% of the number of trees per species and is limited to trees with a diameter at breast height > 60cm.

\(^{14}\) Example of discretionary process-based: Measures to control hunting, capture and collection of plant and animal species should be considered.

\(^{15}\) Example of Non-discretionary performance-based: The rate of forest products harvested does not exceed the rate of resource growth.
social issues increased. Forest policy directives were considered to be increasingly *rigorous* as the use of prescriptive measures and increasingly conservative thresholds on permissible impacts increased.

<table>
<thead>
<tr>
<th>Level of Compulsion</th>
<th>Approach</th>
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<td>Discretionary (voluntary)</td>
<td>Prescriptive Process-/Systems-based</td>
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<td>Performance/Outcome-based</td>
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<tr>
<td>Non-Discretionary (mandatory)</td>
<td>Prescriptive Process-/Systems-based</td>
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<td></td>
<td>Performance/Outcome-based</td>
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(Adapted from: Gunningham, Grabosky, and Sinclair 1998; Bluff and Gunningham 2003; Cashore and McDermott 2004)

**Figure 3.2 Policy Structure by Level of Compulsion and Approach**

*Policy directives* can be put into effect through an array of *policy instruments*. Schneider and Ingram (1990: 87) define policy instruments as “explicit or implicit incentives and other means imbedded in policy that influence the probability of agents and targets taking actions in concert with policy objectives.” Gunningham, Grabosky and Sinclair (1998: 37) describe policy instruments as “tools employed by institutions to do what they wish to be done.” We also know from Gunningham, Grabosky, and Sinclair (1998), that the choice of policy instrument, or mix of instruments, for addressing a public problem has a significant effect on likely policy outcomes. There are many, slightly to significantly, different classifications of environmental policy instruments (see for example: Schneider and Ingram 1990; Gunningham, Grabosky, and Sinclair 1998; Rivera 2002; Sterner 2003).

The classification used for this research drew largely from Gunningham, Grabosky, and Sinclair (1998). The *policy instrument* classification employed in this study is not
exhaustive by any means, but it does provide a concise and comprehensive summary of the main policy tools used in governmental and non-governmental policy approaches to sustainable tropical forest management. Here, policy instruments are classified as compulsory/command-and-control, fiscal/economic, informative, and market-based.

Compulsory/command-and-control policy instruments encompass direct regulation of forest use, typically designed by the state to prohibit or prescribe certain forest-related activities, through legislative authority. These also include the penalties or punitive actions associated with non-compliance of command-and-control policies. Fiscal/economic policy instruments range in their provision of incentives, from positive to negative, which are used to invoke sound forest use. The types of fiscal/economic policy instruments considered in this research include subsidies/incentives, tax breaks, and stumpage and other forest use taxes. Education/informative policy instruments also exhibit a broad range of applications. In this study, they include forest policy-related training and education, technical assistance, information dissemination, public awareness action, and research and monitoring. Finally, while eco-labelling or certification is considered by some to be an informative policy tool (see for example: Gunningham, Grabosky, and Sinclair 1998), the forest certification body of literature refers to certification as a market-based mechanism, which may be considered a subset of economic instruments. However, as forest certification in particular is intended to harness market forces that may go beyond economics (e.g. public image incentives), market-based was selected as the final class of policy instrument considered in this study. Here, market-based policy instruments are those that are designed to influence consumption patterns by encouraging consumers to purchase sustainably produced products and services and thus, creating market incentives for sustainable production.

Policy outputs (policy directives and instruments) were obtained from on-line sources and in hard copy format from governmental and non-governmental forest agencies and organizations in the case study countries. Policy directives and instruments were directly
described and analyzed according to the variables and analytical framework presented above. Data related to people’s perceptions of the strengths and weaknesses of forest policy outputs were also collected through semi-structured interviews with governmental and non-governmental agency and organizational personnel, forest owners and managers, and other forest policy actors. These perspectives were analyzed to understand common and dissenting views associated with forest policy outputs.

3.2.b Policy Execution

**Policy Execution** represented the second research independent variable. The importance of organizational structure, processes, and resources for putting policy into effect is regularly highlighted throughout much of the policy implementation literature, as well as in the literature related to smart regulation, forest policy effectiveness, and illegal logging that was reviewed for this study. Therefore, **policy execution** was classified by **structure**, **processes**, and **resources**. The **structure** of policy execution encompasses the organizational arrangements and assignments for putting governmental forest policy into practice, including organizational and inter-organizational responsibilities, hierarchical integration, and the distribution and/or sharing of decision-making, resources, roles, and responsibilities (*i.e.* decentralization) (Mazmanian and Sabatier 1983; Winter 1990; Gunningham, Grabosky, and Sinclair 1998; Contreras-Hermosilla 2002; Larson 2003; Ferroukhi 2004). The **processes** of policy execution encompass the procedures for authorizing, enforcing, and verifying compliance with sustainable forest management policy (Mazmanian and Sabatier 1983; Jones 1994; Gunningham and Grabosky 1998; Cashore and McDermott 2004; Repetto and Gillis 1998; Contreras-Hermosilla 2002; FAO/IITO 2005). **Resources** for policy execution were classified as human (*e.g.* staff numbers), material/technological (*e.g.* transportation means, such as vehicles; field instruments, such as laptops and GPS units), and financial (*e.g.* budget) (Mazmanian and Sabatier 1983; Jones 1984; Goggin et al. 1990; Repetto and Gillis 1998; Contreras-Hermosilla 2002; FAO/IITO 2005).
Data on **policy execution** (*implementing structure, processes, resources*) were largely collected through semi-structured interviews with governmental and non-governmental agency and organizational personnel, forest owners and managers, and other forest policy actors. These were supplemented by information on structure, processes, and resources from policy directives, other archival documents, and secondary data. These were directly described, compared, and analyzed in accordance with the variables presented above. The semi-structured interviews were also used to collect information on people’s perspectives on the strengths and weaknesses of forest policy execution, which were analyzed to understand common and dissenting views associated with forest policy execution.

### 3.2.c Forest Policy Uptake

**Forest policy uptake** was the research dependent variable. It was categorized by *forest policy adoption* and *forest policy compliance*. While policy adoption and compliance by the policy target group(s) are not uniformly nor always addressed as key factors to better understanding the policy process in the implementation literature, as described in the literature review, a better understanding of target group (i.e. forest owner and user) adoption of and compliance with policy can contribute to better decisions on effective policy instruments for promoting sustainable forest management. Therefore, *forest policy adoption* was determined through data on the total forest area and the number of forest units under approved or certified forest management, as well as the changes in these variables. I also examined *forest policy compliance* through data and perspectives on the degree to which approved forest management met forest policy directives. An understanding of forest policy uptake was also improved through the examination of the forest management unit context and its intervening affects on uptake, described below.

Data on **policy uptake** (*adoption, compliance*) were collected from agency and organization databases and records, as well as through semi-structured interviews with governmental and non-governmental agency and organizational personnel, forest
owners and managers, and other forest policy actors. These were also supplemented by
other archival documents and secondary data. Forest policy adoption and compliance
data were described, compared, and analyzed according to the variables presented
above. The semi-structured interviews were also used to collect information on people’s
perspectives on the opportunities for and obstacles to forest policy adoption and
compliance, which were analyzed to understand common and dissenting views
associated with forest policy uptake.

3.2.d Forest Policy Context

Characteristics of the environment or context in which policy is developed and
implemented can have a significant impact on the ultimate policy outcomes (see for
example Ostrom 1990; Ostrom, Gardner and Walker 1994; Winter 2003; Mazmanian
and Sabatier 1983). Moreover, policies for promoting sustainable resource use in
developing countries are often obfuscated by the context in which they are implemented,
especially where there is rising population growth, severe welfare effects on
environmental degradation, and deficient economic development (Allen and Barnes
1985; Bawa and Dayanandan 1997; Kaimowitz and Angelson 1998). Ultimately,
characteristics of the forest policy context can include both opportunities and challenges
for the policy process, and in particular for the development and execution of forest
policy outputs and their uptake (Repetto and Gillis 1988; Contreras-Hermosilla 2002).

For this study, forest policy context was characterized by national-level socioeconomic,
socio-political, and forest resource factors highlighted in much of the reviewed literature.
Mazmanian and Sabatier (1983) identify other exogenous or intervening aspects at the
policy context level related to government, the public, and the target group and their
support for or attitudes towards policy that were considered important to understanding
the forest policy context in the case study countries. These were addressed through a
fourth characterization of forest policy context: forest management constituency groups
and their attitudes.
The four forest policy contextual factors were further divided into subsets of additional variables. Socio-economic variables were related to population, wealth, poverty, and development issues (e.g. population density, population growth rate, gross domestic product, human development index, literacy rate). Socio-political variables included the current form and history of government. Forest resource variables were related to forest area and change, and current and historical forest ownership, protection, use and production (e.g. total forest area; forested percent of total land area; average annual change in forest area; woodfuel, roundwood, and sawnwood production; total area and percent of private forestland; percent of forest in protected areas). Forest management constituency groups and their attitudes were explored during the field work. The key groups were later categorized as the forest production sector, forestry organizations, other environmental organizations, the state, and the general public.

Data on forest policy context (socio-economic, socio-political, forest resource, forest management constituency groups) were collected from on-line databases, archival documents, and secondary data. These were complemented by information from semi-structured interviews with governmental and non-governmental agency and organizational personnel, forest owners and managers, and other forest policy actors. The forest policy context for each country was described according to the variables presented above for each country and compared.

3.2.e Forest Management Unit Context

Forest policy uptake is not only affected by forest policy outputs, execution, and the larger forest policy context, but by local- or forest management unit- level factors as well. Some of the implementation literature addresses the capacity, behavior, and attitudes of the policy target group as important factors for understanding overall policy implementation and the ultimate success of policy (see for example: Mazmanian and Sabatier 1983; Elmore 1980; Winter 1990). Beyond these aspects, work by Elinor
Ostrom and others (see for example: Ostrom 1990; Ostrom, Gardner, and Walker 1994; Gibson, McKean, and Ostrom 2000; Ostrom 2007) demonstrates the importance of identifying and understanding the factors that affect the positive and negative incentives that confront individuals in their policy related decisions in order to better understand their resultant behavior.

Drawing from both bodies of work, I characterized the **forest management unit context** by forest ownership, size, and distribution; forest management capacity; external support for local-level forest management; and local-level attitudes towards forest policy and policy implementers. **Forest ownership** was further classified as private, public, and communal. **Forest size** was classified by the average and range in size of forest management units. **Forest distribution** referred to degree of forest fragmentation. **Forest management capacity** encompassed the technical and financial capacity of the forest owner or rights holder to manage his/her forest. **External support for local-level forest management** referred to financial and technical support that was available for and distributed at the forest management unit level. **Local-level attitudes towards forest policy and policy implementers** referred to the range of opinions expressed by forest owners and managers in reference to governmental and non-governmental policy and to policy implementers. These last two variables are related to **forest management constituency groups and their attitudes** described at the larger forest policy context level. However, as measured at the forest management unit level, they are more specific in terms of the financial and technical support for forest management and of forest owner and manager attitudes towards policy and implementers on the ground.

Data on the **forest management unit level context** were collected through semi-structured interviews with governmental and non-governmental agency and organizational personnel, forest owners and managers, and other forest policy actors, as well as through archival documents and secondary data. These were described, analyzed, and compared in accordance with the variables presented above. The semi-
structured interviews were also used to collect data related to local level attitudes, which were analyzed to understand common and dissenting views associated with forest policy and implementers.

3.2.f Forest Policy Outcomes, Evaluation, and Revision

Forest policy outcomes are the results in the forest system due to changes in forest management that can be attributed to the original forest policy, its outputs, and execution. Understanding forest policy outcomes through policy evaluation is commonly considered a key component for policy effectiveness, as information on policy outcomes gained from policy evaluation may ultimately lead to forest policy revisions. As mentioned previously, it was not within the scope of this study to directly measure forest policy outcomes in the field. Nevertheless, some important data and perspectives on governmental and non-governmental forest policy outcomes, evaluation, and revisions were captured through semi-structured interviews, archival documents, and secondary data. These were described and compared when possible, and used begin to understand better some of the links between forest policy outputs, execution, uptake, outcomes, evaluation, and revision.

3.2.g Conceptual Framework of Key Research Variables

Table 3.1 presents the key forest policy variables and associated subsets of variables and factors described above that were investigated in this research.
Table 3.1 Conceptual Framework of Key Research Variables

<table>
<thead>
<tr>
<th>Forest Policy Component</th>
<th>Variables</th>
<th>Subset of Variables and Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directives</td>
<td>Policy Content (comprehensiveness); Policy structure (discretionary/non-discretionary; prescriptive/process-based, performance; thresholds) (rigor)</td>
<td></td>
</tr>
<tr>
<td>Instruments</td>
<td>Compulsory/Command-and-Control (direct regulation, penalties); Fiscal/Economic (subsidies/incentives, tax breaks, stumpage and other taxes); Education/ Informative (training and education, technical assistance, information dissemination, public awareness action, and research and monitoring); Market-Based (influence consumption patterns and create market incentives for SFM)</td>
<td></td>
</tr>
<tr>
<td>Structure</td>
<td>Organizational and inter-organizational responsibilities; Hierarchical integration; Degree of organizational centralization/decentralization</td>
<td></td>
</tr>
<tr>
<td>Approval processes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enforcement processes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verification processes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material/technological resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forest area under approval/ certification and change in area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree to which approved management meets policy directives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population dynamics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wealth and Poverty</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education, Health, other Development aspects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Historical and current form of and issues related to government</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forest area and change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current and historical forest ownership, protection, use and production</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forest production sector, forestry organizations, other environmental organizations, the state, the general public, and their attitudes towards forest management and policy</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3.1 Continued

<table>
<thead>
<tr>
<th>Forest Policy Component</th>
<th>Variables</th>
<th>Subset of Variables and Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest ownership</td>
<td>Private, Public, Communal</td>
<td></td>
</tr>
<tr>
<td>Forest size</td>
<td>Average and range</td>
<td></td>
</tr>
<tr>
<td>Forest distribution</td>
<td>Degree of fragmentation</td>
<td></td>
</tr>
<tr>
<td>Forest management capacity</td>
<td>Technical capacity of forest owner</td>
<td>Financial capacity of forest owner</td>
</tr>
<tr>
<td>External support for local-level forest management</td>
<td>Financial support</td>
<td>Technical support</td>
</tr>
<tr>
<td>Local-level attitudes</td>
<td>Towards forest policy and policy implementers</td>
<td></td>
</tr>
</tbody>
</table>

3.3 Comparative Country Case Study Approach

In combination with the choice of theory-driven policy evaluation research, a comparative case study approach was chosen, which is common in cases of “causal complexity, contextual influence, and a limited number of cases” (Cashore, Auld, and Newsom 2004: 51). To increase the power of comparative studies, Geddes (1990) suggests that a broad range of variation in the dependent variable is critical for answering questions related to the causal relationships between the dependent and independent variables. In this case, forest policy uptake represents the research dependent variable. Forest policy outputs and execution represent the research independent variables (Figure 3.3). These variables were the focus of primary data collection. As such, I looked for variation in the adoption of, and compliance with, governmental forest regulation and non-governmental forest certification (i.e. policy uptake) in my selection of case study countries. I also looked for variation in overall forest use and forest retention as these variables reflect, to some degree, forest policy outcomes, which are dependent, in part, on forest policy outputs, execution, and uptake, as demonstrated in the Figure 3.1.
In my selection of case study countries, I focused first on Latin America. This region was chosen in part because it represents an area of significant importance in terms of tropical forests, providing a diversity of forest resources and services at local, national, regional, and global levels and representing a range of forest use and governance. I also focused on the region of Latin America for logistical and pragmatic reasons, such as previous experience and extensive contacts there, and familiarity with the language, culture, and forest context.

Once Latin America was selected as the region of research focus, I conducted a preliminary analysis of country-level forest management and certification data as a gross measure of the research dependent variable – forest policy uptake. I also looked at other forest-related (e.g. forest area, forest area by type, forest ownership, wood removal, import/export value of forest products trade, and change in forest area over time), socio-economic (e.g. total population, population density, Gross Domestic Product (GDP), GDP per capita), and socio-political (e.g. governance indices) data. This preliminary analysis helped in selecting against extreme variation in key national level contextual factors, which might confound the potential to understand the causal connections between policy outputs, execution, and uptake. I also carried out a preliminary review of governmental and non-governmental forest policy directives in a subset of Latin American countries (i.e. Bolivia, Chile, Costa Rica, Guatemala, Nicaragua, ...
and Peru) to gauge, in part, the range of variation in forest policy outputs. Ultimately, Costa Rica, Guatemala, and Nicaragua were selected as case study countries based on their history of and current forest use and on other key factors described above. By choosing these countries within the Central America region, variation in policy uptake was maintained, while extreme variation in policy context and outputs was limited.

3.4 Data Collection Methods

Data collection for this research was largely focused on the variables conceptualized and described in Section 3.2 and presented in Table 3.1. Data were collected through in-situ (i.e. in-country) semi-structured interviews, and in-situ and ex-situ (i.e. out-of-country) primary and secondary data collection. I employed techniques commonly put forth in the research methods literature (see for example Davies 2003; Patton 2004; Weiss 1997; Cresswell 1994).

Ex-situ data collection began in earnest in late 2006, at which time initial plans for field work and contact with key informants was also initiated. In-situ data collection was carried out in Costa Rica, Guatemala, and Nicaragua from late-March through mid-July of 2007. I spent approximately six weeks in each country. About half of the time in-situ was spent in the capitol area, conducting interviews with central-level regulatory and certification officials and forest sector experts, as well as collecting other relevant primary and secondary data. The other half of time in-situ was spent ‘in the field’, in a region selected for its importance to national forest activity. Time in the field was largely spent conducting interviews with forest owners and managers; local-level regulatory and certification agents; and local forest experts.

3.4.a Interview Structure and Implementation

Interviews were based on an interview protocol specific to the interviewee’s association or experience with forest management (e.g. forest certifier; forest owner; forestry expert) (Appendix B). The interview protocols were developed in relation to the interviewee’s
affiliation and intended to measure as many of the research variables described in Table 3.1. For example, the protocol for forest agency personnel included questions about the forest agency context (e.g. how much forest area is administered by the agency, agency organizational structure); agency resources (e.g. annual budget, number of personnel, number of vehicles available for field work); agency procedures for implementing forest policy (e.g. forest management approval and enforcement processes); and interviewee perspectives on the strengths, weaknesses, opportunities, and threats to forest regulatory policy, execution, uptake, and outcomes, among other inquiries. Each interview protocol encompassed mostly open-ended questions that elicited both qualitative and quantitative responses.

The interview protocols and a statement of confidentiality (Appendix B) were submitted to and approved by the North Carolina State University Institutional Review Board for Human Subjects Research (IRB). The protocols were then translated into Spanish and pilot-tested with native-Spanish speaking forest and natural resource experts in Latin America, via email. They were modified slightly, largely in terms of verbiage, and retested in Guatemala, the first country visited. Some minor changes were made to the protocols as a result of the second pilot test, the majority of which were related to question order.

It should be noted that pilot testing of the protocol in-situ demonstrated that rather than putting interviewees at greater ease to share their experiences and perspectives, request for a signed Informed Consent form seemed to put a barrier between myself, the interviewer, and the interviewee. Therefore, after consultation with and consent from the IRB, I did not present the interviewees with the paper copy of the Statement of Confidentiality, though I did assure each interviewee that their responses would be kept confidential. While most were satisfied with this agreement, some requested that their names be associated with their comments.
When possible, interviewees received a copy of the interview instrument prior to our meeting. This functioned well for most interviewees in the capitol, though was decreasingly feasible the further I went ‘into the field’. In the actual interview session, a copy of the instrument was provided to the interviewee. In an effort to permit a rich flow of ideas and conversation, I maintained semi-structured interviews, choosing not to read the instrument verbatim nor keep strictly to the question order, but rather used the interview instrument as a guide, making sure that by the end of each interview session all the questions had been covered.

Interviews took place in offices, hotels, homes, restaurants, automobiles, and the forest, among other locales. Interviews were not recorded, as previous experience indicated this would decrease candor and degree of comfort, which was also corroborated by the key informants. Hand-written notes were taken during the interview, recording all responses and discussion threads. Interview notes were digitized every two to three days, as was strongly recommended by qualitative field research experts. Each interview was coded to protect the identity of the interviewee.

Most interviews lasted about an hour and a half to two hours. Some interviews with high-level agency officials and owners of large forest operations were shorter, though often significantly enriched by follow-up information sent via email. These interviewees typically elected to respond to the quantitative or descriptive questions after the interview and send me the information at a later date. In these instances, the interview sessions largely focused on the qualitative questions related to perspectives and experiences.

3.4.b Selecting and Scheduling Interviewees

A list of possible interview interviewees was developed at the beginning of each country visit with key country-level informants (often key forest sector experts themselves) who identified agency officials and staff; certification country leads and auditors; forest
owners, managers, and operators; and other forest-related experts. The key informants tended to be personal contacts who provided invaluable assistance to the in-situ research. They often initiated contact and made the necessary introductions to high-level agency officials, tracked down contact information for other interviewees, and helped facilitate logistics in the field.

An interview schedule typically began to form on an ad-hoc basis within the first few days in-country through interviewees who had “an immediate opening” in their schedule, then filled in as time permitted. I generally spent the first two weeks in the country capitol where scheduling was comparatively more complicated, then three weeks in the field where it tended to be a bit easier to schedule interviews. I spent the last week back in the capitol interviewing interviewees whose schedules had ‘freed up’ some by then. Overall, I tended to start my in-country work with a substantial list of potential interviewees provided by key informants, that filled in with subsequent interviews, and generally became saturated by the end of the in-country visit (i.e. few new names of potential interviewees were being suggested), resulting in a quasi-snowball sample. However, there were usually some people with whom I was unable to meet in each country. In these cases, and in general, the collection of documentary primary and secondary data, and the application of triangulation was intended to mitigate the potential data gaps from ‘missing’ interviews.

In total, I conducted 88 interviews (Table 3.2). The greatest number of interviews was conducted in Guatemala, largely due to the existence of two governmental agencies associated with forest regulation. The second highest number of interviews was carried out in Nicaragua, where there is a significantly higher number of public- and private-sector actors involved in forest regulation and oversight than in Guatemala or Costa Rica. The least number of interviews was conducted in Costa Rica, in part due to a less active forest management sector at the time that this study was conducted. A typology of the key forest policy actors was used to code the names of interviewees (e.g. CAF1;
GFM4; NOGN1). In the findings chapters of this dissertation, interviewees are referred to according to his/her assigned code. At times, the forest policy actor group to which an interviewee belongs is also identified in the text, though precautions were taken to avoid revealing the identity of the interviewee.

Table 3.2 Number of Interviews with Key Forest Policy Actors in Guatemala, Costa Rica, and Nicaragua

<table>
<thead>
<tr>
<th>Key Forest Policy Actors</th>
<th>Guatemala</th>
<th>Costa Rica</th>
<th>Nicaragua</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forestry Agency</td>
<td>8</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Other National-level Govt Agency</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Other Local-level Govt Agency</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Forest Certifier</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Forest Manager/Regent</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Certified Community Forest</td>
<td>2</td>
<td>(3)</td>
<td>1</td>
</tr>
<tr>
<td>Non-Certified Community Forest</td>
<td>1</td>
<td>(3)</td>
<td>3</td>
</tr>
<tr>
<td>Certified Industrial Forest</td>
<td>2</td>
<td>(1)</td>
<td>1</td>
</tr>
<tr>
<td>Non-certified Industrial Forest</td>
<td>(1)</td>
<td>(1)</td>
<td>2</td>
</tr>
<tr>
<td>Forestry Sector Expert</td>
<td>12</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>34</strong></td>
<td><strong>22</strong></td>
<td><strong>32</strong></td>
</tr>
</tbody>
</table>

() indicates a person having experience or responsibility associated with more than one category.

3.5 Data Analysis

This research was designed to determine how and why governmental forest regulation and non-governmental forest certification lead to, or fail to, promote forest policy uptake by forest owners and users towards a better understanding of the intended and unintended outcomes of these policy approaches. The research design was based in theory-driven policy evaluation and utilized a theoretical and conceptual framework (Figure 3.1, Table 3.1) built from lessons in the relevant literature, and used to guide the data collection and analysis. Thus, the approach to data analysis was largely deductive, yet it still incorporated aspects of exploration and discovery. “Deductive reasoning commences with generalizations (theory), and seeks to see if these generalizations (theory) apply to specific instances” (Hyde 2000: 82).
Deductively, I used the variables and factors in the conceptual framework (Table 3.1) to build my interview protocols, to search for other primary and secondary data, and ultimately, to draw out and analyze those variables, their characteristics, and their interactions from the collected data. I also let the data “speak for itself”, such that the theoretical framework identified basic variables and relationships for which to look, but the context often surfaced specific variables and interactions too detailed to identify in theory, yet key to answering my research questions. Additionally, when common variables or relationships surfaced in the data that were not considered within the original theoretical or conceptual frameworks, these were vetted and addressed in the research findings and implications.

The first phase of analysis began by hand-coding the digitized interview data. Coding was guided by the variables and relationships identified in the theoretical (Figure 3.1) and conceptual (Table 3.1) frameworks, and expanded as new variables, factors, or interactions surfaced within the data (Appendix C). Sentences, phrases, numbers, and other pieces of information were coded. The interview data were hand-coded three times, the second and third time with successive iterations of possible codes, uncovered in the previous run. An unmarked copy of the digitized interview data was used in each run to confirm previous coding and uncover new coding possibilities.

Atlas.ti, a computer assisted qualitative data analysis software package, was utilized for sorting and processing the coded data. While this software can be used to “discover” common themes or codes through inductive research, it was most useful in this study to sort and process a large amount of data (150+ pages of text). The digitized interviews were uploaded into Atlas.ti and each section of hand-coded text was ‘coded’ within the program. Then, the data was sorted by code and printed for further analysis and triangulation with other data sources.
The second phase of data analysis began by processing the remaining primary and secondary data, which included data related to the forest policy and local level contexts and governmental and non-governmental policy outputs, execution, uptake, outcomes, evaluation, and revision. Once these data were processed, they was further analyzed in conjunction with the coded interview data in converging lines of inquiry (i.e. data triangulation). Data triangulation incorporates the use of multiple sources of information aimed at corroborating the evidence of research findings (Patton 2002). By employing different forms and sources of data in this dissertation, I was able to incorporate existing evidence or information (i.e. secondary data) related to the variables and interactions within the theoretical and conceptual frameworks, with information, data, and direct quotes related to on-the ground experiences and perspectives (i.e. primary and interview data) associated with the same variables and interactions.
CHAPTER 4
POLICY CONTEXT

4.1. Introduction

This chapter outlines important national-level socioeconomic, sociopolitical, and forest resource characteristics in Costa Rica, Guatemala, and Nicaragua. It also describes the history and key characteristics of forest management constituency groups in the three case study countries. Presenting this depiction of the larger forest policy contexts in Costa Rica, Guatemala, and Nicaragua, helps to sets the stage for the following chapters on forest policy outputs, execution, and uptake. Ultimately, a description and analysis of the policy context in the case study countries allowed me to identify opportunities and challenges for the development, application, and eventual outcomes of governmental and nongovernmental forest policies.

The first section discusses country-level statistics related to population, wealth, poverty, and development issues. The next section addresses the current form and history of government in each country. The following section looks at forest resource data related to forest area and change, and current and historical forest ownership, protection, use, and production. Then, the major constituency groups associated with forest management and their attitudes towards tropical forest management are described. The final section of this chapter pulls together these key characteristics of the forest policy context and provides insight into some of the significant and potential opportunities and constraints for sustainable tropical forest management and the related governmental and nongovernmental policy processes in Costa Rica, Guatemala, and Nicaragua.
4.2 The Socio-Economic Policy Context

4.2.a Costa Rica

Costa Rica is located north of Panama and south of Nicaragua on the Central American isthmus. With an extension of about 51,000 km$^2$ (5.1 million ha) (FAO 2005), it is larger only than El Salvador and Belize in Central America, and the smallest of the three countries analyzed in this study (Table 4.1). Costa Rica has a population of around 4.3 million people (PD/DESA/WB 2005) and a population density of approximately 85 people per square kilometer, the third highest population density in the Americas (Guatemala 116 persons/km$^2$, El Salvador 317 persons/km$^2$). Costa Rica’s population growth is slowing, estimated at an average annual rate of 1.50% between 2005-2010, down from 1.93% between 2000-2005, though still higher than the regional average (1.26%, 2005-2010). The rural population in Costa Rica is also stabilizing as the country develops and urban population increases. In 2005, around 38% of the population lived in rural areas, with a slowing annual growth rate that declined from 0.6% between 2000-2005 to 0.1% between 2005-2010, the lowest in the region$^{16}$ (PD/DESA/WB 2005).

Costa Rica’s gross domestic product (GDP) was more than US$20 billion in 2005 (DDG/WB 2007). The average annual GDP growth rate from 2000 to 2005 was 3.7%, placing it within the top third fastest growing economies in the Americas. Though Costa Rica is traditionally known for banana and coffee production, pineapples recently exceeded coffee as the number two agricultural export, making Costa Rica the sixth largest producer of pineapple in the world (FAOSTAT 2008). Today, manufacturing and industry are the largest contributors to GDP, surpassing agriculture in the late 1990s – early 2000s, as investment from companies like Intel and Proctor and Gamble grew significantly under investor-friendly policies (US State Department 2008a). Nonetheless, Costa Rica ranks 115th out of 178 countries in the World Bank Group Ease of Doing Business Index (World Bank 2007), indicating much room remains for improving the regulatory environment and making it more conducive to business operations and

$^{16}$ “Region” refers to Central America throughout this document.
investment flow. Additionally, in terms of its economy, Costa Rica is a recipient of international aid and assistance, however a mere 0.15% of gross national income (GNI) was attributable to international aid in 2005, which averaged 0.09% from 2000 to 2005 - the lowest percentage of GNI from international aid in Central America and the fifth lowest in Central and South America combined (DDG/WB 2007).

Table 4.1 Socio-Economic and Political Data for Costa Rica, Guatemala, and Nicaragua.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Costa Rica</th>
<th>Guatemala</th>
<th>Nicaragua</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extension1 (Km²) (million ha)</td>
<td>51,060;</td>
<td>108,430;</td>
<td>121,400;</td>
</tr>
<tr>
<td>Population 2005 (1000s)2</td>
<td>4,327</td>
<td>12,599</td>
<td>5,487</td>
</tr>
<tr>
<td>Population Density (persons/Km²)2, 3</td>
<td>84.7</td>
<td>116.2</td>
<td>45.2</td>
</tr>
<tr>
<td>Pop. Avg. Annual Growth Rate (2000-2005)2</td>
<td>1.93%</td>
<td>2.48%</td>
<td>1.34%</td>
</tr>
<tr>
<td>Pop. Avg. Annual Growth Rate (2005-2010)2</td>
<td>1.50%</td>
<td>2.47%</td>
<td>1.31%</td>
</tr>
<tr>
<td>Rural % of Population 20052</td>
<td>38.3%</td>
<td>52.8%</td>
<td>41.0%</td>
</tr>
<tr>
<td>Rural Pop. Avg. Annual Growth Rate (2000-2005)2</td>
<td>0.6%</td>
<td>1.6%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Rural Pop. Avg. Annual Growth Rate (2005-2010)2</td>
<td>0.1%</td>
<td>1.5%</td>
<td>1.1%</td>
</tr>
<tr>
<td>GDP 2005 (Million US$)4</td>
<td>20,021</td>
<td>31,717</td>
<td>4,911</td>
</tr>
<tr>
<td>GDP annual growth rate 20054</td>
<td>5.9%</td>
<td>3.2%</td>
<td>4.0%</td>
</tr>
<tr>
<td>GPD Avg annual growth rate 2000-20054</td>
<td>3.7%</td>
<td>2.3%</td>
<td>3.25%</td>
</tr>
<tr>
<td>Ease of Doing Business Index Rank (n=178)</td>
<td>115</td>
<td>114</td>
<td>93</td>
</tr>
<tr>
<td>GDP/capita 2005 (US$)4.5</td>
<td>$4,627</td>
<td>$2,517</td>
<td>$895</td>
</tr>
<tr>
<td>Population living &lt; $2/day 1985-20054</td>
<td>9.8%</td>
<td>31.9%</td>
<td>79.9%</td>
</tr>
<tr>
<td>Population living &lt; $1/day 1989-20044</td>
<td>3.3%</td>
<td>13.5%</td>
<td>45.1%</td>
</tr>
<tr>
<td>International Aid as % of GNI 20054</td>
<td>0.15</td>
<td>0.81</td>
<td>15.44</td>
</tr>
<tr>
<td>Avg Annual % of GNI from Int'l Aid (2000-2005)4</td>
<td>0.09</td>
<td>0.96</td>
<td>20.60</td>
</tr>
<tr>
<td>Human Development Index (2005)5 (1=highest)</td>
<td>0.846</td>
<td>0.689</td>
<td>0.710</td>
</tr>
<tr>
<td>Human Development Index Rank (1=highest; n=177)5</td>
<td>48</td>
<td>118</td>
<td>110</td>
</tr>
<tr>
<td>Education spending as % of GNI (2005)7 and Rank (1=highest; n=178)</td>
<td>4.04%</td>
<td>1.57%</td>
<td>2.91%</td>
</tr>
<tr>
<td>Literacy Rate of Persons &gt; 15 yrs (2000-2004)8</td>
<td>94.9%</td>
<td>61.9%</td>
<td>76.7%</td>
</tr>
<tr>
<td>Corruption Perception Index9 2007 Score (10='highly clean', 0='highly corrupt'); Rank (n=177)</td>
<td>5.0</td>
<td>2.8</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>46</td>
<td>111</td>
<td>123</td>
</tr>
<tr>
<td>Corruption Perception Index9 2005 Score(10=highest) Rank (n=177)</td>
<td>4.2</td>
<td>2.5</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>47</td>
<td>117</td>
<td>107</td>
</tr>
</tbody>
</table>

Costa Rica has the highest per capita GDP in Central America at US$4,627 (UNDP 2007; DDG/Worldbank 2007). Compared with its neighbors, Costa Rica has a relatively low poverty rate, with less than 10% of the population living on less than two dollars a day, and 3.3% living on less than a dollar a day (DDG/WB 2007; UNDP 2006). Taking into account these strong economic and other positive social indicators, it is not surprising that Costa Rica ranks highest in Central America on the UNDP Human Development Index\textsuperscript{17} at 0.846, ranking 48\textsuperscript{th} out of 177 countries considered world-wide (UNDP 2007). Additionally, Costa Rica has a well-educated population, reflected by the highest literacy rate (95%) (UNESCO 2006) and highest percent of GNI spent on education (4.04%) (World Bank Group 2005) in the region.

4.2.b. Guatemala

Guatemala is the third largest country in Central America, extending over 108,000 km\textsuperscript{2} (10.8 million ha) (FAO 2007) (Table 4.1). It has a population of approximately 12.6 million people, and the highest population density in the Americas (116 persons/km\textsuperscript{2}) (PD/DESA/WB 2007). At almost 2.5%, Guatemala also has the highest population growth rate in the Americas, decreasing just slightly from the period 2000-2005 (2.48\%) to 2005-2010 (2.47\%). The rural population, which is growing at an average annual rate of 1.5\%, second only to French Guiana (1.6\%) in the Americas, makes up almost 53\% of the total population (PD/DESA/WB 2007).

Highest in the region, Guatemala’s GDP was nearly $32 billion in 2005. However, with an average annual GDP growth rate from 2000 to 2005 of 2.3\%, Guatemala ranks much lower than the regional average of 3.6\% and lower than the average GDP growth rate across the Americas (2.8\%) (DDG/WB 2007). Agricultural products, dominated by sugar, bananas, and coffee, contribute over 13\% to the GDP and account for about three-fourths of national exports. A growing aspect of the economy is represented by

\textsuperscript{17} The Human Development Index aims to quantify the overall ‘well-being’ of a country’s population through a composite value derived from life expectancy, literacy, education, and GDP per capita calculates a score where 0 is the lowest human development and 1 is the highest, such that the country with highest human development is ranked #1 and the lowest is ranked #177.
tourism, textiles, apparel, and nontraditional agricultural products, like winter produce and cut flowers (US State Department 2008). Foreign investment is slowly increasing in Guatemala, though the country is ranked 114th out of 177 countries on the Ease of Doing Business Index (World Bank 2007). More than 85% of Guatemala’s GDP is generated in the private sector, where there is relatively minimal government intrusion. And though Guatemala does receive a significant amount of international assistance, less than 1% of Guatemala’s GNI came from international aid in 2005, averaging 0.96% from 2000-2005, greater only than Panama and Costa Rica in the region, and near the median for all of Central and South America (DDG/WB 2007).

Guatemala’s GDP per capita is just above US$2,500 (DDG/WB 2007; UNDP 2006), which is the region median, though considerably low when compared to all of Latin America. The country also represents a high poverty rate, with almost 32% of the population living on less than two dollars a day, and more than 13% living on less than one dollar a day (DDG/WB 2007; UNDP 2006). Despite its relatively high GDP and per capita income, Guatemala has the lowest human development score (0.689) in the Americas, due in large part to comparatively poor social indicators related to health and education (UNDP 2007). Guatemala spends less than 2% of its Gross National Income on education – the lowest in the region, which is reflected by a comparatively low literacy rate of 69% (World Bank Group 2005).

4.2.c. Nicaragua

Extending over 120,000 km² (12 million ha) Nicaragua is the largest country in Central America (FAO 2007), yet with a population just under 5.5 million people, Nicaragua has the lowest population density in the region with about 42 persons per square kilometer, just below the world average population density (45 persons/ km² (PD/DESA/WB 2007) (Table 4.1). Nicaragua’s slowly decreasing population growth rate is the lowest in the region (1.31% 2005-2010; 1.34% 2000-2005). Forty-one percent of the population is characterized as rural, which is growing at 1.1% on average per year (2005-2010). And
though the rural population growth rate is lower than Guatemala (1.5), Belize (1.4), and Honduras (1.2), it is still much higher than most of South America and the Caribbean (PD/DESA/WB 2007).

Nicaragua had a GDP of slightly more than US$4.9 billion in 2005, and an average annual GDP growth rate of 3.25% from 2000 to 2005, which is stronger than the average GDP growth rate throughout the Americas (2.8%) (DDG/WB 2007). Exports have been one of the key engines driving economic growth in Nicaragua since the end of the civil war in the early 1990s. Coffee, meat, and sugar continue to be important exports, while the export of non-traditional products like vegetables, tobacco products, gold, and textiles have increased significantly in recent years (US State Department 2008). Tourism has also flourished since the end of the civil war, now the third-largest source of foreign exchange in Nicaragua. Fairly stable macro-economic policies and other factors have also made it easier to do business in Nicaragua than in many of its neighboring countries, leading Nicaragua to be ranked 93rd out of 177 countries on the Ease of Doing Business Index (World Bank 2007). Despite a steadily growing economy, Nicaragua is still considered the second poorest country in the hemisphere, lending to extensive debt relief under the IMF Heavily Indebted Poor Countries (HIPC) initiative (US State Department 2008), and reflected in more than 15% of its GNI coming from foreign assistance in 2005, and averaging 20% per year between 2000-2005, by far the highest proportion of gross national income from foreign aid throughout Central and South America (DDG/WB 2007).

The GDP per capita in Nicaragua is less than $900, higher only than Haiti in the Western hemisphere (DDG/WB 2007, UNDP 2006). Thus it is not unexpected that nearly 80% of the population lives on less than two dollars a day, and more than 45% of the population lives on less than one dollar a day (DDG/WB 2007; UNDP 2006). Nonetheless, social indicators on health and education are relatively high compared to some of Nicaragua’s economic indicators. Nicaragua spends 2.91% of its GNI on education and has a literacy
rate of 77% (UNESCO 2006), which are reflected in its human development score (0.710) and rank (110th), which are higher than Guatemala and El Salvador in the region (World Bank Group 2007).

4.3 The Socio-Political Policy Context

4.3.a Costa Rica

Costa Rica is governed by a democratic republic founded on a strong system of checks and balances (US State Department 2008a). The three main branches of government are the executive branch headed by a popularly elected president, the legislative assembly, and the Supreme Court of Justice. The offices of Ombudsman, Comptroller General, and Solicitor General, which exercise oversight of the government, have played an increasingly prominent role at the national level (Peterson 2007). Of note, Costa Rica eliminated its armed services in the early 20th century, avoiding military influence on and involvement in government. This path is quite different than many other countries throughout Latin America (US State Department 2008a).

There are seven provinces (geographical administrative units) in Costa Rica; though provinces do not have elected officials and are solely for administrative purposes. Costa Rica is also divided into 81 cantons. These have municipal governments led by a popularly elected ‘municipal council’ and a mayor, who is appointed by the municipal council (Peterson 2007). Overall, Costa Rica represents a highly centralized government, and one that has

“... long emphasized the development of democracy and respect for human rights. Several factors have contributed to this trend, including enlightened leadership, comparative prosperity, flexible class lines, educational opportunities that have created a stable middle class, and high social indicators” (US State Department 2008a).
Much of this is reflected in the perception of less corruption in Costa Rica. The country received the highest score in the region (5.0) in 2007, and the fifth-highest score in the Americas, indicating a relatively low perception of corruption in Costa Rica (Transparency International 2008).\textsuperscript{18}

4.3.b. Guatemala
Like Costa Rica, Guatemala’s constitution establishes a separation of power among executive, legislative, and judicial branches of government. The country is divided into 22 departments (geographical administrative units) that are administered by governors appointed by the President, while its 331 municipalities are governed by popularly elected mayors or councils. A fairly stable form of democracy is rather recent in Guatemala, given a tumultuous history from the mid-19\textsuperscript{th} century through the mid-1980s, during which time the country “passed through a series of dictatorships, insurrections, coups, and stretches of military rule with only occasional periods of representative government” (US State Department 2008b). An estimated 200,000 people died in Guatemala’s civil war and another 50,000 are estimated to have gone missing (The World 2007). The last military dictator was forced out of power in 1985, permitting the creation a new constitution that provided for a popularly elected president (US State Department 2008b).

After a somewhat shaky start as a newly functioning democracy in the late 1980s, a process for peace finally began in the early 1990s, leading the government to reach and sign agreements on human rights (March 1994) and indigenous rights (March 1995), among others (The World 2007). The final peace accords were signed in 1996 by President Álvaro Arzú Irigoyen. After more than a decade of monitoring the Peace Agreements by a United Nations Verification Mission, UN Secretary General Kofi Anon declared that Guatemala had made “enormous progress in managing the country’s problems through dialogue and institutions” (US State Department 2008b). Yet, given

\textsuperscript{18} The Corruption Perception Index Score relates to the perceptions of the degree of corruption as seen by business people and country analysts, and ranges between 10 (highly clean) and 0 (highly corrupt).
its history of ‘violence and vigilante justice’, crime and impunity remain prominent challenges in Guatemala where progress is limited by inefficiency, corruption, and coercion, present in many of its public institutions (US State Department 2008b). These limitations are reflected, in part, by a significant perception of corruption in Guatemala, which ranked only above Nicaragua and Honduras in the region, and sixth most corrupt in the Americas. It should be noted that Guatemala’s perception of corruption score did improve in 2007 to 2.8, up from 2.5 in 2005 (Transparency International 2008).

4.3.c Nicaragua

Nicaragua is governed under a constitutional democracy with executive, legislative, judicial, and electoral branches of government (US State Department 2008c). The electoral branch is specifically “in charge of the organization, direction and vigilance of the elections (whether national or municipal), plebiscites, and referendums” (Blandino 2007). Compared to many of its neighbors, the legislative branch in Nicaragua has considerable power in relation to the executive branch (e.g. power to override a presidential veto through a simple majority vote; elimination of the presidential pocket-veto of legislative bills). Yet, the judicial branch in Nicaragua is encumbered by a “largely ineffective, often partisan, and overburdened system” (US State Department 2008c).

Nicaragua is geographically divided into fifteen departments (geographic administrative units) and two autonomous regions. The departments are administrative divisions only, while the two autonomous regions along the Atlantic coast (the Northern Autonomous Atlantic Region (RAAN) and the Southern Autonomous Atlantic Region (RAAS) have autonomous controls over various aspects of government and are governed by a popularly elected governor. These regions exercise decentralized and increased control over local resources and their governance. Throughout Nicaragua, including the two autonomous regions, there are 153 municipalities in Nicaragua governed by a publicly elected municipal council (Merrill 1993).
Like Guatemala, Nicaragua has had a turbulent history, with interminable conflict over governance between Conservatives and Liberals, often leading to civil war throughout most of the 20\textsuperscript{th} century. Nicaragua has also been subjected to significant outside intervention, from the United States on behalf of the Conservatives who held power for more than 80 years during the 1900s, and from Cuba and the Soviet Union on behalf of rebels who fought against dynastic rule and the oppression of the common citizen (US State Department 2008c). In 1979, the 40-year Conservative-based Somoza dynasty came to an end with the final, decisive uprising of an ongoing conflict with a large, well-organized rebel group known as the Sandinistas. A new government was established by the Sandinista Party, who nationalized a large portion of private property and industry. They eventually came under significant attack by exiled National Guards, known as the ‘contras’, leading to another civil war that lasted almost a decade, incurring an estimated 50,000 deaths. In the late 1980s, the Sandinista regime responded to domestic and international pressures, and entered negotiations with the contras. They agreed to hold elections in 1990, which led to the first popularly elected woman President in Latin America, Violeta Barrios de Chamorro, and the end of the Sandinista rule (US State Department 2008c).

Since popular elections in 1990, Nicaragua has held three presidential elections, each considered free, fair, and peaceful by international observers, and “reflecting the maturing of Nicaragua’s democratic institutions” (US State Department 2008c). Nonetheless, given its history of conflict, violence, and political volatility, as well as recent executive-level scandals involving money-laundering, corruption, and threats of impeachment, Nicaragua has a long road ahead toward transparency and government stability. So, it is not surprising that there is a significant perception of corruption in Nicaragua (score: 2.6; rank: 123/179), the second worst perception of corruption in the region and fourth worst in the Americas (Transparency International 2008).
4.4 Forest-Related Factors and Historical Development of Forest Use

4.4.a Costa Rica Forest Resource Context

4.4.a.1 Status and Change

According to the FAO (2007), Costa Rica was nearly 47% forested in 2005, with close to 2.4 million ha of forestland; of this 4,000 ha were plantations and the remainder is described as natural forest (Table 4.2). A study by Sanchez-Azofeifa et al. (2006) reports that an estimated 48% of Costa Rica’s land base was forested in 2005, excluding mangroves, marshes, and forest plantations. Regionally, Costa Rica’s percentage of forested land is less only than Belize (72.5%) and Panama (57.7%) (FAO 2007).

Forest area increased in Costa Rica approximately 3,000 ha per year (0.1%) from 2000 to 2005 (FAO 2007). This is consistent with the trend reported by Sanchez-Azofeifa et al. (2006), however these authors use a 2000 forest cover estimate (2,318,000 ha) that was considerably less than the 2000 forest cover estimate used by the FAO (2,376,000 ha). They report an increase of 169,914 ha between 2000 and 2005, mostly from natural regeneration, and a loss of 23,689 ha in areas that were forest in 2000, indicating Costa Rica netted a growth or recuperation of 146,225 ha of forests during the period 2000-2005. Between 1990 and 2000, the FAO reports that Costa Rica lost about 19,000 ha of forest annually. Sanchez-Azofeifa et al. (2002) estimate forest change in Costa Rica from 1987 and 1997, and from 1997 to 2000. They find that forest cover declined an estimated 12,000 ha per year between 1987 and 1997, slowing to approximately 3,033 ha of forest lost per year between 1997 and 2000. Forest loss is detected mostly in the Osa Peninsula in the southwest, the Atlantic Zone, and the Northern Zone, where there was ongoing forest conversion to agriculture and grazing lands and where plantations were harvested without replanting.
Table 4.2 Forest-Related Data for Costa Rica, Guatemala, and Nicaragua.\(^{19}\)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Costa Rica</th>
<th>Guatemala</th>
<th>Nicaragua</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Land (thousand ha)</td>
<td>5,106</td>
<td>10,843</td>
<td>12,140</td>
</tr>
<tr>
<td>Total Forest (thousand ha)</td>
<td>2,391</td>
<td>3,938</td>
<td>5,189</td>
</tr>
<tr>
<td>Forest % of Total Land Area (%)</td>
<td>46.8</td>
<td>36.3</td>
<td>42.7</td>
</tr>
<tr>
<td>Forest Area per Capita (ha)</td>
<td>0.6</td>
<td>0.3</td>
<td>0.9</td>
</tr>
<tr>
<td>Forest plantations (thousand ha)</td>
<td>4*</td>
<td>122</td>
<td>51</td>
</tr>
<tr>
<td>Forest % Under Protection or Conservation Status</td>
<td>26.4%</td>
<td>62.3%</td>
<td>35.6%</td>
</tr>
<tr>
<td>Average Annual Change Forest Area 1990-2000 (thousand ha; %)</td>
<td>-19; -0.8</td>
<td>-53; -1.3</td>
<td>-100; -1.6</td>
</tr>
<tr>
<td>Average Annual Change Forest Area 2000-2005 (thousand ha; %)</td>
<td>3; 0.1</td>
<td>-54; -1.3</td>
<td>-70; -1.3</td>
</tr>
<tr>
<td>Woodfuel - Production (thousand m(^3))</td>
<td>3,445</td>
<td>15,905</td>
<td>5,906</td>
</tr>
<tr>
<td>- Imports; Exports (thousand m(^3))</td>
<td>0; 0</td>
<td>0; 0</td>
<td>0; 0</td>
</tr>
<tr>
<td>- Consumption (thousand m(^3))</td>
<td>3,445</td>
<td>15,905</td>
<td>5,906</td>
</tr>
<tr>
<td>Industrial Roundwood - Production (thousand m(^3))</td>
<td>1,687</td>
<td>419</td>
<td>93</td>
</tr>
<tr>
<td>- Imports; Exports (thousand m(^3))</td>
<td>3; 62</td>
<td>13; 10</td>
<td>0; 29</td>
</tr>
<tr>
<td>- Consumption (thousand m(^3))</td>
<td>1,628</td>
<td>421</td>
<td>64</td>
</tr>
<tr>
<td>Sawnwood - Production (thousand m(^3))</td>
<td>812</td>
<td>366</td>
<td>45</td>
</tr>
<tr>
<td>- Imports; Exports (thousand m(^3))</td>
<td>29; 3</td>
<td>7; 41</td>
<td>1; 39</td>
</tr>
<tr>
<td>- Consumption (thousand m(^3))</td>
<td>838</td>
<td>332</td>
<td>6</td>
</tr>
<tr>
<td>Wood Based Panel - Production (thousand m(^3))</td>
<td>65</td>
<td>43</td>
<td>8</td>
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<tr>
<td>- Imports; Exports (thousand m(^3))</td>
<td>50; 33</td>
<td>63; 13</td>
<td>13; 4</td>
</tr>
<tr>
<td>- Consumption (thousand m(^3))</td>
<td>82</td>
<td>93</td>
<td>18</td>
</tr>
<tr>
<td>Paper &amp; Paperboard - Production (thousand m(^3))</td>
<td>20</td>
<td>31</td>
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<tr>
<td>- Imports; Exports (thousand m(^3))</td>
<td>392; 22</td>
<td>293; 16</td>
<td>37; 1</td>
</tr>
<tr>
<td>- Consumption (thousand m(^3))</td>
<td>390</td>
<td>308</td>
<td>36</td>
</tr>
</tbody>
</table>

(Source: FAO 2007; Except Forest % Under Protection or Conservation Status as reported by FAO 2005, which includes “forest area designated primarily for conservation of biodiversity, as well as primarily for conservation of soil and water resources, including areas outside protected areas.”

* FAO 2007 reports Costa Rica to have only 4,000 ha of plantations, while the FSC (2008) indicates that 32,780 ha of plantations had been certified as of 2008.

(Country comparisons of forest statistics are based on FAO data. Other data sets relevant at the country level are also reported, though due to differences in methodologies and definitions these were not comparable within the context of this study.)

\(^{19}\)
Though the statistics of forest area and forest change differ somewhat significantly between the FAO and Sanchez-Azofeifa et al. (2002, 2006), these three sources confirm a net loss of forests in Costa Rica in the 1990s, that reverses at the turn of the millennium, with a net gain in forested land, in large part due to abandoned agricultural and grazing lands reverting to forest through natural regeneration (Sanchez-Azofeifa et al. 2006). According to the FAO (2007), Costa Rica is the only country in Central America that has shifted from a net forest loss to an increase in forest area in recent history, though Belize has maintained a no net loss or gain of forest from 1990-2005. Figures 4.1a and 4.1b show forest cover and change in Costa Rica in various points in time.
Figure 4.1b Images of Forest Cover in Costa Rica from 1940 to 1996 (FONAFIFO/MINAE)
4.4.a.2 Historical Forest Use

Costa Rica is considered to have once been nearly completely forested, with 99% forest cover enduring through the most of 19th century (MINAE 2001). Nevertheless, by 1940, forest cover decreased to approximately 70%, down to 53% by 1961, and by 1983 forests in Costa Rica were reduced to a mere 26% of the territory (MINAE 2001). Since the independence of Costa Rica, there have been efforts to regulate the use of forests, however while some laws promoted conservation, others, following national economic policy, promoted the clearing of natural forests (Butterfield 1994). According to Cortes-Salas (1995), demand for agricultural land is likely responsible for more than 60% of deforestation in Costa Rica and, with the exception of a few valuable timber species, wood production has had much less effect on forest loss in Costa Rica. This was especially true throughout much of the 20th century, when, with the exception of a few valuable species, most timber was cut and left to burn in the process of converting forest to agricultural land (Campos, Villalobos, and Louman 2005).

Public policy often encouraged the conversion of forests to agricultural use through subsidies and through colonization programs meant to benefit landless farmers by expanding roads and settlements throughout the 1970s (Butterfield 1994). During that time, low interest loans for cattle production and high beef prices also induced land colonization and conversion of forest to pasture (Schelhas 1996). Yet, deforestation has decreased significantly since the mid-1980s, when cattle prices and exports dropped drastically and, thereafter, as policies were created for regulating forest harvests and promoting reforestation. As a result, forested land has been in recuperation in Costa Rica for the past two decades, due in part to policies promoting sustainability, as well as to increasing economic alternatives that have permitted new sources of income that lead to abandonment of agricultural and grazing lands and the eventual regeneration of natural forests (Sanchez-Azofeifa et al. 2006; Sesnie et al. 2006).
Though there was intense promotion of reforestation in Costa Rica in the 1980s and 1990s through government programs (Brockett and Gottfried 2002), according to three interviewed Costa Rican forestry experts with long-term experience in reforestation efforts, there was insufficient follow-up and maintenance of the majority of forest plantations that were beneficiaries of these government programs. This lack of maintenance and subsequent low productivity, left many landowners disillusioned with reforestation, and resulted in decreasing interest in the venture, even with the continuation of reforestation incentives (CE6, CE7, CFM1). In addition, it was suggested by another Costa Rican forestry expert that naturally regenerated and reforested areas are typically susceptible to fluctuations in the economy, such that when there are fewer economic alternatives these areas become a potential source of immediate income, but rarely as a long-term productive system. “In Costa Rica, land dynamics have always responded to the best economic alternative, especially when policies fail to find a way to give greater value to forested land” (CE9).

4.4.a.3 Forest Ownership and Protection

According to the FAO (2007), 24.3% of forests in Costa Rica are on public lands, and more than 75% are on private lands. Forest production is prohibited on public lands, including indigenous lands which represent about 6.5% of the total land base and about 27% of the forests found on public lands (Proyecto Estado de la Nacion 2003). The large proportion of private land in Costa Rica is attributed to state promotion of a private property system that began in the early 1900s and granted land title to any citizen who showed proof of the elimination of native vegetation and its conversion to ‘productive’ land (Butterfield 1994; Navarro and Thiel 2007). With time however, this has produced a fragmented forested landscape, with few large forest patches remaining outside protected areas, and some medium and many small forest fragments scattered

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20 Recall that notations refer to the individuals interviewed for this research in 2007. When appropriate, the associated forest policy actor group of the interviewee may be mentioned, though only when his/her identity is not considered to be revealed.
throughout the country. “This fragmentation brings with it the problems of biological
degradation and makes it difficult to scale up forest management as a viable economic
activity” (Navarro and Thiel 2007: 3).

In terms of forest protection, while the FAO (2005) reports 26.4% of the forest area in
2005 was under protection or conservation status, as reported in the National Forest
Development Plan (PNDF), 31% of the forested land measured in 2000 is located in
National Parks and Biological Reserves (MINAE 2001). Some of this protected forest
area exists in private reserves (i.e. on private land) that must meet regulatory protection
constraints (SINAC 2008). According to the Ministry of the Environment and Energy
(Ministerio de Ambiente y Energía (MINAE)) (2001), another 19% of the total forest area
falls under the protection land use class (VIII), which generally includes areas on extreme
slopes and around bodies of water and waterways and where agricultural and forest
production are prohibited (MAG-MIRENEM 1996).

Costa Rica’s forests and forested landscapes are considered one of the greatest
attractions for tourism, which represents the second highest source of national income
(Rodríguez Quiros 2005). In general, the national protected areas system in Costa Rica
plays an important role for tourism, as do forests on private lands surrounding and
connecting these protected areas. Forests are essential to the sustainability of the
protected area system itself, and thus essentially to the tourism industry, but the future
of forests on private land are not certain as some private land owners find it ever more
difficult to maintain their forests for lack of competitiveness with other land uses
(Rodriguez Quiros 2005: 135).

4.4.a.4 Forest Production
According to the National Forest Development Plan (2001), almost 50% of the forest
area in Costa Rica, or 22.5% of the land base, has potential for sustainable wood
production and the provision of other environmental services (Arce and Barrantes 2006).
As for forest use, fuelwood collection represents a significant portion of wood production (3,400,000 m³, 2005) (FAO 2007), though only 12% of the population uses fuelwood as an energy source (Rodriguez Quiros 2005) since electricity is widely available and accessible throughout the country. Costa Rica also produces the most industrial roundwood (~1.7 million m³, 2005) and sawnwood (812,000 m³, 2005) in the region, though Panama exports the most roundwood, and Guatemala, Nicaragua, Honduras and Panama all export more sawnwood than Costa Rica. Overall, Costa Rica is a net importer of sawnwood, panels, and paper products, the only exception in terms of wood products is industrial roundwood, of which approximately 30% is exported (FAO 2007).

In Costa Rica, there is increasing evidence that domestic wood production rates are insufficient and yet also unsustainable. McKenzie (2000) reports that in 2000 an estimated 30.5% (248,362 m³) of domestic wood production in Costa Rica came from natural forests with an approved management plan and another 15.7% (128,000 m³) from plantations. He also estimates that 28.2% (228,982 m³) of wood production in 2000 came from farmland where isolated trees were harvested and generally fail or are permitted to regenerate, resulting in an unsustainable form of wood production. The remaining 25.6% of domestic wood production (208,684 m³) was attributed to undocumented or illegal sources. Altogether, the study indicates that 46% of domestic wood consumed in Costa Rica was from sustainable sources (natural forests and plantations), while 54% was from unsustainable sources (illegal sources and trees in pastures) (MINAE 2001). Overall, according to Rodriguez Quiros (2005), fewer natural forests are being managed for wood production in Costa Rica, fewer plantations are being planted, and harvested plantations are not being replanted, resulting in increasing dependence on wood imports to meet consumption demands. As reflected by one forestry executive: “In Costa Rica, every day there is less natural forest under management, but an increasing demand for wood products. If this trend continues, by 2010 we will be importing US$100 million of wood products per year” (CFM1).
4.4.b. Guatemala Forest Resource Context

4.4.b.1 Status and Change

In 2005, Guatemala had more than 3.9 million ha of forested land, covering approximately 36% of the national territory - a percentage higher only than El Salvador in Central America (FAO 2007) (Table 4.2). Of this, 122,000 ha (3%) were plantations and the remainder was considered natural forest. The Guatemala Forest Inventory estimates 37.1% (4,050,000 ha) of the country was forested in 2004 (INAB/FAO 2004). Of this, 98% was natural forest and 2% was plantation; while 82% of the total forest area was classified as broadleaf forest, 10% conifer, and 8% mixed forest. The FAO (2007) reports that the average annual change in forest area has remained fairly constant over the past two decades, losing approximately 1.3% of total forest area per year between 1990-2000 and 2000-2005, which totals approximately 17% of the original forest area in 1990. The rate of forest change in Guatemala is the third highest in the region (Honduras -3.1%, El Salvador -1.7% (2000-2005)) and fourth highest when Central and South America are combined (Ecuador -1.7% (2000-2005)) (FAO 2007).

As reported by the UVG/INAB/CONAP (2006), 75% of national forest loss from 1991 to 2001 occurred in the first half of the decade (1990-1996), while 25% occurred in the second half, suggesting that the rate of deforestation is slowing (Figure 4.2). This report indicates that the Petén is the department that had the greatest forest loss from 1991 to 2001, losing more than 47,000 ha per year, largely due to forest conversion for agriculture and settlement. Forest loss in the department of the Petén encompassed nearly 65% of total forest loss at the country level from 1991 to 2001 (CONAP 2007).
Thirty-nine percent of the deforestation in the Petén occurred within the protected areas in that department (CONAP 2007). Another study by Galvez and Rodas (1999) indicates that 73% of the deforestation between 1997 and 2003 occurred in broadleaved forests, while 27% occurred in conifer forests. The authors also report that the greatest loss took
place in the departments of the Petén and Las Verapaces, where 90% of the
deforestation was attributed to agricultural land use change. Galvez and Rodas (1999)
further break down the drivers of deforestation in those two departments and attributed
79% to migratory agriculture (slash-and-burn), 10% to extensive cattle grazing, 5% to
illegal logging, 3% to fuelwood consumption, 2% to forest fires, 2% to pests and disease,
and 0.5% to commercial agriculture.

4.4.b.2 Historical Forest Use
Historically, forest change in Guatemala was promulgated by significant agrarian
colonization policies, established in the early 1950s, that focused largely on the Petén
as a “release valve for Guatemala’s agrarian problems” (Elias et al. 1997 by Manzanero
et al. 2006). These policies made the region the principal source of public lands
available to poor farmers and indigenous populations without access to private land.
The policy persisted through the mid-1980s, as military governments sustained the
strategy in an effort to control land conflicts in the western and southern parts of the
country. The policy resulted in a population explosion in the Petén that went from
around 25,000 inhabitants in the 1960s to over 500,000 in 1998 (Manzanero et al.
2006). Similar to Costa Rica, and other countries in the region, these policies led to
significant pressures on the forest resource as agrarian land access implied forests had
to be cleared to be considered ‘productive’ (Campos, Villalobos, and Louman 2005).

During several decades of settlement into the Petén, there was little control or oversight
in the region by the state, leading to haphazard settlement and considerable forest loss,
mostly in the southern part of the department (Manzanero et al. 2006). Eventually this
spurred increasing governmental and international concerns over the vulnerability of the
Petén’s valuable natural and cultural resources. These concerns led to actions that
ultimately resulted in the creation of the Maya Biosphere Reserve in the northern part of
the Petén as a means to stem the deforestation and protect the ecological and
archeological resources of the region (Nittler and Tschinkel 2005; Manzanero et al.
A Biosphere Reserve is an international conservation designation developed and recognized by UNESCO’s Man and the Biosphere (MAB) Programme. According to the program framework biosphere reserves are created “to promote and demonstrate a balanced relationship between humans and the biosphere” (UNESCO 2008). They must include a legally protected core area, a buffer area where non-conservation activities are prohibited, and a transition zone where approved practices are permitted, all of which is planned and carried out with regard for the sustainable use of natural resources for the benefit of local communities (UNESCO 2008). The Maya Biosphere Reserve is discussed in greater detail in the next section.

4.4.b.3 Forest Ownership and Protection

CONAP (2007) reports that in 2001, 38% of the total forest area in Guatemala was found on private lands, 34% on public lands, and 23% on municipal or community lands (CONAP 2007). The FAO (2005) reports that 62.3% of the forest area in 2005 was under some form of protection or conservation status. Based on the 2001 estimate of forest cover, the Government of Guatemala states that 55% of forests were found in protected areas (INAB/CONAP/MAGA/UVG 2004). The largest protected area in Guatemala is the Maya Biosphere Reserve (MBR) in the department of the Petén, encompassing over two million hectares, of which more than 80% is forest. In 2001, forests in the MBR represented 76% of all forests in protected areas and 42% all forested land in Guatemala (CEMEC 2004).

The MBR is divided into three zones: nucleus, multiple-use, and buffer (CONAP 1996) (Figure 4.3). The nucleus zones (767,000 ha, 36%) are national parks, biotopes, and other biological corridors designated for strict preservation of wildlife and archeological resources. Human intervention is prohibited in the nucleus zones. The multiple use zones (848,440 ha, 40%) function as a first-order buffer to the nucleus zones. Specific activities and sustainable harvest of wood and non-wood products are permitted with authorization and oversight by the National Council for Protected Areas (Consejo
Nacional de Areas Protegidas (CONAP), which is the agency in charge of protected area administration in Guatemala. The protected areas administration in the multiple use zone. Long-term forest concessions, in which the usufruct rights to the forest resource are granted to a concessionaire, are the principal tool used for managing resources in this area. The 'buffer zone', which runs the length of the perimeter between the Reserve and the rest of the county, acts as a second-order buffer to the nucleus zones, which are buffered by the multiple use areas. The principal objective of the buffer zone, which covers 497,500ha and 24% of the total reserve area, is to alleviate pressure on the other zones through the stabilization of appropriate land and resource use (USAID/CONAP/FIPA 2001; Manzanero et al. 2006).

Figure 4.3 Nucleus (Parque Nacional, Biotopo), Multiple Use, and Buffer Zones of the Maya Biosphere Reserve, Guatemala (CONAP 1996)
In terms of change in forest cover, the MBR is not so different from the country at large. When the Reserve was created in 1986, it was more than 92% forested (1,949,473 ha) (CEMEC 2004). In 2004, it was just over 82% forested. The majority of the deforestation has taken place in the buffer zone (36% of total forest change) where land use change is permitted with approval from CONAP to accommodate agricultural and livestock production, largely for the local population. Two of the nucleus zones represent the second and third greatest loss of forests: the Sierra del Lacandon National Park (11.5%) and the Laguna del Tigre National Park (8%). These parks are designated for strict preservation as part of the nucleus zone of the MBR, yet largely due to a lack of staffing and resources, there is little monitoring and control of the borders. This leads to eventual encroachment by squatters and the establishment of settlements, that are difficult to remove but which ultimately create a significant impact on the resource over time. The multiple use zone has had much less forest loss (2.65%), largely attributed to the establishment of forest concessions where forest resources may be extracted but must be based on a long term plan for sustainable harvest (CEMEC 2004).

4.4.b.4 Forest Production

Forests in Guatemala are first and foremost a source of fuelwood, with nearly 1.6 million m$^3$ harvested and consumed in 2005; the second highest fuelwood consumption in Central and South America combined, after Brazil (FAO 2007). In large part, this activity has hindered the development of a national-level approach to sustainable forest management as such a large part of the population (60%) depends on the forest for fuel (Rodriguez Quiros 2005; Carrera et al. 2006). From 1993 to 1997, an estimated 86% of the total wood harvest (1.36 million m$^3$) was attributed to fuelwood consumption, another 7.5% of the total harvest went to charcoal production, and a mere 5.5% was for industrial transformation. Today, fuelwood collection continues to be a principal competitor with the forest industry and is considered a significant source of deforestation, with only 15% of fuelwood comes from clearing or rotating coffee plantations (ANF 2004). And fuelwood is expected to continue as the principal source of
heat and lighting, unless energy consumption patterns change considerably, and electric energy and propane gas supplies are increased (Carrera et al. 2006). By law, every family is permitted the collection of 15 m$^3$ of fuelwood a year, without a management plan. Though with nearly one million families taking part in this activity, a vast expanse of forest is used without any form of planning (Alvarez and Gomez 2004).

Some industrial roundwood, sawnwood and panel production is reported for Guatemala though the numbers pale considerably to fuelwood consumption (Table 4.2). Overall, about 74% of wood harvested from forests is for personal or family consumption, 23% is for commercial production and 3% is for forest health (Alvarez and Gomez 2006). Approximately, 90% of total annual timber harvest is consumed domestically, while 10% is exported. The principal product exported is sawnwood (41,000 m$^3$), making Guatemala the largest exporter of sawnwood in the region (Revelorio 2004; FAO 2007). From 1994 to 2001, on average Guatemala exported US$6.6 million in wood products and imported US$1.98 million annually, most of the deficit was attributed to paper and paperboard products (ANF 2004).

In 2005, forest product exports reached nearly US$7.8 million. Sawnwood, furniture, pallets, doors and pencils were the top five products exported, representing nearly 80% of total wood products exports. Pine (US$2.15 million), mahogany (US$ 10.4 million) and ‘palo blanco’ (*Calycophyllum biflorum*) (US$4.6 million) were the three species of greatest value exported in 2005 (Alvarez and Gomez 2006). Wood that reaches industrial production averages a yield of approximately 53%, of which 68% is sold as sawnwood, 14% goes into secondary transformation, and 8.5% to plywood, veneer, and other conglomerate products (Carrera et al. 2006). And while only about 10% of forests are classified as conifer, these forests supply approximately 75% of total timber production. Broadleaf and mixed forests make-up the other 90% of forest area, but supply just 25% of production, most of which comes from mahogany and cedar (60%) (Galvez and Rodas 1999). As reported in the 2002 National Forest Inventory, timber
production in natural forests is typically carried out through a selective harvest system, except when clearcuts are necessary for forest health reasons (INAB/FAO 2004). In 1997, it is estimated that less than 1% (13,888 ha) of forest cover was legally harvested outside protected areas. By 2000, this had nearly doubled to 25,674 ha of forest land managed for timber outside protected areas (ANF 2004). According to Revelorio (2004), there is an immense under-utilization of forest resources in Guatemala.

4.4.c. Nicaragua Forest Resource Context

4.4.c.1 Status and Change

Nearly 5.2 million ha of forest covered Nicaragua in 2005, equal to about 42% of its land base (FAO 2007) (Table 4.2). Nicaragua has the greatest area of forest in the region, most of which is located in the Autonomous regions along the Atlantic coast, and the largest expanse of tropical broadleaf forest north of Amazonia (~23 million ha) (Roper 2003). According the most recent national forest inventory using data from 1998-1999, approximately 56% of the land base was forested circa 1999, about half of that was classified as dense natural forest and the other half as secondary, degraded, or brush forest (MAGFOR 2001). Less than 1% of the total forest area is classified as plantations.

According to the FAO (2007), Nicaragua lost nearly 1.35 million ha of forest between 1990 and 2005, equal to about 20% of the forest area in 1990, and second only to Honduras in terms of total forest loss (Figure 4.4). Nicaragua contributed nearly 26% of the total deforestation that occurred in the region during that period. The annual rate of deforestation in Nicaragua is the third highest in the region (equal to Guatemala), though it decreased from 1.6% between 1990 and 2000 to 1.3% between 2000 and 2005 (FAO 2007). Forest loss is largely attributed to the expansion of agricultural and grazing land, as well as slash-and-burn practices that create a mosaic of forest and cultivated patches across an increasing expanse of the landscape (Global Witness 2007) (Figure 4.5). Deforestation is also attributed to forest fires and pests (e.g. pine bark beetle (Dendroctonus sp.), but to a much lesser degree (Rodriguez Quiros 2005).
Figure 4.4 Change in Forest Cover in Nicaragua from 1983 – 2000 (INAFOR 2003)

Figure 4.5. Aerial photograph of forest fragmentation from slash-and-burn practices in the Northern Atlantic Autonomous Region of Nicaragua (McGinley 2007)
4.4.c.2 Historical Forest Use

During many decades of civil war and unrest in Nicaragua, much of the forest was without real ownership and left largely undisturbed, especially in the Atlantic regions (Rodriguez Quiros 2005). As the conflicts subsided in the early 1990s, the government established policies to give national lands to excombatants and to recognize indigenous lands. As settlement expanded, forests were often destroyed for ranch land and agriculture and degraded due to indiscriminate and uncontrolled logging (Rodriguez Quiros 2005: 129). In the second half of the 20th century, it is estimated that farmland increased from 7% to 36% of the Nicaraguan land base (del Gatto et al. 2006).

Large-scale forest activities that did occur generally took place through forest concessions, mostly in the northern Atlantic region. These “activities caused massive deforestation, particularly in the pine forests, leaving the region exhausted of much of its forest resources by the 1960s” (Roper 2003: 20). One government official indicated that, for the most part, forest concessions in Nicaragua were “held by foreigners, who came, cut and exported most of the wood, investing very little, if anything, in the local economy or in the long term” (NOGN3). This was an observation echoed by other forestry experts (NE6; NE8; NE9).

When the Somoza dynasty was overthrown and the Sandinistas took power in 1979, they quickly revoked all forest concessions and took state control of forestry activities through the Corporación Forestal del Pueblo (CORFOP) (Roper 2003). Yet, due to more pressing economic and social issues, little was done in the way of forestry during the Sandinista administration. When they lost power in the 1991 elections, the new administration sought to increase economic opportunities and once again privatized the forestry sector, opening much of the Atlantic region to concessions once again. Nonetheless, dubious deals were made with foreign companies overlapping historically indigenous lands, eventually resulting in international attention and alarm. Finally, the government cancelled all concession contracts in process in the late 1990s and ceased its policy of
granting usufruct rights to forest resources, shifting focus to the titling of indigenous and private lands that could then be pursued through individual contracts for timber extraction, though the titling of lands has been met with other challenges (Roper 2003).

4.4.c.3 Forest ownership and protection
In Nicaragua, most forests outside protected areas are ‘private’ (del Gatto et al. 2006). However, there is no clear data on forest ownership at the country level (FAO 2005), largely due to ongoing problems over land tenure, such as incomplete titles, complicated inscription processes, and conflicts over boundaries. Some indigenous lands have been titled, though the boundaries are often in dispute and squatter invasions are common and difficult to remove (Nepenthes and IPADE 2005 cited by del Gatto et al. 2006) “With or without clear title, the majority of natural forest is in the hands of indigenous communities in Nicaragua” (del Gatto et al. 2006: 3).

The FAO (2005) reports that 35.6% on Nicaragua’s total forest area was under protection or conservation measures in 2005. This is similar to the statistic reported by del Gatto et al. (2006) who estimate approximately two million hectares or 38.5% of forested land was located in protected areas. In 2005, the Nicaraguan National System of Protected Areas includes 78 legally declared areas, covering 18% of the Nicaraguan land base. There are another 21 areas proposed to achieve a greater representation of forest ecosystems (Rodriguez Quiros 2005). Most protected areas are not without inhabitants, and these residents practice forest, agricultural, and other types of resource harvests, often generating conflicts over the objectives of the protected areas and among the different user groups (Rodriguez Quiros 2005). And, as one government official observed: “Protected areas in Nicaragua have historically had very porous borders and been susceptible to significant land use change” (NONG3).

4.4.c.4 Forest Production
Forests are a significant energy source in Nicaragua. In 2005, more than 5.9 million m$^3$ of fuelwood were harvested (FAO 2007). That year, fuelwood represented more than
55% of the net energy consumption in the country (Rodriguez Quiros 2005). As for other wood products, Nicaragua exports nearly half of the reported industrial roundwood and sawnwood production (FAO 2007), though the country is still a net importer of wood products (Pommier 2002). Wood product exports were reported to be valued at approximately US$70 million in 1976, dropping to less than US$500,000 in 1986 (Casteilleia 1993 by Roper 2003). Production and exports have increased and fluctuated since then, particularly for mahogany (*Swietenia macrophylla*). Until a 2006 governmental decree banned all mahogany harvest, Nicaragua was the fourth biggest exporter of mahogany in the world (CINCO and CIP 2006).

Timber production in Nicaragua is concentrated in four regions: in the conifer forests of Nueva Segovia, and the predominantly broadleaf forests in Rio San Juan, the RAAN and the RAAS (Rodriguez Quiros 2005). Interviewed government officials cited forest conversion to shifting agriculture as one of the major challenges in the Atlantic regions of Nicaragua (NOGN1; NOGN3). Government officials, forest agency representatives, and forest and natural resource experts also noted dramatically increasing concerns in recent years over abusive logging practices in the eastern part of the country (NAF1; NAF5; NAF6; NE2; NE3; NOGL2; NOGN1; NOGN3). On the other hand, one forest agency official reported that illegal logging is the most important issue concerning the pine forests in the west (NAF1). According to recent estimates, illegal logging in broadleaf forests is around 30 - 50,000 m$^3$/year, while in pine forests it is estimated at 110 - 135,000 m$^3$/year (Richards et al. 2003).

**4.5 Sustainable Forest Management (SFM) Constituents - Status and Perspectives**

**4.5.a Costa Rica SFM Constituents**

**4.5.a.1 The Forest Production Sector**

In Costa Rica, the forest production sector includes forest owners, managers, operators, and the forest products industry. While forest production has been widespread for decades in Costa Rica, it has not traditionally been recognized as having a significant
impact on the national economy. One study demonstrates decreasing contribution of forest production to the GDP during the 1990s, ultimately representing about 1.3% of the GDP by the end of the decade (Lebedys 2004 cited by Navarro and Thiel 2007). However, by taking into account transformation and commercialization, McKenzie (2000) suggests that the forest production sector contributed 5.4% to the GDP in 1998, as opposed to 1.5% that he determined using traditional calculations. Rodriguez Quiros (2005) estimated that the aggregated value of the forest production sector was about US$130 million in 2001 (Rodriguez Quiros 2005).

It should also be noted that forests in Costa Rica represent significant sources of income other than from wood production. For example, Nasi et al. (2002) indicate that one million tourists visited Costa Rica in 2000 and that more than half of those tourists visited forests during their trip. By 2005, tourism represented almost 8% of the GDP (ICT 2006), and in 2007, nearly two million tourists visited Costa Rica, generating approximately US$1.9 million (La Nación 2007). While tourism is an important driver of the economy in Costa Rica, “many different stakeholders capture the values generated (from tourism) but the profits often leave the country and provide little benefit to local populations” (Montagnini and Jordan 2005:9). Nonetheless, it is these and other values that are associated with forests in Costa Rica that have lead to different demands and expectations on their status and use.

Natural forest owners in Costa Rica represent a key component of the forest production sector, particularly since the harvest of forest resources is only permitted on private land by law. However, Ramirez (2006) suggests that all too often forest owners see their forests resource as “petty cash” that can be accessed when other productive activities are insufficient. Interviewed forestry experts also pointed out that more and more forest owners in Costa Rica live somewhere other than where their forests are located and that these owners typically have little involvement or supervision over the management of their forests (CE8; CAF3). One forest owner and participant in forest community
organization did not disagree that forest owners interested in and committed to natural
forest management are decreasing, though he pointed out that “we have fewer and
fewer options and support for maintaining and managing our forests, especially those of
us who cannot afford to simply protect the forest” (CE7).

As fewer forest owners have an interest in or capacity to manage their own forests, the
role of ‘intermediaries’ has arisen as a part of the Costa Rican forest production sector.
These ‘intermediaries’ are forestry professionals or loggers who typically buy standing
wood from landowners and undertake the transactions necessary for obtaining harvest
permits and executing them (Ramirez 2006). Some interviewees suggested that without
ownership of the land and forest, intermediaries are less inclined to be invested in the
long-term sustainability of the managed forest (CAF3; CE8; CFM1). This dispersion of
responsibilities and interest in forests for wood production has led to “a weakening
‘forestry culture’ in Costa Rica in which forest production is viewed less and less as an
important contribution to subsistence and sustained economic development,” observed
one forest manager (CFM1) - a view reflected by forest agency representatives (CAF3;
CAF4), a forest owner (CE7), and forestry expert (CE7; CE8). It was also noted by another
forestry expert that:

“There is a negative cycle weakening the sector, as fewer natural forests are
managed and fewer plantations are replanted after harvest, so there is little
incentive for the industrial forest sector to increase their storage of primary
material or to upgrade outdated, wasteful machinery, which results in decreasing
demand for primary material that provides little incentive to increase or invest in
managed forests or plantations” (CE3).

The forest production sector does benefit from a few key forest industry associations
(e.g. CCF, ONF) and small-farmer/community development organizations (e.g. ASIREA,
JUNAFORCA, ACICAFOC, etc.) who “undertake a wide range of national and regional
activities, ranging from joint management and execution of production and processing
projects, to national lobbying for development policies that benefit the forest sector”
(Watson et al. 1998 by Ramirez 2006). Yet, ultimately, the processes mentioned above
have led to a forest production sector in Costa Rica that is loosely organized, losing strength, and increasingly indifferent to timber production, with less and less power and skill to negotiate or promote its needs for a sustainable and productive future.

4.5.a.2 Other SFM Constituents

With regard to the state’s role in sustainable forest management in Costa Rica, it should first be noted that the country as a whole has largely adopted, embraced, and promoted itself as a ‘green country’ (país verde). The Costa Rican government has taken on serious initiatives related to natural resource conservation and protection for decades. And, as mentioned above, tourism is a significant contributor to the GDP, and it is linked in part to the natural and forest resources of Costa Rica, therefore the state has a vested interest in protecting those resources. As a result, state support for sustainable natural forest management is often trumped by decisions and actions related to protection and preservation. A forest owner, expert, and even agency representative each agreed that sovereign support for forest policy in Costa Rica is often heavily influenced by a ‘green’ national image or ideology that tends to disfavor natural forest management for production (CE7; CE9; CAF3).

The Costa Rican forest production sector is supported by a select few, but key forestry NGOs (e.g. FUNDECOR, CODEFOSA) who promote and provide environmental awareness, training, and improved forestry practices and are in favor of sustainable forest management as a component of larger conservation strategies (Rodríguez Quiros 2005). These groups tend to have more power and influence than the forest production sector itself in national level discourse and negotiations, and typically intervene on behalf of sustainable forest production, and small scale producers in particular. Also, environmental NGOs and donors within the international community have made important contributions to sustainable forest management in Costa Rica, through the provision of funds and technical assistance, often in collaboration with academic institutions and national level environmental and forestry NGOs. According to Watson
(1998) these groups have provided a strong coalition in support of an agenda that prioritizes biodiversity conservation and includes sustainable forestry as one of several tools for working towards that goal.

On the other hand, some national-level environmental groups and interests do not support natural forest management as a component within a national strategy for conservation. One natural resource expert explained that “forest management has not demonstrated widespread reduced impacts on the forest, nor have forest management outcomes been sufficiently monitored to determine if practices are leading to or away from sustainability” (CE8). Another forest resource expert observed that “many national environmental groups have taken an advocacy approach to resource conservation, typically oriented toward strict preservation, some even acting as ‘watchdogs’ to draw attention to the shortcomings of forest resource management and monitoring systems. In places like the Osa Peninsula their actions have led to improvements in the overall system” (CE4). Campos et al. (2004) observe that national environmental groups have also been known to undermine forest management as a valid component within a national conservation strategy and their lobbying of government has led to increasingly limited forest access for forest owners.

Finally, as one forest agency official noted, the general public in Costa Rica seems to generally take pride in the country’s ‘green’ image and a large majority have shifted from “seeing the forest as a provider of cubic meters to a protector of other environmental services” (CAF2). This is reflected in part by more than 20% of the total forest area being enrolled in the Costa Rican Program of Environmental Services Payment for Protection (FONAFIFO 2007). In addition, the general public seems to favor preservation over wood production. However, as one forestry expert observed “the general public has a double standard that on the one hand does not want forests touched, but on the other demands more wood floors and doors” (CE9). This sentiment was echoed by forest owners, managers, and forest agency personnel (CE7; CE3; CE5; CAF3; CFM4).
4.5.b. **Guatemala SFM Constituents**

4.5.b.1 The Forest Production Sector

In Guatemala, the forest production sector includes forest owners, indigenous communities, community and industrial forest concessionaires, forest managers and operators, and the forest products industry. In 2003, the forest production sector contributed approximately 2.56% to the GDP, which represented around 11% of the agricultural sector gross productivity (ANF 2003). However, the installed capacity of the forest products industry to process wood is limited, evidenced by limited storage capacity, little tertiary transformation, and the lack of secondary species product development. Moreover, the capacity of producers to respond to market requests is limited and related to a lack of information on long-term volume supplies (ANF 2003; Rodriguez Quiros 2005).

According to Carrera et al. (2006), with the exception of some of the forest concessions in the Petén, the wood processing industry in Guatemala does not own forests, but largely depends on third parties for raw materials. In addition, while there are some high quality large-scale wood products industries, the majority of sawmills in Guatemala are small enterprises, few of which are registered. These mills typically process softwood, have minimal technical and technological capacities, and are subject to inconsistent flows of raw material. As a result, their products are not generally of high quality, their yield is low, and there is little value added through production (Carrera et al. 2006).

As for the organization of and power exercised by the forest sector, one expert observed that “the formal forest sector that does exist in Guatemala is poorly organized and significantly divided among large scale industry, and communities and small forest land owners” (GE1). According to Carrera et al. (2006) there are a few large forest enterprises and wood products industries in Guatemala, most of which meet “high quality standards” and export a significant portion of their production (Carrera et al. 2006). Nonetheless, as noted by a large scale industry expert, these actors are more
concerned with and active in political issues that affect their bottom line (GE3). That is not to say that there have not been some significant and positive developments in the strengthening and cohesion of the sector, particularly in terms of community forestry, through the creation of the forest concession system in the MBR. And, there are key community level forestry organizations throughout the country (e.g. ACOFOP (Asociación de Comunidades Forestales de Petén), FEDECOVERA (Federación de Cooperativas de las Verapaces). However, a forestry official noted that outside the MBR, few forest owners in Guatemala are organized or work in collective groups, and many do not have the skills or resources to manage their forests themselves (GAF2). As such, similar to Costa Rica, most forest management outside the forest concession system is carried out by intermediaries who purchase standing wood from small landowners and have little reason to invest in long term management, as observed by forest agency officials and a forest expert (GAF1, GAF2, GE5). Two forestry experts and a government official also noted there is also a large segment of forest production that takes place ‘informally’ through individuals and operations that work at the margins of legality (GE1; GE4; GOGN4). “These actors do not generate taxes, they interact in insulated and isolated groups, and avoid the bureaucracy of the formal sector altogether” (GE4).

4.5.b.2 Other SFM Constituents

As for the state’s involvement in sustainable forest management, Nittler and Tschinkel (2005) state that the government has shown strong support and made significant efforts towards the clarification of property rights since the signing of the Peace Accords, the designation of public forest resources available for long term lease through the forest concession system, and the support for forest management on private land. The authors also point out that the government has failed to define a clear policy for dealing with forest invasions and forest land use conflicts, two of the greatest threats to sustainable forest management in Guatemala, and particularly on public lands (Nittler and Tschinkel 2005). A forestry official echoed these views and further observed that
“forest invasions and conflicts typically arise from people who are still looking for land on which to settle (since the Peace Accords were signed) and whose needs have not been met by the government, or at least have not been met to their satisfaction. This leads to ongoing conflicts of interest between those who seek to use the forest sustainably and within the law, those who operate outside the law (e.g. squatters, drug traffickers, smugglers, etc.) and those who are charged with applying the law” (GAF3).

The Guatemalan forest production sector is also supported by national and regional forestry and environmental NGOs (e.g. Naturaleza Para la Vida, Centro Maya, ProPeten) that provide support, training, and technical assistance related to sustainable forestry and community development (Gomez and Mendez 2005). Some of these groups also participate in the broader political discourse on natural resource use and protection, largely on behalf of communities or small forest landowners, to further the general discussion on, knowledge of, and political support for sustainable forest management within larger conservation strategies.

In addition to support from some national and local organizations, sustainable forest management in Guatemala has been strongly supported as a valuable component of a broader conservation strategies in Guatemala, especially in the MBR, by international donors and NGOs (Gomez and Mendez 2005). Many of these donors and organizations continue to have a vested interest in the Reserve’s success. One forestry expert suggested that “many of the national and international NGOs have had a greater impact on the forest production sector, especially in the MBR, than the state itself, in part because they offer assistance, technology, training, market access, clients, and more” (GE2). Nearly US$1.4 billion of international assistance has been invested in the MBR since 1996 (Gomez and Mendez 2005) (Table 4). These funds were principally channeled to forest communities through governmental institutions and forestry and environmental NGOs, like many of those referred to above. And, while some experts maintained that it has been the governmental institutions and NGOs who received the lion’s share of the actual dollar amount invested in the Reserve (GE1, GOGN2), Gomez and Mendez (2005) maintain that these investments have led to the generation of
important knowledge and technical capacity related to the sustainable management of the Petén’s forests and have contributed to the development of its communities within a sustainable forestry context.

Finally, as noted by one forestry official, there number of environmental groups and a segment of the general population that is growing and is “not open to anything but pure protection of forest resources” (GAF3). Many environmental groups opposed to timber production from natural forests are increasingly engaging the media and to a lesser degree getting involved in the political dialogue on how best to conserve Guatemala’s natural resources. Yet, as noted by one governmental official, these groups often “fail to recognize or focus on other land uses that continue to spread throughout Guatemala, which can be far worse than forest management for the environment and for sustainable development altogether” (GOGN4).

**Table 4.3. Major Cooperation Projects in the MBR and Forest Concessions Since 1996 (Source: Gomez and Mendez 2005)**

<table>
<thead>
<tr>
<th>Project</th>
<th>Organization/Donor</th>
<th>Years</th>
<th>Amount (US$)</th>
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<tbody>
<tr>
<td><strong>Principal projects for cooperation and technical assistance</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Maya Biosphere Project</td>
<td>USAID/Counterparts</td>
<td>1990-2002</td>
<td>45 million</td>
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<tr>
<td>PDS</td>
<td>BID</td>
<td>1998-2002</td>
<td>22 million</td>
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<td>PROSELVA</td>
<td>KFW</td>
<td>1998-2000</td>
<td>30.8 million</td>
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<td>Centro Maya</td>
<td>USAID</td>
<td>1998</td>
<td>135 million</td>
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<td>USAID</td>
<td>1998</td>
<td>1 million</td>
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<td>OLAFO</td>
<td>Scandinavian Aid</td>
<td>1999</td>
<td>82 million</td>
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<td>BIOFOR</td>
<td>USAID</td>
<td>2002-2004</td>
<td>8.9 million</td>
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<td><strong>Principal agreements for community development</strong></td>
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<tr>
<td>ACOFOP</td>
<td>Ford Foundation</td>
<td>1999-2004</td>
<td>470 million</td>
</tr>
<tr>
<td>ACOFOP</td>
<td>ICCO</td>
<td>2000-2005</td>
<td>600 million</td>
</tr>
</tbody>
</table>
4.5.c. Nicaragua SFM Constituents

4.5.c.1 The Forest Production Sector

In Nicaragua, the forest production sector includes forest owners, indigenous communities, forest managers and operators, and the forest products industry. This sector contributes about 3% of the GDP, yet a significant amount of the wood utilized in this sector is not from natural forests, but from agroforestry systems (Faurby 2005). Overall, the forest production sector in Nicaragua has ebbed and flowed over the years. Del Gatto et al. (2006) report that there was some significant investment in forest production in Nicaragua in the 1960s, but this mainly focused on large-scale unrestricted extractions. They also note that once the regulation of timber harvests began in the late 1970s, investment in the timber industry reduced significantly as mostly outside investors feared regulations would render business unprofitable. Only fitful starts to the sector have been noted since then, resulting in a few enduring genuine forest products industries that produce finished products like floors, doors, and tongue-and-groove wood products have been established and are enduring, despite the challenges facing the sector (del Gatto et al. 2006). Yet, Rodriguez Quiros (2005: 122) describes the Nicaraguan forest production sector in 2005 as “economically dormant” with access to extensive resources, but having taken little initiative to invest in their long-term production.

Across the spectrum of people interviewed in Nicaragua, several interviewees described the existing forest production sector as underdeveloped, regionalized, and highly divided (NAF2, NE8, NFM1, NNCIF2). One forest agency official recognized there is some strength to the power and negotiation ‘skills’ of some of the larger forest industries, yet he also suggested that those with the most power are “largely corrupt and self-serving” (NAF3). And, while much of the forest is owned by indigenous communities, to date they have had little if any participation or voice in the sector. Several indigenous community forest members expressed their frustrations related to the lack of access to policy making and decisions that have affected their forests and their livelihoods for years (NCCF1; NNCCF1; NNCCF2; NNCCF3). Forestry officials explained that indigenous
communities in the Atlantic regions, as well as many small forest landowners throughout the country, rarely have the skills, resources or organizations to manage their own forests and often simply cede their forest use rights to large industries or intermediaries (NAF5, NAF2), as in the case of many small landowners in Costa Rica and Guatemala.

4.5.c.2 Other SFM Constituents

With regard to the State’s role in sustainable forest management in Nicaragua, in 2007 there was significant promotion of a new focus in forest policy towards community forestry and limitation of large scale forest industry to those operations that would work within the confines of the related laws. This change in policy focus was reflected by one forestry official’s observation that “politicians and the public-at-large are ‘allergic’ to the forest sector these days and have little, if any, interest in the promotion of large-scale forest activities” (NAF2). This shift in policy focus is largely due to some severe and highly publicized forest transgressions, which have led the state to bolster forest-related laws through increased enforcement by the military and oversight by the State Attorney’s Environmental Office. These actions are described in further detail in Chapter 8.

In Nicaragua, there has also been support for sustainable forest management from national and local forestry and environmental groups (e.g. Masangni, Nicambiental) that provide technical assistance and support to forest management and community efforts. These groups have had some involvement in the forest policy dialogue, but limited power to influence forest policy making. Sustainable forest management in Nicaragua has also been supported by some international donors and NGOs. As observed by Rodriguez Quiros (2005), of the instances of sound forest management in Nicaragua by private companies, community organizations, forest owner cooperatives, and NGOs, the majority have received support in one way or another from international aid programs.

On the other hand, one forestry expert indicated that there are some environmental groups in Nicaragua that do not support forest management and have strongly pursued and publicized poor forest management (NE8). “In cases where forest management is
poorly conducted, identification and correction or punishment is certainly in order, yet these occurrences should not be used to condemn the entire sector” (NE8). This forestry expert and a forestry official agreed that increasing publication of instances of poor forest practices has led to an increasing segment of the population in disagreement with forest management as a viable conservation tool (NE8, NAF1). Yet, as this forestry expert also observed, “everyone (in Nicaragua) gets up in arms to see a truck full of timber, but does not even flinch when a truck full of cattle goes by... There is a double moral here that is sinking any possibilities of strong forest sector” (NE8).

4.6 Chapter Wrap-Up

This chapter revealed the range of contexts in which forest policy takes place in Costa Rica, Guatemala, and Nicaragua. Overall, the national–level forest policy context in each country represents opportunities and challenges for the development, execution, and ultimate outcomes of sustainable forest management policy. The remainder of this section presents a summary of key aspects of the forest policy context, opportunities, and constraints in the case study countries.

In Costa Rica, increasing development and wealth have led to decreasing pressures on the forest for subsistence and settlement, and may be linked to recent recuperation and subsequent increases in the overall forest area. However, pressures on forests for continuing expansion of the agricultural frontier and suburban development do exist in Costa Rica. Moreover, where forests are available for production, their typically small size and fragmented status, have constraining implications for the capacity and cost of management. The forest production sector as a whole in Costa Rica faces challenges associated with poor organization and a strong national environmental movement that seldom supports sustainable natural forest management as a component of a larger conservation strategy for the country.
In Guatemala, poverty and population dynamics produce significant pressures on the forest, which is reflected in a relatively high rate of forest loss from, for example, conversion through shifting agriculture and fuelwood consumption. While much of Guatemala’s forests have been fragmented or converted to other land uses, a large expanse of forested land in the northern part of the country has benefited from governmental and international support for protection and long-term sustainable use through the Maya Biosphere Reserve and its long-term forest concessions. The government in Guatemala has established opportunities for the enhancement of sustainable forest management (e.g. clarification of property rights, forest concessions). Guatemala has also benefited from long-term and significant financial and technical support for sustainable forest management from international donors and NGOs, largely directed at the forest concession system in the Maya Biosphere Reserve.

Of the three case study countries, Nicaragua has the largest expanse of forest area and thus a broad canvas in which to incorporate sustainable forest management. However, poverty-related pressures on the forest (e.g. shifting agriculture, fuelwood collection, conversion of forest for agricultural and grazing land) are extensive. Additionally, the forest production sector in Nicaragua is fragmented, has operated erratically in the past, and has been pursued and publicized for significant transgressions in the forest, all of which lead to significant challenges for the development, execution, and uptake of sustainable forest management policy.

Table 4.4 presents a detailed summary of the key aspects of the forest policy contexts in Costa Rica, Guatemala, and Nicaragua that were described in this chapter. This chapter helped to frame the context in which forest policy develops, is executed, taken up, and ultimately produces outcomes. The next chapter presents and analyzes the governmental forest policy outputs in Costa Rica, Guatemala, and Nicaragua.
Table 4.4 Key Aspects of the Forest Policy Contexts in Costa Rica, Guatemala, and Nicaragua.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Costa Rica</th>
<th>Guatemala</th>
<th>Nicaragua</th>
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</thead>
<tbody>
<tr>
<td><strong>Size and Population</strong></td>
<td>Costa Rica is the <strong>smallest</strong> of the three case study countries geographically at 51,060 km². It also has the smallest population (4.3 million) that is slowly growing at about 1.5%. It has a <strong>relatively high population density</strong> (84.7/ km²) compared to the rest of the Americas. It’s rural population represents about 40% of the total population (similar to Nicaragua), though this segment of the population has essentially <strong>stopped growing</strong>.</td>
<td>Guatemala is <strong>more than twice the size</strong> of Costa Rica (108,430 km²), and the second largest of the three case study countries. It’s <strong>population is the largest</strong> of the three countries (12.6 million), which is the <strong>fastest growing</strong> in the Americas (2.5%). Its <strong>population density</strong> (116/ km²) is also the <strong>highest</strong> in the Americas. More than half of Guatemala’s <strong>population is rural</strong>, which is the second fastest growing rural population in North and Latin America.</td>
<td>Nicaragua is the <strong>largest</strong> of the three case study countries (121,400 km²). It has the second largest population of the three (5.5 million) but the <strong>lowest population density</strong> (45/ km²). It also has the <strong>lowest population growth rate</strong> (1.3%). Nicaragua’s rural population makes up about 40% of the total population. It is growing somewhat more slowly than its overall population (1%).</td>
</tr>
<tr>
<td><strong>Economics</strong></td>
<td>Costa Rica has the second highest GDP of the three (US$20 billion), and the <strong>highest per capita GDP</strong> (US$4,627), which is nearly twice that of Guatemala and five times that of Nicaragua. Not unexpectedly, <strong>poverty is much lower</strong> in Costa Rica than the other two countries, the Human Development Index (HDI) is comparatively <strong>high</strong> (0.846).</td>
<td>Guatemala has the <strong>highest GDP</strong> of the three case study countries (US$32 billion), though its <strong>per capita GDP</strong> (US$2,517) is closer to Nicaragua’s than Costa Rica’s. Though not as poverty stricken as Nicaragua, more than 30% of the population lives on less than $2 a day. Moreover, Guatemala has the <strong>lowest HDI score</strong> in the Americas (0.689).</td>
<td>Nicaragua is the <strong>poorest</strong> of the 3 case study countries (US$ 5 billion; GDP/capita: US$895), and only ‘wealthier’ than Haiti in the hemisphere. Over 80% of the population lives on less than $2 a day. Yet, in spite of severe poverty, Nicaragua’s HDI score (0.710) is higher than Guatemala, due to better health and education factors.</td>
</tr>
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Table 4.4 Continued

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<tr>
<th>Issue</th>
<th>Costa Rica</th>
<th>Guatemala</th>
<th>Nicaragua</th>
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<tbody>
<tr>
<td>Government</td>
<td>Costa Rica is a Democratic Republic. It has the longest (c.1899) and most stable democratic form of government of the three. It is also a highly centralized system of governance. Costa Rica does not have an armed forces and has never had a military-ruled government. It’s been more than half a century since any civil war or unrest in Costa Rica, permitting comparatively stable and significant socio-economic development.</td>
<td>Guatemala is a Constitutional Democratic Republic. In Guatemala, a truly democratic form of government is much more recent than in Costa Rica (c.1986). There have been dictatorships, insurrections, coups, and military rule. Today, there has been significant progress towards compliance with the Peace Accords and democracy in general. Though, as a result of years of war, corruption and impunity are major issues for governance in Guatemala.</td>
<td>Nicaragua is a Republic. In Nicaragua, like Guatemala, a democratic government is relatively recent (c.1990). Nicaragua has had a history of dynastic rule, insurgencies, and civil conflicts. Since peace was reached and democratic elections began in 1990, significant progress has been made, especially in terms of decentralization of governing power, though corruption and conflict are still major issues there.</td>
</tr>
<tr>
<td>Forest Area, Change, and Ownership</td>
<td>Costa Rica has the smallest total area of forest (2.4 million ha) of the three, and the highest proportion of forested land (47%). Costa Rica is the only country of the three with an increasing forest base (0.1%/yr), but more than 75% of the original forest cover was deforested by the early 1980s. Some of this has been recovered as converted forest.</td>
<td>Guatemala has the second largest area of forest of the three countries (3.9 million ha), but the lowest proportion of forested land (36%) and lowest forest area per capita (0.3ha/person). The rate of forest loss in Guatemala is equal to Nicaragua (1.3%/yr) and is largely attributed to conversion for agricultural and to a lesser degree, settlements. Additionally, slash-and-burn, or ‘shifting’</td>
<td>Nicaragua has the greatest forest area in Central America (5.2 million ha), and the second highest proportion (43%) of forested land of the three case study countries. It had the highest rate of forest loss in the 1990s (1.6%/yr), though this has decreased since 2000 to equal that of Guatemala (1.3%/yr). There too forest loss is attributed to</td>
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Table 4.4 Continued

<table>
<thead>
<tr>
<th>Issue</th>
<th>Costa Rica</th>
<th>Guatemala</th>
<th>Nicaragua</th>
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<tbody>
<tr>
<td>Forest Area, Change, and Ownership</td>
<td>Land is abandoned. Forest loss is largely due to conversion for agricultural and grazing lands, that have led to a highly fragmented forested landscape, in which the only large expanses of forest are found on public lands and protected areas where forest harvest for production is prohibited. All production forests are on private lands, and are typically small (&lt;100ha) and fragmented.</td>
<td>Agriculture is a significant contributor to forest loss and fragmentation. Productive forests are found in public and private lands. Most productive forest in public land is found in the Maya Biosphere Reserve, which harbors extensive, contiguous forests. Most productive forests on private land are small and fragmented like those in Costa Rica.</td>
<td>Conversion for agriculture and grazing lands. Shifting agricultural practices are a significant source of forest loss in Nicaragua, as well. Commercial forest production is permitted in private, indigenous and community lands, but was recently prohibited in protected areas. Most forests in private lands in the West are small and fragmented, but there are still large, contiguous productive forests in communal and private lands in the East.</td>
</tr>
<tr>
<td>Forest Production</td>
<td>Costa Rica is a net importer of most forest products, with the exception of roundwood. Current production from natural forests is decreasing compared to recent history, largely due to increasingly rigorous and restricted access to management. Declining natural forest production is offset by wood from plantations and</td>
<td>Guatemala is a net exporter of round- and sawn-wood, but a net importer of most other wood products. Fuelwood consumption is by far the most significant wood product harvested from forests in Guatemala, where nearly 60% of the population depends on it for fuel. Industrial wood production is increasing in Guatemala, but considered to be very low</td>
<td>Nicaragua, like Guatemala, is a net exporter of round- and sawn-wood, but a net importer of most other wood products. In Nicaragua forests are a very significant source of fuelwood. Compared to the forest resource, production is low in Nicaragua, due in part to a long lapse in production</td>
</tr>
<tr>
<td>Issue</td>
<td>Costa Rica</td>
<td>Guatemala</td>
<td>Nicaragua</td>
</tr>
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</tr>
<tr>
<td><strong>Forest Production</strong></td>
<td>farmlands, though considered unsustainable as isolated trees are harvested from farms and do not regenerate and many plantations are not replanted.</td>
<td>compared to the immense and valuable forest resource available, especially in the Petén.</td>
<td>during the civil war and consequent aging and decline of industry, and in part to recent limits placed on the sector by the government in response to poor forest practices.</td>
</tr>
<tr>
<td><strong>Forest Stakeholders and Strategies</strong></td>
<td>The forest sector in Costa Rica has a long history but is not well organized, losing strength, and increasingly indifferent to timber production from natural forests. The state has benefited greatly from conservation initiatives and a green image, and decreasingly supportive of natural forest management. There are key national and international forestry and other NGOs that have provided financial and technical support SFM in Costa Rica. There is also a strong environmental movement that prefers and promotes preservation over SFM.</td>
<td>The forest sector in Guatemala is poorly organized, somewhat regionalized, but building some strength through the forest concessions in the MBR. The State has recognized the importance of promoting sound forestry in private and public lands. International aid agencies and NGOs have played a very significant role in the advance of forest production in protected areas. Local forestry and some environmental organizations have also played significant roles in technical support for SFM. There are also some environmental groups and interests that promote preservation over SFM.</td>
<td>In Nicaragua, the forest sector is not well organized and divided and has experienced instances of poor practices that have led to a poor public image. The state is not supportive of industrial forestry due to poor performance, and has recently (2007) focused on a policy for the promotion and development of community forestry. There are a few national forestry and other NGOs dedicated to improving SFM in Nicaragua and there has been some international support for SFM. Env’l groups are against poor industrial forestry.</td>
</tr>
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5.1. Introduction

With a greater understanding of the context in which forest policy develops and is put into effect from Chapter 4, we can better determine the actual forest policy outputs, their execution, and target group forest policy uptake related to sustainable natural forest management in Costa Rica, Guatemala, and Nicaragua. This chapter considers and compares the governmental forest policy outputs (i.e. directives and instruments) in place in the three countries. A comprehensive understanding of forest policy directives and related policy instruments is essential for a more comprehensive understanding of potential and actual policy outcomes (see for example: Mazmanian and Sabatier 1983; Goggin et al. 1990; Cashore and McDermott 2004). The assessment of governmental forest policy directives and instruments in this chapter provides important information on the similarities and differences in governmental forest policy outputs between the three case study countries. It may also shed light on potential opportunities and constraints related to forest policy execution, as well as to forest policy uptake.

5.1.a Forest Policy Directives and Instruments
As indicated in the conceptual framework (Table 3.1), policy outputs are classified by policy directives and policy instruments. Policy directives are the formal written outputs of government, in this case, for implementing forest policy principles and goals, and typically include laws, regulations, rules, norms, and standards of good practice (Anderson 1984; Birkland 2005). This chapter describes and analyzes forest policy directives related to sustainable natural forest management. It also takes a closer look at the forest management issues addressed by governmental policy directives (e.g. operational, ecological, economic, social aspects) within and across case study
countries, taking into consideration the associated level of compulsion (i.e. mandatory, discretionary) and approach (i.e. prescriptive, process-based, performance/outcome-based). Through this type of analysis it is possible to determine and compare not only the range and volume of sustainable forest management issues addressed by governmental forest policy, but also the requirements (i.e. prescriptions, processes, outcomes) and level of discretion (i.e. voluntary/mandatory) associated with their compliance, which together have obvious implications for policy execution and uptake (Gunningham, Grabosky, and Sinclair 1998; Cashore and McDermott 2004). Moreover, as Lipsky (1980: 14) suggests: "Rules (or directives) may actually be an impediment to supervision. They may be so voluminous or contradictory that they can only be enforced or invoked selectively."

The policy instruments selected for putting forest management policy directives into effect in the case study countries are also examined in this chapter. These are classified as compulsory/command-and-control (i.e. direct regulation and penalties or punitive actions associated with non-compliance), fiscal/economic (i.e. subsidies/ incentives, tax breaks, and stumpage and other forest use taxes), educational/informative (i.e. training and education, technical assistance, information dissemination, public awareness action, and research and monitoring), and market-based (i.e. market mechanisms designed to influence consumption patterns and create market incentives for sustainable production). This analysis sheds light on the range or mix of governmental policy instruments in place for regulating or promoting sustainable forest management, which is also important for understanding inducements and constraints for policy execution and uptake (Gunningham, Grabosky, and Sinclair 1998). Furthermore, as McLaughlin (1987: 171) maintains, “effective implementation requires a strategic balance of pressure and support, as policy cannot always mandate what matters to outcomes at the local level.”
This chapter discusses the historical development of forest-related policy, and assesses the forest policy directives and instruments related to the regulation and promotion of sustainable forest management in force in 2007 in Costa Rica, Guatemala, and Nicaragua. Section 5.1.b, below, provides an overview of important aspects and practices associated with tropical forest management, which is provided as a brief introduction to the description and analysis of forest policy outputs in this chapter.

5.1.b Key Aspects and Practices Associated with SFM in the Tropics
By the early 2000s, most laws governing natural tropical forest management in Central America included requirements for forest management planning and the involvement of a professional forester (Campos, Villalobos, and Louman 2005). Given the complexity of tropical forest systems, sustainable approaches to their management are often intricate as well. The basic elements of tropical forest management generally deemed necessary for sustainable resource use include the development of a detailed management plan derived from inventories of species distribution and forest composition and structure (Lamprecht 1990; Verissimo et al. 1998; Louman et al. 2001).

Sound planning also takes into account forest dynamics, soil properties, and water resources, and measures for reducing the impacts on those aspects. This information is used to develop a long-term strategy of sustainable harvests, where each harvest is planned, in part, by mapping the trees to be cut, protected, and left for future crops, as well as the best routes for logging roads and skid trails. Accurate implementation of these plans, monitoring of their impacts, and processes for modification that take outcomes into account, are also crucial components for long-term sustainability (Louman et al. 2001). In recent years, forest laws and policies throughout Central America have increasingly incorporated many of these forest management aspects and practices (Campos, Villalobos, and Louman 2005).
5.2 Costa Rica Forest Policy Outputs

5.2.a Historical Developments

As the escalating change in Costa Rica’s landcover from forest to agriculture and pasture became increasingly apparent in the late 1960s, efforts arose to curb those changes through the control and promotion of forest use (Quiros 2007). The first Forest Law (No. 4465) in Costa Rica was enacted in 1969. It established a state forest agency and was primarily focused on the creation of incentives for reforestation. This first Forest Law included some regulation of forest management, but did not prohibit forest land use change (FAO 2004; Brockett and Gottfried 2002).

A second Forest Law (No. 7032) was produced in 1986 that established a Forest Credit Certificate (Certificado de Abono Forestal) for reforestation payments and maintained the minimal level of oversight for natural forest management from the previous forest law (Rodriguez Quiros 2005; Quiros 2007). By the late 1980s, awareness and concern for adequate forest resource use had increased significantly in Costa Rica. Parallel to these changes, and in the lead up to the World Summit in Rio de Janeiro, Costa Rica published its first forest strategy in 1989 as a FAO Forest Action Plan for Costa Rica. This plan included forest planning at the national level, identified obstacles to forest sector development, and sparked a national debate on forests and the need for the regulation of their use (Rodriguez Quiros 2005).

In 1990, Costa Rica produced its third Forest Law (No. 7174), which was the first to incorporate the concept of forest management plans and to prohibit forest land use change (i.e. forest conversion to agriculture or other land use) (FAO 2004). This signaled a transition from an extractive system, to one that incorporated concerns for the quality of the remnant forest as part of a polycyclic management system (Brockett and Gottfried 2002). The new law provided for the establishment of economic incentives for natural forest management through the Forest Credit Certificate for Forest Management (Certificado de Abono Forestal para Manejo). It also led to the development and
application of the first official guide for forest management planning, produced in 1992, which incorporated the use of forest inventories in planning, vertical management of the forest structure, and volume restrictions for harvestable trees (Quiros 2007).

5.2.b   Forest Policy Directives for Natural Forest Management

5.2.b.1 Forest Law and Regulations

The fourth Forest Law (No. 7575) was passed in 1996. It superseded previous forest laws in Costa Rica and was still in force in 2007. According to this law:

“the conservation, protection, and administration of natural forests, as well as the production, harvest, industrialization, and promotion of the country's forest resources, according to the principles of appropriate and sustainable use, are essential functions and priorities of the state” (CRFL Art. 1).

Forest Law 7575 establishes the organizational structure and resources for putting the law into effect, which are described in Chapter 6. It also defines the policy instruments for regulating and promoting sustainable forest management and other forest activities. This Law maintains the prohibition of forest land use change from the previous forest law, further prohibits the replacement of natural forests with plantations, and establishes the requirement for approved management plans for the harvest of natural forests. It also institutes the first ban on a timber species for ‘almendro’ (*Dipteryx panamensis*), a tree which produces an important food source for the endangered great green macaw (*Ara amigua*).

Forest Law 7575 was later accompanied by the establishment of Forest Regulations in 1997 (Decreto 25721-MINAE) and by Standards for Forest Management in 1998 (Decreto 27388-MINAE). The Forest Regulations further define the organizational and inter-organizational structures and responsibilities of the governmental and non-governmental actors involved in the execution of governmental forest policy, the processes for putting policy into effect, and the means and measures for the legal harvest of forest resources. The forest management standards define the specific
aspects and practices related to forest management that must be met for legal timber harvests. The Forest Law, Regulations, and Standards provide the legal framework for the harvest of trees from natural forests, as well as from ‘outside of forests’.

5.2.b.2 The Development of Forest Management Standards in Costa Rica

Development of the Costa Rican Forest Law 7575 in the mid-1990s coincided with country-level initiatives to uphold and implement agreements made at the World Summit in Rio de Janeiro in 1992, such as the use of Criteria and Indicators to assess forest sustainability, as well as the initial upsurge in the global forest certification movement. Additionally, the Costa Rican Chamber of Forestry, an association of timber producers and industries, had begun to promote the concept of a National Forest Certification System. As a result of these developments and actions, the Forest Law and the Regulations included directives to produce national norms for sustainable forest management, as well as opportunities for the creation of a national forest certification system (CRFL Art.6; CRFR Art.26).

Forest Law 7575 also provided for the establishment of an independent commission to work on the development of a national forest certification system (Art. 6). In 1997, the state created the National Forest Certification Commission (Comisión Nacional de Certificación Forestal (CNCF))\(^{21}\), composed of three representatives of national universities with advanced degree programs in forestry and biology, two representatives of international scientific organizations with projects in technical cooperation and forest development, two representatives of scientific organizations dedicated to the field of forestry, and a representative of the Costa Rican Professional Association of Agronomy Engineers (Chaves 2000). The state authorized this Commission to develop a framework for evaluating the sustainability of managed forests, to be used both for the control of forest management country-wide, as well as for the certification of forest management

\(^{21}\) In February 2007, the name of the CNCF was changed to the Costa Rica National Commission for Forest Sustainability (CNSF) “whose function is to recommend to the State Forest Administration the guidelines for sustainable forest activity that guarantee a viable socioeconomic use of the forest resource with minimal impact and within the governing institutional forest framework” (Decreto 38.815-MINAE).
within the concept of a National Forest Certification System (Rodriguez Quiros 2005). The state also directed the Commission to use the Forest Stewardship Council (FSC) Principles, Criteria, and Indicators (PC&I) as a foundation for the Costa Rican framework for evaluating forest management and certification. A forest certification expert explained that the “selection of the FSC PC&I as a foundation for Costa Rican efforts was based on the global recognition of the FSC framework for evaluating forest sustainability” (CC1). He also pointed out that the selection and use of the FSC PC&I was, in part, an effort to preserve the future possibility of pursuing FSC recognition of the Costa Rican National Standard for Forest Certification, which would guarantee its use in all FSC certifications throughout the country (CC1).

Table 5.1 The FSC and Costa Rica Forest Principles

<table>
<thead>
<tr>
<th>PRINCIPLE</th>
<th>FSC Principles of Forest Stewardship</th>
<th>Costa Rican Principles of Forest Management and Certification</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Compliance with Laws and FSC Principles</td>
<td>Observation of Laws and Principles</td>
</tr>
<tr>
<td>2</td>
<td>Tenure and Use Rights and Responsibilities</td>
<td>Tenure and Use Rights and Responsibilities</td>
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<tr>
<td>3</td>
<td>Indigenous People's Rights</td>
<td>Worker’s Rights and Community Relations</td>
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<tr>
<td>4</td>
<td>Community Relations and Workers' Rights</td>
<td>Indigenous Communities’ Rights</td>
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<tr>
<td>5</td>
<td>Benefits from the Forest</td>
<td>Benefits from the Forest</td>
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<tr>
<td>6</td>
<td>Environmental Impact</td>
<td>Management Impact</td>
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<td>7</td>
<td>Management Plan</td>
<td>Management Plan</td>
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<tr>
<td>8</td>
<td>Monitoring and Assessment</td>
<td>Monitoring and Assessment</td>
</tr>
<tr>
<td>9</td>
<td>Maintenance of High Conservation Value Forests</td>
<td>Maintenance of Natural Forests</td>
</tr>
<tr>
<td>10</td>
<td>Plantations</td>
<td>Forest Plantations</td>
</tr>
</tbody>
</table>
The Principles, Criteria, and Indicators for Forest Management and Certification in Costa Rica were developed by the CNCF and first published in November 1998 (Decreto No. 27388-MINAE). These Standards for Forest Management largely encompasses the 10 principles of the FSC (Table 5.1) and many of the FSC Criteria and Indicators. The Costa Rican PC&I were established to serve the dual purpose of setting standards for forest management approval and for certification of sound forest management through a national system (Decreto No. 27388-MINAE). Compliance with a large majority of the indicators is required for the approval of forest harvest permits (76 out of 92 indicators), regardless of the desire to seek forest certification through the national system. Once published, the PC&I underwent a period of preliminary application, field testing, and review. Based on the results, the PC&I were revised and approved in October 2002 (Decreto 30763-MINAE). Ultimately, the national forest certification system was never implemented, yet, the PC&I were put into practice as legal standards for natural forest management and continued to be in application in 2007.

5.2.b.3 Key Content and Structural Features of Forest Policy Directives for Natural Forest Management in Costa Rica

Costa Rica’s Forest Law 7575 defines forests as:

“native or indigenous ecosystems, previously harvested or not, regenerated by natural succession or other forestry techniques, that occupies a surface area of at least 2 ha, characterized by the presence of mature trees of different ages, species, and appearance, with one or more canopies that cover more than 70% of the surface area and where there are more than 60 trees per ha of at least 15cm diameter-at-breast-height” (CRFL, Art. 3).

The Forest Law also includes mandatory, prescriptive measures such as the prohibition of the harvest of trees within a 100m radius of springs; within 50m around lakes and natural or manmade water catchments; within 50m on either side of rivers, creeks, and streams in hilly terrain; and within 10m in urban areas or 15m in rural areas on either side of rivers, creeks, and streams in flat terrain (CRFL Art.33). The Law and its Regulations also mandate that all natural forest timber harvest must be carried out
through a management plan prepared by a forestry professional and authorized by the state forest regulatory agency, SINAC (Sistema Nacional de Áreas de Conservación) according to specific guidelines outlined in the Forest Regulations and the Standards for Forest Management (i.e. PC&I).

The Regulations define the following requisite elements and processes for natural forest management: (1) a general forest management plan that includes the evaluation of the potential harvest impacts on the residual forest and soil resources, and the corresponding mitigation measures to be applied, (2) justification for the cutting cycle, which cannot to be less than 15 years, and the cutting intensity, both based on the dynamics of the forest as understood through the forest inventory, regional conditions, and accepted local growth rates, (3) identification of the measures for forest protection and surveillance; and (4) operational plan(s) that provide a census and digitally mapped location of the harvest and seed trees, the extraction and road network, the hydrological network, and the mitigation measures to be carried out during operations (CRFR Art. 17).

The Standards for Forest Management (PC&I) further detail required forest management prescriptions, processes, and outcomes. These include restrictions or outcome measures associated with environmental factors, such as canopy openings; the width, length, and total surface area of the extraction (roads) network; and the minimum diameter at breast height at which different timber species can be harvested. They also include required social aspects and processes, such as those related to workers rights and community relations. The Standards address the need to consider the economic costs and benefits of natural forest management, but do no require financial analyses. (See Table 5.3 for further details on natural forest management regulation).

The Forest Law and Regulations also regulate the harvest of trees outside of natural forests as well. The Regulations define ‘farmlands without forest’ as areas on private lands with forests that are less than two hectares in size, or areas where trees are
present that are forest remnants (CRFR Art. 2). The harvest of trees from these land
categories must be carried out with an authorized harvest permit. The Forest
Regulations outline two permit options based on the quantity of trees to be harvested:
(1) permits for harvests of less than ten trees and (2) permits for harvests of more than
ten trees. The first allows for the harvest of up to three trees per hectare, not to exceed
ten trees total on a given property. The request for harvest authorization may be
prepared by the landowner and is approved by the municipal government (CFR Art. 90).
The second permit allows for the harvest of up to three trees per hectare and more than
a total of ten trees to be harvested. It must be prepared by a forestry professional, who
must confirm and declare that the area solicited is not a forest as defined by law, nor
part of a forest. The harvest permit request must include the number of tree species
and number of trees per species to be harvested, the associated volumes, and a map
indicating the location of each tree on the property. This type of permit must be
approved by SINAC (CRFR Art. 91). The Forest Law and Regulations include no other
guidelines or requirements for the harvest of trees outside forests.

5.2.c   Forest Policy Instruments for Natural Forest Management in Costa Rica
5.2.c.1 Compulsory/Command-and-Control Instruments
As outlined above, governmental policy related to natural forest management in Costa
Rica is largely implemented through a ‘compulsory’ or command-and-control approach.
The use and harvest of natural forests and even isolated trees is directly regulated
through mostly mandatory, prescriptive directives, as well as some process- and
outcome- based directives. This command-and-control approach to forest management
is also associated with penalties or punitive actions for non-compliance with the forest
policy directives.

The Forest Law 7575 defines forest-related crimes, such as forest land use change,
disregard for forest species bans, and timber harvest without the prescribed legal
documentation. These particular offenses can be penalized with imprisonment for one
month to up to three years, and the seizure of all associated forest products (CRFL Art. 58, 61). The lack or falsification of legal documentation for transportation of wood from forests and plantations is also punishable by law (CRFL Art. 28). However, as pointed out by a forestry official, Forest Law 7575 does not establish penalties for the lack or falsification of legal documentation for the transportation of wood from agroforestry systems or from farmlands (CAF1). Nor does it establish penalties for cutting the forest understory (CAF1). As discussed further in Chapter 7 on governmental forest policy uptake, there is evidence of forest owners and/or users clearing the forest understory, planting grasses, and later requesting authorization to harvest ‘trees in farmland’ (see for example: McKanzie 2000), which ultimately results in the conversion of forest to farmland, and as noted above, this is prohibited by law (CRFL Art. 19).

5.2.c.2 Fiscal/Economic Forest Policy Instruments for Natural Forest Management

According to Rodriguez Quiros (2005), Costa Rica has a long history of forest-related economic incentives that can largely be divided into three phases. The first phase began in 1979 with income tax deductions for commercial plantations (Quiros 2007; Rodriguez Quiros 2005). A second phase of incentives began in the mid-1980s, dominated by tradable bonds and direct payments for forest production activities. These were initially directed towards small and medium sized landowners and focused on establishing and maintaining forest plantations. During this second phase, bonds and payments for natural forest management were established in 1990, and for natural forest protection in 1995 (Rodriguez Quiros 2005; Sesnie et al. 2006). In particular, natural forest management incentives were distributed across more than 22,000 ha of managed forest from 1991 to 1995 (Quiros 2007).

The third phase of forest incentives began in 1996 with a significant shift from the concept of ‘subsidies’ for forest-related activities, to the ‘compensation’ to forest owners for the environmental services (i.e. watershed protection, biodiversity conservation, carbon sequestration, and aesthetic values) protected and provided by their forests.
(Rodriguez Quiros 2005). These services were first recognized through Forest Protection Certificates in Forest Law 7575 (CRFL Art 22), which also provides tax breaks through exemptions from property and assets taxes on forested land. The concept of ‘compensation’ was later expanded into a bonafide Program of Environmental Services Payments for forest conservation, sustainable forest management, reforestation, and agroforestry systems Decreto No. 25721-MINAE). 22

As explained by one forestry official, though environmental services payments (pago por servicios ambientales (PSA)) for natural forest management were established at the outset of the Program, a national debate over their justification erupted soon after the Program’s initial implementation (CAF2). Several interviewees representing a range of forest experts, officials, and managers described the debate as such: on the one hand, it was argued that PSA for natural forest management helped to offset the costs of compliance with forest regulations, leading to reduced impact logging, and subsequent benefits for local, national, and global society (CE2; CE6; CE8; CAF2; CFM4). On the other hand, it was argued that forest management is a lucrative process that does not merit additional economic compensation, or one that does not necessarily protect the forest (e.g. forest conservation) and its environmental services nor generate forest-related environmental services where they were none before (e.g. plantations, agroforestry systems) (CE2; CE6; CE8; CAF2; CFM4). Ultimately, those opposed to PSA for natural forest management prevailed and this type of environmental services payment was terminated in 2003. Barrantes (2007) likens the termination of PSA for natural forest management to a direct message from the state “that natural forest management no longer provides environmental services to society at large” (Barrantes 2007). A forestry official explained that after the termination of this type of payment, it was established that natural forest owners could access PSA for Forest Protection one year post-harvest, though as he acknowledged “this does little for most forest owners who cannot afford the up-front costs associated with legal forest management” (CAF2).

22 These have since expanded into some site specific and municipal level environmental services payment programs, mostly utilized to compensate forest owners for watershed protection.
From the time of the PSA Program's inception in 1997, to 2003, when payments for natural forest management were discontinued, PSA were distributed to more than 28,000 ha of managed natural forests (FONAFIFO 2007). Additionally, by 2007 PSA had been disbursed to more than 530,000 ha of protected forest and nearly 38,000 ha of plantations and natural reforestation (FONAFIFO 2007) (Table 5.2). While forest area submitted to payments for protection has increased since the end of payments for natural forest management, it remains difficult to determine if forest owners have forgone forest management and chosen to protect their forests with PSA, or if they have elected to manage them without PSA. Despite the distribution of PSA across nearly six million ha of forests by 2007, there is ongoing debate related to the program's overall impact on forest conservation, especially in critical areas (see for example Sanchez-Azofeifa et al. 2007; Sesnie et al. 2006; Sills et al. 2007), and its impacts on the land use decisions and economic livelihoods of small- and medium-landowners (Tattenbach, Obando, and Rodriguez 2008; Nasi et al. 2002 by Campos et al; Sesnie et al. 2006).

Table 5.2  Area and trees submitted to the Costa Rican Program for Environmental Services Payments, by Year and Modality, from 1997-2007 (Source: FONAFIFO 2007).

<table>
<thead>
<tr>
<th>Year</th>
<th>Forest Protection (ha)</th>
<th>Forest Management (ha)</th>
<th>Reforestation (ha)</th>
<th>Established Plantations (ha)</th>
<th>Total Hectares</th>
<th>Agroforestry Systems (# trees)</th>
<th># of Contracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>88,830</td>
<td>9,325</td>
<td>4,629</td>
<td></td>
<td>102,784</td>
<td>1,200</td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td>47,804</td>
<td>7,620</td>
<td>4,173</td>
<td>319</td>
<td>59,916</td>
<td>597</td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td>55,776</td>
<td>5,125</td>
<td>3,156</td>
<td>724</td>
<td>64,781</td>
<td>622</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>26,583</td>
<td></td>
<td>2,457</td>
<td></td>
<td>29,040</td>
<td>271</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>20,629</td>
<td>3,997</td>
<td>3,281</td>
<td></td>
<td>27,907</td>
<td>287</td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>21,819</td>
<td>1,999</td>
<td>1,086</td>
<td></td>
<td>24,904</td>
<td>279</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>65,405</td>
<td></td>
<td>3,155</td>
<td>205</td>
<td>68,765</td>
<td>97,381</td>
<td>672</td>
</tr>
<tr>
<td>2004</td>
<td>71,081</td>
<td>1,557</td>
<td></td>
<td>72,638</td>
<td>412,558</td>
<td>760</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>19,972</td>
<td>4,866*</td>
<td></td>
<td>24,838</td>
<td>380,398</td>
<td>619</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>60,567</td>
<td>5,826*</td>
<td></td>
<td>66,394</td>
<td>541,531</td>
<td>1,180</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>531,960</td>
<td>28,066</td>
<td>37,788</td>
<td>1,248</td>
<td>599,062</td>
<td>1,945,522</td>
<td>7,242</td>
</tr>
</tbody>
</table>

* includes PSA data for reforestation and natural regeneration.
The Forest Law also provided for other fiscal incentives associated natural forest management, such as a forest tax on the wood processing industry, based on timber value at the time of primary transformation (CRLF Art. 43). According to Rodriguez Quiros (2005), this was intended to tax wood processing, as opposed to forest production, with particular consideration for small and medium forest landowners. He further indicates that this was meant to be a positive incentive of sorts for natural forest management. Nevertheless, as clarified by two forestry officials, the tax was difficult to implement and highly contested by the wood processing sector, as well as the Chamber of Forestry (CAF2; CAF3). These issues eventually led to its abandonment and no taxes on any segment of the forest production sector as of 2007 (CAF2; CAF3).

5.2.c.3 Educational/Informational and Market-Based Forest Policy Instruments for Natural Forest Management in Costa Rica

Forest Law 7575 delegates the State Forest Administration with the following responsibilities associated with education and informational forest policy instruments: “inventory and evaluate the country’s forest resources, their harvest levels, and processing; maintain an inventory of forest related research in coordination with the research institutions involved; promote the systematization of forest information and dissemination, education, and forest training; develop and execute, in coordination with competent organizations, information programs that contribute to the sustainable forest development” (CRFL Art. 6). As described above, the Forest Law also established the possibility of a national forest certification program, that would have functioned as a market-based policy instrument. However, this system had yet to be invoked in 2007.

5.2.c.4 Opinions and Perspectives on Forest Policy Outputs

Interviewees expressed a range of opinions and perspectives on the forest policy outputs in place for regulating and promoting natural forest management in Costa Rica. With

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23 The State Forest Administration in Costa Rica includes SINAC, the state forest regulatory agency, FONAFIFO, the forest financing program, and the National Forest Office, a governmental office charged with forest policy development and forest sector promotion. These organizational structures are described further in Chapter 6.
regard to the command-and-control policy directives, a range of interviewees, including a forestry official, forest experts, a forest manager, and a forest owner/community forest organizer described the development of the forest policy directives in place in Costa Rica as having largely benefited from the participation of a wide array of stakeholders and the incorporation of extensive research and results (CAF1; CE3; CE4; CE7; CFM1; CFM2). In addition, others (i.e. a forestry official, a forest expert, and a forest certification agent) stated that, in terms of natural forest management, Forest Law 7575 and its associated policy directives had promoted and clarified the concept of forest management planning and protective measures for good forest practices and use (CAF4; CE4; CC1). These opinions are also reflected by Rodriguez Quiros (2005) and Quiros (2007).

Other interviewees had concerns related to the development of forest policy directives in Costa Rica and their potential for attaining policy goals, particularly with regard to the Standards for Forest Management (i.e. PC&I). A forest resource expert and a community forestry organizer agreed that there had been inadequate representation by small- and medium- forest owners, if any, in the development of the Standards. These two interviewees also maintained that the Standards had not been subjected to a sufficient period and method of testing and pilot implementation to have permitted a complete understanding of the potential impacts and outcomes (CE4, CE6). A forestry official also indicated that the Standards for natural forest management “represent too large of a leap in terms of forest planning and management from the previous Forest Law” (CAF1). This perspective was echoed by a range of other interviewees, including a forest owner, forest experts, and forest managers (CE4; CE5; CE6; CFM2; CFM3).

With regard to the other forest policy instruments for regulating and promoting natural forest management in Costa Rica, several interviewees (a forestry official, two forest experts, two forest managers) disagreed with the discontinuation of PSA for natural forest management, and considered the payments to have been a way to compensate landowners for maintaining their forests as forests, while permitting them a sustainable
use of those forests (CAF2; CE4; CFM3; CFM4; COGN1). One forest expert went further to label the discontinuation of PSA for natural forest management as an “administrative rejection of natural forest management” (CE9), an assessment echoed by another forest expert, a forest manager, and even a forestry official (CAF3; CE5; CFM1). Only one interviewee, a forest expert, indicated that the end of PSA for natural forest management was “valid” given the lack of information on the impacts of forest management to the provision of environmental services (CE8).

Other perspectives on these and additional governmental forest policy instruments (e.g. informational/educational instruments) in Costa Rica were related to their execution, or lack thereof, and are explored in Chapter 6.

5.3 Guatemala Forest Policy Outputs
5.3.a Historical Developments

Guatemala has a much longer history of forest legislation than Costa Rica. The first official reference to the administration of forests occurred in 1920, under a Governmental Decree (No. 670) that designated oversight and regulation of forest conservation and growth to the Ministry of Agriculture (FAO 2004). Then, in 1925, the first Forest Law (No. 1.364) was produced, creating a state forest agency and assigning it with forest oversight and regulation of forest (Manzanero 2005). This first forest law remained in force for twenty years. A second Forest Law was published in 1945 that regulated timber harvests in national forests and industrial forest extractions (FAO 2004). Over the next twenty years or so, various legislative and presidential decrees were published that established forest reserves, a forestry fund, and timber taxes for extractions on state lands (FAO 2004). A third Forest Law was published in 1974 that gave autonomy to the state forest agency and a fourth Forest Law was published in 1984 that reorganized the state forest agency.
It should be noted that most forest activity in Guatemala in the 1970s and 1980s took place in the Petén (located in the northern quadrant of the country), which was administrated by the National Agency for the Promotion and Development of the Petén (Empresa Nacional de Fomento y Desarrollo de Petén (FYDEP)). This was a military-subunit of the government that was given almost exclusive authority over the colonization of and all activities in the Petén from 1959 to 1986, including the regulation of forest activity (Schwartz 1990; Clark 2000). However, there were few technical requirements for forest management in the Petén under FYDEP. For example, the number of trees extracted “depended only on the extraction capacity of the logger or industry” (Manzanero 2005: 22).

5.3.b Forest Policy Directives for Natural Forest Management

By the mid-1990s, there were two laws that applied specifically to natural forest management in Guatemala: one directed at forest management outside protected areas, and the other at forest management within protected areas. These are described separately in the following sections.

5.3.b.1 Forest Law, Regulations, and Guidelines for Forests Outside Protected Areas

The fifth Forest Law (No. 101-96) was produced in 1996 and superseded all previous forest laws in Guatemala. It was still in force in 2007. This Forest Law recognizes that:

“reforestation and forest conservation are of the utmost national urgency and social interest, such that sustainable forest development must be advanced through improved forest land use, increased forest productivity, increased public and private investment in the forest sector, improved promotion of and compliance with related legislation, and the improved quality of life of forest-related communities” (GFL Art 1).

Forest Law 101-96 defines the policy instruments for regulating and promoting sustainable forest management and other forest-related activities outside protected areas. It also establishes the organizational structure and resources associated with its implementation (see Chapter 6 for their discussion). For forests outside protected areas, the Forest Law prohibits forest land use change in areas determined to be of optimal
forest use (vocación forestal). Conversion of these forested areas to agriculture may be permitted with authorization from the state forest agency, INAB (Instituto Nacional de Bosques), based on the preparation of an Agricultural Management Plan demonstrating that the forested area is suitable for “economically sustainable agricultural production” and prepared by an agronomy professional (GFL Art. 46). (Rules on forest land use change in protected areas are described in Section 5.2.b.2).

Forest Law 101-96 was later accompanied by the establishment of Forest Regulations, first issued in 1997 (Resolution 4.23.97). The forest regulations further define the organizational and inter-organizational structures and processes for putting the associated forest policy directives into effect. They also delineate, the means and measures for the legal harvest of forest resources outside protected areas. Technical Guidelines for natural forest management were later produced in 2003. These detail the aspects and practices related to forest management that must be met for legal timber harvests, as well as provide guidance on non-mandatory aspects of forest management, such as the use of reduced impact logging practices (INAB 2003). The Forest Law, Regulations, and Technical Guidelines provide the legal framework for the harvest of trees from natural forests outside protected areas in Guatemala. Their key content and structural features are discussed further in Section 5.2.b.4.

5.3.b.2 Key Content and Structural Features of Forest Policy Directives for Natural Forest Management Outside Protected Areas in Guatemala

The Guatemalan Forest Law 101-96 defines a forest as an “ecosystem in which there are trees of dominant and permanent floral species” (GFL Art. 4). The Law further classifies forests as ‘forests without management’ (i.e. without extractive interventions), ‘forests with management’ (i.e. with extractive interventions), and ‘forests in agroforestry systems’ (i.e. in which forest management and agricultural practices are applied together) (GFL Art 4). The Forest Law and its Regulations do not define many prescriptions associated with forest management practices nor related, prohibited
activities, though they do mandate a forest management plan, which is described as “a fundamental tool for monitoring the sustainability of silvicultural techniques applied to the forest resource” (GFL Art. 48).

The Forest Law and Regulations require an authorized forest management plan, prepared by a forestry professional, for any timber harvest over 10 m$^3$ (GFL Art. 48), and an agreement to ensure natural regeneration or artificial reforestation of any harvested area (GFL Art. 70) that must be secured by a promissory note or a monetary deposit for the value of the regenerated area, which is released after regeneration has been established for four years (GFR Art. 51). The Regulations define the requirements for a forest management plan as: “a biophysical description of the property; forest area, type and class; the area to be harvested and to be protected; the system of extraction; the volume to be extracted; annual forest growth and cutting intensity; regeneration dynamics and their protection; measures for preventing forest fires; and a timetable for execution” (GFR Art. 48). The Regulations also permit small forests (<45ha) the option of using simplified forms for forest harvest authorization that must be prepared by a professional forester. These forms are provided by INAB and encompass the regulated aspects of planning, harvest, silviculture, and protection described above through a standardized format in which the related data is entered (GFR Art. 42). The Technical Guidelines provide detailed guidance on protective zones around water sources and ways, and on slopes and sensitive soils, as well as reduced impact techniques, however these are discretionary policy directives (INAB 2003). Finally, these policy directives do not directly address any social or economic aspects of forest management.

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24 Harvest of 10 m$^3$ per year per property is permissible by law and requires authorization by the corresponding municipality (GLF Art. 54).
5.3.c  *Forest Policy Instruments for Natural Forest Management Outside Protected Areas in Guatemala*

5.3.c.1 Compulsory/Command-and-Control Instruments for Natural Forest Management Outside Protected Areas

As described above, governmental policy related to natural forest management outside protected areas in Guatemala is implemented in part through a command-and-control approach, which is largely focused on regulating forest management processes. This approach is much less prescriptive than that for forest management in protected areas or in Costa Rica. This command-and-control approach to forest management outside protected areas also encompasses related penalties or punitive actions for non-compliance with policy directives. Forest Law 101-96 describes financial and punitive penalties for harvesting wood without the proper permit and authorization (Art. 92), and for commercializing wood without the proper documentation (Art. 94). These penalties increase according to the amount of wood illegally harvested, processed, or commercialized (e.g. up to 100% of the wood value and up to five years in prison).

The law also establishes imprisonment (i.e. 2-6 years) for areas enrolled in national forest incentives program (described below) that convert the forest to another land use without proper authorization (GFL Art. 98). However, there is no penalty established in the Forest Law for forest land use change in areas without incentives. This Law also establishes that noncompliance with an approved forest management plan that results in negative impacts to the forest is subject to a financial penalty in accordance with the assessed value of forest damage and confiscation of the harvested products (GFL Art. 97). There are additional financial and punitive penalties for forest agency officials and staff who falsify or fail to verify officially emitted documentation (e.g. forest management plans, harvest authorizations, timber transportation documents) (GFL Art. 95).
5.3.c.2 Fiscal/Economic Forest Policy Instruments for Forests Outside Protected Areas

Fiscal or economic forest policy instruments have been used for more than 30 years in Guatemala (Rodriguez Quiros 2005). Forest incentives were first introduced under the 1974 Forest Law, which permitted a deduction of up to 50% of income tax based on investments in reforestation and the maintenance of plantations. The subsequent Forestry Law (70-89) maintained the 1974 forest incentives, and amplified their application to include forestation; maintenance, protection, prevention, and combat of forest fires and plagues; and natural forest management. From 1974 to 2006, these incentives distributed approximately US$45 million to reforestation projects alone, contributing to the establishment of 18,716 ha of planted forest (Rodriguez Quiros 2005). Other reforestation incentives were established in the late 1980s, specifically directed at the western part of the country where the pressures for forest conversion and fuelwood collection have historically been significant. To date, these area-specific incentive programs have contributed to an additional 5,500 ha of reforested area (Rodriguez Quiros 2005).

In 1996, a new national Program of Forest Incentives (Programa de Incentivos Forestales (PINFOR)) was established by the Forest Law (101-96) as the principal instrument for promoting reforestation throughout the country and as a tool for drawing a greater part of the population into legal forest activity. The Forest Law designates 1% of the country’s annual budget to fund PINFOR and delegates INAB with the responsibility of administrating the program (GFL Art. 72). Forest incentives are provided for reforestation, natural forest management, and natural forest protection. As indicated by a forestry official, priority areas for the distribution of forest incentives for each of the three forest uses, were identified by INAB, based on local criteria, production potential, and market access (GAF2).

From 1998 to 2006, nearly US$82.5 million (Q627 million) was invested in reforestation, forest management, and forest protection through PINFOR (de la Roca
During that period, 112,349 ha of natural forest, and 42,615 ha of plantations received forest incentive payments (de la Roca 2007) (Table 5.3). A forestry official estimated that about half of the natural forest area with incentives from 1998 to 2006 was managed for production, and the other half was managed for protection (GAF2).

There are other economic policy instruments in place in Guatemala related to forest management outside protected areas. These include a stumpage tax on timber harvests authorized by INAB, assessed at 10% of the value of the standing volume of wood to be harvested (GFL Art. 87). Wood values are determined annually and according to key commercial species, groups of species, products, and regions of origin. The tax must be paid by the forest owner prior to release of the harvest license (GFL Art. 87). By law, 50% of the collected stumpage taxes are distributed to the municipal government in municipalities from which the taxes were collected, and the other 50% goes to INAB. The collection and distribution of these taxes is discussed further in Chapter 6.

5.3.c.3 Educational/Informational and Market-Based Forest Policy Instruments for Natural Forest Management Outside Protected Areas

Forest Law 101-96 includes within the responsibilities of INAB, “support for research aimed at solving the problems of forest development through programs executed by

Table 5.3 Accumulative Natural Forest Area (managed, protected), Reforested Area, and Payments from the Guatemala Program for Forest Incentives (PINFOR) 1998-2006 (Source: de la Roca 2007)

<table>
<thead>
<tr>
<th>Year</th>
<th>Natural Forest (ha)</th>
<th>Plantation (ha)</th>
<th>Total Amount (Q)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>485</td>
<td>1,104</td>
<td>5,987,705</td>
</tr>
<tr>
<td>1999</td>
<td>5,047</td>
<td>5,363</td>
<td>29,820,425</td>
</tr>
<tr>
<td>2000</td>
<td>8,430</td>
<td>11,577</td>
<td>73,203,389</td>
</tr>
<tr>
<td>2001</td>
<td>19,921</td>
<td>18,446</td>
<td>133,289,158</td>
</tr>
<tr>
<td>2002</td>
<td>29,257</td>
<td>27,521</td>
<td>217,463,977</td>
</tr>
<tr>
<td>2003</td>
<td>32,549</td>
<td>33,803</td>
<td>306,560,314</td>
</tr>
<tr>
<td>2004</td>
<td>48,639</td>
<td>41,444</td>
<td>405,146,191</td>
</tr>
<tr>
<td>2005</td>
<td>58,165</td>
<td>41,329</td>
<td>505,001,190</td>
</tr>
<tr>
<td>2006</td>
<td>112,349</td>
<td>42,615</td>
<td>627,847,064</td>
</tr>
</tbody>
</table>
university and other research organizations” and “promotion of and support for technical and professional degrees in forest matters” (GFL Art. 6). It also requires INAB to work with municipal governments in “the formulation and execution of forest education programs” (GFL Art. 7). The Forest Law also establishes a National Forestry Registry, to house and monitor information on forests; forest owners, professionals, managers, and operators; the wood products industry (e.g. permanent and portable sawmills); tree nurseries; and organizations associated with forest research, training, and extension (GFL Art. 70). There were no market-based policy instruments created through governmental forest policy directives in place in 2007 in Guatemala.

5.3.c.4 Opinions and Perspectives on Forest Policy Directives for Forests Outside Protected Areas in Guatemala

Interviewees expressed a range of opinions and perspectives on the forest policy outputs in place for regulating and promoting natural forest management outside protected areas. Yet, with regard to the command-and-control policy directives, a large majority of interviewees with direct knowledge of or experience with the forest policy directives for forests outside protected areas (14/17), including forestry officials, other governmental officials, and forest owners, managers, and experts, considered the Forest Law and Regulations to be ‘clear, coherent, and adequate’ for governing forest management outside protected areas. On the other hand, noting the lack of prescribed forest activities or prohibited practices, three interviewees maintained that forest policy directives for regulating natural forest use outside protected areas do not include sufficient mechanisms for mitigating against the potential negative impacts of natural forest management (GC1; GE4; GE12; GOGN1).

With regard to the other forest policy instruments for regulating and promoting natural forest management outside protected areas in Guatemala, as explained by a forestry official, in the development of policy outputs for forests outside protected areas, the state took an intentionally integrative approach to forest control, in which:
“forest regulation is more than just controlling property owners, loggers, etc.; it is also the promotion of good forest management, reforestation, and a culture of forestry through mechanisms and tools like forest incentives that encompass a commitment to sound forest management” (GAF1).

With regard to the forest policy instruments in place, notably, the majority of all interviewees in Guatemala (21/33), including those without direct experience with forest management outside protected areas, cited the Program of Forest Incentives (PINFOR) as a ‘strength’ of overall Guatemalan forest policy. As noted by a forest certification official, “PINFOR has been a powerful program for incorporating forest owners into legal forest use and a positive approach to the promotion of sustainable natural forest management throughout the country” (GC1). Yet, two public sector actors, while supportive of the Program in general, indicated that the requirements for forest incentives focus almost exclusively on the technical and ecological facets of forestry, and not enough on the social and economic aspects of forest management that are important for sustainability (GOGN1; GOGN5).

Another public sector actor indicated that “the program should focus more on incorporating small and medium landowners”, an opinion shared by forest experts and a forest manager (GE3; GE5; GE6; GE12; GFM2; GOGN3). Finally, with regard to the economic instruments associated with natural forest management outside protected areas, one forest expert noted that the taxes on production “can be prohibitive for small and medium forest owners to access to their forest resources,” particularly as these taxes are collected prior to the release of the harvest license (GE8). Other perspectives on these and additional governmental forest policy instruments for forests outside protected areas (e.g. informational/educational instruments) were largely related to their execution and uptake, or lack thereof, and as such are described in Chapters 6 and 7.
5.3.d Forest Policy Directives for Natural Forest Management in Protected Areas

5.3.d.1 Protected Areas Law, Regulations, and Forest Administration Manual for Forests within Protected Areas

A Protected Areas Law (4-89) was enacted in 1989 that was still in force in 2007. The primary objectives of this Law are to:

“ensure the optimal functioning of essential ecological processes of vital natural systems for the benefit of all Guatemalans; the conservation of genetic diversity of the country’s flora and fauna; the sustainable utilization of species and ecosystems through the country; the defense and preservation of the nation’s natural heritage; and the establishment of protected areas of public utility and social interest throughout the country” (GPAL Art. 5).

The Protected Areas Law 4-89 establishes the organizational structure and resources for wildlife conservation in the country and for creating and protecting a national system of protected areas. These structures and resources are detailed in Chapter 6. The Protected Areas Law also defines the policy instruments for its execution, such as regulations on wildlife harvest and trade, as well as specific policy tools for protected areas, such as master plans and long-term forest concession contracts with forest industry or communities. This Law further prohibits the harvest, hunting, or collection of all flora and fauna from any established protected area without proper authorization by the state protected areas agency, CONAP (Consejo Nacional de Áreas Protegidas).

The Protected Areas Law was complemented by the production of the Regulations for Protected Areas (Acuerdo Gubernativo No.759-90), issued in 1990. These Regulations further define the organizational and inter-organizational structures and responsibilities associated with the implementation of the Protected Areas Law. They also define the protected areas categories and their criteria for selection and management, which may include activities such as strict protection, sustainable harvest of timber and non-timber products, and tourism. Protected area categories include National Parks or Biological Reserves for the “unaltered protection in perpetuity” of the national natural heritage; Private Nature Reserves that are voluntarily submitted by a private landowner to long-
term protection; and Biosphere Reserves designated as “areas of global importance in terms of their natural and cultural resources, and which are sufficient in size to constitute effective conservation units that permit the harmonious coexistence of different modalities of conservation, use, and sustainable harvest of the resources” (GPAR Art. 8). The Regulations further outline that Biosphere Reserves may be declared at a national level, but must be submitted for recognition by the UNESCO Man and the Biosphere Program. In 2007, there were six UNESCO recognized Biosphere Reserves in Guatemala, including the Maya Biosphere Reserve in the Department of the Petén.

Forest production in protected areas in Guatemala is further regulated through the Manual for Forest Administration in Protect Areas (CONAP 1999b). A forestry official indicated that this Manual was developed through a broad and long-term multi-stakeholder process during the mid-1990s (GAF3). The Forest Administration Manual defines the norms and requirements for wood harvest from protected areas for family consumption and for commercial forest management in protected areas through forest concessions. It also outlines the requirements and processes for the authorization of forest land use change within protected areas (CONAP 1999b).

In terms of additional policy directives associated with natural forest management in protected areas, each protected area is required to develop a Master Plan in accordance with its criteria of management and selection, and if permissible within those criteria, may establish areas for wood and non-wood extractions. While there is some extraction of wood resources from many of the country’s protected areas, often for subsistence use or on private land that is within the boundaries of a protected area, the Maya Biosphere Reserve is the only protected area in Guatemala where there is large-scale timber (as well as non-timber forest products) extraction (CONAP 2007). This production occurs in the Reserve’s Multiple Use Zone within the forest concession system described in Chapter 4. Thus, as explained by one protected areas official, in addition to the Protected Areas Law, Regulations, and Forest Administration Manual, forest concessions
in the MBR are further regulated by the Reserve’s Master Plan\textsuperscript{25}, and an array of other official technical guidelines that have been developed locally by CONAP (GAF3).

5.3.d.2 Key Content and Structural Features of Forest Policy Directives for Natural Forest Management within Protected Areas in Guatemala

In 2007, there was a suite of forest policy directives in place to govern forest production in protected areas, and in the forest concessions of the MBR in particular (\textit{i.e.} Protected Areas Law, Regulations, and Forest Administration Manual; MBR Master Plan; Technical Guidelines). As indicated by a range of protected area officials, forest concessionaires and managers, and local forest experts, the large majority of these tools were developed in a collaborative process with local communities and industry, technical NGOs, and forest research organizations (GAF3; GAF4; GE7; GE9; GE10; GFM1; GCIF1; GCCF2).

The Forest Administrative Manual requires the development of an environmental impact assessment, a general forest management plan, and associated operational plans (CONAP 1999b). The Forest Administration Manual also prescribes protective zones along waterways and slopes, sets the requirement for minimum harvestable diameters according to tree species or commercial group, and establishes harvest limits based on species abundance and season or time of year. For instance, tree harvests are prohibited within 20m on either side of waterways less than 10m wide, 50m on either side of waterways 10-50m wide, 100m on either side of waterways 50-100m wide and around lagoons, and 150m on either side of waterways greater than 100m wide (CONAP 1999b). The associated policy directives also require worker safety and security measures and incorporation of conflict resolution processes, as well as financial analyses of annual operational plans.

With regard to the planning tools prescribed for forest management in protected areas, and the forest concessions of the MBR in particular, the Forest Administration Manual

\footnote{\textsuperscript{25} The first MBR Master Plan was produced in 1992. By law, plan updates are required every five years.}
defines the essential components and structure of the general forest management plan, which must be updated every five years\textsuperscript{26}. These include: general descriptive information such as precipitation, soils, vegetation, fauna and human populations; cartographic Information and maps of the area that includes boundaries, topography, roads, stratification of vegetative and forest types, protected areas, productive areas, archeological sites, and camps; forest inventory data, typically from a stratified sample, that provides information for harvest rotations and maximum harvest levels; extraction plans, that include harvesting and silvicultural practices; protection plans, that include the areas and techniques to protect sensitive areas and endangered species, and to prevent encroachment and forest fires; and forest management monitoring that requires the establishment and measurement of permanent long-term monitoring plots to understand growth, yield, and impact (CONAP 1999b).

The Forest Administration Manual and local CONAP guidelines also require the development and authorization of annual operating plans. These plans are based on a census of all trees (> 30cm dbh) in the annual operating area, which permits the estimation of permissible volume to be extracted, the mapping and designation of trees for harvest and for protection, and the design of the extractive road network. Operating plans serve as the detailed guidelines for implementing the general forest management plan, as well as a tool for monitoring and control of forest operations by CONAP (CONAP 1999b; Gomez 2006). In addition to the requirements for annual operating plans, there are discretionary guidelines for the development of five-year plans (\textit{plan quincenal}) intended to facilitate general forest management plan updates and, “more importantly, to provide a tool for improving the projections of species volumes across five annual operating areas”, explained one protected areas official (GAF3). With this information the size of the annual operating area can fluctuate in function of a stable volume harvest over a period of five years. Gomez (2006) indicates that CONAP promoted the

\textsuperscript{26} The minimum harvest cycle for forest concessions is 25 years, and as such GFMPs must plan through a complete cycle which is usually 25 years, though some concessions have planned a 40 year rotation.
development and use of five-year plans to promote greater control over future wood supplies, which can in turn benefit the marketing of timber from forest concessions.

The MBR Master Plan stipulates other requirements for authorization and maintenance of the forest concession contract. For example, community forest concessions must obtain overall technical guidance and accompaniment (at least initially) from an ‘assessor NGO’, as well as, retain a forest professional for the development and oversight of forest management (Manzanero 2005). The Master Plan also mandates that industrial concessions retain a forest professional to guarantee the sound management of the forest resource. Though, as a protected areas official explained, they are not required to attain ‘technical accompaniment’ “given their long-term presence and activity in forestry in the region” (GAF3). The Master Plan also requires that both community and industrial forest concessions acquire and maintain third-party FSC certification of their forest management for the duration of the concession contract (25 years). Finally, Forest Administration Manual and the MBR Master Plan include requirements for forest worker safety and the incorporation of processes for conflict resolution, as well as financial analysis of annual operating plans (CONAP 1999b).

5.3.e Forest Policy Instruments for Natural Forest Management in Protected Areas
5.3.e.1 Compulsory/Command-and-Control Instruments for Natural Forest Management in Protected Areas

As described above, governmental policy related to natural forest management within protected areas in Guatemala is implemented, in large part, through a ‘compulsory’ or command-and-control approach. The use and harvest of natural forests in protected areas is directly regulated through mostly mandatory prescriptions and processes associated with forest management practices. The directives also ‘command’ the co-management of forest concessions. This command-and-control approach incorporates some penalties or punitive actions for non-compliance with forest-related policy directives for protected areas as well. The Protected Areas Law defines illegal acts
within protected areas that include the cutting, collecting, hunting, transporting, trading, or commercializing any live or dead, whole or part, of flora or fauna from protected areas without the corresponding authorization (GPAL Art. 62). These acts are punishable by a fine and/or the seizure of property (Art. 82).

The Protected Areas Law (Art. 22) also establishes that “persons or groups ‘squatting’ within a protected area must comply with the conditions and norms, uses and zoning, of that area”, though no penalty is defined for noncompliance. It should be noted that one forestry official indicated that the crimes and penalties described in Forest Law 101-96 pertain to private and public lands (GAF5), however a detailed review of the legislation for this research did not uncover where or if this is established by law. With regard to forest concessions, the MBR Master Plan defines the penalty for noncompliance with the forest concession contract “cancellation of the concession” (CONAP 1992). A protected areas official also indicated that:

“there are other penalties that can be applied in the concessions, but they are very severe and unrealistic. ...As an agency we believe that it is better to promote compliance and co-management with technical experts, than to pursue and punish transgressions under the letter of law” (GAF4).

5.3.e.2 Fiscal/Economic Forest Policy Instruments for Natural Forest Management in Protected Areas

In Guatemala, there are no fiscal incentives for forest management in protected areas per se. However, according to one protected areas official, the state views the granting of long term rights over the forest resource through concession contracts to be a significant incentive in and of itself, and a means for enhancing the livelihood of those who participate in this process (GAF5). While there are no positive economic incentives, there are taxes on forest production from protected areas. Similar to forest management outside protected areas, forest harvests within protected areas are charged a stumpage tax based on 10% of the value of standing wood proposed for
harvest, required prior to the release of a harvest licenses. A fee for timber transportation authorization is also charged.

A protected areas official further explained that in addition to the stumpage tax, community forest concessions must pay a one time land-based tax for the forest concession (US$1.28/ha; Q10/ha), that may be paid over the first ten years of the concession (GAF4). As for industrial forest concessions, they pay a tax based on the intrinsic value of the standing wood throughout the concession, in addition to the stumpage tax (GAF4). By law, collected taxes are to be redistributed proportionally to the protected areas system regional offices from which they were collected. The collection and distribution of these taxes is discussed further in Chapter 6.

5.3.e.3 Educational/Informational and Market-Based Forest Policy Instruments for Natural Forest Management in Protected Areas

The Protected Areas Law describes “the development of traditional and informal educational programs that promote the recognition, conservation, and appropriate use of Guatemala’s natural heritage” a principal fundamental of the law (GPAL Art. 3). This Law also established the creation of a national registry to collect and house information on the conservation, harvest, and administration of the natural and human resources associated with national system of protected areas and wildlife throughout the country (Art. 75). In addition to these educational and informational instruments defined by the Protected Areas Law, the MBR Master Plan also include such instruments in relation to the forest concessions, such as the requirement for technical assessment and accompaniment by a technically capable NGO in community forest concessions (CONAP 1999b). According to Gomez Caal (2006), this requirement was intended to ensure the sound management of the natural and financial resources of the forest communities and maximize the long term potential the concession system through collaborative co-management. Finally, forest policy instruments for natural forest management outside protected areas in Guatemala include the required attainment of third-party FSC forest
certification. FSC certification is itself a market-based forest policy instrument. Yet, as noted by two protected areas officials, in the case of the forest concessions of the MBR, the state mandated certification more as an informational tool to verify sound management within the forest concessions and their adequate oversight by CONAP (GAF3; GAF4).

5.3.e.4 Opinions and Perspectives on Forest Policy Outputs for Forest Management in Protected Areas

In terms of the command-and-control aspects of forest policy outputs in place for regulating and promoting natural forest management within protected areas in Guatemala, and in the forest concessions in the MBR in particular, interviewees across the spectrum of forestry officials, forest managers, community and industrial concessionaires, forest certifiers, and forest experts noted that the existence of adaptive policy directives that have been subject to collaborative development are a significant ‘strength’ of the system, which have resulted in clear standards and tools for forest planning and management activities in forest concessions (e.g. guidelines and instruments for integrated management planning, environmental impact assessment, forest inventories, operating plans, reduced impact logging practices, diagnostic sampling, forest monitoring, and financial analyses) (GAF3; GAF4; GC1; GE3; GE5; GE9; GFM1; GOGN5). Many of these interviewees also indicated that the very inclusion of collaborative approaches to forest concession management in the MBR Master Plan has lent significant strength to the overall concession system (GAF3; GAF4; GE5; GE9; GE10; GFM1; GFM4).

In contrast, in terms of the policy directives for forest management in concessions, it was noted by a forest expert and certified forest operator, that these are extensive and complex, which can result in a limitation for communities that do not have adequate or consistent technical accompaniment (GE6; GCCF1). Other interviewees, including protected area officials, noted that existing policy directives are founded on insufficient information about the ecology of managed forests in the Petén, and in particular of key
species like mahogany (*Sweitenia macrophylla*) and cedar (*Cedrela odorata*) (GAF3, GAF4, GE1). As such, they noted that it is difficult to ensure that regulated practices and processes in place will actually lead to long-term sustainability of managed forests. As for the other policy instruments in place for regulating and promoting forest management in protected areas, and in the forest concessions of the MBR in particular, none of the interviewees indicated any issues with the taxes on forest production. In addition, a wide majority of the interviewees with direct experience or participation in the forest concessions system indicated the requirement to obtain and maintain forest certification was a reasonable requirement by the state (15/20). As one forest expert explained, “the state is the actual landowner in the forest concession system, and as such maintains the right to require sound management of that land that is verified by an independent, unbiased third-party” (GE4).

### 5.4 Nicaragua Forest Policy Outputs

#### 5.4.a Historical Developments

Of the three countries considered in this study, Nicaragua has the oldest law specifically dealing with forests. In 1905, the Law on the Conservation of Forests was enacted, prohibiting the cutting or destruction of trees along water sources and ways (FAOLEX 2008a). It established a protective zone of 400m around mountain springs and 200m along their flow, as well as 200m around low lying springs, 100m along or around rivers, lakes, and lagoons, among other protection measures. It also defined sanctions for noncompliance. According to del Gatto et al. (2006), though very rigorous and long-lived, this law was not extensively nor well disseminated nor implemented while in force.

Further legislation related to forests came about in 1937 with the decree on Compensation for Replanting (Decreto No. 314-A) that was principally focused on timber concessions. This decree essentially instituted a tax that represented the cost of reforestation in areas that did not reforest or permit regeneration that, in theory, would be carried out by the State (FAO 2004). The first forest agency was created in 1949
under the Ministry of Agriculture and Livestock with duties related to forest conservation, reforestation, and oversight of forest-related legislation (Decreto No. 128/49). Throughout the mid-1900s, several other laws related to forests and natural resources were enacted, including the Law on the Use of Natural Riches (Decreto No. 316/58); the Law for the Conservation, Protection, and Development of National Forest Riches (Decreto No. 1.381/67); and the Regulations for Defense against Forest Fires (Decreto No. 207/DRN/72) (FAOLEX 2008b).

It was not until 1976 that forest protection was legitimately sanctioned through official policy under the Emergency Law on Rational Forest Use (Ley No. 235/76). This law promoted the rational harvest and conservation of forest resources through restrictions on and regulations for forest extractions, and introduced ‘forest guides’ as a form of documenting the legality of wood and its origin. It also amended the 1905 forest law, prohibiting the cutting of trees within 200m around springs, rivers, lakes, lagoons, estuaries, rivers, and other water catchments (FAOLEX 2008b). Though a considerable legal advance, as with previous laws related to forests, implementation of this law was modest, at best, as agricultural expansion remained the prominent land use and regulation of timber extraction was poorly funded and enforced (del Gatto et al. 2006).

With the entrance of the Sandinista government in the 1980s, some modifications were made to forest policy through various laws and decrees, though a new forest law was never issued. The most significant change under this regime was the nationalization of timber companies, the dissolution of the existing forest agency, and the creation of the People’s Forest Corporation (Corporación Forestal del Pueblo (CORFOP)) (Rodriguez Quiros 2005; Larson 2006). Yet, the unfolding armed conflict, which was most intense in the forested regions, essentially brought a halt to all forest activity – state-implemented or otherwise (Larson 2006). After peace negotiations began and a popularly elected administration returned in the early 1990s, efforts to organize the forest sector surged with the privatization of the forest industry, tax relief for forest
activities, and reformation of a state forest agency aimed at changing the old relationship of “forest police vs. logging criminal” to one of mutual respect and support (Rodriguez Quiros 2005).

In 1993, the first official Forest Regulations were produced (Decreto No. 45/93), establishing a forest policy framework to guide forest use and provide the tools for its regulation, as well as the organizational structure for its implementation. The regulations encompassed technical norms and administrative guidelines for forest activity that established management approaches and silvicultural treatments for different forest contexts, cutting cycle parameters according to forest type, species permissible for harvest, and guidelines for wood processing (FAOLEX 2008c). Overall, these regulations were aimed at increasing the transparency and objectivity of forest use and oversight (Rodriguez Quiros 2005).

5.4.b Forest Policy Directives for Natural Forest Management

5.4.b.1 Forest Law, Regulations, and Technical Norms

Though legislation related to forests goes back to 1905, the first Forest Law in Nicaragua was not produced until almost 100 years later in 2003. This Law supersedes all previous forest-related legislation and was still in effect in 2007. One forestry official noted that the Forest Law for the Conservation, Promotion and Sustainable Development of the Forest Sector (No. 462) was in development for nearly a decade (NAF4). This Law recognizes that:

“The forest sector in Nicaragua is a source of economic and social development. ... (and) that it is necessary to update and modernize the existing legal framework on forests... in harmony and cohesion with the national forest policy; that the establishment of a modern, agile, and adequate legal framework for forests will contribute to the generation of employment and enhance the standard of living of the population through their involvement in forest activities; and, that it is the responsibility of the state, through its institutions and with participation by the Autonomous Regional Governments, municipal governments, and civil society to oversee the conservation of the country’s biodiversity and watersheds, ensuring multiple benefits from the goods and services from our forests.” (NFL I-IV).
This Law defines the organizational structure and resources for putting the law into effect, which are addressed in detail in Chapter 6. It also defines the policy instruments for regulating and promoting sustainable forest management and other forest activities in Nicaragua. Through the Forest Law, promotion mechanisms for plantation forestry, planned forest management, and secondary wood transformation appear for the first time in state legislation.

Forest Law 462 was accompanied by the establishment of Forest Regulations, also issued in 2003 (Decreto 73-2003) and by the Obligatory Technical Norms for the Sustainable Management of Broadleaf Tropical and Conifer Forests (NTON18 001-04) in 2004. The Forest Regulations further define the organizational and inter-organizational structures and responsibilities of the governmental and non-governmental actors involved in the execution of state forest policy, the processes for putting policy into practice, and the means and measures for the legal harvest of forest resources. The Technical Norms define the specific aspects and practices related to forest management that must be met for legal timber harvests in broadleaf and pine forests. Together, the Forest Law, Regulations, and Technical Norms were intended to provide the legal framework that governs natural forest management in Nicaragua. However, significant illicit forest activity in the mid 2000s, ultimately led to additional legislation that affects natural forest management.²⁷ This legislation is described and analyzed below.

5.4.b.2 Other Legislation that Affects Natural Forest Management

In May 2006, then President Enrique Bolaños declared an Economic State of Emergency due to the “increasing indiscriminate and illegal exploitation of our natural forest resources, making it necessary to resort to more efficient measures of control” (Decreto 32-2006). The decree suspended for 180 days all harvest, transportation, processing, storage, possession, export, and commercialization of timber in the principal timber

²⁷ The execution and uptake of forest policy associated with the forest activities that spurred this declaration are discussed in Chapters 6 and 7.
producing departments (i.e. Nueva Segovia, Rio San Juan, RAAN, RAAS) and ordered the National Army and the National Police to detain and hold any and all forest products in those regions, overriding existing approved documentation (e.g. harvest permits, transportation guides). As explained by one government official, the declaration of an Economic State of Emergency was intended to permit a hiatus of forest activity through heightened control of the sector and, as such, to allow the state forest agency, INAFOR (Instituto Nacional Forestal), “to get its house in order” (NOGN3).

Then, in June 2006, the Nicaraguan National Assembly passed the Law Banning Logging (No. 585) in an effort to more permanently increase controls on forest activity in Nicaragua. The law states that:

“despite the existence of a National Forest Policy, Forest Law, and Forest Regulations, irrational and alarming exploitation of forest resources has continued, thus leading to increasing deforestation rates, through indiscriminate logging, an advancing agricultural frontier, forest fires, and illegal logging and trafficking of wood, which have taken advantage of limited human and economic resources of INAFOR as the institution responsible” for oversight and control of forest-related matters (Law No. 585).

This Law bans the extraction and commercialization of named forest species throughout the country and bans all timber extraction from within 10km of the national borders and within 15km around protected areas, for a period of 10 years, and delegates enforcement responsibilities to the National Army and the National Police. The banned forest species are listed as “caoba, cedro, pochote, pino, mangle, and ceibo.” However, the Law Banning Logging does not list the scientific names of these species, which leaves significant ambiguity as to which specific species are banned given that some of these ‘common names’ are used for more than one species. For example, as one forestry expert explained, “cedro”, could refer to royal cedar (Cedrela odorata), which one has been over-harvested for decades, or it could refer to all ‘cedar’ species including ‘cedro macho’ (Carapa guianensis), which is prevalent throughout the broadleaf forests of Nicaragua and is an important species for timber production (NE9).
The Law Banning Logging also exempts “wood products from approved and legal management plans that are subjected to secondary industrial transformation such as furniture and its parts, doors, assembled pieces, and plywood.” So, as another forest expert pointed out, “almost any piece of wood that comes from an approved management plan could eventually be subjected to secondary transformation, so does the law just ban wood without a management plan?” (NE6). Though a keen observation perhaps, this is obviously not the interpretation intended by the National Assembly. This particular point is further complicated by the lack of a clear definition of secondary transformation within the Law. Nevertheless, at the end of 2007, the legal framework governing natural forest management in Nicaragua included not only the Forest Law, Regulations, and Technical Norms, but also the Law Banning Logging.

5.4.b.3 Key Content and Structural Features of Forest Policy Directives for Natural Forest Management

The Forest Law, Regulations, and Technical Norms encompass mandatory, prescriptive measures for the management of all forested areas. The Forest Regulations define a ‘forested area’ as “any extension of land that has at least 30% forest cover” (NFR Art. 4). The Forest Law specifically prohibits the harvest of trees in areas with a slope greater than 75°, as well as within 200m from the sea shore and around lakes, natural or manmade reservoirs, and springs, and within 50m along the sides of rivers and water channels (NFL Art. 27) and mandates the authorization of all harvests in natural forests by INAFOR. The Regulations and Technical Norms define the requirements for authorized harvests in natural forests, according to forest size (i.e. < 10 ha; 10-50 ha; >50 ha) and type (i.e. broadleaf, conifer, agroforestry system). They also mandate that a forestry professional plan and oversee all authorized forest harvests (NFR Art. 47).

With regard to the prescriptions for forest planning, for the authorization of timber extractions in forests less than 10 ha, a ‘forest replacement plan’ is required, which
must include general information on and a sketch of the property and forest; a census of
the harvestable commercial tree species; a description of the harvest, protection, and
reforestation (i.e. natural, artificial) activities that will take place; and a timeline for
activities (NTN Art. 47). For the harvest of forests between 10 and 50 ha, a ‘minimal
forest management plan’ is required that includes the same requirements as the forest
replacement plan, with the additional requirement of a cartographic map of the property
showing the forest boundaries (as opposed to a sketch) (NTN Art. 47). Both plans are
intended for the management of “forest fragments” in agricultural areas (NFR Art. 47).

The requirements for authorized natural forest management in areas greater than 50 ha
are intended for unfragmented forests and include: a general forest management plan
and (an) annual operating plan(s), developed by an accredited forest regent; proof of
forest title or legal tenure; and a copy of the forest regent contract for services for the
duration of management. The general management plan must include cartographic
maps of the area(s) to be harvested, a forest inventory and census of harvestable
species, a stratification of the areas designated for production and protection, and a
projection of the extraction network, among other requirements (NTN Art. 47).

For approved management of natural forests greater than 500 ha, an environmental
impact study are also required. This suite of forest policy directives also mandate
processes for recognizing and respecting indigenous rights in all forest activity (NFL Art.
49, 62), though they do not encompass many other social or economic aspects
associated with forest management. Finally, with regard to the Law Banning Logging,
from the legislation alone it is difficult to clearly delineate if and where the above
management practices are permissible, and which species can be harvested. The actual
execution of the Forest Law, Regulations, Technical Norms, Law Banning Logging are
discussed in Chapter 6, and their uptake is discussed in Chapter 7.
5.4.c Forest Policy Instruments for Natural Forest Management in Nicaragua

5.4.c.1 Compulsory/Command-and-Control Forest Policy Instruments

The governmental policy related to natural forest management in Nicaragua is largely implemented through a ‘compulsory’ or command-and-control approach. In part this is intended to take place through the suite of Forest Law, Regulation, and Technical Norms, but has also been augmented by the 10 year Congressional Law Banning Logging of certain species and in certain areas. In addition to these command-and-control measures, the Forest Law defines forest crimes and penalties.

Forest crimes or infractions are classified as minor (e.g. prohibiting officials access to forests; failing to carry the proper documentation for approved harvests and wood products transportation), serious (e.g. cut > 5 trees not approved in the operating plan; harvest forest resources without an approved harvest permit), and very serious (e.g. intentionally provoke a forest fire; illegally cut, extract, transport, or transform forest resources; carry out forest activities other than those approved in the management plan). Minor infractions first receive a warning, and are elevated to a serious infraction if repeated. Serious infractions can be fined US$500 – 5,000 the first time and elevated to a very serious infraction if repeated. Very serious infractions can include the seizure of all products, when applicable, and a fine up to US$10,000.

In addition to the crimes defined in the Forest Law, there is a Special Law of Crimes Against the Environmental and Natural Resources (No. 559), which was produced in October 2005. It outlines environmental transgressions, penalties, and fines, for everything from littering to forest-related crimes. In forestry matters, the law prohibits clearcutting or the removal or destruction of trees on state, community, or public lands, as well as in areas greater than 3 ha on private property without authorization. It also prohibits the cutting of trees and shrubs around springs and along their natural courses (i.e. 400m around mountain springs and 200m on both sides of the entirety of their course; 200m around lowland springs and along their course, whether intermittent or
These limits do not coincide with those established in the Forestry Law (No. 462), and ultimately create even greater ambiguity in the legislative framework for forest use and protection in Nicaragua.

5.4.c.2 Fiscal/Economic Forest Policy Instruments for Natural Forest Management

As mentioned above, Forest Law 462 is the first law to provide for the creation of economic incentives for promoting sustainable forest management in Nicaragua through the establishment of the Forest Development Fund. It defines incentives for plantation forestry, natural forest management, and agroforestry. However, it should be noted that as of 2007, the forest incentives program was not yet fully functioning and had not disbursed any incentive payments for natural forest management (though a few, small municipal reforestation projects had been funded). As for other economic incentives, the Forest Law exempts approved managed natural forests and plantations from property taxes (NFL Art. 38) and the wood products transformation industry is exempt from import taxes on equipment and technology. Additional incentives in the forest law include “governmental purchase preference for wood products from INAFOR approved forests, which can be compensated with up to a 5% price premium” (NFL Art. 38). However, this preferential purchase program had not been implemented as of 2007.

The Forest Law also establishes taxes on timber harvests from natural forests based on 6% of the market price of the projected volume to be extracted. Market prices are defined annually for specific commercial species and species groups by MAGFOR (Art. 48). These are redistributed within INAFOR. Additionally, the autonomous regional governments and municipal authorities also charge ‘fees’ on forest harvest authorizations, as explained by a local governmental official (NOGL2). For example, in the Autonomous Regions, the Regional Council charges an ‘oversight fee’ of US$600 for timber harvest authorizations and the municipal government charges a transaction fee on timber authorizations as well (NOGL2).
5.4.c.3 Educational/Informational and Market-Based Forest Policy Instruments for Natural Forest Management

With regard to forest policy directives on education, outreach, or technical assistance associated the policy goals and guidelines, the Forest Law identifies one of the responsibilities of INAFOR as “the promotion and execution with local governments and civil society, of programs for forest promotion, especially those focused on reforestation in degraded areas” (NFL Art. 7). With regard to other informational instruments, the Forest Law establishes the creation of a national forest registry, to collect and house ‘publicly-available’ information on accords and agreements in forestry matters; forest plantations; forest industry; tree nurseries; approved forest management plans and harvest permits; forest professional and technicians; the national forest inventory; and all public and private forest lands (NFL Art. 8). Additional monitoring and reporting on the forest sector is carried out by the Ministry of Natural Resources (Ministerio de Recursos Naturales (MARENA), which collects and reports annual data on: income generated through activities related to regulation and control of forest extractions; area of broadleaf forest under approved management plans; area of conifer forest under approved management plans; volume of sawn wood; volume of round wood; volume of common commercial species; volume of exported wood) through the National System for Environmental Information (Rodriguez Quiros 2005). Finally, as of 2007, there were no governmental market-based forest policy tools in place in Nicaragua.

5.4.c.4 Opinions and Perspectives on Forest Policy Outputs in Nicaragua

With regard to the command-and-control policy directives in place for regulating and promoting natural forest management in Nicaragua, interviewees across the spectrum of forestry officials, forest experts and managers, and forest owners considered the Forest Law, Regulations, and Technical Norms to be ‘clear, transparent, and sufficiently rigorous’ (NAF4; NE2; NE5; NE10; NFM1; NCIF1). One forest expert described these directives as “built on many years of hard work and collaboration and grounded in a definite path towards sustainable forest management” (NE10). Many of these same
interviewees, including forestry officials as well as others, were dissatisfied with the Law Banning Logging and its ‘lack of clarity’ and ‘ambiguity’ in relation to the other forest legislation (ibid., NAF1; NA2; NAF6; NOGN1). Two government officials and another public sector actor supported the Law Banning Logging as a backstop to a broken forest control system (NOGN2; NOGN3; NOGL3).

In terms of other forest policy instruments, several forest owners and community members expressed frustration with the ‘duplicitous’ forest production tax system (NNCF1, NFM3, NFM4; NNCIF1). As one forest manager put it: “Basically, everyone has their hand in the cookie jar here!” (NFM4). Others also suggested that the lack of incentives for natural forest management is another weakness of the existing system (NNCCF1; NCCF1; NE8 NFM1; NFM4). Other perspectives on these and additional governmental forest policy instruments for forests outside protected areas (e.g. informational/educational instruments) were largely related to their execution and uptake, or lack thereof, and as such are described in Chapters 6 and 7.

5.5 Chapter Wrap-Up

Table 5.4 summarizes some of the key aspects of the regulatory forest policy directives and associated instruments in Costa Rica, Guatemala, and Nicaragua discussed in this chapter. While Costa Rica has the shortest history of governmental forest regulation, governmental policy directives for regulating forest use in place in 2007 are of the most rigorous and comprehensive of the three case-study countries. That is, they are largely prescriptive, and they address a broad range of operational, ecological, and even some social and economic forest issues. In addition to the regulation of natural forests, policy directives also regulate the harvest of trees outside forests. As for policy instruments other than a command-and-control approach to regulating forest management in Costa Rica, there are no real positive or negative economic incentives for management, though there are educational and informational instruments in place.
In Guatemala, the state has regulated forest use for a much longer period of time than in Costa Rica, though at first, largely through economic policy instruments, such as incentives for and taxes on forest production. As of 2007, there were two sets of policy directives and instruments for regulating and promoting natural forest management in Guatemala: one set for forests outside protected areas and another for forests within protected areas. And, these two sets of directives and instruments represent rather significant differences in terms of rigor and comprehensiveness. The policy directives for forest management outside protected areas are largely process-oriented in terms of the aspects of forest management that they address. Moreover, they address mostly operational and ecological management aspects, and as such, are some of the least comprehensive of the three countries studied. In addition to direct regulation of forest management outside protected areas, there are economic incentives for forest management, as well as taxes on forest production. As for policy directives for regulating forest management within protected areas in Guatemala, these represent the most comprehensive and rigorous of the three case-study countries, as they mandate prescriptions and processes for operational, ecological, social, and even economic aspects of forest management. Additional policy instruments in place for forest management in protected areas include taxes on production and required third-party FSC forest certification. Though there are no positive economic instruments per se, the long-term lease of usufruct forest rights through the concession contracts may be considered a powerful positive incentive.

Nicaragua has the longest history of forest-related legislation, though only recently established its first Forest Law in 2003. The Nicaraguan Forest Law and Regulations are some of the most rigorous and comprehensive of the three countries in terms of the planning, operational, and ecological aspects of forest management, as well as the focus on indigenous community rights. Yet, they are comparatively limited in terms of other social or economic aspects of forest management. Other legislation, such as the Law Banning Logging, has bearing on the regulation of natural forest management in
Nicaragua. These forest policy directives are largely implemented through a command-and-control approach. Other policy instruments in place include negative economic incentives in the form of taxes on forest production. No positive economic incentives were in place for natural forest management in 2007.

This analysis of forest policy outputs in Costa Rica, Guatemala, and Nicaragua provides important information for understanding better the structures, processes, and resources for executing forest management policy directives and instruments. It is also helpful in identifying potential opportunities and constraints to policy execution and uptake. For example, the more rigorous and comprehensive governmental policy directives for regulating and promoting sustainable forest management in Costa Rica and in protected areas in Guatemala may prove “impediments to supervision”, as may the contradictions and lack of clarity in the forest policy directives and related legislation in Nicaragua (Lipsky 1980). On the other hand, the mixes of forest policy instruments, for example that for protected areas in Guatemala, may result in enhanced or “smarter regulation” as proposed by Gunningham, Grabosky, and Sinclair (1998). These issues and more are further explored through an analysis of the structures, processes, and resources associated with governmental forest policy execution in Chapter 6, and an assessment of the combined effects of policy outputs and execution on governmental forest policy uptake in Chapter 7.
Table 5.4 Key Aspects of the Regulatory Forest Policy Outputs in Costa Rica, Guatemala, and Nicaragua.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Costa Rica</th>
<th>Guatemala – Private Forestland</th>
<th>Guatemala – Public Forestland</th>
<th>Nicaragua</th>
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<tbody>
<tr>
<td>Historical Forest Policy</td>
<td>Costa Rica has the shortest history of forest legislation of the three case study countries, with the first Forest Law appearing in 1969. There have been three Forest Laws since then, including the law in force in 2007.</td>
<td>Guatemala has a much longer history of forest legislation than Costa Rica, that began in 1925. Early laws largely focused on incentives for and taxes on the forest sector. There have been several Forest Laws produced since the first, though none included significant technical requirements.</td>
<td>Unlike Costa Rica and Nicaragua, forest production is permitted in designated parts of protected areas. Forest production on public lands in protected areas was first legislated under the Protected Areas Law, produced in 1989. This law was still in force in 2007.</td>
<td>Nicaragua has the oldest forest related legislation (1905) of the three case study countries. Other legislation related to forests was produced over the years, with the first forest regulations produced in 1993. The first Forest Law was not published until 2003.</td>
</tr>
<tr>
<td>Current Forest Policy Directives</td>
<td>The Costa Rican Forest Law has been in force since 1996. The law prohibits forest conversion to other land uses. It is complemented by Forest Regulations, and Standards for Forest Management through Principles, Criteria, and Indicators of sustainable forest management.</td>
<td>The Guatemalan Forest Law has also been in force since 1996 and is specific for forests outside of protected areas. It is complemented by Regulations and Discretionary Technical Norms.</td>
<td>The Guatemala protected areas (PA) law has been in force since 1989. It permits forest use in designated zones in PA, the most significant are the forest concessions in the MBR. The directives governing forest management include the PA Law, Regulations, and Manual for Forest Administration, other technical guidelines.</td>
<td>The 2003 Forest Law is largely focused on the technical aspects of sound forest management. It is accompanied by Regulations and Technical Norms. Other legislation with forest management implications includes a Congressional Law Banning Logging.</td>
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<td>Issue</td>
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<tr>
<td><strong>General Directives</strong></td>
<td>Costa Rican Regulations stipulate that all natural forest management (NFM) requires an approved forest management plan and that wood production from farmlands also requires a permit but is a much simpler, less rigorous process. The Standards cover planning, operational, and ecological aspects of forest management; many social and some basic economic aspects of forest management are also covered.</td>
<td>Guatemalan forest regulations require an approved management plan for forest production and provides a simplified model for forest management plans for forests &lt;45ha. Forest regulations focus largely on the technical requirements for forest planning and operations, and do not include specific directives on the social or economic aspects of management.</td>
<td>Several planning tools are required under the regulations for forest concessions in the MBR (e.g. Forest Management Plan, 5-Year Plans, Annual Operating Plans) Community concessions are also required by law to include technical accompaniment throughout the management process. The regulations for forest management in protected areas rigorously and extensively cover planning, operational, and ecological aspects of forest management, as well as some key economic aspects and social aspects.</td>
<td>The Regulations establish increasing requirements for the approval of forest management with increasing forest size. Requirements for forests &lt; 50ha are much less rigorous than those for larger forests. The Nicaraguan regulations and technical norms for forest management are considerably comprehensive in terms of the technical planning and operational aspects of forest management. There is also some focus on the inclusion and respect of indigenous rights, though little emphasis on other social and economic aspects of forest management.</td>
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<tr>
<td>Issue</td>
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<td>Guatemala – Private</td>
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<tr>
<td><strong>Directives on Forest Planning</strong></td>
<td>All natural forest management must be carried out with a forest management plan approved by SINAC. The plan must be developed by a forestry professional (though not necessarily a registered forest regent).</td>
<td>All natural forest management for &gt;10m³ requires a plan approved by INAB and a bonded guarantee of regeneration. There are simplified planning formats for areas &lt;45ha. All plans must be prepared by a forestry professional.</td>
<td>NFM in forest concessions requires a 25-yr general forest management plan, updated every 5 years, annual operating plans, and 5-yr volume projection plans. Each must be prepared by a forestry professional and are most sophisticated regulated planning tools of the 3 countries.</td>
<td>All natural forest management requires an approved plan. Simplified plans are permitted for areas &lt;50ha. All plans must be prepared by a forestry professional.</td>
</tr>
<tr>
<td><strong>Directives on Limits in Riparian Buffer Zones</strong></td>
<td>Mandatory: 100m around springs; hilly terrain: 50m around lakes and on either side of rivers, creeks, and streams; flat terrain: 15m around lakes and along rivers, creeks, and streams</td>
<td>Discretionary: 200m around lakes and lagoons; Slopes&lt;32°: 50m around springs &amp; non-navigable waterways (NNW); 100m navigable rivers (NR) 32-60°: 75m springs, 50m NNW, 100m NR; Slopes &gt;60°: 100m springs, 75m NNW, 100m NR</td>
<td>Mandatory: 20m along waterways &lt;10m wide; 50m along waterways 1-50m wide; 100m along waters 50-100m wide and around lagoons and springs; 150m along waterways&gt;150m wide.</td>
<td>Mandatory: 200m around springs, lakes, reservoirs, and along the seashore; 50m along all other waterways.</td>
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<tr>
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<tr>
<td>Directives on Harvest Limits on Slopes</td>
<td>Mandatory: Harvest is prohibited in slopes &gt; 60°</td>
<td>Discretionary: In soils &lt; 20cm deep, harvest not recommended in slopes &gt; 32°</td>
<td>Mandatory: Harvest is prohibited in slopes &gt; 55° and mechanized extraction is prohibited in slopes &gt; 75°</td>
<td>Mandatroy: Harvest is prohibited in slopes &gt; 35°</td>
</tr>
<tr>
<td>Directives on social aspects</td>
<td>Worker safety; Respect for indigenous communities rights and interests; among others</td>
<td>No specific social aspects of forestry are regulated</td>
<td>Worker safety and security; Incorporation of conflict resolution practices; among others</td>
<td>Significant consideration of indigenous rights, especially where standing wood is purchased.</td>
</tr>
<tr>
<td>Directives on financial aspects</td>
<td>Costs and benefits of management should be considered according to the regulations, but financial analyses or other economic aspects are not regulated</td>
<td>All forest management must maintain an insurance policy until regeneration is established for 4 years.</td>
<td>Financial analyses of proposed and most recent operations must be submitted with plans.</td>
<td>Nothing specific about economic or financial analyses.</td>
</tr>
<tr>
<td>Instrmnts: Command-and-Control (COC), Penalties</td>
<td>Regulation and promotion of SFM is largely through COC. Forest-related crimes are also defined in the Forest Law, punishable with imprisonment and fines.</td>
<td>Regulation and promotion of SFM is partly through command-and-control. There are also forest-related crimes outlined in the Forest Law punishable with imprisonment and fines.</td>
<td>Regulation and promotion of SFM is mostly through command-and-control. There are also forest-related crimes outlined in the Protected Areas Law punishable with fines, but not imprisonment.</td>
<td>Regulation and promotion of SFM is largely through COC. Forest-related crimes and fines are outlined in the Forest Law, and by a special law that defines crimes for imprisonment.</td>
</tr>
</tbody>
</table>
### Table 5.4  Key Aspects of the Regulatory Forest Policy Outputs in Costa Rica, Guatemala, and Nicaragua.

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<tbody>
<tr>
<td><strong>Instrmmts:</strong> Incentives, Taxes</td>
<td>Environmental services payments are no longer paid for natural forest management (NFM). No additional economic incentives, and no taxes on forest use or production as of 2007</td>
<td>Incentives for NFM are available through PINFOR and have been widely distributed. There is a forest use tax of 10% of the value of standing wood volume authorized for harvest (VSWV)</td>
<td>No fiscal incentives for NFM in protected areas. There is a forest use tax of 10% of VSWV. Community concessions - one time land use tax. Industrial concessions – annual intrinsic value tax</td>
<td>There is a forest incentive program, but no payments to NFM as of 2007. There is forest use tax of 6% of the market value of the standing wood volume. Add’l local taxes/fees.</td>
</tr>
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6.1. Introduction

Having examined the governmental policy directives and instruments for regulating and promoting sustainable forest management in Costa Rica, Guatemala, and Nicaragua, in Chapter 5, we now turn to an examination of how those policy directives and instruments are put into effect. The structures, processes, and resources for policy execution can represent both opportunities and limitations for policy uptake, and ultimately for overall policy outcomes (see for example: Mazmanian and Sabatier 1983; Winter 1990; Gunningham, Grabosky, and Sinclair 1998). These aspects are particularly important for understanding how and why forest policies in the tropics succeed or fail (see for example: Contreras-Hermosilla 2002; FAO/ITTO 2005). Thus, this chapter assesses governmental forest management policy execution in and across the three case study countries.

In this chapter, policy execution is examined in terms of structure, processes, and resources. As laid out in Chapter 3, the structure of policy execution refers to the organizational and inter-organizational assignments and responsibilities, organizational hierarchy, and the distribution and/or sharing of decision-making, resources, roles, and responsibilities (i.e. decentralization) for putting governmental forest policy into effect. An assessment of the overall designation, distribution, and sharing of responsibilities and decision-making in policy execution sheds lights on the structural strengths and weaknesses for putting governmental forest policy into practice. Some suggest that the fewer divisions and/or levels of decision-making involved, the more likely for policy execution to be efficient (see for example: Schofield and Sausman 2004). On the other hand, others suggest that the decentralization and/or devolution of responsibilities and decision-making can result in more effective policy execution and uptake (see for example: Goggin et al. 1990; Larson 2003; Ferroukhi 2004).
The processes of forest policy execution examined here encompass the procedures for authorizing, verifying, and enforcing compliance with sustainable forest management policy. Authorization of sustainable forest management in this chapter basically encompasses the processes in place for legal authorization or approval of forest management and harvest. Verifying and enforcing compliance with forest policy directives are closely linked. For example, directives may enforced through the interactions between forest managers and operators, and forestry agents and/or forest regents during the verification of compliance with those directives. And, this may take place in the office or in the field. On the other hand, in the process of verifying the legality of a truckload of wood, the laws on illegal timber may enforced through seizure of the wood and property. And, as for the resources for putting policy into effect, these include financial (e.g. budget), human (e.g. staff numbers), and material/technological (e.g. means for transportation, GPS technology) resources.

In general, the processes for policy execution are closely linked to the resources for putting policy into practice (as well as the structures), such that weaknesses or deficiencies in one can undo the strengths or proficiencies in the other (Mazmanian and Sabatier 1983). In particular, Contreras-Hermosilla (2002) and the FAO/ITTO (2005) indicate that sufficient resources (financial, human, material, etc.) are required for efficient authorization, verification, and enforcement of sustainable tropical forest management, and vice versa, in order to prevent, detect, and suppress illegal logging in the tropics and increase compliance with forest policy. Through the description and analysis in this chapter, these and other interactions among the structures, processes, and resources are explored. For each country, the structures, processes, and resources for executing forest policy are first described, then the associated strengths and weaknesses of policy execution are assessed and compared.
6.2 Governmental Forest Policy Execution in Costa Rica

6.2.a Organizational and Inter-Organizational Structure for Policy Execution

Costa Rica’s 1996 Forest Law (No. 7575) designates the Ministry of Environment and Energy (Ministerio de Ambiente y Energía (MINAE)) as the “principal governing body to preside over the forest sector. Associated functions are to be carried out through the State Forest Administration (Administración Forestal Estatal (AFE)), whose organic structure is to be defined by the Forest Regulations” (CRFL Art. 5). In 1997, the Forest Regulations delegated the organization of the AFE through a decentralized system of administrative units (i.e. Conservation Areas), which was designated as the National System of Conservation Areas (Sistema Nacional de Áreas de Conservación (SINAC)) (CRFR Art. 3). Then in 1998, the Law on Biodiversity (No. 7788) redefined SINAC as a participatory, decentralized government agency with integrated jurisdiction over forest administration, wildlife conservation, and protected areas (Art. 22) (Figure 6.1).

As of 2007, SINAC was organized through a central headquarters in the capitol, San Jose, and eleven Conservation Areas, which are designed to integrate public and private-sector activities “in search of joint solutions oriented towards conservation strategies and the sustainable development of natural resources” (SINAC 2008, web) (Figure 6.2). Each Conservation Area has a regional administrative center or office, as well as
subregional offices, with departments dedicated to protected area management, wildlife conservation, and state forest administration (Law 7788: Art. 28).

Figure 6.2 Conservation Areas in the Costa Rican National System of Conservation (SINAC 2008)

The State Forest Administration (AFE) within SINAC is delegated the following responsibilities: conservation of the country’s forest resources, on private and public lands; establishment of forest planning guidelines and authorization of forest management plans; inter-agency coordination of forest control with other governmental entities (e.g. police, municipalities, etc.); promotion of sound forest use and plantation forestry; detection and deterrence of illegal forest use; and verification and enforcement of applicable forest-related laws and regulations, among other responsibilities (CRFL Art. 6). Most of the operational and financial decisions related to these responsibilities are
made in the regional offices. Direct contact with forest owners, managers, and other constituents and the carrying out of these responsibilities in the field largely take place through the 32 sub-regional offices (CRFR Art. 3).

Though the AFE is the state entity designated by law to promote, authorize, and oversee forest activities throughout the country, the Forest Law (Art. 21) and Forest Regulations (Art. 22) also authorize the figure of ‘forest regent’ (*regente forestal*) to oversee and ensure the legal compliance of timber operations in the field. S/he is a forestry professional and member of the private sector, who is contracted and paid directly by the forest owner or logger, and is given public trust to carry out his/her responsibilities as outlined in the law. As noted by one forestry official, “the incorporation of forest regents in the execution of governmental forest policy is intended to complement the oversight functions of SINAC, not replace them” (CAF3). The Forest Law also designates the Professional Association of Agronomy Engineers (*Colegio de Ingenieros Agronomos* (CIA)) with oversight of the forest regency system (CRFL Art. 21). The CIA is responsible for monitoring the work of forest regents and, in the case of transgressions by forest regents, issuing appropriate warnings or suspensions (Law No. 7221).

The Forest Law establishes other organizations with responsibilities related to the forest production sector. The National Forestry Office (*Oficina Nacional Forestal* (ONF)) was created as a non-government organization, financed by the state, and with legal authority to oversee development of policy and strategies related to forest production and propose these to MINAE; to promote, support, and carry out training programs, research, and organization related to forest production; and to collect and disseminate information on the national and international forest production sector (CRFL Art. 10). The Forest Law also created the National Forest Financing Fund (*Fondo Nacional de Financiamiento Forestal* (FONAFIFO)) as an independent program with a Board of Directors including members of the ONF and SINAC. FONAFIFO is designated with developing and

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28 The forest regent’s role in the processes of forest policy execution are described in the following section.
disbursing financial resources for in recognition of forest activities, to be directed at supporting small and medium landowners. Ultimately, FONAFIFO was charged with administration of the Environmental Services Payment Program. The Law also designates Regional Environmental Councils, established under the 1995 Organic Law, to analyze forest problems at the regional level, to monitor the advance of and compliance with forest development at the regional level, and to inform the AFE of regional developments and recommend priority areas for incentives and intervention.

Other actors and organizations involved in the execution of governmental forest policy directives include members of civil society organized through ‘forestry surveillance committees’ to provide “social control and oversight over all forest related activities” (CRFL Art. 37). The forestry surveillance committees are coordinated and supervised by SINAC. The Environmental Comptroller’s Office is also given discretion to “visit, inspect, investigate, and denounce” any forest related activity deemed necessary (CRFR Art. 93). The Costa Rican National Police are given the responsibility to monitor and verify legal timber transportation through roadside checkpoints throughout the country (CRFL Art. 54). Finally, the Costa Rica judicial system is responsible for assessing penalties for prosecuted forest-related crimes.

6.2.b Resources for Governmental Forest Policy Execution in Costa Rica

6.2.b.1 Financial Resources

Since its inception in 1998, the financial resources that fund SINAC have been allocated as part of the overall annual budget for MINAE, which has also, historically, administered SINAC’s funds. It is unclear how much of SINAC’s annual budget is dedicated to forest administration, as funding for its three core functions (i.e. forest administration, wildlife conservation, protected areas management) is managed in a single account from which each department draws. In 2004, SINAC was designated US$12.39 million for forest

29 Note SINAC’s budget of US$13.93M in 2007 covered the Protected Area System (160 areas under 9 protection classes over nearly 1.4M ha = 26% of landbase); the wildlife conservation division, which
administration, wildlife conservation, and protected area management (SINAC-MINAE 2005). In 2006, funding for SINAC dropped to US$11.99M, and increased again in 2007 to US$13.93 million (Asamblea Legislativa 2007). In MINAE’s 2008 budget request, US$15.95 million was designated for SINAC (CGR 2007). And, though the Forest Law (No. 75757) stipulates that the AFE is to be financed through a forest tax on the wood processing industry (CRFL Art. 43), as noted in Chapter 5, this tax is no longer collected. As of 2007, the AFE was funded through SINAC’s general budget, which is derived from the central government and the National Park Fund, as well as intermittent funds from FONAFIFO (Chavarria 2008).

6.2.b.2 Human, Material, and Technological Resources

Regarding the AFE's human resources, in 2006 there were approximately 150 employees dedicated to forest administration within SINAC (Chavarria 2008). At that time, the AFE Central Office included the Director, nine technical and four administrative staff. The remaining number of AFE employees are distributed throughout the regional and subregional offices, where there are generally more staff in regions and subregions where there is greater forest activity (Chavarria 2008).

In terms of capacity for transportation, regional offices have one to three vehicles and up to three motorcycles, while sub-regional offices have up to one vehicle (usually a 4x4 pick-up truck) and three motorcycles to carry out field visits and harvest inspections (Chavarria 2008). In terms of tools and technology, a forestry official and a forest manager indicated that few offices are supplied with sufficient and proper equipment for forest control and oversight (e.g. GPS units, laptops) (CAF4; CFM3). However, two forestry officials indicated that the supply and caliber of tools and technology have improved since the implementation of the Strategy Against Illegal Logging (CAF1; CAF2).

oversees the listing and protection of nearly 250 threatened and endangered fauna species and a growing number flora species; and the forest management division, which oversees all forest-related activity.
6.2.c Processes for Governmental Forest Policy Execution in Costa Rica

6.2.c.1 Processes for Authorizing Forest Management

As described in Chapter 5, by law in Costa Rica, natural forests greater than two hectares in size can only be harvested with a forest management plan and operational plan(s) that are developed and signed by a registered forestry professional, authorized by SINAC, and carried out under the supervision of a registered forest regent (CRFL Art. 20-21). With regard to the process for authorizing the harvest of natural forests, a forest management plan, operational plan(s), and proof of land title or tenure must be prepared by a forestry professional and presented by the landowner or legally recognized land tenant to the corresponding local SINAC Sub-Regional Office (CRFR Art. 14, 20). At that point, the Sub-Regional Office appoints an agent who is responsible for verifying the compliance of the plan with the Forest Law, Regulations, and Standards. Verification of compliance is carried out through in-office documentation review as well as a review of the planned activities in the forest. However, when initially issued, the 1997 Forest Regulations only required a site visit prior to the authorization of a forest management plan if “deemed necessary by SINAC” (CRFR Art. 20). This degree of discretion in the forest management authorization process was later linked to abuses in the timber harvest permit system described below.

As explained by two forestry officials (CAF1; CAF2), and documented by McKanzie (2000), in the late 1990s there was a rapid rise in and detection of clandestine forest conversion in Costa Rica. This process begins by clearing the forest understory. With the understory cleared, mostly large trees are left on the land, and grasses are planted beneath them. These areas are then described as ‘pastures with trees’, for which the landowner submits a permit request for the harvest of ‘trees on farmland without forest’ for authorization by SINAC (CAF1; CAF2). As described in Chapter 5, the requirements for legal harvest of trees on farmland are significantly simpler than the requirements for natural forest management. As a result, many natural forest owners avoided the rigorous requirements for harvesting their forests as forests and converted them to
‘pastures with trees’ for access to the timber (see Chapter 7 for further discussion of the aspects of this process related to forest policy uptake). Ultimately, this process resulted in the clandestine conversion of natural forests to agricultural lands, which once detected, as noted by one forestry official (CAF2), “demonstrated the need for mandatory site visits by SINAC for the authorization of timber harvests.”

In 2001, an administrative order by MINAE (MINAE Directive DM 173-2001, 01/30/01) modified the existing Forest Regulations, obligating the AFE to conduct field inspections prior to the approval of any timber harvest permit (i.e. small permit for <10 trees on farmland without forest; permit for >10 trees on farmland without forest; forest management plan for forests > two ha). MINAE also supported the development of a National Strategy Against Illegal Logging (ECTI 2002-2007) as an “administrative tool for controlling illegal logging”. The Strategy encompassed the establishment of an autonomous office within SINAC to address the issue of illegal logging; the formation of an assessor group of academic, environmental, and forest institutions; increased focus on inter-institutional coordination to combat illegal logging; related training of personnel in the AFE, SINAC, MINAE, and the National Police; and the utilization of improved information technology systems (Esquivel 2003).

The initiation of the Strategy Against Illegal Logging coincided with a declared State of Emergency in several Conservation Areas that had been severely affected by flooding in 2002. At the time, there was no general consensus on, nor technical studies to support or refute, the relationship between forest extraction and the susceptibility of harvested areas to excessive flooding and landslides (Executive Decree 30866, Dec. 2, 2002). Following the declaration of the State of Emergency, MINAE took further steps toward a greater understanding of the impacts of forest activity on the landscape, and toward increased control of tree harvests, especially in areas without forest. Executive Decree 31332-MINAE (2003) placed a temporary (5 month) ban on the approval of all permits for harvest of trees on farmland in the emergency areas. The decree also ordered the
AFE to carry out audits on all legally authorized forest harvest permits in the emergency areas to determine the degree of impact of extraction and any related increase in vulnerability to natural disasters; a revision of the requirements, procedures, principles, and criteria for forest harvest authorizations; and the adoption of GPS technology for verifying the location of forest boundaries and trees submitted for harvest within an improved system of control and monitoring of forest resource use.

Executive Decree 31332-MINAE (2003) also established the use of the 2000 Costa Rica Land Cover map (Sanchez-Azofeifa 2000) as an important tool in verifying land use as of 2000 for areas submitted for harvest authorization. When the executive order expired, the AFE issued internal directives that standardized the use of GPS and the 2000 land cover map as tools for verifying compliance with Art. 19 of the Forestry Law (i.e. no land use change) and for all harvest permit approvals (SINAC DS-987; Oct. 29, 2003). These rules mandate that agents conduct a site visit to verify the forest boundaries, trees to be cut, and actual land use prior to authorization of all harvest permits and forest management plans. These rules were still in effect in 2007.

6.2.c.2 Processes for Verifying and Enforcing Forest Policy Compliance
The authorization of a harvest permit or management plan is in many ways only the beginning of the process in place in Costa Rica for executing policy directives for natural forest management. Verification and enforcement of compliance with policy directives are also key processes in policy execution. Among the AFE’s related responsibilities are the verification of compliance with authorized plans and associated policy directives in the field; the correction of administrative forest management errors and denouncement of illicit forest acts; oversight and control of timber transportation documentation; and coordination of participating agencies in the forest and timber transportation surveillance systems (CRFR Art. 21). Yet, once a forest management plan is authorized by the AFE, responsibility for its oversight in the field falls largely to the forest regent.
As set forth in the Forest Regulations, the forest regent is responsible for: ensuring strict compliance with the technical norms established and authorized in the management plan; verifying that the design and path of the extraction roads and infrastructure is carried out according to the approved plan; verifying that the felling, extraction, and transportation practices minimize damage to the remnant forest, soils, and environment; provide technical guidance when necessary; ensuring that the forest operators are properly trained to carry out their functions; controlling timber transportation documentation for an approved management plan; and submitting at least three written, legally binding reports (i.e. pre-, during- and post-harvest) to the AFE (CRFR Art. 23). According to the regulations, “the recommendations and observations of the forest regent during the phase of management plan execution are of an obligatory nature for the forest owner, operator, and/or contractor” (CRFR Art. 22).

As discussed above, other actors are also involved in verifying and ensuring compliance of forest activities with forest policy directives. These include the Environmental Comptroller who may visit, inspect, investigate, and denounce any forest-related activity (CRFR Art. 93). They also include the citizen forestry surveillance committees who may monitor forest activities in their area and report any anomalies to the AFE. Additionally, the transport of all timber from natural forests and plantations must be accompanied by a ‘guia de transporte’, which is a document that demonstrates the legality of transported timber from natural forests and plantations (CRFL Art. 56.). These documents are issued by the AFE based on the authorized volumes in forest management plans or plantation permits, and are managed by the forest regent. Once timber leaves the forest or plantation it must be accompanied by the guia de transporte all the way to the mill or export. The National Police are charged with examining transported timber at roadside checkpoints and verifying its legality based on this document (CRFL Art. 54).

The final step in the verification and enforcement of forest policy directives in Costa Rica is intended to take place in the forest products processing segment of the sector. Forest
administration departments in the sub-regional SINAC offices are responsible for inspecting local mills to verify the transportation permits and tags that ensure all stockpiled logs and timber are legally obtained (CRFL Art. 55). Portable and permanent industries/mills are required by law to maintain copies of all timber transportation documentation for purchased and processed wood (CRFL Art. 55; CRFR Art. 77). Theoretically, information from the wood processing industry can be used to close the loop on forest production oversight that begins with harvest authorization, through to extraction, and finally, to its processing and sale.

6.2.d Assessing Governmental Forest Policy Execution in Practice in Costa Rica

This section assesses the strengths and weaknesses of governmental forest management policy execution in Costa Rica. It is based on interviewees’ perspectives and opinions, as well as the theoretical constructs that informed this research. This assessment also ties in the other governmental forest policy instruments in place for regulating and promoting natural forest management.

6.2.d.1 Structures for Governmental Forest Policy Execution

In terms of the organizational structure and division of decision-making in place for executing policy directives on forest management in Costa Rica, the AFE is decentralized logistically through SINAC, as well as in terms of forest-related decision-making. However, most decisions related to forest management are maintained within the AFE. There are other organizational structures in place intended to complement the AFE’s responsibilities, such as the forest regent system, Regional Environmental Councils, and community surveillance committees.

With regard to the agency organization overall, one forestry official indicated that the integration of forest management, wildlife conservation, and protected areas under one agency is a powerful means for “integrated planning, conservation, and management of natural resources on public and private lands” (CAF2). However, a broad range of forest
constituents, including forestry officials (and e.g. forest managers, regents, and some experts), maintained that the integration of these three areas under one agency has led to an increasingly preservation-oriented administration of forests by the state, and has significantly moderating state promotion of forest production (CAF3; CE3; CE5; CE7; CFM1; CFM3). Many of these individuals noted a lack of leadership from the SINAC Forest Division in terms of support and strategic development for the forest production sector (CE3; CE5; CFM1; CFM3). As one forest regent stated:

“Ever since the Forest Division lost its autonomy through the creation of SINAC, it has lost much of its efficiency and effectiveness as a promoter and regulator of sustainable forest use. Today, there is little agency promotion of reforestation and even less promotion of natural forest management. They don’t seem to have any real strategy or power to reinvigorate the forest production sector, and appear to have their hands tied in a big green web of bureaucracy.” (CFM1)

6.2.d.2 Resources for Governmental Forest Policy Execution

While it is difficult to assess, for example the relationship between productive forest area and governmental funding for forest activity oversight since it was not possible to determine the latter, most agency personnel; forest owners, managers, and certifiers; and forestry experts noted that insufficient funding for the AFE, and the resulting deficiencies in material and technological resources, were a significant weakness in the overall state forest administration system (cited in 16 out of 22 interviews). One forest manager observed that the AFE’s financial and material limitations have led to increasing dependence on other agencies, as well as dependence on their own constituents (CFM3). For example, he noted that “at times, forest agents request transportation to field evaluations from permit owners due to a lack of transportation means and funds (CFM3). This and another forest manager, as well as two forest experts, suggested that limited resources ultimately have resulted in a loss of administrative autonomy and control of forest activities (CE3; CE6; CFM1; CFM3). One forest expert, went on to say that: “Every year it seems like the budget for forest administration is more limited than the last, resulting in decreases the agency’s operational capacity and their ability to make commitments they can keep” (CE6).
Although financial resources represented a significant limitation in forest policy execution in Costa Rica, many interviewees (e.g. forest experts, managers, certification auditor) considered AFE’s personnel to be competent, honest, and well-trained (CAF4; CC1; CE3; CE6; CE7; CE9; CFM1; CFM2; CFM3), though limited in number (CE2; CE3; CE6; CFM3). Forestry officials and staff also indicated that there is significant workforce stability and motivation within the AFE, despite insufficient resources and staff to carry out agency functions (CAF1; CAF3; CAF4). On the other hand, a forest expert and a forest regent noted that there had been some susceptibility of the AFE to corruption in recent years (CE6; CFM4). Notwithstanding the efforts to “clean-up” the agency as part of the Strategy Against Illegal Logging, the forest regent indicated that “some of the corruption in the AFE has been difficult to isolate and remove” (CFM4).

6.2.d.3 Processes for Governmental Forest Policy Execution

In terms of the authorization, verification, and enforcement processes in place for executing forest management policy in Costa Rica, there are identifiable opportunities and constraints for putting forest policy into effect. First, a forestry official and forest expert both noted that the AFE’s combined use of GPS technology and the 2000 land cover map were proving to be valuable and effective tools for improved control of clandestine forest land use change (CAF1; CE3; also noted in Exec. Decree 31362, 2004). According to the forestry official:

“Before the implementation of GPS and the 2000 land cover map, though there was a ban on land use change, there was no real means for controlling this activity nor enforcing the law. ...Today, regulatory authorization and enforcement have been significantly enhanced by the required use of GPS by all AFE agents and forest regents” (CAF1).

Nonetheless, one forest regent pointed out that while the use of GPS and map-based verification of land use are definite advances in forest control,

“they only work when landowners actually request ‘authorization’ for forest harvests, but what about those who harvest their forests or change the land use without ever approaching AFE?” (CFM4).
Monitoring and control of this type of landowner or land user may be better addressed through other mechanisms, such as local detection and reports of land use change, and control of wood products transportation. In addition, though the enhanced processes for forest harvest authorization are considered by some to represent advances in forest activity control and oversight, they also represent a significant increase in the duties of forest agents, who are already stretched thin. And, as noted by one forestry official, there were no increases in human or financial resources for the AFE to carry out these additional tasks (CAF3). With regard to verification and enforcement of authorized forest harvest, several forest experts, managers, and officials noted that while the authorization process was standardized across the agency, verification of compliant operations was not standardized and led to significant differences in how these activities are carried out across the country (CAF1; CAF2; CAF4; CE2; CE9; CFM1; CFM2).

One role intended to offset the AFE’s limited resources is that of the forest regent, which incorporates private sector professional foresters, gives them public trust to oversee the compliance of forest activities in the field, and establishes that forest production pay for these services. Moreover, Ramirez (2006) suggests that the inclusion forest regents in the forest oversight process has decreased opportunities for corruption within the system, particularly with regard to the state’s susceptibility to corruption, by creating divisions in the oversight powers associated with forest production. He contends that prior to the inclusion of forest regents in the system, power over harvest authorizations and execution in the field was concentrated under one actor (i.e. the state), such that due to over-extension of duties or simply to corruptibility, agency officials were known to take ‘bribes’ to authorize plans that were never visited in the field or to overlook forest transgressions, for example. Ramirez (2006) further maintains that the role of forest regents in the field distributes the sources of power over forest control, and essentially, reduces the potential for corruption (if only because more people would have to be paid off). On the other hand, two forest experts pointed out that there is also potential for a
conflict of interest, and ultimately for corruption in the forest regent system, as forest regents are paid by the very people they are expected to oversee and monitor (CE4; CE8). One of these experts maintained that the “the role of forest regent has not functioned as was envisioned. ...They have not been adequately overseen and have found much room within the law to do things incorrectly” (CE8).

With regard to corruption in the AFE and in the forest regent system, there are additional controls in the system to monitoring, identify, and penalize cases of corruption. As part of the ECTI program, a review of AFE personnel and processes was carried out to assess the level of corruption within the agency (Esquivel 2003). According to one forestry official, this review led to the identification of transgressions at all levels, and encompassed penalties that ranged from warnings and garnished wages for mild transgressions, to legal action and penalties for major violations of the law (CAF1). He indicated that:

“The state has actually had more success penalizing agency officials and forest regents for forest abuses because they are closer at hand, while landowners, loggers, transporters, police, etc. are outside the jurisdictional reach of the AFE, and the processes for prosecution and penalization of those actors are much more complicated” (CAF1).

As noted above, the CIA is given responsibility for monitoring the work of forest regents and, in the case of transgressions by forest regents, taking corrective actions (Ley No. 7221), which has been documented by Ramirez (2006). Table 6.1 presents data on inspections, warnings, and suspensions issued by the CIA of forest regents from 1998 to 2006. Inspections increased in the late 1990s – early 2000s, likely due to increasing awareness of abuses in the forest permitting process. These escalated in 2001, with the suspension of 43 forest regents. Ramirez (2006) indicates that the majority of infractions committed by forest regents are associated with logging in legally protected zones (e.g. riparian buffer zones); misrepresentation of land use in harvest permit requests (e.g. trees are claimed to be in pasture when they are actually in a forest, or are in areas where the understory has been cleared); and failure to prepare and submit post-
harvest closure reports, which, according to Ramirez, typically indicates that the logger was left unsupervised in the final extractions, leaving the forest vulnerable to ‘grabbing a few extra unapproved trees’ on their way out. Of note, a forest expert and forest manager agreed that ‘house of regents’ has been cleaned up significantly since the early 2000s, in large part due to actions taken under the ECTI program, and reflected by decreased actions taken by the CIA in recent years\(^{30}\) (CE6, CFM1).

| Table 6.1 Warnings and Penalties Placed on Forest Regents in Costa Rica between 1998-2006 by the Association of Agronomy Engineers (From Ramirez 2006) |
|---------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Action                          | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | Total |
| Field Inspection                | 80   | 152  | 82   | 127  | 23   | 33   | 47   | 35   | 50   | 629   |
| Regents warned by the AAE Exec Attorney | 7    | 103  | 8    | 59   | 0    | 0    | 1    | 1    | 0    | 179   |
| Regents suspended by the AAE Exec Attorney or Board of Directors | 5    | 12   | 2    | 43   | 19   | 0    | 2    | 6    | 10   | 99    |

With regard to the verification and enforcement of compliance with governmental forest policy directives by other designated actors, the 2001 Costa Rican National Forest Development Plan notes that “the penalization process (for forest crimes) is complicated and in few occasions actually finds against the offender” (PNDF 2001: 45). As noted by one forestry official (CAF1), forest crimes are not at the top of prosecutors’ lists in Costa Rica, and even when charges are made, the legal system is rarely prone to significantly fine or penalize these types of crimes, which ultimately results in little deterrent against forest transgressions. There are also noted gaps in the enforceability of the forest legal framework. For example, even though there are typically three actors involved in the submission and approval of forest harvest permits \(i.e.\) (property owner, forest regent, and logger), only the property owner and the forest regent are held legally responsible for authorized forest activity, even when the landowner has sold the wood ‘standing.’ And, according Ramirez (2006), when there are irregularities or abuses in the execution of

\(^{30}\) Though the reduction in numbers could be interpreted as a failure on the part of the CIA to detect forest transgressions, the organization is essentially set up to be reactive as opposed to proactive, such that when forest crimes were at their peak the CIA numbers increased in response after a slight time lag.
authorized forest harvests, the forest owner often blames the regent, who blames the logger, who is ‘safe’ from prosecution by legal default (PNDF 2001; Ramirez 2006). Additionally, as pointed out by two forestry officials, the lack of a defined penalty for clearing the forest understory might also be considered an oversight in the legal framework, as this practice represents a significant step toward forest land use change, which is prohibited and punishable by law (CAF1; CAF2).

Finally, with regard to the execution of other policy tools for promoting sustainable forest management (e.g. educational tools such as forest policy dissemination or technical assistance), several interviewees across the board from forest experts, to managers, to regents, government officials, and even forestry officials, indicated that the AFE has failed to adequately disseminate forest policy information to forest owners and users, as well as failed to provide sufficient technical assistance to the forest sector (CAF1; CE3; CE7; CFM1; COGN1). As one forest expert described: “One of the great weaknesses of forest administration in this country has been a lack of technical assistance, especially to small- and medium- forest owners and to producer groups” (CE3). In addition, as noted by a forest regent, “Even though the Forest Law prohibits forest land use change, the AFE did very little to disseminate this information, resulting in many landowners never knowing that clearing forest on their own land was illegal” (CFM4).

One forestry official recognized that policy dissemination and technical assistance are not sufficiently carried out but cited limited resources as the main reason (CAF3). And, it should be noted that by law the ONF is charged with forest policy dissemination though there were no comments on its effectiveness or lack thereof. Nonetheless, as another forestry official indicated, the AFE has recently increased efforts to engage with forest owners, as a means for facilitating increased information on the legal forest use options available to them, promoting greater access to the PSA program for protection post-harvest, and reducing the propensity to clandestinely convert forests to other land uses (CAF1). Finally, as noted by two forest experts and a forest manager, in the absence of a
prominent and effective state role of technical assistance and training within the forest production sector, key environmental and forestry NGOs (e.g. FUNDECOR; CODEFORSÁ), as well as the forest regency system, have in many ways, filled in for the AFE’s limitations, carrying out these important functions for promoting sustainable forest use and related regulatory compliance (CE9; CE2; CFM3).

6.3 Governmental Forest Policy Execution in Guatemala
As forest management outside and within protected areas in Guatemala is subject to different legislation and overseen by different state agencies, the execution of these policy directives will be discussed separately in this section.

6.3.a. Organizational and Inter-Organizational Structure for Forest Policy Execution Outside Protected Areas in Guatemala
In 1996, the Guatemalan Forest Law (101-96) created the National Forest Institute (Instituto Nacional de Bosques (INAB)) as an “autonomous, administratively independent, decentralized, state entity”, charged with overseeing forest activities outside the national protected area system on private and municipal forested land (GFL Art. 5). As opposed to direction by, for example the Ministry of Agriculture or Environment, INAB is directed by a multi-stakeholder Board of Directors and a Secretary (gerente), who is the head of the agency (GFL Art. 5; Art. 9). This Board is presided over by the Minister of Agriculture, Livestock, and Food, and includes a representative and an alternate from: the Ministry of Public Finances; the National Association of Municipalities; the National Central School of Agriculture; the Chamber of Industry Forestry Guilds; universities with forestry programs; and the National Association of NGOs for Natural, Ecological and Environmental Resources (GLF Art. 10). The Secretary of INAB also sits on the Board of Directors, but has “no voice nor vote” (GFL Art. 10).

As of 2007, INAB was organized through a central headquarters in the capitol, Guatemala City, nine regional offices, and 32 sub-regional offices (INAB 2008; GAF2) (Figure 6.3). Similar to Costa Rica, direct contact with forest constituents (e.g. forest
owner, regent, logger) takes place in the sub-regional offices, where most forest activity promotion, authorization, and oversight (i.e. verification and enforcement) are carried out on the ground. According to one forestry official, the regional offices act as a backstop to the local offices in terms of forest management promotion, administration, and oversight (GAF2). These offices also control the regional-level operational and financial decisions related to the execution of forest policy directives for forests outside protected areas.

The Forest Law delegates the Board of Directors with “monitoring the implementation of the Forest Law and related policies; nominating the Secretary and Assistant-Secretary of INAB; authorizing INAB proposals, workplans, and budget; and approving priority forest
species and regions for reforestation and incentives” among other responsibilities (GFL Art. 14). The responsibilities of INAB as an agency include: “execution of national forest policies; promotion and support of forest development, research, and education; coordination of forest development programs; development and implementation of forest conservation programs; elaboration of forest regulations; and authorization, denial, supervision, extension, and cancellation of forest use licenses outside protected areas” (GFL Art. 6).

Recognizing the “nature and magnitude” of natural forest management in Guatemala, the Forest Law also designates the forest regency system as a ‘participant’ within the administration of the country’s forests (GFL Art. 51). In Guatemala, the forest regency system is intended to support governmental forest regulation through the participation of accredited, trained, private sector forestry professionals who are charged with overseeing and ensuring the planning and legal compliance of timber operations in the field. As in Costa Rica, forest regents in Guatemala are contracted and paid directly by the forest owner or logger and given public trust to carry out their legally designated responsibilities, though in Guatemala they are monitored and overseen by INAB. As described by one forestry official: “Forest regents are the ‘eyes and ears’ of the state forest agency in the forest” (GAF1).

Other organizations or actors involved in the execution and oversight of governmental forest production policy include the National Police, municipal governments, and the judicial system. The National Police includes a Nature Protection Division (División de Protección de la Naturaleza (DIPRONA)), which is given the responsibility of patrolling, monitoring, and reporting on all forest activities, especially illicit forest acts, in cooperation with INAB, CONAP, and the Environmental Public Ministry (World Bank 2006). DIPRONA is also responsible for monitoring the transportation of forest products and verification of their legality at checkpoints along major transportation routes. The Forest Law also invokes assistance from municipal governments through their Municipal
Forestry Offices, which play a local role in the monitoring and oversight of municipal-level forest activities (GFL Art. 8). Finally, as in Costa Rica, the Guatemalan judicial system is responsible for assessing penalties for prosecuted forest-related crimes outside (as well as within) protected areas.

6.3.b Resources for Governmental Forest Policy Execution Outside Protected Areas

6.3.b.1 Financial Resources

The Forest Law requires the Executive Branch to allocate an annual budget to INAB that is at least 10% of the overall approved budget for the Ministry of Agriculture, Livestock, and Food (Ministerio de Agricultura, Ganadería, y Alimentación (MAGA)) (Art. 21). The general budget allocation for INAB is supplemented by the Exclusive Forest Fund (Fondo Forestal Privativo) and by donations from international organizations and other groups (FL Art. 20). The Exclusive Forest Fund is primarily generated from forest production taxes (50% of which go to INAB, and 50% to municipal governments) and harvest license fees, described in Chapter 5. Seventy percent of this Fund is used to support INAB’s forest administration functions and 30% to support ‘agroforestry education throughout the country’ (LF Art. 84-86). Logically, as forest activity outside protected areas increases, the Forest Fund increases as well, which in turn results in increases in INAB’s overall budget.

In 1998, INAB was allocated US$5.85 million (Q36.88 million), and by 2000 was allocated US$6.63 million (Q51.20 million). Additionally, in 1999, INAB collected US$1.66 million through the Forest Fund (Sandoval 2001). Throughout the 2000s, INAB’s annual allocation remained fairly stable or decreased slightly in some years. In 2007, INAB was allocated US$5.77 million (Q44.25 million), supplemented by US$1.54 million (Q7.66 million) from the Forest Fund. A forestry official reported that stumpage tax collected on timber production totaled US$383,946 (Q$2,917,988) in 2005 and US$347,140 (Q$2,638,260) in 2006 (GAF1). This official also noted that half the funds
go back to INAB’s general budget, and are then redistributed to the corresponding Regional and Sub-Regional Offices where forest harvests were approved (GAF1).

6.3.b.2 Human, Material, and Technological Resources
Since its inception, INAB has steadily grown in staff. In 2000, INAB employed a total of 355 people, 26% of whom were administrative staff, 68% were technical, and 8% were managerial (Sandoval 2001). As reported by a forestry official, by 2007, INAB employed 409 persons, 185 (45%) were managerial or administrative staff, and 224 (55%) were technical and field staff (GAF1). As of 2007, overall, the agency had 80 vehicles and 82 motorcycles at its disposal, largely spread throughout the regional and sub-regional offices. Every office is also equipped with computers and the “basic tools” necessary for forest regulation oversight and monitoring, according to a forestry official (GAF1).

In terms of the regional offices, for example, in Region VIII, there were 31 full time employees, seven (22%) of whom are managerial and administrative staff, and 24 (78%) are technical and field staff positions in 2007. According to one official, the regional office has had to decrease its overall staff by two positions due to budget constraints in the recent years (GAF2). Each of the five sub-regions in Region VIII has a director, subdirector, an administrative assistant, and two to three field technicians (GAF2). Each of the five sub-regions in Region VIII has one to two 4x4 pick-up trucks (seven total) and two motorcycles (10 total) to cover a total area which exceeds 48,000 km². According to a forestry official, the low number of vehicles to area is largely the case for most regional and sub-regional offices of INAB (GAF2).

6.3.c Processes for Governmental Forest Policy Execution Outside Protected Areas
6.3.c.1 Processes for Authorizing Forest Management
As detailed in Chapter 5, the Forest Law in Guatemala requires an approved forest management plan for any timber harvest more than 10 m³ from natural forests outside
protected areas (Art. 48). Forest management plans and operating plans (if harvest is to take place over more than one year) must be prepared and signed by a registered forest regent, and submitted by the land owner, with proof of land title or tenure, to the corresponding sub-regional INAB office for approval (GLF Art 49, 52; GFR Art. 36, 41, 42). Simplified forest management plans (<45 ha) must also be prepared by a forest regent, and follow the submission guidelines listed above (GFR Art. 42).

Once the Sub-Regional Office receives a management plan and the associated required documentation, the paperwork is submitted to the first of three reviews, as outlined by a forestry official (GAF2). An ‘administrative review’ is performed to ensure the plan meets all INAB requirements. Then a ‘judicial review’ is carried out to ensure that the title and other legal documents are in order. This is followed by a ‘technical review’, which is first carried out in office to assess the technical standards implemented in the plan development, followed by a mandatory field visit to verify that plan projections are consistent with the conditions in the field. If any modifications to the plan are required, INAB informs the landowner and forest regent, who must comply with the requested modifications before the plan is authorized. Once the plan meets all the requirements, and if necessary, all modifications, the Sub-Regional Director issues a final opinion to authorize the plan, which is submitted to the Regional Office for official authorization, along with the calculation of stumpage taxes due (GAF2). The Regional Director issues an official authorization of the plan as well as the License for Forest Harvest, which are released to the forest owner or regent upon payment of the taxes (GAF2; GFR Art. 37).

6.3.c.2 Processes for Verifying and Enforcing Forest Policy Compliance

As in Costa Rica, the authorization of forest management is only the beginning of forest policy execution outside protected areas in Guatemala. As described by a forestry official, once a forest management plan is authorized, the Sub-Regional Director is held responsible for monitoring the execution of the plan during- and post-harvest, for

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31 Harvest of 10 m^3 per year per property is permissible by law and requires authorization by the corresponding municipality (GLF Art. 54).
verifying and ensuring compliance with the forest activities approved in the plan and with forest legislation, and for confirming the establishment of natural regeneration within four years post-harvest (GAF2). Another forestry official indicated that INAB’s regulatory guidelines require quarterly visits by INAB officials to authorized forest harvests to monitor the progress of forest management plans (GAF1). Yet, he also noted that when resources are limited, Regional and Sub-Regional offices are given discretion to “prioritize site visits according to forest area, authorized volume, harvest time-frame, and most importantly, the degree of confidence local officials have in the integrity and capabilities of the forest owner and regent” (GAF1).

In addition to the oversight of authorized forest harvests delegate to INAB, forest regents (along with the forest owner) are held legally responsible for the compliance and correct execution of an authorized management plan under his/her supervision (GFL Art. 52). The Forest Law delegates forest regents with ‘authority’ over all technical forestry practices in the field and authority to prescribe necessary changes in forest operations that are to be considered mandatory by the forest owner and/or logger (GFR Art. 48). Forest regents are also required by law to prepare and submit quarterly reports on the progress of operations and to prepare and submit biannual reports on post-harvest silvicultural treatments and forest protection and regeneration measures to INAB (GFR Art. 48). INAB is required to verify these reports in the field, though as indicated by a forestry official, verification is largely determined on a purposive basis, “that selects for loggers, operators, or regents not known for their ‘trustworthiness’” (GAF2).

As noted above, other actors are involved in monitoring, verifying, and ensuring legal compliance of forest activities. These include the National Police Division of Nature Protection and the Municipal Forest Offices. The legal compliance of forest production outside protected areas is further enforced through timber transportation documentation, which is overseen and issued by INAB. Once the forest regent reports to INAB that authorized operations are coming to a close and transportation of timber is
about to begin, INAB prepares and issues a ‘Nota de Envío’ based on authorized the
timber volume. This document demonstrates a timber load's legality and must
accompany all transported wood from the forest to the point of sale or export (INAB
2004). The National Police or INAB personnel are designated the responsibility of
examining the transportation of timber at checkpoints or other places along
transportation routes to verify the legality of the timber and Nota de Envío (INAB 2004).

INAB responsibilities also include supervision of the wood processing industry and wood
exports to 'close the loop' on forest sector oversight. By law, timber mills must be
registered with INAB; maintain records of purchased and processed wood, including the
Nota de Envío, and provide quarterly reports on purchased wood (e.g. origin, harvest
authorization numbers), productivity, and outgoing products (GFL Art. 64; GFR Art. 56).
INAB is also permitted by law to enter any sawmill, at any time, and request the
documentation demonstrating the legal source for all wood products in the mill (GFL Art.
64). If illegal wood products are found, INAB can seize the products and press
appropriate charges. INAB is also charged with monitoring wood products exports
through mandatory reports from exporters on all exported wood products, volumes, and
copies of the original Nota de Envío or harvest authorization number (GFR Art. 58). In
theory, these two pieces close the loop on forest management control.

6.3.d Assessing Governmental Forest Policy Execution Outside Protected Areas
This section assesses the strengths and weaknesses of governmental forest
management policy execution in Guatemala. It is based on interviewees' perspectives
and opinions, as well as the theoretical constructs that informed this research. This
assessment also includes other governmental forest policy instruments in place for
regulating and promoting natural forest management.
6.3.d.1 Structures for Governmental Forest Policy Execution

As of 2007, INAB functioned as a truly autonomous, independent, and decentralized forest agency in practice, and not just on paper. Interviewees across the board, from forestry and other governmental officials, to forest experts, managers, owners, through to community organizers and forest certifiers specifically cited INAB’s autonomy and its decentralization as significant strengths of the agency and of state forest administration as a whole in Guatemala (19 out of 33 interviews). INAB has also benefited from leadership that is represented by key forest sector stakeholder groups, which has permitted a fairly broad and long-term vision for the agency. As noted by one forest expert: “the independent and integrated status and direction of INAB has lent strength to its institutional direction and permitted a continuity to the development and application of its policies, that is rarely seen in government in the region” (GE13).

6.2.d.2 Resources for Governmental Forest Policy Execution

With regard to the resources for executing governmental forest policy outside protected areas in Guatemala, many interviewees noted that the fact that the Forest Law designated a stable and secure budget source for INAB is a strong point for the agency, yet resources are still stretched thin (16 of 33 interviews). As one forestry official noted:

“Although INAB’s budget is fairly stable and has remained more or less fixed over the years (which doesn’t account for inflation), every day our budget is stretched further and further to meet to the ever increasing demand for services” (GAF1).

Another government official observed that: “While INAB is better off than most, it still does not have sufficient financial and human resources to implement and enforce forest regulations ‘all the time and everywhere’” (GOGN5). This is reflected by the vast area of forest to be covered by INAB in Region VIII (48,000 km²) that is designated 24 technical and field staff and seven pick-up trucks and ten motorcycles, which “is hardly sufficient”, as noted by a local forestry official (GAF2).
While INAB’s resources are generally considered to be limited, a broad range of interviewees described INAB staff as competent, dedicated, and having good relationships with their clients (GOGN1; GOGN2; GOGN5; GE1; GE7; GE10; GE13; GE14; GFM2; GC1). INAB personnel also indicated that managerial and field staff feel secure and motivated in their positions and have options for long-term employment, and even upward movement (GAF1; GAF2; GOGN3). However, one forest expert and a governmental official noted that many staff are “overworked” due to increasing requests for services and limited resources, resulting in the agency’s inability to fulfill “all of its legal responsibilities”, such as forest promotion and technical assistance within the sector (GE5, GOGN5).

6.2.d.3 Processes for Governmental Forest Policy Execution
With regard to the processes associated with forest policy execution outside protected areas, INAB has considerably detailed and standardized procedures and processes for authorizing, verifying and ensuring compliance of forest management. Two forestry officials described the standardization of harvest authorization and oversight procedures throughout the agency as a significant strength of the system (GAF1; GAF2). And, as noted by Contreras-Hermosilla (2002), standardization of procedures for forest policy execution permits a consistent application of forest legislation across the land and effectively reduces potential for anomalies, misinterpretations, and illegality. In the case of INAB, a standardized application of the law is facilitated by the decentralization of the agency. Additionally, the decentralization of decision-making powers has permitted some degree of discretion in the oversight process, increasing the agency’s capacity to work within the confines of limited resources. For example, as one forest official indicated, it was not uncommon to prioritize field visits during operations according to those which have not proven in the past to always be in compliance (GAF1). Nonetheless, limited funds can only be stretched so far, and it was also indicated by some forest experts, INAB has been unable to close the loop on forest administration and oversight in terms of their oversight of sawmills, which is reportedly minimal, and no
real system having been put into place to link data from harvest authorizations, to timber transport, to wood processing, to wood products exports (GE2; GE4; GE12).

With regard to the other instruments employed by the state to promote sustainable forest management outside protected areas, a broad and large majority of interviewees described the forest incentives program, PINFOR, as a strong tool for promoting forest sustainability throughout the country (23/33). In less than ten years PINFOR had enrolled over 60,000 ha of natural managed forest, as well as another 60,000 ha of protected natural forests and over 40,000 ha of plantations. Some forest experts also suggested that enrollment in PINFOR serves as an additional verification of legal compliance as it requires monitoring and evaluation beyond that required for authorized forest management (GE1; GE4; GOGN5). Nonetheless, PINFOR was also criticized by a few interviewees for not requiring funded forest management to go beyond regulation, particularly in terms of social or economic forest aspects (GOGN1; GOGN5).

On the other end of the spectrum, penalties for noncompliance with the Forest Law and related policy directives are rarely enforced, according to two forestry officials (GAF1; GAF2). As explained by one official: “Though penalties for forest transgressions are defined by law, they have been especially difficult to implement, in large part due to a failure or disinterest to apply the Forest Law within the justice system” (GAF1). For example, as reported by another forestry official, in Region VIII in 2006, INAB submitted six cases of forest crimes to the Ministry of the Public, yet as of 2007, no action had been taken on any of the cases, such that to date no penalty has been assessed for documented transgressions in the forest (GAF2). Overall, a range of interviewees (e.g. forestry and other officials, forest experts, regents) cited the lack of prosecution and penalty for forest-related crimes in Guatemala as one of a highly significant weakness in the execution of governmental forest policy directives for forests, outside, as well as within, protected areas (GAF2, GE3, GE4, GE7, GFM2, GGL1, GGN4).
6.3.e Organizational and Inter-Organizational Structure for Forest Policy Execution in Protected Areas in Guatemala

Now, turning to the structure for executing governmental policy on forest management within protected areas in Guatemala, the 1986 Protected Areas Law created the National Protected Areas Council (Consejo Nacional de Áreas Protegidas (CONAP)) as a state entity with “functional autonomy” that “depends directly on the Presidency of Republic” (GPAL Art. 59). CONAP has an Executive Secretary, selected by the President, who is designated to “provide leadership on policy-making and program implementation” (GPAL Art. 70). S/he is delegated the duties of proposing regulations for the protected areas system, executing the resolutions and directives of the Council, and directing the technical and administrative activities of the agency and the protected areas system, among others (GPAL Art. 70).

CONAP is also led by a multi-stakeholder Council, that is presided over by the National Environmental Coordinator, and comprised of a representative and an alternate from the National Environmental Commission; the Center for Conservation Studies; the National Institute of Anthropology and History; the National Association of Municipalities; the Guatemalan Institute of Tourism; the Ministry of Agriculture, Livestock, and Food (GPAL Art. 63). The Executive Secretary of CONAP participates on the Council, with a ‘voice but no vote’ (Art. 65). The Council’s responsibilities include the: formulation of policies and strategies for the conservation, protection, and enhancement of the national natural heritage through the SIGAP; approval of the regulations and norms for the SIGAP; and approval of harvest concessions within the SIGAP and monitor their compliance with the established regulations and norms (GPAL Art 69).

As of 2007, CONAP oversaw 162 legally protected areas within the Guatemalan National Protected Areas System (Figure 6.3), and was organized through a central headquarters in Guatemala City, eight regional offices throughout the country, one of which has two sub-regional offices, and various offices within protected areas (CONAP 2008).
The Central Office has several technical divisions in charge of thematic areas such as Conservation, Wildlife, Indigenous Groups and Civil Society, and Forest Management. The Central Office Forest Management Division supervises the development and legal
compliance of forest activities in protected areas, advises the Council on current and future forest activities within the SIGAP, and maintains a registry of forest regents working in protected areas, among other duties (CONAP 2008).

As described in Chapters 4 and 5, forest management is largely centered in the forest concessions of the Maya Biosphere Reserve, which fall under CONAP’s Region VII office and two Sub-Regional Offices (i.e. in Sayaxche and Poptun). These offices each have a Forestry Department with designated responsibilities that include: the oversight of community and industrial forest concessions; authorization and oversight of wood and non-wood products permits; evaluation and verification of legal compliance of natural resource management; and technical assistance in the prevention and control of forest fires throughout the reserve (CONAP 2008).

Other actors and organizations delegated responsibilities in the oversight of forest management in protected areas in Guatemala include the forest regency system, which as explained above is intended to support governmental forest regulation in Guatemala. The Protected Areas Forest Administration Manual and the MBR Master Plan (as well as the Forest Law) require that a registered forest regent prepare forest management and operational plans, as well as oversee the correct application of authorized plans in forest concessions (CONAP 1999b). Forest regents working within protected areas must be registered with and are overseen by CONAP. Regents may also work outside protected areas, but must be registered with and are then overseen by both CONAP and INAB.

The National Police Division of Nature Protection, in coordination with INAB and CONAP, is delegated to patrol, monitor, and report on all forest activities throughout the country, as well as monitoring the legality of transported forest products (World Bank 2006). The judicial system is responsible for assessing penalties for prosecuted forest-related crimes. Finally, with particular regard to the Maya Biosphere Reserve, technical assessment and accompaniment of community forest concessions by a technical NGO is
mandated by the MBR Master Plan, and all forest concessions are required to obtain and maintain FSC third-party certification (CONAP 1992).

6.3.f Resources for Executing Forest Policy in Protected Areas in Guatemala

6.3.f.1 Financial Resources

Still in force in 2007, the Protected Areas Law designates that CONAP’s budget is to be derived from “an annual allocation, determined by the state, and the product of donations from individuals, friendly countries, and international organizations” (GPAL Art. 59). The budget is also supplemented from taxes charged for wood and non-wood product harvest permits (Sandoval 2001). And, as indicated by protected areas officials, CONAP’s funds are allocated to and managed from the Central Office, such that the budget is essentially centralized (GAF3; GAF4).

CONAP’s annual budget in 1999 was US$3.95 million (Q28.65 million), and in 2006 the budget was US$4.26 million (Q33.74 million) (Sandoval 2001; CONAP 2007). In local currency this is an average annual growth rate of about 2.54%, but only a 1.12% average annual increase in US currency, given the decreasing value of the quetzal to the dollar. In 2006, 60% of the overall budget was dedicated to salaries and 40% to operations. Twenty-two percent of the 2006 budget was invested in the Maya Biosphere Reserve (CONAP 2007), though the Reserve represents more than 80% of the total land area in the SIGAP (GCCF2).

In addition to governmental allocations and international assistance or donations, CONAP’s budget is augmented by taxes collected from natural resource harvest permits within protected areas (e.g. timber, non-wood resources like xate, chicle, and pimienta). From 1994 to 2004, CONAP collected an estimated US$1.77 million (Q13.5 million), which is an average of US$177,460 per year during that time period (Rodriguez Quiros 2005). In 2007, CONAP collected an estimated US$460,000 (Q3.5 million). As pointed out by one official, the increase in collected taxes was largely due to timber operations in
12 forest concessions (whereas in the late 1990s only a few concessions were on-line) (GAF4). By law, the taxes collected by CONAP are to be reinvested proportionally into the regional offices from which they were collected. However, as noted previously, CONAP’s budget is largely centralized (GAF3; GAF4).

6.3.f.2 Human, Material, and Technological Resources

In 1999, CONAP employed 774 people, 18% of which were administrative personnel, 68% technical personnel, and 8% management (Sandoval 2001). It is not clear how many of these staff were dedicated to forest use matters. Agency numbers have increased slightly over time. Today, there are a total of 814 persons employed by CONAP, 173 are technical personnel, 118 are administrative, 12 work in operational aspects, and 511 are park guards (CONAP 2007). Of the administrative and technical staff, CONAP’s central forestry department office consists of one director, one administrative assistant, and four technicians who oversee programs related to mahogany CITES II listing, forest fires, management norms, environmental services payments proposals, and other issues. For the most part, central office forest staff carry out administrative and political functions, and do not carry out field work (GAF5).

In CONAP Region VIII with oversight of the MBR, the Department of Forestry encompasses one Director, one Sub-Director, three forest technicians, two field assistants, and one administrative assistant. In the two Region VIII sub-regional offices, there is a Director, a Sub-Director, and four field technicians in each office. As for forest equipment and tools for forest administration and oversight, according to one local official, Region VIII is “significantly limited in terms of the tools necessary for forest management oversight” (e.g. computers, field equipment, GPS units, etc.) and has one 4x4 pick-up and six motorcycles, “most of which are not suitable to take into the field” (GAF3). Similar to SINAC agents in Costa Rica, as reported by protected areas officials and a certifier, CONAP depends in large part on its own constituents (i.e. forest
concessionaires), technical NGOs, or on certification auditors for transportation to the field for operational and other evaluations in the forest concessions (GAF3; GAF4; GC1).

6.3.g  Processes for Governmental Forest Policy Execution in Protected Areas

6.3.g.1  Processes for Authorizing Forest Management

The Protected Areas Law and its Regulations establish the possibility and rules of forest use throughout the SIGAP. The Manual for Forest Administration in Protected Areas, along with a specific protected area’s Master Plan regulate how forest management is planned, authorized, carried out, verified and enforced. This section focuses on processes for executing forest management policy directives associated with the forest concessions in the MBR, as this is where a large proportion of forest production takes place within the larger system.

As outlined in Chapter 5, the Manual for Forest Administration and the MBR Master Plan indicate that all forest management planning tools (e.g. general forest management plan, annual operating plan, plan quincenal) must be developed and overseen by a registered forest regent. The Manual for Forest Administration further establishes that general forest management plans and the five-year updates must be authorized by the CONAP Council if more than an average of 5,000 m$^3$ per year is planned for harvest, and by the Executive Secretary if less than 5,000 m$^3$ per year is planned for harvest (CONAP 1999b). Once the general forest management plan is authorized, the corresponding regional office, which is the Region VIII office in the case of the forest concessions of the MBR, is delegated with authority to authorize and oversee the annual operating and other developed plans (CONAP 1999b).

For the authorization of the annual operating plan, which is the essential planning tool for timber extractions, a representative of the forest concession or the associated forest regent submits the prepared plan to the Region VIII Forest Management Department. As explained by forest concessionaires, forest regents, and protected areas officials, the
annual operating plan is submitted to an extensive in-office and field evaluation prior to authorization (GCIF1; GFM1; GAF3; GAF4). According to the Manual and a protected areas official, the first step in the in-office review is an administrative assessment of the operating plan to ensure that all the proper documentation and components are present (GAF4; CONAP 1999b). If the plan passes this step it receives an ‘administrative authorization’ to proceed through the process. The second step is an in-office technical review that encompasses an assessment of planning practices, forest data, calculations, etc., as well as a GIS assessment and evaluation against the authorized general forest management plan and environmental impact assessment. The third step consists of a site visit to ascertain that what is presented in the plan coincides with the conditions in and state of the forest (GAF4ñ CONAP 1999b).

The Manual provides detailed guidelines and prescriptions of forest resource and planning aspects to consider and assess in the field (e.g. trees marked for harvest are not within riparian protection zones; seed trees are marked and protected in the field; road design is best suited to the distribution of harvest trees and protection zones, etc.). If any modifications are required, based on the in-office and/or field review they are presented to the forest regent for revision. Once the technical requirements are satisfied, a technical authorization is emitted. The fourth step is a legal review of the plan, satisfaction of which results in the legal authorization of the plan. With the administrative, technical, and legal authorization of the annual operating plan, the fifth and final step is the authorization of the forest harvest license, which is released to the concessionaire upon payment of the estimated forest taxes (GAF4; CONAP 1999b).

6.3.g.2 Processes for Verifying and Enforcing Forest Policy Compliance
As with the other processes examined thus far, the authorization of a forest harvest is just the first step in the governmental processes for forest policy execution. The Manual for Forest Administration requires that CONAP carry out at two field visits in addition to the pre-harvest/authorization visit, one during- and one post- harvest (CONAP 1999b).
Inspections during operations include an assessment of reduced-impact logging techniques such as tree felling; review of road construction; protection of seed and residual trees; solid waste disposal; location of logging decks; etc. (GAF3; GAF4; CONAP 1999). If necessary, modifications and/or corrections to harvest practices and procedures are presented to the forest regent and required for continued operation. If serious transgressions are discovered, they must be presented to the legal department, and may result in the suspension of operations (CONAP 1999b). Yet, as indicated by one protected areas official: “These evaluations during harvest operations are focused primarily on assessing adequate field operations and determining if, where, and how improvements can be made, and are much less focused on uncovering and prosecuting poor plan implementation” (GAF4).

The post-harvest evaluation focuses on harvest impacts, and includes an assessment of seed tree protection and condition; wood waste left in the forest; protection zones around waterways and around archeological sites; among other aspects of the managed forest and practices, as explained by protected areas officials and indicated in the Manual (GAF3; GAF4; CONAP 1999b). If transgressions are found, they could result in required modifications to future operating plans, and if they are grave transgressions, they are presented to the legal system for examination and possible prosecution. In addition, as noted by one protected areas official, given limited resources and seasonal time constraints, the post-harvest inspection is sometimes carried out in conjunction with the next pre-harvest inspection (GAF4).

In addition to CONAP’s evaluation of harvest operations, as in Costa Rica and in forests outside protected areas in Guatemala, the forest regent is responsible for overseeing correct application of authorized harvest plans in forest concessions. The forest regent is typically in the forest for much of, if not the entirety, of the operations process. Moreover, the forest regent has legal authority to determine necessary changes during operations to meet legal compliance with the authorized plan and forest policy.
directives, which are obligatory by law. The regent is also responsible for reporting any anomalies to CONAP (CONAP 1999b). Third-party FSC certification is an additional instrument to verify and ensure legal compliance and other measures of sound forest management in the concessions (see Chapter 8 for detailed discussion of this process).

CONAP also exercises oversight of forest use in protected areas through the control of the transportation of approved forest products. Transportation of timber from protected areas is controlled by *Guías de Transporte de Vida Silvestre Maderable* (GPAR Art. 67; CONAP/INAB 2004). These documents are issued by CONAP for each truckload of wood from an authorized operating or harvest plan from forests within protected areas (GPAR Art. 66). If the wood is to be transported out of the protected area it must also be accompanied by a *Nota de Envío* from INAB, who issues this document based on the volumes in the harvest plan authorized by CONAP. All wood products from natural forests from protected areas that leave the boundaries of the protected area must be accompanied by a *Guía de Transporte de Vida Silvestre Maderable* and a *Nota de Envío* to the point of sale, storage, or export and must be available and presented when requested by recognized officials (e.g. National Police) at checkpoints or other places along transportation routes (CONAP/INAB 2004). Essentially, CONAP's oversight of forest administration in protected areas extends through the issuance of the *Guía*, from there the control of the wood products processing industry is the responsibility of INAB, as explained above (CONAP/INAB 2004).

6.3.h Assessing Governmental Forest Policy Execution in Practice in Protected Areas in Guatemala

6.3.h.1 Structures for Governmental Forest Policy Execution

As of 2007, CONAP, by law, was a ‘functionally autonomous’ agency that was also a dependency of the President of Guatemala. The Protected Areas Law also establishes the decentralization of agency offices and functions. With regard to this structure, a range of interviewees (e.g. forest experts, managers, and other government officials)
considered CONAP’s dependence on the Presidency as a significant source of weakness in terms of policy development and execution (GE10, GE11, GE5, GE6, GFM2, GFM3, GOGN1). As one forest expert noted:

“By depending on the Presidency, CONAP is by its very nature extremely reliant on the will of the administration in power, and thus, is not autonomous at all in its policies or its programs” (GC1).

On the other hand, one forest expert suggested that CONAP’s ties to the Presidency can be beneficial if and when the President is sympathetic to the protection and/or sustainable use of resources in the protected areas system, though this expert also noted that, to date, this had seldom been the case (GE10). This expert also noted that while the Council was meant to provide leadership to CONAP from a multi-stakeholder perspective, decisions by the Council have often been “trumped by pressures from the Presidency, which are influenced by outside political pressures” (GE10). Another forest expert in reference to the dual leadership of CONAP by a Council and Executive Secretary, described the agency as a “two-headed monster that is usually pulled in two different directions”, resulting in little progress over time towards overall agency goals (GE14). A wide range of interviewees including forest experts, managers, regents, certifiers, and industrial and community concessionaires, also described CONAP as highly centralized agency in terms of decision-making and financial control (GC1; GCCF2; GE5; GE6; GE10; GE11; GFM2; GFM3; GOGN1).

In contrast, the Region VIII Office of CONAP, charged with oversight of the Maya Biosphere Reserve and its forest concessions, was considered by many to be an exception to the overall agency characterization, and was described as demonstrating a notable degree of autonomy in local decision- and policy-making (though not in budget terms) (GAF3; GAF4; GE13; GOGN4; GOGN5). Some explained that the degree of autonomy exercised by CONAP’s Region VIII offices was attributable to their oversight of the forest concessions, not found throughout the protected areas system (GOGN4; GOGN5), yet others also noted that the region had more autonomy due to the large
geographical distance between Region VIII and the Central Office (GAF3; GAF4; GE13). Ultimately, CONAP’s overall structure presented obstacles to the execution of its overall policies and functions, yet the development and execution of policies for forest management in protected areas, and in the forest concessions of the MBR in particular, have benefited from a de facto form of decentralization and autonomy.

Other structural factors in the execution of forest management policy in the MBR included the incorporation of non-governmental actors or organizations, such as the requirement for community forest concessions to maintain technical accompaniment or assistance by an NGO. According to Gomez Caal (2006), this requirement was intended to ensure the sound management of the natural and financial resources of the forest communities. Moreover, Nittler and Tschinkel (2005: 11) suggest that “in essence, CONAP delegated to NGOs much of the technical assistance and quality control it was unable to perform itself.” And, with regard to the requirement for FSC third-party certification of the forest concessions, two forest experts explained that when this requirement was first established, certification was seen as a mechanism to independently verify sound forest management on State lands, as well as a means to verify the adequate execution of related laws and regulations by CONAP (GE4; GE7). As of 2007, protected area and other officials indicated that third-party FSC certification has become a key component in the oversight of the forest concession system that has not only produced improvements in overall forest management, but has also validated the agency’s execution of protected area forest management policy directives (GAF3; GAF4; GAF5; GOGN2).

6.3.h.2 Resources for Governmental Forest Policy Execution

With regard to the resources for executing governmental forest policy in protected areas, as of 2007 there was not a clear legal mandate establishing a baseline for the generation of CONAP’s annual budget. As a result, as described by one forest expert: “CONAP’s annual budget has never been near sufficient, and tends to stay the same, if
not decrease. ...What’s more, the agency has to fight every year for the little bit that they do get” (GC1). A broad majority of interviewees in Guatemala described CONAP’s budget (or lack thereof) as a significant, if not the biggest, weakness in the execution of agency policies and programs, particularly considering the vast expanse of land under CONAP’s supervision (25 out of 33 interviewees). Moreover, as noted by one forest expert, given CONAP’s limited budget and leadership that changes at least once with every administration), staff positions were often left underfunded and unstable, and with few opportunities for support or training (GC1). Additionally, as noted by other forest experts, CONAP has not had a very positive public image, which they suggested was correlated with publicized instances of uncontrolled human activity and settlements throughout the protected areas system, which result in large part from a severe lack of resources to monitor and manage the system (GCCF1, GE9). One forest expert also indicated that: “While there is a scarcity of resources in CONAP, there is also poor management and prioritization of what the agency does have such that the most important aspects of protected area management (i.e. monitoring, systematization) are not even prioritized” (GFM1).

Despite limited resources and other structural obstacles, a broad range interviewees indicated that CONAP personnel overall were capable and dedicated, particularly those employed in the Forest Department Region VIII Offices (19 out of 33 interviewees). Many interviewees (e.g. forest experts, managers, concessionaires, other government officials) also described CONAP staff in charge of oversight of the forest concessions in the MBR as competent, committed, and having benefited from some degree of autonomy in the development and execution of forest management policies (GCCF1; GCCF2; GE5; GE7; GE11; GFM1; GFM2; GFM4; GOGN1; GOGN4; GOGN5). Several of these interviewees also indicated that local CONAP officials (i.e. in Region VIII) have been very collaborative over the years in the development, dissemination, and technical assistance related to new policies, applications, or guidelines for forest management in the forest concessions (GFM1; GE7; GE11). As one forest manager noted: “Even with
their minimal budget and personnel, CONAP (in Region VIII) is available to support the concessions system in terms of training, finding equipment, border protection, etc.” (GFM1). Others also noted that CONAP Region VIII and its Forest Department have benefited from long-term external and international financial and technical support for the sustainable development of forest use and practices in the forest concessions (described in Chapter 4) (GE5; GFM2; GOGN1; GOGN4; GOGN5).

6.3.h.3 Processes for Governmental Forest Policy Execution
In terms of the processes in place in 2007, for executing governmental policy on forest management in protected areas, this discussion is largely focused on those in place in the MBR. Several interviewees, including forest experts, managers, and regents indicated that CONAP Region VIII has worked with academic and research organizations to find ways to simplify the very complex process of planning tropical forest harvests, while incorporating much of the state of the art knowledge on the foundations of forest sustainability (GE7; GE9; GE11; GFM1; GFM2). As described by Nittler and Tschinkel (2005), “In general, the guidelines for forest management and operational plans (in Region VIII) have evolved to a level of sophistication which, if followed, is almost certain to assure the sustained management and long term conservation of the forest.”

Forest experts and forest regents also noted that the processes in place for authorizing and overseeing forest harvests in the concessions are considerably thorough and effective (GE7; GE9; GFM1; GFM2; GFM4). As noted by one forest expert, “Despite weaknesses associated with financial and other resources, CONAP (Region VIII) is very effective in facilitating, reviewing, authorizing, and overseeing the forest management planning process” (GE9). As for the role carried out by forest regents in forest management oversight, while one forest expert noted that there is always the potential for a conflict of interest between the regent’s duties and his/her allegiance to the concessions (that pay them) (GE8), a broad range of interviewees described the forest regents working in the forest concessions in the MBR as capable, competent, and
scrupulous actors (GAF3; GAF4; GE4; GE5; GE7; GE8; GE9; GE11; GCIF1; GCCF1; GC1). Protected area officials also noted good working relationships between the forest regents and their concession groups, as well as between the regents and CONAP Region VIII officials (GAF3; GAF4).

As for the enforcement of policy directives on forest management and use in protected areas in Guatemala, though forest-related crimes and penalties are defined by law, a number of interviewees (e.g. protected area officials, forest experts, managers, and regents, and forest concessionaires) noted that that there has been a near absence of enforcement and prosecution of these laws that results in little deterrence for forest-related crimes and was noted as a significant weakness in the overall execution and uptake of forest policy, particularly in protected areas (GAF3; GAF4; GCCF1; GCIF1; GE10; GE13; GOGN4). As explained by one protected areas official, “CONAP does not have legal authority to remove squatters or invaders, which have become a problem in some of the forest concessions (as well as in the nucleus zones), and the police and judicial system have almost entirely, failed in terms of upholding and enforcing the laws against invasions, especially in forest concessions” (GAF3). This was also noted by a range of interviewees (i.e. another protected areas official, a forest concessionaire, a forest regent, and forest experts) (GAF5; GCCF1; GE7; GE10; GE13; GFM2; GOGN4). As one forest expert noted, “In Guatemala, there is no political will for controlling forest invasions and illicit acts, especially in public lands, partly because the government doesn’t know what to do with, and more importantly, where to put, these people, especially when they are poor and hungry” (GE10). And, the failure to enforce the law was troublesome to some forest concessionaires as well, as explained by one:

“We have worked hard to be in compliance with and go beyond the law, but, for example, when we have had problems with squatters, and reported these to state officials they have been very slow in assistance and in enforcing the law on them (the squatters). This reflects a lack of respect and understanding for the concession contract, which is between the concessionaire and the state, and both have responsibilities to comply with the law.” (GCCF1).
The 2004 Guatemalan National Forest Agenda (ANF 2004), described the justice system as ineffective in forest-related matters due to an overall lack of action by the Public Ministry and the Judicial Branch to the prosecution and penalty of forest crimes. It was also noted that in the few cases from the forest concessions (e.g. for forest invasions) brought before the court there was no resolution due to a poor understanding of the content of the related laws and legal contracts by some district and departmental judges. Overall, the lack of law enforcement appeared to represent a gap in the regulation and promotion of sustainable forest management within and outside protected areas in Guatemala.

6.4 Governmental Forest Policy Execution in Nicaragua

6.4.a Organizational and Inter-Organizational Structure for Forest Policy Execution

Still in force in 2007, the 2003 Nicaraguan Forest Law (No. 462) designates the Ministry of Agriculture and Forestry (MAGFOR) with the responsibilities of “formulating forest policy and norms, supervising forest promotion programs, maintaining and sharing information about the forest sector, and defining the reference prices for timber species and products” (NFL Art. 6). The Law also designates the National Forest Institute (Instituto Nacional Forestal (INAFOR)) as a ‘semi-autonomous’ agency within MAGFOR in charge of authorizing and overseeing forest activity in Nicaragua (NFR Art. 2).

According to the Forest Law, decentralization of the forest administration agency “facilitates and improves attention to the forest resource end-user” (NFR Art. 12). As such, the Forest Law directs INAFOR to develop and carry out its functions “through decentralized forest districts, in which Mayoralities, Regional Councils, local universities, the National Police, the National Army, the Ministry of Education, the Ministry of Environment and Natural Resources, and forestry groups participate in district level forest activities” (NFL Art. 7). As of 2007, INAFOR was organized through a central headquarters in the capitol, Managua, and ten forest districts, which represent “a
decentralized administrative- and technical- operating unit” (INAFOR 2008: web) (Figure 6.4). District offices are intended to provide a permanent agency presence through a District Delegate, who coordinates forest activities in the municipalities with other forest-sector institutions and local organizations (NFR Art 12-13). Each forest district is led by a District Delegate, who, along with his/her staff (i.e. the district delegation) are responsible for executing governmental forest policy directives and coordinating the other organizations and actors involved in forest activity and monitoring. The district delegation has local authority in decision-making and actions related to forest activity authorizations and oversight (INAFOR 2008 (web)).

Figure 6.5 National Forest Institute Forest Districts (I – X) in Nicaragua (INAFOR 2008)

INAFOR’s responsibilities include: “the authorization of forest harvest permits and supervision of their execution; development of technical norms for forest management and their proposal to MAGFOR; and accreditation of Forest Regents and Municipal Forest
Technicians” (NFL Art. 7). A National Forest Registry Office was also established within INAFOR by law to track and monitor forest-related policy and information (NFL Art. 8).

The Forest Law also institutionalizes the participation of the autonomous regional governments, municipal governments, and civil society in forest policy development and its oversight. The National Forest Commission (Consejo Nacional Forestal (CONAFOR)) is defined by law as a forum for forest sector stakeholders to participate in the formulation, approval, and monitoring of national forest policy, strategy, and norms (NFL Art. 5). The Commission is presided over by the Minister of Agriculture and Forestry, and includes the Minister of Environment and Natural Resources; the Director of INAFOR; the Minister of Industry and Commerce; the Minister of Education, Culture, and Sports; and representatives of the Northern and Southern Atlantic Autonomous Regional Councils, forest industry, forest community groups, environmental NGOs, the National Police, and the National Army, among others. The Law also calls for the formation of Regional, Departmental, and Municipal Forest Commissions in Nicaragua’s autonomous regions, departments, and municipalities to coordinate with CONAFOR and with INAFOR in the development and monitoring of forest conservation, promotion, and policy throughout the country (NFL Art. 5).

Other actors and organizations with designated roles and responsibilities in forest policy execution in Nicaragua include the figures of ‘forest regent’ and ‘forest auditor’. As in Costa Rica and Guatemala, forest regents as well as forest auditors are defined as professional or technical foresters accredited by INAFOR who are given public trust to guarantee the proper execution of authorized forest harvests (NFL Art. 9). According to the Law, the Forest Regent is to be contracted directly by the forest owner to oversee forest plan development and operations, and the Forest Auditor is to be contracted by INAFOR to evaluate the execution of forest planning and harvests in the field (NFL Art. 9). The Law also requires the National Army and National Police “to collaborate with INAFOR in overseeing compliance with the Forest Law and related legislation” (NFL Art. 32)
6.4.b Resources for Governmental Forest Policy Execution in Nicaragua

6.4.b.1 Financial Resources
With regard to financial resources for forest policy execution in Nicaragua, the Forest Law establishes a timber harvest tax (pago por aprovechamiento), of which 35% of the collected taxes are designated to go to the local mayoralties (i.e. municipalities and regional governments), 50% to the National Forest Development Fund for forest incentives, and 15% to the National Treasury (NFL Art. 49). The Law further stipulates that the General Budget should allocate to INAFOR “either 50% of the collected income taxes from the forest sector, or 50% of the 15% of collected forest use taxes, whichever is greater” (NFL Art. 61).

In 2007, INAFOR’s budget totaled US$4.2 million (C82.44 million), including US$1.67 million (C32.885 million) (36%) from the General Budget and another US$2.53 million (C49.555 million) (64%) from cooperative funding (principally from a joint initiative between Switzerland, Sweden, Norway and Finland) (INAFOR 2007). Additionally, in 2006, INAFOR (2007) collected approximately US$252,000 (C$4.671 million) from timber harvest taxes and approximately US$28,000 (C$514,217) in fines for forest transgressions.

6.4.b.2 Human, Material, and Technological Resources
Regarding INAFOR’s human resources, in 2007, INAFOR employed 301 people (INAFOR 2007). Ninety-four of those employees worked in the central office, approximately 25% in leadership positions, and the remaining 75% were technical and administrative staff (INAFOR 2007). In 2007, there were 10 Forest District Delegates, 62 Municipal Forest Delegates, and another 96 people working throughout the District offices. An additional 39 people worked in specific programs or projects, such as the National Forest Seed Bank (INAFOR 2007).
As an example of district-level human resources, District 1 covers two municipalities (Waspan, Puerto Cabezas) and a total of 14,118 km². As reported by a forestry official, in 2007, the District Delegation included a District Delegate, two Municipal Delegates, and five forest technicians for the total area, one 4x4 pick-up truck and five motorcycles to cover the territory. The official also reported that the Delegation had some forest equipment, (e.g. four GPS units, dasometers, digital cameras, first aid kits, etc.), most of which had been donated by international assistance programs, however there was not enough equipment to ‘adequately’ equip each office or staff member (NAF4). INAFOR Forest District 1 includes two municipal forest offices in Waspan and Puerto Cabezas. In 2007, the Waspan Municipal Office, which oversees 8,133 km² of territory was staffed with a single Municipal Delegate. As reported by a forestry official, this Municipal Office has two motorcycles, “though only one was suitable for site visits”, but did not have a boat or water transportation and many forest operations in the region are not accessible by land; nor “basic administrative equipment necessary for forest oversight, such as a laptop and first aid kits for carrying out the basic agency functions” (NAF2).

6.4.c Processes for Governmental Forest Policy Execution in Nicaragua

6.4.c.1 Processes for Authorizing Forest Management

As described in Chapter 5, the Nicaraguan Forest Law, Regulation, and Technical Norms defined the requirements and guidelines for authorized natural forest management, which escalate in rigor according to forest size (i.e. < 10 ha; 10-50 ha; >50 ha). These policy directives also mandate that an accredited forest regent prepare and oversee all forest management planning and operations (NFR Art. 47). The Law mandates that all forest harvest plans be submitted to the corresponding INAFOR Forest District Office, which is responsible for their “authorization and oversight of compliance” (NFL Art. 21). According to the Forest Regulations and Technical Norms, harvest plans for forests less than 50 ha (i.e. forest fragments) must be reviewed by the INAFOR District Office to ensure compliance with the associated policy directives and guidelines, however the Regulations do not require INAFOR to carry out a site visit prior to plan authorization.
(NFR Art. 48). Upon authorization, the forest harvest permit is released to the forest owner once the harvest taxes are paid and the forest regent is responsible for oversight of legal compliance of operations in the field.

For the authorization of harvests in natural forests greater than 50 ha, INAFOR is required to carry out an evaluation of the harvest plans in-office and in the field. Once the general forest management plan, first annual operating plan and other required documentation (e.g. proof of land title/tenure) are submitted to the Forest District Office, the District Office provides a copy of the documentation to the local Mayor’s Office, and the Regional Council’s office in the case of the Autonomous Regions, for simultaneous review (NFR Art. 49-50). As described by a forestry official, INAFOR’s review process begins with an in-office administrative assessment of the plans to ensure they meet the related requirements, which is followed by a review of the legal aspects of the plans and associated documentation (NAF3). If the plans pass these steps, they are submitted to an in-office review of the technical aspects (e.g. forest inventory data, harvest calculations) and consistency of the plans with the Law, Regulations, and Technical Norms. The local government office(s) carry out in-office reviews of the forest management and operational plans based on administrative, legal, and technical guidelines as well, though INAFOR is responsible for ensuring the plan’s compliance with governmental forest policy directives (NFL Art. 7). As explained by a forestry official, if there are any required modifications to the plans based on the in-office reviews these are present to the forest owner or regent, and if significant, must be modified prior to further action on the part of INAFOR (NAF3).

Once a plan(s) passes through the in-office reviews, INAFOR is required to carry out a site inspection of the area to be harvested (NFL Art. 7) (e.g. checking forest boundaries, trees marked for harvest and for protection; protection zones; roads; etc.). As noted by a forestry official, though not required by law, INAFOR generally requests the presence of a representative from the local government office(s), the police, and the army, during the
site evaluation “to promote increased inter-institutional coordination and understanding of the specific forest management plans, site, and conditions” (NAF3). Any required modifications in the field are presented to the forest regent and must be met prior to authorization. Following the pre-approval site evaluation, INAFOR is required by law to coordinate a forum for public review of the plan, which may also result in the request for modifications to the plan prior to authorization. This is the final step in the authorization process, such that if the general forest management plan, operating plan, and associated documentation pass these stages, INAFOR issues an Official Act of Authorization, signed by the INAFOR District Delegate, as well as the local government office(s) (NFR Art. 51). The authorization and harvest permit are released to the forest owner or regent upon payment of harvest taxes (NFR Art. 88).

6.4.c.2 Processes for Verifying and Enforcing Forest Policy Compliance
The Forest Law designates INAFOR with ultimate authority over the verification and enforcement of regulatory forest compliance (NFL Art. 12), though once a forest harvest is authorized by INAFOR, oversight of legal compliance of operations in the field falls largely to the forest regent. As indicated in the Forest Law, “forest regents guarantee the execution of authorized forest management for INAFOR in conformance with the relevant laws and regulations,” (NFL Art. 9). Once a forest harvest is authorized by INAFOR, the corresponding Forest District Office monitors implementation of the harvest plan via progress reports from the forest regent. Forest regents are obligated by law to develop and submit monthly progress reports to INAFOR on forest harvest and wood products extractions, as well as develop and submit a final report of the overall implementation of the harvest plan (NFR Art. 26-27). As noted above, the Forest Law also defines the role of a forest auditor to evaluate the implementation of forest management and operating plans, as well as the work of forest regents, in the field (NFL Art. 9; NFR Art. 29). However, as of 2007, this component of the verification system had not been implemented. At the completion of an authorized forest harvest, INAFOR is also required to carry out a post-harvest site evaluation to assess adequate implementation of the
originally authorized plan, which is required for the authorization of future operating
plans, as noted by a forestry official (GAF3).

Other actors involved in the oversight and verification of forest regulatory compliance
include the Attorney General for the Defense of the Environment and Natural Resources,
the Environmental Prosecutor’s Office (a specialized unit for crimes against the
environment and natural resources), the National Army, the National Police, local
government, and civil society. The Attorney General’s Office of the Environment was
established under the Law of the Environment and Natural Resources (No. 217) and is
“in charge of representing and defending the interests of the state in environmental
matters,” as explained by a government official (NOGN1). This office investigates
environmental violations of the law (e.g. noncompliance with approved harvest plans and
permits), and when a law has been broken, brings up charges (i.e. administrative, civil or
penal) against the transgressor(s) (NOGN1). Administrative charges are reported to
INAFOR, civil charges are reported directly to the judicial system, and penal charges are
reported to the Environmental Prosecutor’s Office, who prosecutes environmental crimes
on behalf of the state in the judicial system, which is where penalties for proven forest
crimes are to be assessed (del Gatto et al. 2006).

Municipal governments are also involved in the oversight of forest activity. The Law of
Municipalities grants municipal governments the right to contribute to the “monitoring,
surveillance and control” of the rational use of the environmental and natural resources
in their jurisdiction (No. 466 Art. 7). Many municipalities exercise this function through a
Municipal Environmental Unit, a technical-operational entity that collaborates with the
municipal delegate of INAFOR in supervisory work of harvest permits, participating in
inspections and reporting infractions and illegalities (Barrios and Broegaard 2006). And,
as noted by a government official, in the two autonomous regions oversight of
environmental and natural resources is also carried out by Regional Councils’ Natural
Resources Secretariat (Secretaría de Recursos Naturales (SERENA)) (NOGL2).
By law, the Nicaraguan National Army and Police are also designated to provide assistance and protection against invasions or other illicit acts in approved managed forests and plantations (NFL Art. 18). The Army and the Police also coordinate with INAFOR field inspections and control of the transportation of forest products. This is largely exercised through control posts along transportation routes, at which Police or Army officials inspect wood products for proper documentation and are given the power to detain products that do not comply with the regulations. The Law Banning Logging, described in Chapter 5, expanded the role of both authorities in terms of forest surveillance, granting them power to provide “back-up to INAFOR in the effective application, surveillance, and control of the logging ban” (Law No. 585 Art 12). This Law also establishes a “restriction on the harvest of all forest species within 15 km of the national borders, to be under the control and surveillance of the Nicaraguan Army” (Law No. 585 Art.1).

In terms of the oversight and control of forest management and production, INAFOR also controls the transportation of forest products from the extraction site to the mill. According to the Forest Law (Art. 30) and Regulations (Art. 67), all transported forest products from natural or plantation forests must be accompanied by a timber transportation document known as a ‘Guía Forestal’ and a certificate of origin emitted by the corresponding INAFOR Forest District Office. The certificate of origin is stamped on each transportation tag, and indicates the authorized forest management unit from which the wood was extracted and includes the harvest permit authorization number. The number of transportation tags issued by INAFOR is determined by the projected volume of roundwood to be extracted (i.e. one transportation tag per every 10 m³ of roundwood) (NAR Art. 49). INAFOR provides the transportation documents to the forest regent or permit owner upon payment of forest use taxes (NAR Art. 49), and the regent is responsible for overseeing their adequate use. S/he fills in each tag, noting and coding the logs transported, and stamping and signing each tag, which holds him/her
responsible for its information (NAR Art. 50). The forest regent is required to maintain a log of used transportation tags (NAR Art. 79), and the forest harvest permit owner must submit monthly reports to INAFOR on the production and transportation status of approved wood products (NFR Art. 81).

INAFOR is also responsible for “promoting and coordinating the establishment of a network of timber transportation check points throughout the country” (NFR Art. 84). These are manned in coordination with the National Police and National Army (NFL Art. 31). All transported wood products must carry the corresponding certificate of origin and transportation tag, which can be requested by recognized officials at any checkpoint or elsewhere along transportation routes. Additionally, the Forest Regulations stipulate that wood products from authorized management plans may only be deposited in sawmills registered with INAFOR (NFR Art. 73). Registered sawmills (i.e. portable, permanent) must maintain an operational permit, that is renewed annually through INAFOR (NFR Art. 73). Primary transformation mills must obtain an official copy of the certificate of origin and transportation tag of all incoming wood products (NFR Art 75) and maintain logs of incoming and outgoing wood products, along with the transportation documentation, to be made available for inspection by INAFOR at any time (NFR Art. 79). Forest products processors must provide monthly reports on production status to INAFOR (NFR Art. 81). This system of documentation of wood harvests, sales, and processing is intended to be linked together for greater control and oversight of forest production in Nicaragua.

6.4.d Assessing Governmental Forest Policy Execution in Practice in Nicaragua

This section assesses the strengths and weaknesses of governmental forest management policy execution in Nicaragua. It is based on interviewees’ perspectives and opinions, as well as the theoretical constructs that informed this research. This assessment also ties in the other governmental forest policy instruments in place for regulating and promoting natural forest management in Nicaragua.
6.4.d.1 Structures for Governmental Forest Policy Execution

In Nicaragua, decentralization of INAFOR is intended to “permit an effective administration of the forest sector through an optimization of human, financial, and material resources, as well as through the active participation of local actors,” as stated on the agency website (INAFOR 2008: web). While INAFOR is logistically decentralized, forestry officials, a forest manager, and a forest regent indicated that agency finances and major decision-making, for the most part, have remained centralized (NAF2; NAF3; NFM3; NE1). Other interviewees noted that the lack of divested power to Forest District Delegations has further complicated agency control of the forest sector and its coordination with local government, military, police, and others. (NFM3; NFM4; NNCIF2).

A range of interviewees (i.e. forest experts, a forest manager, and forest owner) further indicated that while the Forest Law delegates ultimate authority over the administration of the forest sector to INAFOR (NFL Art. 12) and incorporates inter-institutional collaboration as a means to strengthen control of the forest production sector (NFL Art. 7), as of 2007, the lack of a clearly defined hierarchical integration of the various roles, actors, and organizations involved (e.g. regional councils, municipal government, State Attorney’s Office, National Military) has resulted in significant obstacles to the effectiveness of this collaborative approach to forest administration (NE1; NE2; NE8; NFM1; NNCIF1). As one forest expert noted: “There is significant overlap in responsibilities without any real leadership” (NE1). He and other interviewees indicated that this has led to a loss of autonomy and authority for INAFOR, which is linked to insufficient resources, but also to ambiguous rules on the distribution and sharing of power, with, for example, the National Army and the State Attorney’s Environmental Office (NE1; NFM3; NFM4). One forest manager explained:

“The Army says that INAFOR has the final word on forest oversight, but does not demonstrate this in practice. They stop truckloads of logs, with the correct paperwork, and question the species or volume or something else, but they are not adequately trained to identify or measure these things. Then, even when INAFOR comes and confirms that everything is in order, since they issued the permits and can identify species and estimate volume, the State Attorney has...”
stepped in to investigate because of questions by the Army. Then, the Army won’t let the truck go until the State Attorney and INAFOR Central validate the load – all of which takes too much time to corroborate, while it was all legal in the first place and just cost us literally thousands of dollars in the process” (NFM4)

6.4.d.2 Resources for Governmental Forest Policy Execution

With regard to the financial resources for INAFOR, though the Forest Law does define the source of funding (i.e. income tax or harvest tax on the forest industry, whichever is greater), as reported by forest officials and forest experts, for the first two or three years that the Forest Law was enacted (2003 – c.2005/2006), this resulted in a severe underfunding of the agency as the generation of funds was insufficient for basic operations and the sources were “not properly tracked” (NAF1; NAF4; NE1; NE5). As of 2006, INAFOR’s budget has been funded by a general budget allocation, as well as by international financial assistance. However, as noted by several forest officials, experts, managers, and owners, even with international assistance, INAFOR has been consistently and significantly underfunded since its inception, resulting in understaffing and insufficient material and technical resources to carry out day-to-day activities (NAF1; NAF2; NAF3; NAF4; NAF6; NCIF1; NE1; NE3; NE5; NFM1; NFM3; NNCIF2; NOGL1). As one forest expert noted: “There shouldn’t be any wonder how forest operations get away with major transgressions in the forest, given that INAFOR is bare-boned at best across the country” (NE1).

In terms of agency personnel, one forest owner indicated that:

“Apart from needing more financial, physical, and human resources to complete its functions, INAFOR has local officials that are dedicated and competent, who are sensitive to the local forest sector context, but have their hands tied by central authorities in terms of making any real or meaningful decisions to advance forest management” (NNCIF2).

Other forest owners and regents echoed perceptions that INAFOR personnel are, for the most part, competent and dedicated (NFM1; NFM2; NCCF1; NCIF1). However, other interviewees noted that INAFOR officials have been far from uncorrupt, and that many
have played a significant role in instances of illegal forest activities (NAF3; NE3; NE5; NE9). For example, CINCO/CIP0 (2006) report that during the 2006 State of Economic Emergency declared by then President Bolaños, it was demonstrated in an external audit of the agency that INAFOR had authorized more permits than it was capable of monitoring and that INAFOR staff were responsible for extending permits for harvest plans for forests less than 50 ha that had had little regulatory oversight and which were abused by loggers to extract mostly mahogany from large, continuous extensions of forest that should have been harvested through a general forest management and annual operational plans. Additionally, CINCO/CIP0 (2006: 2) reports that INAFOR ultimately “legalized illegal activities.” Media reporting on these and other forest transgressions in recent years in Nicaragua has led a mostly poor public perception of the agency, as indicated by a forest owner (NCIF1) and by CINCO/CIP0 (2006) and del Gatto et al. 2006).

6.4.d.3 Processes for Governmental Forest Policy Execution
As for the authorization, verification and enforcement processes in place to execute forest policies in Nicaragua, INAFOR’s harvest authorization system seems very clear, thorough, and inclusive on paper. Nonetheless, execution of these processes have been complicated in practice. As indicated by a forest owner and government official, scarce resources (i.e. financial, logistical, and human) often preclude pre-authorization forest site visits (NCCF1; NOGN1) or, as indicated by a forest expert they are not carried out effectively enough to corroborate planned actions and activities with forest conditions in the field (NE1). Moreover, of the three countries in this study, Nicaragua officially includes the largest number actors in the authorization of forest harvests. And, while this is intended to promote inter-institutional participation in and oversight of the sector, it all too often has resulted in significant delays in the process, due to the basic challenge of coordinating numerous actors in the authorization process, according to a forest official, expert, and owner (NAF3; NNCCF1; NE1). Or, as indicated by forest experts, managers, and owners, it is also attributable to numerous ‘authorizers’ who may
not sufficiently or wholly understand the forest management process itself, or the forest policy directives upon which legal forest management is assessed in Nicaragua (NE5; NE6; NFM1; MFN4; NNCIF1; NNCIF2).

Nicaragua’s forest policy directives on paper also seem to provide for a comprehensive system of verification and enforcement of legal forest management compliance as well, by incorporating an array of public figures at the centralized and local levels, as well as private operators, such as forest regents and forest auditors. Nonetheless, the potential effectiveness of the system is compromised at many points, largely due to a scarcity of resources for adequate implementation and oversight of the law. For example, forest regents are contracted directly by the forest owner or title holder (NFF Art. 9), and as noted by (Krauter et al. 2003), this implies a certain vulnerability of the regent to the socioeconomic interests of the client, which has been documented to play out in the field (CINCO and CIP 2006). And, without the invocation of the forest auditor figure, there is little oversight of the forest regents, especially in the field, as INAFOR is not required to carry out site visits during operations. One forest official indicated that, as a result:

“many forest regents found the path of least resistance and misused the small harvest permits (<50ha) to avoid rigorous requirements of the correct forest management plans. Today, INAFOR is in the process of cleaning-up the forest regent system, taking away the licenses of regents who have abused or broken the law, but it would be more efficient and effective to have oversight of them in the field” (NAF4).

As of 2006, INAFOR had also incorporated an external monitor, Global Witness Independent Forest Monitoring (IFM)\(^{32}\), to provide technical assistance and support for their oversight responsibilities in the forest sector. As indicated by one forestry official, since incorporating the assistance from IFM, INAFOR has made measurable progress in the evaluation of ongoing forest management (NAF6). And, as reported by Global Witness (2007:12), the agency has made significant strides in the “progressive institutionalization of forest monitoring activities within INAFOR. ... However, the agency

\(^{32}\) IFM is an independent third party, with recognized credibility that provides an assessment of legal compliance, and observation of and guidance on, official forest law enforcement systems.
must play a more active role in subsequent stages of the process such as follow-up on forest transgressions and improving evaluation transparency” in order to regain control and oversight of the forest sector.

Although crimes and penalties are defined in the Forest Law and elsewhere, overall, there has been minimal enforcement of these through the judicial system. According to two government officials, since the enactment of the Forest Law in 2003 through 2007, no guilty verdicts had been made in relation to prosecuted forest crimes (NOGN2; NOGN3). Additionally, according to (CINCO and CIP 2006: 5), in 2005, for example, INAFOR opened 100 administrative processes (i.e. investigation into suspected transgression in forest activities), 70 of these were followed-up by the Environmental State Attorney, though not one made it to trial, “indicating the lack of oversight and the climate of impunity in the forest sector”. Nonetheless, INAFOR has taken corrective action in the case of forest transgressions. In 2007, INAFOR opened 83 administrative processes, applying administrative sanctions in 52 cases, and resolving a total of 65 of these processes (INAFOR 2007). Six cases were submitted to the Environmental State Attorney (INAFOR 2007), though it is unclear if these were brought to court.

Finally, with regard to other governmental policy instruments for regulating and promoting forest management in Nicaragua, though the Forest Law calls for the creation of incentives, these had not been implemented or dispersed for natural forest management as of 2007. The Forest Law also delegates INAFOR to provide and coordinate technical assistance to the forest production sector, though several forest owners, managers, and regents indicated they had received little if any technical assistance from INAFOR (NFM1; NFM3; NFM4; NNCIF1; NNCIF2; NNCCF1; NNCCF2).

6.5 Chapter Wrap-Up

Table 6.2 summarizes some of the key aspects of the structures, resources and processes for executing governmental forest management policy directives in Costa Rica, Guatemala, and Nicaragua from this chapter. The remainder of this section
highlights some of the obstacles and opportunities for effective forest policy execution in each country. In Costa Rica, impediments to effective governmental forest policy execution include the lack of autonomy of the regulatory forest agency; lack of standardized procedures for verifying and enforcing legal compliance in authorized forest operations; limited financial and material resources; and poor enforcement of the forest law in the judicial system, which has lead to little deterrence against forest-related crimes. In addition, there are few other governmental policy instruments in place for regulating and promoting forest management in Costa Rica, other than command-and-control (e.g. no incentives for forest management). Forest policy and instruments in Costa Rica are more oriented towards protection rather than production. There are some recent advances in the execution of regulatory forest policy in Costa Rica, much of which resulted as a response to inadequate oversight of non-forest timber harvest permits and their abuse. These include the utilization of georeferencing techniques to determine proper forest land use for harvest authorizations. Forest regulatory execution is also facilitated by a forest regency system with independent oversight and forestry NGOs that have significantly contributed to technical forestry assistance and promotion.

In Guatemala, while there are obstacles to effective execution of governmental forest policy, there are several notable strengths within and outside protected areas as well. Mechanisms that facilitate forest policy execution outside protected areas include the autonomy and independence of the regulatory agency, which also benefits from a stable (though still limited) budget; standardized and rigorous procedures for authorizing and overseeing forest operations; and an established program of incentives for natural forest management. Constraints to implementation of forest regulations outside protected areas are largely associated with limited agency resources, especially in view of increasing demand for services. Execution of governmental forest policy in protected areas is hindered by significantly limited financial, human, logistical, and material resources, as well as limited enforcement of forest-related crimes in the judicial and penal system. However, these limitations to effective policy implementation are
overcome to some degree by local autonomy of the forest regulatory agency; positive relationships between the forest agency and the forest client; sophisticated forest planning tools; rigorous and standardized forest management approval and oversight processes; the adaptiveness of regulatory policy to forest management outcomes; a proficient forest regency system; and significant outside financial and technical support for the advance of sustainable forest management in protected areas.

In Nicaragua, execution of governmental forest policy has been significantly limited by insufficient financial, human, logistical, and material resources. A lack of resources for adequate oversight has been linked to inadequate oversight of the forest production sector and documented forest transgressions. The lack of clearly defined roles and hierarchical integration of those roles has also produced constraints on forest policy execution in Nicaragua. Many of the roles and mechanisms defined in the governmental forest policy directives represent a potential opportunity for effective policy execution, such as the forest auditor systems, decentralization forest regulatory powers, and forest management fiscal incentives, however in practice these have either not been fully executed (i.e. the forest auditor system, forest incentives) or have been complicated to put into practice (e.g. shared oversight).

This analysis of governmental forest policy execution in Costa Rica, Guatemala, and Nicaragua uncovered important insights into the obstacles and strengths of different structures, resources, and processes for putting policy into effect. For example, as is indicated in much of the literature poorly resourced agencies can prove a major obstacle to effective policy execution (see for example: Mazmanian and Sabatier 1983; Winter 1990; Gunningham, Grabosky, and Sinclair 1998; Contreras-Hermosilla 2002; FAO/ITTO 2005). Also, while Schofield and Sausman (2004) suggest that fewer divisions and/or levels of decision-making may make for more effective policy execution, forest policy execution outside protected areas in Guatemala demonstrated that decentralized decision-making can in fact be very effective for forest policy execution, as is proposed
by Larson (2003) and Ferroukhi (2004), for example. On the other hand, as demonstrated in Nicaragua, major constraints to policy execution can arise when the divisions of power or levels of decisionmaking and their hierarchical integration is not clearly defined, as suggested by Mazmanian and Sabatier (1983), for example.

The analysis of governmental forest policy execution in this chapter, combined with the analysis of governmental forest policy outputs in the previous chapter, also provide important information for understanding better the opportunities and obstacles to governmental forest policy adoption and compliance by forest owners and users. For example, the combination of rigorous and comprehensive governmental policy directives for regulating and promoting sustainable forest management in Costa Rica and policy execution processes that are constrained by limited financial resources, may lead to their low adoption and poor compliance. On the other hand, despite rigorous and comprehensive governmental policy directives for regulating and promoting sustainable forest management in protected areas in Guatemala, the incorporation of multiple policy actors in their oversight, as recommended by Gunningham, Grabosky, and Sinclair (1998) may prove to facilitate increased policy adoption and compliance. These issues and more are further explored through an analysis of the adoption of and compliance with governmental forest management policy in the next chapter.
Table 6.2 Key Aspects of the Regulatory Forest Policy Execution in Costa Rica, Guatemala, and Nicaragua.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Costa Rica</th>
<th>Guatemala – Outside Protected Areas</th>
<th>Guatemala – In Protected Areas</th>
<th>Nicaragua</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure</td>
<td>The Costa Rican State Forest Administration (AFE) is one of three entities that make up the National System of Conservation Areas (SINAC), an agency under the Ministry of Environment and Energy. AFE is decentralized logistically, and in terms of decision-making for the most part. Yet, the integration of forest sector oversight with wildlife protection and protected area management under SINAC has permitted little autonomy for the AFE and has constrained its capacity to lead and promote the forest production sector.</td>
<td>The Guatemalan National Institute for Forests (INAB), which oversees forest activities outside of protected areas, is a truly autonomous, independent forest agency led by a multi-stakeholder Board of Directors. Institutional autonomy and independence has permitted significant stability to the agency and its goals and programs. INAB is decentralized both logistically and in terms of decision-making.</td>
<td>The Guatemalan Protected Areas National Council (CONAP) though constitutionally ‘autonomous’ is a dependency of the Administration. CONAP has dual leadership from the President and a multi-stakeholder council, but political interests have historically decreased its autonomy. The agency is logistically decentralized to some degree but most power and decision-making is centralized. Region VIII, which oversees the forest concessions, is the exception, having considerable autonomy in terms of decision- and even policy-making.</td>
<td>The Nicaraguan National Forestry Institute (INAFOR) is an agency under the Ministry of Agriculture and Forestry. INAFOR is decentralized logistically and in terms of decision-making, though decisions have become increasingly centralized in recent years. Administrative arrangements of INAFOR are the most inclusive of other agencies and actors on paper. Local level coordination with municipal and local government and other actors is mandated, but not clearly defined in terms of integration, leading to constraints on the forest administration system overall.</td>
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<tr>
<td><strong>Financial Resources</strong></td>
<td>In 2007, SINAC was allocated US$13.93 million for its three main functions, though it is not possible to say how much of this is dedicated to forest administration. Overall, SINAC’s budget has increased annually, though slightly over the past few years, but this does not take into account inflation. There were no taxes on the forest sector to supplement state forest administration. Overall, the agency was considered to be limited financially.</td>
<td>In 2007, INAB was allocated US$7.31 million. By law, INAB is guaranteed at least 10% of the Ministry of Agriculture and Livestock budget. Forest use taxes for forested land outside protected areas finance part of INAB’s budget. Overall, the agency was considered to benefit from stable, secure and dependable funding, though as with all the agencies in this study, to be limited financially.</td>
<td>In 2006, CONAP was allocated US$4.26 million for protected area management; 22% (US$937,000) went to the MBR (= 80% of the protected area system landbase). It is unclear how much of that 22% went to administration of the forest concessions. CONAP’s general budget is derived in part from a forest use tax though this is not proportionally redistributed through the agency. Overall, CONAP and its Forest Department were considered extremely underfunded.</td>
<td>In 2007, INAFOR was allocated US$1.67 million, which was supplemented by an additional US$2.53 million from international assistance. INAFOR’s budget is financed in part by a forest use tax. Initially, INAFOR was essentially given an unfunded mandate to implement the new Forest Law, which led to weaknesses in the forest control system. Overall, INAFOR was considered extremely underfunded.</td>
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<td><strong>Human, Material, Technical Resources</strong></td>
<td>Forest administration activities were not considered to be limited in terms of personnel.</td>
<td>Overall, personnel were considered to be competent, dedicated, and well-respected and Oversight of forest concessions was considered to be significantly limited in</td>
<td>Though agency personnel were generally considered to be technically competent</td>
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<tr>
<td>Human, Material, Technical</td>
<td>though limited financially and materially. Overall, SINAC forestry personnel were considered competent and well-trained, though with some degree of corruption within the agency in recent years. Technical resources (e.g. GPS units, technology) were limited but have increased in recent years in an attempt to combat illegal logging.</td>
<td>the agency enjoyed a very positive public image. Forest administration activities were not considered to be significantly limited in terms of personnel. There were more limitations in terms of transportation and financial resources. Limitations on administrative capacity were increasing as resources remained stable, and demands for INAB services increased.</td>
<td>terms of personnel, transportation and other material resources. Agents largely depended on constituents or certification auditors for transportation to site visits. In general, forest administration personnel in Region VIII were considered dedicated and competent, though with little workforce stability, and a poor agency public image.</td>
<td>and dedicated, overall workforce was considered unstable and insecure. INAFOR also suffered from a poor public image and a recent history of agency corruption. INAFOR was significantly limited in terms of transportation and material resources, especially in relation to the expansive territories their under supervision at the district level.</td>
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<td>Resources</td>
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<td>Processes:</td>
<td>Forest harvest authorization encompassed an in-office and site review of the plan, though there were no standardized agency procedures for planning and operational oversight. A pre-approval Authorization procedures included in-office (administrative, judicial, technical) and on-site review, which are standardized across all regional and sub-regional offices of the agency.</td>
<td>Authorization procedures included extensive office (administrative, technical, judicial) and on-site reviews that are standardized for Region VIII. Planning and review procedures are</td>
<td>Authorization procedures require in-office and on-site review by INAFOR and other local government and a public comment/review period; they were very rigorous and the most inclusive of other local actors. Yet,</td>
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<td>Harvest Authorization</td>
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<td><strong>Processes: Harvest Authorization</strong></td>
<td>site visit was obligatory for any timber harvest, including trees on farmland, significantly increasing the demands on SINAC and leading to further delays in all timber authorization processes.</td>
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<td>also adaptive to the results of management and oversight.</td>
<td>authorizations processes have been complicated and constraining to execute effectively.</td>
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<td><strong>Processes: Verification and Enforcement</strong></td>
<td>SINAC’s forest administration division is in charge of enforcement and verification of forest law compliance, though only required to carry out a pre-harvest site visit such that supervision of operations in the field falls to forest regents. Other actors with a role in forest oversight are the Environmental Comptroller and civil society through surveillance committees, though neither has INAB oversees compliance with the Forest Law outside protected areas. The agency directives mandate quarterly visits to forest operations, though limited resources force the agency to carry out site visits on a purposive basis. Forest regents are given responsibility of overseeing compliance of forest operations in the field and those working</td>
<td>CONAP directives mandate pre-, during- and post harvest site evaluations with guidelines for assessment. While CONAP is significantly limited in terms of resources, for the most part they carry out all site visits, sometimes combining post-harvest and pre-approval visits, even if often depending on their constituents or certification auditors for transportation to the</td>
<td>INAFOR is legally designated as the agency in charge of forest oversight and agency directives mandate a pre- and post- harvest site visit. Forest regents are given the responsibility of “guaranteeing” compliance of approved harvests in the field and submitting monthly reports on operations. The figure of forest auditor was created to oversee, in part, the</td>
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<td><strong>Processes: Verification and Enforcement</strong></td>
<td>played a very active role to date. The National Police are delegated with responsibility of verifying transportation documentation at checkpoints though they are poorly trained and there is no feedback system for transported wood data. Finally, SINAC is also charged with oversight of the wood products processing industry and correlating inputs and outputs with approved harvested volumes though this is component of forest sector oversight if poorly implemented. While there are forest-related crimes identified in the legislation, a lack of their implementation and prosecution has</td>
<td>outside protected areas are overseen by INAB. Regent reports are (supposed to be) verified by INAB in the field (when possible). INAB also supplies timber transportation permits based on authorized volumes to be overseen by the regent in the field. Other actors include the National Police who man wood transportation checkpoints, though in Costa Rica there is insufficient capacity and feedback in this component of the overall oversight system. INAB is also responsible for oversight of the wood products processing industry and</td>
<td>field. CONAP also requires regent supervision of all planning and field operations. Additionally, CONAP mandates certification of forest management, which independently verifies compliance with approved plans and forest regulations and serves as an additional and very effective component of oversight.</td>
<td>forest regent system in the field, though this figure has not been implemented to date, leaving the forest regent system without effective oversight. INAFOR supplies transportation permits based on authorized volumes to be overseen by regents in the field. INAFOR is also responsible for coordinating transportation checkpoints with the military and the police, through these have been poorly trained and staffed in the past, and more recently the military has been given more power over the verification of transported timber effectively reducing the</td>
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<td>Processes: Verification and Enforcement</td>
<td>of their implementation and prosecution has proved to be a significant gap in the forest oversight system, which is essentially represented by a failure to apply the law in the judicial system. As such, there is little deterrent against forest crimes, such as forest conversion to other land uses. Penalties exist within the forest administration and forest regent system and these have been applied more vigorously, resulting in a deterrence through penalization of forest agents and regents.</td>
<td>correlating the information with harvested volumes, though this is poorly implemented, due to limited and already thinly stretched resources. The forest law describes forest-related crimes and penalties though, as in Costa Rica, these are seldom applied or prosecuted in the justice system. Some suggest this lack of deterrence represents the greatest weakness in the forest oversight system.</td>
<td>serious crimes related to protected areas such as illegal settlements and forest conversion, CONAP is not given the power to remove squatters or enact penalties or condemn in the judicial system, representing a significant weakness in the overall forest concession system.</td>
<td>authority of INAFOR in this component of forest oversight. The forest products industry must report productivity to INAFOR on a monthly basis though this is poorly if at all linked to harvest approvals and transportation permits. Other prominent actors include the Attorney General of the Environment, the Environmental Prosecutors Office, and municipalities and other local government. Overall, Nicaragua has the most inclusive and multi-stakeholder verification system, yet the roles are not clearly defined nor respected, causing delays and conflicts in the overall forest oversight system.</td>
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<td><strong>Processes: Verification and Enforcement</strong></td>
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<td><strong>system. Forest crimes are defined by law and since mid-2000s have been aggressively investigated and reported by the State Environment Attorney, and brought to court by the Env'l Prosecutor. The judicial system is considered corrupt by some and disinterested by others, and had not condemned nor penalized any forest transgression by 2007.</strong></td>
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<td><strong>Forest Regent System</strong></td>
<td>Registered forest regents are delegated oversight of forest operations in the field under the Forest Law. They are required to submit at least three reports (pre-, during-, post-harvest) to SINAC. SINAC supplies transportation permits</td>
<td>Forest regents are given responsibility of overseeing compliance of forest operations with the approved plan in the field and those working outside protected areas are overseen by INAB. Regents must submit quarterly reports on the</td>
<td>Registered forest regents are delegated oversight of forest operations in the field must submit reports on operational status to CONAP. Regents working in protected areas are overseen by INAFOR on field operations. Without invocation of the forest auditor role, the forest</td>
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<td>Forest Regent System</td>
<td>based on authorized wood volumes, and regents are responsible for their adequate use and related reports to SINAC. Regents are monitored by the Association of Agronomy Engineers. While the role of forest regents is intended in part to mitigate potential for corruption within the forest agency, there is the potential for corruptibility and conflict of interest as regents are paid by the forest owner.</td>
<td>progress of operations and bi-annual reports of regeneration establishment for 4 yrs post-harvest. Regent reports are (supposed to be) verified by INAB in the field (when possible). The regent oversees the use of timber transportation permits and reports on their use quarterly and a final report post-harvest to INAB. Overall the regent responsibilities and reporting system work efficiently and effectively in Guatemala. However, as in Costa Rica, there is always the potential for corruptibility and conflict of interest as regents are paid by the forest owner.</td>
<td>and working relations between regents and CONAP has resulted in an effective component of oversight. The forest regent is in charge of overseeing the proper use of timber transportation permits in the field. INAB is responsible for supplying transportation permits for wood transported outside protected areas and oversight of the wood transportation and transformation sectors.</td>
<td>regent system is essentially left without effective oversight. The forest regent is responsible for the proper use of transportation permits and submitting monthly reports on their usage to INAFOR.</td>
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CHAPTER 7

GOVERNMENTAL FOREST POLICY UPTAKE

WITH INSIGHTS INTO FOREST POLICY OUTCOMES, EVALUATION, AND REVISION

7.1 Introduction

Having assessed the governmental policy outputs for regulating and promoting sustainable forest management in Costa Rica, Guatemala, and Nicaragua in Chapter 5, and their execution in Chapter 6, this chapter examines the uptake of governmental policy on natural forest management by forest owners and users (i.e. the policy target group). Determining policy uptake by the target group is essential for a more complete understanding of policy effectiveness towards the attainment of policy goals, as well as a better understanding of the intended and unintended policy impacts and outcomes (Winter 1990; Winter and May 2002). In this chapter, governmental forest policy uptake is evaluated, first through an assessment of policy adoption, which is determined in part through data on the conformance of natural forests with legal forest management, and through information and perspectives on the compliance of authorized forest management with governmental forest policy directives.

Though some have focused on target group compliance (see for example: Mazmanian and Sabatier 1983) and/or target group behavior (see for example: Elmore 1980; Winter 1990) for understanding the process of policy implementation and its ultimate success or failure, their focus does not sufficiently explain the inducements and constraints on the decisions of the policy target group beyond the implementation of the policy itself and the larger policy context. Since forest policy adoption and compliance are not only influenced by forest policy outputs, execution, and the larger forest policy context, but by local level conditions as well, this chapter also examines the local- or forest management unit- context in which decisions on forest management and related policy are made. This examination of local-level factors, such as forest ownership, size, and distribution; forest
management capacity; external support for local-level forest management; and local-level attitudes towards forest policy and policy implementers, enhances our understanding of the positive and negative incentives that confront forest owners and users in their decisions on forest use, and their ultimate adoption (or rejection) and compliance (or noncompliance) with governmental policy on forest management (Ostrom et al. 1994; Gibson, McKean, and Ostrom 2000; Ostrom 2007).

This chapter also utilizes the assessment of forest policy outputs, execution, and uptake, in combination with key forest policy actors’ perceptions, experiences, and observations of the complete governmental forest policy process in each country, to explore some of the outcomes of governmental forest management policy, as well as their evaluation and the revisions that may result. While the ideal study of the forest policy process would encompass direct measurement of policy impacts and outcomes in the field, such an undertaking was not feasible within the timeframe and finances of this dissertation research. However, people’s perceptions, experiences, and observations associated with policy impacts, outcomes, evaluation, and revision were captured through the interview process and triangulated with archival and secondary data to better understand the larger forest management policy process in Costa Rica, Guatemala, and Nicaragua. Such an assessment also permits a better understanding of the adaptiveness of governmental forest management policy to the intended and unintended results from forest policy outputs and their execution that combine to produce inducements and constraints on forest policy uptake, which is also affected by local opportunities and limitations and the larger forest policy context.

7.2 Governmental Forest Policy Uptake in Costa Rica

7.2.a Target Group Governmental Forest Policy Adoption and Compliance

The amount of natural forests under authorized management was in decline in Costa Rica from 1994 to 2007 (SINAC 2008; Arce and Barrantes 2006). Arce and Barrantes (2006) report authorized wood harvests from natural forests in 1994 totaled 475,000
m$^3$, which dropped to slightly over half of that in 1998 (248,362 m$^3$), and continued to decline, averaging less than 55,000 m$^3$ per year from 1999 to 2004 (Figure 7.1). In 2006, the AFE authorized 42 natural forest management plans, totaling 35,104 m$^3$ of harvestable wood across 1,915.6 ha of productive forest area, and in 2007, 29 natural forest management plans were authorized, totaling 22,651 m$^3$ across a total area of 1,288 ha of productive forest area. In comparison, Arce and Barrantes (2006) and Rodriguez Quiros (2005) estimate that Costa Rica can ‘conservatively’ support an annual harvest of 150,000 m$^3$ of roundwood from 10,000 ha (per year), given the availability of productive natural forest in 2005 (1.15M ha total; 22.5% of the national territory), which excludes natural forests in protected areas, under PSA, with potential for environmental services production, and in land uses classes that prohibit forest production or permit agricultural production.

Figure 7.1  Authorized Natural Forest Production in Costa Rica from 1994 to 2007 (Arce and Barrantes 2006; SINAC 2008)

These wood volume figures are for roundwood production.

Forest management plans generally cover a larger forest area that is divided into productive and non-productive areas (i.e. have little or no commercial species) based on the forest inventory. The productive forest area is further divided into harvest areas and protected areas, which are delineated based on riparian buffer zones, slopes, etc. These figures refer only to the productive forest area under approved management plans. There were no figures available for total forest area under management plans.
As an indication of the demand for authorized natural forest harvest versus actual authorizations in Costa Rica, between 2006 and 2007 a total of ten natural forest management plans were denied by SINAC/AFE, another 13 were returned to the plan owner for revisions, and three were suspended, such that a total of 74 plans out of 97 were authorized between 2006 and 2007 (76%), and three of the authorized plans were ultimately suspended for noncompliance with forest policy directives (4%) (SINAC 2008). However, as indicated by two forest officials, noncompliance of authorized natural forest management does not always result in plan suspension (CAF2; CAF4). Corrective measures are typically attempted first, and if these are not adopted or applied correctly, suspension of the management plan may follow (CAF2; CAF4).

Several forest officials, regents, and experts considered most authorized managed natural forests in Costa Rica typically to be in legal compliance with governmental forest policy directives (CAF1; CAF3; CAF4; CFM1; CFM2; CFM4; CC1; CE2; CE3; CE5; CE9). Many attributed legal compliance of authorized natural forests to the rigorous planning process and standards for natural forest management mandated by SINAC/AFE and the participation and oversight of forest regents and forestry NGOs in forest operations (CAF1; CAF4; CFM1; CFM2; CFM4; CE2; CE5; CE9). And, while there are no national level reports on forest policy compliance beyond records of suspended forest management plans, Louman et al. (2005) evaluated the rigor and impacts of forest management in the Northern and Atlantic Zones of Costa Rica, comparing the performance of forest operations in FMUs with certification, with environmental services payments for forest management, with both of these mechanisms, and with neither mechanism (i.e. the control). The authors found that where natural forest management was carried out under a plan authorized by SINAC/AFE, all FMUs studied (n = 30), including the control group (n = 10) met or exceeded the governmental forest regulations and standards for forest management.\(^{35}\) Their results demonstrate compliance with governmental forest management policy in authorized forests is not uncommon, at least in the Northern and Atlantic Zones.

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\(^{35}\) Louman et al. (2005) did find improved performance and reduced environmental impacts in the FMUs with certification and or PSA, which is discussed further in Chapter 8.
Atlantic zones of Costa Rica where the study was carried out. Nonetheless, while compliance of authorized managed forests may be high, the overall decline in natural forests submitted for legal harvest leads one to wonder what induces or constrains a forest owner in his/her forest land use decisions, and in particular, in his/her decision to submit the forest to authorized management. To better understand these factors requires an understanding of the local level conditions (see for example: Ostrom et al. 1994; Ostrom 2007).

7.2.2 Local-Level Conditions that Induce and Constrain Governmental Forest Policy Uptake in Costa Rica

Governmental forest policy uptake by forest owners and users in Costa Rica is better understood through local- or forest management unit- level conditions. By law, forests can only be harvested for timber production on private land in Costa Rica (CFL Art. 34), which represents 22.5% of national territory (1.5M ha) (Arce and Barrantes 2006). These forests are predominantly small (100 ha on average, and commonly < 50ha), fragmented, and located within a larger mixed land use system (SINAC 2008). There are few if any large areas of natural forest (>1,000 ha) under management for wood production in Costa Rica (SINAC 2008). For example, PORTICO/Masonite is one of the few forest industries in Costa Rica with a large forested land base that totals more than 8,500 ha of natural forest. However, this is not a continuous block of forest, but a conglomeration of smaller forest units (5 - 300 ha in size) purchased from individual landowners over time (Qualifor 2001).

The ownership and size of production forests in Costa Rica have implications for their management. As one forest expert explained:

“Most production forests in Costa Rica are small forest fragments located within a larger landholding that typically includes agriculture and/or grazing lands. If the landowner works his/her own land, s/he is usually focused on agricultural or cattle production, rather than the forest. And, since the forest fragment is small and is usually harvested once every 15 years at the earliest (by law), s/he has limited capacity to and even interest in managing the forest him/herself” (CE9).
This observation is reflected by Campos et al. (2000), who note that forest owners in Costa Rica rarely depend economically on forest productivity as a main source of income, but rather as a supplement to farming or other earnings. In other words, forest production is not a common means for subsistence or primary income in Costa Rica. Ramirez (2006) also indicates that some landowners consider their forests a source of “petty cash” that can be accessed when other productive activities are insufficient. Yet, one forest owner/community organizer noted that some landowners see their agricultural and grazing lands as sources of productivity, and see their forest ‘patches or fragments’ as a means for conservation and a source of pride (CE7). Finally, forest managers, experts, and owners observed it is also not uncommon in Costa Rica for forest owners to live somewhere other than where their forests are located (e.g. in a larger city or the capitol) (CE2; CE7; CE9; CF2; CFM4), resulting in further “disconnect with their forest as a potential long-term source of sustainable wood products” (CFM2).

With few natural forest owners in Costa Rica having the capacity and sometimes even the interest to manage their forests, forest harvests are typically carried out by ‘intermediaries’ (intermediarios), as noted by several interviewees (e.g. forest experts, managers, official) (CAF3; CAF4; CE9; CFM3; CFM4). Intermediaries can take the form of forestry NGOs that develop long term contracts with the forest owner to undertake the planning, operations, and post-harvest protection associated with natural forest management. These NGOs are traditionally founded on the principles of sustainable resource use and conservation, and may represent group or umbrella forest certification schemes (e.g. FUNDECOR; CODEF ORSA) (CE9).

More often though, as described by other interviewees (i.e. a forest expert, government official and forest official), ‘intermediaries’ are professional loggers who purchase standing wood from the landowner, carry out the extraction, and sell the timber to the wood processing industry, retaining a significant portion of the overall profitability of the
harvested forest resource (CE3; COGN1; CAF1). These individuals are not held legally responsible for the execution of approved activities (i.e. only the property owner and the regent are liable by law CRFL Art. 21, 22). Moreover, as one forest official suggested: “this type of intermediary is rarely concerned with the long term viability of the resource at the FMU level, given the nature of the system” (CAF3) (i.e. the intermediary is not the landowner, nor is s/he held liable by law to comply with forest policy; and the possibility of returning for future harvest (at least 15 years) is usually beyond the business horizon under which intermediaries operate). This observation was also made by two forest experts (CE3; CE8), as well as by Ramirez (2006). As described by one forest owner and forest expert, the role of intermediaries perpetuates the lack of experience in or profit from forest management in the hands of forest owners, which extends the disconnect between forest owner and his/her view of the forest resource as a potential source for sustainable wood production and conservation (CE7; CE9).

Other factors that intervene in governmental forest management policy uptake at the FMU level include the cost of doing forest business and the competitiveness of timber production versus other land uses. A broad range of interviewees (16 out of 22) identified the costs of legal forest management as one of the greatest obstacles to forest policy uptake in Costa Rica. One forest manager indicated that:

“Forest owners in Costa Rica may be conservationists at heart, but they base their decisions on questions of simple economics... for example, if they depend on their land for income and it is more profitable to raise cattle than to harvest wood from the forest, or to protect it and receive environmental services payments for conservation, many will find a way to get rid of the forest to graze more cattle” (CFM2).

For the forest owner interested in legally harvesting the resources from his/her forest, or for the intermediary who purchases the standing wood, s/he must assume the costs associated with harvest planning and extraction in compliance with the associated forest policy directives. In Costa Rica, these costs increase not only under rigorous regulations, but in an inverse relation to the size of the forest area under management (i.e. smaller
area over which to spread the costs cuts into potential profits). Echoing comments by a forest official, and forest experts (CAF1; CE5; CE9), one forest expert stated that:

“The cost of compliance for legal (natural) forest management is the greatest obstacle to the forest production sector here. ... As forest regulations and standards for forest management became increasingly excessive under the new Forest Law (No. 7575), the potential long-term profitability of natural forest management basically disappeared in Costa Rica” (CE3).

Navarro et al. (2006) present research on the costs of different types of timber harvest in Costa Rica (e.g. approved natural forest management; permits for >10 trees and for <10 trees on farmland; unregulated/illega forest harvest). They report that the cost of authorized natural forest management is the most expensive type of forest use by far. The greatest opportunity costs for legal harvests are associated with bureaucratic procedures (e.g. requirements for plan development such as the use of GPS; harvest and transportation tag permitting processes). In another study, Navarro and Bermudez (2006) report the comparative opportunity costs of regulated and unregulated forest management (i.e. illegal logging) versus other common land uses in Costa Rica. They demonstrate that unregulated managed forests are competitive with cattle ranching in terms of cost-effectiveness/profitability, but not with pineapple or banana production. They also indicate that regulated forest management is not economically competitive with any of the other land uses studied, largely due to the costs associated with the authorization of the management plan, compliance with forest policy directives (e.g. maximum 60% species abundance cutting intensity; protecting banned tree species; required mitigation measures, etc.), and the impact of intermediaries (i.e. loggers taking the large proportion of potential profits) (Navarro and Bermudez 2006). As one forest manager observed: “Even intermediaries are getting out of the logging business, because it has become so restrictive and expensive to do business here” (CFM4).

A final factor that helps us to understand forest management policy uptake, or the lack thereof, is forest owner attitudes toward forest policy and policy implementers in Costa Rica. As described by forest owners, managers, experts, organizers, and one forest
official, forest owners in Costa Rica are less and less interested in managing their forests for production (CE3; CE5; CE6; CE9; CFM1; CFM2; CFM3; CFM4; CAF3). This may be due in part to increasing economic options which permit landowners to simply leave their forests untouched, to decide to actively protect them, and/or to submit them to PSA for Protection. The latter is surely the situation in some cases as more than 48,000 ha of natural forest were submitted to PSA for Protection on average each year from 1997 to 2007 (FONAFIFO 2007). Yet, a forest owner indicated that the “excessive regulatory hurdles” required for authorized natural forest management have resulted in increasingly prohibitive choices for legal forest use on private land (CE7), an observation reflected by other interviewees (CAF3; CE3; CE5; CFM2). An oft quoted saying during the interview process was: “The quickest way for a landowner to lose his/her private property rights in Costa Rica is for there to be forest on that property” (CAF3; CE5; CE3; CFM2). Overall, while some forest owners in Costa Rica may be choosing to conserve or protect their forests, other forest owners may still prefer to manage their forests for long-term sustainable timber production, but are increasingly impeded by the costs implied in governmental forest management policy compliance.

With regard to forest owner and user attitudes towards forest policy implementers, though a broad majority of interviewees described SINAC/AFE personnel as competent, honest, and well-trained (CAF4; CC1; CE3; CE6; CE7; CE9; CFM1; CFM2; CFM3), at the local level some forest managers and owners also pointed to a lack of leadership and direction for the forest production sector from SINAC/AFE and from the state, in general (CE5; CE7; CFM2; CFM4). One forest manager said that:

“The state does not promote nor even defend the forest production sector against ‘misconceptions’ about forest management as an activity that does not contribute to conservation. They have given in to the extreme conservationist viewpoint that regards all forest management as destructive, when it is a much better option for conservation than clearing the understory and converting forests to farmlands, for example” (CFM2).
This was echoed by other forest managers, owners, and experts who observed that the decreasing support for natural forest management from the state and increasing inclination toward strict preservation of forests are reflected in the rigorous, and all too often, prohibitive standards for legal natural forest management in Costa Rica (CE7; CE9; CFM2; CFM4). On the other hand, two forest experts indicated that the rigorous forest policy directives have had a positive impact on controlling destructive forest practices and on the forest production sector overall (CE4; CE8). Nevertheless, a broad range of interviewees including forest owners, managers, experts, and officials (18 out of 22 interviewees), pointed to the constraints of rigorous forest management policy directives, combined with the typically small size of productive forests and resulting high costs of legal access to forest management, as drivers of decreasing interest in forest production by forest owners (which may actually be part of the larger policy objectives in Costa Rica), as well as to the clandestine conversion of forests to ‘farmland with trees’ that was described in Chapter 5. As noted by Barrantes (2007:3), “the excessive regulation of tree harvests from forests and the lack of homogeneity in the application of regulations across the different Conservation Areas, makes management and conservation of forest resources less and less attractive for landowners.”

So, with regard to the outcomes, evaluation, and possible revision of governmental forest management policy in Costa Rica, though the outcomes were not directly measured on the ground, there was a significant consensus from the interviews. Namely, the obstacles presented by rigorous forest management standards combined with small forests that could not offset the associated high costs of compliance, and an initial lack of oversight in the field by SINAC/AFE of other timber harvest permits (i.e. trees from farmland without forests), eventually led, in part, to a clandestine conversion of forests and a “greenwash” of illegal timber and land use change (18 out of 22 interviews). This took place through the conversion of forests to farmland by clearing the understory, planting grasses, and eventually receiving authorization to cut the remaining
These dynamics of strict regulations and increasing opportunity cost for natural forest management, in combination with a legal loophole provided by permits for trees in pasture that was not initially reviewed in the field, ultimately led to the loss of forests which has significant negative ecological, economic, and social implications for overall forest sustainability. However, this trend was eventually noted, monitored, and evaluated by the state (e.g. Strategy Against Illegal Logging; MINAE/SINAC 2002), and in cooperation with research organizations such as CATIE. The results of these evaluations, ultimately led to revisions in the processes for executing forest policy, and in particular, to processes associated with the authorization and oversight of all timber harvest permits in Costa Rica, as described in Chapter 6.

7.3 Forest Policy Uptake in Guatemala

In Guatemala, the concept of forest policy uptake is quite different for privately owned forests outside protected areas than for long-term ‘leased’ forest use rights on forests inside protected areas. As described for one forest expert, the first implies greater decision-making power to take up forest policy on the part of the forest user, while the second implies greater power to enforce policy uptake by the state (GE1). As such, this section describes target group uptake of government policy for natural forest management outside protected areas and inside protected areas separately.

7.3.a Target Group Governmental Forest Policy Adoption and Compliance Outside Protected Areas in Guatemala

Nearly two million hectares of forested land fall under Guatemala’s governmental policy directives for forests outside protected areas (Revelorio 2004). These forests are overseen by INAB. In 2006, approximately 6.6% (130,000 ha) of these forests were under an authorized forest management plan, as reported by one forestry official (GAF1). This includes forests which may have been harvested in 2001 and onward, as a natural
forest management plan for forests outside protected areas has a duration of five years and is monitored by INAB for compliance with the regulations and the requirement for established regeneration within four years of harvest (NFL Art. 55). Of the 130,000 ha of forests under an authorized forest management plan outside protected areas, nearly 40% were found on private property outside the MBR in Department of the Petén in INAB Region VIII, as documented by another forestry official (GAF2). INAB Region VIII oversaw 232 approved management plans totaling 52,746 ha in 2006 (GAF2).

The authorization of natural forest management plans outside protected areas from 1999 to 2005 totaled over 5,000 plans, 202,424 ha of forests, and nearly four million cubic meters of harvestable wood (INAB 2005, 2006). On average, 721 forest management plans were authorized annually between 1999 and 2005. Each year these plans covered an average of just under 29,000 ha and more than 566,000 m$^3$ of harvestable wood (INAB 2005, 2006). As described in the section above, forest management plans generally cover a forest area that is divided into non-productive and productive forest, which is further divided into harvestable and protected forest area. In addition, the productive forest in an authorized forest management plan may be harvested over time, such that authorized timber harvests from natural forests for a given year may be less than the total harvestable wood authorized from all management plans. As such, from 1999 to 2005, the productive forest area under an authorized natural forest management plan that was submitted to legal harvest averaged 6,035 ha a year and 284,308 m$^3$ of authorized timber extraction, and totaled 43,021 ha and more than 2.6 million m$^3$ of authorized timber extraction. The authorization of natural forest management plans and production fluctuated between 1999 and 2005, largely attributed to variations in the timber market and demand for wood products (INAB 2005, 2006) (Figure 7.2). However, forestry officials indicated that demand for services has generally increased since the early 2000s, and is expected to continue to increase slowly as more forest owners recognize the productive capacity of their forests (GAF1; GAF2).
Table 7.1  Authorized Forest Area and Wood Volume under General Management Plans (GMP) and Harvests from 1999 to 2005 Outside Protected Areas in Guatemala (Source: INAB 2005, 2006)

<table>
<thead>
<tr>
<th>Year</th>
<th>Area under GMP (Ha)</th>
<th>Volume under GMP (m$^3$)</th>
<th>Harvested Area (Ha)</th>
<th>Harvested Volume (m$^3$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>34,301</td>
<td>651,682</td>
<td>4,895</td>
<td>449,003</td>
</tr>
<tr>
<td>2000</td>
<td>21,864</td>
<td>486,143</td>
<td>4,469</td>
<td>453,025</td>
</tr>
<tr>
<td>2001</td>
<td>18,898</td>
<td>498,439</td>
<td>4,676</td>
<td>366,893</td>
</tr>
<tr>
<td>2002</td>
<td>35,983</td>
<td>588,941</td>
<td>8,943</td>
<td>378,993</td>
</tr>
<tr>
<td>2003</td>
<td>35,501</td>
<td>711,444</td>
<td>8,435</td>
<td>369,054</td>
</tr>
<tr>
<td>2004</td>
<td>25,184</td>
<td>521,160</td>
<td>5,737</td>
<td>339,240</td>
</tr>
<tr>
<td>2005</td>
<td>30,693</td>
<td>508,291</td>
<td>5,866</td>
<td>333,258</td>
</tr>
<tr>
<td>TOTAL</td>
<td>202,424</td>
<td>3,966,100</td>
<td>43,021</td>
<td>2,689,466</td>
</tr>
</tbody>
</table>

Figure 7.2 Forest Area Authorized for Natural Forest Management Under a Plan from 1999 to 2005 (not cumulative) (INAB 2005, 2006)

With regard to the legal compliance of managed natural forests outside protected areas in Guatemala, forestry officials indicated that authorized forest management is generally found to be in legal compliance with the associated forest policy directives (GAF1; GAF2).
They noted the primary approach to evidence of non-compliance is rarely immediate suspension or cancellation of the management plan or harvest license, but a collaborative process with the forest owner, regent, and/or operator to reach compliance (GAF1; GAF2). They also noted that incentives for natural forest management through PINFOR require proof of compliance with the authorized management plan and the associated forest policy directives (GFL Art. 75). Therefore, the total area of managed natural forests with incentives could be used as a type of proxy measure for regulatory compliance. Between 1999 and 2005, a total of more than 58,000 ha of managed natural forests were enrolled in PINFOR (Oliva and Paiz 2005). This represents nearly 30% of the total forest area under authorized natural forest management plans during the same time frame (1999-2005).

7.3.b Local-Level Conditions that Induce and Constrain Governmental Forest Policy Uptake Outside Protected Areas in Guatemala

This section considers the local- or forest management unit-level conditions that contribute to or constrain forest owners adoption and compliance with policy directives for forest management outside protected areas. According to the 2004 National Forest Inventory, 40% (1.53 million ha; 14% of the national territory) of all forests are found on private land, and another 9% of forests are in municipal lands (FAO/INAB 2004). Together these represent the forests overseen by INAB.

Managed natural forests outside protected areas are largely found on private, mixed use land, that is typically dedicated to agricultural and/or livestock production (INAB 2005). These forests are very similar to those in Costa Rica in terms of size, distribution, ownership, capacity, and costs. The average forest fragment on private land in Guatemala is about 45 ha (INAB 2005), with very few larger forest tracts, as noted by one forest official (GAF2). According to Carrera et al. (2006), the principal obstacles for forest management outside protected areas include small-scale landownership,
pressure to convert forests into agricultural lands, and low productivity of coniferous and mixed forests and their overexploitation for firewood.

As in Costa Rica, the typical forest owner in Guatemala does not have the capacity to manage the forest him/herself, and as such there is a prevalence of intermediaries, largely represented by loggers or logging companies (GA1; GAF2). As explained by forest officials, intermediaries usually purchase the standing wood from landowners outside protected areas and take it upon themselves to acquire the necessary plans and permit approvals for forest harvest, carry out the extraction, and sell the wood to the processing industry (GAF1; GAF2). In Guatemala, the intermediary is not held legally responsible for compliance with approved harvest plans and permits (only the forest owner and the forest regent (GFL Art. 58)).

Costs of forest management on private lands were not readily available for the mid 2000s. Morales (1999) reports that the costs of forest management in broadleaf and conifer forests throughout Guatemala vary by forest type, size, and location (distance to capitol and markets). He demonstrates that the most significant variables in the cost of forest management on private land in Guatemala include those associated with construction and maintenance of roads, followed by the costs of technical services such as the development of the management plan, licensing transactions, and forest regency. One forest official noted that while the costs of legal forest management are only likely to have increased with inflation, “it still must be a profitable business if over 700 plans are submitted and more than 280,000 cubic meters of timber are harvested from forests every year” (GAF1). Additionally, a forest expert pointed out that “intermediaries would not likely purchase standing wood and pursue legal management if the regulations were too restrictive and the related costs were too high” (GE12).

On the other hand some forest owners indicated that it is difficult for most forest owners to assume the costs of and manage their forests themselves, for example even paying
the taxes on timber production up front prohibits them from carrying out the work themselves. Thus, most forest owners sell their standing timber to intermediaries who assume most of the costs but also make derive the much greater economic benefit from the operations (GOGN1; GE2; GE10). Yet, these and other interviewees indicated that the availability of incentives for natural forest management has offset some of the costs for the forest owner, and drawn many people into long-term sustainable forest management that may otherwise have logged their forest without authorization or even have converted it to another land use (GAF1; GAF2; GC1; GE2; GE10; GE14; GFM1; GOGN1; GOGN3; GOGN5).

In addition to positive perceptions related to forest management incentives, many interviewees, including forest owners and managers, described INAB personnel as dedicated, competent, and having positive and supportive relationships with their clientele (GOGN1; GOGN2; GOGN5; GE1; GE7; GE10; GE13; GE14; GFM2; GC1). As one forest manager explained, “INAB officials are typically seen as allies to the forest owner and the forest production sector as a whole. They act as partners in progress toward sustainable forest management, but also command respect in terms of oversight and enforcement of forest compliance” (GFM1). This observation was echoed by forest experts and a government official (GE6; GE12; GOGN1). Finally, several forest owners, managers, and experts described the governmental policy directives for natural forest management outside protected areas as ‘sufficiently rigorous and reasonable’ (GE2; GE3; GFM1; GFM2; GOGN3; GOGN4). However, one forest expert indicated that these policy directives may “not go far enough in terms of identifying and mitigating the negative ecological as well as social impacts of forest management” (GC1), which was an observation noted by three other interviewees (GE4; GE12; GOGN1).

In terms of the outcomes, evaluation, and revision of governmental forest management policy for forests outside protected areas in Guatemala, interviewees described both inducements and some constraints for increased policy uptake and ultimately for the
intended policy outcomes associated with enhanced sustainable forest management. As for policy evaluation and revision, one forestry official explained, “there has not been much demand for policy revision, other than for increased services and incentives” (GAF1). Similarly, I did not find any empirical data on forest policy impacts and outcomes, and/or evidence of systematic policy evaluation and revision in the forest policy process in Guatemala.

7.3.c Target Group Governmental Forest Policy Adoption and Compliance in Protected Areas in Guatemala

The Guatemala protected areas system covers 2.365 million hectares of forest (including broadleaf, conifer, mixed, and mangrove forest) (SIGAP 2007). Since 1996, over 533,000 ha of the protected areas system have been leased to 12 communities (400,830 ha) and two industrial operations (132,303 ha) through 25-year forest concessions in the MBR. These forest concessions contain 512,786 ha of forest. Of this total forest area, 350,980 ha are designated as productive forest (SIGAP 2007). As noted by one protected areas official, no additional areas were available for community nor industrial concessions in the MBR as of 2007 (GAF3).

Each forest concession must maintain a general forest management plan for the entire concession area, these are updated every five years, and annual operating plans are based on the general plan. In 2006, authorized annual operating plans for the 12 community forest concessions covered a total area of 7,519 ha and just under 20,000 m$^3$ of authorized harvestable wood volume. In 2006, the authorized annual operating plans for the two industrial concessions totaled 4,428 ha and more than 9,500 m$^3$ of authorized harvestable wood volume (SIGAP 2007).

As part of the concession contract between the state and the community or industrial concessionaire forest concessions must be FSC certified (CONAP 1999b). As such, the status of certification of these concessions serves as a strong measure of legal
compliance with forest policy directives for forest management within protected, given that the first of the ten FSC principles stipulates that forest management must comply with and respect all applicable laws of the country (FSC 2008, web). As of 2007, 11 of the 14 forest concessions (both industrial concessions and nine community forest concessions) totaling 480,173 ha (90%) were FSC certified (FSC 2006). So, based on third-party evaluation, these 11 concessions were deemed to be in compliance with governmental forest policy directives, as well as the additional standards for FSC forest certification (FSC 2007; SmartWood 2007).

However, the status of forest concessions without certification is significant in protected areas, given the mandate to maintain certification as part of compliance with the concession contract (CONAP 1996). As such, failure to maintain certification demonstrates non-compliance in and of itself, but also typically represents non-compliance with forest policy directives as well. As of 2007, one community concession’s certification had been suspended and two other community concessions had voluntarily suspended their certification (SmartWood 2007). The mandatory and voluntary suspensions were due to forest land use change and uncontrolled squatters or settlements that were not part of the original forest concession land use plan (SmartWood 2007), both of which are significant transgressions, not only in terms of FSC certification, but of governmental forest policy compliance as well. Noncompliance with the concession contract or with governmental policy for forest management in protected areas can result in the cancellation of the concession contract (CONAP 1996).

7.3.d Local-Level Conditions that Induce and Constrain Governmental Forest Policy Uptake in Protected Areas in Guatemala

This section considers some of the key local- or forest concession-level conditions that may induce or constrain adoption and compliance with governmental forest management policy in protected areas. As noted by Carrera et al. (2006), the forest concessions in the MBR benefit from their location within a vast expanse of intact,
productive forested area that has a broad distribution of valuable hardwood species. Yet, on the other hand, the Reserve is subject to pressures from illegal settlements, squatters, and drug-trafficking, as well as poor transportation access and a long trajectory of forest fires and illicit logging of valuable species (Carrera et al. 2006).

In the forest concessions, there is a significant degree of variation between concessions. They range in size from 7,039 ha to 83,558 ha, and as noted above they differ in terms of tenure (FSC 2007). Two concessions are leased to forest industries, and twelve are leased to communities. The community concessions are further classified by concessions with resident populations and concessions with non-resident populations (CONAP 1996). These distinctions have been linked to differences in forest policy uptake, whereby smaller concessions with non-native resident populations have had the most difficulties in terms of widespread governmental policy adoption and compliance, as noted by protected area officials and regents (GAF3; GE5; GFM3; GFM4), as well as by Manzanero et al. (2006). Community concessionaires, protected area officials, and other interviewees attributed these difficulties to three key conditions. First, difficulties arise from the fact that some concessions were granted with residents living within the concession area and were permitted diversified land use and development within a restricted area, but in some cases these areas have been extended beyond the original boundaries as, for example, resident populations grow (GAF3; GC1; GCCF1; GCCF2; GE7; GOGN3). These difficulties are also attributed to the customs of non-native residents who bring with them subsistence experiences and cultures tied to agriculture rather than forest use, such that for some it has not been easy to adopt a ‘new’ way of life based on forestry, as opposed to agriculture or livestock. Finally, these difficulties are attributed to the comparatively limited forest resources of smaller concessions, where annual timber harvests are carried out over a smaller area and thus are less productive, than the larger, richer forest concessions (GAF3; GCCF1; GCCF2; GE7; GOGN3). In sum, while the forest concession area as a whole encompasses a vast and rich forest resource, the
differences in forest concession size, tenure status, and resident background can produce opportunities and/or challenges for forest policy adoption and compliance.

With regard to concessionaire capacity to manage forests in compliance with governmental policy directives, there are definite differences between the community and industrial concessions. One protected areas official explained that the two forest industries that were granted forest concessions had been working in the region for well over a decade when concessions were first granted, and they had significant experience with and tools for managing tropical forests at an industrial scale (GAF3). However, as explained by forest concessionaires and managers, the state was initially opposed to granting any industrial concessions in the MBR due to historically destructive logging by some industries in the region (GCIF1; GFM2; GFM4). However, two forest industries ultimately convinced the state to grant two industrial forest concessions, in large part by committing to attaining FSC certification, participating in community forestry development, and contributing to the long term productivity of the forest concession system (GCIF1; GFM2; GFM4). And, as noted by a certification official: “The industrial concessionaires had the expertise to manage forests long before the concessions were established, but they have gained considerable capacities in terms of the sustainable management of the ecological and social aspects of managed forests since participating in the forest concession system” (GC1).

On the other hand, as explained by one protected areas official, many of the communities that were granted concessions had little or no experience at all with sustainable forest management when the concession process began in the mid 1990s (GAF3). As for the community concessions, ‘technical acompaniment’ by an assessor NGO was initially mandated in the MBR Master Plan as a means for ensuring the sustainable use of the forest resource as well as for promoting the technical training and capacity of the communities (CONAP 1996). This technical acompaniment included services for forest planning and operations, as well as organizational and business
development. This technical accompaniment was initially provided by international and local NGOs (e.g. WWF; Conservation International; ProPeten) and academic institutions (e.g. CATIE), financed largely by international donors (Gomez and Mendez 2005).

Forest experts, managers, and concessionaires also noted that as of 2007, most community concession organizations carried out the technical, field, and operational activities associated with the management of the forest concession themselves, and financed the services of a forest regent, as well as some administrative and financial services through concession earnings (GE7; GE10; GFM1; GFM3; GCCF2). Additionally, the industrial forest concessions have often contracted community concession members in their operational activities, which has lent to further training and experience with industrial level operations (GCCF1; GFM4). As indicated by one certification official, “community concessionaires have gained considerable experience and skill in harvest planning and operations over the years, and even in terms of organizational and business practices, though these to a lesser degree than the forestry aspects” (GC1). So, as a result of this internal capacity building of concessionaires over the years, there is little if any presence of intermediaries in the management and operations of the forest concession system in the MBR, which, as noted by Chemonics (2005), permits much greater income from forest management for the concessionaire.

The perceptions and attitudes of concessionaires and forest managers toward forest policy and implementers also helps to shed light on policy adoption and compliance, or lack thereof, in the forest concession system. Forest concessionaires and managers generally had a positive impression of CONAP as a regulatory agency, as well as an ally in forest resource use and protection, despite limited agency resources (GFM1; GFM2; GFM4; GCCF1; GCCF2). Several of these interviewees also indicated that local CONAP officials (i.e. in Region VIII) have been very collaborative over the years in the development, dissemination, and technical assistance related to new policies, applications, or guidelines for forest management in the forest concessions (GFM1;
As one forest manager noted: “Even with their minimal budget and personnel, CONAP (in Region VIII) is available to support the concessions system in terms of training, finding equipment, border protection, etc.” (GFM1). And, a government official observed that “CONAP has ‘converted’ many members of the concessions into allies of the protected area system” (GAF3).

On the other hand a few forest concessionaires and an expert noted that the regulations and guidelines for legal forest management in the MBR, while robust and effective, are still very complex, which can be challenging for community groups who do not have good or consistent technical support or who have smaller forest areas and cannot afford adequate technical accompaniment (GE6; GCIF1; GCCF1). In addition, for some forest managers and experts, CONAP had lost some of its credibility due to inadequate attention to and resolution of invasions and land use change in some of the community concessions, as well as the unresolved issue of community concessions that have failed to comply with governmental policy directives (e.g. land use change, FSC certification) (GE10; GFM3; GFM4). This has resulted in a decrease in confidence in CONAP as the state agency in charge of forest administration in protected areas (GE10; GFM3; GFM4).

A final consideration in understanding forest policy uptake in the forest concessions of Guatemala is the impact on the system of outside pressures to comply with governmental and non-governmental sustainable forest policies. Even before the creation of the MBR in the mid-1990s there was immense external influence to incorporate sustainable forest management as an option in the Reserve (Chemonics 2005; Manzanero et al. 2006). This influence was coupled with significant financial and technical assistance for more than a decade to promote compliance with governmental forest policy directives for protected areas, as well as with internationally recognized standards for sustainable forest management (i.e. FSC) (Manzanero et al. 2006). As of 2007, financial assistance for governmental policy and certification compliance had decreased considerably, and community concessions were largely responsible for
covering the costs of technical support and certification themselves, as reported a protected area official, a forest expert, and a forest manager (GAF3; GE4; GFM1). Nonetheless, as one governmental official stated, “the MBR would never have succeeded on its own had it not been for the external pressure and support to promote and enhance sustainable forest management there” (GOGL1).

With regard to the outcomes of governmental policy for forest management in protected areas, it is difficult to separate the impacts and outcomes of governmental forest policy and its execution from those of non-governmental forest certification as well as those of outside support and technical assistance. These actors and their actions overlap in terms of direction, oversight, and evaluation of forest management in the forest concessions. Nonetheless, some key impacts of governmental forest policy for protected areas were clearly identifiable. For instance, several interviewees including forestry officials, concessionaires, and forest managers, noted that CONAP has worked with research organizations (e.g. CATIE) to have a significant impact on improvements to forest management planning (e.g. forest inventory techniques and analysis; plan quincenal which facilitates volume projections and annual operating area limits;), operations (e.g. minimization of wood waste in the forest; reduced impact logging techniques), and ecological aspects of forest management (e.g. diameter cutting limits; selection and protection of seed trees; riparian zone and fire protection; etc.) (GAF3; GCCF1, GE7, GFM1). Additionally, Conservation International sponsored a large scale, intensive monitoring project in the MBR and concluded that “at current extraction levels (0.8-2.4 trees/ha), the ecological impacts of timber extraction are minimal. Modest changes in the community structures of birds, beetles, diurnal butterflies, and game species suggest that current logging practices do not preclude any species from logged areas, but rather increase species richness by augmenting habitat heterogeneity” (Balas et al. 2004 cited by Nittler and Tschinkel 2005: 17).
There was also evidence that CONAP has been adaptive to the results of forest planning and management towards the regulation and promotion of forest sustainability in the forest concessions. Indications of these adaptations included the development of the five year planning tool (i.e. plan quincenal) and a review of community forest concession accounting systems as part of the forest management plan approval process. The financial review is intended to promote more efficient and transparent financial systems, which have historically been one of the greatest limiting factors for the development of sustainable community forest enterprises in the concession system, according to a protected areas official and a forest expert, as well as Nittler and Tschinkel (2005) (GAF3; GE7; Nittler and Tschinkel 2005).

On the other hand, there were also concerns expressed by protected areas officials and forest experts that there a still insufficient understanding of the complex processes of forest regeneration, especially in relation to mahogany (Swietenia macrophylla) (GAF3; GAF4; GE7; GE13). These are also noted by Nittler and Tschinkel (2005). Mahogany is relatively abundant in the Petén and economically the most valuable species extracted from the forest concessions. And, while some 20 tree species are regularly harvested from the forest concessions, mahogany represents approximately half of all production (Carrera et al. 2006). Monitoring of harvest impacts and forest regeneration through permanent sampling plots is a technical requirement for forest concessions, and although many plots have been established throughout the MBR, one forest expert noted that most plots have only been evaluated intermittently at best, and the information has not been consistently collected nor analyzed by CONAP (GE13). This ultimately leaves a significant gap in the overall capacity to adaptively regulate and manage forests in the forest concessions within the broader goal of their long-term sustainability.
7.4 Governmental Forest Policy Uptake in Nicaragua

7.4.a Target Group Governmental Forest Policy Adoption and Compliance

In Nicaragua, there was a significant decrease in authorized natural forest management between 2005 and 2007, which can certainly be linked in part to increasing restrictions on forest harvests and on the forest production sector overall (i.e. State of Forest Emergency Decree; Logging Ban Law, both passed in 2006). In 2005, INAFOR approved a total of 210,720 m$^3$ of harvested wood, largely through cutting permits for areas less than 50 ha (Rodriguez Quiros 2005) (Figure 7.3). In 2006, INAFOR approved a total of 112,909 m$^3$, nearly half of which (i.e. 54,744 m$^3$) was submitted through Minimal Plans (10 – 50 ha) and Forest Replacement Plans (<10 ha) (INAFOR 2007). In 2007, INAFOR approved a total of 30,881.25 m$^3$, through 49 annual operating plans linked to existing, authorized general forest management plans, as well as 271 non-commercial permits, 93 salvation plans, 173 agroforestry permits, and five permits for fallen wood, for a total of 591 permits. No harvest permits for forests less than 50 has were authorized in 2007 (INAFOR 2007).

Figure 7.3 Total Wood Volume (m$^3$) Authorized from Natural Forests by INAFOR from 2005 to 2007 (Source: Rodriguez Quiros 2005; INAFOR 2007)
Independent reviews of forest activity in Nicaragua between 2005 and 2007 revealed significantly low compliance with governmental policy directives in a large majority of forests authorized for production (CINCO and CIP 2007; Global Witness 2007). The Center for Communication Research (CINCO) and the Center for International Policies (CIP) investigated forest practices and legal compliance in the RAAN, the RAAS, and the Department of Nueva Segovia in 2005-2006. They found that of the 63 forest operations and industries evaluated, 83% (52) were noncompliant with the Forest Law, Regulations, and Technical Norms. Furthermore, they found that 40% of the operations reviewed had committed serious infractions in the forest (e.g. logging areas outside the approved forest boundaries; cutting mahogany below the diameter limit (i.e. 50 cm)) (CINCO and CIP 2006).

Between 2006 and 2007, the Independent Forest Monitoring (IFM) program carried out 15 monitoring missions across the country in coordination with INAFOR (Global Witness 2007). From these missions they concluded that “violations of the Forest Law are prevalent in all kinds of forest management plans authorized by INAFOR, regardless of ownership, size, and actors involved” (Global Witness 2007: 9). In 87% of the forest management units reviewed, poor or incorrect mapping techniques and a failure to delineate forest boundaries were documented. These transgressions were often linked to logging trees beyond the approved forest management unit boundaries, logging trees in areas that should be protected (e.g. waterways, slopes > 60%), and logging trees not included in the approved forest inventory (Global Witness 2007).

7.4.b Local-Level Conditions that Induce and Constrain Governmental Forest Policy Uptake in Nicaragua

Governmental forest policy uptake, or the lack thereof, in Nicaragua, can be better understood through the local or forest management unit context. While most forest units available for production in Nicaragua are small (<50 ha) and fragmented, there is also a significant amount of productive forest in large extensions on private and
indigenous lands (NAF4; NAF5). While specific data on forest size and ownership is not available in Nicaragua, as reported by one forestry official, most of the forest area in the west consists of conifer forests that are found in relatively small forest management units (<100 ha) on private lands (NAF5). In the eastern part of the country, there are also innumerable small forest fragments, it is also in the East that large extensions of continuous broadleaf forests are found (NAF5; Global Witness 2007).

While the large majority of productive forest land in the west is titled, much of the forest area in eastern Nicaragua is located in communal or indigenous lands, few of which possessed complete or even partial land title and/or demarcation as of 2007 (Global Witness 2007; Finley-Brook 2007). There is a long history of declarations to clarify and disputes over land tenure in the Atlantic regions of Nicaragua that predates Nicaragua’s independence in 1821 (Finley-Brook 2007). Conflicts over land tenure there heightened during the Sandinista regime, which promised demarcation and titling of communal lands but disputed the areas claimed by indigenous and community groups. More recently, in 2003, the Demarcation Law was issued with the intention of finally settling communal and indigenous land boundaries and tenure in the Autonomous Regions (Law No. 445). However, some suggest this law has led to increased disputes between indigenous communities who consider themselves the historical and rightful land steward or ‘owner’, and colonists who were promised land in the region by the Sandinista administration (NNCCF3; Finley-Brook 2007). As of 2007, little progress had actually been made in terms of demarcation and titling of lands in the Atlantic regions (NNCCF3).

As indicated by a forestry official and forest regent, unclear and insecure land title represent obstacles for forest policy uptake, both for the communities who ‘own’ the forest and for anyone (including communities) who seeks to harvest and market those forest resources (NAF5; NFM1). By law, clear land title or proof of legal forest tenure is

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36 Ownership patterns are highly skewed in Nicaragua, with 40% of farms, even those with forest fragments, encompassing less than 3.5 ha (Bathrick 2003); and 70% of all the land in the hands of small farmers on lots less than 18 ha (NAF5).
required for the authorization of harvest plans and permits in Nicaragua (NFR Art. 47). So, as some forestry officials and managers pointed out, while the state has shifted focus away from industrial forestry to promote community forest management, the demarcation and titling of indigenous and community lands are obviously fundamental for such a program to effectively move forward (NAF3; NAF4; NFM1).

As noted by one community forest member, another local-level aspect that influences decisions on governmental forest management policy uptake is the cultural association of the forest ‘owner’ or community group with the forest (NNCCF3). Take for example the Mayangna and the Miskito populations: two prominent indigenous groups in the Autonomous Regions that occupy/claim a significant area of the forest resource there. The Mayangna are primarily concentrated in the interior forests, and the Miskito predominate along the Coco River and the coastal plains of Puerto Cabezas and Prinzapolka, but are found throughout the Autonomous Regions (Roper 2003). Both groups generally perceive natural resources as a common good accessible by all community members, and both engage in a diversity of small-scale economic activities such as swidden agriculture, livestock production, fishing, hunting, and forest harvests. However, the Mayangna are “fairly isolated from the broader political-economy of the region and nation, [while] the Miskito have more commonly participated in the wage labor economy” (Roper 2003:17).

As indicated by one community forest member, the differences in forest-related experiences may be linked to differences in their views of the forest system, such that the Miskitos generally view the forest as a potential commercially productive resource (NCCF1). On the other hand, as explained by another community forest member, the Mayangnas tend to see the forest more as a protector of important resources such as bushmeat, non-wood forest products, and wood for subsistence uses (NNCCF3). These differences in the ‘cultural view’ of the forest impact forest owners’ interest in forest
management and ultimately their uptake of governmental forest management policy. Nonetheless, as noted by Roper (2003), interest in forest management as a means for community development is likely to increase in both communities as severe poverty continues to be one of, if not the, most pressing issue in Nicaragua, and especially in the Autonomous Regions, a view echoed by a community forest member (NNCCF3).

Other local-level factors that constrain governmental forest policy adoption and compliance in Nicaragua are similar to limiting factors in Costa Rica and Guatemala (e.g. forest management capacity, costs). For example, the large majority of small forest owners and indigenous groups or communities in Nicaragua are limited in terms of forestry capacity and financial resources to manage their forests themselves (NAF5; NCIF1; NE3). Consequently, as indicated by two forestry officials, these forest owners typically sell standing wood to intermediaries who obtain most of the economic benefit, but have little incentive to manage the resource with long-term sustainable production in mind (NAF1; NAF5). Nevertheless, as noted by another forest official and community forest member, for some communities, timber contracts with logging companies encompass income not only from the sale of standing wood but from employment opportunities in forest planning and extraction activities, which subsequently leads to increased training and capacity in forest management (NAF2; NNCCF2). There has also been considerable financial and technical assistance for the development of community forest enterprises from international aid agencies (e.g. GTZ; USAID) and environmental NGOs (e.g. WWF; Rainforest Alliance) for a select few indigenous communities and small forest owner groups (NCCF1; NCIF1; NFM1; NOGL2). However, as noted by one forest manager, progress toward the establishment of productive and self-sustaining community forest enterprises has been a “rather slow and complex process, with few success stories to date” (NFM1).

In terms of the economic costs and benefits associated with forest management, several interviewees noted that the cost of forest management in Nicaragua is not constrained
only to the forest, but is compounded by a multiplicity of actors and taxes, that ultimately reduce the profitability of already ‘slim’ profit margins (NNCF1; NE5; NFM3; NNCIF1). Ampie Bustos (2003) examined forest production throughout Nicaragua and demonstrated that that most forest owners in Nicaragua (i.e. indigenous groups or communities and small private forest owners) who sell their standing wood to intermediaries receive approximately 4-6% of the overall economic benefit from forest activity. In a study on the forest sector in the Northern Atlantic Autonomous Region (RAAN), Roper (2003) reports that communities that sell standing wood earn approximately 3.4 – 7.4% of the wood’s value on the national or international market. And even when communities harvest and transform wood products into sawnwood, they obtain only 8% to 34% of the national or international market wood value (Roper 2003). In another study on forest management costs in Nicaragua, Zea (2003) indicates that forest harvest and production in the Atlantic region is costly even for intermediaries, in large part due to transportation costs to market (accounting for 39% of total costs). In sum, the low economic return on forest activity for many resource owners and users can present obstacles to the uptake of governmental forest management policy, particularly if legal access is more costly than other land uses or means for timber extraction.

With regard to forest owners’ and users’ perceptions of and attitudes toward governmental forest management policy and implementers, there was a common observation that forest management policy directives and other forest-related laws and in Nicaragua are unclear, cumbersome, and even contradictory (noted in 19 out of 33 interviews). Moreover, some interviewees suggested that INAFOR lacks the capacity to lead and navigate the complicated forest administration system in place in 2007 (NE5; NNCCF1; NNCCF2). As one forest owner stated: “INAFORE does not provide technical support nor assistance for the implementation of the complicated web of forest laws, decrees, regulations, etc. in existence today, and does not seem to even comprehend them themselves” (NNCCF1).
Another aspect of forest owners’ and users’ attitudes on governmental forest policy and implementers in Nicaragua are the differences noted in private property forest owners, largely in the West, and community and indigenous groups in the East. One forest producer from the West stated that “even though we’re talking about forests on private property, the government keeps finding ways to take away our rights” (NNCIF2). A sentiment echoed by other private forest owners in Nicaragua (NCIF1; NNCIF2). On the other hand, indigenous community forest ‘owners’ maintained that INAFOR has historically and almost consistently overlooked them, despite recent initiatives to promote ‘community forestry’ (NCCF1; NNCCF1; NNCCF2; NNCCF3). One community forest member stated that: “If they’re going to really promote community forestry what we need are training and tools. We aren’t asking for handouts, we want to integrate into the sector and contribute as producers and protectors of forest resources, but we won’t wake up tomorrow as foresters without some assistance” (NNCCF1). Another community forest member said:

“We want to find ways to make better use of our forest resources and community forestry may be the answer. But, if so the state and INAFOR need to take us into account, and how is that going to happen when they don’t even come here to talk to us or see what we have to work with? - when they make their rules from far away? - and when we don’t have the resources to go and knock on their door in Puerto Cabezas, and even less so to go find them in the Capitol?” (NNCCF2)

In terms of the outcomes, evaluation, and revision of governmental forest management policy in Nicaragua, while policy outcomes were not directly measured in the forest, there was evidence and agreement among many interviewees that the availability of forest policy directives intended for forest fragments (<50 ha), in combination with significantly limited resources for executing forest policy by INAFOR resulting in insufficient oversight of forest management options, led to a misuse and abuse of small forest plans as a less rigorous and less expensive form of access to large contiguous forest areas (NAF1; NAF3; NAF5; NAF6; NE1; NE7; NE8; NFM1; NCIF1; NOGN1). As noted by one forestry official and a forest regent, these abuses led to the fragmentation of once contiguous forest, among other negative impacts (NAF1; NFM1). And, these forest transgressions
were ultimately discovered and led to a Presidential declaration of an Economic State of Emergency and a Congressional Law Banning Logging. As a result, INAFOR also prohibited the use of minimal forest plans (10 – 50 ha) and forest replacement permits (<10 ha), and incorporated an external auditor (i.e. IFM) to assist the agency with authorized forest management monitoring. Some interviewees maintained that these developments have had led to a decrease in illicit forest activity, making it much more difficult to operate without legal documentation and authorized harvest permits, for example (NAF3; NCIF1; NOGN3).

In contrast, one forestry official noted that they had “thrown out the good fruit with the bad! They’ve punished both those operating outside the law, as well as those trying to operate within the law” (NAF4). This notion was echoed by other forestry officials, experts, a forest manager and owner (NAF6; NE7; NE10; NFM1; NFM2; NNCIF1). In particular, forest managers, owners, and community members indicated that these new legislative developments have led to significant gridlock in governmental authorization and oversight of forest activity, resulting in significant economic losses for many who are trying to stay in the forestry business and for communities trying to enter the forest production sector (NFM1; NFM2; NFM3; NCCF1; NNCIF1; NOGL1; NOGL2). Finally, some also observed, that while the state has begun to promote “community forestry” and greater incorporation of local forest resource owners in the chain of forest production, the Law Banning Logging, which is to be in effect for 10 years, has locked many forest communities out of forest production possibilities, by prohibiting forest production within 10km of protected areas and 15km of the national borders, areas in which both communities and their forests are found (NFM3; NOGL1; NOGL2).

7.5 Chapter Wrap-Up

Table 7.2 summarizes some of the key aspects of governmental forest management policy uptake in Costa Rica, Guatemala, and Nicaragua that were discussed in this chapter. In Costa Rica, where governmental forest management policy is applied on-the-
ground, there is evidence to suggest that compliance with forest management standards is high (SINAC 2008; Louman et al. 2005). Nonetheless, the adoption of governmental policy for natural forest management declined significantly between 1994 and 2007. Moreover, governmental forest management policy was essentially rejected in areas where forests were clandestinely converted to other land uses, since forest land use change is prohibited by law. Constraints to governmental forest management policy uptake by forest owners are linked to the small average size and fragmentation of forests in Costa Rica and the rigorous standards that natural forest management must meet, which combine to produce increasing costs for policy adoption and compliance. Other factors that limit governmental forest management policy application on-the-ground encompass increasingly limited experience with forest management in the hands of forest owners; the prevalence of intermediaries with little investment in the long-term sustainability of managed forests; and a growing perception by forest owners that the state and the regulatory agency does not support natural forest management as part of a national conservation strategy.

In Guatemala, adoption of governmental forest management policy for forests outside protected areas oscillated between 1999 and 2005, which is associated in part with market variations. Yet, on average nearly 30,000 ha of natural forest were submitted to authorized forest management each year during that time period. Inducements to increased adoption of governmental forest management policy outside protected areas include incentives for natural forest management and the positive public image of INAFOR. Constraints are related to the small size and fragmentation of most forests outside protected areas, which encompass similar challenges to governmental forest policy uptake in Costa Rica (e.g. ensuring legal forest management is also profitable; few forest owners with capacity to manage their own forests, participation of intermediaries who do not hold long-term sustainability as a priority).
The adoption of and compliance with governmental forest management policy in protected areas in Guatemala is the most extensive of the three case study countries at more than half a million hectares. Nonetheless, the land tenure system is considerably different in this context such that the state is the landowner and leases the usufruct rights to the forest resources through long-term concession contracts. The factors that promote and constrain governmental forest management policy uptake in protected areas are quite different than in forests outside protected areas and on private land. For example, the forest concession system has benefited from extensive outside financial and technical support that has lent to increased and more successful governmental forest management policy uptake overall. On the other hand, policy uptake by the target group is not uniform, such that smaller forest concessions tend to produce smaller profits and may find it more difficult to effectively comply with the governmental forest policy directives. Moreover, when communities reside within the forest concession, pressures on the forest increase as do challenges for policy compliance, especially in when the community has not traditionally depended on the forest for subsistence.

In Nicaragua, where there is the most forest resource available for production, adoption and compliance of governmental forest policy directives has been erratic and in decline from 2005 to 2007. Moreover, even where forest management is authorized, noncompliance with the governmental forest policy directives is far from uncommon. Poor compliance of authorized forest management is linked to limited agency resources that resulted in poor oversight and misuse of the harvest permitting system, which ultimately led to increased restrictions on forest productivity from natural forests through additional legislation. Enhanced policy uptake in Nicaragua is further constrained by small, fragmented forests in the eastern part of the country that have similar challenges related to forest production as in Costa Rica and outside protected areas in Guatemala, and by unclear tenure in indigenous and community lands where there are extensive forests but limited capacity for community forestry.
This chapter assessed governmental forest management policy adoption and compliance, which were further explained by an examination of the inducements and constraints on forest owners’ and user’s forest policy decisions at the local level. It also drew together the assessment of governmental forest policy outputs, execution, and uptake. The following chapter considers these processes and variables in relation to non-governmental forest management policy in the three case study countries. The final chapter brings the two forest management policy approaches together in a comparative analysis and discussion.
Table 7.2  Key Aspects of Regulatory Forest Policy Uptake, Impacts, and Outcomes in Costa Rica, Guatemala, and Nicaragua

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<tr>
<th>Issue</th>
<th>Costa Rica</th>
<th>Guatemala – Outside Protected Areas</th>
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<tr>
<td>Overall governmental forest management policy adoption at country level</td>
<td>There is a decreasing submission of natural forests to legal management in Costa Rica. In 2007, 1,288 ha of productive forest was authorized for harvest, compared to 7,278 ha in 2006, and an average 10,000 ha/yr in the late 1990s. Though a large area of private forest has been submitted to PSA-protection since the late 1990s, a significant area has also been approved for harvest of “trees in pasture”, much of which is suspected to have been clandestinely converted from natural forest.</td>
<td>Submission of forests outside protected areas to authorized forest management in Guatemala varied between 1999 and 2005 but averaged almost 29,000 ha/yr and totaled more than 202,424ha. In 2006, 130,000 ha of natural forest were under an approved management plan. Nonetheless, forests are converted to other land uses, predominantly shifting agriculture, at one of the highest rates in Latin America (1.3%).</td>
<td>More than half a million ha of forests in Guatemala are managed through long term concessions in protected areas, which encompasses almost 2.4 million ha of forests. By far, this is the greatest area in which regulatory forest policy is adopted of the three case study countries.</td>
<td>There has been a sharp decrease in forest management in Nicaragua in recent years, due in part to restrictions on the forest sector and forest productivity by the State. In 2007, INAFOR approved the harvest of 30,881m$^3$, down from 112,720m$^3$ in 2006, and from 210,720m$^3$ in 2005.</td>
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<td>Overall compliance with governmental forest management policy where management is authorized</td>
<td>Where forest management is approved by SINAC, there is evidence that compliance with regulations and standards for forest management is high.</td>
<td>There are no known studies on regulatory compliance in forests outside protected areas, however incentive payments for forest management require proof of compliance, such that more than 27,000 ha receive incentives, or 21% of the total area under forest management.</td>
<td>95% of the forest area covered by the forest concessions is independently certified as soundly managed and in compliance with regulations. Nonetheless, the 5% that is not certified is indicative of noncompliance not only with the mandate to be FSC-certified, but with other governmental forest regulations as well (e.g. no forest conversion).</td>
<td>Even where forest management is approved, forest policy compliance is weakest in Nicaragua of the three countries. Studies of compliance have shown that most approved operations do not comply in one way or another with forest regulations, and oftentimes, have committed serious forest infractions.</td>
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<td>Inducements and Constraints at the FMU-level to governmental forest policy uptake: size, ownership, etc.</td>
<td>Forests available for production are typically small (&lt;100ha) and part of a larger land-use system in which agriculture or grazing land is the primary source of income. In general, forests are not relied upon for subsistence and as such</td>
<td>The average FMU outside protected areas is 45ha, with the majority being &lt;100ha. Few forest owners have the capacity and knowledge to manage their forests themselves, so there is a prevalence of intermediaries who carry</td>
<td>Forest management concessions range from about 7,000 ha to more than 80,000 ha. Some of the concessions have a designated area for community development, but most do not have residents living in them. The differences in tenure are attributed to</td>
<td>Most FMUs in Nicaragua are small (&lt;50ha), yet there are still large expanses of continuous forest in the Atlantic regions of the country. Tenure is also a factor in Nicaragua, where much of forests in the West are on titled, private land but are small and often</td>
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<td>Inducements and Constraints at the FMU-level to governmental forest policy uptake: size, ownership, etc.</td>
<td>there is a disconnect from seeing the forest as a sustainable source of income, which can be exacerbated when (non-NGO) intermediaries take over the forest management activities and do not have an investment in the long term sustainability of the forest resource.</td>
<td>out harvests but are not legally responsible for compliance so they are rarely invested in sound or long-term management.</td>
<td>differences in compliance, such that where there are non-native resident communities there have been the most challenges with sustainable forestry uptake and with forest conversion. These issues are exacerbated by the size of the concession, such that the smaller concessions with non-native residents have had the most challenges with regulatory forest policy compliance.</td>
<td>managed by intermediaries with similar issues as in Costa Rica and Guatemala. Much of the continuous forested land in the East is occupied by indigenous groups, but few of these areas are properly delineated and titled. In general, insecure and unstable land tenure complicates legal access to the forest resource. Nonetheless, studies show that non-compliance occurs throughout Nicaragua, “regardless of ownership, size, and actors involved” (Global Witness 2007: 9).</td>
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<td>Inducements and Constraints at the FMU-level to governmental forest policy uptake: costs of forest management</td>
<td>The costs of compliance are very high in Costa Rica given highly rigorous and comprehensive regulations combined with small forest area over which to distribute those costs. Additionally, some studies suggest forest management is rarely profitable given the regulations and conditions in Costa Rica, making it uncompetitive with other land use options and forest conversion more appealing.</td>
<td>While costs associated with forest management are not as high for forests outside protected areas as those within protected areas and in comparison to the other countries, they do increase with distance to market which is an obstacle for much of the managed forest in the Dept of the Peten. Some of the costs are offset by the provision of incentives for forest management.</td>
<td>For the first several years of the forest concessions system, the costs and development of forest management and certification were largely subsidized by international aid agencies. There was also significant support and technical assistance provided to the process. Over time the concessionaires gained considerable experience in sustainable forestry and now carry out most of the related activities themselves. Today the large majority of concessions are self-sustaining and profitable, though some suggest this is largely dependent upon continued high production rates of mahogany.</td>
<td>The costs of forest management are prohibitive for most forest owners in Nicaragua, even where forest area is large. This leads to a low value associated with forest land for many forest owners and the prevalence of intermediaries who often play a big role in forest activity but pay very little to the forest resource owner, exacerbating a disconnect between the forest owner and their view of the forest as a long-term source of productivity.</td>
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<td>Inducements and Constraints at the FMU-level to governmental forest policy uptake: forest owner attitudes</td>
<td>Forest owners in Costa Rica are increasingly disinterested in management, largely due to the difficulty of legal access to the forest resource, resulting in challenges in terms of forest policy uptake. More and more forest owners are also disillusioned with SINAC for a perceived lack of support and promotion of the forest production sector.</td>
<td>Forest owners in Guatemala are increasingly interested in forest management as a long-term land use option and are thus increasingly open to forest policy adoption. They are also generally very positive in their attitudes toward the regulatory agency INAB.</td>
<td>Forest concessionaire attitudes toward the forest resource are generally very positive and protective, though the non-native resident concessionaires have been the most difficult to “transform” into forest managers, resulting in challenges in terms of forest policy adoption. Forest concessionaires generally have a positive impression and relationship with CONAP, yet some are concerned about the lack of action on forest conversion and invasions in the concessions, but CONAP is limited in taking action on these matters.</td>
<td>Forest owners in the West generally see the forest as an economic resource, but one that is largely managed by a 3rd party. Indigenous forest ‘owners’ in the East are generally not prepared to manage timber and tend to differ by culture (e.g. Mayangna see the forest as a protector of important non-timber resources and are less inclined toward productive management, while the Miskito are more inclined to see the forest as a source of sustained timber production). Few forest owners anywhere have a positive view of INAFOR, or the increasing restrictions by the state.</td>
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CHAPTER 8
NON-GOVERNMENTAL FOREST CERTIFICATION: POLICY OUTPUTS, EXECUTION, AND UPTAKE

8.1 Introduction
Having assessed the governmental policy outputs for regulating and promoting sustainable forest management in Costa Rica, Guatemala, and Nicaragua, as well as their execution, and uptake in Chapters 5 through 7, this chapter examines forest certification as an alternative or additional non-governmental policy approach for promoting sustainable forest management in these countries. Non-governmental forest certification was originally promoted as a mechanism for improving forest management and its monitoring in the tropics. However, as of 2007, forest certification had primarily been taken up in temperate and boreal forests, accounting for more than 95% of the global area of certified forests. In Central America, as of 2008 only about 3.5% of the total forest area in the region was certified by the FSC, which was the only certification system applied at the time (FSC 2008; FAO 2007). Determining how and why non-governmental forest certification leads to or fails to produce enhanced uptake by forest owners and users in Costa Rica, Guatemala, and Nicaragua, provides important information on the opportunities and constraints associated with this policy approach towards an overall better understanding of its potential and effectiveness for enhancing sustainable forest management in the tropics.

This chapter begins with an assessment of non-governmental forest certification policy directives and the associated instruments for promoting or enhancing sustainable forest management in the three countries. A comprehensive understanding of policy directives and instruments is essential for a more comprehensive understanding of potential and actual policy outcomes (see for example: Mazmanian and Sabatier 1983; Goggin et al. 1990; Cashore and McDermott 2004), and permits an examination of the similarities and differences in non-governmental and governmental forest policy outputs in the three
case study countries. Then, the structures, resources, and processes for executing forest certification policy are examined, which can also uncover opportunities and limitations for policy uptake, and ultimately for overall policy outcomes (see for example: Mazmanian and Sabatier 1983; Winter 1990; Gunningham, Grabosky, and Sinclair 1998). Finally, this chapter considers the uptake of non-governmental forest certification by forest owners and users. This includes an assessment of the adoption and compliance with forest certification, as well as the inducements and constraints on the decisions of the policy target group at the local- or forest management unit- level.

8.2 Non-Governmental Forest Certification Policy Outputs
As of 2007, there were no FSC recognized national certification standards in Costa Rica, Guatemala, nor Nicaragua, despite the investment of significant efforts and resources by each country in the development of a national standard for forest certification (Rodríguez Quiros 2005; GC1). As described by a forest expert and government official, after several years of unsuccessful country-level efforts, there is now a regional effort underway to develop a certification standard for Central America (GOGN1; NE8). One certification official noted that Guatemala and Nicaragua are active participants in this regional effort, though Costa Rica has been less involved (GC1).

While there is no officially recognized national certification standard, certification evaluations and audits in each country are based on country-level interim standards developed by the certification auditor (FSC 2003). Four FSC-accredited auditors have certified forests in Costa Rica and Nicaragua (i.e. SmartWood; GFA; SCS; SGS), while only one auditor has certified forests in Guatemala (i.e. SmartWood) (FSC 2008). For Costa Rica and Nicaragua, each auditor has developed their own ‘interim standard’ for evaluating natural forest or plantation management. And, although there may be some organizational and other slight differences in interim standards, these must be based on the FSC Generic PC&I and approved by the FSC based on consistency with the generic framework and country conditions (FSC 2003).
8.2.a Forest Certification Policy Directives in Costa Rica

As described in Chapter 5, in the mid-1990s, Costa Rica initiated a process to develop a national certification system for sustainable natural forest and plantation management. Standards for authorized and certified forest management at the national level were developed within a framework of Principles, Criteria, and Indicators (PC&I), based on the FSC generic framework of PC&I (Chaves 2000). As of 2007, these PC&I had only been implemented as the standard to be met for authorized forest management, and had not been implemented through a national forest certification system. Rodriguez Quiros (2005), attributes this to the challenge of convincing larger forestry groups or industries to certify under a national system that does not have the global recognition associated with the FSC and to the small (<100 ha) and fragmented nature of natural forests in Costa Rica, which make it difficult to absorb the added costs of certification.

In the early 2000s, Costa Rica submitted the nationally developed PC&I for forest and plantation management to the FSC for recognition as the official standard to be used by FSC-accredited auditors working in the country (CC2; GC1). As explained by two certification officials, ultimately, the Costa Rican PC&I were not approved by the FSC, principally due to non-compliance with established procedures for the formation of the national working group that did not have the required representation by all stakeholders and to modifications of the FSC Principles and Criteria (GC1; CC2). As of 2008, FSC-accredited auditors working in Costa Rica had developed and executed interim standards, based on the FSC Framework, but that also included the Costa Rican Standards for Forest Management (PC&I) as a key component for evaluating forest management and for certification authorization and compliance (GFA 2005; Rainforest Alliance/ SmartWood 2008a; SCS 2008a; SGS 2006).

Of the three case study countries, Costa Rica represents the least difference in comprehensiveness and rigor between governmental forest policy directives and the
various interim standards for FSC certification of forests in Costa Rica (Table 8.1). This is attributable in part to the basis of the Costa Rica standards on the FSC framework of PC&I, as well as to the inclusion of many of Costa Rican policy prescriptions and thresholds in the interim standards (e.g. limits on road network widths, lengths, and slopes). Where there are differences, certification standards in Costa Rica tend to be more comprehensive and rigorous in terms of respect for and protection of workers and indigenous groups; community consultation; financial analyses related to the costs and benefits of forest operations; and monitoring of forest activity impacts.

Table 8.1 Comparison of FSC and Costa Rican Policy Directives for Forest Management using the FSC Principles as a Starting Point

<table>
<thead>
<tr>
<th>FSC Principles</th>
<th>Requirements in FSC Standards for Costa Rica</th>
<th>Requirements in Costa Rican Governmental Policy Directives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance with Laws and FSC Principles</td>
<td>Compliance with national and international related policy, as well as FSC standards</td>
<td>Compliance with national laws</td>
</tr>
<tr>
<td>Tenure and Use Rights and Responsibilities</td>
<td>Clear land title/tenure, forest boundary delineation, and protection against trespass</td>
<td>Clear land title/tenure, forest boundary delineation, and protection against trespass</td>
</tr>
<tr>
<td>Indigenous People’s Rights</td>
<td>Respect for indigenous rights and ownership, protection of their associated forest uses and values</td>
<td>Respect for and protection of indigenous rights and uses</td>
</tr>
<tr>
<td>Community Relations and Workers’ Rights</td>
<td>Local employment and benefits; Worker rights, health, safety, training; community consultation and collaboration; conflict resolution</td>
<td>Workers rights, health, and safety; local employment and benefits</td>
</tr>
<tr>
<td>Benefits from the Forest</td>
<td>Economic analyses and diversification; waste minimization; harvest cannot exceed growth</td>
<td>Optimal use of forest resources; harvest cannot exceed growth; waste minimization; operations ensure financial viability</td>
</tr>
<tr>
<td>Environmental Impact</td>
<td>EIA; mitigation and protection measures; soil and water conservation measures; prescriptions (= to CR standards) for felling, extraction and road network;</td>
<td>Mitigation and protection measures; soil and water conservation measures; prescriptions for felling, extraction, and road network;</td>
</tr>
<tr>
<td>Management Plan</td>
<td>Required with detailed guidelines and requirements</td>
<td>Required with detailed guidelines and requirements</td>
</tr>
<tr>
<td>Monitoring and Assessment</td>
<td>Required</td>
<td>Not required</td>
</tr>
</tbody>
</table>

Sources: GFA 2005; Rainforest Alliance/SmartWood 2008a; SCS 2008a; SGS 2006; CRFL 7575; CRR 25721; CR PC&I
8.2.b Forest Certification Policy Directives in Guatemala

In 2000, INAB initiated a process to develop a national framework of PC&I for sustainable forest management with support from the Guatemalan Forest Action Plan (*Plan de Acción Forestal de Guatemala* (PAFG)). These efforts led to the formalization of a national working group, the Guatemalan National Council for a Sustainable Forest Management Standard (*Consejo de Estandares Forestales de Guatemala* (CONESFORGUA)), to pursue FSC recognition of a national certification standard (Rodriguez Quiros 2005). “Following the FSC-established guidelines,” CONESFORGUA led a widespread, participatory process in the development of the National Standard for Sustainable Forest Management, which was published in 2005 (CONESFORGUA 2006). The Guatemalan National Standard for SFM was submitted to the FSC for recognition in 2005. However, as indicated by a certification official, the standard had been through several revisions by then, resulting in a dilution of its original comprehensiveness in response to “criticisms and complaints over its ‘excessive’ rigorousness by certain segments of the forest sector” (GC1). This certification official and two forest experts noted that it seems unlikely that this standard will be recognized and accredited by the FSC due to a lack of qualitative and quantitative parameters of sustainability and an insufficient level of overall rigor (GC1; GE10; GE14).

Similar to Costa Rica, FSC-accredited auditors working in Guatemala develop their own ‘interim’ standard for forest certification based on the FSC generic PC&I template. Different from Costa Rica and Nicaragua, however, there is only one auditor working in Guatemala (*i.e.* SmartWood), such that to date all certified forests are evaluated against the same specific criteria of sustainability (FSC 2008). Until 2004, SmartWood used an interim standard for Guatemala, then implemented certification standards developed specifically for the Mayan Forests of Guatemala and Belize through 2006, and today uses an interim standard for evaluating forest management in Guatemala that was developed through a multi-stakeholder process (Rainforest Alliance/SmartWood 2008).
The difference in comprehensiveness and rigor between the governmental policy directives for forest management (both for within and outside protected areas) and certification standards are greater in Guatemala than in Costa Rica, but many of the areas of difference are similar (e.g. social, economic, and monitoring requirements) (Table 8.2). The differences between certification standards and governmental directives for forest management in protected areas are not that much greater or different than in Costa Rica, with the exception of focus on indigenous rights. However, the differences in terms of comprehensiveness and rigor between governmental policy directives for forest management outside protected areas in Guatemala and the interim Guatemalan certification standards were the greatest of the four legislative frameworks considered in this study. In this case, the interim certification standards were much more comprehensive and rigorous than forest policy directives for forest management outside protected areas in terms of indigenous rights, community relations and workers’ rights, economic analyses and benefits from the forest, and monitoring and assessment.

Table 8.2 Comparison of FSC and Guatemalan Policy Directives for Forest Management using the FSC Principles as a Starting Point

<table>
<thead>
<tr>
<th>FSC Principles</th>
<th>Requirements in FSC Standards for Guatemala</th>
<th>Requirements in Guatemalan Policy Directives for Forests Outside Protected Areas</th>
<th>Requirements in Guatemalan Policy Directives for Forests in Protected Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance with Laws and FSC Principles</td>
<td>Compliance with national and international related policy, as well as FSC standards</td>
<td>Compliance with governmental forest policy directives</td>
<td>Compliance with governmental forest policy directives</td>
</tr>
<tr>
<td>Tenure and Use Rights and Responsibilities</td>
<td>Clear land title/tenure, forest boundary delineation, and protection against trespass and harvest</td>
<td>Clear land title/tenure; Protection against illegal harvest</td>
<td>Clear land title/tenure, forest boundary delineation, and protection against trespass and invasions</td>
</tr>
<tr>
<td>Indigenous People's Rights</td>
<td>Respect for indigenous rights and ownership, and respect and protection of their association forest uses and values</td>
<td>No specific requirements</td>
<td>No specific requirements</td>
</tr>
</tbody>
</table>
### Table 8.2 Continued

<table>
<thead>
<tr>
<th>FSC Principles</th>
<th>Requirements in FSC Standards for Guatemala</th>
<th>Requirements in Guatemalan Policy Directives for Forests Outside Protected Areas</th>
<th>Requirements in Guatemalan Policy Directives for Forests in Protected Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Relations and Workers' Rights</td>
<td>Local employment and benefits; Worker rights, health, safety, training; community consultation/collaboration; conflict resolution</td>
<td>No specific requirements</td>
<td>Worker health, safety and training; conflict resolution</td>
</tr>
<tr>
<td>Benefits from the Forest</td>
<td>Economic analyses and diversification; optimal and integrated use; waste minimization; harvest cannot exceed growth</td>
<td>Harvest cannot exceed growth</td>
<td>Harvest cannot exceed growth; waste minimization; operations ensure financial viability;</td>
</tr>
<tr>
<td>Environmental Impact</td>
<td>EIA; mitigation and protection measures; soil and water conservation measures; prescriptions for felling and extraction</td>
<td>Mitigation, protection, and conservation processes; Regeneration protection and insurance</td>
<td>Mitigation and protection measures; soil and water conservation measures; prescriptions for felling, extraction, and road network;</td>
</tr>
<tr>
<td>Management Plan</td>
<td>Required with detailed guidelines and requirements</td>
<td>Required with guidelines</td>
<td>Required with detailed guidelines and requirements</td>
</tr>
<tr>
<td>Monitoring and Assessment</td>
<td>Required</td>
<td>Not required</td>
<td>Required</td>
</tr>
</tbody>
</table>

Sources: Rainforest Alliance/SmartWood 2008b; GFL 101-96; GFR 4.23.97; GPAL 4-89; CONAP 1996; CONAP 1999b

#### 8.2.c Forest Certification Policy Directives in Nicaragua

In 1996, a national ENGO, NICAMBIENTAL, initiated efforts to develop a national standard for FSC certification (NE8). After some years of work and dissemination, the Nicaraguan Council for Voluntary Forest Certification (CONICEFV) was established as a formal working group in 2001. By the end of 2002, a national standard for forest certification had been developed and submitted to the FSC for recognition. Nonetheless, as noted by two forest experts, some key requirements and regulations of the FSC national standard process related to group formation and processes were not met, and the standard had not been recognized as of 2007 (NE2; NE9; RQ 2005). Therefore, like in Costa Rica and Guatemala, the four auditors that have worked in Nicaragua
implemented individually developed interim standards (GFA 2005; Rainforest Alliance/SmartWood 2008; SCS 2008b; SGS 2007).

Comparing the comprehensiveness and rigor of the Nicaraguan forest management policy directives and the interim standards used there for forest certification demonstrates few, if any differences, in the rigor of the planning and operational aspects of forest management. Yet, the certification standards are considerably more comprehensive and rigorous in terms of control and resolution of land use conflict, delineation of forest boundaries, monitoring forest activity impacts, community relations and consultation, and economic analysis of the costs and benefits of forest operations.

Table 8.3 Comparison of FSC and Nicaraguan Policy Directives for Forest Management using the FSC Principles as a Starting Point

<table>
<thead>
<tr>
<th>FSC Principles</th>
<th>Requirements in FSC Standards for Nicaragua</th>
<th>Requirements in Nicaraguan Governmental Policy Directives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance with Laws and FSC Principles</td>
<td>Compliance with national and international related policy, as well as FSC standards</td>
<td>Compliance with governmental forest management policy directives</td>
</tr>
<tr>
<td>Tenure and Use Rights and Responsibilities</td>
<td>Clear land title/tenure, forest boundary delineation, and protection against trespass</td>
<td>Clear land title/tenure</td>
</tr>
<tr>
<td>Indigenous People’s Rights</td>
<td>Respect for indigenous rights and ownership, and respect and protection of their association forest uses and values</td>
<td>Respect for and recognition and protection of indigenous forest rights and uses</td>
</tr>
<tr>
<td>Community Relations and Workers’ Rights</td>
<td>Local employment and benefits; Workers rights, health, safety, training; community consultation and collaboration; conflict resolution</td>
<td>No specific requirements</td>
</tr>
<tr>
<td>Benefits from the Forest</td>
<td>Economic analyses and diversification; waste minimization; harvest cannot exceed growth</td>
<td>Harvest cannot exceed growth</td>
</tr>
</tbody>
</table>
Table 8.3 Continued

<table>
<thead>
<tr>
<th>FSC Principles</th>
<th>Requirements in FSC Standards for Nicaragua</th>
<th>Requirements in Nicaragua Governmental Policy Directives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Environmental Impact</strong></td>
<td>EIA; mitigation and protection measures; soil and water conservation measures; prescriptions (= to CR standards) for felling, extraction and road network;</td>
<td>EIA (&gt; 500 ha); mitigation and protection measures; soil and water conservation measures; prescriptions for felling, extraction, and road network;</td>
</tr>
<tr>
<td><strong>Management Plan</strong></td>
<td>Required with detailed guidelines and requirements</td>
<td>Required with detailed guidelines and requirements</td>
</tr>
<tr>
<td><strong>Monitoring and Assessment</strong></td>
<td>Required</td>
<td>Not required</td>
</tr>
</tbody>
</table>

Sources: GFA 2005; Rainforest Alliance/SmartWood 2008c; SCS 2008b; SGS 2007; NFL 465; NR 73-2003; NTON18 001-04

8.2.d Forest Certification Policy Instruments

As discussed earlier in this dissertation, non-governmental forest certification typically represents an alternative, “non-state market-driven” approach intended to influence forest user behavior through market-based incentives (Cashore, Auld, and Newsom 2004). Forest certification was developed as a private-sector effort to tap into “the market's supply chain, rather than governments, for policy making authority” (Cashore and McDermott 2004: 11). It is intended to harness the market’s power to recognize and reward sustainable forest management, thus promoting improvements in forest management, and ultimately, decreases in the negative externalities associated with unsustainable forest practices.

Non-governmental forest certification generally works as a voluntary non-state market driven policy approach in the three case study countries, with the exception of the forest concessions in protected areas in Guatemala, where FSC forest certification is mandatory (CONAP 1996). Similar to findings by Rickenbach and Overdevest (2006), although very few certified forest operations in the three case study countries indicated that market incentives had been demonstrated through a price differential for harvested or processed certified wood (GCIF1; GFM2), many did note that certification has served
to open and secure new market and improve the overall public image of the certified forest (CE3; CE9; CFM2; CAF1; GCCF1; GCCF2; GE7; GE9; GE10; GFM2; GFM4; NCCF1; NCIF1), and in some cases of the forest production sector as a whole (GAF3; GAF5; GCCF2; GE7; GE10; GE13).

In terms of penalties for non-compliance with certification standards, the certifier may require that the forest unit meet certain conditions to maintain certification status, and if these conditions are not met within the prescribed amount of time, the certification agreement can be cancelled (FSC 2003). Forest certificates have been cancelled for non-compliance with certification conditions in Guatemala and Nicaragua (FSC 2007; FSC 2008; Rainforest Alliance/SmartWood 2007). However, in the forest concessions of the MBR in Guatemala, FSC certification is mandatory for maintenance of the concession contract, and is associated with penalties for non-compliance (i.e. cancellation of concession contract). However, even though certification contracts were suspended in three community forest concessions (two voluntarily), no forest concession contract had been revoked as of 2007.

With regard to the mandatory nature of forest certification in the concessions of the MBR, government officials recognized the implications of forest concessions certifications being suspended, but they also indicated that these concessions were in the process of improving their management practices and reinstating their certification status (GAF3; GAF4). In addition, as noted by one forest regent, the penalty for forest concessions that do not maintain certification may not be realistic, as revocation of a community forest contract carries with it ramifications “much larger than simply canceling a forest concession contract. ... In many cases it means ejecting forest communities that have established settlements and based their livelihood in the concession area” (GFM3). A forestry official seemed to concur as he explained that: “For now, we (CONAP and the state) are focused on improving the performance of the
concessions that have fallen behind and reorienting them toward a more sustainable development and use of forests that will also permit them to recertify” (GAF4).

In terms of educational and informational policy instruments, there are obvious conflicts of interest for certifiers to provide technical assistance directly to certification applicants. As pointed out by one certification official, certifiers are not permitted to suggest ways to address pre-conditions or conditions as this would lead to a conflict of interest in the overall judgment of the certifier (GC1). Yet, while certifiers do not directly provide technical assistance, many certified forest owners and managers perceived technical ‘benefits’ from certification through the mandated improvements in forest management (GCCF1; GCCF2; GCF1; GFM1; GFM2; CFM1; CFM4; NFM1). Certified forest owners and operators also indicated that there is a significant need for assistance from the certifier or from the FSC itself in identifying and deriving increased benefits from certification (CE9; CFM4; GCCF1; GCCF2; NCCF1; NCIF1). Moreover, non-certified forest owners and operators and forest agency personnel identified a need for increased access to and information about forest certification (CAF2; GAF1; GOGN5; NE7; NAF4).

Finally, as for fiscal incentives associated with forest certification (e.g. governmental preferential purchasing programs), as of 2007, there were no direct fiscal incentives for forest certification in any of the case study countries.

### 8.3 Non-Governmental Forest Certification Execution

The execution of non-governmental forest certification is quite different than that of governmental forest regulation in many regards, mostly due to the fact that certification is implemented through the private sector.
8.3.a Structure and Resources for Executing Forest Certification

FSC-accredited auditors are typically internationally active companies, that often certify the sustainability of a wide range of products and processes worldwide (e.g. Scientific Certification Systems; GFA Consulting Group). All of the certification auditors working in the three case study countries have a central headquarters outside the region, but a regional office located in Latin America. The regional office plans and coordinates local certification evaluations and audits (e.g. SmartWood Central American and Caribbean Office is located in Guatemala City).

As explained by one certification official, the process of forest management certification initiates with the forest owner or operator who requests a certification audit and is responsible for covering the costs of the certification process (or as in many cases in the case study countries, the costs are covered by a third-party donor) (GC1). While each certification company maintains a small administrative and technical staff at the regional level, the ‘personnel’ and resources for forest management audits are contracted on an ‘audit-by-audit’ basis, according to two local forest certification officials (GC1; CC1). Forest certification audits typically include one or two of the company’s permanent local technical staff and two or three local or regional forestry consultants who are contracted for that particular forest evaluation, as are vehicles, accommodations, and other logistical and material resources (GC1; CC1).

A broad range of interviewees in Costa Rica and Guatemala (e.g. forest officials, experts, managers, owners) described certification auditors as generally ‘highly qualified’, proficient, well-trained, and knowledgeable of the local forest context (CAF2; CE9; CFM4; GFM3; GFM4; GE1). However, in Nicaragua, several interviewees noted that the certification process in general, an certification auditors in particular, lack transparency and reliability, especially in cases where questionable forest operations have been certified (NAF2; NAF4; NE1; NE9; NFM1). Additionally, there were questions about the objectivity of forest certification in Nicaragua and Guatemala, especially when conditions
for certification do not seem to be applied consistently across different forest management units (GE6; GE10; GE13; GCIF1; NAF1; NE3; NE9; WWF 2004; Carrera et al. 2006). For example, in Guatemala, there have been cases of community concessions, recognized for superior compliance with governmental regulations and basic standards of sustainable forest management that have been assigned a significantly higher number of conditions for maintenance of certification than community concessions widely recognized for comparatively poor forest management (i.e. 64 conditions versus 13). One forest expert explained that this is due to the fact that certification is meant to continuously improve forest management, based on a minimum but no maximum standard of sustainable forest management (GE11).

8.3.b Processes for Executing Non-Governmental Forest Certification
The processes for granting or authorizing forest certification were explained by one certifier as follows (GC1). Once an applicant submits a request for forest certification and an ‘agreement for services’ has been established, the certifier releases a Public Announcement of the intent of the forest unit to certify. An evaluation of the forest unit is programmed at least one month after the public announcement has been published. The evaluation includes a review of forest-related documentation, interviews with forest stakeholders, and a field assessment of the forest management unit and surrounding area that takes into account forest management planning, previous and current operations, and mitigation and protective measures, among other aspects of forest management. The duration of the evaluation varies with the size of the forest, but averages about four days with a team of three to four auditors. At the conclusion of the evaluation the auditor team prepares a draft of the evaluation assessment, which is sent to the applicant for review and response. If the applicant has significant comments, the evaluation and applicant comments are sent to a panel of independent auditors who may provide suggestions for modifications that are incorporated into the final evaluation. At this point, the central office determines the final decision to certify. If the evaluation includes pre-conditions for certification, the applicant must resolve these prior to
certification of the forest unit. If there are no pre-conditions then a certification contract is issued. A certification contract has a duration of five years, based on annual reviews to ensure that the certified forest maintains the standards of certification. After five years, the certification contract must be renewed to maintain certification status (GC1).

Two certifiers further explained the processes of verification with certification standards (CC1; GC1). The office evaluation encompasses a review of forest documents (e.g. general forest management plan, annual operating plan(s), maps, company policies, legal documents, etc.) and interviews with the applicant as well as some of the key forest stakeholders. The field evaluation serves to corroborate the forest related documentation with implementation and activities in the forest, to ensure that all applicable laws and standards are followed in the field, and to carry out additional forest stakeholder interviews. In the field, the auditors assess the entire forest management unit through a random sample sub-unit selection process. Previous areas of operation are visited chronologically to assess the implementation of management and its impacts over time. Through this approach to evaluation, the number of variables that can be observed (e.g. harvest history, forest cover types, special management zones, landscape considerations, silvicultural systems, and harvest systems) is maximized (CC1; GC1).

Once a forest is certified, the annual surveillance audits for maintenance of certification are similar to the initial evaluations described above, just on a smaller scale (CC1; GC1). If non-compliance with the certification standards, conditions may be set that must be met by the next annual audit – termed corrective action requests (CARs). If non-compliance persists or is a grave transgressions (i.e. forest land use change), suspension or cancellation of the certification contract may follow (CC1). Overall, the verification process of forest certification is a very rigorous process, and while governmental processes may be comparably rigorous on paper (e.g. Nicaragua), as demonstrated in all three case study countries, they are often constrained by limited resources and thus are rarely executed as planned.
8.4 Non-Governmental Forest Certification Uptake

Certification of forest management has been implemented for more than a decade in Central America, reaching to more than 775,000 ha, or about 3.5% of the region’s total forest area by 2008 (FSC 2008; FAO 2007). More than 85% of the certified area in Central America is natural forest, a large majority of which is located in the forest concessions of Guatemala (Figure 8.1). The largest area of certified forest plantations in the region is found in Costa Rica (FSC 2008). As noted above, the FSC is the only certification system implemented in the region.

![Figure 8.1. FSC Certified Forest Area in Central America (March 2008)](image)

Of the three countries in this study, Guatemala has the most certified forest area and the largest area of certified natural forests, which is nearly 17 times that of Nicaragua and more than 70 times that of Costa Rica (Table 8.4). Costa Rica has the largest area of
certified forest plantations and the greatest overall number of certified units. Nicaragua has the least area and percentage of certified forests of the three countries, yet significantly more certified natural forest area than Costa Rica. Overall, about 5% of the total forested area of these three countries is certified (FSC 2008; FAO 2007).

Table 8.4 Certification Statistics for Costa Rica, Guatemala, and Nicaragua (2008)

<table>
<thead>
<tr>
<th>Variable (FSC March 2008)</th>
<th>Costa Rica</th>
<th>Guatemala</th>
<th>Nicaragua</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certified Forest Total Area (ha) / No. Certificates</td>
<td>58,772 / 20</td>
<td>509,425 / 13</td>
<td>40,775 / 4</td>
</tr>
<tr>
<td>Certified Natural Forest (ha)</td>
<td>6,975</td>
<td>506,304</td>
<td>30,000</td>
</tr>
<tr>
<td>Certified Plantation (ha)</td>
<td>32,780</td>
<td>3,121</td>
<td>6,311</td>
</tr>
<tr>
<td>Certified Semi-Natural/Mixed (ha)</td>
<td>19,017</td>
<td>-</td>
<td>4,464</td>
</tr>
<tr>
<td>Certified % Total Forest (FSC 2008/FAO 2007)</td>
<td>2.46%</td>
<td>12.94%</td>
<td>0.79%</td>
</tr>
</tbody>
</table>

8.4.a Forest Certification Adoption and Compliance in Costa Rica

PORTICO, S.A. (now known as Tecnoforest), a Costa Rican company that is a forest owner and producer of doors, was the first tropical forest to be certified by an internationally recognized system in 1993 (Alfaro and Rodriguez 1999). In 2008, Technoforest had 6,600 ha of managed natural forests under FSC certification (FSC 2008). The first FSC ‘umbrella’ or group certificate was also granted in Costa Rica to the Fundación de Desarrollo del Corredor Volcánico Central (FUNDECOR). FUNDECOR is a non-profit NGO created in 1990 whose mission is to maintain forest cover, protect biodiversity, and promote the sustainable development of the natural resources of the Central Volcanic Mountain Range. FUNDECOR was first certified in 1996 and as of 2008 was still certified under the FSC ‘forest manager’ scheme (FUNDECOR 2008).

Forest certification grew steadily in Costa Rica throughout the 1990s and early 2000s, peaking at almost 86,000 ha in 2002 (Figure 8.2). Between 2002 and 2008 the total certified forest area in Costa Rica fluctuated significantly, representing about 60,000 ha of mostly plantation and mixed forest in 2008. One forest expert noted that some of the fluctuation in certified forest area in the mid-2000s can be attributed to changes within
group certificates managed by forestry NGOs (e.g. FUNDECOR) (CE9). As he explained, some of these forestry NGOs oversee the management of natural, mixed, and plantation forests, as well as the protection of natural and mixed forests, and that they shifted the forest area covered by the group certificate from all forests under their care to only those forests under active or potential future management for timber production. This shift led to a significant decrease in the statistics on certified natural and mixed forest during that time. He further indicated that these certificate changes were largely done to reduce the overall cost of group certification (CE9). However, several natural and plantation forests (e.g. Fundacion TUVA; Tropical American Tree Farm, respectively) that were certified in the late 1990s and early 2000s did not recertify once their certification expired. To understand better what impede or induces forest certification in Costa Rica, let us turn now to an assessment of related local-level conditions.

Some of the decline in forest certification adoption and even retention in Costa Rica is surely linked to the decline in overall forest management adoption that began in the late...
1990s (see Chapter 7). Additionally, a range of interviewees noted the perceived lack of economic benefits (i.e. price differential) and market pull (international, or otherwise) for certified forest management as major impediments to increased uptake (CE2; CE3; CE7; CE9; CC1; CC2; CFM1). As one forestry official stated: “The declining statistics of forest certification in Costa Rica speak for themselves... and reflect the common perception that certification provides little economic benefit to the forest owner” (CAF3). In a study by Garay (2004) of certified and other natural forest management units in Costa Rica, she demonstrates that the decision to initially adopt forest certification was most often motivated by the expectation of additional income derived from forest certification status, however none of the study subjects had perceived such an increase in income.

Added to the perceived lack of market pull for and economic benefits from certification, are the associated costs, which, as one forest expert indicated, are all but prohibitive for the mostly small managed forests in Costa Rica (CE3). If it is difficult for small forest owners to cover the costs of legal forest management, it would surely be nearly impossible to afford forest certification. In an effort to offset the individual costs of certification, group and manager certification schemes have been introduced and implemented in Costa Rica, as one certifier noted. In 2008, these two certification schemes accounted for about 20% of the total certified area in Costa Rica, and more than half of the certified semi-natural/mixed forest (FSC 2008). Nonetheless, there seems to be a ‘growing lack of interest’ in forest certification in Costa Rica that goes beyond the associated costs (CFM3; CFM4). This was evidenced by recent experiences of two certified forestry NGOs that have absorbed the costs of certification elsewhere in their business and thus, do not pass them on to the client (i.e. forest owner). Yet, when some clients are offered the opportunity to include their managed forest in the group or manager certification agreement, more and more forest owners decline the offer to certify their forest management ‘at not additional cost to them’ (CFM3; CFM4). One of these forest managers said most forest owners response when asked ‘why not certify’ is: “why would I want to complicate my life with all that?” (CFM3).
8.4.b Forest Certification Adoption and Compliance in Guatemala

The history of forest certification in Guatemala is quite different from that of Costa Rica and Nicaragua, principally because FSC certification is a mandatory requirement for access to community and industrial forest concessions in the Maya Biosphere Reserve (MBR). As one forest expert noted, “for many this implied an enormous learning curve to approach ecologically, economically, and socially sound forest management” (GE9). And, while the costs of certification can be one of the biggest impediments to widespread uptake, the initial costs of certification in the community concessions were covered by international donors (e.g. USAID) (Manzanero et al. 2006).

In 1998, the community concession group Impulsores Suchitecos achieved the first certified forest in Guatemala (Carrera et al. 2006). Between 1998 and 2000, certified forest area in Guatemala increased nearly tenfold (Figure 8.3). As more forest concessions were certified in the early 2000s, certification became a “sign of prestige” for the communities, industries, and the accompanying NGOs living and working in the MBR (Carrera et al. 2006). By 2005, certified forests in Guatemala had reached over half a million hectares, nearly 75% of which was managed by communities (i.e. community forest concessions in the multiple use zone, community forest cooperatives in the buffer zone) (FSC 2005). Beyond the MBR, forest certification has had a much slower pace of uptake, with the first forest plantation certified in 2002 and the first natural forest certified in 2004 (FSC 2002, 2004). As of 2008, certified natural forests in the MBR accounted for 99% of the total certified forest area in Guatemala (FSC 2008). That year there were an additional 938 ha of certified natural forest and 3,121 ha of certified forest plantations outside of the MBR (FSC 2008).
Taking into account the local-level forest management unit conditions beyond the requirement for FSC certification in the forest concessions of the MBR versus no such requirement for forest management outside protected areas, helps us to understand better the inducements and constraints to non-governmental forest certification in Guatemala. First, several interviewees, including forestry officials, certifiers, and experts, considered the costs associated with certification to represent, in part, an impediment to forest certification outside the MBR (GAF1; GAF2; GC1; GE2; GE13; GOGN1). On the other hand, the financial support from outside donors to cover the initial costs of community forest management and certification in the MBR forest concessions was considered to be a significant inducement to the overall uptake of certification in Guatemala by a broad range of interviewees (GAF3; GAF4; GAF5; GE4; GE7; GE9; GE10; GE11; GE13; GFM1; GFM2; GFM4; GCI1; GCCF1; GCCF2; GC1). As one forest expert explained, “the costs associated with forest certification and with the development and
improvement of forest management in the community forest concessions were heavily subsidized during the initial years of the concession process” (GE13). Another forest expert further explained that as of 2007, international financial assistance was no longer used to subsidize the costs associated with the community forest concessions (GE11). As such, the community concessions have been responsible for covering the costs of forest management and of forest certification since then, and “most are covering these costs within a considerable profit margin” (GE11).

One certified community forest concessionaire noted that the adoption of a group certification scheme by many of the community concessions has helped to reduce the costs of forest certification (GCCF1). He indicated that this approach has reduced the costs of certification for some communities by up to 35% (GCCF1). A forest expert also noted that this approach has “lowered individual concession certification costs, distributed forest monitoring efforts across a larger forest area, and motivated those concessions that are performing well to help those who are not (since many are under the same certification agreement and must all comply with certification standards to maintain their certification status)” (GE10). Given the typically small size of forests outside protected areas, the group and manager certification schemes may also prove helpful in promoting certification uptake in forests outside protected areas, though no group or forest manager certificates had been granted outside the MBR in Guatemala as of the end of 2007 (FSC 2008).

In addition to the costs of forest certification, the lack of perceived economic benefits from certification, particularly in the form of a price differential for certified wood products, was considered an obstacle for forest certification throughout Guatemala by a wide range interviewees (25 out of 33 interviews). In the forest concessions of the MBR, forest certification is required as part of the concession contract, therefore, despite a lack of a tangible price differential this does not prevent its uptake there. In addition, many certified forest concessionaires and forest experts indicated that although forest
certification had not resulted in a price differential for certified wood products, it had helped to secure market niches and enhance the overall public image of the forest concession system (GE5; GE7; GE9; GE11; GFM1; GFM2; GFM4; GCCF1; GCCF2; GCIF1). On the other hand, outside the MBR, the combination of certification costs and the lack of perceived economic benefits, has produced a significant obstacle to certification’s uptake outside protected areas. Two government officials also indicated that certification uptake outside protected areas has been slow due to a lack of promotion and dissemination of certification’s benefits outside the MBR (GOGN3; GOGN5).

8.4.c Forest Certification Adoption and Compliance in Nicaragua
In the early 2000s, certification grew slowly but steadily in Nicaragua (Figure 8.4). The first certified forest in Nicaragua was granted in 2002 for 3,500 ha of natural forest located in the Northern Atlantic Autonomous Region (SCS 2002). New certificates incorporated natural, plantation, and mixed forests, representing private and community ownership. By 2006, there were more than 20,000 ha of certified forest under different types of ownership in Nicaragua, including three natural forests (13,157 ha), one semi-natural/mixed forest (4,464 ha), and one plantation (3,570 ha) (FSC 2006).

By the mid-2000s, the forest sector as a whole in Nicaragua began to unravel and serious legislative actions were taken to correct the unchecked transgressions (i.e. State of Economic Emergency Decree, Logging Ban Law, See Chapters 5-7). According to forest experts and a forest manager, the new forest-related legislation significantly diminished growing interest in forest certification as day-to-day operations became increasingly complicated, if not altogether impossible to carry out (NE1; NE9; NFM1). Moreover, as existing operations came under increasing scrutiny, some FSC certified forests were found to be in non-compliance with national laws and legislation (e.g. PRADA certified by SmartWood; Hermanos Ubeda certified by SCS) (Global Witness 2007). And, as forestry officials and experts noted, these transgressions not only called into question those forest operations and INAFOR as the oversight agency, but the forest
certification process and certifiers, as well (NAF2, NAF4; NAF5; NE1; NE2; NE3; NE7). One forest expert stated: “The objectivity of the forest certification process is questionable here, especially if companies can get certified when the company has committed documented transgressions in the forest and there are existing complaints against the company by local forest communities and even from INAFOR” (NE3). However, it should also be noted that one of the certified forest units under scrutiny had its certification agreement suspended for non-compliance with numerous conditions in 2007 (SmartWood 2007).

![NICARAGUA CERTIFIED FOREST 1998-2008](image)

**Figure 8.4 FSC Certified Forest Area in Nicaragua (1998-2008)**

In addition to the constraints on forest production and ultimately on forest certification from new legislation related to forest production in Nicaragua, there are other opportunities and constraints to forest certification in Nicaragua. A broad range of interviewees considered the costs of certification to be prohibitive for widespread adoption, especially if the costs of legal forest management continue to increase under
increasingly rigorous regulatory standards and taxes on production (NAF1; NAF3; NAF5; NC1; NCCF1; NCIF1; NE1; NE2; NE4; NE5; NE8; NE9; NFM1; NFM4; NNCIF1; NNCIF2). Some interviewees (e.g. forestry officials, forest managers/owners, forest experts) also suggested that the overall (poor) level of forest management in Nicaragua is an obstacle to greater uptake of forest certification (NAF3; NCIF1; NE8; NE9; NFM1).

There have been some significant, yet isolated cases of technical assistance and support for certified forest management in communities (e.g. WWF - Laysiksa, - SIPBAA, etc.) and in industrial forest operations (e.g. CATIE - PRADA). Yet, the associated goals of improved forest management and increased certified forest area have been mostly elusive, as pointed out by one forest manager (NFM1). After many years and extensive investments by these and other NGOs, only one community forest operation was certified in Nicaragua as of 2008 (FSC 2008). And, though one of the industrial operations that benefited from significant technical assistance in sustainable forestry practices was certified at one time, it has since had its certification agreement suspended for non-compliance with the FSC standards (SmartWood 2007).

Finally, as one certified forest owner indicated, there are a number of pressing issues within the forest production sector that must be figured out (e.g. ban on key timber species, lack of clarity in the roles related to forest regulatory implementation) before forest certification can be effectively promoted and pursued in Nicaragua (NCIF1). “Until then, interest in forest certification will continue to decrease” (NCIF1). And, as framed by one forest expert:

“How can we talk about or promote forest certification in Nicaragua when the costs of legal compliance are so high, where there is endless paperwork and procedure for accessing forest resources, and where the impunity of the forest sector seems limitless? ... All this leads to a drastically decreasing interest to comply with the law, and even less interest in forest certification” (NE5).
8.5 Perspectives on Forest Certification Impacts and Outcomes

8.5.a Costa Rica

With regard to the operational and environmental aspects of forest certification, certified forest owners and managers in Costa Rica indicated that forest certification has led to numerous improvements in the technical aspects of forest management (e.g. planning, reduced impact logging techniques, monitoring), which in turn have led to increased adaptiveness of forest management to management impacts and outcomes (CC1; CE9; CFM3; CFM4). And though there is the shortest leap between governmental regulations and certification standards for forest management in Costa Rica, Louman et al. (2005) found that certified forest operations demonstrate better performance than non-certified legal forest operations in terms of protection of waterways, the extraction/road network, post-harvest treatments, and control of hunting and illegal extractions. In other words, certification contributes to significant improvements in forest management over governmental regulation in Costa Rica. Nonetheless, one forest expert also pointed out that forest certification focuses on the ‘sustainability’ of the forest management unit but does not consider sustainability at the landscape level (CE1). Given the typically small size of forests in Costa Rica, their sustainability depends in large part on the landscape level dynamics in which they are found, such that while forest management may be ecologically, economically, and socially sound within the forest management unit, if the forest is surrounded by extensive agriculture and/or development the likelihood of its long-term sustainability may be significantly diminished (CE1).

In terms of the economic and social aspects of certified forests, forest experts and certifiers noted that accounting and financial analyses have been incorporated into certified forest management systems as a result of certification, and that organizational and administrative aspects have also improved, towards more sustainable business practices (CC1; CE3; CE5). Enhanced workforce training, security, and stability are also attributed to the impacts of forest certification (CC1; CE3; CFM1; CFM3). Louman and colleagues (2005) found that certified forests also have increased security in terms of
land tenure and access to financial and technical assistance. Yet, while certification has served to secure some specific niches in the wood products market (CE3; CE4; CFM2), it has not produced a price differential for certified wood products and overall, has failed to produce economically tangible benefits to the forest owner (CAF1; CE4; CEE5; CE6; CE9; CFM2; Louman et al. 2005), which has likely led at least in part to the waning interest and adoption of forest certification in Costa Rica.

8.5.b Guatemala
In Guatemala, certification in forest concessions is credited by a range of interviewees with promoting significant improvements in the overall management systems implemented there (GAF1; GAF3; GAF4; GC1; GCCF1; GCCF2; GCIF1; GE4; GE7; GE8; GE9; GE10; GE11; GE13; GFM1; GFM2; GFM4). Specific ecological aspects that have been improved include protections against trespass and hunting, improvements in mitigations measures for road construction, monitoring and cultivation of regeneration post-harvest, and the diversification of species harvested, as noted by forest managers and experts (GE10; GFM1; GFM2; GOGN1). However, a forestry official and two forest experts noted concerns related to the insufficient compliance with forest monitoring requirements in the certification standards (GAF4; GE1; GE13). As explained by one forest expert, as long as forest impacts are not adequately monitored and interpreted and management practices adapted in response to information from monitoring, “the long-term sustainability of the whole system is not absolutely conclusive” (GE13).

As for the economic aspects of certified forests, some forest experts and certified operations credited certification with overall improvements in the organization and formalization of the forest management system, which together improve the economic bottom line of the forest operations (GCIF1; GE2; GE9). Many also credited forest certification with leading to improved overall wood products marketing and access to specific market niches (GAF2; GC1; GE2; GE5; GE11; GOGN1; GOGN4). As one forest expert indicated: “Certification has opened doors to markets that may not pay more, but
are more reliable, more loyal, and more conscientious about the sources of the products they purchase” (GE2).

Forest certification in Guatemala is also associated with some improvements in the social aspects of managed forests, such as enhanced stability and provision of employment, increase in salaries, improved workforce training and safety, and even conflict resolution, among others, as noted by a forest expert, manager, and certified operator (GE13; GFM1; GCCF1). One forest expert also indicated that the social improvements in forest management that result from certification are also thought to have a ‘spillover’ effect as improvements in community quality of life (e.g. improvements in waste management and in health and safety in the forest management unit are introduced into the communities) (GE2). However, as pointed out by a forest certifier and forest expert, the organizational, administrative, and other key social aspects of forest management continue represent the aspects in need of most improvement for forest certification and sustainable forest management overall (GC1; GE1).

8.5.c Nicaragua

Of the three case study countries, interviews in Nicaragua produced the least amount of evidence of positive impacts and outcomes from certification on forest management, in part due to comparatively fewer instances of certified forest management and a shorter history of forest certification. Yet, this was also due in part to experiences with forest certification in which questionable forest practices had been certified. For example, in their assessment of forest management compliance in 15 forest management units in Nicaragua, the International Forest Monitoring program evaluated two certified forest management units and two others in the process of certification, and found no detectable significant difference in the level of legal compliance of the certified forests or forests in process of certification in comparison to the non-certified forests (Global Witness 2007). This suggests that in these cases, the process of certification did not lead to significant improvements beyond the status quo level of forest management.
Some interviewees (e.g. certified operators and a forest expert) noted improvements to the ecological aspects of forest operations as a result of forest certification (NCIF1; NE2; NFM1). These included the development of forest monitoring programs for management impacts, improved road planning and development, silvicultural treatment evaluations, and wood waste minimization in the forest (NCIF1; NE2; NFM1). One forest manager indicated that certification has also provoked changes and learning in the financial aspects of forest management and long-term projects and plans (NFM1). Moreover, some credit certification with leading to significant improvements in the overall management system that have in turn led to significantly enhanced sales and prices for wood products (NFM1; NCCF1). However, other certified operations indicated that certification has only represented added costs to the forest operations, with “no return on the investment” (NCIF1; NFM3). Finally, in terms of social improvements from certification, some certified operations stated that certification has significantly improved community relations (NCIF1) and organizational aspects of managed forests (NFM1). Yet, a forest certifier and expert suggested that the most difficult changes in terms of forest certification in Nicaragua have been the social improvements, especially where industry often fails to see the benefit in adequate training and the health and safety of its workforce (NC1; NE2).

8.6 Chapter Wrap-Up
Table 8.5 summarizes some of the key aspects of the forest certification policy process in the three case-study countries that were discussed in this chapter. As none of the case study countries has an FSC-recognized national standard for forest certification, the evaluation of forest management in each of the three countries is based on interim certification standards developed by the respective certification auditor, founded on the FSC PC&I and incorporating the local context and existing regulations and standards for forest management. Though there are some, mostly subtle, differences in the interim standards, the foundations of evaluation are the same within and between countries (i.e.
the FSC PC&I). The basic procedures and processes for certification implementation are also standardized and consistent across certification auditors and countries.

Costa Rica has the longest history of forest certification, the most certified forest management units, and the most certified area of forest plantation of the three case study countries. However, in recent years the number, area, and interest in forest certification has declined, especially among natural forests owners. And while there is the least difference between governmental regulations of forest management and the standards for FSC forest certification, which would require the shortest leap for forest owners from regulated to certified forest management, the high costs associated with legal forest activity, and the lack of a tangible price differential for certified wood products, have resulted in decreasing interest in forest certification there. Where forest certification is adopted in Costa Rica, compliance is considered to be high. And, there is empirical evidence of notable improvements to forest management processes and impacts in certified forests, yet these improvements are limited to the relatively small area where natural forests are certified.

Guatemala represents the largest total area of certified forest of the three countries, though nearly all of the certified area of natural forest occurs in the forest concessions of the MBR, where certification is mandatory. In some ways it is difficult to separate the impacts of forest regulations and their implementation from the impacts of certification in these forests, though some impacts from certification are clearly identifiable such as improvements to the organizational, financial, and social aspects of forest management, as well as improvements to key ecological aspects of forest management. Outside of protected areas, the uptake of forest certification has been much slower, in part due to a much larger leap from regulated to certified forest management, especially in terms of the economic and social aspects of forestry, but also due to the costs associated with certification and little evidence of a price differential for certified wood products. In addition, there has been much more emphasis and support for certification in the MBR
of Guatemala, than in forests outside protected areas. Nonetheless, of the three case study countries, forest certification has had the most widespread uptake in Guatemala.

Nicaragua represents the shortest history of forest certification and the least amount of certified forest area of the three case-study countries, though the area of certified forest has increased since its inception. The experiences with forest certification in Nicaragua have been the most mixed of the three case study countries, where there has been some significant and widely publicized evidence of non-compliance in certified forests there. Although the certification agreement was suspended for non-compliance in one certified forest, evidence of and experiences with poor performance in certified forests have led to questions by the state and other forest stakeholders about the objectivity and reliability of forest certification as a measure of sound forest management in that country. And, while the area of certified forests in Nicaragua has increased in recent years, overall interest in the process of certification is waning, largely due to more pressing issues in the forest production sector (e.g. limits on productivity under the Law Banning Logging), but also attributed to the costs of certification that are not compensated by a price differential for certified wood products and persisting questions as to the transparency of forest certification. However, some suggest that the biggest reason for the slow uptake of forest certification in Nicaragua is largely due to the fact that most forest management is just not up to par with forest certification standards.
Table 8.5 Key Aspects of Non-Governmental Forest Certification in Costa Rica, Guatemala, and Nicaragua

<table>
<thead>
<tr>
<th>Issue</th>
<th>Costa Rica</th>
<th>Guatemala</th>
<th>Nicaragua</th>
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<tr>
<td><strong>Forest Certification</strong></td>
<td>Interim standards based on the FSC Generic PC&amp;I are developed by each certification auditor (<em>i.e.</em> four) working in Costa Rica. While the Costa Rican PC&amp;I are not the official national standard used by the FSC, they are used in each evaluation for certification. There is the least difference in terms of comprehensiveness and rigor between the interim standards used for certifying forest management and the Costa Rican forest regulations and standards for forest management of the three case study countries, such that the certification in Costa Rica requires the least improvements over the legal status quo of forest management of the three countries.</td>
<td>Only one interim standard based on the FSC Generic PC&amp;I is implemented in Guatemala, as there is only one auditor working in this country (<em>i.e.</em> SmartWood). While Guatemala has been developing a national standard for certification it has yet to be recognized by the FSC. In terms of comprehensiveness and rigor, there is a much larger leap in performance from the governmental regulations for forests outside protected areas to meet the standards for forest certification, than the leap from the State requirements for forest management in protected areas to the standards for certification.</td>
<td>Similar to Costa Rica, each auditor working in Nicaragua has developed its own interim standards for certification based on the FSC Generic PC&amp;I. There is little difference in terms of comprehensiveness and rigor of the governmental forest regulations and non-governmental interim certification standards for the planning and operational aspects of forest management, but there is a significant improvement required in the economic and social and some ecological aspects of regulated forest management to meet certification standards.</td>
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The approval and verification processes associated with certification are generally the same across countries as certification is a non-governmental process. In general, certification is not limited by financial or other resources, as it is a private sector process, that is paid for by the applicant or a donor partner. Across all three countries the approval and verification process is considerably rigorous and standardized, including extensive office and field evaluations, and annual audits to maintain certification status, though the rigor of the process has been called into question in Nicaragua of late due to poor performance of certified operations.

<table>
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<tr>
<th>Certification Uptake</th>
<th>Costa Rica has the largest area of certified plantations (32,780 ha) and the most number of certificates (20). The first certified tropical forest and the first group certificate took place in Costa Rica (1993). Forest certification grew steadily in the 1990s but maintenance of and interest in certification has declined significantly in recent years, largely attributed to the already high costs of forest management. Adoption of certification has declined since the mid 2000s in Costa Rica, largely attributed to the perceived lack of economic benefits from certification and the already high cost associated with forest management, especially given the typically</th>
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<td>Guatemala has the most total and natural certified forest area of the three case study countries (509,425 ha), though 99% of certified forests are located in the MBR, where certification is mandatory. Certification of forests outside protected areas has been very slow, which is largely attributed to the additional costs and lack of price differential associated with certification. While adoption of certification is comparatively very high in Guatemala, 99% of this occurs in forests where certification is required. And while compliance with certification standards is very high in the forest concessions, two have had their certificates suspended for non-</td>
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<td>Nicaragua has the least area (40,775 ha) and number of certified forests (4), though significantly more area of certified natural forest than Costa Rica (30,000 ha vs. 6,975 ha). Certification grew slowly but steadily in the early 2000s, but as the forest sector exhibited increasing impunity and the state limited production, interest in certification declined. Adoption of certification has been slow since then with interest declining as regulations and legislation on forest management have become increasingly restrictive. Certified operations also demonstrated poor compliance with governmental forest regulations and the reputation of certification as an objective</td>
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<tr>
<td>Certification Uptake</td>
<td>Where certification is adopted in Costa Rica, there are notable improvements to management, such as planning, operations, monitoring, workforce health and safety, and management adaptiveness. There is empirical evidence of improved performance of certified forest operations, though these are limited to the relatively small area where natural forests have been certified. Moreover, there are concerns that the evaluation of sustainability overlooks the importance of sustainability at the landscape level, considering the small and fragmented nature of most forests in Costa Rica.</td>
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| Table 8.5 Continued | small size of managed forests. Where certification is adopted compliance with the certification standards is considered to be high, in part because no certified operation has been suspended or cancelled. | compliance. The lack of certification outside protected areas is attributed to the high cost for typically small forests and a lack of dissemination on certification and its benefits. | assessment of sustainability has been called into question. Some also suggest that typical forest management in Nicaragua is far from certifiable, thus requiring too large of a leap to meet certification standards. The costs of certification are a mitigating factor for adoption in Nicaragua as well. |
CHAPTER 9
SUMMARY DISCUSSION, IMPLICATIONS, AND FUTURE RESEARCH

9.1 Introduction
Employing theory-driven policy evaluation research that utilized interviews, archival documentation, and triangulation of data, this dissertation has documented and analyzed how governmental and non-governmental forest policy outputs and their execution affect forest landowner and user decisions on sustainable tropical forest management policy adoption and compliance within the local and larger policy contexts. The overall objective of this research was to determine how and why governmental forest management regulation and non-governmental forest certification lead to, or fail to produce, the desired changes or improvements in forest management, toward a greater understanding of the contributions of governmental and non-governmental forest policies to the enhanced sustainability of managed tropical forests. This final chapter reviews the approach to research, cites and summarizes evidence reported in Chapters 4 through 8 in a discussion of the forest policy and theoretical implications discovered through this research, and provides recommendations for governmental and non-governmental sustainable tropical forest management policy and future research.

9.2 A Theoretical Foundation for Policy Evaluation Research
When this research began, I discovered a theory-based method for evaluating public policy that is designed to provide insight into why policies succeed or fail and how they may be improved toward greater achievement of policy goals. Theory-driven policy evaluation takes into account not only the policy outcomes, but the policy itself, how it is put into effect, and the associated variables and interactions that together produce intended and unintended policy impacts. Employing elements of theory and study on forest management and related policies, as well as the policy process; policy implementation, adoption and compliance; and institutional development to guide the process of inquiry and analysis, I developed a theoretical framework to facilitate a theory-
driven evaluation of governmental and non-governmental policies for promoting sustainable forest management in Costa Rica, Guatemala, and Nicaragua (Figure 9.1).

The theoretical framework presented in Figure 9.1 takes into account the forest policy outputs (i.e. directives and instruments) of governmental and non-governmental processes; the characteristics of and resources for putting those policies into effect (i.e. organizational structures, processes and resources), the uptake of forest policy by forest owners and users (i.e. forest policy adoption and compliance); the outcomes of forest policy outputs, execution and uptake; the evaluation and revision of forest policies, and the local and larger contexts in which this forest policy process takes place.

Primary data collection focused on forest policy outputs, execution, and uptake, as well as the local and larger policy contexts. As such, forest policy outputs and execution represented my research independent variables that together were demonstrated as having an affect on forest policy uptake by the target group - my research dependent variable. The local (i.e. FMU level) and larger (i.e. national-level) policy contexts were considered intervening variables in this relationship. Secondary data related to policy outcomes, evaluation, and revision were also collected and evaluated to further understand the processes and results of governmental and non-governmental tropical forest management policies in Costa Rica, Guatemala, and Nicaragua.

My theoretical framework not only helped to guide the design and analysis of this dissertation research, but also permitted a better understanding of the efficacy of theories from the political and policy sciences for identifying and conceptualizing key research variables associated with sustainable forest management policies. The integration of cross-cutting and theory-specific variables and their interactions that are identified in the bodies of literature described above proved to be particularly useful in the process of inquiry employed in this research. Ultimately, the development and use of this theoretical framework also permitted me to bridge the gap between the insights
Figure 9.1 Theoretical Framework of Sustainable Forest Management Policy Implementation
(The black dashed circle indicates variables measured through primary data collection. The gray dotted circle indicates variables examined through secondary data collection)
from the body of literature on policy implementation and its focus on policies, processes, bureaucrats, implementers, and policy outcomes, and insights from the Institutional Analysis and Development literature and its focus on individuals and the incentives that impact their behavior and decision-making in relation to policy. Essentially, it is the combination of these factors that result in policy uptake, an understanding of which became the focus of my research, as well as my contribution to political sciences theory and to practical forest management policy applications.

9.3 Summary of Key Findings and Policy Implications

Findings from this research suggest that many factors at several levels combine to influence the uptake of governmental and non-governmental forest management policy by forest owners and users, and ultimately, the effectiveness of governmental and non-governmental policies in promoting and enhancing sustainable forest management in the tropics. This may be generally expected from the literature on tropical forest management (see for example: Repetto and Gillis 1988; Contreras-Hermosilla 2002; Gibson, McKean, and Ostrom 2000; IADF 2000; Agrawal, Chatre, and Hardin 2008), and more generalized study of policy implementation (see for example Mazmanian and Sabatier 1983; Goggin et al. 1990; Matland 1995; Winter 1990; 2003) and institutional development (see for example: Ostrom 1991; Ostrom, Gardner, and Walker 1994; Gibson, McKean, and Ostrom 2000). However, the theory-driven approach to governmental and non-governmental tropical forest policy evaluation and the theoretical framework designed for and implemented in this research permitted identification of specific elements of the forest policy process and their interactions, within the local and larger policy contexts, that may facilitate and/or adversely affect positive outcomes in managed tropical forests.
9.3.a Governmental Forest Management Regulation

With regard to regulatory forest policy outputs, the research findings indicate that increasingly rigorous and comprehensive regulatory forest management directives, with regard to the operational, ecological, economic, and social aspects of forest management, are intended to increase the positive impacts and outcomes associated with the sustainability of tropical forest management. However, as was demonstrated in Costa Rica and Nicaragua, and consistent with much of the theory and research findings on tropical forest management and policy (see for example: Repetto and Gillis 1988; Contreras-Hermosilla 2002; FAO/ITTO 2005), and from the larger body of implementation literature (see for example: Lipsky 1980; Mazmanian and Sabatier 1983; Vogel and Kessler 1998; O'Toole 2004), the potentially positive impacts of increasing forest regulatory rigor and comprehensiveness, can be adversely affected by insufficient or inadequate organizational structures, processes, and resources associated with policy execution.

The findings also demonstrate that limited organizational resources (i.e. human, technical, material, and financial) for executing regulatory forest policy represented a critical limiting factor to enhanced forest policy uptake, regardless of the rigor or comprehensiveness of governmental forest management directives. Moreover, effective execution of governmental forest policy may be negatively affected by gaps or failures in the judicial system in terms of the prosecution and penalization of noncompliance with regulatory forest management directives. As seen in Costa Rica, Guatemala, and Nicaragua, where there was limited or nonexistent penalization of forest-related crimes, there was little deterrence for noncompliance with forest law and illicit forest activities, which is consistent with findings from illegal logging research (see for example: Contreras-Hermosilla 2002; Ravenel, Granoff, and Magee 2004; FAO/ITTO 2005; Tacconi 2007). In addition, the findings on governmental forest regulation reveal that the existence of comparatively less rigorous forest use policy options, such as the case of minimal forest plans in Nicaragua, or loopholes in the forest regulatory framework,
such as harvest permits for isolated trees on farmland in Costa Rica, that combine with inadequate regulatory forest policy execution (i.e. organizational structures, processes, and resources) can result in adverse effects on enhanced uptake of governmental forest regulation, and ultimately limit the positive outcomes of regulatory forest management policy in the field.

Measures and means that contribute to more effective execution and enhanced uptake of regulatory forest management policy were also revealed through the analysis of collected data. First, the findings indicate that increasing regulatory rigor and comprehensiveness of governmental forest management directives generally requires increases in the organizational structures, procedures, and resources for putting directives into effect in order for regulatory forest management policy to be effectively executed, and ultimately, to be increasingly adopted and complied with by forest owners and users. This is in line with recommendations in the tropical forest management and illegal logging literature mentioned above. It was also demonstrated that regulatory forest management policy execution may be enhanced by increasing the autonomy and decentralization of resources and decision-making processes of the regulatory forest agency, as evidenced in the case of the National Institute for Forests (INAB) in Guatemala, and in line with work by Fisher (1994), Larson (2003), and Ferroukhi (2004), for example. Nevertheless, these policy implications largely represent tall orders for most tropical forested countries.

Other measures and means that contribute to more effective execution and enhanced governmental forest management policy uptake were also determined through this research, and these may be more feasible to implement in the tropics. Many of these measures and means support the concepts of “smart regulation” as proposed by Gunningham, Grabosky, and Sinclair (1998), and their basic premise that the use of multiple rather than single policy instruments, and an increased range of regulatory actors, produces better environmental regulation. The first of these, derived from
evidence in Costa Rica, Guatemala, and Nicaragua, is that limited resources for policy execution can be positively mitigated, to some degree, by innovative forest policy enforcement and/or verification arrangements, such as the incorporation of private or outside sector actors in the oversight of forest management compliance (e.g. forest regents, forest auditors, independent certifiers). However, as was also demonstrated to varying degrees in the three case study countries, the ultimate effectiveness of these non-traditional regulatory enforcement and oversight arrangements in enhancing regulatory forest policy uptake, depends in large part on clearly defined roles, responsibilities, and integration with the regulatory forest agency, as well as their independence or objectiveness in the process of oversight, and that measures are put in place for their external monitoring and evaluation.

The findings further support the notion of “smart regulation” and the idea that “effective policy implementation requires a strategic balance of pressure and support” (McLaughlin 1987), demonstrating that regulatory forest management policy uptake can be positively affected by the selection and application of complementary policy instruments by various forest policy actors. These may include the development and distribution of governmental fiscal incentives for natural forest management, as in the case of governmental incentives for forest management outside protected areas in Guatemala. They also may include governmental education and technical assistance programs for enhancing the understanding and adoption of, and compliance with, regulatory forest policy by the state and non-state forest policy actors, as evidenced most markedly in the forest concessions of the Maya Biosphere Reserve in Guatemala. They can also encompass integrated participation and financial and technical support and assistance from non-governmental forest policy actors towards enhanced sustainable tropical forest management, as was seen to varying degrees in each of the case study countries.
9.3.b Non-Governmental Forest Certification

With regard to non-governmental forest certification outputs, the findings demonstrate that forest certification directives were generally more rigorous and comprehensive than governmental forest regulatory directives, particularly in terms of the economic and social aspects of forest management. As such, the findings indicate that non-governmental forest certification is intended to go beyond the intended impacts and outcomes of governmental forest regulation with regard to the sustainability of tropical forest management. Yet, the findings also reveal that where non-governmental forest certification represented a voluntary mechanism for evaluating and labeling the sustainability of forest management, the rigor and comprehensiveness of the certification directives can have adverse affects on the decision of the forest owner or user to adopt non-governmental forest certification and/or his/her capacity to comply with certification directives, essentially affecting certification policy uptake, and ultimately, the potential for widespread impacts of certification on forest management.

In terms of the execution of forest certification policy, the findings do not indicate that non-governmental forest certification was significantly limited by organizational structures, processes, or resources once the decision to adopt non-governmental forest certification was made by the forest owner or user. However, the overall findings and particularly those from Nicaragua, reveal that a lack of transparency and/or impartiality in forest certification processes and decisions can have adverse effects on the uptake of non-governmental forest certification, and ultimately, on certification’s impacts and outcomes in managed tropical forests.

The research also revealed some measures and means for increasing the uptake of forest certification, which include the dissemination of opportunities for group or forest manager certificates, as seen in Costa Rica and Guatemala. In addition, external financial and technical support for forest certification can increase its overall adoption and compliance. Finally, a governmental requirement to obtain and maintain
certification as a requisite for access to public forest resources can have significant impacts on the uptake of certification, particularly where there are extensive public forest resources available, as in Guatemala.

9.3.c Overlap and interactions of Forest Management Regulation and Certification
In terms of the overlap and interactions of governmental forest regulation and nongovernmental forest certification, the findings reveal that the uptake of governmental forest regulation was typically more widespread than that of non-governmental certification, with the exception of areas where certification is mandated by the state. The findings also demonstrate that forest regulators do not tend to substitute the results of certification audits for governmental verification of legal compliance, nor do they permit certification to serve as a means for expediting forest management approval or oversight processes. Nevertheless, the findings do show that where governmental forest regulation and non-governmental forest certification are both applied in a forest management unit, certification can serve to verify or provide evidence of compliance with governmental forest regulation, as well as adequate regulatory oversight (e.g. the forest concessions in the MBR). However, it was also demonstrated that it should not be assumed that certification unequivocally demonstrates regulatory compliance (e.g. forest law transgressions discovered in certified forests in Nicaragua).

9.3.d National and FMU Level Forest Policy Contexts
With regard to intervening contextual factors in the forest policy processes studied in this research project, the findings demonstrate that uptake of both governmental forest regulation and non-governmental forest certification of forest management may be positively or negatively mitigated by conditions in the larger and local forest policy contexts. The research revealed a broad range of current and historical socioeconomic, sociopolitical, and environmental conditions at the national level in each of the case study countries. These conditions helped to shape governmental and non-governmental support and priorities for enhancing the sustainability of forest management, and their
variation also had obvious impacts on governmental capacities to regulate forests, on the opportunities for nongovernmental interventions in forest use decisions and applications, and on the development and capacities of forest owners and users. Ultimately, what can be gleaned from the description of the diversity in national level forest policy contexts in this study, is that no single or even mixed forest policy approach is likely to fit all circumstances, and that forest policy approaches should be selected and developed within the limitations and opportunities that are shaped, in part, by national level conditions.

At the forest management unit or local level, aspects such as forest ownership regimes and the clarity of tenure, the size and richness of the forest resource, and attitudes toward and relationships with the forest regulator or certifiers demonstrated intervening effects on governmental and nongovernmental forest policy uptake. These findings support theories and propositions from some of the policy implementation literature (Elmore 1980; Winter and May 2001, 2002) and institutional development (Ostrom 1991; Ostrom, Gardner, and Walker 1994). In particular, the findings indicate that widespread uptake of forest regulation and of forest certification is mitigated in large part by the associated costs of forest policy compliance and the potential profits from forest production, such that in most cases the smaller the forest, the greater the costs of compliance with either policy approach. These costs tended to increase with increasingly rigorous, comprehensive, and complicated policy directives and forest management approval or certification processes, and ultimately deter both governmental regulatory and non-governmental certification forest policy adoption and compliance.

The findings also indicate that limitations to policy uptake at the forest management unit (e.g. forest size, costs of compliance) and national (e.g. limited government resources or interest) can be positively mitigated to some degree by external financial and technical support for forest policy adoption and compliance. This was most significantly evidenced
by the extensive and long-term assistance from bilateral, multilateral, and private donors that contributed, in part, to the establishment, development, and certified sound management of more than 95% of the forest concession system in the Maya Biosphere Reserve, in Guatemala. Yet, it was also demonstrated on smaller scales by active forestry organizations in all three countries. Thus, there appear to be real and significant opportunities for bilateral, multilateral, and private donors, as well as for sustainable forestry oriented organizations, to continue to have positive and substantial impacts on the promotion and enhancement of sustainable forest management in the tropics.

9.3.e Outcomes of Forest Policies, their Evaluation, and Policy Revisions
In terms of the impacts and outcomes of both governmental and non-governmental forest policy, while there is some degree of monitoring and evaluation of both policy approaches in each case study country there is little direct or systematic measurement in the field of changes in managed forests that can be linked to governmental forest management regulation or to non-governmental forest certification, with some exception in the forest concessions and monitoring of forest management impacts in the Maya Biosphere Reserve. Overall, the findings demonstrated that there is very limited systematic collection and analysis of forest policy outcomes, which is ultimately a key component for the adaptiveness of governmental and non-governmental forest policies to the intended and unintended policy outcomes, and to the negative outcomes of forest policy in particular.

9.4 An Integrated Analysis of Policies for Sustainable Tropical Forest Management
Tropical forests are indeed complex, as are the contexts in which they are found and the policies developed and employed for their governance. As such, an analysis of policies for promoting sustainable tropical forest management should take into account those complexities. The results of this research indicate that evaluating sustainable forest management policies through an integrated theoretical lens, based on key elements from a range of theories on natural resource policy, the policy process, policy
implementation, and institutional development, permits a comprehensive understanding of the complex nature of how and why policies lead to intended and unintended changes in target group behavior, and ultimately in the original policy issue.

As with any theoretical framework and its conceptualization into measurable variables, there are limits to the explanatory power of the theoretical and conceptual frameworks developed for this dissertation research. While a broad and relevant range of policy and tropical forestry related theory and literature was studied to determine the appropriate theories from which to develop a theoretical framework for evaluating policy effectiveness, there are certainly other theories and studies that may have added to or possibly even changed the process of inquiry that was applied for this research. Nonetheless, the validity of the theoretical framework and the conceptual variables was supported in large part through the process of data collection and analysis. And, while the approach to inquiry was largely deductive, such that some variables and/or their interactions may have been overlooked or misinterpreted to fit the framework mode, caution was taken in the data collection and analysis to maintain an open perspective to unidentified variables and interactions in the forest policy process in place in the case study countries. Additionally, the selection and analysis of three case-study countries permitted some generalizations on the key variables and interactions that determine how and why governmental and non-governmental forest policies enhance or improve the adoption of and compliance with those policies by forest owners and users. Nonetheless, the inclusion of additional case-study countries would have certainly expanded the explanatory power of this research.

9.5 Conclusions and Recommendations
A major contribution of this research is a comprehensive description and analysis of the policy processes associated with governmental forest regulation and non-governmental forest certification in Costa Rica, Guatemala, and Nicaragua and their effectiveness. No other known studies have produced a systematic understanding of governmental and
non-governmental forest policies, their execution, and uptake by forest owners and managers in any of the case-study countries.

The findings support other research results that have demonstrated the importance of clear and consistent policies and adequately funded and equipped implementing agencies for enhanced attainment of intended forest policy impacts and outcomes (see for example OECD 1997; McDermott and Cashore 2004; Ebeling 2005). They also support other studies that have demonstrated the importance of transparent and well-defined property rights, and target groups who perceive that the benefits of policy uptake outweigh the costs, and who are generally supportive of the policy and its implementers (Gibson, McKean, and Ostrom 2000). However, whereas the studies mentioned tend to focus either on the forest policies themselves and the means and processes for their implementation (i.e. top-down approach), or on the target groups of forest policy and their response to policy, its enforcement, and other intervening factors at the decision-maker level (i.e. bottom-up approach), this is the only known piece of research that has looked at governmental and non-governmental tropical forest policies from both ‘above’ and ‘below’ (Goggin et al. 1990) in a theory-driven approach to policy evaluation. Furthermore, this is the only known study that has produced findings that highlight the singular and interactive variables associated with forest policy outputs, their execution, and the local and larger level policy contexts that act as inducements and/or constraints to governmental and non-governmental forest policy adoption and compliance by forest owners and users towards a better understanding of the effectiveness of governmental forest regulation and nongovernmental forest certification in promoting or enhancing the sustainability of tropical forest management. As, much of the relevant literature indicates, there is significant need for a deeper understanding of how governmental and non-governmental forest governance works “if forest dwellers, users, managers, and policy-makers are to make better choices about forest governance at a variety of scales (Agrawal, Chhatre, and Hardin 2008).
Key factors to consider in the development and implementation of policies for promoting sustainable tropical forest management were identified throughout the results chapters (4-8) and summarized in the key findings (Section 9.3). Principle of these was the demonstration that a rigorous regulatory approach to controlling forest use requires substantial resources in order to be effective, and that ‘smart’ approaches to forest regulation that integrate complementary policy instruments and actors can work to increase forest policy uptake by forest owners and users, particularly where resources for policy implementation are limited. Additionally, broad restrictions on forest use (e.g. logging bans, prohibitively rigorous regulations) can have unintended consequences such as increased illicit forest activity or the conversion of forests to other, less restricted land uses, especially when other forest use options are not available and/or enforcement resources are limited. And, while certification does not prove to be a viable alternative to governmental regulation of forest use in these case-study countries, it was demonstrated in this research that it can be used as a powerful complement to governmental regulation of sound forest management. Furthermore, certification may represent a critical tool for improving the traditionally unregulated aspects of tropical forest management (i.e. economic and social aspects).

Ultimately, governmental and non-governmental policies for promoting sustainable forest management in the tropics matter because they continue to be powerful tools within larger overall forest conservation strategies. Yet, designing and implementing effective policies for promoting sustainable tropical forestry is clearly complex. The theoretical and conceptual frameworks presented in this research (Figure 9.1, Table 3.1) offer policy-makers and forest stakeholders a straightforward and reliable way to consider relevant policy factors and interactions that influence forest outcomes. Moreover, while there is an increasing number of policy approaches for promoting sustainable forest management, few are evaluated systematically, especially in the tropics. The theoretical and conceptual frameworks and approach to policy evaluation presented here should be
used to further the development of forest policy evaluation and adaptiveness, particularly in tropical forest settings.

This study also contributes to the body of implementation literature by demonstrating the added value of incorporating, other related theories and literature, such as those on institutional development (Ostrom 1990; Ostrom, Gardner, and Walker 1994) in the model and study of policy implementation. The research supports many of the variables and interactions identified in the policy process model and policy implementation theory with empirical evidence from the context of sustainable forest management policies in the tropics. It also identifies specific variables and interactions important to effective forest policy execution and enhanced forest policy uptake, such as the importance of outside financial and technical support for policy uptake and compliance, that could apply to, and be explored in, future research on other policy processes.

Other possibilities for related future research include the application of the theoretical and conceptual frameworks in other tropical countries in the hemisphere, and around the world, which would serve to further enhance our understanding of sustainable tropical forest policies, their outputs, execution, and uptake, as well as the relevance and adequacy of the theoretical and conceptual frameworks in other settings. Future research should also be carried out to examine the ongoing forest policy processes in Costa Rica, Guatemala, and Nicaragua to understand the future impacts and adaptation of their policy processes and dynamics. Additional research should also focus on the empirical measurement of the impacts and outcomes of governmental and non-governmental policies for sustainable forest management in the case study countries, and in the tropics in general, which would provide powerful inputs for the adaptation of forest policy towards true sustainability.


Austin, D. 1999. Economic Instruments for Pollution Control and Prevention – a Brief Overview. World Resources Institute: Washington, D.C.


APPENDICES
# APPENDIX A

## SFM Issues Compared across National Regulations and Certification Standards

<table>
<thead>
<tr>
<th>D/Q*</th>
<th>Code</th>
<th>Issue – Description, Threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Legislative/Legality Issues:</td>
</tr>
<tr>
<td>D</td>
<td>L1</td>
<td>National laws – is compliance with national legislation mandated?</td>
</tr>
<tr>
<td>D</td>
<td>L2</td>
<td>Tenure rights – is proof of tenure mandated for approval of forest use?</td>
</tr>
<tr>
<td>D</td>
<td>L3</td>
<td>Protection from illegal trespass – are specific measures required to protect against illegal trespass or possession?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Adaptive) Management Issues: planning, operations and monitoring</td>
</tr>
<tr>
<td>D, Q</td>
<td>MP1</td>
<td>Forest inventory – are specific inventory methods mandated?; if applicable, what is the minimum intensity/sampling error permitted?</td>
</tr>
<tr>
<td>D, Q</td>
<td>MP2</td>
<td>Management plan – are specific plan components and/or format required?; specific person/group designated to develop the MP?; renewal period?</td>
</tr>
<tr>
<td>Q</td>
<td>MP3</td>
<td>Annual allowable cut – if applicable, what % of species abundance is permitted for harvest? If applicable, what is the MDC (minimum diameter cut)?</td>
</tr>
<tr>
<td>Q</td>
<td>MP4</td>
<td>Cutting cycle – if applicable, minimum cutting cycle/rotation per forest type?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Operations:</td>
</tr>
<tr>
<td>D, Q</td>
<td>MO1</td>
<td>Roads – are there rules for decommissioning roads?; if applicable, what is the % of area permitted to be cleared for road network?</td>
</tr>
<tr>
<td>Q</td>
<td>MO2</td>
<td>Clearcut size limits – if applicable, what is the limit on ‘clearcut’ area?</td>
</tr>
<tr>
<td>D</td>
<td>MO3</td>
<td>Erosion control – are there specific rules for erosion control?</td>
</tr>
<tr>
<td>D</td>
<td>MO4</td>
<td>Regeneration/reforestation – are silvicultural treatments permitted/promoted?; is enrichment planting permitted/promoted?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Monitoring:</td>
</tr>
<tr>
<td>D, Q</td>
<td>MM1</td>
<td>Monitoring rules – is monitoring required?; if applicable, minimum number of plots/% of area or acreage required for PSP (permanent sampling/monitoring plots)?; are there specific aspects to be measured/monitored?</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td>Environmental/ecological issues:</td>
</tr>
<tr>
<td>D</td>
<td>E1</td>
<td>Protection of at-risk species – are there specific rules on at-risk species?</td>
</tr>
<tr>
<td>D, Q</td>
<td>E2</td>
<td>Protected areas – if applicable, what measures define PAs (limits on slopes, around bodies of water, etc.); is there a minimum % of area required for PA</td>
</tr>
<tr>
<td>D</td>
<td>E3</td>
<td>Land use change – is land use change in mngd forests permitted/prohibited?</td>
</tr>
<tr>
<td>Q</td>
<td>E4</td>
<td>Riparian buffer zone rules – if applicable, limits around bodies of water?</td>
</tr>
<tr>
<td>S</td>
<td></td>
<td>Social Issues:</td>
</tr>
<tr>
<td>D</td>
<td>S1</td>
<td>Indigenous rights – are there specific rules for dealing with indigenous groups?</td>
</tr>
<tr>
<td>D</td>
<td>S2</td>
<td>Community consultation– specific rules to work with communities?</td>
</tr>
<tr>
<td>D</td>
<td>S3</td>
<td>Public reporting – are there specific rules on public reporting?</td>
</tr>
<tr>
<td>F</td>
<td></td>
<td>Economic/Financial issues:</td>
</tr>
<tr>
<td>D</td>
<td>F1</td>
<td>Economic analyses – are financial analyses required?</td>
</tr>
<tr>
<td>D</td>
<td>F2</td>
<td>Wood waste minimization – are there specific rules on waste minimization?</td>
</tr>
<tr>
<td>D, Q</td>
<td>F3</td>
<td>Chain of custody – are there specific rules on chain of custody?</td>
</tr>
<tr>
<td>D, Q</td>
<td>F4</td>
<td>Incentives/taxes/stumpage fees – if applicable, what incentives, taxes, stumpage fees, etc. apply to managed forests/plantations?</td>
</tr>
</tbody>
</table>

* D = Descriptive, Q = Quantitative
APPENDIX B
Forest Policy Impacts Surveys

Encuesta de los Impactos de la Política Forestal en Centroamérica:
Dueños/Gerentes/Regentes de Bosques Certificados

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Departamento de Bosques y Recursos Ambientales
Universidad del Estado de Carolina del Norte
Contacto: kamcginl@ncsu.edu

<table>
<thead>
<tr>
<th>País:</th>
<th># de Referencia:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Nombre del Entrevistado/a:</td>
<td>Fecha:</td>
</tr>
<tr>
<td>Titulo del Entrevistado/a:</td>
<td>E-mail:</td>
</tr>
<tr>
<td>Nombre y Ubicación de la UMF:</td>
<td>Teléfono:</td>
</tr>
</tbody>
</table>

Estoy conduciendo esta encuesta para entender mejor el manejo forestal en América Central y como el manejo es influenciado por las políticas forestales de los sectores público y privado. Nuevas regulaciones forestales gubernamentales en el sector público y la certificación forestal no gubernamental en el sector privado han sido establecidas en América Latina por varios años, pero pocos estudios han determinado o han comparado su eficacia en promover el manejo forestal sostenible. Esta investigación proporcionará un análisis de unas políticas forestales en América Central para comprender mejor la regulación forestal, la certificación forestal, y sus interacciones en la región. Los resultados ayudarán al dueño o gerente del bosque a entender mejor estos dos tipos de política forestal y las prácticas necesarias a conformar a ambos. También, el estudio ayudará a las agencias forestales gubernamentales y a los sistemas de certificación forestal a entender mejor los impactos positivos y negativos de sus políticas.

Le agradezco por aceptar participar en este estudio que forma parte de mi investigación en el programa de doctorado de la Universidad del Estado de Carolina del Norte. Todas sus respuestas y los datos proporcionados serán mantenidos confidencialmente y no estarán disponibles a nadie con excepción de los investigadores del proyecto. Utilizaré un sistema de codificación para mantener la confidencialidad de su identidad y no utilizaré los nombres de compañías, de comunidades, o de respondedores en la presentación o en la publicación de los resultados. Una copia del informe de la tesis estará disponible electrónicamente a través de la Universidad del Estado de Carolina del Norte. Además, un resumen ejecutivo podrá ser proporcionado a usted si así lo solicita.
Información del Entrevistado/a

1. ¿Cuál es su puesto actual?

2. ¿Cuánto tiempo ha estado usted en este puesto?

3. ¿Usted desarrolló y/o supervisó el plan general de manejo (PGM) de la unidad de manejo forestal (UMF)?

4. ¿Usted desarrolló y/o supervisó el plan operativo anual más reciente (POA) de la UMF?

5. ¿Usted participó en la certificación original y/o la auditoria más reciente de la UMF?

Contexto de la UMF/Organización

6. ¿Dónde se localiza la UMF? (estado/región/país)

7. ¿Qué tamaño es la UMF? (ha)

8. ¿Cuánta área de la UMF es certificada? (ha)

9. ¿Bajo qué tipo de título/tenencia está la UMF? (círculo)
   Propiedad Privada              Propiedad Indígena              Propiedad Comunitaria
   Concesión Privada              Concesión Indígena              Concesión Comunitaria
   Otro: __________

10. ¿Qué tipo(s) del bosque contempla la UMF? (ha)
    __________ bosque natural de madera dura/latifoliados
bosque natural de pinos
plantación de madera dura
plantación del pino
bosque mixto (natural y plantado)

11. (a) ¿Cuántos empleados equivalentes a tiempo completo (EETCs) trabajaron en las operaciones forestales de la UMF en 2006? (b) ¿Cuántos empleados de tiempo medio/temporales? (c) ¿Cuánto han cambiado estas cifras en los últimos tres a cuatro años?

12. ¿Se incluyen aserraderos de producción forestal como parte de las operaciones forestales? Si la respuesta es sí, por favor describa los tipos y niveles de producción.

13. ¿Tiende la UMF la certificación de cadena de custodia?

14. (a) ¿Qué porcentaje de sus productos de madera se vendió nacionalmente en 2006? (b) ¿Internacionalmente? (c) ¿Cuánto han cambiado estas cifras en los últimos tres a cuatro años?

15. (a) ¿Cuál era su presupuesto total en 2006? (b) ¿Cuánto de ésto estaba dedicado a sueldos? (c) ¿Cuánto para operaciones? (d) ¿Cuánto han cambiado estas cifras en los últimos 3 a 4 años?

16. (a) ¿Cuánto costó la certificación original? (b) ¿Cuánto cuesta promedio las auditorias anuales para mantener la certificación? (c) ¿Están suplementados/pagados los costos de certificación por parte de otra entidad? Si la respuesta es sí, por favor describa.
## Implementación de la Política Forestal: Procesos e Impactos

17. Prácticas forestales y cambios requeridos debido a la regulación gubernamental o a la certificación:

<table>
<thead>
<tr>
<th>Tema</th>
<th>¿Es parte del manejo?</th>
<th>¿Hicieron cambios debido al control del gobierno en-</th>
<th>¿Hicieron cambios debido a la certificación en-</th>
<th>Descripción de los cambios</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Legalidad:</strong></td>
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<td></td>
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<tr>
<td>Conformidad con la legislación nacional</td>
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<tr>
<td>Establecimiento de derechos de tenencia</td>
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<tr>
<td>Protección contra la entrada ilegal</td>
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<tr>
<td><strong>Planificación:</strong></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Inventario del bosque</td>
<td></td>
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<td></td>
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<tr>
<td>Plan de manejo</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Corta anual permisible</td>
<td></td>
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<td></td>
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<tr>
<td>Diámetro mínimo de corta</td>
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<tr>
<td>Ciclo de corta</td>
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<tr>
<td><strong>Operaciones:</strong></td>
<td></td>
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<tr>
<td>Vías: construcción</td>
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<tr>
<td>Vías: densidad</td>
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<tr>
<td>Vías: clausura</td>
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<tr>
<td>Límites de tala raza</td>
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<tr>
<td>Control de erosión</td>
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<tr>
<td>Regeneración/ reforestación</td>
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<tr>
<td>Tratamientos silviculturales</td>
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345
<table>
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<tr>
<th>Plantaciones de enriquecimiento</th>
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</thead>
<tbody>
<tr>
<td>Monitoreo/Parcelas permanentes de muestreo</td>
<td></td>
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</tbody>
</table>

**Ambiental/Ecológico:**

| Protección de especies amenazadas |  |  |  |
| Limites del aprovechamiento en pendientes |  |  |  |
| Áreas protegidas |  |  |  |
| Cambio de uso de la tierra |  |  |  |
| Zonas riparias de amortiguamiento |  |  |  |

**Social:**

| Derechos de los indígenas |  |  |  |
| Consultoría/Participación de comunidades |  |  |  |
| Capacitación de los trabajadores |  |  |  |
| Seguridad de los trabajadores |  |  |  |
| Información pública |  |  |  |

**Económico:**

| Análisis económicos |  |  |  |
| Minimización de desechos madereros |  |  |  |
| Cadena de custodia |  |  |  |
18. ¿Cómo clasificaría usted la UMF en términos de su progresismo hacia el cambio o a la adaptación en sus prácticas forestales? (señale uno)

___ nada progresivo
___ algo progresivo
___ progresivo
___ muy progresivo
___ extremadamente progresivo

19. ¿Qué tan difícil es la adaptación/innovación del manejo forestal en los trópicos? (señale uno)

___ nada difícil
___ algo difícil
___ difícil
___ muy difícil
___ extremadamente difícil

Implementación de las Regulaciones Forestales: Experiencias y Perspectivas

20. ¿Qué porcentaje del trabajo de los empleados se dedica a la aplicación de las regulaciones gubernamentales?

21. ¿Usted tiene un estimado de los costos de la implementación de las regulaciones forestales gubernamentales? (e.g. $/año, $/ha)

22. ¿Cuántas veces al año la UMF es visitado/inspeccionado por la agencia forestal – (a) ¿en oficina? (b) ¿en el campo? (si hayan inspecciones de más de una agencia forestal, primero enumérelas, y luego indique el número de visitas en oficina y en el campo).

23. (a) ¿La UMF ha sido sancionado o penalizado por la agencia forestal debido a alguna(as) práctica(s) forestal(es)? Si la respuesta es sí, describa por favor:
Implementación de los Estándares de la Certificación: Experiencias y Perspectivas

26. ¿Qué porcentaje del trabajo de los empleados se dedica a la aplicación de los estándares de certificación?

27. ¿Usted tiene un estimado de los costos de implementar los estándares de certificación? (e.g. $/año, $/ha)

28. ¿Cuántas veces al año la UMF es visitado/inspeccionado por la certificadora – (a) ¿en oficina? (b) ¿en el campo?

29. ¿La UMF ha recibido alguna calificación de no-conformidad, pre-condición, o condición en relación a la certificación? Si la respuesta es sí, describa por favor:

Implementación del la Política Forestal: Impuestos e Incentivos

32. ¿La UMF paga impuestos relacionados al manejo del bosque? Si la respuesta es sí, describa por favor:

33. ¿La UMF recibe incentivos, subsidios o exenciones de impuestos (círculo)? Si la respuesta es sí, describa por favor:
Las Regulaciones Forestales Gubernamentales: Perspectivas

34. ¿Qué obstáculos considera usted que son los más grandes para lograr conformidad en relación a las regulaciones forestales gubernamentales?

35. ¿Qué fortalezas considera usted que existen para la regulación forestal gubernamental?

36. ¿Qué debilidades considera usted que existen para la regulación forestal gubernamental?

37. ¿Usted tiene sugerencias para mejorar la regulación gubernamental?

38. ¿Usted desea expresar o compartir otros comentarios o críticas sobre la regulación y/o la fiscalización forestal?
La Certificación Forestal: perspectivas

39. ¿Qué obstáculos considera usted que son los más grandes a obtener la certificación forestal?

40. ¿Qué fortalezas considera usted que existen para la certificación forestal?

41. ¿Qué debilidades considera usted que existen para la certificación del bosque?

42. ¿Usted tiene sugerencias para mejorar la certificación?

43. ¿Usted desea expresar o compartir otros comentarios o críticas acerca de la certificación?
44. ¿Desde su perspectiva, existen algunas intersecciones beneficiosas/perjudiciales entre la regulación y la certificación? Si la respuesta es sí, por favor explique.

45. ¿Usted tiene comentarios o críticas en general acerca del manejo de bosque o sobre esta entrevista que usted quisiera compartir?

Si usted está interesado/a en un resumen ejecutivo de estos datos, por favor provéame un nombre y e-mail de contacto y le enviaré uno tan pronto como el documento esté listo.

¡MUCHAS GRACIAS!
Appendix C

CODES: Forest Policy Context, Outputs, Execution, Uptake, Outcomes

01 Policy Context
0101a Natl-level sociopol factors
0101b Natl-level socioecon factors
0101c Natl-level forest factors
G102a Sovereign reg policy support
G102b Stakeholder reg policy support
C102a Sovereign cert policy support
C102b Stakeholder cert policy support
0104 Historical devt of forest use/mngt
G105 Hist devt of forest reg policy
C105 Hist devt of forest cert
0106a Historical devt of stakeholders (forest sector)
0106b Historical devt of stakeholders (others)
0107a Hist devt of stakeholder strategies (forest sector)
0107b Hist devt of stakeholder strategies (others)
02 SFM Policy Outputs/Statements
G201 Govt forest regulation
C202 Non-state forest certification
03 Policy Implementation
G301 Regulatory people, resources, facilities
G301a Reg agency capacity
G302 Regulatory admin arrangements
G303a Regulatory incentives, probability, influence
G303b Regulatory penalties, prob, influence
G303c Regulatory taxes, prob, influence
G303d Reg TA
G303e Reg dissemination of policy-related info
G304 Reg enforcement/verification processes
G304a Probability of reg inspections
G305 Reg approval/admin processes
C301 Cert people, resources, facilities
C301a Cert agency capacity
C302 Cert admin arrangements
C303a Cert incentives
C303b Cert penalties
C303c Cert taxes
C303d Cert TA
C303e Cert dissemination of policy-related info
C304 Cert enforcement/verification processes
C304a Cert prob of inspections
C305 Cert approval/admin processes
04 FMU Context
0401a FMU size
0401b FMU ownership
0401c FMU capacity (mngt., admin., etc.)
0401d FMU investment/costs
0401e Forest type/spp composition
0402 Products produced
0403 Product destination
G404 Internal support/attitiudes toward regs/implementers
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## APPENDIX D
### LIST OF INTERVIEWS

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