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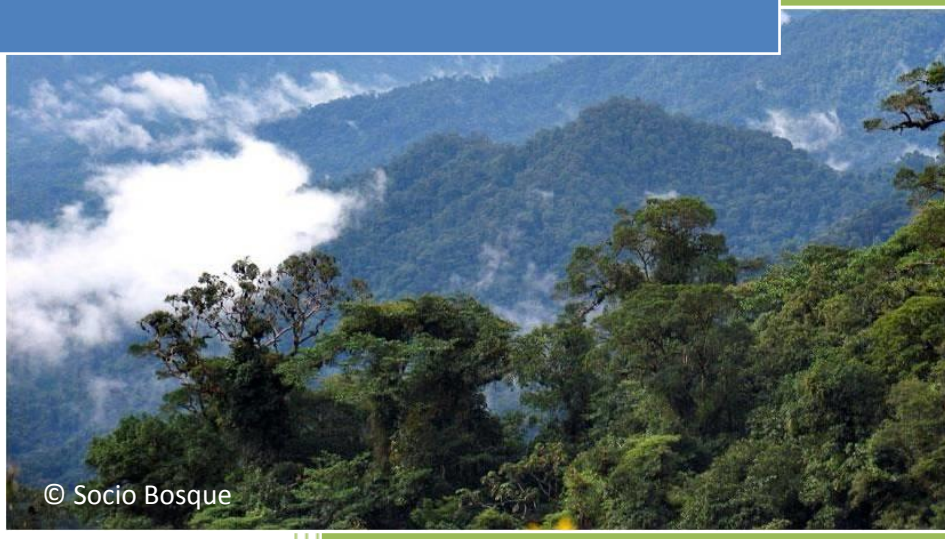
Institutional analysis of the Socio Bosque Program: an Ecuadorian forest governance initiative and its interactions with REDD+



Karen J. Podvin
Student Number: 821011 658090
Supervisor: Ingrid Visseren-Hamakers

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Karen J. Podvin

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MSc Forest and Nature Conservation

Wageningen University, Netherlands

Supervisor

Dr. Ingrid Visseren-Hamakers

Forest and Nature Conservation Policy Group (FNP)

Wageningen University and Research Center

Thesis code:

Registration number: 821011658090

Email address: karenpodvin@yahoo.com; karen.podvin@wur.nl

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List of acronyms

CI	Conservation International
ES	Environmental services
IBPs	Incentive-based programs
GHG	Greenhouse gas
GIZ	German Technical Cooperation
IPs	Indigenous peoples
MAE*	Ministry of Environment of Ecuador (*Ministerio del Ambiente del Ecuador*)
MRV	Measurement, Reporting and Verification
PES	Payments for Environmental Services
PNBV*	National Plan for Good Living (*Plan Nacional del Buen Vivir*)
PNREDD+*	National REDD+ Program (*Programa Nacional REDD+*)
REDD+	Reducing Emissions from Deforestation and Forest Degradation, plus conservation, sustainable management of forests and enhancement of forest carbon stocks
SCC*	Undersecretary of Climate Change (*Subsecretaría de Cambio Climático*)
SES	Social and Environmental Standards
SPN*	Undersecretary of Natural Heritage (*Subsecretaría de Patrimonio Natural*)
UNFCCC	United Nations Framework Convention on Climate Change

*Abbreviations in Spanish

Summary

This research examines the Socio Bosque program, a forest conservation incentive-based initiative implemented at a national scale in Ecuador under the "New Forest Governance Model". Socio Bosque aims to conserve native forests, reduce deforestation and improve the living conditions of its participants. Parallel, the National REDD+ (Reducing Emissions from Deforestation and Forest Degradation, plus conservation, sustainable management of forests and enhancement of forest carbon stocks) Program (PNREDD+) is being developed as a means to contribute climate change mitigation and to strength forest governance; the PNREDD+ is one of the potential financing options for Socio Bosque. Based on certain confusions that have emerged between Socio Bosque and PES (Payments for Environmental Services), and uncertainty in how Socio Bosque and the PNREDD+ relate, this research focuses on two main aspects. First, I identify the differences and similarities of Socio Bosque with PES. Secondly, I assess the interactions between Socio Bosque and the PNREDD+ and the actions that are being implemented to deal with these interactions.

I provide some theoretical background on forest governance; follows theory on conservation incentive-based programs (IBPs) and PES, schemes which are also considered as basis for the development of REDD+. Then, I discuss briefly the status on REDD+. Since these diverse conservation tools can be analysed as institutions within forest governance, I provide a background on institutions, institutional analysis, institutional interaction and interaction management. Qualitative research methods for both data collection and analysis were used. This included literature review and 16 semi-structured interviews with main stakeholders and/or knowledgeable informants (government, civil society organizations and few experts).

The analysis shows three main findings. Firstly, Socio Bosque has mostly similarities based on the main criteria that characterize PES and has some distinctive features from which PES and 'PES-like' schemes can learn. Having these differences in mind, and as the PES definition has been subject to debate, Socio Bosque is better defined as *conservation agreements*. Secondly, the interactions between Socio Bosque and the PNREDD+ have both brought positive and negative effects for one or both programs and these range from cognitive to impact-level interactions. Most of these interactions are *synergistic*, meaning that the existence of both programs has overall generated mostly positive effects (e.g. additional resources and tools such as a platform of experiences and communication, established structure, international attraction, financial resources) than disruptions (i.e. confusion and uncertainty of REDD+, potential competition on the areas under conservation). Thirdly, the actions taking place within the analysis of interaction management are mainly coordination efforts within the Ministry of Environment that are aimed at enhancing the interaction between both programs and actions to enhance their communication to civil society.

Using PES literature I expand the discussion regarding the relevance of these concepts (e.g. PES and 'PES-like' schemes), the implications for comparing them across schemes, and some lessons these provide for enhancing conservation initiatives and REDD+ (e.g. balancing trade-offs between socioeconomic and environmental goals). I also suggest some recommendations for interplay management to enhance the synergies and tackle the disruptions between Socio Bosque and the PNREDD+, including effective multi-sector planning, enhancing coordination among the programs and learning from previous experiences. Overall, this study provides further insight of the conceptualization of Socio Bosque within incentive-based conservation tools, and reveals the interactions with the PNREDD+ providing recommendations pertinent to policy makers and practitioners.

Keywords: forest governance, Socio Bosque Program, incentive-based mechanisms, PES, REDD+, institutional interaction, interaction management.

1. Introduction

Role of forests in climate change

One of the major current global environmental challenges is the conservation of global forest resources, since these provide a manifold of environmental, economic, social and aesthetic services which are pivotal in human development (FAO, 2010). Some of these services include climate stabilization and carbon storage, refugees for biodiversity, regulation of the hydrological cycle, protection of soil resources, recreational uses, spiritual needs, provision of food, medicinal and forest products (Pagiola, et al., 2002; Siry, et al., 2005; Bonan, 2008). In addition, forests maintain the livelihoods of hundreds of millions of people globally and contribute to the economies of many countries (FAO, 2010).

However, forests are under severe threat in many parts of the world (Pagiola, et al., 2002). Almost half of the original forest cover worldwide (around three billion hectares) is gone, and most of this has been destroyed during the last three decades (Siry, et al., 2005). Although FAO (2010) shows that deforestation, mainly the conversion of tropical forests to agricultural land, has decreasing patterns in several countries (e.g. due to reforestation activities, whilst native natural forests continue to decline), it continues at high rates in others; in the last decade around 13 million hectares were converted to other uses or lost through natural causes each year. On a global average, more than one-third of all forest corresponds to primary forests[1], which have decreased by more than 40 million hectares since year 2000. The decrease of these forests is mainly due to change to other naturally regenerated forests because of selective logging and other human interventions. It is worth mentioning that within primary forests, tropical moist forests include the most species-rich, diverse terrestrial ecosystems (FAO, 2010).

Forests play an important role influencing climate through exchanges of energy, water, carbon dioxide (CO_2) and other gases in the atmosphere (Bonan, 2008). Specifically in the carbon cycle, forests play an important role in at least two ways: i) terrestrial ecosystems remove nearly 3 million tons of anthropogenic carbon every year through net growth, absorbing around 30% of all CO_2 emissions from fossil fuel burning and net deforestation; ii) 4 billion hectares of forests (around 30% of global land area) store large amounts of carbon, holding more than double of the amount of carbon in the atmosphere (FAO, 2010; Canadell & Raupach, 2008). Hence, when forests are cleared, overused or degraded, they release carbon acting as a source of greenhouse gas (GHG) emissions, contributing to about one-sixth of global carbon emissions; when restored, they sequester carbon and become a sink of carbon. Therefore, the use of forests can either be a problem or a way of mitigating climate change. Although afforestation and reforestation provide opportunities to sequester carbon in vegetation and soils, it takes decades to restore carbon stocks resulting from land-use changes. Thus, it has been suggested that reducing deforestation is the only effective way to reduce carbon losses from forests (Streck & Scholz, 2006; FAO, 2010).

Incentive-based programs and REDD+

In response to this deforestation scenario in the world, with special emphasis on tropical forests due to the major role they play in climate change (Gullison, et al., 2007) there are diverse strategies which aim to tackle deforestation. Incentive and market-based mechanisms for nature conservation and environmental services (ES) have been proliferating in the last decade (Muradian, et al., 2010), with widespread experimentation of those addressing the loss of forests

[1] Forests of native species in which there are no clear visible signs of human activities and the ecological processes have not been significantly disturbed (FAO, 2010).

including Payments for Environmental Services (PES) and other and other incentive-based programs (IBPs) (Spiteri & Nepal, 2006; Pagiola, et al., 2002).

It is suggested that PES can result in an efficient means to deliver localized incentives and benefits to forest users and managers in developing countries (Angelsen, et al., 2009). PES have gained much attention and adoption worldwide amongst practitioners in the past years because of their potential to reduce the loss of ecosystems, to capitalize the value of services, and they are being recognized as measures to tackle climate change both as mitigation and adaptation strategies (Rankine, et al., 2009; Mahanty, et al., 2012). They have also gained criticism such as the debates behind the commodification of nature, and the many methodological and moral drawbacks this can lead to ecological and socioeconomic issues (Corbera & Brown, 2010; Prudham, 2009). Within international climate change discussions, PES have been identified as important mechanisms that aim to provide incentives or direct payments for the conservation of forests to local landholders, constituting experiences to learn from for schemes such as REDD+ as a mitigation strategy within the United Nations Framework Convention on Climate Change (UNFCCC). PES has emerged as a suitable mechanism to link national level REDD+ payments to sub-national resource management activities, for example for the distribution of benefits (Angelsen, et al., 2009).

REDD+ has become an emerging international policy instrument to halt land-use related carbon emissions from developing countries; it aims to direct payments to forest owners and users (through national governments or directly) in order to reduce deforestation and improve forest management (Angelsen, 2009). Hence, REDD+ can be seen as an application of PES in forest governance (Arts & Visseren-Hamakers, 2012, p. 3). Since its inception as RED in the UNFCCC's Conference of the Parties (COP) 11 in 2005 until now as REDD+, the scheme is intended to become one of the key pillars of a post-2012 international climate regime, especially regarding developing country mitigation efforts (Corbera & Schroeder, 2011). Many developing countries have prepared REDD+ policy strategies and hundreds of local REDD+ projects have started (Angelsen & McNeill, 2012). However, most of the nationally focused REDD+ initiatives are still in preparation phases, including aspects such as legal frameworks or research to construct the reference levels[2], numerous REDD+ projects and pilot activities that are also in early stages, with few activities being implemented (Peskett, 2011). Some countries are exploring the potential of applying or extending their existing benefit sharing systems (Chandrasekharan, 2012).

Case study in Ecuador

This research focuses on two initiatives implemented in Ecuador: the Socio Bosque Program and the National REDD+ Program (PNREDD+). These are being developed as part of a bundle of initiatives focused on increasing the protected areas, reducing deforestation and improving the living conditions of the participants as part of the National Development Plan. The programs are also part of the Forest Governance Model, which seeks to manage forest resources with social, economic and ecological sustainability criteria (MAE, 2012c). This model comprises five elements: 1) forest administrative and control systems 2) incentive systems for sustainable forest management and forest conservation; 3) information systems; 4) reforestation in degraded and protection areas, and; 5) research, training and dissemination (MAE, 2012a; MAE, 2011b).

Within this Forest Governance Model, direct monetary incentives for conservation are implemented through Socio Bosque since 2008 (MAE, 2011b). This is an incentive-based forest conservation program implemented at a national scale. It aims to preserve native forests and

[2] These refer to the baselines in which for forest carbon stocks so that changes in carbon stocks (or proxies) from the implementation of REDD+ policies can be measured (Angelsen, 2009).

other native ecosystems (4 million hectares), to reduce deforestation and the associated GHG emissions and to enhance the living conditions of the participants. It provides a direct monetary incentive per hectare per year to individual landowners and indigenous and local communities who are voluntarily willing to protect the ecosystems within their territories through 20 year-agreements that are regularly monitored (De Koning, et al., 2011; MAE, 2012a). Since its implementation in 2008 until now the program has signed 2002 agreements with over one million hectares of native ecosystems under conservation, benefiting around 34 thousand households (Proyecto Socio Bosque, 2012).

The Government is also implementing the PNREDD+. The program comprises four action areas for the implementation of REDD+ in the country which relate to the Forest Governance Model's goals, including 1) Monitoring, Reporting and Verification (MRV) forest information and monitoring system; 2) Involvement, safeguards and multiple benefits; 3) Strengthening the forest governance and, 4) Strengthening the system of incentives including Socio Bosque (Subsecretaría de Cambio Climático - MAE, 2013). Even though Socio Bosque is not a REDD+ mechanism nor it is *per se* part of the PNREDD+, is part of the Forest Governance Model; hence, the Ministry of Environment must define how the REDD+ mechanism can support the financial sustainability of Socio Bosque (MAE, 2012c), by which areas within the program could be eligible to receive REDD+ compensations. Socio Bosque also constitutes a platform for communication and involvement between the indigenous and local communities and the government (Carrión & Chíu, 2011; MAE, 2012a). Hence, REDD+ and Socio Bosque are initiatives which interact with one another under the umbrella of the Forest Governance Model.

1.1. Problem statement

Considering the rapid growth of Socio Bosque since its inception (demonstrated by the high number of agreements, large covered area and high number of beneficiaries until present), as a national-level scheme in the context of forest governance, and linked with the PNREDD+, the program has received wide recognition both at national and international levels, and both positive and negative criticism from civil society (De Koning, et al., 2011).

On the one hand, Socio Bosque is one of the emblematic programs well recognized amongst the government and its diverse ministries as an important strategy within the National Plan for Good Living (PNBV). Complimentarily, the program has established several alliances with local and international organizations (e.g. Conservation International −CI− and the Technical German Cooperation −GIZ−) by which they support its promotion, implementation, and capacity building of the program's participants (MAE, 2011a). Also, the program is overall supported by the participating communities and individual landowners. Their main arguments revolve around the outcomes of the program providing both environmental and socioeconomic benefits (De Koning, et al., 2011; Proyecto Socio Bosque, 2012). Socio Bosque has been highlighted as being successful for several reasons. It comprises a scheme proposed as a response to ineffective command-and-control measures; it combines ecosystem conservation with poverty mitigation by providing direct benefits to the participants (MAE, 2012a). In addition, since there is a spatial prioritization, program it focuses in preserving and benefitting those areas with higher conservation and socioeconomic relevance. Also, the 20-year voluntary agreements are meant to halt with deforestation and increase long-term socioeconomic benefits (De Koning, et al., 2011).

On the other hand, Socio Bosque has received several critiques amongst local communities and environmental NGOS. Their arguments rely on the fact that the "commodification[3]" of ecosystem services does not provide environmental nor social benefits. Instead, it disrupts the 'harmonic' relation of the local peoples with the forests. Also, it is claimed that marked-based schemes such as REDD+ and other schemes such as Socio Bosque can disrupt the land tenure regime taking away the rights over their lands (Acción Ecológica, 2010; Acción Ecológica, 2011; CONAIE, 2011; Moraeano Venegas, 2012; Ramos, 2012; Acción Ecológica, 2012).

In addition, there is criticism among some participants due to the inefficient benefit sharing within these communities (Podvin, 2011). The agreements have also received critiques, such as its lack of flexibility (Pachamama, 2011); also, their long-term duration and the potential sanctions that would apply if the participants exit anticipatively, may result in a forced participation (Ramos, 2010). The agreements have more clauses for the participants (15) compared to the ones of the Ministry (3); one of the clauses refers to quit activities such as hunting, fishing, and change of the land use (agriculture) or logging; this might result disruptive since these are traditions of these communities (Ramos, 2010). Moreover, it has been argued that the program doesn't provide guarantee against other strategic governmental sectors (such as mining and oil) (Lang, 2012; Ramos, 2012). The monitoring (i.e. *in-situ* visits, remote sensing techniques and the legal declaration assuring compliance) has also been considered somewhat "invasive" (Ramos, 2010).

Additionally, Socio Bosque is also sometimes confused with these PES schemes, which has led sometimes to critiques.[4] In this sense, it is important to make the distinction between payment as an incentive (Socio Bosque) rather than a compensation (PES) which needs further study in inventive-based programs (IBPs) (Corbera & Brown, 2008) such as Socio Bosque. However, Socio Bosque has also similarities with PES as it comprises incentives to change the landowners' behavior to protect forests. PES schemes have been widely studied and these are in many cases the basis for the development of REDD+ at the national levels (FONAFIFO, CONAFOR y MAE, 2012); in this case it results relevant to study Socio Bosque as a program which can be an interesting initiative for the implementation of REDD+ in Ecuador.

Socio Bosque and the PNREDD+ are related but with differences which are often overseen. REDD+ is one of the financial sources for Socio Bosque and Socio Bosque can provide experiences for REDD+ (Carrión & Chíu, 2011). However, there is still uncertainty how exactly the two programs will link and the challenges and benefits deriving from this interaction process. For instance, there has been certain confusion of these schemes generating misunderstandings or diverse expectations among participants. Due to these confusions, the MAE has highlighted that when landowners subscribe an agreement with Socio Bosque, they are not signing an agreement with REDD+, and Socio Bosque participants won't be forced to participate in REDD+ (MAE, 2012a). Also, Socio Bosque has been implemented by the government which has been already promoting and allocating funds to the initiative for 4 years, and considers REDD+ as an additional financial option (MAE, 2012a). Regarding REDD+, there is considerable uncertainty about the implementation and effectiveness of national REDD+ schemes, as it remains largely exploratory and speculative; also, there is little systematic evidence about how REDD+ will be implemented in practice (Corbera &

[3] "Process during which a thing that previously circulated outside monetary exchange is brought into the nexus of a market" (Page, 2005, p. 295).

[4] For instance: "The program seeks to commercialize with public and private companies, environmental services such as water, biodiversity and carbon... and to enter this competitive market of environmental services, the Ministry of Environment is assuring that the contracts last 20 years…" (Ramos, 2010, p. 45).

Schroeder, 2011). In this sense, there is still a need for Ecuador to learn in more depth from the existing incentive schemes in the forest sector (FONAFIFO, CONAFOR y MAE, 2012).

There are several aspects which need to be addressed. First, Socio Bosque is sometimes confused with both PES and REDD+ schemes (while REDD+ activities have not been officially implemented yet) generating uncertainty among the main stakeholders and criticism amongst civil society (MAE, 2012a; MAE, 2011c). Thus, this research supports a better understanding of Socio Bosque by collating it with other schemes that involve payments for conservation and are being the basis of experiences for the development of REDD+ policies. Secondly, there is still uncertainty on the how Socio Bosque and REDD+ are interacting and how these will be linked (MAE, 2011c); hence, this research can support elucidating these interactions and drawing recommendations at a policy level. Thirdly, there is a lack of published articles related to Socio Bosque; a search of "Socio Bosque" in Google Scholar in October 2012 generated 1 hit and in Google several non-published articles. Hence, there is a lack of formal assessments of the main positive outcomes and challenges the program faces so far. This research aims to gather the existing documents (e.g. conceptualizations and assessments) and validate and compliment the information with key informants. Also, there are less studies and articles regarding other forest conservation IBPs such Socio Bosque since PES are the schemes most assessed within these type of conservation tools. Lastly, as a former employee of the program, it is my interest to support the conceptualization and a more thorough assessment aiming at recommending aspects that may be useful.

1.2. Research objectives and research questions

This study is aimed at providing more insight of Socio Bosque as a conservation tool within the Ecuadorian Forest Governance Model. Particularly, the objective of this thesis is to contribute to conceptualize and assess the program's principles by assessing how it differentiates from other payment-based schemes, and how it interacts with REDD+ through PNREDD. In this sense, the research objectives are:

- To compare the Socio Bosque Program with PES (with which it is often confused).
- To analyze the interactions between Socio Bosque and the PNREDD+ through an *institutional interplay* approach; this to understand how these programs interact, the main challenges and synergies regarding these interactions, and the actions –if existing– implemented to address these interactions through an *interaction management* approach.

Hence, the research questions of the study are as follows:

1) What are the similarities and differences of Socio Bosque and PES schemes? And at what extent is Socio Bosque a PES scheme?
2) Which institutional synergies and conflicts exist as a result of institutional interactions between Socio Bosque and the PNREDD+?
3) Which actions are being implemented or considered to address the challenges encountered in these interactions?

1.3. Outline of the thesis

Chapter 2 explains the theories with which Socio Bosque is analyzed including; firstly it covers governance and forest governance (Ch. 2.1). Then as part of tools within forest governance, I provide a description of incentive-based forest conservation programs including IBPs and PES (Ch. 2.2). Later, the emergent REDD+ mechanisms and a short evolution and updated status, and how these are linked with IBPs and PES (Ch. 2.3). Next, I provide some theoretical background on

institutions from the policy perspective (since Socio Bosque and the PNREDD+ are analyzed as institutions), and then into more detail institutional interplay and interplay management. Chapter 3 describes briefly the conceptual framework regarding the main concepts used throughout the thesis. Chapter 4 comprises the methods employed.

Chapter 5 refers to the first results; firstly it explains the Forest Governance Model (Ch. 5.1); then, a description of Socio Bosque (Ch. 5.2), with a brief history, institutional framework, functioning and updated results. The PNREDD+ is described later (Ch. 5.3) mainly describing the institutional framework and the updated components. Follows a brief explanation of how Socio Bosque and the PNREDD+ differ (Ch. 5.4). Chapter 6 shows the results of the analysis, organized according to the three research questions; firstly the comparison of Socio Bosque and PES schemes (Ch. 6.1); secondly, the interactions between Socio Bosque and the PNREDD+ according to the classification of Gehring and Oberthür (2008) (Ch. 6.2), and thirdly the actions being implemented to address the interactions according to the interplay management classification of Oberthür (2009) (Ch. 6.3). Chapter 7 firstly summarizes the findings (Ch. 7.1) and then discusses the results in a broader context, using existing theory and the empirical results (Ch. 7.2 and Ch. 7.3); later it briefly overviews the limitations and recommendations for future research (Ch. 7.4) and lastly the thesis ends with conclusions of the research (Ch. 8).

2. Theoretical Framework

As the Socio Bosque Program and the PNREDD+ are instruments within the Ecuadorian *Forest Governance Model*, the theoretical framework initiates with a brief description of governance with particular attention to forest resources. Later, an overview of forest conservation IBPs, including PES schemes. In addition, an institutional analysis will be used to assess the interactions between Socio Bosque and PNREDD+; in this respect, *institutions, institutional interaction* and *interaction management* are pivotal in the development of this study.

2.1. (Forest) Governance

First of all, *governance* can be seen as the process by which the rules, norms, and strategies that guide certain behavior(s) within a specific area of policy interactions are formed, applied, interpreted, and reformed (McGinnis, 2011, p. 171). Another definition refers to the rights, institutional roles in decision making, and the systems by which decisions are made, put into action, enforced and monitored (Broekhoven, et al., 2012, p. ix). A similar definition refers to prioritizing at a social level, resolving conflicts, and facilitating organization actions by establishing goals, defining rules to achieve these goals, and the measures developed to control the outcomes by using those rules (Vatn, 2010, p. 1246). Within a broader perspective of governance in an international context, a governance system can also be seen as a "collective", a shared set of responsibilities of states, market and civil society actors (Visseren-Hamakers & Glasbergen, 2007, p. 409). An important aspect of the term governance is that generally it implies some degree of self-regulation by societal actors, private-public cooperation in solving societal problems and new forms of multilevel policy (Biermann & Pattberg, 2008, p. 278).

Governance has acquired various meanings. In its broader interpretation, it is about the many ways in which public and private actors from the state, market and or civil society govern public issues at multiple scales, autonomously or in mutual interaction. Similar to this, the definition: "governing beyond the confines of the state", refers to a change of paradigm in which societies and organizations are governed, and according to this, the old top-down, state-led, command-and-control way of governance has lost its legitimacy and effectiveness. Governance has also been characterized as "governing at multiple levels" (e.g. policy-making between state and other institutions and at local, sub-national, national and global levels) (Arts & Visseren-Hamakers, 2012). Within development policy, the governance concept also gained relevance during the 1990s, with the qualifier of "good governance" (Biermann & Pattberg, 2008) which includes reforms to the public and/or private management in accordance with a number of "good" governance criteria, such as cost-effectiveness, transparency, accountability, participation, among others (Arts & Visseren-Hamakers, 2012).

Within the environmental realm it has been suggested that *environmental governance* can be understood as the establishment, affirmation, or change of institutions to resolve environmental conflicts (Paavola, 2007). When referring to forests, governance affects the allocation and regulation of ownership and access rights to the social and ecological benefits from forest resources. Hence, it is argued that governance complements the traditional role of the state in planning, monitoring and controlling the use, management and conservation of forests (Broekhoven, et al., 2012). *Forest governance* can have various meanings: "from steering in general to new modes of governance that go beyond the confines of the state, which can be multi-level in nature" (Arts & Visseren-Hamakers, 2012, p. 3). Another definition suggests it is "the many ways in which public and private actors (i.e., the state, private sector and civil society) work together in order to create capacity to make and implement decisions about forest management

at multiple spatial, temporal, and administrative scales" (Broekhoven, et al., 2012, p. viii). In this sense, it includes the policy, legal, regulatory and institutional frameworks dealing with forests, and the processes that shape decisions about forests and the way these are implemented based on fundamental democratic principles (Broekhoven, et al., 2012).

Forest governance is an interesting topic because the increased decentralization and devolution of forest management authorities and the forested area managed by local communities and indigenous peoples have reduced the ability of central governments to govern forests in a top-down approach (Sunderlin, et al., 2008; Broekhoven, et al., 2012). Also, the increasing competition for land and the importance of land and forest resources' tenure and rights, adds complexity regarding the diversity of interests and stakeholders. Hence, the diverse interests and high expectations on forest resources (goods and services) have led to an increase in the number of actors and institutions involved in forest governance at national and international levels, incrementing the complexity in this realm. With this, the need for effective frameworks for sustainable forest management has become a main axis in international initiatives that promote the maintenance of forests' functions. For instance, markets for timber and carbon are now recognized as essential initiatives in forest governance (Broekhoven, et al., 2012).

It has been suggested that current forest governance (or new modes of forest management) comes mainly in three forms: decentralization, participation and marketization (Agrawal, 2008; Arts & Visseren-Hamakers, 2012). *Decentralization* of forest management refers to the de-concentration of administrative competencies and/or the transfer of political authority from the central state to sub-national administration and it is considered to bring politics closer to the people and increase policy effectiveness (Arts & Visseren-Hamakers, 2012). *Participation*, in which local management of forests, either by communities themselves or jointly with regional forest departments, can be as or more efficient and effective than central state institutions in conserving forest resources (Arts & Visseren-Hamakers, 2012); this can also refer to *community management* which comprises a system based on cooperation where individual decision units formulate both individual and common goals (Vatn, 2010). Within a broader governance categorization, *markets* are systems of voluntary exchange, in which the formulation of goals rests with each participating individual agent, and the final allocation of resources is determined by the largest extent on the willingness and capacity to pay; hence distribution of access to resources to trade becomes important (Vatn, 2010). Within forest governance, *marketization* includes market-based mechanisms including forest certification or PES (Arts & Visseren-Hamakers, 2012, p. 3).

The term "*good forest governance*" has also emerged, referring to the quality of forest governance. It can refer both to forest governance reform programs (for instance reforming and strengthening the institutions and arrangements of forest governance), and to the principles of good governance employed in these actions. These key principles can include access to information, trustworthy and accountable processes, multi-actor deliberative participatory processes, fairness, decency, legitimacy, efficiency, equity and sustainability. In addition, it should generate the capacity for continuous learning and the ability to adapt to lessons learned among those engaged in the participatory processes of governance (Broekhoven, et al., 2012). In the context of tropical countries, many factors have been recognized influencing the effectiveness and outcomes of forest governance, such as the forests' user rights and responsibilities, greater participation and support of the forests-dependent, downward and horizontal accountability of decision-makers, better monitoring of forest outcomes, stronger enforcement of property rights and governance arrangements, and investments in institutional capacities at local, regional, and national levels (Agrawal, 2008, p. 1462).

2.2. Forest conservation incentive-based programs

In response to the deforestation scenario in the world, with special emphasis on tropical forests due to the major role they play in climate change (Gullison, et al., 2007) and biodiversity services there are diverse strategies which aim to tackle deforestation. It is often argued that by giving an economic value to nature and its immersion into market processes successful conservation may be achieved (Igoe, et al., 2010). Since there can be differences of the private and social benefits deriving from ES, "the problem of "externalities", results in a classic market failure: individuals will tend to provide too little of the ecosystem services" (Jack et al. 2008 p. 9465). To control these externalities, many governments have adopted command-and-control regulations, which mandate actors to undertake specific actions and applies sanctions when they do not comply. In contrast, incentive-based policies address externalities by altering the economic incentives among private actors, allowing those actors to decide whether they are willing to and how much to change their behavior (Jack, et al., 2008).

Incentive and market-based mechanisms for nature conservation and ES have been proliferating in the last decade (Muradian, et al., 2010), with widespread experimentation of those addressing the loss of forests considering the manifold services these provide (Spiteri & Nepal, 2006; Pagiola, et al., 2002). It is believed that market-based approaches can provide powerful incentives and efficient ways to conserve forests and their goods and services, offering also sources of income to support rural livelihoods (Pagiola, et al., 2002). Market-based mechanisms for forest conservation entail selling the services provided by forests, aiming at generating funds that can be used to increase the private benefits of conservation to individual forest managers, changing their incentives (or behavior), or generating resources that can be used to finance conservation efforts by public or private conservation groups (Pagiola, et al., 2002, p. 4). Among these bundle of schemes, PES, and other forest conservation incentive-based programs (IBPs) can be named (Rankine, et al., 2009; Pagiola, et al., 2002; Spiteri & Nepal, 2006).

Conceptualizing IBPs and PES

Incentives are "direct or indirect incentives granted to an element of the economy to raise or sustain its contribution to the activity" (Jäger & García, 2001, p. 5). *Environmental services* (ES) are the capacities of the processes and natural components to provide goods and services which provide benefits deriving for the existence and dynamic development of the natural resources or ecosystems (Zbinden & Lee, 2005). In addition, the term of "ecosystem services" have been given a connotation of benefits to society, conceptualized as the benefits that nature provides to humans and influence our well-being (MEA, 2005). In the case of forests, PES aim at maintaining the flux of an environmental service such as the habitat for biodiversity, provision of clean water or carbon sequestration (Hitomi, 2009).

The underlying principle of PES is based on contractual payments to users of a natural resource, such payments being subject to the condition that they maintain a pre-defined environmental service (Wunder, 2005). PES are typically defined as voluntary transaction where well-defined ES (or land use likely to secure that service) is being 'bought' by a (minimum one) ES buyer from a (minimum one) ES provider if and only if the ES provider secures ES provision (conditionality) (Wunder, 2005). Some important terminology aspects, in which the P (from PES) belongs to the generic term "payments"; however depending on the diverse situations that deserve remuneration, the actors (to whom), and the type of currency have generated debate of other terms such as "markets" (in cases where there is a competitive interaction between multiple agents), "rewards" (just and equitable prize for services rendered), and "compensations"

(recompense for a cost the service supplier has suffered) (Wunder, 2005, p. 4). The "E" stands either for environmental or ecosystem, but usually although the latter is more integral, the first one assumes a separable nature of different services; finally the "S" stands for services which have been defined as the non-material or non-extractive benefits from nature (Wunder, 2005, p. 4).

PES belong to the family of approaches making pronounced use of economic incentives and directness, in which incentives are the core (Wunder, 2005). PES usually differ from other conservation tools, and they are also quite diverse. There are four types of PES that stand out according to the services: carbon sequestration and storage (e.g. planting and maintaining additional trees), biodiversity protection (e.g. setting aside areas with biological importance), watershed protection (e.g. downstream water users paying upstream landowners for adopting land uses that secures those water resources) and landscape beauty (e.g. payments to prevent an specific activity, such as hunting in an important wildlife are for tourism) (Wunder, 2005).

Some additional distinctions have been made including *area* vs. *product-based* schemes, *public* vs. *private* schemes, ad *use-restricting* vs. *asset-building* schemes. *Area-based* schemes entitle contracts which define land and/or resource use limits for a pre-agreed number of land units; in *product-based* schemes consumers pay a green "premium" on top of the market price for a production scheme that is certified to be 'environmental friendly'. *Public-sector* schemes involve the central state or municipalities: "in which the state acts on behalf of ES buyers by collecting taxes and grants and paying alleged ES providers" (Wunder, 2005, p. 8) and they tend to have different access filters and less payment differentiations compared to the private-sector ones (Wunder, 2008); *private-sector* schemes are more locally focused. *Use-restricting* schemes reward providers for conservation (including natural regeneration) for capping resource extraction and land development (i.e. people are paid for conserving pre-existing ES such as setting areas aside); *asset-building* schemes aim to restore ES in an area (Wunder, 2005).

Within these types of incentive-based programs, there are other typologies such as *Conservation Agreements* (CAs) or the more generic term *incentives for conservation*. *CAs* have been defined as "negotiated transactions in which conservation investors finance direct social benefits in return for conservation actions" (see Nietsen et al. 2010, p. 5). These link sources of conservation finance (e.g. government, bilateral cooperation, private sector, NGOs) and local resource owners who can provide biodiversity conservation services (Wunder, 2007). CI is one of the organizations implementing CAs in developed countries, aiming at making protection of biodiversity an attractive and viable choice (Nietsen, et al., 2010). Particular characteristics of these schemes include an agreement that stipulates required activities for resource users that usually involved two parties: those who agree on collaborating with conservation, and the investor who agrees in providing compensatory benefits. The benefits include cash payments or livelihood support; these also include performance monitoring and sanctions when there is a failure to comply the agreement (Gjertsen & Nietsen, 2010). It has been suggested that these schemes must assure transparency through the participatory processes in the agreements; also, flexibility resulting in initiatives that adapt according to the stakeholder circumstances and development priorities. A special feature of these schemes is the broader goals of amplifying impacts with respect to both conservation and human wellbeing outcomes (Nietsen, et al., 2010).

Impacts of IBPs and PES

Both negative and positive impacts have been identified regarding these conservation mechanisms. On the one hand, they can have limitations in reconciling the challenges of achieving meaningful conservation and providing livelihood opportunities and benefits to those who are directly related to the conservation efforts (Spiteri & Nepal, 2006). In this sense, inability to

generate uniform community support has been identified as one of the main barriers to achieve conservation; as a result of deficiencies in the development, implementation, and distribution of benefits, local people may result skeptical about conservation IBPs (Spiteri & Nepal, 2006).

Regarding PES, some negative social side-effects can also occur; for instance, enrolling targeted participants may create jealousy and raise inequality; in addition, not every individual has all the capacities and motivation to improve from the incomes (Wunder, 2008), or non-conditional benefits may create paternalistic expectations and tensions when these higher expectations are not met (Robertson & S., 2005). In addition, it has been assessed these can lead to a deterioration of the cooperative agreements and community disruption due to inequality (e.g. the monopolization of resources by the leaders) (Grieg-Gran, et al., 2005; Landell-Mills & Porras, 2003). In addition, there can be a reduction in the households' incomes due to restrictions in the area under conservation by the inflexibility of long-term agreements where landowners cannot perform certain activities; this may lead to a loss of access to vital rights where the providers of the services are not fully compensated by the payments and thus, affecting their livelihoods (Grieg-Gran, et al., 2005; Landell-Mills & Porras, 2003). In addition, the impacts of payments in inducing behavioral changes can be quite diverse depending on how the social meaning of such payments is constructed (Muradian, et al., 2013).

On the other hand, it has been argued that well-designed incentive programs that establish linkages between conservation and local subsistence based on equity, local needs and sustainability can generate positive perceptions of conservation aims and lead to environmental stewardship (Spiteri & Nepal, 2006; Brown, 2002). Regarding PES, it has been highlightedthat "by altering private incentives to induce desired outcomes, PES schemes offer a direct, and possibly more equitable, method for achieving environmental outcomes than other approaches" (Spiteri & Nepal, 2006, p. 9469). The emergence of PES in the conservation arena has provided interesting results because of its rapid development; it seems to have shifted, sometimes dramatically, the borders between local development promoters and conservation advocates (Pirard, et al., 2010, p. 5). For instance, PES schemes can generate an increment in the households' incomes, reduce negative pressures towards native ecosystems, investment in sustainable activities (Russo & Candela, 2006), generation of jobs, value added to the activities of preserving native ecosystems and increased participation of indigenous peopled (IPs) and women (Arriagada, et al., 2009).

Moreover, it has been suggested that the success of PES concept is based on the simplicity-equity-efficiency criteria (Pirard, et al., 2010). Simplicity and efficiency are related to the limited number of stakeholders involved in the transaction; also, it directly addresses the problem. In addition, PES in some cases can induce changes in land use without addressing sensitive land tenure issues, for instance, when resource users without formal rights receive payments. This flexibility is believed to make PES a more cost-effective tool and, in some cases, a less politically risky option than other conservation strategies. Equity mostly relates to the voluntariness of the scheme and the economic value which is in principle, the result of transparent negotiations (Pirard, et al., 2010). In addition, "PES combine to some extent the participatory approach (primacy of the process) with the pragmatism of financial compensation (result-based management and direct incentives)" (Pirard, et al., 2010, p. 6).

Overall, these programs (i.e. PES or other IBPs) have gained much attention and adoption worldwide amongst governments, donors and NGOs in the past years for several reasons. They have the potential to reduce the accelerated loss of ecosystems and to capitalize the value of the services, mobilizing new financial resources for forest conservation and develop sustainable financing. Also, they are being recognized as measures to tackle climate change both as mitigation

and adaptation strategies (Rankine, et al., 2009; Mahanty, et al., 2012). In addition, they have the potential to not only address environmental issues such as deforestation and forest degradation, but also help improve the quality of life of participants and reduce poverty (Grieg-Gran, et al., 2005). Hence, within international climate change discussions, PES have been identified as important mechanisms that aim to provide incentives or direct payments for the conservation of forests to local landholders. Thus, there is growing interest in the lessons learnt from past and present PES and other market-based schemes and in how they might inform REDD+ initiatives (Ferraro & Kiss, 2002; Kandel & Cuéllar, 2011; Ochieng, et al., 2012; Mahanty, et al., 2012).

Critique on PES and other IPBs

It has been assessed how PES (and other IBPs) may fall into the controversial "neoliberalisation of nature"; this term has been emerging within this capitalist expanding world through different ways aiming to achieve particular objectives for the state and/or for the capital (Castree, 2008a). Castree (2008b) defines these diverse ways as "environmental fixes". These fixes either comprise neoliberal actions that are taken to obtain certain capital through the physical environmental (fixes one through three), or the ways in which the state uses neoliberal measures to solve certain environmental issues within the larger spectrum of economy and society (fourth fix) (Castree, 2008b). Within the first bundle of fixes, concepts such as "free market environmentalism" can be highlighted, as a set of ideas and practices that aim to conserve resources and ecosystems by allowing them to be privatized and commodified (Castree, 2008b).

Within this new trend of studying conservation policy within neoliberalism, it has been argued that Neoliberalisation involves a "reregulation of nature through forms of commodification" (Igoe & Brockington, 2007, p. 432), in which states transform previously untradeable things into tradable commodities[5] (Castree, 2008a). This process of commodification related to environment and nature (both non-human and human) has been an aspect that has received rising attention in recent years (Prudham, 2009). Within environmental governance there has been an increasing emergence of 'market-based' mechanisms characterized by commodification of biophysical processes within the 'neoliberalisation' of nature (Castree, 2003). These processes can include biodiversity conservation and carbon sequestration markets, to name a few. In regard to this, assessments such as commodification of nature, the nature of commodification, and the social and environmental implications of commodification are emerging among scholars (Prudham, 2009).

As stated by Muradian et al. (2013, p. 2), "there is a heated debate in the current academic literature about the so-called 'market-based' instruments for environmental policy, a generic term that has been used to refer to a wide range of tools such as cap-and-trade permits, certification schemes, biodiversity offsets, PES, and others". Some distinctions have been made between Markets for Environmental Services (MES) and PES, in which the former demand a well-defined ES and active supply and demand sides, whereas the latter are not necessarily markets.[6] Thus, it has been suggested (Muradian, et al., 2013) that MES is not an appropriate term to label PES as in practice as very few existing PES can be considered as pure markets. Markets involve buyers and sellers in transactions through which goods or services are exchanged against monetary payments or other arrangements; markets are also typically characterized by the existence of various types of intermediaries and they require high levels of commodification and conditionality (Muradian, et

[5] Commodity can be defined as anything that is exchanged or exchangeable, or as "a process where qualitatively distinct things are rendered equivalent and saleable through the medium of money" (Castree, 2003, p. 278).

[6] "PES are not actual markets where ES are sold to service buyers; the commodity is ill-defined, and, in most cases, governments play an intermediary role by mobilizing resources from consumers to a government fund, which then distributes financial resources to ES stewards at a pre-established price" (Corbera, et al., 2007, p. 366).

al., 2013). Most PES do not fulfil the criteria that define markets (i.e. high commoditization, high conditionality, voluntariness) (Muradian, et al., 2013; Wunder, 2008), mainly due to complexities of socio-ecological systems and high transaction costs (Muradian, et al., 2010).

It has been discussed that nature´s commodification has many methodological and moral drawbacks that can lead to ecological and socioeconomic issues (Corbera & Brown, 2010; Prudham, 2009). Some of these barriers comprise the way in which markets involve privatization and the increasing government's role as a guarantor of private property rights (Corbera & Brown, 2010). Also, carbon trading (for example in REDD+) is a result of a "market environmentalism pursuing the commodification of ES" (Corbera & Brown, 2010, p. 1757). Carbon credit mechanisms (or other ES schemes) can be seen as neoliberal governance engaging business and government elites of industrialized and developing countries (Corbera & Brown, 2010). There also may be competing views of the resource management practices which should be allowed in market frameworks, and setting a price for carbon may result controversial (Corbera & Brown, 2008).

Besides the prior debate on markets, there are other critiques including a variety of perceptions among diverse actors regarding the certainty and scale of the climate change problem; these actors may critique the rationale behind the idea of planting trees (or reducing deforestation) to offset emissions generated in other areas (Corbera & Brown, 2008). In addition, it also has been argued that there must be particular institutional and governance contexts to allow PES schemes to meet both conservation and development goals (Muradian, et al., 2013). The context in which most PES schemes operate is often characterized by high uncertainty in the accountability of ES' provision, due to the biophysical complexities associated with the relationships between land use and such services (Muradian, et al., 2010). Certain complexities such as the uncertainty of the markets, efficiency and benefit distribution, and social embeddedness, are crucial aspects that can steer a better planning, implementation and assessment of PES schemes (Muradian, et al., 2010).

2.3. Current status of REDD+ discussions

REDD+ has become, in the past years, an emerging international climate policy instrument to halt land-use related carbon emissions from developing countries. This framework is expected to establish incentives –through national governments or directly– for developing countries to protect and better manage their forest resources, through an economic value for the additional carbon stored in trees or not emitted to the atmosphere (Corbera & Schroeder, 2011; Angelsen, 2009). REDD+ activities can include expanding or strengthening protected areas; fighting illegal logging; chancing subsidy, incentive, taxes and sanction policies; improving land-use; developing new forest management regulations; and most likely, incentivizing local landowners through national and project-based PES schemes (Angelsen, et al., 2009; FONAFIFO, CONAFOR y MAE, 2012). In addition, it will require coordinated efforts at national, regional and local levels and among multiple actors: governments, NGOs, multilateral agencies, private organizations, communities and individuals (Corbera, 2012). It has been argued that besides generating an opportunity to reduce tropical deforestation and promoting forests' social and ecosystem functions, it might also have the potential to contribute to poor people through its diverse benefits (Angelsen, 2009; Peskett, et al., 2008). Also, by ensuring benefits for the forest-dependent people might allow to secure that forests are effectively protected (Mwayafu & Peskett, 2009).

REDD+ has developed rapidly, however, not as expected (Pistorius, 2012). It has been subject to many changes regarding how it was perceived and what it has become in practice (Angelsen & McNeill, 2012). The idea of RED (Reductions of Emissions from Deforestation) was launched at the

UNFCCC's COP 11 in 2005. *Forest degradation* (the second D) was included after much pressure in COP 13 in 2007, due to the fact that a large share of forest emissions is the result of degradation. Three additional aspects where added to the definition to accommodate diverse interests: i) *conservation*, to meet the interests of high forest, low deforestation countries and environmental NGOs; ii) *sustainable management of forests*, to fit the interests of countries with and active forest-use approach and iii) *enhancement of forest carbon stocks*, to include the interests of countries with growing forests stocks. In COP 13 this scheme has fully integrated into the global climate negotiation agenda, and as an idea, it has become potentially one of the most effective mitigation strategies. From the contents of the Copenhagen Accord at the COP 15, and the current progress under the UNFCCC, REDD+ might become an important pillar of a post-2012 international climate regime, regarding developing country mitigation efforts (Angelsen & McNeill, 2012).

However, climate change negotiations have not yet achieved a global climate agreement providing significant long-term funding (Angelsen & McNeill, 2012); although along these negotiations there has been a proliferation of multilateral and bilateral funds to support the development of REDD+ strategies and demonstration activities in developing countries (Corbera & Schroeder, 2011). REDD+ so far has been supported mostly by non-market sources such as public funds supporting the development of technical capacities and design of early implementation of development country policy options (around 1,5 billion US$) (Corbera, 2012). In this sense, billions of dollars have been pledged to REDD+ by donors, and new international (or multi-country) programs have been created, such as the World's Bank's Forest Carbon Partnership Facility (FCFP) and the Forest Investment Program (FIP), the UN-REDD Programme (Angelsen & McNeill, 2012), and other programs and funds (e.g. with contributions from UK, Norway and Germany) (Corbera, 2012). It is expected that later the "the payments are likely to be articulated through transnational or global markets for REDD+ and other types of carbon offsets" (Corbera, 2012, p. 613).

Many developing countries have prepared (and some have even started to implement) REDD+ policy strategies, hundreds of local REDD+ projects have started and researchers and others have been motivated to write numerous publications (Angelsen & McNeill, 2012). However, most of the nationally focused REDD+ initiatives are still in preparation phases, including aspects such as legal frameworks or research to construct the reference levels. Also, there are several REDD+ projects and pilot activities that are also in early stages, with seldom activities in practice (hence, most of these do not entail payments for reduced emissions yet) (Peskett, 2011). Important relations have been identified between PES and REDD+: "REDD+ in one sense represents PES writ large, where developed countries are able to fund the conservation of carbon in the forests of developing countries" (Mahanty, et al., 2012, p. 2).

Debates and critiques on REDD+

The evolution process of REDD+ is a result of both a natural maturation of the idea, and also as it has been a scheme thrown into the political arena and altered by differing interests and ideologies (Angelsen & McNeill, 2012). Along these evolving negotiations, REDD+'s procedural rules have evolved over time (Pistorius, 2012; Corbera & Schroeder, 2011). As suggested by Pistorus (2012), the REDD+ debate has evolved in three phases. Firstly, the emergence of the debate was characterized by the simplicity of the approach, in which the diverse actors (i.e. stakeholders, negotiators, and scientists) shared the common ultimate goal of tackling deforestation in developing countries. A defining characteristic of the initial idea of REDD+ was the use of financial incentives to change the behavior of forest users: forest conservation could become more profitable than forest clearing as a result of PES (Angelsen & McNeill, 2012). Secondly, the readiness and pilot activities (2007-2009) characterized of increased political and technical

complexity as a result of particular national interests adding technical and safeguard aspects to the debate (Pistorius, 2012). Thirdly, a debate towards the governance of REDD+ (since 2009) in a wider context landscape and development context both more optimistic (attempting to reconcile sub-discourses and support the development of policy options at diverse governance levels) and skeptical discourses (critically assessing whether REDD+ can address the core problem of deforestation and generating additional environmental and social benefits) (Pistorius, 2012).

There is also debate on the most appropriate international and national architecture for REDD+. Also, defining how global mechanisms will link with national and local initiatives with private sector and NGO support (Angelsen, 2009). PES has been considered as a likely scheme to link national level REDD+ payments to sub-national resource management activities, as means to deliver localised incentives and benefits to forest users and managers in developing countries. (Angelsen, et al., 2009; Mahanty, et al., 2012). It has been suggested that "PES have the potential to become effective, cost-effective and equitable instruments for implementing REDD+ on the ground" (Wunder, 2009, p. 213). Hence, aspects that characterized the idea of REDD+ are the magnitude of the available funding and that it aimed for reforms at multi-sector levels beyond the forestry one, therefore enhancing its impacts (Angelsen & McNeill, 2012). Although welfare improvement was never a core objective of PES (Wunder, 2005), the possible future connection between REDD+ and PES schemes makes the experiences of established PES schemes important to REDD+ design (Mahanty, et al., 2012). REDD+ has also has been conceptualized as "the world's largest PES experiment" (Corbera, 2012, p. 613), since the scheme aims to deliver payments s from carbon offset buyers (articulated through transnational or global markets) to sellers, conditional to sustainable land-use practices and reducing emissions against national or project-based baselines (i.e. tonnes of avoided or sequestered CO_2 emissions).

As pointed out by Pistorius (2012, p. 643) "So far, the REDD+ debate, the unprecedented political institutional support as well as the hope for the promised compensation payments have fueled high expectations." REDD+'s support has remained high, partly due to the fact it has not been entirely defined leading to uncertainty; some of these difficulties include whether the reference levels should be based on national circumstances, or the definition of "enhancement of forest carbon stocks" which was interpreted by some to include plantations while others not (Angelsen & McNeill, 2012). Regarding social impacts, some of the potential challenges include fair allocation and access and perceived injustices, including unequal distribution of environmental risks, across peoples and places, and power bases of different stakeholders within and between states. Also, there are some moral and ethical issues regarding whether REDD+ should compensate large, commercial deforesters, or those who have been contributing to preserve forests, such as the IPs; also, how forest and indigenous communities who may not have secure right tenure rights can trust they will be compensated for their efforts, and the definition of social and environmental safeguards (Corbera & Schroeder, 2011; Angelsen & McNeill, 2012). Overall, it has been assessed that it is relevant for the interdisciplinary approaches for REDD+ to have a better chance to work: "In-depth analysis of REDD+, encompassing multiple disciplines because of its inherent complexity, in term of both content and actors" (Visseren-Hamakers, et al., 2012, p. 589).

REDD+, as PES or other incentive-based schemes, has also received critiques in the way it has been conceived as a type of conservation based o management of nature according to monetary values and utilitarian principles of supply and demand (Kosoy & Corbera, 2010). It has been argued that "REDD+ transforms the conservation logic and reconfigures livelihood strategies without significantly altering procedural and distributive justice conditions of the geographies where concrete REDD+ policies and project interventions unfold" (Corbera, 2012, p. 613). In this sense, as REDD+ can be conceived as PES, can fall as a tool within the debated "neoliberalisation of nature"

and the same critique seen for PES, characterized by the commodification of new ecosystem goods and services for conservation purposes, a diversity and complexity of actors pursuing these goals, the demarcation of controlling people and natural resources, and potential unequal distribution of benefits and costs (Castree, 2008b). For instance, a collection of articles from developing countries reveals: "REDD+ is a scheme of carbon trade based on fixating a price to trees is the best way of protecting the forests... although many indigenous peoples, communities dependant on the forests, peasants, women association, social movements and environmental NGOs' reject REDD+, a false solution to climate change that commodifies nature even more" (REDD monitor et al., 2010). In this context, and as assessed by scholars such as Corbera (2012), REDD+ and PES can have this more utilitarian rather than ethical way of conservation, potentially increasing existing disruptions through the valuation logic that might reduce the intrinsic conservation motivation (however, it also has been suggested that this argument requires further empirical proof). In addition, critiques revolve around the deficient targeting of the deforestation problem: "In the climate negotiations of the United Nations, a controversial scheme to supposedly protect the remaining forest in Earth is covering the urgent need to reduce the emissions in the place of origin and leave the fossil fuels under the oil" (REDD monitor et al., 2010).

2.4. Institutions

A simple definition of institutions refers to "set of rules" (North, 1990). Institutions, or ways of organizing activities, affect the resilience of the environment (Dietz, et al., 2003, p. 1907). As seen previously, human societies depend on the ecosystems and the provision of ES these provide. In addition, human actions are interconnected in these processes involving ecosystem dynamics (Vatn, 2010). In this sense, human actions in certain places (e.g. emissions, land use changes) affect the conditions for people in other places. Among these, climate change is an example of how human actions intervene in other lives and livelihoods. The interrelations detailed above can be understood through the concept of *institutions*, as they can be "solutions to collective choice problems" (Vatn, 2010, p. 1245)**.**

However, since the early theorizing and research on institutions focused mostly on "top-down" models of social influence, these have been assessed by scholars "in the various ways in which rules, norms, and shared beliefs impacted organizational forms" (Scott, 2005, p. 11). In the last decades, there has been a movement within social sciences known as *new institutionalism* characterized as pragmatic, empirical, and with an emphasis on "rules in use", in contrast to other formal provisions of contracts, treaties or other constitutive documents (North, 1990). What strengthens this movement is the aim to understand the actual roles that institutions play as determinants of the outcomes of interactive human behavior (Young, 2002). New institutionalism offers a broad umbrella that shelters a range of perspectives of human affairs. In this context, institutions defined as the "rules of the game in a society", or "humanly devised constraints that shape human interactions" (North, 1990, p. 3) can either be formal or informal; formal institutions include legislation, executive decisions, and private contracts that are respected and enforced (Tucker & Ostrom, 2005). Institutions can also be described as constraints or opportunities within which individual choices are made and which define the consequences of these choices (McGinnis, 2011). In this regard, the role of institutions in a society is to establish (although not necessarily efficient) structure to these human interactions or aspects in every day's life, whether these are in political, social, or economic arenas, hence, reducing uncertainty (North, 1990).

Institutions also vary widely along diverse dimensions, including the nature and number of related actors or subjects, the character and scope of the social practices they rule for, the degree to which they are fomalized, their period of existence (e.g. newly formed or long-established

arrangements), the extent of the organizational apparatus established to administer them, and the degree to which they are embedded in larger systems involving both other institutions and culturally determined bahaviors (Young, 1999). In addition, it is important to distinguish institutions from *organizations*. The latter include political, economic, social and educational bodies; they comprise "groups of individuals bound by some common purpose to achieve objectives" (North, 1990, p. 5). Lastly, to make this distinction, institutions can be described as the rules of the game and organizations and other actors are the players (North, 1990). This approach is relevant as the influence of institutions on organizations needs to be revealed, and according to Scott (2005) two clarifications need to be done regarding the "institutional effects". Firstly, he points out that the environments where institutions operate are not monolithic, but rather varied and conflicted; in this sense authorities may be diverse and schemes might compete amongst each other, the boundaries of organizations are often not clearly defined, and there might be interests that may influence new structures within these institutions. Secondly, although actors can be considered as institutionally constructed, it is pivotal to acknowledge their potential for reconstructing the rules, norms and beliefs that guide their actions. With these aspects in mind, the language has shifted from discussions of institutional "effects" to institutional "processes", and towards more bottom-up approaches (Scott, 2005).

In the context of global environmental change research, it has been suggested that sustainable management (or conservation) of forest resources can be studied from an institutional perspective (Corbera, et al., 2009). Institutions shape the way in which humans relate to their environment. Hence, institutions exist or are created to mediate these relationships, constituting systems of rules, decision-making procedures, and programs that give rise to social practices in relation to the environment, assigning roles and guiding interactions among the participants embedded in these practices (Dietz, et al., 2003; Young, 1999). However, the study of institutions for natural resource management remains dynamic, in which there are intense debates over the kinds of institutions, arrangements and approaches to provide the best outcomes in the diverse political, economic, cultural and environmental settings that characterize the world's forests (Tucker & Ostrom, 2005).

Critical assessments to institutional theory include the "simplified and unilinear models of the institutional evolution process" (Cleaver, 2002, p. 13). Within environmental change, institutions can be designed and implemented at distinct levels of social organization, ranging from international regimes to national policies, or local rules of community resource management. Institutions can also interact with other existing institutions, which also can be either formal (e.g., national laws) or informal (e.g., social habits and traditions) (Corbera & Brown, 2008). It also has been suggested that fixed rules or institutions linked to environmental change are likely to fail. Hence, these must be designed in such way they can adapt, as some current understanding is likely to be wrong, the required scale of organization can shift, and biophysical and social systems change (Dietz, et al., 2003, p. 1909). There are major analytical and methodological drawbacks when seeking to prove conclusions about the effectiveness of specific institutional arrangements, with a risk of arriving at conclusions that are based on false correlations (Young, 2002).

An alternative approach has been proposed, referred by Cleaver (2002) as "institutional bricolage"; with this approach the assessment goes beyond the formal organizations and conceptualizes social relations as a core aspect, rather than simply context or assets. In addition, this term suggests how "mechanisms for resource (e.g. forest resources) and collective action are borrowed or constructed from existing institutions, styles of thinking and sanctioned social relationships" (Cleaver, 2002, p. 17). For natural resource management, institutional bricolage can

result an effective tool to assess its complex and dynamic nature, and how the institutions interact with the web of livelihood networks and practices in which they are embedded.

2.5. Institutional analysis: institutional interaction and interaction management

Institutional analysis studies how institutions are formed and function. As suggested by Vatn and Angelsen (2009)[7] concerns three main issues: 1) the distribution of rights and responsibilities among the actors; 2) the costs of coordination/interaction between them (transaction costs); and 3) how institutional structures influence actors' perspectives, interests and motivations. Rights and responsibilities within political systems include the distribution of decision-making power and the rules defined for political decision-making. Transaction costs concern the technical aspect of institutions concerning how costly interactions between actors are including information gathering, formulation and control of the agreements. Lastly, institutional structures may also influence the way actors see issues and what motivates their actions. These motivations vary across institutional systems and the positions people/actors have (e.g. opportunity to make profits, interest representation, concerns for society) (Vatn & Angelsen, 2009).

Within the study of environmental change, several analytical domains or dimensions have been recognized which can result handy when carrying out an institutional analysis including: *fit*, *scale*, *performance, organizational capacity, design and interplay* (Young, 2002; Corbera, et al., 2009). *Fit* revolves around the proposition that the performance of institutions in environmental terms is determined mostly by the congruence or compatibility between the attributes of the relevant institutions and the main characeristics of the ecosystems. The dimension of *scale* arrises from the fact that institutions affecting large environmental systems operate at several levels of social organization (e.g. from local traditional practices through national arrangements dealing with uses of natural resources to international regimes addressing global problems such as climate change and the loss of biological diversity) (Young, 1999). *Institutional performance* assesses how a certain institution achieves its stated objectives. *Capacity* can be described as the availability of social institutional and material capital to meet certain goals (e.g. such as climate change mitigation and sustainable development objectives). *Design* aims at understanding why the institution under study has been proposed as a policy tool in a particular context and identifying the actors that shape the rule-design process (Corbera, et al., 2009). *Interplay or interaction,* revolves around the the proposition that institutional arrangements regularly interact with one another, even though it may seem convenient to treat them as self-contained entities for purposes of analysis (Young, 1999). This last dimension will be described in more detail in the next section.

Institutional interaction

Institutions for environmental change can be designed and implemented at distinct levels of social organization, from international regimes to national policies, or local rules of community resource management. These institutions interact with other existing institutions (Corbera & Brown, 2008). *Institutional interplay or interaction* characterizes complex societies because as human societies develop, and social systems become integrated, the more complex institutional structures are established and their outcomes become more dependent on existing and evolving institutional contexts (Corbera, et al., 2009, p. 746). Also, in the context of forest governance, when the number and complexity of overlapping institutions related to forest resources increases, the effectiveness of a particular institution will most likely depend not only on its own features but also in how it interacts with other institutions (Young, 2002).

[7] In this context, referring to institutional analysis of REDD+.

Interplay concerns how a set of institutions affect one another by assuming that interaction between two or more institutions can influence their respective outcomes (Young, 2002; Corbera, et al., 2009; Stokke & Oberthür, 2011). Interactions can be characterized as *vertical* (across levels of governance) or *horizontal* (on the same level of governmental organization), and *symmetrical* (institutions affect each other in a similar way) or *unidirectional* (one institution affects the other in a larger extent) (Young, 2002). Also, it can be analyzed whether the interacting institutions under study are compatible with other existing ones, assuming that the effectiveness of one regime or institution is affected either positively (*synergistic*), negatively (*disruptive*) or with indeterminate influences (Gehring & Oberthür, 2008). It can also occur that the effects are neutral when there is no influence on the effectiveness or development of the target institution (Oberthür & Gehring, 2006).

Going further with categories for classification set to investigate the forces that determine institutional interaction and to identify general pathways clarifying how the institutions relate to each other (Gehring & Oberthür, 2008). These pathways derived from the major theoretical approaches of international relations[8] and have been distinguished through which institutional interaction can influence the effectiveness of the regimes involved: *Ideational* interaction related to the processes of learning suggesting that the substantive or operational rules of one institution serve as models for those of another regime. *Normative* interaction refers to situations where the substantive or operational norms of one institution either contradict or validate those of another institution. *Utilitarian* interaction relates to situations where decisions taken within one institution alter the costs and benefits of options available in another institution. Finally, *interaction management*[9] relates to the political management of inter-institutional influence, including the deliberate coordination of activities under separate institutions in order to avoid normative conflict or wasteful duplication of efforts (Gehring & Oberthür, 2008; Gehring & Oberthür, 2011).

With this previous categorization exercise, the causal mechanism approach has been proposed suggesting that institutional interaction is driven by one of four exclusive general causal mechanisms (cognitive interaction, interaction through commitment, behavioral interaction, impact-level interaction) covering three levels of effectiveness of governance institutions: output (collective knowledge or norms prescribing, proscribing, or permitting behavior), outcome (behavioral change of relevant actors, and impact (ultimate target of governance). The two first are located at the first level –output– and influence in the decision-making process of the target institution. The third mechanism is located at the outcome level, including changes of behavior of relevant actors. The fourth occurs at the impact level. These two last ones modify the effectiveness of the target institution, instead of modifying the decision making of the target institution (Gehring & Oberthür, 2008; Gehring & Oberthür, 2011). These will be briefly described:

- **Cognitive interaction**: determined by the power of knowledge and ideas, conceived as a particular type of inter-institutional learning. Depending if the information-processing capacity of the actors or if the relevant information are limited, actors may adapt to new information. For this interaction to occur, the source institution must generate new information which can be inserted in the decision-making process of the target institution. If cognitive interaction is unintentionally triggered by the source institution, and members of the target institution voluntarily use some aspects of the source institution results in a policy model. If cognitive interaction is intentional, the source institution takes the form of a request for assistance from the target institution; when

[8] Although these have been mostly determined as theoretical approaches of international regimes, they will be used here for national-scale policies such as Socio Bosque and REDD+ in Ecuador. See also Ochieng et al. (2012).
[9] This will be described in further detail in the following section.

there is successful request for assistance besides most likely resulting in synergistic or neutral effects, it might also generate positive feedback for the source institution by enhancing its own effectiveness (Gehring & Oberthür, 2008).

- **Interaction through commitment**: normative commitments may also provide the power behind the interaction based on the fact that international obligations may create some binding force on those they address. In this case, an institution must adopt a prescription or proscription that formally or informally commits its member states. This type of interaction argues that although it is only possible when there is overlap in both the membership and issue areas of the interacting institutions, there can be a significant influence between them is possible when they differ in some important dimensions. It is argued that there are three ideal types of interaction based on differences in the membership, objectives and governance instruments of the interacting institutions (Gehring & Oberthür, 2008).

  Interaction between nested institutions occurs when one institution is nested in another one, with similar objectives and governance instruments; it constitutes a mechanism for policy diffusion within the same policy field and generates synergies among the institutions involved. Jurisdictional delimitation occurs when two institutions have similar memberships, address similar issues but have different objectives; these cases pose the governance challenge of identifying measures to achieve the basic objectives of both institutions involve (otherwise disruption may when attempting to achieve the diverse objectives). Additional means of implementation happens when one of the institutions aiming at the same objectives and with identical membership provides additional means or instruments for implementing commitments in the other, hence producing synergistic effects; this interaction occurs in two stages: firstly one institution transfers an obligation to another institution, and secondly, the incorporation of this obligation mobilizes an additional governance instrument (Gehring & Oberthür, 2008).

- **Behavioral interaction**: based on the interconnectedness of behavior across the domains of institutions. It may occur if behavioral changes triggered by the source institution become relevant for the implementation of the target institution. Hence, these changes must affect implementation behavior under the target institution in ways that are relevant for the target institution's effectiveness; in addition, behavioral interaction occurs when the issue areas of the two regimes must be closely linked. The effects of this interaction will depend on whether the institutions involved differ predominantly in their memberships, objectives, or governance instruments. If the diverse groups of actors address certain issues in institutions with similar objectives, this type of interaction may create synergies, benefiting both institutions, and tend to create disruptions of the institutions when they have different objectives (Gehring & Oberthür, 2008).

- **Impact-level interaction**: results on the interdependence of the ultimate governance targets of the institutions involved. In contrast to behavioral interaction, inter-institutional influence does not depend on any action within the target institution or its domain but rests on the "functional linkage" of the ultimate governance targets of the institution involved at the impact level (Gehring & Oberthür, 2008). For example, if the climate regime successfully combats climate change, a regime or institution targeting biodiversity conservation is automatically supported since climate change is an important threat to biodiversity (Ochieng, et al., 2012).

Table 1. Categories for the classification of institutional interplay. Summarized from Gehring & Obertür (2008).

Categorization approach	Types of interplay
Level of interaction	Vertical vs. Horizontal
Quality of effects*	• Synergistic • Disruptive • Indeterminate • Neutral
Direction*	Symmetrical vs. Unidirectional

Causal mechanism approach*	• Cognitive
	  ○ policy model (unintentional)
	  ○ request for assistance (intentional)
	• Interaction through commitment
	  ○ Nested
	  ○ Jurisdictional delimitation
	  ○ Additional means
	• Behavioural
	• Impact-level

*This research will focus on these types of interaction.

Lastly, it has been proposed that institutional interaction can be analyzed through four different perspectives depending on decisions of the role of actors and institutions (Table 2). *Systemic* approaches address the causal relationship among institutions so that both dependent and independent variables are located at the macro level of institutions, rather than the *micro level of actors*. Interaction can also focus on different units of analysis: either on specific cases of inter-institutional influence, or by taking its unit of analysis the overall patterns emerging from complex interaction situations, which might involve several institutions and possibly many individual cases of interaction (Gehring & Oberthür, 2008). To facilitate a thorough analysis it's recommended that individual cases of interaction are analyzed separately (see Ochieng et al. 2012).

Table 2. Key research questions of different perspectives on institutional interaction (Gehring & Oberthür, 2008).

		Unit of analysis	
		Case of interaction	Complex interaction setting
Levels of analysis	Systemic	I. How, and with what effects, does an international institution influence another international institution?	II. How, and with what effects, does an international institution affect the institutional structure of the international system?
	Actor-centered	III. How can and do actors exploit opportunities arising from institutional interaction or avoid undesired interaction effects? How does institutional interaction frame policy choices of actors?	IV. How, and with what effects, do actors change the institutional structure of the international system through institutional interaction?

An important aspect when studying of interactions refers to the different approaches when looking at institutions or regimes. For instance, it has been assessed (Visseren-Hamakers, et al., 2011) how some authors consider institutions as all rules in a given issue-area, whilst others consider a regime or institution as a single international agreement (Oberthür & Gehring, 2006). These different approaches may result useful for specific types of analysis since they can steer the research in a particular direction; for instance, a narrower regime approach might result interest for analyzing interactions among individual agreements, but less useful in an integral perspective, whilst a more broad perspective might be less useful for interactions of individual regimes; also, these perspectives also struggle defining the limits of the regimes and how these overlap (Visseren-Hamakers, et al., 2011).

Interaction management

The term *interaction management* has been defined as the "conscious efforts by any relevant actor or group of actors, in whatever form or forum, to address and improve institutional interaction and its effects" (Stokke & Oberthür, 2011, p. 6). This management is inherent in the notion of institutional interaction, which originates from political decisions within the source institution and can be influenced by political decisions within a target institution (Oberthür, 2009). Nevertheless, these aspects have mostly been dealt theoretically, with few empirical analyses in practice (Visseren-Hamakers, et al., 2011). An important differentiation among institutional interplay and interaction management is that the first can occur without knowledge of the actors involved, whereas the in the second there is an awareness and reflection on the interaction (Stokke & Oberthür, 2011). Hence, interplay management can refer to the governance of institutional interaction (Oberthür, 2009). Also, interplay management distinguishes from political linkages in three ways: i) it focuses attention on political measures that target inter-institutional relations and effects; ii) it may occur in anticipation of inter-institutional effects as an integral part of the original interaction and, iii) it does not carry a predilection for inter-institutional aggregation and coordination (Oberthür, 2009).

For assessing International Environmental Governance (IEG) through interaction management, a conceptual framework[10] was developed distinguishing four levels and two principal modes of interplay management. Regarding the levels, the first and highest level has been defined as **overarching institutional framework**, which requires decision-making beyond the interacting institutions; these can comprise either those institutions overarching the frequently interacting sectorial governance systems, or more general/comprehensive and cut across several policy fields. A second level includes **joint interplay management** of the institutions, involving active targeted efforts to coordinate the activities of the interacting institutions and even potentially creating joint rules governing the interaction; these coordinating actions require communication processes between the interacting institutions and involves the creation of horizontal structures for coordination between the sectorial regimes. A third level, **unilateral management by individual institutions** requires coordination at a lower level, involving independent collective action and decision-making within one or more of the interacting institutions without coordination between them; unilateral management requires hence cooperation among regime members within existing institutional boundaries. The fourth and lowest level of coordination includes **autonomous management** in which the diverse actors (government and other actors such as civil society) take decisions on the rules and norms individually (Oberthür, 2009).

The two modes of interplay management distinguished in the analysis of EIG comprise **regulatory interplay management**, which focuses on prescribing, proscribing or permitting certain behavior, ascribing regulatory authority, and depending on the authority, implementing and enforcing measures against opposition. This type of management can set standards of behavior (e.g. by prescribing which rule to follow in the case of a rule of conflict), or it can be a procedural character (e.g. by determining the procedure that should be followed in order to resolve a rule conflict). The second general mode –**enabling interplay management**– aims at learning and capacity building by using cognitive elements (communication, information and knowledge) and the allocation of resources in order to persuade relevant actors, overcome barriers related to knowledge and information processing, and enhance actor's capacities to implement the program under study. This mode reflects more the cognitivist/constructivist insight that knowledge, argumentation and ideas can significantly influence politics. These two modes of interplay management are not

[10] Which may be used to analyze forest governance initiatives at a national level such as Socio Bosque and REDD+.

mutually exclusive, but allow to systematically distinguishing principal rationales of interplay management (Oberthür, 2009).

There are various standards which can be applied in order to analyze management, including efficiency and effectiveness, mitigating conflict and enhancing synergy, justice, and equity (Oberthür, 2009). An important factor of interaction management is that this concept implies managing something, including a certain standard of evaluation. Hence, interaction management may generally aim to enhance synergy and mitigate disruption among the institutions involved, without giving priority to environmental objectives (Stokke & Oberthür, 2011, p. 8). Another important factor refers to the instruments or means actors used to avoid or deal with disruptive interplay or to maximize synergy. Within the "new modes" of environmental governance mentioned earlier, including market-based approaches becoming more common among policy instruments at national levels, are also a starting point for thinking about means of interplay management. As it has been seen in analyses of global environmental regimes, little is actually known concerning how actors manage interactions in practice, although the call for "institutional synergies" is becoming increasingly mainstreamed into global negotiations, and institutional interactions are actively managed (Visseren-Hamakers & Verkooijen, 2012).

3. Conceptual Framework

As seen in other analyses of PES (Corbera, et al., 2009), it has been highlighted the importance of understanding why and how these IBPs (such as Socio Bosque) emerge as new institutions for environmental governance, how they are integrated with other institutions (such as climate change) and how effective these are in practice regarding its goals of protecting forests and its services. Hence, Socio Bosque and the PNREDD+ can be defined as evolving institutions.

Using PES theory (Wunder, 2005; Wunder, 2008) Socio Bosque was assessed to compare its differences and similarities regarding various aspects including its typology, terminology, definition and other key features (first research question). Regarding the typology, there have been various ways of classifying these including: area-based vs. product-based; *public-sector* vs. *private-based* and *use-restricting* vs. *asset-building* schemes (Wunder, 2005). In addition, there are four types of PES that stand out including carbon sequestration, biodiversity protection, watershed protection and protection of landscape beauty. Regarding its terminology, Socio Bosque is mainly compared to the controversial term "payments". Regarding its definition, there are five criteria that define PES according to Wunder (2005): 1.*voluntary* transaction where 2.*well-defined* ES (environmental service) (or land use likely to secure that service) 3. is being 'bought' by a (minimum one) ES *buyer* 4. from a (minimum one) ES *provider* 5. if and only if the ES provider secures ES provision (*conditionality*). Finally, there are some other aspects which are compared including: measurement and monitoring; level of threat and opportunity costs; differentiation of incentives; land tenure issues; targeting social benefits and; the legal, political and social contexts.

It is proposed for this research that an institutional analysis may result appropriate to assess Socio Bosque focusing on interplay and interaction management to understand this policy tool in the context of forest governance and REDD+. Such an institutional approach can allow assessing the similarities and differences between Socio Bosque and other incentive-based schemes, understand how the institutional linkages are formed, how it interacts as an existing institution with REDD+, and the actions to manage these interactions. This type of examination can overall contribute to improve the interactions between schemes and address the challenges encountered so far.

In the case of institutional analysis of PES, interplay has been used to assess the impacts on these by other schemes, and by assessing which type of synergies or conflicts exist across the diverse institutional arrangements. PES can serve as platform for the identification and discussion of sources of interplay and provides specific insights for the improvement of these types of IBPs (such as Socio Bosque) and provide policy recommendations for REDD+ (Corbera, et al., 2009).

Hence, an **institutional interaction** allowed assessing which interactions exist among both institutions: Socio Bosque and REDD+ (second research question). The interactions found were assessed according to the classifications described earlier. According to this description, and considering the aim of this research, I focused on the institutional interaction at the systemic level and as a case interaction (Gehring & Oberthür, 2008) focusing on *how, and with what effects, does an institution (Socio Bosque) influence another institution (PNREDD+)?* and vice versa (PNREDD+ to Socio Bosque). As it has been seen with other analyses in the environmental realm (Oberthür, 2009) (e.g. with International Environmental Governance), interplay management can result pivotal both in the development of Socio Bosque and establishment of REDD+ schemes in Ecuador.

Interaction management was assessed according to the diverse levels and modes to answer the third research question, mostly concentrating on the actions that have been considered at the policy-making level for enhancing the synergies or addressing the disruptions.

Figure 1 describes graphically the conceptual framework to address the second and third research question:

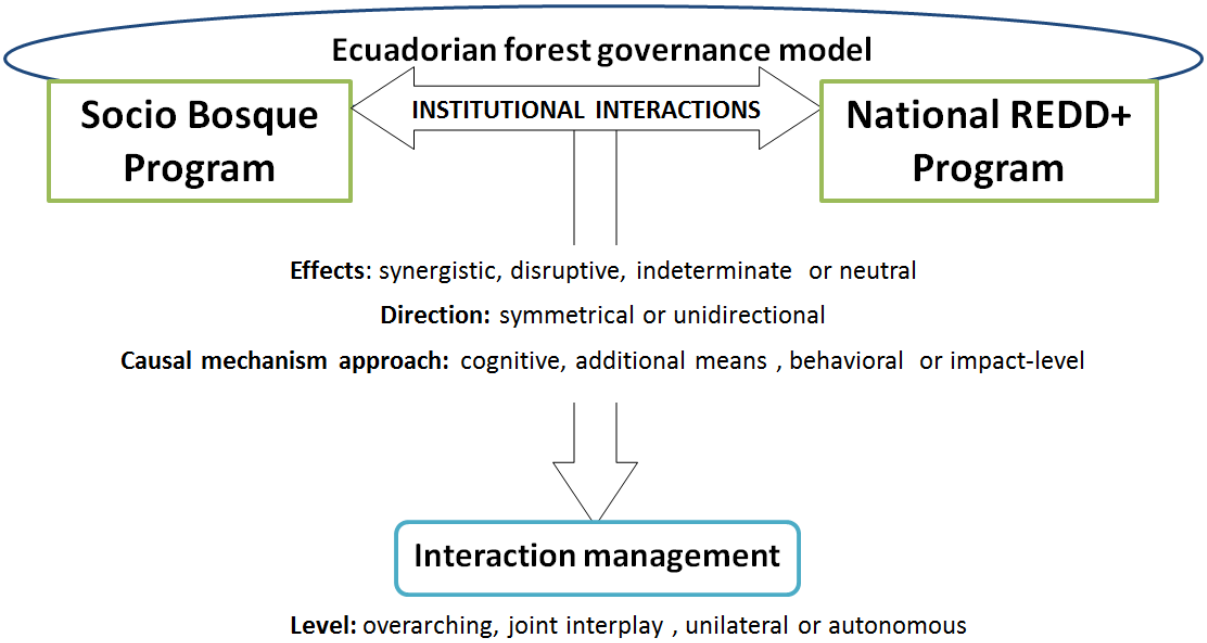

Figure 1. Conceptual framework for the institutional interaction analysis of Socio Bosque Program and the National REDD+ Program.

4. Methods

Qualitative research methods were employed in both data collection and analysis.

Data collection

Data collection was carried out with several tools within research methodology (Kumar, 2011). The data was collected through desk research and Skype interviews. Both secondary and primary sources were used. For the first, I carried out a review of available literature regarding the functioning, updated results and assessments of the Forest Governance Model, Socio Bosque and national REDD+ processes. Besides the published articles and reports, meeting and workshop minutes and latest presentations, were also analyzed. Complementary, I undertook a broader review of the updated literature regarding REDD+ and PES schemes in order to compare these schemes with Socio Bosque. Lastly, literature regarding institutional analyses with special focus on interplay and interaction management was carried out to enhance the theoretical framework.

Since the preliminary literature review for this proposal showed an information gap of published articles regarding Socio Bosque, and to conceptualize in more detail the forest governance model, Socio Bosque and PNREDD+ , and to collate Socio Bosque with PES and implement the institutional approaches of interplay and interplay management, I also obtained information from primary sources. This was obtained through 16 semi-structured Skype interviews and/or specific-question emails with the main actors involved in the implementation processes of the two institutions. These actors included government agents from the Ministry of Environment from both Natural Heritage and Climate Change Undersecretaries, one from international cooperation, and representatives of several civil society organizations (CSOs) such as NGO (e.g. CI, GIZ, CEPLAES and CONAIE) and private sector (PROFAFOR) (see Appendix 1 for the list of interviewees).

I also tried to interview other relevant actors within CSOs (such as the NGOs: Acción Ecológica and Pachamama, the indigenous organization COICA) since they have been either involved in assessing Socio Bosque and/or the PNREDD+ or involved in some of the processes related to these initiatives; however, I couldn't carry out these interviews because of lack of time from the potential interviewees. In addition, I also contacted S. Oberthür and T. Gehring as the scholars focusing on institutional interactions, to attempt to have a brief overview of the findings according to the categories identified in their prior work; however, I also couldn't arrange these interviews.[11]

The interviews were carried out between December 2012 and February 2013, and they aimed to compliment and/or reaffirm or adjust the information found in documents and articles. Although there was list of basis questions, these were adapted according to the interviewee and her/his knowledge and relation on the topic. The questions related to their main knowledge regarding the rules of Socio Bosque PNREDD+, the interactions they can identify (and if applicable the actions to address these interactions), and their position regarding both institutions (see Appendix 2 for the example of interview questions). Determining the list of actors and number of interviews was carried out through an initial mapping of actors and assessment of time requirements and availability of the interviewees. I also employed a snowballing process to identify the later interviewees, commonly used in stakeholder analysis research. I carried out an initial identification of knowledgeable individuals through policy and program documents and my own knowledge;

[11] However Mr. Oberthür replied mentioning that he could probably refer to my thesis in the future.

then I asked these individuals to identify other individuals and organizations with a stake in the institutions under analysis.

It is relevant to mention that I used to work in the Socio Bosque for two years (10/2009 to 09/2011) as the specialist in community management.[12] In this sense, I have broad knowledge and perspectives regarding the program –including the achievements and pitfalls– shaping also the aims of the research. However, I have tried to obtain a more holistic perspective from a researcher's point of view, and from the interviewees and revised documents. I include later in the discussion my appreciation on several matters that may result relevant as a former insider of the program and as a current researcher.

Data analysis

This is qualitative research aimed to obtain deeper insights of the topics under subject. I employed a case study analysis of Socio Bosque examining the overall scheme in the context of forest governance in which it develops, collating and assessing the main similarities and differences with PES schemes, identifying and assessing the interactions with the PNREDD+, and the actions addressing these interactions. In addition, a case study is a useful tool as it is a multi-perspective analysis from the diverse groups of actors (e.g. governments, NGOs, participants) and the interaction between them (Tellis, 1997). The most relevant documents (mostly policy documents) were revised in detail. The interviews were transcribed (in Spanish); revising each transcript, I identified the segments that add or reconfirm important information to answer the research questions according to a coding system (based on coloured highlighting and specific comments). I translated many of these segments to use them as illustrations of certain facts or views throughout the text.

[12] My tasks included the follow up and evaluation of community investment plans; coordinating and facilitating capacity-building workshops with the participants; follow up of the inter-institutional relations and strategic alliances and I was the focal point in the REDD+ processes.

5. Ecuador's efforts to conserve native forests and reduce deforestation

This is the first chapter presenting part of the results. It comprises a description of Socio Bosque and PNREDD+ as tools within the Forest Governance Model. It starts by giving some background information on Ecuador's forest resources and follows the institutional and political context in which the governance model operates. Later it goes into more detail into the Socio Bosque Program and the PNREDD+, ending the chapter with a differentiation of both initiatives.

5.1. Forest governance model in Ecuador

Ecuador is one of the countries with highest biodiversity per area in the world, considered as one of 17 megadiverse countries (Mittermeier & Goettsch, 2004). According to the preliminary results of the historic deforestation map, continental Ecuador had until 2008 with approximately 14.1 million hectares of natural vegetation, and from these 11.7 million ha correspond to different types of native forests (47% of the total area). However, these remaining forests are under severe threat with approximately 77.6 thousand hectares which have been lost yearly in the decade from 2001 to 2008, corresponding to a deforestation rate of 0.66% positioning the country within the top three South American countries with the highest annual deforestation rates (FAO, 2010; MAE, 2012b). Deforestation predominantly occurs in the northern province of Esmeraldas, the rest of the Coast, and the Amazon region (MAE, 2012c).

With the establishment of the Constitution of the Republic of Ecuador in 2008, important aspects regarding nature and the environment were taking into account. For the first time nature's rights are recognized, and its conservation, sustainable management and restoration are inserted in the National Development plan for Good Living (or "*Plan Nacional del Buen Vivir*" or PNBV). As part of this plan (2009-2013), some goals include a reduction of 30% of the deforestation rate, the increment of the protected areas by 5%, and the improvement of the living conditions of the Ecuadorian population, with emphasis in the rural populations. To accomplish these goals, the Ministry of Environment is currently implementing a series of initiatives focused on reducing deforestation in the country as part of good governance of the forest resources, by simultaneously contributing to mitigate climate change by reducing the GHG emissions related to these resources (MAE, 2012a). The Political Constitution (2008), the PNBV (2009-2013), the Strategy for Sustainable Forest Development (2000) and the National Climate Change Strategy are the guidelines which have led the establishment of the Forest Governance Model in the country (MAE, 2011b). Forest governance is defined within this model as the *modus operandi* by which the population, key actors and institutions (formal and informal) manage the forest resources improving the living conditions from the actors that depend on this sector (MAE, 2011b).

Figure 2 shows the main institutional structure of the departments (in bold) within the Ministry of Environment who are currently part of the Forest Governance Model in the country. The National Forest Directorate and the Socio Bosque Program operate within the Undersecretary of Natural Heritage (SPN), whilst the PNREDD+ under the Climate Change Mitigation Directorate within the Undersecretary of Climate Change.

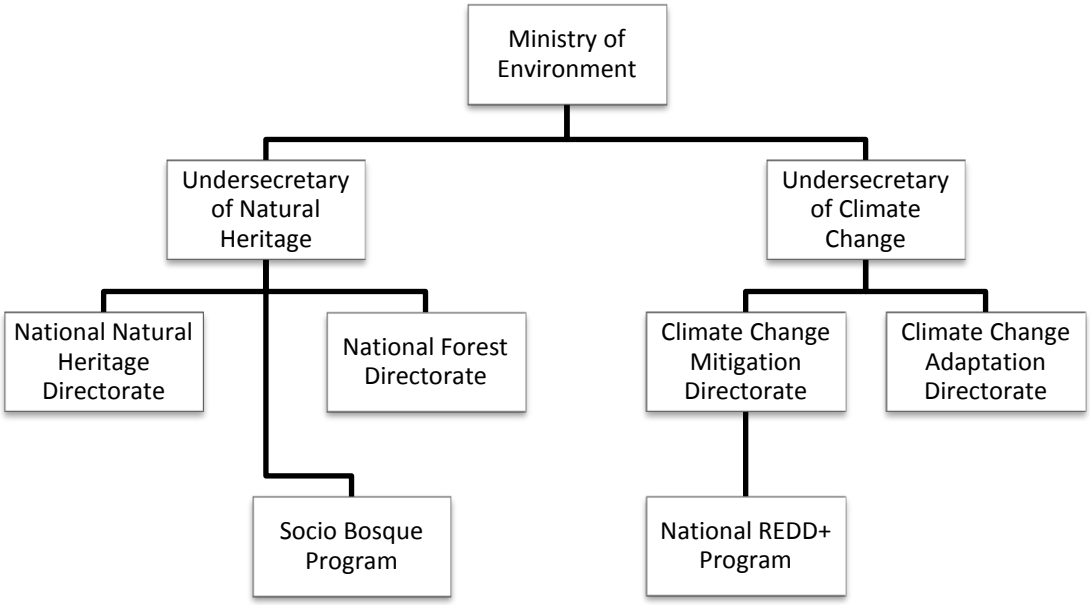

Figure 2. Main institutional structure of the Ministry of Environment's departments involved in the Forest Governance Model (adapted from MAE 2013).

The Forest Governance Model focuses on five areas to contribute to the sustainable use of forest resources in the country: 1) Improving the efficiency of the forest administrative and control systems to enhance the legal trade of forest products; 2) Strengthening the incentive systems for sustainable forest management and forest conservation; 3) Generate required information which can facilitate efficient decision-making; 4) Promote processes of reforestation in degraded and protection areas, and; 5) Implement processes of research, training and dissemination. All these elements within a legal framework harmonized with other public policies and laws which allow a new forest institutionalization (referring to the capacities and tools within the public sector towards an effective sustainable forest management) in the country assuring the provision of goods and ES, conservation of biodiversity, and an equitable distribution of economic incentives through forest activities among small producers and actors related to these activities (Figure 3) (MAE, 2011b).

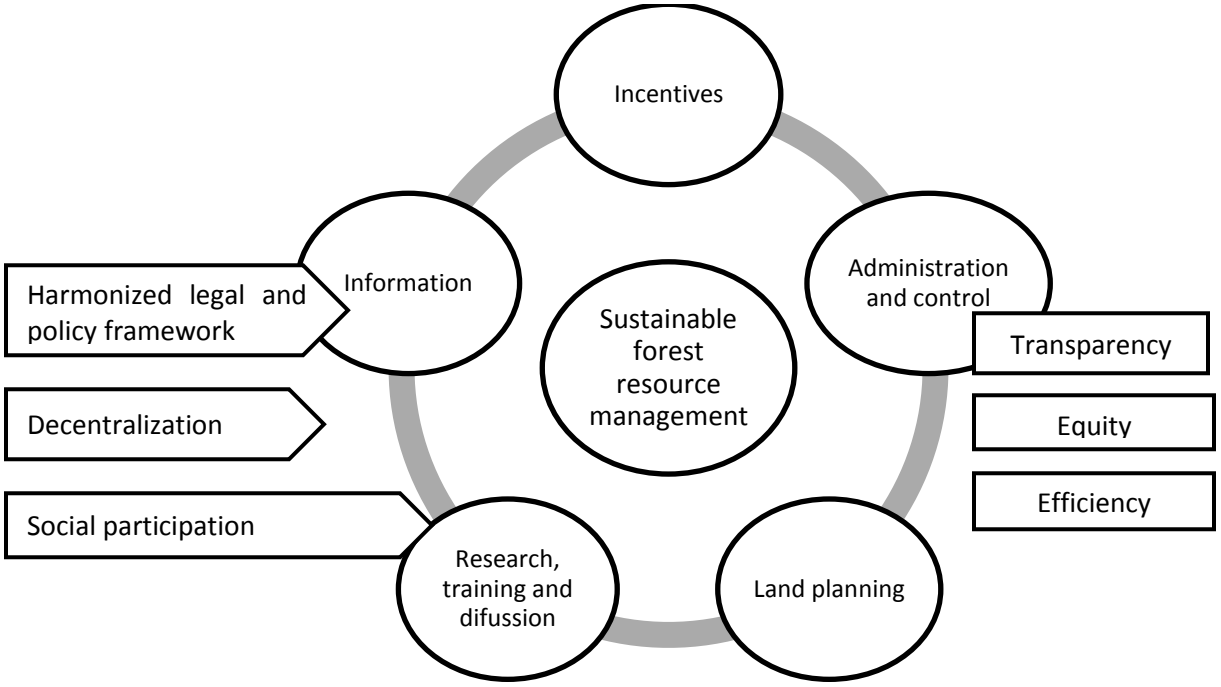

Figure 3. Ecuadorian Forest Governance Model (MAE, 2011b).

One of these elements involves incentives for conservation, sustainable forest management, ecological restoration, forest plantations, among others, and they can be classified as monetary and non-monetary. Direct monetary incentives for conservation are implemented through the Socio Bosque Program (MAE, 2011b) considered within this model as the tool which will efficiently contribute to the achievement of the national goals related to long-term preservation of the natural heritage, biodiversity and ecosystem services conservation whilst recognize the labor, will and commitment of the families and communities that own these valuable forested lands (MAE, 2012a). It's relevant to mention that at the moment the strongest of these components involves the system of incentives, and Socio Bosque as one of the most important programs; this because of its more than four years of implementation and the recognition that has gained: "In this moment the component of incentives is the strongest within the Forest Governance Model, but also with the other incentives within the policy, so not only the conservation incentives but also the other ones including the non-monetary ones. We also conceive participation as a crucial aspect, which is also closely linked to the incentive systems" (W. Tene, pers. comm., 11 Dec 2012).

5.2. The Socio Bosque Program

History

The idea of Socio Bosque started with previous similar initiatives implemented at a local level in the country. On the one hand, it based on the project "Great Chachi Reserve" implemented in 2005 by CI[13] along with other actors such as the GIZ (MAE, 2011a). This consisted of an agreement conservation program with Chachi indigenous communities in North-western Ecuador. The voluntary agreements specified a direct annual payment for an agreed community conservation

[13] As the Technical Director of CI, Free de Koning (pers. comm., 18 Dec 2012) explained *"in CI we work in a type of similar projects to Socio Bosque; we call them "conservation agreements" which are a certain type of PES but not exactly the same, where under agreements we convene incentives for certain conservation activities and the involved receive economic incentives"* (F. de Koning, pers. comm., 18 Dec 2012).

area conditional on compliance (De Koning, et al., 2011). The communities received economic incentives per hectare per year plus technical assistance (Mora, et al., 2010). The Ministry of Environment was interested in implementing a similar scheme at a national level. Although it had elements of conservation agreements schemes it was also adjusted to the national scale. Also, there was a local experience in the Municipality of Pimampiro, in Imbabura province, in which a fund for the protection and conservation of forests and páramos[14] was established to regulate water resources, in which agreements were signed between the authorities and the owners of the water resources to guaranty the conservation of these areas (MAE, 2011a).

So in some way it was based on experiences and examples of local schemes for conservation payments in other countries (e.g. PES schemes in Mexico and Costa Rica which have similar governmental programs). In Ecuador this process was adapted to the local level and with specific requirements to the conditions of the country.[15] Once the program was launched, there was a pilot phase implemented between September and December 2008, in the three main provinces of Esmeraldas, Morona Santiago and Sucumbíos, that supported to refine the design of the mechanism to be implemented at a national level in 2009 (PwC, 2012). "From the outset Socio Bosque's design was guided by a number of principles: it should be fair and equitable, not prohibitive for participants, simple and transparent, and legally enforceable; it was clear that there was no perfect design..." (Fehse, 2012, p. 3).

Institutional framework and description of the program

Socio Bosque is a national incentive-based forest conservation program implemented by the Ecuadorian government and its Ministry of Environment (MAE) since September 2008. It is part of the components of the new Forest Governance Model with a vision of economic and social inclusion within the new Constitution (2008) and the PNBV (2009-0213) relating to the conservation of biodiversity, native ecosystem protection and its ecological and cultural value and reduction of deforestation (MAE, 2012a). This program operates within the MAE's Undersecretary of Natural Heritage (Figure 1); it counts currently with an central office in Quito (Ecuador's capital city), and a total of 41 staff members: 12 office-based, and 29 field technicians distributed in the different provinces with different functions such as area responsible (15), monitoring (7), and investment plans (7) (C. Rosero, pers. comm., 14 Dec 2012). Besides this specific team within the program, it also supports itself through the Ministry's offices throughout the country ("province directions") and through the support of NGOs and other organizations through memorandums of understanding (MAE, 2011a). Alliances with NGOs have been identified important in building community capacity and enhancing participation, and in many cases they have acted as a communication bridge between the local landowners and the Ministry of Environment, and support the communities to comply with the requirements (PwC, 2012).

It has three main objectives: 1) Protect forests, páramos and other native ecosystems and their ecological, economic and cultural values (around 4 million hectares); 2) Reduce deforestation rates and the associated GHG emissions from the conservation of these ecosystems; and 3) Improve the living conditions of peasants, indigenous communities and rest of the population of rural areas (around 1 million of beneficiaries) (MAE, 2012a).

[14] Native Andean high altitude grasslands, crucial for regulation of freshwater flows (MAE, 2012a).

[15] *"It's been an initiative that has been gaining strength; it started as something small, although as idea it was always aggressive, but in the institutional part it didn't start with all the needed resources. So it has been growing, strengthening on the way, each year obtaining more importance and the material and financial resources that it needs. At the beginning it was a good idea but there weren't so many expectations that it would grow so much, so now that it has been growing and complying with its goals it has also been gaining political will and recognition within the Ministry of Environment and the rest of the government* (M. Lascano, pers. comm., 17 Dec 2012).

Socio Bosque provides direct monetary incentives per hectare per year to individual landowners and indigenous and local communities who are voluntarily willing to protect the ecosystems within their territories through 20 year-agreements that are regularly monitored. Since its inception, three chapters have been established: i) Conservation of native forests[16]; ii) Conservation of páramos (since 2009) and iii) active and passive restoration[17] (since 2012 and with the first agreements signed in 2013). Individual landowners, legally constituted communities, indigenous organizations and nationalities, associations and cooperatives, with property rights (land title) of those territories can participate in the program. Also, territories within the National System of Protected Areas (SNAP) also counting with land title before the establishment of the protected area (MAE, 2012a). The "operation manuals", which are enforced by Ministerial Agreements by the highest authority of the Ministry, are the guidelines for its functioning (MAE, 2012a).

Operative framework

The program has many processes which are running simultaneously; however, these diverse steps can be grouped in two main processes (Fig. 4):

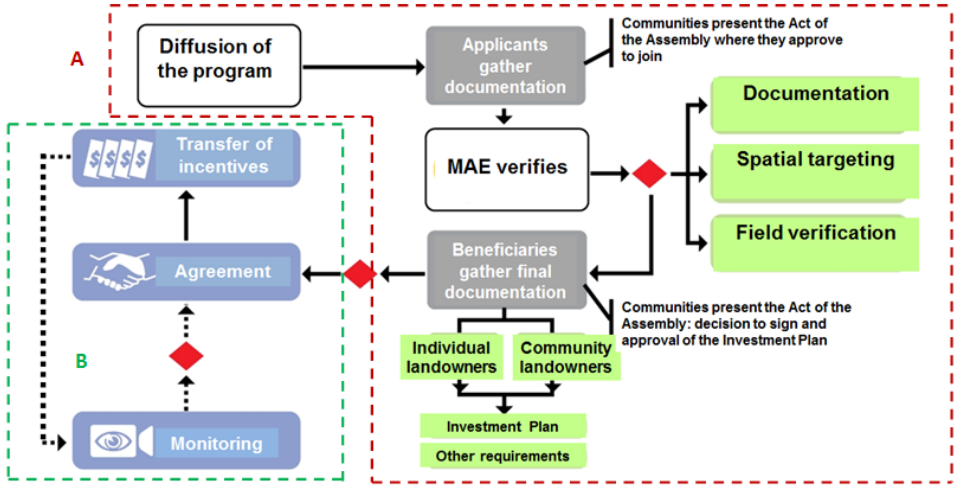

Figure 4.Functioning scheme of the Socio Bosque Program adapted from MAE (2011a).

A) Entering the program

Diffusion of the program is carried out throughout the country at local and national levels, focusing mostly on high-priority areas, based mostly on the ES these areas provide and the threat of this forest (explained later in this paragraph in the spatial targeting criteria). In the case of community or collective ownership, the diffusion of the program is done in the assemblies.[18] The applications are revised and assessed to make sure they comply with the legal requirements[19] (property rights being the most important). A spatial targeting for the forest ecosystems is also taken into account which was developed through a ranking system, using three main criteria: 1) deforestation threat (9 points); 2) importance of the three ecosystem services: carbon storage, water cycle regulation, and habitat for biodiversity (10 points); 3) poverty levels (3 points). A similar process was carried for spatial targeting for páramos. The output of this process of

[16] Native forests area considered as plant ecosystems composed by native species, and as a result of a natural process of ecological succession (MAE, 2012a).
[17] This research will focus on the conservation chapters since the restoration chapter is new.
[18] Participatory spaces where communitarian decision-making processes are carried out.
[19] For full requirements to participate in the Socio Bosque program revise the following link: http://sociobosque.ambiente.gob.ec/?q=node/196

overlapping layers result on areas with higher and lower priority to enter the program. After this first filter, staff members verify if the area is under good conditions and the landowners is requested to fulfill further requirements. The agreements are signed twice a year and the payments are directly transferred to the landowner's bank account (MAE, 2012a).

B) Agreement follow-up and monitoring of the agreements

In order to receive the incentive, the participants need to comply with the delivery of a social investment plan and comply with conservation obligations (MAE, 2012a):

- Investment plan: in the case of individual participants, they need to fill in an interview-style investment plan. In the case of the communities they must present an investment plan generated in a participatory process among the members of the communities or organizations (MAE, 2012a) aiming at ensuring that the funds are used for locally appropriate economic and poverty-alleviation activities (PwC, 2012). In addition, there is a follow-up process of these community investment plans. Hence, accounting reports are requested prior to the payment of the incentives, complemented with monitoring activities on the sites through five monitors. In addition, the program develops several training workshops to strengthen the capacities in developing and reporting the plans.
- Monitoring the vegetation cover by a combination of remote sensing and in-situ monitoring through field staff. The monitoring and its frequency is done depending on the level of threat of the area identified an analysis of the dynamics of land use change and identification of threats.

Important features

Incentives: The incentives were initially the same for all participants, but then it became relevant to differentiate these according to the services provided by the diverse ecosystems and the per capita and per hectare incentive compared to those individual and community landowners. Currently, these fluctuate depending on the type of ecosystem (forests or páramos) and the type of landowner (individual or communitarian), ranging between US$60 per hectare per year for individual landowners and US$18.38 for communities (Table 3). The Ministry of Finance pays directly to the individual or community bank accounts (MAE, 2012a).

Table 3.Structure of incentives of the Socio Bosque (MAE, 2012a)

Individual landowners with more than 2 hectares			Individual landowners with 20 hectares or less		
Rank of hectares		Incentive per hectare	Rank of hectares		Incentive per hectare
1	50	$ 30,00	1	20	$ 60,00
51	100	$ 20,00			
101	500	$ 10,00			
501	5000	$ 5,00			
5001	10000	$ 2,00			
More than 10001		$ 0,50			

Community landowners in forest ecosystems			Community landowners in paramo ecosystems		
Rank of hectares		Incentive per hectare	Rank of hectares		Incentive per hectare
1	50	$ 35,00	1	50	$ 60,00
51	100	$ 22,00	51	100	$ 40,00
101	500	$ 13,00	101	900	$ 20,00
501	5000	$ 6,00	901	3000	$ 10,00
5001	10000	$ 3,00		10000	$ 4,00
More than 10001		$ 0,70	More than 10001		$ 1,00

Financial sustainability

This is a crucial aspect to assure the program's future implementation. The program has idealized the future sources (MAE, 2012a):

- State funds: until now, the Government has assigned financial resources each year. It is projected these can contribute around 45% to the total budget.
- Compensations and regulations[20]: aims to include Socio Bosque in the values generated through compensated by public or private projects which affect the forest/ecosystem cover (potentially covering 30% of the budget).
- International Cooperation: Through donations of organizations and countries. Currently there is non-refundable financial support from the German government through its Cooperation Bank KFW with 10 million Euros (around 12 million USD) for the strengthening of the Socio Bosque Program and the PNREDD+ since 2011 (aiming at contributing 10% of the budget).
- Certificates Socio Bosque: Aims to engage the private sector in conservation and local development activities. Through a cooperation agreement, the company commits to support economically to the Socio Bosque Program (aiming at contributing around 5% to the budget).
- Potential REDD+ mechanisms: through access to carbon market system in which Socio Bosque is an essential element through the National REDD+ Program (potentially contributing 10% of the budget).

Other important aspects

Some aspects that are relevant to mention regarding an effective implementation and participation processes of Socio Bosque include:

- **Prior consultation**: the program carries out socialization workshops previously to signing the agreements. There are efforts especially to carry out these workshops as many times as necessary regarding communitarian potential participants, and promote an effective and wide participation[21].
- **Land title**: is the main requirement to enter into the program.
- **Obligations**: participation in the program (entering) is voluntary, however, once the agreement is signed, the participants are committed to the conservation and protection of the forests and páramos in their lands, and the rest of the responsibilities in the Operating manual issued by Ministerial Agreement.
- **Participatory Investment Plan**: seeks that the incentives given by the program are used in a legal, transparent, and benefiting all the members of the community.
- **Agreement duration**: the duration of the agreements is for a 20-year period, as the objective of the program is long-term goal is conservation. However, there are alternatives to exit the program, but in some cases it can involve the devolution of the money.

[20] *"We're starting to work on some other lines of financial sustainability, and one of the strategies which was already approved included compensations by productive activities which have to remove forest cover, so in this case oil and mining companies, and any other activity that needs an environmental licensing which have to remove forest/ecosystem cover; so there must be an assessment of the economic value of the native ecosystem, and they have to compensate this value to the Ministry…"*(M. Lascano, pers. comm., 17 Dec 2012).

[21] However, in practice and from my own knowledge from working in Socio Bosque, logistics and resources (technicians) may impede this process to carry out in an extensive way.

Results

Since its implementation the program has had an exponential growth regarding the agreements, areas under conservation, and beneficiaries (Table 4). Until October 2012 it has signed 2002 agreements (from which 93% are with individual landowners and 7% to communities and organizations) with over one million hectares of native forests and other native ecosystems under conservation, benefiting around 31 thousand households and investing annually USD 7.7 million in incentives (See table 4) (Proyecto Socio Bosque, 2012). Most of the area under conservation corresponds to humid tropical forest (86%), followed by associations of forest and páramo (4.3%), dry forest (3.6%), montane forest (3.2%), páramo (2.7%), and other vegetation types (e.g. "chaparro" and "matorral", with 0.2%). The areas under conservation are spread across the country, and the range of size varies greatly (See Appendix 3 showing the areas under conservation under agreements with Socio Bosque, both with communitarian and individual landownership, and how they either overlap/complement with the Natural Heritage Areas).

Table 4. Accumulated results of the Socio Bosque program since its inception until the end of 2012 (Proyecto Socio Bosque, 2012)

Year	2008	2009	2010	2011	2012
Number of agreements	59	418	971	1,548	2,002
Hectares under conservation	170,364	412,680	638,555	927,344	1,112,615
Beneficiaries	12,836	37,615	67,783	90,646	126,915
Accumulated investment in incentives (USD)	918,813	3,590,620	7,381,477	14,407,711	14,903,255

From previous analysis back in 2011[22] individual landowners invest in average 42% of the incentives to general household consumption, followed by conservation activities in order to achieve their conservation commitment (e.g. zoning, path and limit maintenance, signaling, payment to forest guard, etc.); then smaller percentages are for savings, debt payment and buying infrastructure or other amenities. Communities and other collective organizations invest in average in productive economic development around 23% (e.g. for agriculture, tourism, community banks, among others), followed by conservation activities and land securing activities with 22% (e.g. land delimitation, signaling, community forest guards, restoration); then, they invest in similar percentages (18%) in organizational development and infrastructure. In smaller percentages they invest in health (10%), education (6%) and transportation (3%) (Podvin, 2011).

5.3. The National REDD+ Program

Institutional framework and description of the program

The Second National Communication under the UNFCCC reported 410,010.75 Ktons of CO2eq as GHG emissions up to 2006. The agricultural sector is the largest contributor of total emissions, followed by land use, land use change and forestry (LULUCF) (hence, one of the main sources of GHG emissions at the national level is deforestation), and in less percentage the energy, waste and industrial sectors (MAE, 2011d). Climate change mitigation and adaptation were declared as State policy in July 2009, establishing in October 2009 the Undersecretary of Climate Change (SCC) within the Ministry of Environment (Figure 1). These aspects (mitigation and adaptation) are considered as national priorities for Ecuador are embodied both in the country's Constitution and the PNBV. Three strategies are part of the National Environmental Policy: i) mitigate the impacts of

[22] There is no updated analysis regarding the investment areas until 2013.

climate change and other natural and anthropogenic events on the population and ecosystems; ii) implement integrated risk management to cope with extreme events associated with climate change and iii) reduce emissions of GHG in the productive and social sectors (MAE, 2012c).

Discussions about REDD+ mechanisms in Ecuador started in 2009, as a means to contribute mitigating climate change and strengthening forest governance, whilst supporting local development especially for forest-dependent people. It represents an opportunity to leverage financial resources to reduce GHG emissions associated both with deforestation and forest degradation, and value standing forests. In this sense, the country seeks to implement a high quality REDD+ mechanism including actions to mitigate climate change and considering social and environmental co-benefits, for forest conservation and reducing deforestation (MAE, 2012c).

The SCC acts as the focal point for REDD+ activities in Ecuador and develops and implements policy for REDD+ readiness (Carrión & Chíu, 2011). In October 2010 the Inter-institutional Committee on Climate Change (CICC) was also established as a coordinating and decision-making entity among the various Sate Ministries to streamline climate change policies (MAE, 2012c). This performs as a high-level institution to coordinate and facilitate the integrated implementation of national policies related to climate change, the National Strategy for Climate Change and the country's responsibilities under the UNFCCC, in which there is a specific working group on REDD+ (The REDD+ Desk, 2012).

The National REDD+ Program (PNREDD+) was created on 2010 within the National Climate Change Mitigation Plan, which is also part of the National Climate Change Strategy 2012-2025. It aims to "reduce deforestation and forest degradation and associated GHG emissions, thereby contributing to the mitigation of climate change, to an integrated management of ecosystems and sustainable development policies in the country, respecting the rights of communities, peoples and nationalities who depend on the forests" (MAE, 2012c, p. 18).

Based on this general goal, there are three objectives:

a) Have a system for forest reporting and monitoring, and associated GHG emissions, to effectively monitor the implementation of REDD+ policies.
b) Implement policies and cost-effective measures to reduce deforestation and degradation of forest ecosystems in coordination with other strategic sectors.
c) Ensure that the implementation of the REDD+ mechanism contributes to sustainable development through compliance with safeguards, ensuring multiple benefits, involvement of stakeholders and related legal regulations (MAE, 2012c, p. 19). .

The PNREDD+ derives from the Forest Governance model (MAE, 2012c), comprising four main action areas for the implementation of REDD+ in the country and several cross-cutting components (Fig. 5):[23]

[23] These components have been updated recently (end of 2012) and they are not exactly as published in the document: REDD+ Readiness in Ecuador, 2012. In this latest published report, the components include 1) System of forest information for Measurement, Reporting and Verification (MRV); 2) System of incentives to reduce forest degradation and deforestation; 3) Forest control and; 4) Regularization of land tenure. As transversal components: institutional, financial and legal framework; financial sustainability; safeguards and multiple benefits,; inter-sectorial planning and inter-institutional coordination; investigation and stakeholder involvement.

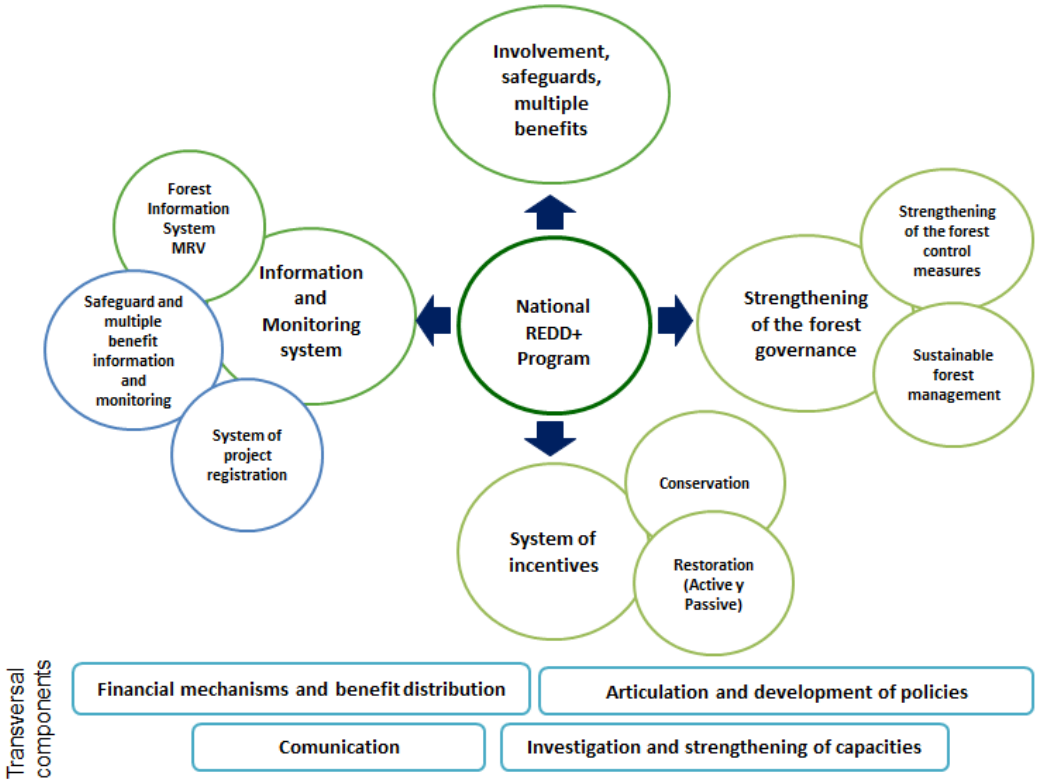

Figure 5. Preliminary National REDD+ Program scheme (Subsecretaría de Cambio Climático - MAE, 2013)

Components of the National REDD+ Program

1. **MRV Forest information and monitoring system**: aiming for a national system for measuring, reporting and verification (MRV), which besides considering forest and carbon information and monitoring, also considers the mandatory registration of projects as a source of information and an instrument of monitoring at the project level, and information and monitoring of safeguards and multiple social and environmental benefits with the aim of having a unique system that acts as liaison of all the information of REDD+. The activities under implementation include: National Forest Assessment (nine forest strata have been identified and a multipurpose inventory methodology for quantifying carbon considering the IPCC guidelines), Historical Deforestation Map (for the periods 1990, 2000 and 2008, determining the deforestation rate of 0,66% for the period 2000-2008) Reference Emissions Scenario for Deforestation (Subsecretaría de Cambio Climático - MAE, 2013; MAE, 2012c).

2. **Involvement, safeguards and multiple benefits**, as a component which orientates the implementation of activities that assure the effective participation and involvement of actors in all REDD+ phases, but that also allow the respect and compliance of safeguards to assure social and environmental multiple benefits for the mitigation of climate change. This component started in 2009, in which the MAE has been participating in the REDD+ Social and Environmental Standards (REDD+ SES) led by the Climate, Community and Biodiversity Alliance (CCBA) and CARE International; this comprises an initiative that has developed a framework of principles, criteria and indicators that not only seek to minimize

risks of REDD+, but also enhance or maximize additional benefits of REDD+ implementation (Subsecretaría de Cambio Climático - MAE, 2013; MAE, 2012c).

3. **Strengthening the forest governance** and
4. **Strengthening the system of incentives**: components which have been updated based on the model of forest governance and a priority for internal coordination within the Ministry to achieve concrete agreements which allow the support from the PNREDD+ to these two components of the forest governance (Subsecretaría de Cambio Climático - MAE, 2013). In this sense, one of the components that was considered up to the last report on REDD+ readiness (2012c) was to support the strengthening of the control measures in the forestry sector, although the jurisdiction of this task is under the SPN and its National Forest Direction. Regarding the incentive system, it aims to complement these command-control measures through the implementation of incentive policies (MAE, 2012c).

Within this preliminary scheme there are also four transversal aspects (Subsecretaría de Cambio Climático - MAE, 2013; MAE, 2012c):

- **Financial and benefit sharing mechanisms**: which will allow developing a financial architecture to capture and channel financial resources for the preparation and implementation of REDD+, and also defining transparent and equitable benefit sharing mechanisms. At the moment, the MAE is working with bilateral and multilateral partners to implement activities in the readiness phase, and so far the main bilateral partner is the German Government through the German Technical cooperation (GIZ) and the German financial cooperation (KFW); In addition, Ecuador has been an observer member of the UN-REDD Programme since Oct 2009 and since March 2011 is one of the twelve countries accepted in this program that are implementing REDD+ activities such as ensuring multiple benefits for REDD+ implementation, and the development of a legal, financial and institutional framework for REDD+ with a budget of USD 4 million (until the end of 2013), and managed by FAO, UNEP and UNDP. This program officially began in the second semester of 2012 (MAE, 2012c).
- **Articulation and policy development**, based on an effective inter-sectorial policy articulation, and no only on legal and institutional arrangements for REDD+.
- **Communication of the PNREDD+** with effective and accessible information among stakeholders and making visible Ecuador's achievements in these processes.
- **Research and strengthening of capacities**, not only regarding REDD+ but also to develop skills among key actors to enhance the additional benefits from REDD+ (e.g. field technicians for the community deforestation monitoring and information collection for the inventories of GHG) (Subsecretaría de Cambio Climático - MAE, 2013).

5.4. Differences between Socio Bosque and REDD+

First of all, it is clear that the main relation of these two programs constitutes that REDD+ is a potential financing source for the Socio Bosque Program (MAE, 2012a). However the same Ministry has identified many differences between these two initiatives (Table 5) (MAE, 2011c):

- **Level of implementation**: Socio Bosque is a Governmental national incentive policy whilst REDD+ is an international mechanism for climate change mitigation under the UNFCCC whilst In Ecuador, REDD+ is being developed through the National REDD+ Program.
- **Type of mechanism:** Although the general distinction that Socio Bosque is a conservation mechanism and REDD+ is a mitigation mechanism, needs to also consider the fact that the plus in REDD+ includes conservation of forests.
- **Objectives of the programs**: Socio Bosque is a policy of incentives for forest conservation, and even though among its goals is to reduce GHG from deforestation it also has a broader scope as it includes diverse types of ecosystems ("páramos", "chaparros"). In this sense REDD+ is a climate change mitigation mechanism which aims to compensate to those who reduce emissions from GHG from deforestation and forest degradation. In this sense, Socio Bosque is an incentive program which recognizes to those who preserve the forests, whilst the REDD+ mechanism will compensate to those who reduce their GHG emissions from reducing deforestation and forest degradation (and other activities included in the plus: conservation, sustainable management of forests and enhancement of forest carbon stocks).
- **Incentives:** the Incentives from Socio Bosque are calculated based on the total area under conservation; the incentives are transferred to the participants twice a year during the 20-year agreement, with a potential extension of the program. REDD+ only applies to areas that have demonstrated a reduction of emissions; With a REDD+ mechanisms, the payment takes place only for the area in which there was a reduction of carbon emissions in a determinate period. This means that for REDD+ projects, the baseline for REDD+ projects establishes the area which would be deforested by year without the project.
- **Financing**: until now, the Socio Bosque has been financed mainly by the Government, and in small percentages from international cooperation and private sector. For REDD+ the financing is not assured yet, but it mainly comes from International Cooperation and donators, and in the future through markets. As seen previously, REDD+ readiness phases in Ecuador are being financed by UN-REDD+ and KFW (German Financial Cooperation).
- **The requirements to enter the Socio Bosque are less complex and costly than the ones to develop REDD+ projects.** For Socio Bosque there are several requirements (e.g. land title). But they are still less expensive. Although REDD+ procedures still need to be developed, in REDD+-like projects in the voluntary market it is necessary to develop a PIN, a PDD (detailed work), validate and register the project which result more costly compared to those of Socio Bosque. In addition, in REDD+ there are safeguards which are being developed (e.g. REDD+ SES), whilst in Socio Bosque it mainly focuses on guarantying that the program complies with aspects such as good information, prior consultation, and participation but does not operate under specified standards.

Table 5. Main differences of the Socio Bosque Program and the REDD+ Scheme (adapted from MAE 2012a).

Comparison variable	Socio Bosque	REDD+
Level	Governmental national policy of incentives	International mechanism for climate change mitigation
Type of mechanism	Mainly conservation mechanism.	Climate change mitigation mechanism
Objectives	More objectives: conservation of forests, reduce deforestation (and its GHG emissions) and improve the living conditions of the participants.	Compensate to those who reduce emissions from GHG from deforestation and forest degradation
Incentives	Annual incentive (given twice a year) for each hectare under conservation under a 20-year agreement	Payment for the quantity of avoided emissions from deforestation and degradation activities payment is done once
Financing	Financed mainly by the government budget, international cooperation, and private sector	Financing through markets, donators and international cooperation
Requirements	The requirements to enter the program are less expensive	The processes are more complex and costly than the ones of Socio Bosque; Monitoring is MRV of reduced emissions of CO2; Safeguards and specific processes of application

After revising this descriptive chapter, it is recommended to see Appendix 4 where I present some of the important milestones of the evolution processes of the Forest Governance Model, Socio Bosque and the PNREDD+. This figure also shows some of the main activities for this year. This summarized timeline results useful for understanding some aspects regarding the institutional interaction and interaction management analyses (Ch. 6.2 and 6.3).

6. Institutional analysis of the Socio Bosque Program

This chapter moves beyond the previous descriptive chapter (5). These results are organized according to the main research questions, basically in three sections: comparing Socio Bosque with PES schemes (Ch. 6.1), and analyzing Socio Bosque and the PNREDD+ through the institutional interplay approach (Ch. 6.2) with a later analysis of the actions being implemented within interaction management (Ch. 6.3).

6.1. Differences and similarities of the Socio Bosque Program and PES schemes: Is Socio Bosque a PES scheme?

First, I briefly compare Socio Bosque with the general PES typology and terminology; later I go into more detail in comparing Socio Bosque with the criteria that define PES schemes, and some other key features. In the final section of the chapter I provide a summary of the findings.

Typology and terminology

Although it has been highlighted by Socio Bosque that it is not a PES scheme, namely because "it does not fixate a payment, trade or rent for the ES… It constitutes an incentive for the conservation of areas that generate ES, recognizing the landowners their commitment and efforts to conserve" (MAE, 2012a, p. 30), this analysis shows that the program shares some similarities and differences described later:

Regarding the **typology**, Socio Bosque firstly matches the *area-based* PES schemes' (vs. product-based) definition in which the agreements define the land and/or resource use limits for a pre-agreed number of units (Wunder, 2005). In this case, the agreements signed between the landowners and the MAE define conservation use for a determinate number of hectares the landowner(s) wishes to maintain under conservation. Secondly, it also matches the *public-sector* PES scheme definition involving the central state through the MAE, as seen as those PES schemes in Costa Rica and Mexico (Wunder, 2008) and has indeed less payment differentiation of payments (discussed later) compared to other *private-based* PES (Wunder, 2005). Considering pro-poor goals, *public-sector* PES schemes are usually less spatially targeted, but tend to have more formal requirements for enrolment which can result either pro-poor or anti-poor (Wunder, 2008); Socio Bosque's spatial targeting includes poverty criteria (however recognized to be at a broad scale and might need to be adapted at a smaller scale) and has several requirements to enter the program that might result difficult to fulfill for poor local landowners. Thirdly, it can be categorized as a *use-restricting* scheme which rewards providers for conservation, so landowners are paid for conserving the area under conservation (area set aside), although currently with the new Restoration chapter it also could be considered as an *asset-building* scheme.

Also regarding the **typology**, four types of PES currently stand out: carbon sequestration, biodiversity protection, watershed protection and protection of landscape beauty; it would be difficult to strictly categorize Socio Bosque in a particular type of PES according to this typology; however, in some way its goals do match these diverse types of PES as the native forests and other native ecosystems that are under conservation within the projects can store carbon, protect biodiversity, protect water resources[24] and/or enhance landscape beauty; in addition, these diverse aspects (carbon storage, habitat for biodiversity and water cycle regulation) are considered for the spatial targeting criteria.

[24] Especially through its Páramo Chapter, as it is an important water regulator ecosystem.

Regarding the **terminology** that stands for "PES", and the most controversial term "payments", Socio Bosque emphasizes that it does not fixate a payment, transaction or rent for those ES; it provides incentives for those areas that generate ES (MAE, 2012a). However, in assessments of the terminology of PES, the term "rewards" are also used: "which can have an overtone of entitlement and justice for the providers of ES being secured through transaction: everybody who delivers a benefit should also be rewarded" (Wunder, 2005, p. 5); but it has been suggested that this general term might have the risk of raising excessive expectation, since ES that do not have high values or are not sufficiently threatened might have difficulties to find buyers (Wunder, 2005). However, for Socio Bosque, payments are also part of its terminology since its operation manual also uses this term referring to the transference of the incentives (MAE, 2012a). The other two terms: "E" (environmental or ecosystem) and "S" (services) do not really apply since Socio Bosque mostly comprises incentives for a specific land use and not ES (analyzed later). However, it is interesting to highlight the social emphasis in the program's name: "Socio Bosque", which refers in English to "Forests' Partners".

Definition

Comparing of Socio Bosque with the **five criteria that define PES** (Wunder, 2005) showed that some of these criteria are met by the program. With these general five PES criteria in mind, Socio Bosque could be defined[25] as a *voluntary* scheme through which *conservation* (specific land use) *agreements* are signed among individual or communitarian/collective landowners and the Ministry of Environment who provides *direct economic incentives conditional on compliance* of the agreements (Table 6).

Table 6. General definition of PES and Socio Bosque according to PES criteria.

PES (Wunder, 2005)	**Socio Bosque**
1.*voluntary* transaction where	*1. Voluntary* scheme through which
2.*well-defined* ES (environmental service) (or land use likely to secure that service)	*2. conservation* (specific land use, although not well-defined ES)
3. is being 'bought' by a (minimum one) ES *buyer*	*3. agreements* are signed among individual or communitarian/collective landowner(s)
4. from a (minimum one) ES *provider*	4. and the Government through the Ministry of Environment who provides *direct economic incentives*
5. if and only if the ES provider secures ES provision (*conditionality*)	*5. conditional on compliance* (conditionality) of the agreements.

These criteria are described and analyzed in further detail for Socio Bosque:

1. Voluntariness

"PES is a voluntary, negotiated framework, which distinguishes from the usual command-and-control measures" (Wunder, 2005, p. 3). Socio Bosque is also a voluntary scheme and it also differences from command-and-control measures as it constitutes an incentive instrument; landowners are entitled to decide if they want to join the program or not and under the conditions established already in the agreement: "Private landholders or communities wishing to participate will sign a short standard agreement based on a voluntary 'opt-in', no-negotiation approach" (Fehse, 2012, p. 3). In the case of community/collective landowners it is important that the program emphasizes the importance of several socializations and the need to have a collective agreement to participate in the program through a signed resolution demonstrating this (MAE,

[25] My own definition based on the conceptualization of Socio Bosque.

2012a). However in practice, this is a complicated aspect to assure the full participation and decision-making processes, namely among the communitarian/collective landowners considering their diversity on the governance structures, sizes and locations, capacities, and other social and institutional aspects.

2. Well-defined ES or land use that secures that service

In PES, it has been pointed out that what is bought needs to be well-defined, either directly measurable or land-use caps that are likely to provide a particular service (Wunder, 2005). However, it is often difficult to value the ES, so in many cases they are similar in defining a land use proxy to preserve those ES (Wunder, 2008): "…ES or land use proxies that provide that service. Few PES schemes in the real world pay according to a measured service. The usual is to pay for a land use proxy, such as forest conservation and that is what SB exactly does; that is what the Costa Rican PES scheme also does..." (S. Wunder, pers. comm. 23 Jan 2013). Although Socio Bosque does not define an ES for its conservation but rather a specific area which meets the conditions regarding its priority according to the spatial targeting, it does indeed aim to incentive a particular land use, securing the environmental service present in that area so it would meet this criteria; however, the ES are not measured nor monitored as it will be described later.

3. Buyer and 4. Provider

In PES there are usually a (minimum) *buyer* and a (minimum) *provider* for those ES (Wunder, 2008). The provider can be seen as the user of a resource which is susceptible to receive a payment for the maintenance or restoration of an associated ES, while the buyer is the beneficiary of this service (Pirard, et al., 2010). As seen before, Socio Bosque can be catalogued as a *public-sector* scheme, in which the MAE (government) pays the incentives (mainly from the government budget); in a broad sense then the MAE could be considered as the *buyer* and the landowners the *providers* by securing the conservation of the areas under the agreement: "In the issue released in 2008 (Wunder, 2008), we're actually making the point that there are use of finance PES schemes that follow this definition in 2005, but there is also government PES schemes, where the government sort of takes the place of the buyer" (S. Wunder, pers. comm. 23 Jan 2013).

However, Socio Bosque uses the terms *participants* instead of providers. Also, in a more strict analysis, the terms buyers and providers do not really apply since it is not precisely a transaction scheme where ES are being bought or sold (MAE, 2012a). In this sense, Socio Bosque does not make a transaction of particular services and does not fully compensate the cost of the provision of the ES, which in principle should characterize PES: "One difference is the type of payment, the direct payment versus the payment for certain activities or projects, or the payment for certain tradable services" (M. Alban, pers. comm. 14 Dec 2012).

5. Conditionality

Both types of schemes (PES and Socio Bosque) are conditional on compliance, and they work under a set of obligations. In the case of Socio Bosque the agreements[26] state various obligations for the participants; these agreements refer to the "operating manual" or extended rule book as well as to applicable national laws (MAE, 2012a). Ideally, participants should have professional legal assistance to fully understand the implications of these agreements; to address this the Ministry, along with the organizations with which it has alliances make efforts to train participants

[26] For standard agreement sample revise http://sociobosque.ambiente.gob.ec/?q=node/198

in these aspects (Fehse, 2012). In addition, the payments are transferred (every six months) once the participants have proven they complied with the obligations stated in the agreements, mainly regarding maintaining intact the ecosystem cover in the areas under conservation and complying the investment plan (especially in the case of the community/collective landowners).

In this sense, the agreements are mainly focused in assuring the conservation land use, in which non-destructive uses of the forest, in which non-commercial hunting and gathering can be allowed. However, this criterion is indeed difficult to meet in PES as "many initiatives are loosely monitored or not at all, and payments are up front instead of periodic, and they are made in good faith rather than being truly contingent on monitored service provision" (Wunder, 2005, p. 4). As pointed out: "…But that is the point where many PES schemes are actually perhaps not fully performing; it doesn't really go in the sense that if it is conditional or nor, but how conditional it is; how likely are you able to receive the payment while you weren't able to comply with the obligations…" (S. Wunder, pers. comm., 23 Jan 2013). Socio Bosque acknowledges the difficulty of defining, monitoring and enforcing effective protection (Fehse, 2012). In addition, it is relevant to mention that the non-compliance of the agreement may results in sanctions, such as suspension of the payments or expulsion from the program with possibilities of having to partially or fully return the payments received after thorough analysis of the case (MAE, 2012a; Fehse, 2012).

Other key features

Besides the prior PES criteria, there are also some additional aspects[27] which were compared::

- **Measurement and monitoring**

These features are usually more detailed for PES schemes, as in theory they would have to be able to both measure and verify that the ES is being provided (see point 1 in previous section). Also, estimating the economic value of ecosystem services is often difficult, and sometimes even impossible, subject to a wide margin of error and subjective assumptions, even when limited to the use value (Pirard, et al., 2010, p. 7). In the case of Socio Bosque, the measurement occurs on the area of land that the landowners wish to preserve under the 20-year agreement. For entering the program, this area must be geo-referenced (as input for the program's geographical database for future monitoring) and meet both the ecological (i.e. status of the forest or ecosystem) and legal conditions of the land (i.e. legal title with demarked area) (MAE, 2012a). PES schemes usually do not have clear and explicit frameworks for monitoring and evaluating the degree of their own success (Wunder, 2007, p. 51). Although monitoring is also a feature that in theory would be more complex in PES schemes as they should be able to monitor the ES provided, often this does not occur in practice (Wunder, 2005). As pointed out: "I actually haven't seen a monitoring system that really monitors what's going on with the service; it has always been more a monitoring of the forest cover as Socio Bosque, but not over the service" (M. Alban, pers. comm., 14 Dec 2013).

Socio Bosque carries out a monitoring both in the forest or ecosystem cover and in the investment of the incentives prior to the transferences. An important lesson that Socio Bosque has identified is that "monitoring is turning out to be more costly and onerous than anticipated" (Fehse, 2012); the difficulty in carrying out monitoring with the cloud interference and at small scale, requiring more field visit from the monitoring team, but also increases the costs since there are many small land areas under conservation, adding travel costs. As stated earlier, Socio Bosque acknowledges the constraint of strictly defining the services maintained or generated within the areas under conservation, and the limitations of monitoring and enforcing their protection (MAE, 2012a; Fehse, 2012).

[27] These are based on the differences that some that Socio Bosque Program emphasized in its publications.

- **Socio Bosque does not calculate the level of threat and opportunity costs**

"I think the major difference, at least in theory about PES, is the economic efficiency. This means that by the generation of a market, the ES providers and buyers can reach an agreement on the price of these ES or what is optimum…" (M. Lascano, pers. comm. 17 Dec 2012).

The logic behind PES relies that these schemes make sense only when there is some current or projected threat to meet the additionality criteria (Wunder, 2005). However, when there is high level of threat there are high opportunity costs; in this scenario other conservation tools might be more appropriate than PES as there might not be enough funding. "PES is usually more appropriate in the intermediate range of positive but numerically small opportunity costs: degraded pastures, marginal croplands, forests in slow-moving agricultural frontiers, etc." (Wunder, 2005, p. 21). It has also been suggested that spatial targeting toward high-threat, high-service and low-cost areas can dramatically improve PES carbon results; failing to use these features in the design can make PES inefficient (Wunder, 2009, p. 213).

Socio Bosque on the other hand does not calculate the opportunity cost for each area that a landowner wishes to subscribe into the program; it has pre-determined incentive: "Socio Bosque does not determine the opportunity cost of each property that participates in the program; to calculate these costs can result in a complex and expensive task, and since the markets are dynamic these prices on ES can promptly become obsolete" (MAE, 2012a). The level of threat is also not considered into the analysis of defining these prices; however, it considers the deforestation threat in its spatial targeting. In this sense, areas with higher level of threat add weight on the prioritization to enter into the program (MAE, 2012a). Overall, determining the level of threat and the opportunity costs are indeed one of the sound differences between Socio Bosque and PES. However, it was highlighted that this might not be an appropriate comparison, but rather a criterion to assess whether Socio Bosque meets efficiency criteria: "…you can have several options of designing a PES schemes, if you know about the provider's opportunity cost, or if you know how they bare in space, and about where the threatened areas are, that you can target. But, those are not components of the PES definition, but are features you would use to be able to make a good design of the scheme… these points are perhaps more relevant in defining weather it is a good or a bad PES scheme, but to me, it wouldn't question if is a PES scheme or not… I think it (Socio Bosque) is a PES scheme" (S. Wunder, pers. comm. 23 Jan 2013).

An important feature that differentiates in this case Socio Bosque from many PES schemes is that environmental additionality is not explicitly an objective of the program, since performance cannot be measured based on a baseline of forest loss; however, preliminary analysis has shown that at least some areas would have already been lost without the program. At the moment success is monitored in terms of non-compliance, regarding to the loss of forest that is under conservation within the agreement (Fehse, 2012).

- **Differentiation of incentives: Socio Bosque uses simple pre-agreed values per hectare**

Usually PES schemes have differentiated payments according to the services and opportunity costs. However, *public-sector* PES schemes tend to have less payment differentiation mechanisms compared to the *private-sector* buyers (Wunder, 2008). In the case of Socio Bosque, "it does not differentiate the cost regarding the level of threat of the ecosystem, as this might lead to perverse incentives in areas with lower deforestation or deterioration threat" (MAE, 2012a). Socio Bosque differences the incentives according to the type of ecosystem (two categories: diverse forest ecosystems and páramo), and the type of landowner (individual or communitarian/collective). In addition, the incentives per hectare are based according to the area under conservation, in which

for the first hectares (1-50 ha) receive the highest incentive per hectare, followed by a lower price in the next category, and so on (see Chapter 3.2. for detailed incentive differentiation); this is a modality designed to improve social equity (Fehse, 2012); as detailed: "the program implemented at national scale seeks a direct, equitable and solidary distribution of benefits associated to the conservation of the native forest cover in Ecuador and the directly responsible for their conservation" (MAE, 2012a, p. 7).

Other national programs in Costa Rica and Mexico (PES schemes), also work with uniform and standardized contracts, in which there is no individual negotiation and which provide a price or value per each hectare conserved. The Mexican PES program has 6 differentiated payments up to 2010 (when in 2003 it had only 2) according to the type of vegetation, and in less extent the deforestation threat. The Costa Rican program also differentiates between types of projects that are subject to different conditions including the payment amounts. These three schemes are more alike to the incentives for conservation (as Socio Bosque explicitly does), rather than other PES. The benefit from this kind of payment structure is that it's direct, and does not require individual negotiation or evaluation of the ES generated in each piece of land that participates. On the other hand, it has also been suggested that these unique and uniform payment scales are not an effective approach to obtain environmental results, but are rather attractive in terms of simplicity and low administrative costs. However, countries working on PES or PES-like schemes can work on differentiated schemes in an adaptive manner (FONAFIFO, CONAFOR y MAE, 2012).

- **Requirement of land title and requiring clear and secure land tenure**

PES service providers have to be 'land stewards', such as legal landowners, informal but recognized occupants, communities with traditional rights, or long-term concession or lease holders (Wunder, 2009, p. 214). Applicants for Socio Bosque must have legal title to the land; this however, is recognized as one of the most important challenges seen by the MAE, since it is a limitation for many poor rural people and indigenous communities who although have possession on the land, do not hold legal titles (M. Lascano, pers. comm. 17 Dec 2012). This requirements however is aiming to incentivize properly to those who have the rights over the land and are conserving it, and to prevent conflicts and potential 'land grabbing' (Fehse, 2012; FONAFIFO, CONAFOR y MAE, 2012). This requisite varies among PES schemes. For example, considering the similar barriers regarding land tenure in many developing countries, Costa Rica and Mexico are moving towards recognizing the land rights rather than only the formal title (FONAFIFO, CONAFOR y MAE, 2012). Although PES usually do not involve chances in land tenure, participants perceive that PES contracts can support the land tenure security from neighboring landholders and squatters through the process of mapping and demarcating the land and demonstrating an income-generating activity from it (Wunder, 2005). I has also been perceived that the requirement of formal land titles is probably the most common anti-poor enrolment criterion (Wunder, 2008), which in this case would have repercussions for the eligibility of poor landowners.

Land tenure issues present challenges for Socio Bosque. Firstly, it is expected that the rate of application will eventually start to decrease, because some potential participants might not have yet formalized their ownership, and will need to acquire land titles in order to apply (De Koning, et al., 2011). Secondly, Socio Bosque is targeting social benefits by improving the living conditions of its participants and alleviating poverty; hence, as indicated by Vatn (2010) land distribution is a key issue as poor people might not be able to participate as they either do not hold title to their land or those who hold a title might not be able to set aside areas for conservation. In response to this, the Ecuadorian government is implementing a large land titling program, which still needs to enhance as it is costly and time consuming process (De Koning, et al., 2011). Socio Bosque could

also consider engaging participants that can prove the landholding based on this other experiences; as it was highlighted by one of the interviewees "…knowing the situation in Ecuador, most of the forests don't have titles, so this is something that could be interesting for Socio Bosque to be flexible" (M. Alban, pers. comm., 14 Dec 2012).

From lessons on previous PES schemes in Ecuador (watershed initiatives and few carbon sequestration programs), it was also identified that secure and clearly defined property rights and land tenure are necessary for sustainable PES (Cordero, 2008). Overall, for Socio Bosque, and also both for PES schemes and REDD+, clarifying land tenure indeed remains as a crucial aspect to assure efficient results in terms of efficient land use and development (Wunder, 2005; Angelsen & McNeill, 2012). However, it has been pointed that PES schemes may induce more secure land tenure, either tenure-consolidation efforts enabled by the PES schemes, or increasing perceptions of land security by proving that the land has an economic use rather only being a 'reserve land' more vulnerable to grabs by neighbors (Wunder, 2008). Participation in Socio Bosque has in some cases increases the land security, mostly in a perceptional way (e.g. through the geo-referencing of the area, signaling with few Socio Bosque signs, and in some cases increasing the pressure for the landowners to get "hands on" land tenure issues).

- **Targeting social benefits and investment plans**

Although there is still scarcity of formal performance evaluations of PES schemes, there is already some evidence that well-defined PES schemes can result in efficient, cost-effective and equitable conservation (Wunder, et al., 2008). In addition, it has been argued that in cases where providers of ecosystem services are poor landholders or disadvantages communities, such payments can contribute to poverty alleviation (Pagiola, et al., 2005). However, it has been also suggested that PES schemes should focus mostly in environment goals over poverty or other side objectives (e.g. human rights, gender, indigenous peoples), since these schemes may lose their efficiency (Wunder, 2008). In this sense, Socio Bosque would differ since besides its environmental goals through conservation of native ecosystems, it also aims to improve the livelihoods of the participants and reduce poverty (MAE, 2012a): "When you talk of PES, it seems these are mostly focused on a service, which I consider is taking away the value of biodiversity, or conservation in general. That's a feature that I like about Socio Bosque (M. Alban, pers. comm., 14 Dec 2012).

Besides land-tenure effects (discussed earlier), PES schemes may result in other non-monetary social benefits, including increased human and social capital by improving their internal organization, or also as a result of training courses o support in starting an association. In addition, PES can also work as a strategic advertisement increasing the recognition of the village or community to other donors or public entities (Wunder, 2008). Although these benefits have not been systematically reported, Socio Bosque has some benefits with the training processes; also some participants have pointed out the benefits of advertising their conservation efforts.

Also, it has been identified (De Koning, et al., 2011) that the requirement of the investment plans in Socio Bosque to keep track of the expenses from the participants, mainly for the community/collective landowners, results in an innovative feature compared to other PES schemes (for example the national conservation payment schemes in Mexico and Costa Rica). *"I think this idea is innovative. I saw in other experiences that it was necessary to count with management plans as a tool to see what is done and what is different. Investment plans promote community members to keep accountability, and developing capacities, which [responsibilities] in other PES were assumed by the implementer of the program. This is an innovative difference"* (M. Alban, pers. comm., 14 Dec 2012). These plans allow for more transparent and participatory decision-making processes among the community members and also as a pivotal tool to monitor

the socioeconomic impacts of the program (De Koning, et al., 2011). In addition, metrics for assessing the socioeconomic impacts are still being developed, but at the moment the investment plans are a useful tool for this (Fehse, 2012).

- **Legal, political and social contexts**

Regarding Ecuador's legal context to develop PES, there is still a need to work on the legal framework that relates to ES. The article 74 of the Constitution of 2008, explicitly details that the people, communities, nationalities will have the right to benefit from the environment and the natural benefits that allow their good living. However "the ES are not allowed to be subject of appropriation; their production, provision, and use will be regulated by the State" (MAE, 2011c). This means that the state is responsible to regulate the ES, and that the private transactions cannot take place before these aspects are clarified (FONAFIFO, CONAFOR y MAE, 2012). To address this, the MAE is working on the regulation framework to work on this aspect since for REDD+ this needs to be clear (MAE, 2011c). It was highlighted that for Ecuador this particular legal limitation is indeed an obstacle to develop PES schemes, and Socio Bosque results more suitable.[28]

Besides this impediment to actually talk about ES and its benefits to the local landowners as the state must regulate them, it also was mentioned by some interviewees that the political context in Ecuador regarding conservation market-based schemes may be described as "inappropriate"; in this sense, PES might not develop properly because of people's positions and ideologies on commodification of nature and the potential perverse incentives. Also, other more simpler schemes might result more convenient: "...conservation agreements –which is a simpler derivate than PES schemes– is a more feasible idea; in other countries with other legal and political conditions, it might be easier to talk about PES" (M. Lascano, pers. comm., 17 Dec 2012).

However, it was also mentioned that based on experiences in other PES projects developed previously in Ecuador, these local people's positions weren't really an obstacle and that the country can be suitable to develop these types of projects as seen in other countries in the region. In addition, since there is the debate whether all PES are markets (Muradian, et al., 2013) the previous arguments of this political context regarding PES might not be substantially important: "it is important to mention that PES is not a market mechanism, what causes some of the ideological discussions about it, seen as a neoliberal tool; many times PES is more like a negotiation platform between parties that have diverse interests in natural resource management" (S. Wunder, pers. comm., 23 Jan 2013). In this sense, although there is an effort from the Ministry to distinguish that Socio Bosque does not constitute a PES because PES are assumed to fall into the market categorization, clarifying it does not constitute a market-scheme might contribute to tackle existing misunderstanding of its conceptualization.

Summary

Regarding the typology of PES, Socio Bosque can be considered as an *area-based*, *public-sector* and *use-restricting* scheme. Although Socio Bosque does not strictly match one of the four types of PES (i.e. carbon sequestration, biodiversity protection, watershed protection and protection of landscape beauty), its goals do match these diverse schemes. Regarding PES terminology, it can match the controversial term 'payments', whilst the other two terms (environmental or ecosystem services) do not really apply in this case. Comparing Socio Bosque with the five criteria that define PES showed that some of these criteria are met by the program. Firstly it is a voluntary scheme

[28] "Other aspects that vary depending on the country regarding environmental services concern their ownership. In the case of Ecuador the owners of the land are not the owners of the ES, so there wouldn´t be a legal way of payments for something they are not owners" (M. Lascano, pers. comm., 17 Dec 2012).

and it defines a specific land use (i.e. strict conservation). Socio Bosque does not strictly fit with the "buyers" or "providers" definitions; however in a more flexible definition the Ministry could be considered as the *buyer* and the landowners the *providers* by securing the conservation of the areas under the agreement. Lastly, the conditionality is a similarity as Socio Bosque is also conditional on compliance, and works under a set of obligations.

Regarding other aspects, such as measurement and monitoring of the ES, Socio Bosque differs from PES (if these were applied strictly in the later schemes); however, limitations in defining both ES and monitoring these in practice result in a similarity in both types of schemes. Regarding the differentiation of incentives, Socio Bosque is similar as other national PES programs such as Costa Rica and Mexico, as it has uniform and standardized agreement and provides a price or value per each hectare conserved. Nevertheless in practice, PES schemes have differentiated payments according to the services and opportunity costs. The major difference is that Socio Bosque does not calculate the level of threat and therefore the opportunity costs for each area that a landowner wishes to subscribe into the program as PES do (or would have to do in practice); instead, it has pre-determined incentives. Regarding the requirement of land title, in the case of Socio Bosque this is a definite requirement, whereas seen in other PES this is being a more flexible feature; however, for both PES schemes and Socio Bosque, clear land tenure is a fundamental challenge for their success. Socio Bosque explicitly has social targeting, whereas although PES schemes many times contribute to social goals, they (should) emphasize mostly in environmental goals. In this same line, Socio Bosque requires investment plans which are an innovative difference to other PES schemes. Lastly, the legal, political and social contexts are particular for each country; in this respect, the legal carbon rights needs to be clarified in Ecuador as this is different in other countries that develop PES schemes.

6.2. Interactions between Socio Bosque and the National REDD+ Program: synergies and conflicts

Several types of interactions were found between Socio Bosque and the PNREDD+. For purposes of understanding these according to the causal mechanism approach (Gehring & Oberthür, 2008), these are described in the following order: cognitive, interaction through commitment, behavioral and impact-level interactions. In order to answer the second research question, the interactions were identified whether they are synergistic or disruptive (i.e. the quality of the effect); furthermore, the source and target institutions were identified; whether these are existing or potential interactions; and if these interactions are unilateral or symmetrical (Table 7).

Table 7. Classification of interactions between Socio Bosque and the National REDD+ Program

Brief description of the interaction	Source institution	Interaction type	Existing or potential	Unilateral or Symmetrical	Quality of Effect
Socio Bosque has contributed as a policy model for the PNREDD+ with its ideas and learned lessons	Socio Bosque	Cognitive: policy model	Existing	Unilateral	Synergistic
Socio Bosque's benefit sharing mechanisms can provide experiences for the PNREDD+	Socio Bosque	Cognitive	Potential	Unilateral	Synergistic
Socio Bosque has contributed to the PNREDD+ with the historic deforestation map	Socio Bosque	Additional means	Existing	Unilateral	Synergistic

Socio Bosque has served and will continue to serve as a communication platform for the PNREDD+	Socio Bosque	Additional means	Existing	Unilateral	Synergistic*
The PNREDD+ and Socio Bosque attract international financing opportunities	Both	Additional means	Existing	Symmetrical	Synergistic*
Socio Bosque gains recognition mostly in international spheres because of its relation to the PNREDD+	PNREDD+	Additional means	Existing	Symmetrical	Synergistic*
REDD+ social and environmental standards (SES) are applied as a case study in some communities participating in Socio Bosque	PNREDD+	Additional means	Existing	Symmetrical	Synergistic*
The PNREDD+ benefits from the established structure of Socio Bosque, including the institutional and legal frameworks	Socio Bosque	Additional means	Existing	Unilateral	Synergistic
Confusion and uncertainty about REDD+ (might) create behavioral changes for Socio Bosque's participants or potential participants	PNREDD+	Behavioral	Existing	Symmetrical	Disruptive
Expectations of the financing sources that REDD+ can provide to Socio Bosque are diverse, leading the later to search for new sources	PNREDD+	Behavioral	Existing	Symmetrical	Indetermi-nate
Expected behavioral changes of Socio Bosque's participants can favor later REDD+ initiatives	Socio Bosque	Behavioral	Potential	Unilateral	Synergistic
Socio Bosque and the PNREDD+ supporting each other's ultimate targets	Both	Impact-level	Potential	Symmetrical	Synergistic
Socio Bosque and REDD+ might apply/compete for the same areas under conservation	Both	Impact level	Potential	Symmetrical	Disruptive/ synergistic

*These interactions may also be disruptive, as detailed in the description bellow.

Cognitive Interactions

These interactions are determined by the power of knowledge and ideas, conceived as a particular type of inter-institutional learning (Gehring & Oberthür, 2008). In general, Socio Bosque has supported with ideas for the PNREDD+ with two main interactions:

- **Socio Bosque has contributed as a policy model for the PNREDD+ with its ideas and learned lessons:**

There have been, and still are, cognitive interactions occurring between the PNREDD+ (target institution) and Socio Bosque (source institution), since the first initiative is learning and using some of the features of the already established structure of the later. As seen in the relations between these two programs, Socio Bosque has as one of its objectives the reduction of deforestation, and hence, it is a policy instrument which partly shares the pool of stakeholders (e.g. forest landowners who participate in Socio Bosque and some that could potentially enter in REDD+ schemes later, the Ministry of Environment and its offices across the country, NGOs and international cooperation supporting both initiatives; among others). Socio Bosque provides legal

and operative frameworks which are already under implementation from which the PNREDD+ can learn (e.g. operating manuals, standard agreements, own webpage, among others).

In this sense, Socio Bosque provides ideas, experiences and learned lessons that can feed the development of the PNREDD+ and other REDD+ initiatives or similar programs in the region. For instance, it provides an understanding in key aspects such as the relationship with its partners, and their internal processes including benefit sharing among the community members, functioning of the participatory processes and their organizational structures (Carrión & Chíu, 2011). Overall, these learning processes of the PNREDD+ about Socio Bosque may result in synergistic interactions. Although this interaction can be considered as a policy model (i.e. unintentional), in many cases the Undersecretary of Climate Change requests Socio Bosque for assistance in sharing information, preparing specific reports or participating in certain processes; hence, in these specific cases it can also be considered as request for assistance (i.e. target institution intentionally requesting for the information from which it will learn from).

- **Socio Bosque's benefit sharing mechanisms can provide experiences for the PNREDD+:**

Socio Bosque (target institution) and its benefit sharing mechanisms (BSM) from the government to the local landowners, and internally at a community level which are already under implementation provide valuable lessons (achievements and challenges) that can serve as a platform of experiences to develop similar schemes and to learn from these for the PNREDD+ (target institution). Although the PNREDD+ is not yet at the stage of implementing BSM, it can be projected that these interactions will most likely be synergistic as it can learn from good experiences and mistakes from these BSM. In this sense, the interactions would be intentional −as a form of request for assistance− as the PNREDD+ is/will be aware of this potential learning process. Socio Bosque has been considered as a case study to assess countries operating forest management/conservation models to develop REDD+ benefit sharing mechanisms (see Foli & Dumenu, 2011; PwC, 2012; FONAFIFO, CONAFOR y MAE, 2012).

For instance, some of the identified lessons that Socio Bosque provides for establishing other forest sector benefit sharing mechanisms, such as REDD+ include: the need of a clear legal framework and alignment of the scheme with a national strategy; engaging local governments and CSOs, and enhancing their capacities in forest management, community development and planning to support beneficiaries effectively; effective communication to enhance civil society's awareness and engagement; and simplicity in calculating, monitoring and transferring the benefits might help with public understanding and reduce transaction costs (PwC, 2012).

'Interaction through commitment': additional means

Transferring commitments from one regime to another with similar objectives might result beneficial if it offers additional means (instruments) for implementing these commitments (Gehring & Oberthür, 2008). Although both Socio Bosque and the PNREDD+, as seen previously, overlap in their objectives (reducing deforestation) or they are complementary pursuing the broader forest governance goals, in this specific case it might be inappropriate to talk about 'interaction through commitment' *per se*, as both institutions are not transferring commitments towards one another. However, these programs do offer some additional means or instruments to enhance the other program. The identified interactions providing additional means include:

- **Socio Bosque has contributed to the PNREDD+ with the historic deforestation map:**

The generation of information such as the historical deforestation map implemented by a sub-team within the Socio Bosque Program supports with information which is crucial for REDD+:

"with the map of historic deforestation, REDD+ projects have more possibilities..." (D. Carrión, pers. comm., 24 Jan 2013). Besides providing relevant information for land planning and management, this project is important to implement REDD+ as it constitutes one of the elements of the MRV component, in which with the National Forest Assessment it aims to set the Reference Emissions Scenario (MAE, 2011c).

- **Socio Bosque has served and will continue to serve as a communication and involvement platform for the PNREDD+:**

Socio Bosque constitutes a platform for communication and involvement between the indigenous and local communities and landowners and the government (Carrión & Chíu, 2011). For instance, the PNREDD+ has involved some participants of the Socio Bosque Program in the interpretation process of the REDD+ SES, in the REDD+ committee actions and the rest of REDD+ workshops throughout these years. In addition, in many of the workshops and socializations of the Socio Bosque Program with its participants and potential ones, there are also opportunities to explain about the PNREDD+ (as an additional governmental initiative, as a potential financing source for Socio Bosque and distinguishing the differences). In addition, besides these advantages for the PNREDD+, the material published for both Socio Bosque and REDD+ discuss in many cases these two initiatives (discussed later in the third research question). Although this communication platform could be categorized mostly as a synergistic interaction, it might be disruptive if the Ministry's technicians, other actors (CSO's working with both programs directly or indirectly), or the communication material does not explain properly both Socio Bosque and the PNREDD+ leading to more uncertainty among the local actors (discussed in behavioral interactions).

- **The PNREDD+ and Socio Bosque attract international financing opportunities:**

Regarding financing through bilateral cooperation, Socio Bosque can be considered as an 'innovative' government-led program which has gained recognition at an international sphere for potential funding from developed countries; on the other hand, since REDD+ is also such a broadly-discussed topic internationally, it has also gained much recognition to attract funders (currently German government) and potential ones as well (e.g. Norway) that could support Socio Bosque. Socio Bosque (target institution) has been strengthening with the REDD+ readiness phase (source) during these past years, especially with financial resources that have been contributing to specific components of the program resulting in a synergistic interaction.

With regard to the KFW funds (which was obtained mainly for the readiness phase for REDD+, there are many activities supporting the Socio Bosque Program, for instance in funds for incentives and several consultancies that are taking place in the provinces of the German Cooperation's target areas (e.g. supporting the monitoring processes of both investment plans and areas under conservation) (A. Marín; pers. comm., Jan 5 2013). With the UN-REDD+ program there have been also some activities supporting Socio Bosque, although according to some of the interviewees, this project apparently has moved slowly in the past year. However, it was also pointed out that the attraction of international actors for potential support for Socio Bosque has always came linked to REDD+ (or seems it will always be). In this sense, the current financial support from the German government through GIZ and KFW is also related to REDD+; the same goes for the recent mission from the Norwegian government who are also mainly interested in supporting Socio Bosque but framed under REDD+.

- **Socio Bosque gains recognition mostly in international spheres because of its relation to the PNREDD+:**

Both programs have been able to expand their recognition in diverse international media in several articles, discussion forums, websites and other media resulting mostly in a synergistic interaction. For instance, although Socio Bosque is not a REDD+ project, has been considered as a case study because of its importance to REDD+ processes or as early REDD+ experiences in national (see Cárdenas, 2012), regional (See Cenamo et al. 2011; FONAFIFO, CONAFOR y MAE, 2012) and international publications (See: PwC, 2012). However, it has also been referred to in articles that oppose REDD+ (e.g. REDD monitor et al. 2010; Lang, 2012) creating in this case disruptive interactions for both programs (this will be dealt later in more detail). Also, in several occasions Socio Bosque has been able to be discussed in side events in the UNFCCC's COPs and Convention of Biological Diversity (CBD) events, and other international workshops (e.g. The Forests Dialogue) mainly due to its relation to the PNREDD+.

- **REDD+ social and environmental standards (SES) are applied as a case study in some communities participating in Socio Bosque**:

In the interpretation of the REDD+ SES within the PNREDD+ (source institution), specifically the process of validating them using as a case study some communities participating in Socio Bosque (target institution) was conceived as a (potential) positive impact or synergistic interaction. Although the initial idea was to pilot these standards entirely in the Socio Bosque Program, the assessment changed to define whether these were well define (M. García; pers. email, 21 Jan 2013). It was identified by some interviewees that by having used the standards in this case study with communities participating in Socio Bosque, and potentially using the standards in the future implementation of the Socio Bosque, provides an opportunity to level up to international regimes. As detailed: "REDD+ SES can be used by governments, NGOs, financing agencies and other stakeholders to support the design and implementation of REDD+ programs that respect the rights of IPs and local communities and generate significant social and biodiversity benefits" (CCBA, 2012, p. 3); in this context, as a national-level incentive-based scheme can have important benefits showing how the program is respecting crucial aspects as rights, and social and environmental benefits, and taking into consideration potential risks in the implementation.

However, this process of 'committing' Socio Bosque to these standards, it was also identified as a potential disruptive interaction since these standards are in practice difficult to achieve; as it has been seen throughout these years of the implementation of Socio Bosque, there are complicated cases where the local governance structures are weak and/or complex (e.g. not well organized, corrupt leadership, obsolete regulatory frameworks) or difficult to manage with the program's resources available (e.g. few monitors/field technicians considering the large number of agreements signed and people involved especially in the communitarian agreements) and knowledge of how to work with these local organizations (e.g. lack of staff members with formal education in social sciences with emphasis in knowing indigenous people's cultural and governance structures). With this experience in Socio Bosque and other projects with local and indigenous communities, it was also identified that that for future REDD+ projects with a full implementation of REDD+ SES might result in a complicated task as these are difficult to reinforce in practice (e.g. prior, informed consent among local communities and IPs). It is important to point out that this interaction does not really fall within additional means, but rather an obstacle for both institutions in the way the stakeholders may result complex to deal by implementing these new initiatives.

- **The PNREDD+ benefiting from the established structure of Socio Bosque:**

Besides the benefits highlighted previously, and the ones under cognitive interactions, Socio Bosque has also provided some additional instruments for the development of the PNREDD+. First, it is important to mention that the PNREDD+ was initially developed within the Socio Bosque Program, as it constituted since the beginning as a strategy for the financial sustainability of Socio Bosque. In this regard, it even shared at some point the facilities and financial resources before the SCC was established as a separate Undersecretary within the Ministry. In addition, Socio Bosque has served as a liaison between the PNREDD+ and many local landowners;[29] in fact, it was also identified that with the implementation of Socio Bosque, trust has been created between the landowners and the government which is an important positive benefit for the PNREDD+ to continue working.

Behavioral interactions

It may occur if behavioral changes triggered by the source institution become relevant for the implementation of the target institution and it occurs when the issue areas of the two regimes are closely linked (Gehring & Oberthür, 2008), as in the case of Socio Bosque and the PNREDD+.

- **Confusion and uncertainty about REDD+ create behavioral changes for Socio Bosque's participants:**

It was highlighted by many interviewees (and my own experience working there previously) that confusions between Socio Bosque and REDD+ exist among the diverse stakeholders of both initiatives (government, local and indigenous landowners and CSOs) leading mostly to disruptive interactions. On the one hand (and probably with the most important effects), Socio Bosque (target) is being affected by the confusions and uncertainty that have arisen because of the complexity that REDD+ entitles (through PNREDD+, source). In a sense, Socio Bosque can be seen as more simple and straightforward program, in which there are certain criteria and requirements to enter the program (e.g. land title, participatory process in the case of communities, etc.); also, it is financed until now almost entirely by the Government, and with certain rules or obligations to follow under a standard agreement and with incentives differentiated only in four categories. REDD+ projects need a more complex procedure in which compensations are calculated based on the reduced emissions (MAE, 2012a). However, as Socio Bosque considers REDD+ as one of the potential financing sources, and the PNREDD+ has as one of its area of focus to strengthen the system of incentives including the Socio Bosque Program, the differentiation results difficult to make, especially when not all this information is clearly defined in the government's discourse towards the civil society through its publications and communication/dissemination spaces.

Many actors have criticized Socio Bosque, the PNREDD+, or both. At the local and indigenous communities-level, REDD+ has been causing confusions of how it relates to Socio Bosque and in many cases participants (or potential participants) of the program consider that both initiatives are the same. In the case of Socio Bosque this has led in some cases to potential participants to decide not to participate in the program since they fear that by signing the agreement they will be subject to REDD+ schemes afterwards. In addition, among the participants, there were[30] cases that during workshops with current participants, they would compare both initiatives and demand better explanations of both schemes as they feared they are or will be the same.

[29] being beneficial not only for REDD+ but also to keep preserving the forests for example in protected areas through the National System of Protected Areas.
[30] This based on my own experience.

As one of the interviewees highlighted: "I'm afraid that Socio Bosque becomes REDD+; that is not completely clear for the associations and communities and there is a lot that needs to be cleared; this hasn't been able to be communicated due to the political conditions about REDD+, and the Ministry of Environment hasn´t been really able to communicate clearly its intention, because it generates discomfort…" (S. Vásconez, pers. comm. 13 Dec 2012). In addition, although there have been some previous pronouncements against Socio Bosque and REDD+ from indigenous organizations such as CONAIE, it was pointed out by few interviewees that apparently they have shifted in a sense to evaluate in more detail the pros and cons of the Socio Bosque and the PNREDD+ (this also since many indigenous communities and nationalities had already subscribed agreements with Socio Bosque). As pointed out that the "as we live in a plurinational and intercultural country, communities and nationalities who are the landowners must give their opinion and make their own decisions..." (A. Karakras, pers. comm., 30 Jan 2013).

- **Expectations of the financing sources that REDD+ can provide to Socio Bosque, are quite diverse**:

It has not been identified yet the potential funding that REDD+ can contribute to Socio Bosque; although a preliminary analysis -not yet official- indicated that REDD+ could potentially contribute around 10%. However, since REDD+ remains still speculative and uncertain (Corbera & Schroeder, 2011), the expectations for Socio Bosque can also generate behavioral changes. In addition, as an interviewee pointed out, rapid calculus of what REDD+ can contribute to the country might limited compared to what other productive activities (e.g. oil and mining) can contribute to the country's economy; in addition, REDD+ is carbon-related (even though there is the plus), it will depend on the dynamic carbon market. Uncertain REDD+ financial opportunities might lead to Socio Bosque to keep searching for other sources, as it actually has been doing so far. This would have indeterminate effects; on the one hand, it might be beneficial since it increases Socio Bosque's efforts to effectively demonstrate its environmental and socioeconomic benefits nationally and internationally (governmental and private funds). On the other hand, it might result disruptive if the PNREDD+ cannot assure timely the probable funds it can provide to Socio Bosque.

- **Expected behavioral changes of Socio Bosque's participants can favor later REDD+ initiatives:**

So far it has been assessed for Socio Bosque that very few cases exist concerning intentional deforestation by the participants, as opposed to losses caused by calamities of third parties; although this could be partly explained by the lack or low deforestation pressure under conservation, it is hoped that Socio Bosque's participants may have long-term behavioral changes favoring conservation even though the pressure increases (Fehse, 2012). In this sense, this could be a positive effect or synergistic interaction for future REDD+ initiatives. As identified: "I think that Socio Bosque has generated a change of mentality, as people see a value in the forest, and not only by taking it down... this under a very important principle: repair is much more expensive than to avoid its destruction; in this sense, to make efforts to reduce deforestation is much more efficient than trying to repair afterwards which in many cases it is not even possible" (A. Garzón, pers. comm. 14 Dec 2012).

Impact-level interactions

- **Socio Bosque and REDD+ supporting each other's ultimate targets:**

This kind of interaction occurs from the interdependence of the ultimate governance targets of the institutions involved (Ochieng, et al., 2012). In this sense, both initiatives have been supporting with their goals and actions (and aim to continue doing so) the goals of managing sustainably the

country's forest resources under the umbrella of the Forest Governance Model. Therefore, besides the overlap in the objectives of the two initiatives, there is also an overall in their issue area at the national level: both are concerned with forestry in Ecuador. Hence, the interdependence in the ultimate targets or goals of these two interacting institutions supports each other expected outcomes, or in short, the ultimate target influences the ultimate target of the other regime.

Although REDD+ is a climate change mitigation strategy and its main goal is to reduce tropical deforestation and forest degradation (IPCC, 2007) and for the country to leverage financial resources from doing this (MAE, 2012c), it contributes to reduce deforestation and preserve standing forests and reforestation activities as part of the targets of Socio Bosque. Socio Bosque acts both as an instrument to incentive landowners to preserve standing forests and other ecosystems and reduce deforestation (MAE, 2012c), hence contributing as activities that can be considered as early REDD+ activities. In this case it can be argued that the targets of these two initiatives are "functionally linked" and both influence each other at this broad goal-level synergistically.

Also, climate change is considered within the country's forest resource agenda and 'automatically' supports the goals of managing these resources properly with its diverse ES (e.g. carbon storage, biodiversity and water regulation, which are spatial targeting criteria for Socio Bosque). Forest conservation (Socio Bosque) also contributes to the climate change issues as it supports mitigating emissions from deforestation (MAE, 2012c) but also supporting adaptation measures as locally conditions might be better maintained for livelihoods and environmental resilience: "Socio Bosque also has the potential to improve resilience and adaptive capacity of the rural poor in the face of environmental stresses such as climate change" (Fehse, 2012, p. 1).

- **Socio Bosque and REDD+ might apply or compete for the same areas under conservation:**

On the one hand, Socio Bosque's areas under conservation are not all eligible for REDD+ being a potential risk, or disruptive interaction for the PNREDD+, since (as pointed out also by a representative of the MAE) not all of the areas that are participating in Socio Bosque will be likely to receive compensations for reducing emissions as they might not meet all the requirements of additionally as they have low deforestation threat (MAE, 2011c). In addition, it was identified that REDD+ could eventually compete with Socio Bosque's areas under conservation depending on the resources that REDD+ could offer once projects are implemented. However, it can also be considered that having areas already under conservation agreements can facilitate the future implementation of REDD+ projects or activities; participants may have strengthened their organizational structures and have implemented sustainable land use practices (e.g. through the zoning of their area) from having participated in Socio Bosque, which can result beneficial – synergistic interaction- for the goals of REDD+. This interaction may be complimentary with the previous behavioral interaction regarding the change of mentality and practice of the participants.

Summary

The interactions between Socio Bosque and the PNREDD+ have brought positive and negative effects for one (unilateral interaction) or both programs (symmetrical interaction). Several interactions where found according to the institutional interplay classification; cognitive interactions mainly are synergistic as Socio Bosque has provided (and keeps doing so) a wide range of ideas and experiences for the development of the PNREDD+, and as an important basis for the development of the benefit sharing mechanisms. Regarding interaction through commitment, it was identified that the majority of interactions are additional means, since Socio Bosque

contributes to the development of the PNREDD+ in many ways: map of historic deforestation, platform of experiences and communication, and established structure; the PNREDD+ also provides additional means for Socio Bosque through financial resources from KFW and UNREDD+ and having verified REDD+ SES in communities participating might be potentially a benefit for SB.

Both programs support each other attracting international actors for both potential funding and through their dissemination. Among the behavioral interactions, firstly there are confusions regarding REDD+ and the lack of clarity of how Socio Bosque and REDD+ differ and relate may cause behavioral changes among stakeholders (for instance influencing existing and potential participants in engaging Socio Bosque). In addition, the expectations on REDD+ are quite diverse generating behavioral changes at the policy-making level to search for new financial sources for Socio Bosque. Also, it was identified that behavioral changes may occur among Socio Bosque's participants enhancing their willingness and commitment to preserve the standing forests, even when the deforestation pressure increases, resulting beneficial later for REDD+. Finally, impact-level interactions anticipate synergistic interactions, as both programs aim to reduce deforestation and can overall contribute to the sustainable management of forest resources in Ecuador.

6.3. Interaction management: actions to enhance synergies and mitigate disruption

I present the actions that Socio Bosque and the PNREDD+ have been developing according to the diverse categories that Oberthür (2009) has identified depending on the level of coordination between the two programs (i.e. overarching, joint, unilateral or autonomous). In addition, I identified whether these are regulatory or enabling interactions (Table 8):

Table 8. Classification of interaction management actions found between Socio Bosque and the PNREDD+

Overview of actions	Interaction level	Mode (Regulatory or enabling)
The Undersecretary of Natural Heritage supporting the coordination between Socio Bosque and the PNREDD+ within the Forest Governance Model	Overarching Institutional Framework	Regulatory
Policy-making and coordination meetings between Socio Bosque and the PNREDD+ enhances the interactions	Joint interaction management	Regulatory
Adaptation of the projects that involve Socio Bosque and the PNREDD+ to achieve current needs	Joint interaction management	Regulatory
Enhancing communication regarding Socio Bosque and REDD+: engaging and training local MAE's staff and other CSOs), and generating communication material	Joint interaction management	Enabling
Socio Bosque is searching for financial sustainability from other sources besides REDD+	Unilateral management	Regulatory

Overarching institutional framework

Overarching institutional framework requires decision-making beyond the interacting institutions; these actions can be set by institutions overarching the sectorial governance systems or more integral and cross-cutting institutions (Oberthür, 2009).

- **The Undersecretary of Natural Heritage supporting the coordination between Socio Bosque and the PNREDD+ within the Forest Governance Model:**

Within the Ministry of Environment, *overarching institutional framework* can be identified within the same Ministry and the Undersecretary of Natural Heritage (SPN). In the strict sense, this could be difficult to categorize these coordination efforts as overarching institutional framework since these actions are taking place within the same institution, but from a logic of segregating both programs, this analysis might result interesting as to see where the major coordination efforts are taking place within the Ministry. Based on the interviewees, it was highlighted that the SPN has been the axis of liaison of Socio Bosque and the PNREDD+ as it has been coordinating the meetings to make progress in the implementation of the Forest Governance Model.

Also, it was highlighted from both the government and the CSO's there is a general consensus that both undersecretaries (SPN and SCC) have been achieving a better coordination, especially in the past months (since November 2012 until present) where the lines of action and synergies between forest governance, the PNREDD+ and Socio Bosque are better defined. Specially, it was highlighted that the component of information of the forest governance model (including the deforestation map which is implemented by the Socio Bosque Program) is being consolidated within the SNP, from which many of the actions for REDD+ are dependent on. *Regulatory interplay management* can also describe these efforts from the SPN, as the authority implementing and enforcing measures to obtain better interaction outcomes.

In addition, it was identified that there is a need to enhance the coordination among the country's diverse sectors with strategic objectives in areas that are currently or potentially could be under conservation under the Socio Bosque Program and, eventually could apply for REDD+ projects. In this sense, inter-sectorial management from an overarching interaction management approach is necessary for land planning in the issue areas that apply for both programs (e.g. agriculture, non-renewable resources such as oil and mining, infrastructure such as roads and other major projects, etc.).

Joint interplay management

Most of the actions that both institutions -Socio Bosque and the PNREDD+- are implementing to enhance and/or mitigate the impacts of the interactions were identified as *joint interaction management* in which both programs are aware and coordinate actions:

- **Policy-making and coordination meetings between Socio Bosque and the PNREDD+ enhances the interactions:**

As mentioned earlier, during the last months, there have been important efforts to regain the coordination between both undersecretaries to coordinate the actions that have influence in each program under the umbrella of forest governance. The meetings and "daily" coordination to proceed with the implementation of both policy instruments can be categorized as regulatory, in which Socio Bosque and the PNREDD+ set actions of a procedural character (i.e. according to Oberthur (2009), determining the steps to resolve conflicts and enhance synergies): "In the operative part I consider there are good interactions... in the last month (Nov-Dec 2012) these meetings between the SPN and the SCC were crucial to define the political vision, what we want,

where we want to go, how are going to negotiate, what we will present as a country..." (W. Tene, pers. comm., 11 Dec 2012).

- **Adaptation of the projects that involve Socio Bosque and the PNREDD+ to achieve current needs**:

Since the REDD+ processes had this slowing phase during part of 2012, the main international cooperation projects managed by the German cooperation (technical cooperation through the GIZ and financial cooperation through the KFW) have adapted their projects based on the country's current needs (A. Marín, pers. comm. 5 Jan 2013); in this sense this cooperation has strengthened the current requirements of Socio Bosque instead of focusing entirely on REDD+. Since both programs have agreed on these adaptations, this coordination falls in the category of joint interaction management and regulatory since the programs set measures to use efficiently he cooperation resources.

- **Enhancing communication and information of Socio Bosque and the PNREDD+:**

Communication efforts that both programs have been implementing can be categorized as enabling, which aims at informing better relevant actors about each program. These efforts have been carried out both internally within the Ministry and towards the civil society through material and workshops:

- **Training Ministry's staff members:** Besides the previous efforts at a policy-making level, there have also been trainings to the Ministry's staff members (mainly in the province and regional offices of the Ministry, and staff members of the Socio Bosque Program) in both REDD+ and Socio Bosque to enhance communication and diffusion from the government to the civil society, including potential participants. These capacity-building workshops can be identified as enabling, as they use cognitive elements to enhance actors' capacities to implement the programs.

- **Communication material and information campaigns to enhance the understanding and address misinformation of Socio Bosque and REDD+:** Since the implementation of both programs, diverse communication material has been developed to enhance the understanding of the programs among the main stakeholders. In addition, some of these documents include sections to clarify the relations and differences of Socio Bosque and the PNREDD+: "…in our publications we are detailing important things about Socio Bosque and REDD+ respectively, and differentiating them, to clarify among the participants; with special emphasis that they will have to option to decide whether they want to participate in REDD+ or Socio Bosque" (C. Rosero, pers. comm., 17 Dec 2012).

  In addition, the MAE and the GIZ have launched recently communication material, especially oriented for the forest-dependent peoples, which were piloted in the past month in some communities in the Amazon region. However, it was also identified that there is still an urgent need to expand these workshops and communication campaigns considering the large pool of participants and actors. For Socio Bosque it was identified that the program has effectively used internet, newspaper, radio, television communication channels (besides printed fliers and publications) to increase public engagement with the program, but also identified that it required further communication work in the more remote parts of the country (PwC, 2012). The PNREDD+ could also use these diverse channels, understanding however the complexity of the mechanisms for its understanding among diverse audiences.

Unilateral management

- **Socio Bosque is searching for financial sustainability from other sources besides REDD+:**

Socio Bosque has also done some efforts that can be categorized as unilateral management, in which they are searching for alternative financial sources besides REDD+; this can be seen through the engagement of the private sector and the rest of the civil society in the culture of forest and ecosystem conservation through the new certificates of Socio Bosque. This management may most likely fall into the category of regulatory, in which there is a procedural character, as Socio Bosque determines the procedure to achieve its financial sustainability. In addition, it was also perceived that Socio Bosque has been trying to promote itself without a direct linkage to REDD+ in its diverse communication material, and from some interviewees that this might solve some of the misunderstandings that the linkages between these two programs generate among the stakeholders: "It might be better to separate Socio Bosque from REDD+, clarifying that Socio Bosque can be a system of incentives for conservation managed by the Government, with other goals and monitoring processes… but if it is forced to being REDD+, it still needs so much and it mainly generates conflicts" (S. Vásconez, pers. comm. 13 Dec 2012).

Summary

A type of overarching interaction management (regulatory mode) occurs within the Ministry, in which the SPN is heading most of the coordination meetings and workshops to enhance the interactions between Socio Bosque and the PNREDD+. Three actions recognized are within the joint interaction management including firstly intra-institutional coordination (regulatory mode), in which both programs coordinate actions; specially, there has been and adapting process of the projects that involve financial and technical cooperation according to the current requirements of the country.

In addition, there are enabling interaction management efforts aiming at enhancing the capacities and knowledge of both programs; in this mode, there are trainings of the Ministry's staff members in Socio Bosque and REDD+ to enhance their role as communicators towards the civil society, including potential participants. There have also been several communication material and information campaigns to address misinformation of Socio Bosque and REDD+. Categorized as unilateral management, Socio Bosque is searching for other financial sources besides REDD+. No actions could be found at this lowest level or autonomous management, this mostly because any actions that one program decides to address the interactions are mostly known within the Ministry since they are both part of this governmental institution.

7. Discussion

7.1. Summary of findings

This analysis brings out three main findings for Socio Bosque. Firstly, based on the comparison carried out between Socio Bosque and other incentive-based schemes such as PES, it is still arguable whether it falls into the PES definition or not. As seen previously, Socio Bosque has mostly similarities based on the main criteria that characterize PES and has some distinctive features from which PES and PES-like schemes can learn from. Having these differences in mind, and as the PES definition has been subject to debate, Socio Bosque is better defined as *conservation agreements* or *conservation incentives*.

Secondly, the interactions between Socio Bosque and the PNREDD+ have both brought positive and negative effects for one (unilateral interactions) or both programs (symmetrical interactions), and these range in the causal-pathway approach from cognitive to impact-level interactions. Most of the interactions were identified as *additional means*, in which the existence of one program brings additional resources and tools for the other one (i.e. platform of experiences and communication, established structure, international attraction, financial resources); in addition, most of these interactions are *synergistic*, meaning that the existence of both programs has overall generated mostly positive effects than disruptions (i.e. confusion and uncertainty of REDD+, potential competition on the areas under conservation). However, it seems that the existence of Socio Bosque has generated most of the positive effects for the PNREDD+.

Thirdly, the actions taking place within the analysis of interaction management are mainly coordination efforts within the Ministry to enhance the interactions between both programs and their respective undersecretaries, and actions to enhance the communication towards the civil society; most of these actions fall into *joint interaction management* as both programs are working in a coordinated way as it is for their interest to expand their synergistic interactions.

I will expound on these three aspects in this section: Firstly, using literature about PES and other conservation initiatives within the forest governance, I will discuss the relevance of their concepts and their importance for developing REDD+ mechanisms (7.2). Secondly, using institutional interplay and REDD+ literature I will expand the discussion regarding the interactions between Socio Bosque and REDD+ in Ecuador, heading to a broader analysis of the implications of developing such strategies in developing countries; also I will include recommendations for interplay management to enhance the synergies and tackle the disruptions (7.3). Thirdly, I will discuss some of the limitations of this study and provide suggestions for future study (7.4).

7.2. Socio Bosque and PES: conservation incentive-based tools to achieve environmental and socioeconomic goals

Firstly, I recapture some of the controversies on the PES definition and the implications when comparing them with Socio Bosque. Secondly, I discuss some lessons from Socio Bosque, and PES or 'PES-like' schemes for incentive-based conservation.

Do concepts matter? Debates on PES concepts and its implications for its comparison with Socio Bosque

Although Socio Bosque differs in some ways from the strict PES definition, both these schemes are quite similar in practice as not all PES criteria are fulfilled. As pointed out by Wunder (2008) there

are many “PES-like” compensation schemes in the tropics that meet some of these criteria for not all five; and there are probably not more than a couple of dozens of experiences globally that fit all five criteria. However, Socio Bosque makes an explicit clarification that it is not a PES nor REDD+ scheme; considering that REDD+ is a type of PES scheme, it is relevant to once again state that following a strict PES definition it would not be considered as one, but broadening the analysis of PES as a more adaptive tool, ‘PES-like’ and Socio Bosque result quite similar.

Furthermore, “despite the precise definition of PES, this concept opens the floodgates to an extremely diverse array of interpretations” (Pirard, et al., 2010, p. 6). For instance, the nature of the two contracting parties (provider and buyer) is inexact, allowing other actors that control the resources such as the state, private sector, landowners, concessionaires and individuals; also, as indicated before, the term payment can be interpreted more broadly as a reward (Pirard, et al., 2010; Wunder, 2005), as in Socio Bosque that prefers incentives or rewards with a more equitable connotation (MAE, 2012a) rather than payments.

In addition, aspects such as simplicity, efficiency and equity in PES are not as clear as it seems; it has been argued that the simplicity (and hence efficiency) might be diverting attention from the real causes of deforestation and degradation as PES focus mostly on the symptoms (Pirard, et al., 2010). The equity feature is also debatable when the nature of providers (e.g. rich over poor landowners) and buyers is not fully considered into the implementation process (Pirard, et al., 2010). For Socio Bosque these issues have also caught attention among some of the interviewees, as it results relevant to pay attention to the balance between the simplicity that characterizes the program (i.e. straightforward incentive scheme and low transaction costs) and the efficiency both in economic and environmental terms (i.e. addressing the real causes of deforestation, maintaining the integrity of the areas under conservation, and the socioeconomic conditions of the participants).

In a recent publication, Muradian et al. (2013) capture and assess some of the main debates on PES including aspects such as the closeness to markets; also the way institutions and power shape their design and outcomes and the controversial compensation logic, among others. Some of these aspects that apply to discuss Socio Bosque are elaborated:

a) Not all PES schemes are markets; Socio Bosque is not a market scheme either

Even though PES were considered as markets reflecting the scarcity of services and therefore ways of internalizing the costs of the degradation of ecosystems (Engel, et al., 2008), in practice, very few existing PES can be categorized as pure markets (Muradian, et al., 2013). Most PES do not fulfil the strict criteria that define markets (i.e. high commoditization and high conditionality) (Muradian, et al., 2013; Wunder, 2008). The degree of commodification of the ES referring to the degree and clearness of the compensation to the provider can result difficult to determine; in many cases the definition of the commodity can be blurry based on the relations among land use and the provision of ES (Muradian, et al., 2010). Socio Bosque, along with the national PES programs from Costa Rica and Mexico, identified that its uniform payment structures are not an effective approach to obtain environmental results, beyond the ones under normal conditions, regardless of their simplicity and low administrative costs (hence, showing a low environmental additionality) (FONAFIFO, CONAFOR y MAE, 2012). Giving more weigh to reward environmental stewardship (as Socio Bosque) instead of additionally has been considered as a political reason, as seen in similar analysis where the outcomes of payments depend to a large extent on the interplay of political forces (Vatn, 2010).

From a broader perspective, PES aim to create incentives to assure the provision of the services by changing social behavior (individual or collective) which otherwise would lead to a deterioration of the ecosystems (Muradian, et al., 2010). Therefore, PES require coordination of various actors to enhance its socioeconomic outcomes resulting convenient to define these as a "transfer of resources between social actors, which aims to create incentives to align individual and/or collective land use decisions with the social interest in the management of natural resources" (Muradian, et al., 2010, p. 1205). These transfers can occur through different mechanisms such as markets, incentives or public subsidies (Muradian, et al., 2010). Hence, nor all PES, and this case also Socio Bosque, are automatically market transactions. Socio Bosque can be excluded from the "market transaction" definition since it involves incentives aiming at changing or maintaining a certain land use through the monetary incentives which are transferred directly from the government to the landowner, falling into the broader definition stated earlier in this paragraph. In addition, regarding the critiques around commodification of nature, the question still remains whether Socio Bosque can be defined as a process of commodification, as it not precisely fits within these definitions of exchangeable goods or services (as ES), but it does add a monetary value to the conservation of the forests which did not occur previously.

b) PES and Socio Bosque depend on the political, institutional and socio-cultural contexts

It has been suggested that the outcomes of PES strongly depend on the political, institutional and socio-cultural contexts in which they are implemented and they are part of broader structures of power (Muradian, et al., 2013). Pressure groups might have crucial influence on the design of payment schemes, determining their effectiveness and distributional outcomes (Corbera, et al., 2009). Also, emphasis should be given to the process of policy design since the design of PES cannot be "depoliticized" (Muradian, et al., 2013).

In this political context, Socio Bosque received high-political support speeding up the process for the ministerial decree to launch Socio Bosque; however, this process has been also criticized by some CSOs due to the concerns regarding a lack of consultation with civil society (PwC, 2012). In addition, this political support was also due to the linkage of Socio Bosque to Ecuador's National Development Plan, which targets tackling deforestation and poverty issues, and increasing protected areas (PwC, 2012). Also, Socio Bosque directs its incentives (although not all) for those who have been historically preserving these native ecosystems (MAE, 2012a) under a stewardship approach (hence, it seems like a more political reason). Although it still hasn't been proven how much reduction of deforestation the program has achieved since its implementation, it still remains as a need to determine at what extent it will achieve this goal since many of the areas that are participating were already under conservation and might have remained like this without the incentives (FONAFIFO, CONAFOR y MAE, 2012). In any case, as it has already been pointed out, for REDD+ to develop, the deforestation risk must exist and many of these Socio Bosque areas might not be applicable (MAE, 2012a). In addition, with the recent re-election of the current government (Feb. 2013) Socio Bosque might have more opportunities to continue with its financial annual pre-assignations as a program that started with this government more than four years ago.

The socio-cultural scenario is particularly important in for Socio Bosque, where the collective landownership represent such a high percentage of hectares and beneficiaries achieved so far. As seen in PES and other IBPs, monetary incentives might create disruptions when collective groups are not entirely organized. Hence, a better understanding of these behavioral and governance dimensions is needed, before rushing into payment schemes that might not be the most appropriate policy option (Muradian, et al., 2013). Also, my impression carrying out this thesis is

that the emphasis to distinguish Socio Bosque from PES is mainly a societal reason. The term PES brings out more controversy than the label 'incentives for conservation'. In that sense REDD+ and its link to Socio Bosque also creates controversy, as besides being a debatable topic in the international spheres, is created controversy at the local and national levels as it seems that the discourses of both commodification of nature and the reward model might not be accepted among civil society.

It has also been suggested that PES should be designed as a tool guiding production practices benefiting the environment and creating wealth and revenue (Pirard, et al., 2010). In this sense, it has been proposed that Wunder's definition could be elaborated as: "i) a voluntary transaction in order ii) to preserve or enhance at least one well-defined environmental service, between iii) at least one provider, iv) who clearly cannot be subject to the polluter pays principle, and v) at least one buyer, vi) who offers a payment over a limited period (vii) as a means for investment in locally productive and sustainable activities" (Pirard, et al., 2010, p. 17). Although Socio Bosque does not fit completely this definition either, does emphasize that the incentives are meant to invest in sustainable activities for the landowners participating. In addition, as pointed out by some of the interviewees, Socio Bosque can fit within the *CAs* definition, as a tool for creating incentives (see Nietsen et al. 2010), or just plain *Incentives for Conservation* to prevent more confusion with PES schemes. To address the confusions between Socio Bosque and the PES definition, it may result relevant in further publications emphasizing that Socio Bosque is not a MES. In addition, although this study encountered similarities, the differences pointed out between PES and Socio Bosque might have to be kept as to prevent even further confusions among non-technical audiences.

Lessons from Socio Bosque and PES or 'PES-like schemes' for incentive-based conservation

There are several lessons resulting from this research on Socio Bosque as a conservation government-led scheme –lessons which in some cases overlap with those from PES – which can be useful for enhancing both Socio Bosque and the PNREDD+:

Schemes such as Socio Bosque, PES and 'PES-like' must balance tradeoffs between diverse goals: Although PES have been considered in the past decades as tools to solve complex policy problems, policy-makers and practitioners need to consider important issues including "...the quality and effectiveness of rule-making where there are conflicting interests, the validity of assumptions underlying the decisions, and how to face trade-offs" (Muradian, et al., 2013, p. 4). It has been suggested (Muradian, et al., 2013) that PES cannot be considered the most cost-effective policy option to achieve environmental and/or development benefits, as argued by some (Ferraro & Kiss, 2002). Previous experience with IBPs suggests that PES schemes are unlikely to simultaneously improve livelihoods, increase ES, and reduce costs (Jack, et al., 2008). Socio Bosque must also assure that it can achieve its goals in conserving the remaining native ecosystems and improving living conditions of its participants (i.e. achieve ambitious multiple goals). There must be a prior assessment of potential tradeoffs between these goals, taking into account the correlation between characteristics of (poor) landholders and their land, characteristics of the costs and benefits of providing ES, and the political feasibility of diverse policy options (Jack, et al., 2008).

IBPs can also aim for contributing to long-term socioeconomic benefits:

As it has been assessed for PES schemes, the welfare effects on the providers of ES are generally determined by the rules of the PES game (e.g. payment rates and modes, conditionality, monitoring), which in public, nation-wide schemes are usually pre-set by the buyers (Wunder, 2008, p. 286). Also, the participants may also be surprised by the *ex-post* livelihood impacts (e.g.

due to under-estimated opportunity costs) and local-economy derived effects (e.g. changing land or labor markets) or simply make irrational decisions (Wunder, 2008, p. 286). A challenge for Socio Bosque is to make its incentives enhance the livelihoods of its participants; these incentives can be considered as "seed" funds for productive activities that later can bring more financial resources (e.g. eco-tourism, agricultural activities, community banks). In addition, among the communitarian participants, assuring equity, transparency, participation and investment in sustainable activities are imperative to ensure socioeconomic benefits (Podvin, 2011). Strengthening the participant's capacities is required to enhance the impacts of the benefits in the ability to plan, use and report the use of the funds in a proper way. However, the requirement of the resources to enhance these capacities (e.g. time, money, technicians) means also higher transaction costs. A combination between self-learning processes of the participants, alliances (governmental and CSOs) that can support these processes, and own Socio Bosque's efforts can support to achieve these goals.

The potential impact of 'PES trapped' into lasting negative livelihood outcomes, for instance when long-term land-use deals were signed under asymmetric access to information or power (Landell-Mills & Porras, 2003) might apply to Socio Bosque if in the cases of communities the information to enter the program was not widespread or the benefit sharing is not equitable among the community members (Podvin, 2011). However, it has been assessed that this 'PES-trap' has not been yet proven (Wunder, 2008), but it still remains important to provide communities and small-holder landowners with more information of the value of the ES, and the realistic compensation levels and land-use changes (Wunder, 2008, p. 294).

Some important aspects for CAs is assuring long-term financing, including options such as PES, trust funds, and relationships with the private sector (Nietsen, et al., 2010), as Socio Bosque is doing at the moment. In addition, to include more concrete plans among the implementers with respect to arrangements for long-term management of the agreements (Nietsen, et al., 2010). In this case, project where the areas under conservation in Socio Bosque are heading after the 20-year agreement period. As seen for PES little systematic 'with or without PES' welfare assessments have been carried out (Wunder, 2008), and since ES are provided over time, it is necessary to have a projection of what would happen without the implementation of the PES schemes (Wunder, 2007, p. 51). In this sense, although Socio Bosque could still be considered a 'young program' and the socioeconomic and environmental impacts have not been assessed in detail yet, the question remains whether the effects if the participants and the areas under conservation would be doing the same, better-off, or worse with the program.[31]

IBPs must assure that (integral) environmental goals are achieved:

Instead of considering PES as policy panaceas, attention has to be paid to the conditions under which these can have significant contribution to the conservation of ecosystems (Muradian, et al., 2013). In addition, an integral approach between multidisciplinary teams including ecologists and economists can provide better information regarding the production of ES, improving the environmental effectiveness; it also has been highlighted that more research can also focus on the diverse trade-offs and synergies for the production of multiple ES (Jack, et al., 2008). In this sense, the integrity of the ecosystems under conservation with Socio Bosque must also be assured; since the current monitoring only considers forest or ecosystem cover, and not the quality of the forest, additional measures should be implemented to ensure that more ES are maintained and

[31] However, this might result complex as no socioeconomic nor environmental baselines where established before the creation of the program.

generated within these areas.[32] In addition, as the incentives do not cover the opportunity costs, the re-structuring of incentives periodically might be relevant to ensure that the landowners are still willing to protect the forests for the 20-year agreements. In this sense, committing themselves for such a long term, with uncertainty in several aspects (e.g. economic needs, demographic or external pressures on the land use, and conflicts among the members and/or neighbours) might result complex as the future in assuring conservation is uncertain.

Moving beyond socioeconomic and environmental, enhancing co-benefits:

Pirard et al. (2010) assessed two contrasting PES approaches: *use-restricting* PES (involve the cessation of activities tackling environmental degradation such as forest conservation schemes) versus *asset-building* (which aim at changing practices); it has been suggested that the former can result more transitory and flexible because payments may stop anytime, whereas the later can provide long-term effectiveness although it needs more initial investment (costs and training). In this sense, although Socio Bosque has been considered in this analysis as a *use-restricting* scheme, it may need to address aspects such as stronger capacities among its participants for a better use of the incentive (Podvin, 2011) and the long-term commitment to maintain/change the conservation land use; also, focusing on *asset-building* approaches, for instance by promoting land use change to sustainable practices or through the new restoration incentives.

Although PES implemented in developing countries are starting to have interesting findings, new projects –and existing ones− will have to learn from the successes and failures of previous initiatives in the way the outcomes relate to the environmental, socioeconomic and political contexts, and these are systematically documented and compared between cases (Jack, et al., 2008). All the lessons in this respect can feed the future development and implementation of IBPs in the country, applicable also to future REDD+ projects.

7.3. Studying interacting initiatives in forest governance

Firstly, I discuss implications of using institutional interaction and interaction management to assess programs at the national level. Secondly, I discuss further potential challenges and contributions resulting from the interactions between Socio Bosque and the PNREDD+. Thirdly, I provide further insights of these programs within the Forest Governance Model.

Using institutional interaction and interaction management to assess institutions

Institutional interplay and interplay management were used for analyzing two programs that are being implemented at a national level in Ecuador (although REDD+ is an international regime), when these approaches have been used so far for international regimes. There has been only one research suggesting that frameworks developed to analyze interaction at the international level can also be easily applied at the national level (see Ochieng et al. 2012). In this sense, it becomes pivotal to highlight the potential of expanding the application of these theories (institutional interplay and interplay management) to other initiatives in the environmental arena. However, it is necessary to assess the limitations these exercises may have as not all the categories fit the criteria that apply for programs implemented nationally.

Research on interaction management is particularly relevant where interactions are intense and their importance is recognized (Visseren-Hamakers, et al., 2011). In this particular case, it seems

[32] Although a new biological monitoring pilot has recently been implemented in an area under conservation in the Coast region, and the plan is to expand these activities to other areas of the country by establishing alliances with conservation NGOs (C. Rosero, pers. comm., 17 Dec 2012).

the interactions are intense as the implementation of both programs is having relevant impacts which have to be considered in the short, mid and long-term. However, the importance of these interactions has not been studied yet previous to this analysis; hence, it is relevant to continue in this line of research to enhance both programs. In addition, when two programs are designed and implemented, it results complex to have certainty of the effects that they will have on each other. As Socio Bosque has been established previously than the PNREDD+ (Fig. 6), the disruptive effects could not really been considered in the design phase (e.g. having REDD+ as an important potential financial contributor. In this sense, policies also need to apply adaptive management and enhance the interactions on the run through learning processes. In addition, disruptive interactions have to be addressed timely and efficiently; once the sources and nature of the interactions are encountered, action plans must follow.

Enchaining the synergies and addressing the conflicts between Socio Bosque and the PNREDD+: A call for interaction management

Besides the existing cases of interaction between Socio Bosque and the PNREDD+, there might be a great potential for future co-evolution of both programs; there is also a need to enhance interaction management among policy-makers and practitioners to obtain better outcomes. To determine at what extent Socio Bosque would be doing the same, better or worse if the PNREDD+ would not exist in the country (and vice versa), from this analysis I suggest that the existence of both programs does indeed support the development of the other. There are needs to continue enhancing these programs individually to achieve further synergies and tackle disruptions; this by strengthening from the highest level of forest governance to focalized activities for each program. I shortly discuss the contributions, challenges and requirements at these three levels:

Firstly, Ecuador has already a guiding framework of how they conceive the forest governance for the country being a great starting point for further synergies among Socio Bosque and REDD+. Whilst some components of this model still need to be enhanced and/or developed (e.g. forest control and administration, and non-monetary incentives, land planning and regularization of land tenure), relevant components under implementation (such as the information and monetary incentive systems) support the overall development of Socio Bosque and REDD+. Also, as pointed out by interviewees, the forest governance needs to be raised from the action document (MAE, 2011b) to a policy status. Hence, strengthening the forest governance and all its components as an effective umbrella for both Socio Bosque as a conservation incentive tool and REDD+ as means to reduce deforestation, should be prioritized within the MAE. Also, the coordination between the two undersecretaries heading these policies (forest governance, Socio Bosque and REDD+) needs to continue and be enhanced to achieve integral goals. Overall, this would be a call to enhance joint interaction management within the Ministry.

There is also a call for enhancing overarching institutional framework for integral results. At the highest level, the Secretary of Planning and Development (SENPLADES) would be the governmental institution that would have to set the overarching rules to manage the interactions between these two programs, as it coordinates diverse sectors to achieve the PNBV. In this sense, it results pivotal that both initiatives coordinate timely with other sectors that play an important role in land use in the country (especially those that can overlap, such as oil, mining, agriculture and infrastructure).[33] As it has been assessed for REDD+, it is necessary to link REDD+ policies to

[33]"Strategic sectors in Ecuador, such as agricultural expansion, mining and oil extraction can make the conservation scenario complicated to achieve; it is necessary to enhance the inter-sector interactions, in the sense that conservation goals, such as Socio Bosque can be integrated into the land use plans. In this case, for instance SENPLADES as the

broader national objectives; this to contribute to the country's sustainable development and so policies don't overlap with other government policies from strategic sectors (MAE, 2012c).

Secondly, it is important to highlight the significant efforts that Ecuador has made in order to preserve the remaining forests and reduce the deforestation in the country (i.e. not only with Socio Bosque but also with its national system of protected areas) regardless of the implementation of REDD+; the country is not only relying on external funding from mechanisms such as REDD+ but also investing from its own internal (governmental) sources. The Ecuadorian government seems to maintain its credibility on Socio Bosque, with proofs such as the expansion of the incentives for active and passive restoration and the increment of the incentives (MAE, 2012a). A general perception throughout this research is that the country has gained credibility among civil society (i.e. local landowners and organizations supporting the initiative) in its own commitment to preserve the remaining native ecosystems. However, it still remains necessary to proof with solid evaluations the diverse benefits (Podvin, 2011).

As former employee of Socio Bosque, I suggest there needs to be a balance between the goals reached and the quality of the processes in the sense that the institutional capacities might result limited in important processes. For instance, the high results obtained so far (i.e. large area covered and beneficiaries) might require at some point higher numbers of personnel and implementation and monitoring efforts to assure the best quality outcomes. Also, there is still a need for Socio Bosque to move on from a governmental program to a state policy to assure its long-term viability. Hence, it seems Socio Bosque as a policy tool under implementation and with credibility can continue providing excellent lessons for the PNREDD+ and in the areas where they interact. Also, it has been identified the need to implement complimentary activities for the conservation of native forest, including sustainable forest management, reforestation and afforestation, as well as complementing incentive with other control policies in the forestry sector to effectively achieve a reduction in deforestation and forest degradation (MAE, 2012c).

Climate change currently represents threats to the living conditions of human societies, and even more to the more vulnerable (Burroughs, 1997). Engaging local communities in programs such as Socio Bosque can result in an interest response to climate change related programs and environmental degradation, whilst creating opportunities to promote sustainable development. It is important to consider that although Socio Bosque is one of the activities to mitigate climate change as it aims to reduce deforestation and its related GHG emissions (MAE, 2012a), it can also be an adaptation measure (Podvin, 2011; Fehse, 2012) as it seeks to improve the living conditions of the beneficiaries and the resilience of the ecosystems and the services these provide.

Although there are still projections that REDD+ will contribute to the financial sustainability of Socio Bosque, it is relevant to mention that "the prospect for economic rents (the value of carbon credits beyond what is needed for covering all the costs needed to curb deforestation, including a normal remuneration for the investor) will be limited. This is because the price of avoided emissions (or ''carbon prices'') is likely to remain weak due to the bleak prospects for an inclusive international agreement for reducing dramatically GHG emissions" (Karsenty, et al., in press, p. 8). This being said, it remains uncertain how will REDD+ contribute to Socio Bosque's financial requirements, and even more that it will exceed the projected future contribution. Hence, it is appropriate Socio Bosque's efforts to continue searching and ensuring for other financial sources. This would be a call of unilateral management by Socio Bosque in order to continue its

regulatory secretary of the government can act as liaison between the diverse strategic sectors and regulate that these do not overlap" (M. Lascano, pers. comm.,17 Dec 2012).

independence regardless of the future implementation of REDD+. Also, an important challenge that Socio Bosque faces, and eventually REDD+ projects in Ecuador, is to understand in more depth the local governance structures.[34] This could be a call for joint interaction management between the two programs as to enhance their staff's capacities, share experiences and/or use appropriate alliances for solid interactions with the local and IPs communities.

Thirdly, regarding REDD+, although it represent both promising and complex and uncertain scenarios worldwide, for Ecuador it also seems relevant how the country will progress in its REDD+ processes. As it has been suggested in a political economy analysis by Hiraldo and Tanner (2011), the future of REDD+ decision-making processes is likely to be (remain) complex, as part of a decentralised and power-embedded network where there is a convergence of diverse interests, narratives and actors (Peskett & Brockhaus, 2009). As concluded in a recent editorial review (Visseren-Hamakers, et al., 2012, p. 589) "scope, scale and pace of REDD+ are still subject to negotiation and compromise; only if these are dealt with in a legitimate, accountable and equitable manner will REDD+ fulfil its potential". Some of the main challenges for the PNREDD+ include engaging effectively civil society, communities, IPs and nationalities in this preparation phase; identifying the drivers of deforestation for effective reduction of deforestation and its GHG; ensuring environmental integrity, assuring a transparent and accurate information and monitoring system; and continue seeking for bilateral and multilateral contributions timely (MAE 2012).

Another challenge is to generate technical and institutional capacities, as well as legal and financial structure for the implementation of REDD+ policies and measures (MAE 2012). An important institutional aspect regards to the personnel permanence within the MAE; frequent changes of staff members might slow processes down. Also, the adaptation process that the PNREDD+ has experienced is an example of adaptive management in response to the country's conditions and needs. This has been either conceived by some an effective way of communicating the program to the diverse stakeholders, whilst for others, these changes on the PNREDD+'s components has created a degree of uncertainty on where the REDD+ processes are heading. Hence, the PNREDD+ needs to assure solid steps in moving forward in its readiness phase and increase its credibility among its various stakeholders. Therefore, there is a call to continue with joint implementation regarding a better communication of REDD+ among Socio Bosque's stakeholders (and vice versa), and a call for unilateral management from the PNREDD+ in order to provide a better basis for potential funding sources for Socio Bosque.

Socio Bosque and the PNREDD+ achieving the forest governance goals

Also, Socio Bosque can fall into one of the "new modes of forest governance" as it constitutes the system of incentives with a change of paradigm of the conventional government command-and-control measures (MAE, 2012a), and as an adaptation between the governance modes of *marketization* (since Socio Bosque is not precisely marketing but rather incentivizing) and *participation* in which local landowners are monetarily incentivized to protect the forests.

It would also be appropriate to assess Socio Bosque and the PNREDD+ within the good governance criteria (see Broekhoven, et al. 2012). For instance, access to information (e.g. how the diverse stakeholders have access to all the information required to make sound decisions regarding their

[34] "Socio Bosque needs to understand in more depth the local governance structures of the communities and local landowners…comprehend in more detail the ideological and political views and structures of these organizations to enhance the achievements and tackle the internal conflicts...I consider Socio Bosque is a good initiative but it is necessary to understand that communities have very diverging governance structures (e.g. demographic growth and the concept of reserve to inherit instead of reserves for conservation purposes; in addition, an appropriate financial management of the incentive" (S. Vásconez, pers. comm., 13 Dec 2012).

participation); cost-effectiveness (e.g. how much Socio Bosque costs in relation to the benefits to its participants and to the rest of the society); multi-actor deliberative participatory processes (e.g. with which the PNREDD+ and Socio Bosque are properly engaging the diverse stakeholders); transparency and accountability (e.g. with which the communities are being transparent, accountable, fair and equitable regarding benefit sharing both towards the local members and towards the government); sustainability (e.g. how Socio Bosque's incentives are being invested on sustainable activities or the financial sustainability envisioned by both programs); and the capacity for continuous learning and ability to adapt to learned lessons among those involved in the participatory processes (e.g. how at several levels of governance, such as at the decision-making both programs are learning and adapting considering the lessons learned for further development and within the participants, the communities are learning from their previous mistakes).

Socio Bosque has been highlighted as an alternative to the usual command-and-control strategies in the forest sector as they comprise incentives to reward conservation; however, it would be interesting to assess whether this program (and the PNREDD+) is truly a new forest governance strategy or a more political governmental program; in this sense, it has been questioned several times the socioeconomic and environmental repercussions if Socio Bosque would come to an end. As pointed out for some PES schemes, paternalistic expectations may cause disruption when these are not met (Robertson & Wunder, 2005). This might be particularly important to highlight since a market scheme under a logic of delivering services and receiving the payment might in some way result less politized than incentivizing stewardship. Hence, a way of preventing this might be creating a certain independency of a governmental program moving towards a more "technical" program where the rules are set in the way that combines the service provider logic, and a change of positive behaviour. A challenge is to strengthen the efforts made by the country to effectively reduce the deforestation, ensuring environmental integrity in the implementation of policies and measures related to the REDD+ mechanism, and important for forest governance (MAE, 2012c).

7.4. Limitations and recommendations for future research

This research might have some limitations which are important to highlight. Firstly, it is important that even though the period of the thesis since the proposal stage to its final stage (around 6 months) the two initiatives –Socio Bosque and the PNREDD+– might have progressed or changed. Hence, some of the results might be subject to change based on the newest stages. Secondly, reflexivity must be considered within the analysis both from the interviewees and me as a researcher. Although the interviewees' comments contributed to answer the research questions, and complemented the literature review, these cannot be strictly considered as the views and positions of the institutions they represent since also they have personal views that can contribute to the discussion. Also, as former employee of Socio Bosque I also included my perspective in several aspects addressed in the analysis. Thirdly, although I tried to include the views and opinions of diverse stakeholders, many others would be necessary for a more thorough analysis. For instance, Socio Bosque and REDD+ (potential) participants and other CSOs that are working closely to these programs ore related field would be necessary to interview to expand the views.

Regarding the analysis, there are two main limitations or areas of opportunity for further research. Firstly, comparing Socio Bosque and PES can be done at several levels and considering diverse criteria (considering that PES are quite broad in practice); however, for simplifying the analysis some of the key features were considered for this research (i.e. typology, terminology, definition). Further thorough analyses can be done comparing other features of the programs, such as the

financial structure (e.g. differences in incentives, sources), legal framework (conditionality regarding obligations on the agreements), environmental versus socioeconomic benefits, among others. This research however, constitutes a first approach (although not detailed) to analytically compare these two schemes providing hints where other comparisons can focus later.

Although there are plenty analyses regarding PES (Wunder, 2005; Wunder, 2008; Muradian, et al., 2013), it seems there are not enough assessments of other forest conservation incentive-based schemes such as Socio Bosque, which can be considered as a requirement for further research. In this sense, although in this particular case, PES might have the closest definition to compare it to Socio Bosque, IBPs, CAs and conservation incentives may require further conceptualization to have a better defined bundle of conservation incentive-based schemes within environmental policy instruments. In addition, from the aforementioned discussion relating PES and Socio Bosque, it has been highlighted that "due to the expansion of the implementation of the instrument, we consider it timely and necessary to question the possible implications of changes to the spatial and temporal scales of the PES concept" (Pirard, et al., 2010, p. 7); this research is needed "when the discussions are increasingly focused on the translation of the REDD+ mechanism into a multitude of forest conservation PES" (Pirard, et al., 2010, p. 7). The future inclusion of avoided deforestation activities as a source of carbon credits under the UNFCCC may also impact existing PES (or PES-like) programs in developing countries and lead towards the inclusion of new eligible activities and project implementation rules (Corbera, et al., 2009).

In this sense, further analyses of interplay and interplay management for different PES schemes (research area which has been least studied so far in PES field) implemented in different countries and at different scales need to be undertaken with urgency (Corbera, et al., 2009). Hence, the analysis of the Socio Bosque under these approaches –as this thesis– aimed at contributing to these research needs. Interaction management still requires further research since little is known about the policy responses various actors have applied at diverse levels and how they have performed (Gehring & Oberthür, 2008). The starting point to overcome this and to develop policy options to enhance synergy and mitigate conflict under particular conditions for their successful implementation would be to develop empirical research into existing policy responses and their performance over time (Gehring & Oberthür, 2008). In addition, as recommended by Corbera (2012), aspects that are relevant for both Socio Bosque and the PNREDD+ include analyzing the engagement of actors in the design of REDD+ policies and projects, principally in the formal and informal means of recognition and participatory processes, examining carbon commodity chains under these schemes, assessing the distribution of benefits and who bears the costs and the underlying reasons, and how the REDD+ incentives might affect conservation behavior.

Although institutional interaction and interaction management were interesting approaches to study these two programs, they present some difficulties when they have been mostly developed to address the interactions in international regimes. However, in practicing policy measures, many times the effects that one program is having over another with related targets and stakeholders, results pivotal and might be underestimated and/or ignored.

8. Conclusions

Throughout this thesis I have aimed to provide further insight of the Socio Bosque program, a government-led forest (and other native ecosystem) conservation incentive-based scheme implemented in Ecuador. Since Socio Bosque is sometimes confused with both PES and REDD+ schemes, and since there is still uncertainty on the how Socio Bosque and REDD+ are interacting, this research aimed at better understanding Socio Bosque by collating it with other schemes that involve payments for conservation and are being the basis of experiences for the development of REDD+ policies. Two main goals were core of this study: a) Identify the differences and similarities of Socio Bosque with other incentive-based conservation tools such as PES; thereby trying to answer the question, can Socio Bosque be considered a PES scheme? b) Assess the interactions between Socio Bosque and the PNREDD+ and the actions that are being implemented or considered to deal with these interactions.

How Socio Bosque has been conceptualized, differs or resembles from other more common programs such as PES. However, looking at how PES have been developing in practice, we can conclude that Socio Bosque can result in a 'PES-like' scheme although it shares several distinctive features from the strict PES definition. Socio Bosque meets some of the criteria that define PES, such as voluntariness, conditionality and specific land use; on the other hand, it is distinctive from PES, as it does not calculate the level of threat and opportunity costs (criteria defining the efficiency of PES). Moreover, there are some features which can be considered as differences or similarities according to diverse PES schemes; thus, measurement and monitoring of the ES, and consequently differentiation of incentives or payments are in theory different for PES schemes. Although both PES and Socio Bosque require clear and secure land tenure, Socio Bosque requires land title. Socio Bosque's explicit social goals of improving the living conditions and reducing poverty (suggested to be more environmentally focused for PES, although welfare and poverty alleviation are in many cases complimentary goals) and the legal, political and social contexts in which the schemes develop might be different for each country.

Socio Bosque could be defined as a *voluntary* scheme through which *conservation* (specific land use) *agreements* are signed among individual or communitarian/collective landowners and the Ministry of Environment who provides *direct economic incentives conditional on compliance* of the agreements. Nonetheless, Socio Bosque can be closer to a simpler definition such as *incentives for conservation* or *agreements for conservation*. After having seen all the diverse debates on PES, do concepts really matter when aiming at achieving conservation linked to sustainable development? Since labeling Socio Bosque as PES arrays some negative connotations among certain stakeholders, it is important to exclude Socio Bosque from the market-scheme definition (since also not all PES are markets). Another important lesson from all these diverse conservation incentive schemes is that there is no "one-size fits all recipe"; the programs may have to adapt to the diverse political, legal, institutional contexts in which they develop. In addition, PES schemes seem to be more commonly studied (and systematically documented), providing a number of lessons that can inform the future implementation of Socio Bosque and the PNREDD+.

I suggest that concepts don't really matter; what matters is assessing, documenting and sharing the successes and failures of these diverse schemes. In this sense, Socio Bosque, 'PES-like' and PES schemes provide a wide range of experiences both in terms of linking conservation to sustainable development and for the development of REDD+ initiatives. Some of these lessons include balancing trade-offs of the diverse goals; this being said, incentive-based programs may also contribute for long-term socioeconomic benefits, integral environmental impacts and generating co-benefits (e.g. by providing adequate information, enhancing participatory processes,

strengthening capacities for adequate investment of the incentives and land use practices, and sustained and long-term projections).

Socio Bosque seems to offer promising environmental and socioeconomic benefits as a government-led initiative with steady progress by incentivizing local landowners' conservation efforts. However, filling gaps in its design and implementation, learning from previous mistakes, adapting with the evolving conditions of the country (and its main stakeholders: the participants), assuring that the incentives are sustained and are properly invested, and promoting proper conservation of the native ecosystems, will enhance the opportunities for its success. The PNREDD+ has also progressed in its readiness phase and several policies and measures underway. However, it requires clarifying the country's REDD+ approach, and moving forward with firm steps to assure effective engagement of the civil society and local landowners and communities. Also, identifying and addressing effectively the drivers of deforestation, ensuring accurate information and monitoring systems, and enhancing the institutional capacities and the legal and financial frameworks for the implementation of REDD+ policies and measures (MAE, 2012c).

The development of the PNREDD+ parallel to Socio Bosque has created some impacts that, according to this study, are mostly synergistic for one or both programs. These range from ideas and experiences, additional instruments (e.g. tangible products such as the deforestation map, financial sources and recognition in international arena) to some behavioral changes among the participants and finally supporting each other goals. However, disruptive interactions are also occurring. Hence, there are several confusions and uncertainties on REDD+ provoking some behavioral changes among Socio Bosque's participants. In the future, REDD+ projects might compete for the same areas with Socio Bosque. Also, some synergistic interactions might become disruptive if these two initiatives do not enhance firmly their coordination efforts.

A main recommendation includes assessing the occurring interactions –as these two programs have overlapping objectives and stakeholders– and project actions to address the disruptions timely and efficiently. Although interaction management has been taking place at the policy-making level, there is still a need for both programs to enhance their coordination and do not take for granted that the disruptions will solve themselves. In this sense, effective multi-sector planning to achieve both Socio Bosque's and REDD+ goals is required (i.e. through overarching institutional framework engaging SENPLADES and applying good forest governance). Moreover, the programs need to enhance their coordination from a daily basis to long-term efforts (joint interaction management), assessing what is functioning, what not, and implementing creative solutions. In addition, the learning process that the PNREDD+ and the REDD+ initiatives can have from Socio Bosque and other development projects is pivotal; for example, not doing the same mistakes, and learning and addressing the weak and unstable governance structures.

Overall, Socio Bosque has so far been a fast-growing initiative with its beneficiaries and area under conservation, and with potential for achieving larger results. The PNREDD+ has already stepped forward with its preparation, and required measures and policies. Hence, it results pivotal to assess and act promptly and efficiently so that both programs work along in delivering sustainable social, economic and environmental benefits for the country. Promising results accompanied by hard work await both initiatives. Only coordinated efforts at diverse governance levels and efficient stakeholder engagement will define the fate of the Ecuadorian forest resources.

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10. Appendixes

Appendix 1: List of interviewees.

Contact Person	Position	Institution	Type of Institution	Date int.
Vladimir Tene	Forestry Director	Ministry of Environment	Government	10/12/12
Andrea Garzón	Advisor in REDD+ Policies	GIZ (German Technical Cooperation)	International cooperation	13/12/12
Montserrat Albán	Coordinator of Environmental Services	Conservation International	NGOs - supporters	14/12/12
Max Lascano	Manager	Socio Bosque Program, Ministry of Environment	Government	17/12/12
Carolina Rosero	Monitoring and Evaluation team	Socio Bosque Program, Ministry of Environment	Government	17/12/12
Sigrid Vásconez	Director, Environment and Society	FARO Group (Public Policies' Research Center)	CSO	17/12/12
Free de Koning	Technical Director	Conservation International	NGOs - supporters	18/12/12
Sebastián Cárdenas	Technician	Rainforest Foundation Norway/CEPLAES	CSO	04/01/13
Andrea Marín	Coordinator KfW Socio Bosque and REDD+ project	Socio Bosque Program and KfW	Government, international cooperation	05/01/13
Fabián Englert	REDD+ Specialist	Undersecretary of Climate Change	Government	09/01/13
Sven Wunder	Principal Economist	Center for International Forestry Research (CIFOR)	Expert in PES	23/01/13
María del Carmen García*	Specialist in SES for REDD+	Undersecretary of Climate Change	Government	24/01/13
Daniela Carrión	Ex-responsible for REDD+, consultant	Ex-Ministry of Environment and independent consultant	Expert in REDD+	24/01/13
Lourdes Barragán	Focal point in Ecuador	Rainforest Foundation Norway/CEPLAES	CSO	25/01/13
Ampam Karakras	Technician	Confederation of Indigenous Nationalities of Ecuador (CONAIE)	CSO	30/01/13
Luis Fernando Jara	Manager	FACE Reforestation Program of Ecuador (PROFAFOR)	CSO	06/02/13

*Email with answers to interview questions.

Appendix 2. Interview questions

Background Information for Chapter 5

A. Socio Bosque as part of the forest governance model

- Briefly, how and why was the *new* Ecuadorian forest governance model conceived?
- Remarks on the updated status on the implementation in the forest governance model?
- What are the next steps of this model?
- Overall, what are the main challenges and achievements of this model?
- How are Socio Bosque and the PNREDD+ inserted in the forest governance model?
- How are the coordination efforts between the actors leading the forest governance model, Socio Bosque and the PNREDD+?

B. Evolution and updated results of Socio Bosque

- From how the Socio Bosque program was conceived initially has it changed during these four years of implementation? How?
- What are the highlights of this evolution/adaptation process of the program?
- Any remarks on the updated status[35] of the policy instrument? (e.g. goals, funding sources, political support, changes on the incentives?)
- Important projections for the future? (mid and long-term)

Information for comparing Socio Bosque and PES schemes

C. Socio Bosque and PES (RQ1) (short background: considering that from a preliminary assessment, Socio Bosque is often confused among actors with PES and REDD+, or in some cases it is treated as PES)

- How is Socio Bosque different from other incentive-based programs such as PES? How is it similar?
- With these previous differences/similarities in mind, how can you describe the program?
- What types of confusions exist between PES and Socio Bosque? (e.g. different perceptions from its participants)
- Why do you consider that Socio Bosque is confused with PES and REDD+? (e.g. lack of information on these schemes, they are similar schemes that can be dealt equally...)
- How important/often are these confusions and among which actors? (e.g. very important, as they can alter the decision of landowners to join the program, etc.)
- How have these confusions among diverse actors been addressed?
- What are the main impacts (both opportunities and risks) you see from PES and other schemes such as SB for REDD+? And the other way around? How do you consider these potential risks can be managed?
- From your experience (in the many PES schemes, and mainly with forest ecosystems), what are the barriers/challenges for an effective implementation of PES?
- What are your main arguments for considering PES and/or REDD+ as effective tools to reduce deforestation in developing countries? What about the social vision of PES/REDD+?
- From your previous experience in Ecuador, how did you see the environment regarding implementation/development of PES

[35] Besides the updated results available through the Website or updated reports.

Information for the Institutional Interaction and Interaction Management analyses:

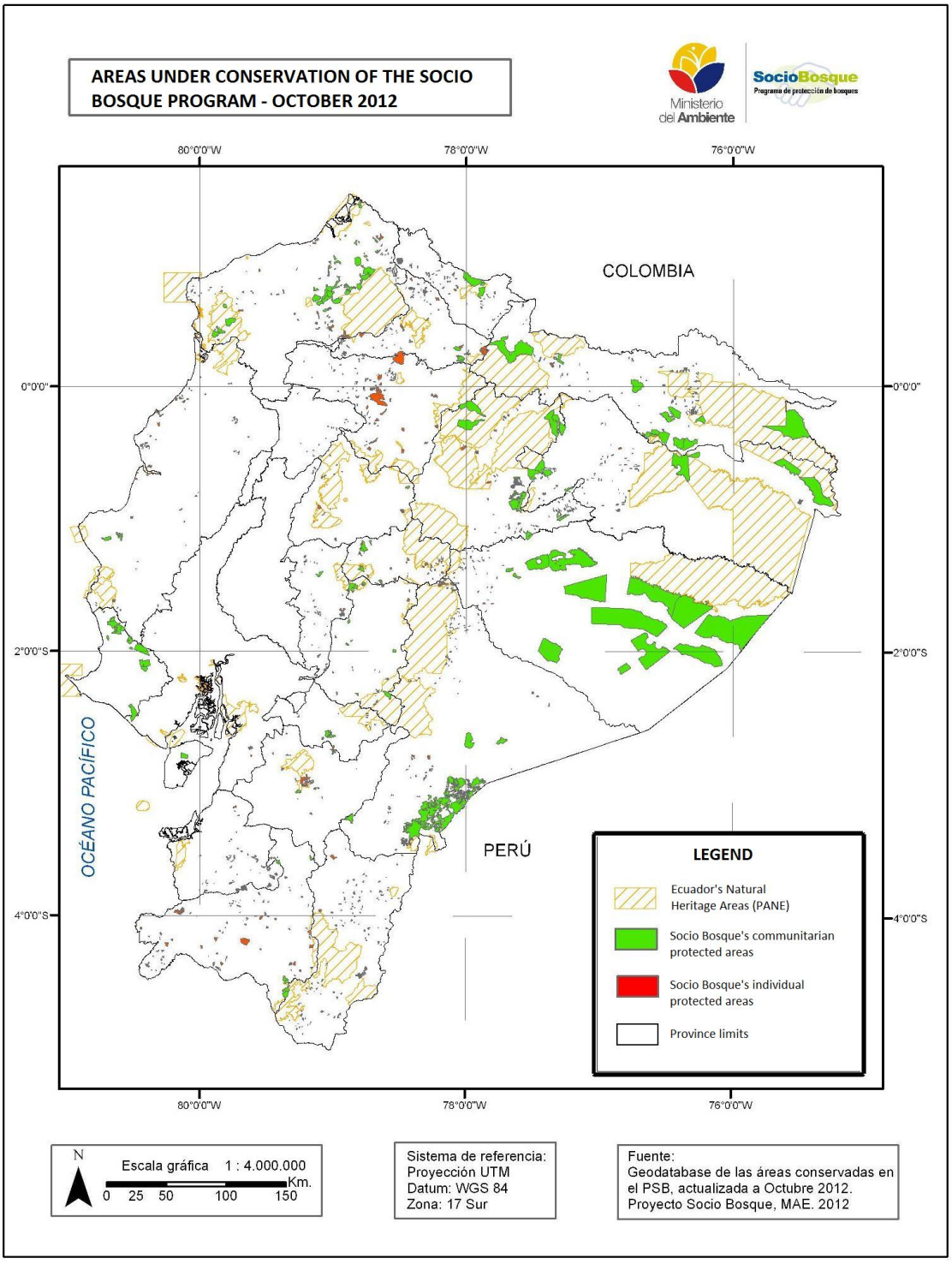
D. Socio Bosque as part of the National REDD+ Program (RQ2 and RQ3)

- What are the key highlights of the evolution of the REDD+ processes in Ecuador?
- What are the remarks on the updated status of the National REDD+ Program?
- How does Socio Bosque integrate within the National REDD+ Program?
- What are the current and potential impacts (positive and negative) seen from REDD+ for Socio Bosque? And from Socio Bosque for REDD+?
- Are there any actions and if so, which ones, are being implemented or considered to enhance the positive outcomes and address the challenges/conflicts encountered?
- Overall, what are the main challenges and achievements in the REDD+ processes carried out in Ecuador? And with regard to adapt Socio Bosque to REDD+?
- What are the next steps the country must take to make progress on REDD+ (move forward from the preparation phase).

***Additional questions for NGOs and CSOs**

- What is the relation of the organization that you represent with Socio Bosque and REDD+?
- Overall, what is the institution's position regarding Socio Bosque and the PNREDD+ (or REDD+ in general)?
- What are the underlying reasons for the institution's position stated before?
- What are the main aspects you consider that have to be taken into account for an effective implementation of Socio Bosque, the PNREDD+ and REDD+ projects in Ecuador?

Appendix 3. Areas under conservation within the Socio Bosque Program.



Map kindly provided by Gabriela Celi, staff member of Socio Bosque (21-02-13).

Appendix 4. Main milestones on the evolution processes of the Forest Governance Model, Socio Bosque and the PNREDD+