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Is REDD a Game Changer?: Assessing the Economic and Institutional

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Feasibility of Avoided Deforestation in

El Chore Forest Reserve, Bolivia

By,

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1. Executive Summary

In El Chore National Forest Reserve, migrants from the Bolivian highlands have illegally settled and converted the land for agriculture in search of livelihoods. The proliferation of agriculture in C hore ‟s southern ar ea has led to rap id deforestatio n as w ell as social tension within and along the periphery of the reserve between tenured residents, concessionaires, and the illegal settlers. It estimated that under business as usual conditions, by 2036 42% of the current forested area of El Chore will disappear (Stich 2008, page 1).

Fundacion Natura Bolivia, a Bolivian NGO that represents NGOs in the partnership, is currently considering a REDD – reducing emissions from deforestation and forest degradation - project in the forest using a grant from the European Union to incentivize avoided deforestation.

In this analysis conducted for *Fundacion Natura Bolivia*, we assess the feasibility of implementing an avoided deforestation project in El Chore focusing on the complex web of institutional and individual actors that might facilitate or impede a REDD project in the region. We asked specifically, *what are the institutional opportunities and constraints to implementing a REDD project in El Chore Forest Reserve?*

Our methodology included gathering data from extant literature, applying the IUCN-Katoomba Guiding Questionnaire for PES Country Assessments, and conducting interviews in the Department of Santa Cruz, Bolivia in January 2009 with individuals representing all levels of governance, NGOs, and community organizations. To the extent possible we met with those directly involved in negotiations and policy making concerning Payments for Ecosystem Services and REDD. Using this data, we analyzed opportunity cost, identified key actors, their roles, and the institutional capacity and legal readiness for REDD in El Chore.

Our findings indicate several institutional barriers that make implementing a REDD project in El Chore unfeasible at this time. The primary constraints include: First, the central government owns the right to sell Verified Emissions Reductions and is not willing to do so until a National REDD System is in place, and it is unclear when such a system will be finalized; second, inconsistent land reform policies have generated a high level of social unrest within the reserve; and third, poverty-driven migration of campesinos from the western highlands constantly threaten the reserve with land use conversion to agriculture.

There exist however, some institutional opportunities that can be exploited now to lay the foundation for a REDD project in the future. We make recommendations for long-term policy interventions as well as for immediate action. In the long run we propose:

- *Fundacion Natura Bolivia* should initiate pilot avoided deforestation projects in one or two of the three municipalities in El Chore: Santa Rosa and/or San Juan.

- With the support of the municipalities and active engagement of the communities, *Natura* should facilitate the creation of a specific Community Development Strategy which will lay the foundation for future cooperative agreements and payment distribution methodologies. Land tenure issues in El Chore may be addressed by cooperative collective action.
- *Natura* can use these pilot projects to develop trust in the community upon which to base a scaled up future project.
- To gain political support, the pilot projects should tie avoided deforestation and other pa ym ents for e cos ystem services a cti vit ies to t he countr y‟ s Nati onal D evel opment P lan which emphasizes community development.

We recommend *Natura* take the following immediate actions:

- Act as a facilitator to bring together the leadership of the San Juan and Santa Rosa municipalities to understand the *specific* necessary incentive structures.
- Coordinate the drafting of specific Community Development Strategies by the municipalities in concert with their communities.
- Initiate conversations with the Sindicatos in Yacapani including the mayor of Yacapani and the Federacion de Sindicatos de Yacapani.
- Start conversations with industrial agriculture producers south of the reserve who are benefiting from the ecosystem services provided by the reserve. This could provide a cash flow that could help to sustain the project until a REDD project is more feasible.
- Coordinate technical assistance which can come from the Universidad Gabriel Moreno, the Departmental Government, World Bank, USAID, and other NGOs.

Our diagnosis concludes that if this set of actions is not performed, even with a national REDD system in place, El Chore will be unable to benefit from this potential revenue source. If this set of actions is implemented and the national government is able to coordinate a national REDD system, the El Chore project will be in an ideal situation to scale up and to begin receiving certified emissions reductions payments.

2. Introduction

W hil e standing on a corn er in what i s probabl y S a nta Cruz , Boli via‟s poshe st neighborhood, a car to our left approaches a red signal at the stoplight. The car slows, and then, seeing no cross-traffic, careens through the intersection without hesitation or concern for the red light. S uch is t he rule of law in Boli via‟s mos t eco no mically prosperous city. Approximately 200 miles north, in El Chore National Forest Reserve (El Chore), the rule of law is equally evasive. Illegal settlers have invaded the reserve, migrants from the Bolivian highlands in search of land for agriculture and income. The proliferation of agriculture in El C hore‟s southern are a has led to rapid deforestation as well as social tension within and along the periphery of the reserve between tenured residents, concessionaires, and the illegal settlers. A preliminary estimate suggests that under a business as usual scenario 42% of the currently forested area will be gone by 2036.

The rise in deforestation alarmed the Departmental government of Santa Cruz, and they formed *Salvemos El Chore* – Let‟s S ave El C hore, a publi c -private partnership, in response to find a solution. *Fundacion Natura Bolivia*, an NGO representing Bolivian NGOs in the partnership, is currently considering a REDD – reducing emissions from deforestation and forest degradation - project in the forest using a grant from the European Union to incentivize avoided deforestation.

An upwelling of international support for REDD and avoided deforestation followed the 2007 UN Framework Convention on Climate Change 13th Conference of the Parties (COP 13). The primary policy recommendation emerging from the COP 13 was the inclusion of avoided d e f o r e s t

ation in the voluntary carbon market and possible future inclusion in the post-2012 agreement; the COP 13 further called for the initiation and funding for pilot REDD projects.

Approximately 20% of global CO2 emissions are the result of deforestation and deforestation contributes more to CO2 concentrations in the atmosphere than the transportation sector, curbing deforestation, therefore, is a potentially significant tool for a post-Kyoto global climate change regime. Further, since tropical forests are among the Earth's most biodiverse areas and since approximately 1.2 billion[1] people, many of them low-income, depend on forests for their livelihoods, avoided deforestation has attracted development and conservation groups alike calling for the inclusion of "co-benefits" – ensuring low-income forest dwellers benefit from carbon storage payments - in future REDD schemes.

REDD presents a complicated development policy problem. The actors involved include a wide array of stakeholders with divergent interests and an unequal distribution of power and influence. Indigenous and migrant farmers who depend on the forest for food security, livelihood, and in some cases cultural identity, small and large scale commercial extractive industries who exploit natural resources and provide local employment, and non-governmental organizations seeking to preserve biodiversity, reduce poverty, and store carbon compete for access to forested areas; the most numerous group, that of small-scale and subsistence Indigenous and migrant farmers have the least amount of influence while commercial interests have the most (Swallow et al 2007 page 2). Yet, if designed properly, REDD can produce winners across the board, allowing for sustainable extraction and community-based forest management with compensation directed toward livelihood improvement and biodiversity conservation.

To understand the viability of a REDD scheme, three analyses are necessary. First, the additionality of the emissions reductions must be established; that is, it must be proven that in the absence of a REDD regime, the emissions reductions would not have occurred; this analysis has

[1] Figure from the World Bank Forest Carbon Partnership Facility

already been undertaken by Stich (2008) who determined that under business as usual conditions 42% of the forest will disappear by 2036. Second, the economics of the project must be analyzed to ascertain costs, including the opportunity cost of and subsequent transaction costs. Third, assuming a market-feasible price is determined by the economic analysis, an institutional analysis must be conducted to assess the service-p rovider‟s c apa cit y to sell the service, rec eive payments, monitor and enforce conservation, and manage the project stakeholders.

Based on extant studies of the cost of avoided deforestation we believe that economics are very likely *not* to be the binding constraint in the case of El Chore due to the kinds of economic activities currently taking place in the forest and the presence of annual floods that undermines high-profit agriculture in the forest. Further, since several studies have already addressed the costs of REDD in various forest locales, and their results yield a fairly narrow band of estimates that are well within the range of market prices, this report assumes the opportunity cost of REDD in El Chore are likely to fall within this range. We provide a review of the extant literature opportunity cost of avoided deforestation, and, based on previous findings and our understanding of the ecology and economic activities in El Chore, estimate the opportunity cost of avoiding deforestation in the reserve.

Most of the literature estimating the costs of REDD do not account for institutional capacity, and this gap is duly noted as a weakness – for institutional capacity largely determines transactions costs and can also affect opportunity costs (Kindermann et al 2008, page 10306). Therefore, our analysis emphasizes complex web of legal, political, individual, and institutional actors that might facilitate or impede a REDD project in El Chore. We ask specifically, *what is*

the economic feasibility and what are the institutional opportunities and constraints to implementing REDD project in El Chore Forest Reserve?

The report will be organized as follows: Section Three explains our methodology; in Sections Four and Five, we build our theoretical framework, reviewing extant studies of opportunity cost of avoided deforestation (Section Four) and presenting role of institutions in conservation, particularly concerning payments for ecosystem services; Section Six will present the political context in Bolivia and El Chore National Forest Reserve; Section Seven presents our findings; and in Section Eight we provide a policy recommendation based on our findings. Details concerning the state of REDD in the international community can be found in Annex One, and details on the state of the carbon market can be found in Annex Two.

3. Methodology

To analyze the feasibility of REDD in El Chore National Forest Reserve, we pursued the following methodology:

- Conduct a review of extant literature concerning the broader policy context
- Review extant studies of the opportunity cost of REDD.
- Analyze the current political situation in Bolivia and in El Chore
- Gather data on the legal and institutional capacity of the country to implement, manage, and enforce a REDD project using the IUCN-Katoomba Guiding Questionnaire for Country Assessments and conducting field research in Santa Cruz, Santa Rosa, and Portechuelo, Bolivia (IUCN-Katoomba 2008)
- Gather data on the economic activities taking place in El Chore National Forest Reserve
- Identify the key stakeholders and institutional actors in El Chore Forest reserve
- Identify legal frameworks and processes that enable or prohibit REDD
- Identify existing institutional capacity for implementing a REDD project
- Identify institutional constraints to implementing a REDD project
- Identify political tension that might undermine a REDD project
- Identify a potential incentive structure to ensure sustained cooperation between the relevant actors

Our analysis required understanding the political and institutional structure at all levels of governance in Bolivia - the Federal, Departmental, and Municipal – as well as the role of the political community organizations, NGOs, and informal institutions operating in the El Chore region. Due to political change in Bolivia over the past three years, consistent information concerning

l and legal frameworks governing the country was difficult to ascertain from

publically available, published documents. Information concerning economic activities inside the reserve and the official political and institutional structure of the three municipalities governing the El Chore region was largely unpublished. Information concerning illegal economic activities and unofficial political and institutional arrangements in the Chore region was largely unknown. Therefore, in order to achieve our objectives, we supplemented extant studi es of Boli via‟s economic, institutional, and legal capacity and official documents with in-person interviews, telephone interviews, and skype interviews with individuals from the three levels of Bolivian governance as well as community organizations and NGOs (a full list of the individuals interviewed can be found in Annex Three).

We conducted most of the interviews during the week of January 18th 2009 – January 23rd 2009 in the Department of Santa Cruz, Bolivia. To the extent possible we met with individuals directly involved in negotiations and policy making concerning Payments for Ecosystem Services and REDD. We asked many of the same questions of each actor in order to understand on what issues perspectives differ and on what issues there appears to be consensus. Further, due to the politically charged atmosphere at the time of our fieldwork, we felt it was necessary to confirm the data we received by triangulating responses[2]. For example, we asked each subject what was driving deforestation in El Chore; each responded that migration of campesinos from the *altiplano* in search of land for agriculture and the inability of the Forest Superintendent to enforce the Forestry Law protecting Forest Reserves. This degree of consensus gave us confidence that these factors were indeed the proximate causes of deforestation in the reserve.

Differences in responses were not, however, considered useless. Where perspectives differ

will impact, and in some cases will determine, the kinds of institutional arrangements needed to

[2] A constitutional referendum was held on January 25th 2009; the new constitution effectively re-centralizes the federal government thereby consolidating the erosion of the powers of the departmental governments that has been occurring over the past 3 years.

ensure a successful project. Thus, these differences of opinion and/or perspective were treated as valuable data points. In most cases, observed differences in opinion could be predicted by political affiliation.

Compiling the data collected through the interviews, official national legal documents, and extant studies we pursued two analyses: economic and institutional. Our economic analysis used extant opportunity cost assessments and data concerning the ecology of and the economic activity in El Chore we estimated the opportunity cost of avoiding deforestation in the reserve. For the institutional analysis, we created a matrix identifying the key stakeholders, the legal frameworks that constrain each stakeholder, their roles, and the opportunities and constraints each stakeholder brings to the project. Using the matrix, we were able to identify the institutional channels by which a REDD project was feasible and the primary institutional constraints to the project. We also identified the institutional and legal opportunities that may enable our client to overcome existing constraints.

Due to safety concerns we were unable to meet with any representatives of the Yacapani municipality. Therefore, we spoke with the Director of the NGO CEPAC that has implemented several projects in Yacapani. Failure to contact directly any member of this community, however, is a limiting factor in our analysis.
Finally, although REDD includes forest degradation, we consider only deforestation in this paper due to time and resource constraints.

4. The Economics of Avoided Deforestation

Avoided deforestation projects entail different kinds of costs - opportunity costs and transactions costs[3] – which are discussed below. Broadly, costs accrue to the provider and the institutions facilitating the projects; indigenous and local peoples who rely on the forest for their social, economic, and cultural value also pay costs in the form of lost jobs, loss of land, and loss of community. In this section we review the extant literature concerning the costs of avoided deforestation and REDD. We will use the results of these studies to estimate the opportunity cost of REDD in El Chore in Section Seven.

4.1. Opportunity Cost

Generally, opportunity cost is the value of the foregone economic opportunity when we make an economic decision (Case and Fair 2002 page 25). In the case of avoided deforestation, opportunity cost is the forgone profit (total revenue less total costs) from not converting forested area to some alternative land use. Alternative land uses include intensive agriculture, timber extraction, pasture land, and swidden agriculture. The opportunity cost can be used as an estimate of what the price of a carbon payment must be in order to incentivize avoided deforestation. This sub-section describes these costs and reviews of the extant literature analyzing the costs of avoided deforestation.

There is extensive literature estimating the opportunity cost of avoided deforestation, and estimates vary depending on the methodology employed. Boucher (2008) and Wertz-Kannounikoff (2008) have written excellent reviews of the extant studies; we provide a summary

[3] Some studies of the cost of REDD refer to administrative costs and implementation costs which may overlap with transactions costs. We refer only to transaction costs.

of these reviews including specifics from the original papers where necessary or particularly illustrative. The purpose of this review is to provide an overview of the methodologies employed by environmental scientists and economists, and how these methodologies yield disparate opportunity cost estimates. The studies differ in their geographic scope, however, are likely produce a range within which the opportunity cost of avoided deforestation in El Chore is likely to lie.

Boucher (2008 page 8) classified opportunity cost estimates into three categories: Regional Empirical estimates, Global estimates, and Global Partial Equilibrium Models. This classification is acknowledged and also used in Wertz-Kannounikoff (2008 page 7). Regional Empirical studies provide a point estimate (in some cases such as Swallow (2007) whole supply curves are created for the regions studied) of the opportunity costs of avoided deforestation in a particular region, country, or forest. These studies begin by estimating deforestation rates and the amount of CO2 sequestered by the project per hectare using remote sensing data and spatially explicit analysis – measuring pixel by pixel land use change. Once this value is obtained, returns to the different land uses – agriculture, timber extraction, cattle ranching - are calculated using a Net Present Value (NPV) approach (Swallow et al 2007), (Borner and Wunder 2008) or econometric analysis modeling potential returns based on climatic, edaphic, and economic conditions (Nepstad et al 2007). Studies vary considerably in the complexity of their models, assumptions about carbon densities, time horizon, and in the discount rate used (Wertz-Kannounikoff 2008).

Regional Empirical studies are based on ground studies and provide detailed, specific analysis. Authors use data fro

m fieldwork as well as from national accounting services to construct their estimates. Boucher (2008 page 15) created a frequency distribution of

opportunity cost estimates based on twenty-nine Regional Empirical studies (Figure 1). He finds the range of values reported by these studies to be $.84-$4.18 per tonne of CO2 equivalent[4]. The shortcoming of this approach is that it likely underestimates the actual opportunity cost, or carbon price, that would be used in a regulated market (Wertz-Kannounikoff 2008 page 7).

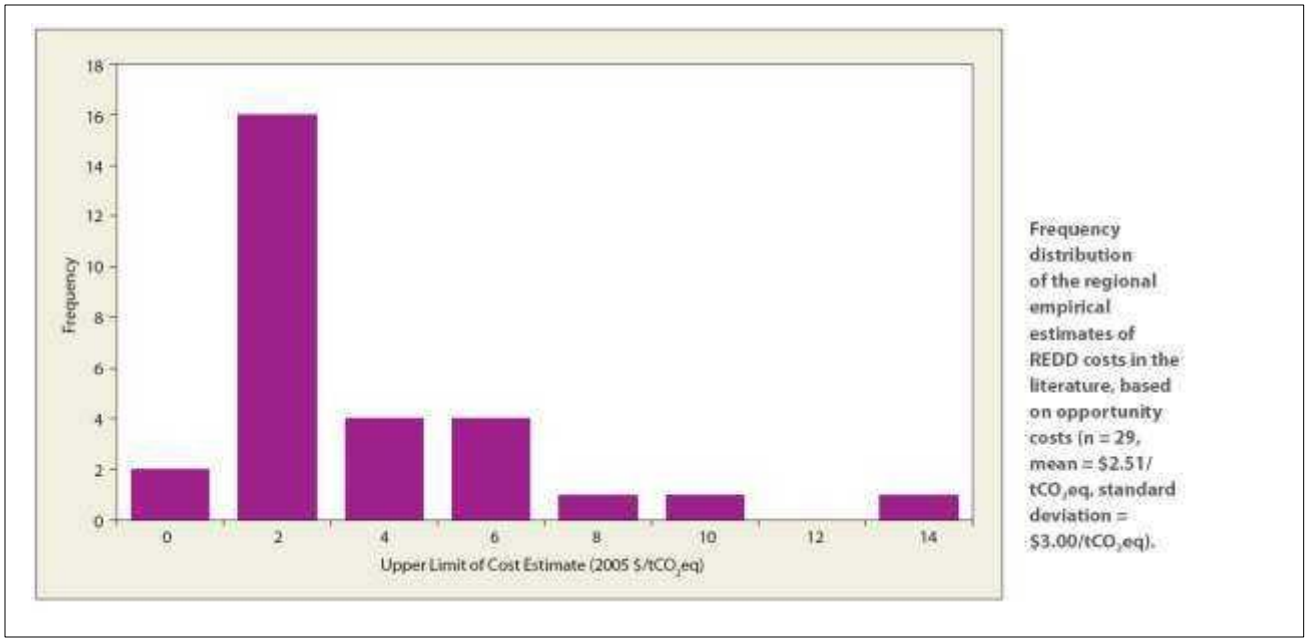

Figure 1. Frequency diagram of the opportunity cost estimates produced from 29 Regional Empirical studies. From Boucher (2008 page 15).

The Global approach aggregates the Regional Empirical studies of eight countries with the highest deforestation rates assuming an average carbon density across the regions studies (Boucher 2008 page 10). This approach was used by Maryanne Grieg-Gran ‟s report pr epar ed for

[4] Carbon Dioxide Equivalents (CO_2 eq) is a standard of measurement against which the impacts of releasing (or avoiding the release of) different greenhouse gases can be evaluated. It is related to the Global Warming Potential (GWP, or the additional heat/energy which is retained in the Earth's ecosystem through the addition of this gas to the atmosphere) of each particular substance. The GWP of a given gas describes its effect on climate change relative to a similar amount of carbon dioxide and is divided into a three-part "time horizon" of twenty, one hundred, and five hundred years. As the base unit, carbon dioxide numeric is 1.0 across each time horizon. (International

Emissions Trading Association)

the Stern Review (2006) and updated by Eliasch (2008). Both studies estimated that the cost of reducing deforestation by 46% to be $2.76 - $8.28/CO2 tonne.

Global Partial Equilibrium models simulate the dynamics of the world economy and yield marginal cost curves (Boucher 2008 page 10). Three models are the Global Timber Model (GTM), the Dynamic Integrated Model of Forestry and Alternative Land Use (DIMA), and the Generalized Comprehensive Mitigation Assessment Process (GCOMAP). The models differ in terms of how they spatially divide up the globe, which economic sectors are included (energy, agriculture, and other sectors influencing land use change), and assumptions about mean carbon densities, however they all use the same opportunity cost data used in Regional and Global Empirical studies (Boucher 2008 page 11). The benefit of these models is that they recognize that the cost of avoiding deforestation depends on the extent of the deforestation reduction and which economic activity is driving deforestation. Figure Two presents the findings of a comparative survey of the three models estimates of opportunity cost of avoided deforestation in 2010 and in 2020 (Kindermann et al 2008 page 10303-04). The curves show increasing marginal costs; the cost of early reductions is quite low while the cost of total reduction is high. The models predict a cost of between $6.77 and $17.86/CO2 tonne.

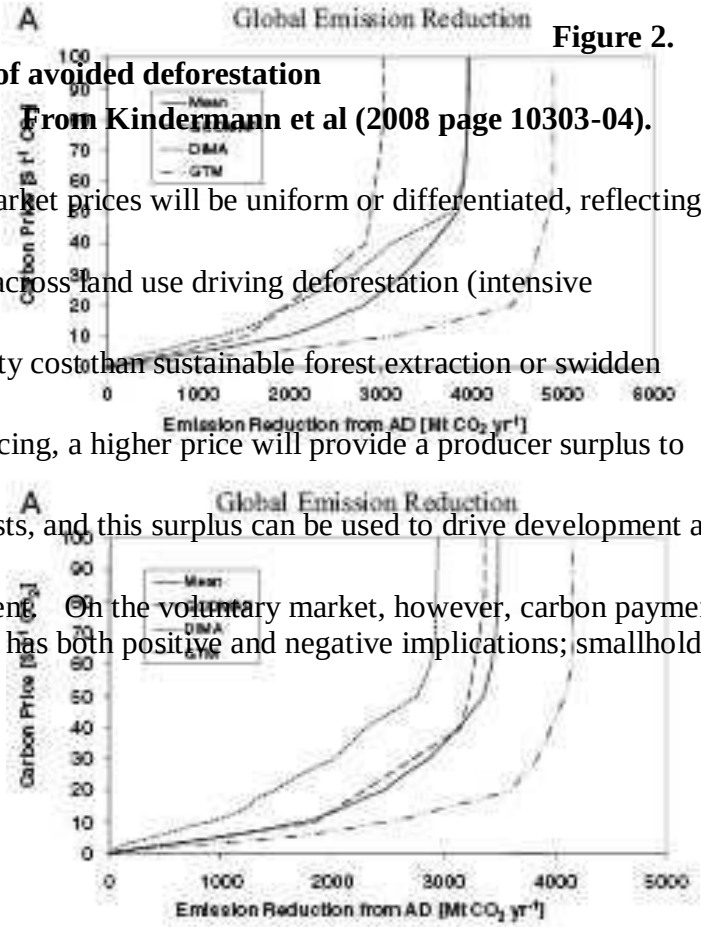

Figure 2. Global Simulation Models project marginal cost curves of avoided deforestation in 2010 (left) and 2020 (right). From Kindermann et al (2008 page 10303-04).

It is unclear if regulated REDD market prices will be uniform or differentiated, reflecting the non-uniformity of opportunity cost across land use driving deforestation (intensive agriculture will have a higher opportunity cost than sustainable forest extraction or swidden agriculture.) In the case of uniform pricing, a higher price will provide a producer surplus to smallholders with lower opportunity costs, and this surplus can be used to drive development and to improve sustainable forest management. On the voluntary market, however, carbon payments are differentiated. Price differentiation has both positive and negative implications; smallholders

can benefit from buyers unwilling to pay the higher prices, however, lower prices eliminate smallholder producer surplus.

4.2. Transaction costs

The opportunity cost assessments reviewed above acknowledge a failure to include transaction costs into their opportunity cost estimates (with the exception of Nepstad 2007 which includes implementation costs). Transactions costs include the creation and maintenance of the necessary institutions for project management, including the marketing and sourcing carbon payment deals (Scherr 2004 page 60). We were able to identify only one empirical estimate of the transaction costs of avoided deforestation; Antinori and Sathaye (2007) estimates these costs at $.03 - $1.23/CO2 tonne (Boucher 2007 page 19).

Some transactions costs will accrue before the project is even underway, including establishment of a credible baseline and negotiating contracts. Other transactions costs are more sustained and include monitoring and enforcement of the project area. The magnitude of transactions costs are also determined by the kind of REDD scheme in place: traditional conservation, multi-use sustainable extraction, or community based forest management.

Traditional conservation may require smaller fees up front, but the cost of monitoring and enforcement as well as compensating local and indigenous peoples displaced from the land will be costly over time. Community-based forest management may require more transactions costs up front, but is more likely to be financially sustainable as the community benefits from the project and more invested in maintaining the integrity of the protected area (Asquith et al 2002 page 335, Smith and Scherr 2003 page 2152).

Projects undertaken in a country for the first time will suffer first mover disadvantage as the first project will likely assume many of the start-up transactions costs, particularly those related to the creation of necessary legal and institutional frameworks. Carbon projects will also exhibit economies of scale, thus transactions costs will decrease as the scale of projects increase over time. As Boucher (2008) points out, however, over time *marginal* costs will increase as deforestation reductions deepen. Nonetheless, transactions costs will likely get absorbed into the price of VERs or CERs, or will be subsidized by a third party.

Given the economic framework described above, the determinants of the cost of REDD include the scope of avoided deforestation, the kind of ongoing economic activities, or potentially economic activities, driving deforestation, and institutional capacity. Potential economi c a cti vit ies wil l depend on the fo rest‟s pa rticular e colog y, soil conditions, proximity to transportation lines, as well as other prevailing factors such as conflict and social tension. Determinants of institutional capacity are detailed in the following section.

5. Institutions in Payments for Ecosystem Services

As we learned in the previous section, economics are not likely to the binding constraint to REDD. In fact, institutional capacity may be the most salient issue confronting REDD projects. Insti tut ions are oft en re fe rred to as "th e rules of th e game," ho weve r this de finiti on is somewhat

unsatisfying. Dou glass North clarifies, ex plaining that ins ti tut ions are " the humanly devised constraints that shape human interaction… [that] structure incentives in human exchange – whether political, social, or economic… includin g what i ndivi duals are pro hibi ted fr om doing and what t he y a re pe rmitt ed to do" (North 1990 page 3). North adds that institutions further affect the economic outcomes by their effects on the costs of exchange and production (North 1990 page 7).

Institutions can be both formal (national laws) and informal (norms of behavior) and can be dynamic (Kyoto Protocol) or stagnant (U.S. Constitution). The role of institutions in public policy is to create opportunities for constituent organizations and to reduce uncertainty, thereby building trust within and between communities. In conservation, institutions serve to mediate the relationship between human beings, other institutions, and their environment (Corbera and Brown 2008, page 1957). They constrain environmental extraction and provide opportunities for environmental exploitation; often the opportunities an institution creates in turn influence the nature and scope of that institution resulting in institutional change.

The emergence of Payments for Ecosystem Services (PES) represents one such exploitive

opportunity created by international and domestic institutions. The growth of PES markets over the past two decades has followed and facilitated the emergence of the institutions necessary to ensure the integrity of PES transactions, and many of them continue to evolve apace with market

expansion. Buyers need to verify the value of the service they pay for, and sellers need to verify the right to sell and receive payments for those services. Often, the institutional frameworks needed to effectively implement PES co-evolve with existing institutional frameworks, property rights for example, and in some cases strengthen them (Corbera et al 2009 page 747).

For PES, international and national level institutions are needed to facilitate the growing market. For example, the growth of the voluntary and regulated carbon market has led to the creation of international institutions to regulate carbon trading and to certify emissions reductions. Domestically, legal provisions for the marketing and selling of ecosystem services and clearly codified property rights are necessary to reduce uncertainty and to generate trust within these new markets. Due to the scope of this paper, we consider only the domestic institutions pertinent to PES herein.

Many countries attempting to establish PES projects cited domestic institutional constraints as a major barrier to effective implementation (Ruhweza and Waage 2007). Lack of effective PES institutions result in unnecessarily high transaction costs and become increasingly problematic when project attempt to scale up.

In 2008, the IUCN Environmental law Centre and the Katoomba Group created a guiding questionnaire for assessing a country's institutional readiness for PES. Their questionnaire provides a framework for institutional analysis and is broken down according to the following areas:

- Legal Frameworks

 Contractual Issues Monitoring and Enforcement

Legal frameworks include the Constitution and legislation specific to the marketing and selling of ecosystem services and may be included in one or more aspects of environmental law such as forest law and water law. Institutional frameworks include public agencies such as environmental protection and private organizations such as international or national NGOs which may provide technical assistance or facilitate implementation[5]. Clear and codified property rights are essential for PES; the ability to sell an ecosystem service must be coherently defined in order to secure transactions and the recognition of customary law may be an issue in some PES-providing countries. Negotiation and contractual issues largely concern the details of agreement-design and a country's capacity to build substantial and fair PES agreements[6]. Finally, monitoring and enforcement capacity refers to the ability to monitor changes in the ecosystem service (forest stocks for example) and to enforce non-compliance. Monitoring and enforcement are the most technically demanding components of PES institutions and often pose the largest constraint to program implementation.

These institutional components, except where noted, served as a guiding framework for our analysis of the institutional capacity for a REDD project in El Chore. All of these components, however, must be viewed through the lens of Bolivia and El Chore's political context. In the next section we describe this context.

[5] We acknowledge that there are

theoretical differences between organizations and institutions, however, in this analysis some organizations, such as NGOs and unions, will be treated as institutional actors.

6 Due to time and resource limitations we did not extend the scope of our analysis to include these variables.

6. The Bolivian Political, Social and Economic Context

6.1. Bolivia

Bolivia is currently experiencing a phase of deep division between its eastern and western regions. In order to understand the countr y‟s political situation, some historical context is required. Bolivia is the second poorest country in Latin America with a purchasing power parity adjusted GDP of just USD 4,200 (World Development Indicators). Since the economic crisis of 1978, poverty has persisted in the country. By 1999 the overall poverty rate was 62.6% with urban poverty at 51.5% and rural poverty at 81.6%. According to the Economical Policy Analysis Unit (UDAPE), between 1999 and 2001 almost 380,000 Bolivians fell below the poverty line, and more than 50,000 jobs were lost (Rodrigo Valenzuela 2009, Page 8). The group most affected by poverty was the indigenous population, which represent, according to the 2001 census, 62% of the population. In 2002, the poverty rate among indigenous peoples in Bolivia reached 80%; the rate for the non-indigenous population was half that at 40%. Further exemplifying economic inequality in Bolivia, 10% of the population managed 70% of the wealth. This led to a social revolt in the second half of 2003, which forced President Gonzalo Sanchez de Lozada to an early resignation This social movement also gave rise to an indigenous political movement, which in 2005 elected Evo Morales to the Presidency of Bolivia with 54% of the vote. Morales is the first indigenous president of the country.

The goal of Morales‟ government is to establish a new political-economic regime aimed at recentralizing the government, overcoming poverty, ending social discrimination, and redistributing Bolivian wealth more evenly across the population. His so-called socialist policies

have not been well received by the wealthier Eastern Amazonian departments where he faces strong political opposition. This political conflict came to the fore in 2006 when Morales

initiated the process of drafting a new constitution. Elections were called to form a Constituent Assembl y ch ar ged with writ ing the ne w tex t. The Government o f Boli via ‟s (GO B) main goals

were to recentralize government authority over natural resources and to cede more power to the indigenous majority. A Constitutional referendum was held on 25 January 2009, and the new constitution passed 60% to 40%. The new Constitution generated social unrest in the East and fueled an independence movement whose end is uncertain. Political demonstrations in Santa Cruz de la Sierra in the Santa Cruz department during the week leading up to the referendum called for departmental autonomy and even civil war.

The political tension between the eastern departments and the central government will prove to be a crucial variable when performing an institutional analysis for a REDD project in El Chore. El Chore is located inside Santa Cruz, but due to its status as a national reserve, the land belongs to the state and is administered by the central government.

6.2. El Chore

El Chore Forest Reserve was the first forest reserve established in Bolivia on the 3 August, 1966 by the supreme decree Nº 7779. Located in the northwestern part of the Santa Cruz Department, it originally covered an area of approximately 900,000 hectares of forest between the Ichilo and the Yapacani rivers, north of the 17th parallel (Figures 3 and 4). It is the densest forest reserve in Bolivia with an average of 119 trees per ha (Jorge Avila 2009). According to the Forest Chamber of Bolivia, El Chore is the reserve with the highest potential productivity level in Bolivia because of its density and growth rate, but the actual extraction volume is

comparatively much lower due to social tension in the area we will discuss in detail below (Jorge

Avila 2009).

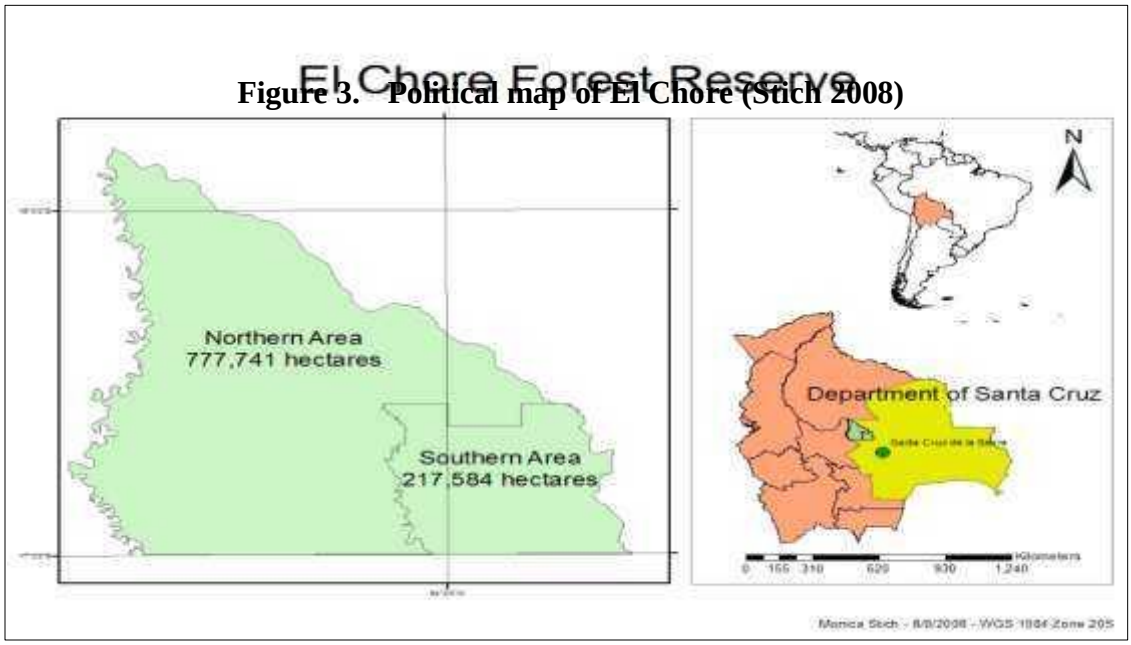

Figure 3. Political map of El Chore (Stich 2008)

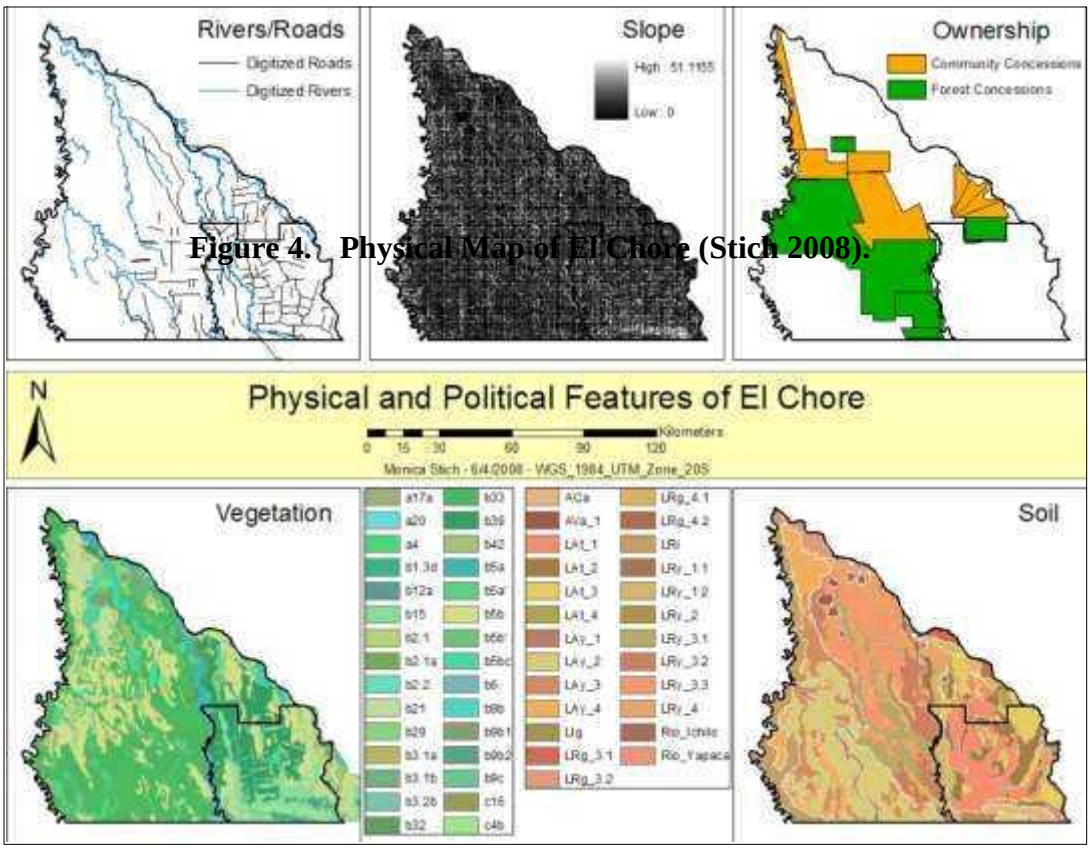

Figure 4. Physical Map of El Chore (Stich 2008).

El Chore National Forest Reserve (El Chore) provides valuable environmental services to the Department as a result of its effect on the highly productive agricultural lands south of the reserve (Killeen 2007). These services include protection from wind and stabilization of the rain regime in the zone. It is difficult to prove and quantify these services scientifically, but the value is grounded in the so-call ed "Andes Elbow Eff ect" as di agramm ed in Figu re 5 (Kil leen 2007);

wind coming in from the Atlantic and through the Brazilian Amazon collides with the Andes Mountains and rushes south towards Bolivia. These strong winds bring highly dense clouds that encounter a natural barrier in El Chore. The forest exhibits a steep rain isohyets gradient that goes from over 3,000 mm a year in the north to 900 mm a year in the south. Timothy Killeen has developed a model where without the forest, the rain regime would be modified causing flooding on some areas and causing drought on others. Local authorities estimate the forest stabil iz es a 620,000 ha ar ea that contribut es 64% o f the depa rtment"s so y p r oduct ion, 27% of

corn production, 97% of rice production, 98% of sugar cane production and 25% of the livestock. The estimated value of these productive activities is USD 222 million a year (Government of Santa Cruz 2007).

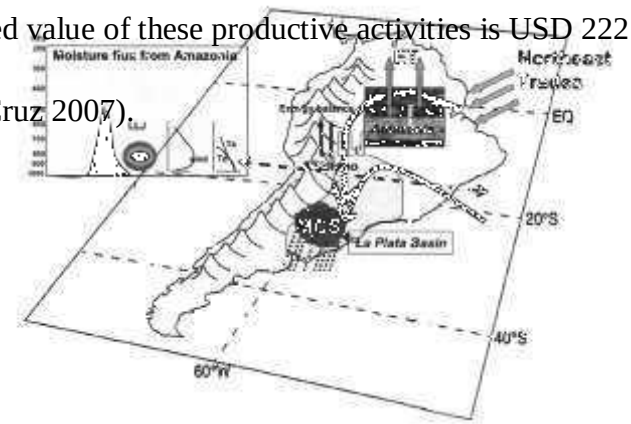

Figure 5: The A

ndes Elbow Effect (Marengo et al 2002 in Killeen 2007).

El C hore‟s status as a nat ional reserv e all ows for s ustainable tim ber ex tracti on, but prohibits any agriculture and human settlement inside the reserve. The protected area was expanded in 1991 by 180,000 ha, but in 2000 the decree N 25389 allowed the national land reform institute (INRA) to give land titles on the southeastern part of the reserve to settlers who could demonstrate settlement prior to 1996. As a result of this decree, 211,632 ha were removed from the reserve, all of which was given in title to local immigrant campesinos. This zone, comm onl y re fer red to as the "disaff ected are a," ha s been alm ost enti rel y de forested and converted for agricultural use. Inside the reserve, approximately 2.5% of the forest area has been illegally cut down and is currently being used for agriculture (Salvemos El Chore 2007). High levels of precipitation in the northern part of the reserve floods large swathes of El Chore almost every year, making these lands unfeasible for agriculture and not appropriate for human settlement; therefore the bulk of deforestation in El Chore occurs in the southern part of the reserve. The flooding effectively creates a natural barrier against deforestation in the North. Today, El Chore reserve covers 776,379 ha and includes three municipalities: Yapacani, Santa Rosa and San Juan.

Timber extraction inside the reserve must conform to standards of sustainability as defined in Forest Law 1700 (Box 1 below). According to the law, up to 80% of the reserve can be granted as timber concessions and 20% needs to be left to the municipalities for them to grant extracting permits to locals associations (ASL for its name in Spanish). Almost half of the reserve (46%) is under the 15 forest concessions in place today (Salvemos El Chore 2007), and of them only the concessions of Marabol and San Pedro, together with the ASLs of Aroyo

Negro, Santa Rosa, Los Tajibos and Entre Rios are developing productive activities due to social and political tension.

Box 1. Sustainable Forestry in Bolivia

Sustainable Forestry in Bolivia Sustainable Forestry, as defined in the Forestry Law 1700, provides for a 20-year extraction cycle that is granted and supervised by the Forest Superintendence. When a concession (to private concessionaires or ASLs) is granted for sustainable extraction, the concessionaire must leave 10% of the total concession area for conservation. The rest the land must then be divided into 20 quadrants, of which only one can be harvested per year. Before extraction begins on a particular quadrant, an extraction plan must be presented to the Forest Superintendence for approval. The plan must include a census of the trees in the quadrant - including the radius of trees and identification of seeding trees - and must specify which trees will be cut down. The law mandates concessionaires protect seeding trees and establishes a per-species minimum. Concessions last 40 years and are subject to an audit by the Forest Superintendence every 5 years.

Since its foundation, El Chore has been an area where immigrants from the western Andean highlands come in search of land for agriculture. The so-called Campesinos threaten the reserve in their search for better living opportunities. This phenomenon has several roots. First, Bolivia has traditionally been a mining country. During the 1960s and 1970s silver and tin mines in the highlands were exhausted, and the GOB had to develop alternative productive opportunities for thousands of Andean miners, many of whom were relocated to Santa Cruz to become agricultural producers (Rodrigo Valenzuela 2009). Since the 1980s, Andean campesinos have been spontaneously colonizing forests in the department. They are mostly young people searching for a piece of land for agriculture. It is estimated that 90% of the population living near or inside El Chore are western migrants (Carlos Roca 2009).

The new settlers organized themselves into "Sindicatos," or unions, and have formed a social network to facilitate spontaneous colonization in the forest. Sindicatos consist of groups of 40 to 60 families that have claimed a piece of uninhabited land (Sindicato "8 Diciembre" 2009). Sindicatos have a tiered organizational structure consisting of Sub-centrals, Centrals and Federations. Today there are two Federations of Sindicatos in El Chore, "Federacion de Sindicatos de Yapacani" and "Federacion de Sindicatos de la Provincia de Ichilo." The primary objective of the two Federations is to obtain title to the land claimed by their constituents (Katsumi Bany 2009 and Jose Luis Vega 2009). Most of the land they claim lied inside El Chore.

Lately however, Sindicatos have been increasing their land claims. Even though article 14 of Forest Law 1700 states that anyone occupying land in a forest reserve must be expelled from that land, supreme decree number 25,839 of July 12th 2001 specifically states that "prohibition of human settlements in forest units is exceptionally revoked for land possessions prior to the establishment of the INRA land reform law Nº 1715 of October 18th 1996". This decree allowed INRA to give land titles inside the reserve, a decision that encouraged the Sindicatos to make illegal claims on the land by stating they were there before October 1996 (Katsumi Bany 2009). Further, Sindicatos have an incentive to raise the number of claims because the charge every new member $400 in exchange for the promise of a 50ha plot once they get the lands rights. People from nearby regions like Chapare see this as an opportunity to get cheap land so they sign up with the Sindicatos. Mayor Katsumi Bany of the San Juan municipality has compared the

number of claims with the municipal registry, and the amount of people living in San Juan has not risen at the same rate claimed by the Sindicatos (Katsumi Bany 2009). The Sindicatos have

allegedly received technical assistance from NGOs working in the reserve to develop maps of the area to "prove " to INRA that the y inde ed hav e a ri ght t o the land (K atsum i Ban y 2009).

At last, several of our sources raised the issue of coca plantations in the reserve. Even though their opinions disagree in the size of these plantations, or if they even existed, they all agree in the fact that if coca plantations were able to consolidate in the region the opportunity cost of avoiding deforestation would raise to a level unfeasible to meet with any other productive activity (Carlos Roca 2009, Jorge Avila 2009, Jose Luis Vega 2009, Widen Abastoflor 2009). The risk of coca introduction comes mainly from agricultures from the neighboring region of Chapare, one of the two zones in Bolivia where coca growth is allowed.

7. Findings

In this section we present the results of our research and analysis. We begin with our estimate of the opportunity cost of avoiding deforestation (REDD) in El Chore and then move to the institutional analysis. The institutional analysis proceeds in five subsections. First, we identify the key actors, including how they interact and influence each other; second, we assess the countr y‟s institutional technical capacity to implement a REDD project; third, we present the opportuni ti es and const ra int s of Boli via‟s le gal i ns ti tut ions; fourth, we present t he opportuni ti es

and const raint s of the co untr y‟s polit ical institutions; and fifth we address socio-cultural (informal institutions) considerations that could impact project implementation.

7.1. Opportunity Cost

Drawing on the theoretical framework described in Part Two, in this section we apply our findings on the ecology of El Chore and the current and potential economic activities ongoing in the reserve. We acknowledge this analysis provides a rough estimate, however, as we have stated above, we do not expect economics to constrain REDD in El Chore

The economic activities in El Chore are sustainable forestry (previously defined for Boliva), illegal swidden agriculture, and illegal logging. Concessionaires engaged in sustainable forest extraction in the reserve would not have to stop their activity in the forest under a REDD project, and would only benefit from the cessation of illegal encroachment resulting in zero opportunity cost for these actors. The illegal agricultural activity (no agriculture is lawful in the

reserve) is subsistence and entirely unmechanized resulting in low opportunity costs. The potential for high opportunity cost, intensive agriculture in the reserve is constrained by the combination of soil conditions and high precipitation in the region. The soil in El Chore has two

distinct qualities which limits the viability of intensive agriculture in the reserve. First, a very thin surface layer means soil nutrients exhaust quickly and require long fallow periods. Second, the subsoil layer is composed primarily of non-permeable clay; heavy rainfall in the region thus leads to regular, periodic flooding in the reserve.

Illegal extraction occurs in the reserve, but is far less economically attractive than legal extraction; illegal extractors do so because they do not have the right to operate legally. Enforcement of illegal timber extraction is rigorous enough to prohibit extensive activity. Timber sellers must provide buyers with a certificate of sustainable extraction, and buyers are motivated to operate in the legal market in order to access export markets (Carlos Roca 2009). Illegal timber is sold almost exclusively in the domestic market.

Illegal timber operations earn on average one-sixth of timber harvested sustainably; the regulated timber market fetches approximately 150 Bolivianos per cubic meter of timber while the black market fetches just 25 Bolivianos per cubic meter (Marcos Lopez 2009). Given the paucity of reliable carbon data, we cannot convert this figure into an opportunity cost per tonne of CO2 stored, however, this activity would have to be accounted for in a rigorous opportunity cost assessment of REDD in El Chore. Again, however, we do not expect this to represent a high opportunity cost given the small scale of illegal extraction and the relatively low returns.

Considering the ecology of and economic activities in El Chore, and using the more conservative global simulation estimates (Figure Two), the opportunity cost of avoided deforestation is therefore likely to fall within the lower portion of the marginal cost curve in the $6-$10/tonne CO2 range. Due to institutional constraints, however, transactions costs are likely

to be on the higher end in the $1-$1.25/tonne CO2 range. With an upper estimate of $11.25/tonne CO2, this value falls well within the price range offered currently on the voluntary

market: $2.50 - $30/tonne CO2. Therefore, we do not expect opportunity cost/price to be a constraint to REDD in El Chore.

A potential caveat is conflicting reports about the presence of and level of soy and coca production in the reserve. If mechanized soy production were ongoing in the reserve, the opportunity cost of avoiding deforestation would increase thereby increasing the cost of a carbon storage project; given the ecological constraints to agriculture in El Chore mentioned above, this scenario seems highly unlikely. Coca production activity, believed to be happening in Yacapani [7]municipality, would also threaten the viability of an avoided deforestation project due to the increased opportunity cost, the increased cost of enforcement, and associated elevated levels of conflict.

Despite the (likely) low opportunity cost of a carbon storage project in El Chore, there are other existing economic considerations that must be accounted for. These issues include the long-term need to redirect the productive capacity of the community and the revenue generating limitations of alternative forest extraction.

The primary motivation for illegal encroachment in the forest is economic. Incentivizing a cooperative agreement not to deforest will require remuneration in the short run and in the long run will entail redirecting the productive capacity of the El Chore community away from agriculture and unsustainable forest extraction. Increased investment in education and community development will also be required. This will not be easy, and will require substantial long-term financial commitment and technical assistance.

Assuming a project were feasible, the possible alternative uses of the forest would include

traditional conservation, sustainable forestry, and the production of non-timber forest products.

[7] Yacapani lies on the border with Chapare, one of the two provinces in Bolivia where unlimited coca production is legal.

Since traditional conservation provides little benefit to the surrounding communities in the absence of substantial subsidies, the latter two options would be more desirable to generate income for area residents. These two activities, however, present economic challenges. First, the cost of monitoring and enforcing hundreds of sustainable forestry concessions may be prohibitive. Second, it can take up to sixteen years to begin generating positive returns from reforestation-driven forestry (Widen Abastoflor 2009). Third, little is known about what non-timber forest products can be extracted from El Chore and market; subsequently, there is uncertainty whether a large enough market for the products exists.

7.2. Institutions

7.2.1. Description of Institutional Actors

Any policy context will involve stakeholders - individuals, institutions, or organizations - with an interest in the policy outcome. In this paper we focus on actors rather than on all stakeholders, defining actors as those with a non-trivial capacity to influence policy action. Actors, as opposed to all interested parties, have the ability to exert influence and power over the policy making process including access to or control over the necessary resources to affect the content of and/or the destiny of the policy initiative (Merilee Grindle PED-313, 4 February 2009). El Chore is home to a complex web of actors with divergent interests and varying abilities to affect policy action. To begin, however, we identify the following key actors including their roles, their degree of influence, and the priority of the project. The results are

summarized in Table 1. Reading the table, it is clear that the actor with highest degree of influence in this policy area – the Central government - does not necessarily highly prioritize the

project. We will revisit this paradox below in the subsection on political institutions.

The Forest Chamber Represents the interests of private concessions for sustainable extraction in the reserve Low High

Table 1: Summary of Actors

Actors	Description of Role	Degree of Influence	Priority of the Project
The Central Government, including the National Climate Change Program and the Bolivia REDD Secretariat	According the new Constitution approved by popular referendum on 25 January, 2009 the Centr al go ver n me nt has c o ntr o l o ver the co untr y‟ s natural resource wealth.	High	Low
The Forest Superintendant, housed ~~inside the central government~~	Monitors forestry activities and grants extractive concessions	Low	Low
The Departmental Government of Santa Cruz de la Sierra	Provincial government whose budget determined by ~~the central government~~	Low	High
Instituto Nacional de Reforma Agraria (INRA)	The national land reform agency evaluates claims to land and grants titles to land inside and outside the forest reserve	~~High~~	~~Low~~
The Municipal Governments of San Juan, Santa Rosa, and Yacapani			
The Municipal Council of Santa Rosa			
The Sindicatos ~~organized and very powerful in El Chore~~	Political organizations who represent the interests of the campesinos; highly	High	Medium/ Low
		Unknown	Unknown
	~~Private companies running sustainable forest~~ extraction concessions inside the reserve		
	Provide technical advice and can attract funding for development projects; some have a long history of working in the area.		
	A coalition of non-governmental, departmental government, and private actors aligned to preserve El Chore forest reserve.		
Co ns titu tio nall y mand ated	ste war d s o f t he co u ntr y‟ s natural resources		
Associacion Social del Lugar (ASLs)	Community granted concessions for sustainable timber extraction inside the reserve	Medium	High
The Concessionaires			
NGOs: CEPAC, Fundacion Natura Bolivia, FAN, SEGIS			
Commite Salvemos El Chore[8]			
Armed Forces			

LowMe
m

7.2.2. Technical Issues for Establishing an Avoided Deforestation Project

To establish an avoided deforestation project specific technical capacity is required to meet the requisite standards of the voluntary and, ultimately, the regulated carbon market. These standards include proving additionality, managing leakage, and permanence. For additionality, a

[8] Salvemos El Chore is an organization rather than an institution, but we believe this actor has the potential to have a non-trivial impact on the project.

baseline national deforestation rate must be calculated using historical high-resolution aerial data. To address leakage and permanence, a national monitoring system must be in place to ensure decreased deforestation in El Chore will not simply lead to increased deforestation elsewhere in the country (or elsewhere in the world - in fact, an international monitoring system should be in place) and to maintain the integrity of the carbon stock.

Bolivia faces significant technical capacity constraints. At this point in time, the country lacks the high-resolution satellite imaging required to effectively track land use change (Gisela Ulloa 2009 and Rolf Wachholtz 2009). Existing technology enables the country to track only large changes in land use and to monitor large scale deforestation. Even though data is available to calculate a national baseline deforestation rate, this is a very technical and resource-intensive endeavor at the national level and has yet to be done. The National Climate Change Program acknowledges these constraints and is actively working to improve its technical capacity. Bolivia has applied for financial resources and technical assistance throu gh the W orld Bank‟s Forest Carbon Partnership Facility to develop a national monitoring system, however funding has not yet been approved, and there is no official timeline for this project.

One way to overcome technical constraints in the short run and to direct government expenditures to low-income communities is to engage stakeholder communities in the forest-monitoring regime as is done in many PES projects, including Mada gasca r‟ s Makira REDD project discussed in Annex One. Further, engaging local communities would provide an opportunity to accomplish several national goals. Revenue streams from carbon payments can be used to redirect the productive capacity of the forest away from unsustainable extraction by

employing local people as rangers, guards, and data collectors. Employing local people also advances the Bolivian National Development Plan that aims to promote community development

and economic growth. An extensive and effective on the ground data collection regime could compensate fo r the count r y‟ s inferior s atelli te imagin g resolut ion. In ord er for a r e gim e such as

this to be effective in addressing leakage, however, strong coordination among and between municipal actors would be needed.

7.2.3. Legal Institutions: Opportunities and Constraints

Legal frameworks will define how payment for ecosystems services, and in particular carbon storage projects, are going to evolve in a particular country and will play a role in determining the feasibility of these kinds of initiatives. First and foremost is the right to sell the ecosystem services. In the case of El Chore that right is owned by the central government as established by the forestry law. The forestry law states that all national forest reserves belong to the state and their rights are administrated by the central government. Due to the national extractive forest reserve status of El Chore it is the central government the one who owns the land and has the right to sell any ecosystem service provided by the reserve. The 1996 Forest Law 1700 also describes the sustainable extractive forestry permitted in the reserve and creates the forest superintendence as the institution in charge of overseeing and managing the national forest resources (Box 1). Bolivian sustainable forestry has been characterized as the most conservation-minded in the world (Nigel Asquith 2009). A lawyer informed the president of the municipal council of Santa Rosa that there is also a decree in the forestry law that provides for the granting of non-extractive concessions in national forest reserves (Marcos Achacollo 2009).

Another relevant law regarding property ownership in El Chore is the Land Reform law Nº1715 - Ley del Servicio Nacional de la Reforma Agraria. Sindicatos base their claims on this

law - enacted in 1996, which is a modification of 1953 land reform Law Nº3564. Article 2

introduces the concept of the socio-economic purpose of the land. According to this article, any owner of land who does not use the land for productive activities is not fulfilling its socio-economic role, and the land can be therefore expropriated and granted to whomever is engaged in productive activities. Sindicatos seize land by cutting down the forest for agriculture, and then explain to the government that they are making a socio-economic contribution, and are thus entitled to ownership of the land (Katsumi Bany 2009). The 2000 decree that granted formerly protected land to the campesino settlers was actually intended to create a buffer zone to discourage further encroachment of this kind into the forest. The plan worked well until the children of these initial campesinos settlers realized they also needed land and initiated a land grab inside the reserve (Katsumi Bany 2009). The Land Reform Law also states that the minimum plot size for small-scale agriculture is 50 ha. This provision serves as the basis for campesinos demands for 50 ha plots of land per family. The amount of land presently claimed by the Sindicatos does not sum to a large proportion of the forest, however, granting title to the land would set a precedent for potentially numerous future claims.

The recently enacted constitution might also affect the land tenure regime in El Chore by two, almost conflicting, articles. One of its main articles states that all natural resources belong to the central government but another states that land can be use for traditional purposes. The fact that the first statement is very clear but the second one really subjective generates uncertainty about how the new constitution will affect the concessions, the scope of action of land reform law or property rights over currently privately own land the disaffected area.

There is no provisi on for pa ym ents for e cos ystem services with in Boli via‟s legal

framework, however there is also nothing that would preclude the implementation of an avoided deforestation project in El Chore. The largest carbon storage project in the world, Noel Kempff

Mercado, is in Santa Cruz, and payments for watershed services projects have been implemented in the department as well. However, there are some legal constraints on PES in El Chore since the forest is designated as a national reserve. The kinds of forestry activities allowed in the reserve are limited; for example any agreement with the communities and the Sindicatos wherein they are allowed to perform any type of agriculture at any scale would be in violation of Forestry Law 1700.

The legal opportunities and constraints affecting a REDD project in El Chore are summarized in Table 2 below.

Table 2: Summary of primary legal institutions affecting a REDD project in El Chore

Legal Framework	Opportunity	Constraint/Threat
2009 Constitution	Only one owner of the land - the GOB has the right to sell the carbon storage service and is open avoided deforestation projects	The provision that land can be used for traditional purposes may validate the claims of campesinos invading El Chore to practice traditional agriculture
~~Forest Law 1700 of 1996~~	~~Provides institutional framework~~ for sustainable extraction	Necessitates involvement of GOB in the project and limits possible conservation schemes
Land Reform Law of 1953	INRA has the ability to reject illegal claims to the land inside the reserve	Creates a perverse incentive to convert forest for agrarian use Allows INRA to grant land title inside the reserve to advance political goals Establishes a precedent for granting land titles within the reserve

7.2.4. Political Institutions: Opportunities and Constraints

The network of political actors operating in El Chore is extremely complex. Further, as we described above, there is a wide range of actors whose interests often diverge. In order to understand the possible ways in which to implement an avoided deforestation project in El Chore it is essential to anal yz e e ach part y‟s interests and motivations. The major political institutions and actors in El Chore are the central government, the Sindicatos representing the campesinos illegally encroaching on El Chore, and municipal leadership. An interaction and influence diagram of the institutional actors affecting El Chore is presented in Figure 6.

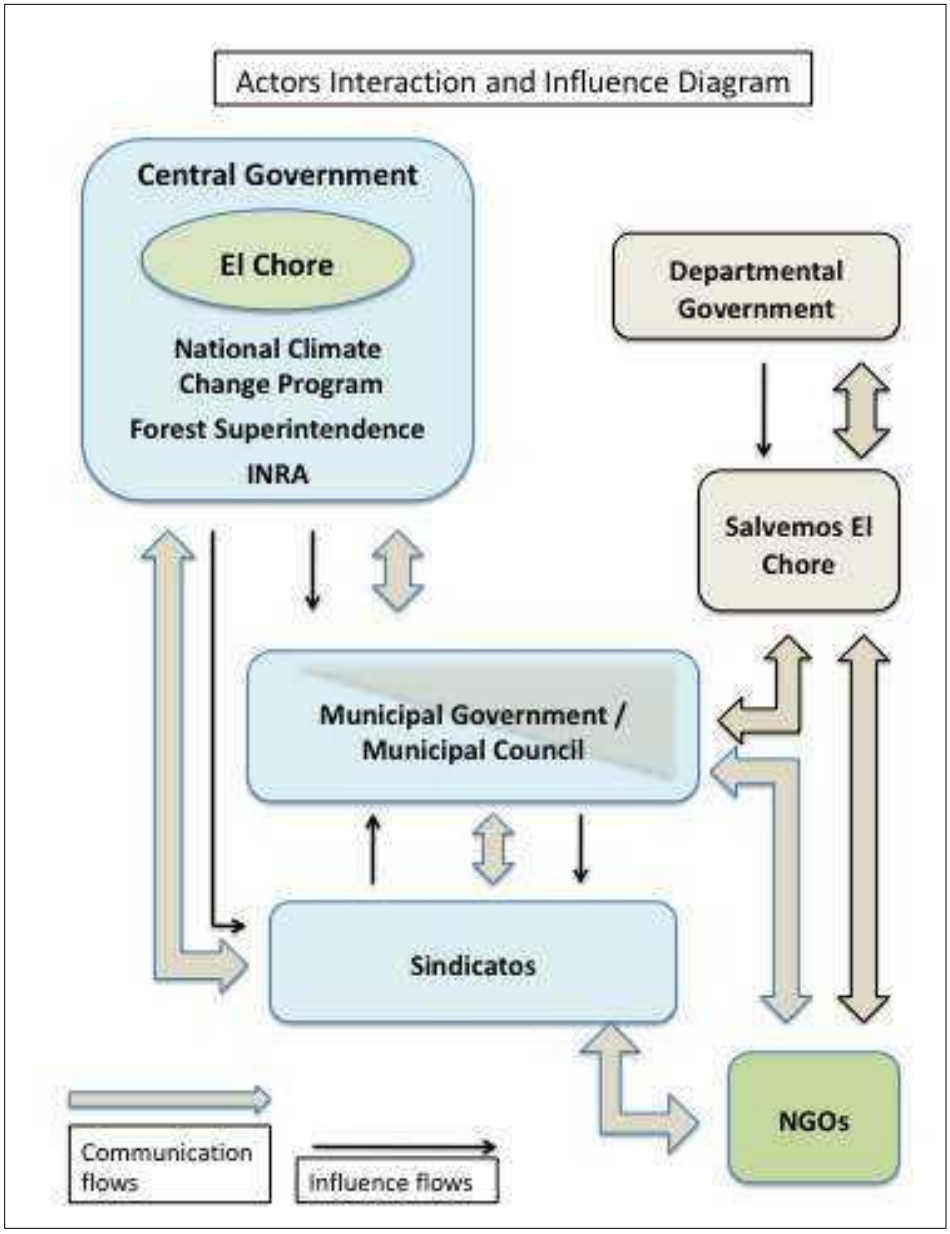

Figure 6: Interaction and Influence Diagram

(i) The Central Government

The central government has an extraordinary degree of influence in El Chore and plays several roles. Most importantly, as sole proprietor of the land, it has the right to market and sell VERs earned from an avoided deforestation project. The central government also controls the National Climate Change Program, INRA, and the Forest Superintendence. Further, the government has a specific political interest in the region; El Chore represents a rare central government stronghold in Santa Cruz, and is therefore less likely to constrain illegal behavior by the Sindicatos since cam pesinos are Mor ales‟ mo st ardent sup porters .

The government houses the National Climate Change Program (NCCP) which is committed to building its technical capacity to create a national monitoring system. The central government expects REDD to factor into a post-Kyoto regime despite the fact that the message coming out of Poznan (14th U.N. Conference of the Parties) was that this remains highly uncertain. Subsequently, the GOB is reluctant to market and sell VERs until the national regime is established. Evidence of this will is the fact that VERs from the Noel Kempf Mercado Climate Action Plan constitute 25-36 million tonnes CO2, none of which have been sold since receiving verified status in 2005. Further, the central government has made it clear that they oppose any market-based mechanism for conservation; they are not opposed to selling environmental services, but those transactions would have to occur via specifications laid out by the GOB (Box 2). The GOB is in the process of finalizing an opportunity cost assessment of avoided deforestation. Preliminary findings of this assessment suggest an opportunity cost ranging from $15 - $1800/ CO2 tonne, a figure that is quite high compared with mainstream

academic predictions (Gisela Ulloa 2009). These actions, or inactions, suggest the government is

looking to achieve a higher price for their emissions than current market prices. This is

unfortunate for El Chore where the opportunity cost of avoided deforestation in the reserve is likely to be quite low and communities in and around the reserve could benefit from carbon payments transacted through the voluntary market. Effectively, the current position of the central government eliminates the possibility of implementing an avoided deforestation project in El Chore for the time being.

Box 2: Bolivian Government Position on Climate Change Market Oriented Solutions

Climate Change: Save the Planet from Capitalism
(Excerpt)

Sisters and brothers: … Competition and the thirst for profit without limits of the capitalist system are destroying the planet. Under Capitalism we are not human beings but consumers. Under Capitalism mother earth does not exist, instead there are raw materials. ...In the hands of Capitalism everything becomes a commodity: the water, the soil, the human genome, the anc est ral cult ures , j ust ice , et hi cs , deat h … and lif e it sel f. Ever yt hi ng, absol utel y ever yt hi ng, ca n be bought and sol d and under Capi tal ism. And e ven "c l i mat e cha nge" itself has become a business.

… The market mechanisms applied in the developing countries have not accomplished a significant reduction of greenhouse effect gas emissions. **An Integral Financial Mechanism to address ecological debt** 7) Acknowledging the historical ecological debt that they owe to the planet, developed countries must create an Integral Financial Mechanism to support devel opi ng count ri es … 10) Finance has to be directed to the plans or national programs of the different States and not to projects that follow market logic. 12) The Integral Financial Mechanism must be under the coverage of the United Nations, not under the Global Environment Facility (GEF) and other intermediaries such as the World Bank and regional development banks; its management must be collective, transparent and non-bureaucratic. Its decisions must be made by all member countries, especially by developing countries, and not by the donors or bureaucratic administrators.

18) The reduction of the emissions from deforestation and forest degradation must be based on a mechanism of direct compensation from developed to developing countries, through a sovereign implementation that ensures broad participation of local communities, and a mechanism for monitoring, reporting and verifying that is transparent and public.

Evo Morales Ayma
President of Bolivia

Even if the GO B‟s NC C P strateg y *would* allow for a carbon project today, other constraints remain that undermine the feasibility of such a project. Monitoring and enforcement capacity and social tension in the reserve area preclude a viable avoided deforestation scheme. The Forest Superintendence is mandated by the Forest Law to monitor all forest activity, including granting concessions and reporting illegal behavior. The Superintendence is, however, severely underfunded and incapable of comprehensively performing its duties and lacks support from t he armed forc es w ho are const it uti onall y m andated to def end and p r otect all of Boli via‟s resources. According to Rolf Wachholtz of the Santa Cruz department office, deforestation in El C hore isn‟t a priorit y given the a gen c y‟s r esourc e const raint s; Wachholtz explains that the Superintendence can only respond to large scale deforestation due to the legal expenses of prosecuting illegal behavior (Rolf Wachhotz 2009). While the sum total deforestation in El Chore is significant, it occurs in small patches; mobilizing legal action against every perpetrator would simply be too costly. “ For get about El C hore,” W achholt z said, im pl yin g the for est was fated for destruction. A 2006 W orld Bank repo rt corrobor ates W achholt z ‟ skepti cism statin g (translated from Spanish), “as long as the Forest Superintendence continues to receive marginal attention and public financing, and does get enough support from the national police or armed forces, and continues to be obstructed by other state institutions such as INRA, forest governance will continue to be marginally real and substantially an illusion” (Andaluz and Mancilla 2006, page 44).

At the provincial level, the Superintendence of Sara, which contains the Santa Rosa municipality, staffs just three rangers equipped with one motorcycle and one truck to monitor a 6,886 km2 area. The provincial Forest Superintendence is further marginalized by social tension in the area between illegal settlers and legal residents. The provincial office was forced to

relocate from Santa Rosa to Portechuelo after illegal settlers burned down their office. The provincial superintendence has been effectively bullied into inaction as staffers fear physical retribution for reporting illegal activity (Marco Antonio Lopez 2009).

Lack of response to illegal activity in El Chore and the powerlessness of the provincial Forest Superintendence can be explained by political forces. The Morales government has consistently campaigned on a platform of indigenous and local community empowerment and the redistribution of Bolivia‟s natural r esourc e we alt h . His speeches have resonated in the hearts and minds of Boli via‟s la rge low -income popul ati on, which has be come his part y‟ s, the "Movement Towa rds Sociali sm" (MAS) , main electoral base. He has found particularly strong

support among the campesinos because of his agricultural origins as a coca grower in Potosi. They are MAS supporters and are particularly relevant to the central government because they represent a stronghold in the Santa Cruz department where political opposition is strong. Subsequently, any motivation of enforce the Forest Law in El Chore is undermined by the political incentive to look the other way.

One of the political institutions the government can use to maintain support among Sindicatos is INRA, the national agrarian reform agency. The power to grant property rights has been extensively exploited for decades in Bolivia as means for political leverage. A relatively recent example is the removal of over 200,000 ha from the reserve in 2000 – the so-called "disaffe cted z one." INRA granted property rights inside the reserve to mollify the demands of the campesinos. We do observe, however, that the government uses this instrument in a cautious way, providing only a minimal amount of the actual claims to the strongest MAS supporters. We

also learned that the government pressured municipal officers to certify claims of settlements

prior to 1996 that were dated after 1996 (Anonymous 2009). The governm ent‟s ambi guit y on land titles in the reserve is what transforms campesinos claims into a tool for political bargaining.

(ii) Sindicatos

At the local level, the Sindicatos are the dominant political group; they are highly organized and extremely powerful. Sindicatos formed to represent the voice of the campesinos and to ensure their needs are acknowledge by national and local authorities; their main objective is to obtain land rights inside the reserve for agriculture.

There are a large number of Sindicatos in the region operating in El Chore, united by two Federations – (Yacapani and Ichilo). Sindicatos can be divided into two categories - the old settlers and the landless. The old settlers are the sons and daughters of settlers bearing legal title to land in El Chore area; the landless are those who may or may not live in the area but are seeking land in El Chore. Sindicatos are the most powerful organization in the region due to their size and the lack of enforcement mechanisms in the reserve. Their power and capacity to defy the local government is exemplified by their successful interference in the construction of a public canal running between the municipalities of Yapacani and San Juan; they argued that no one had consulted with them about the plans (Katsumi Bani 2009).

Sindicatos function in the following way. They organize a consortium of between 40 and 60 families who are interested in making a land claim. Each family is charged approximately $400 for membership (Widen Abastoflor and Katsumi Bany, 2009). Then, they enter the reserve

in search of land they can claim belongs to no one. Once they have identified a suitable place,

the Sindicato remains on the land for a couple of days, and if no one appears, they claim the land for themselves (Widen Abastoflor 2009). Later, with aid of external groups, they map and divide

the area into 50ha plots (Katsumi Bany 2009). In order to demonstrate establishment and land use, the Sindicato will cut down or burn the trees on the plot and may settle their families on the land. They may also engage in civil demonstration as required by membership and dictated by the Federation. Members are expected to comply with all these activities and failure to do so might end in expulsion from the group; anyone who is expelled will lose their claim on the land (Katsumi Bany 2009).

There is, however, some internal conflict among the Sindicatos. Conflicts arise from the difference in interests of the old settlers and the landless. Old settlers are not solely focused on land claims, but are also interested in local development. The landless are primarily interested in claiming land (Widen Abastoflor 2009). These internal divisions have blocked several proactive measures led by local leaders to address the land claims and resulting deforestation. Nevertheless, we believe Sindicato interest in local development can be use as a foundation to build support for a cooperative conservation/community development project.

(iii) Municipal Government

The municipal governments potentially the most significant actors affecting a REDD project in El Chore. The municipalities of Yapacani, Santa Rosa and San Juan form the Municipal Association of San Juan, Yacapani, and S anta Rosa whose ch air is S an J uan‟s ma yo r

Mr. Katsumi Bany. The association was formed to deal with the threat to El Chore, but lacks the ability to coordinate activities between the municipalities. Two of the three mayors are politically

obsolete; in Yacapani, the President of the Yacapani Federation of Sindicatos holds the most power, and in Santa Rosa the President of the Municipal Council, Mr. Marcos Achacollo, holds

the most power and influence with the community (Katsumi Bany, Jose Luis Vega and Widen

Abastoflor 2009). The Municipal Association, however, represents an institutional precedent for political cooperation that would be useful for a REDD project, or any cooperative conservation agreement.

Due to security issues we were not able to visit Yapacani to interview the leadership there, thus our knowledge of the situation in that municipality is limited. We did meet with Mayor Bany and President Achacollo, however, and discovered both leaders were conscious of the ecological services provided by the El Chore and have both, independently, pursued entrepreneurial agreements with the Sindicatos to curb deforestation.

In San Juan, Mayor Bany is establishing, outside the reserve, a conservation project whereby Aerosur Airlines and La Caixa Foundation will pay to avoid deforestation to offset the airline‟s emiss ions. The M ajor is also promoting organic apiculture as a way to modify the traditional agricultural production scheme of the zone. He also has a proposal to stop reserve invasion by creating a buffer zone inside the reserve wherein non-extractive activities are allowed and establishing settlements outside the reserve including the provision of public services for the community. Mayor Bany is also working on a creating a register of Sindicatos to discourage new claims and is considering building a natural barrier for the reserve. Bany has had little success thus far in his enterprises due to financial constraints, yet the Ma yo r‟s a cti vit ies represent an established channel of communication between the Sindicatos and the local government aimed at reducing deforestation in El Chore and aimed at economic and social development.

In Santa Rosa, the municipal council is equally concerned about deforestation in El Chore

as well as the impact of increased deforestation on changes in rainfall; the council claims to already be seeing changes on the microclimate of Santa Rosa (the disaffected zone, where

deforestation is almost complete, lies almost entirely in Santa Rosa). Council activities have been focused on the development of agreements between the concessionaires and the campesinos/Sindicatos. The agreements acknowledge that campesinos have short-term economic needs, that agriculture is their only present source of income, and that the concessionaires are the only ones who have the legal right to extract the forest and should not be restrained to do so by the settlers. Within this context these premises, the Council has been quite successful forging arrangements whereby campesinos are allowed to live inside the concessions and perform small-scale agriculture.

These agreements do have some caveats. Since no agriculture is legally permitted inside the reserve, they are not essentially legal. Further, the council has committed to finding alternative sources of income for the campesinos and has not yet been able to do so. Mr. Achacollo is thus concerned about the sustainability of agreements. The council believes immediate action should be taken because the higher the deforestation rates and the more entrenched the campesinos become in their settlements the smaller will be their leverage to negotiate (Marcos Achacollo 2009).

The Municipal Council of Santa Rosa provides a particularly interesting institutional opportunity. In addition to their history of forging agreements with illegal settlers in the reserve, they are a validated actor, close to the campesinos and the community, and they are concerned about the environment. The Council is also a link to the Central Government; most of the Council members are MAS and have access to high level central government authorities - Mr. Achacollo's sister is the Bolivian Minister of Justice. The Council's willingness to cooperate, their political power,

and their connection to the central government make them the most important link in the institutional web surrounding El Chore.

(iv) Department of Santa Cruz

The Departmental government of Santa Cruz plays a very limited role in El Chore because of inst it uti onal constraints and lack of poli ti cal po wer. The GO B‟s Sus tainable Dev elopm ent

Secretariat has four agencies: the Protected Areas agency, the Forest Management and Biodiversity agency, the Environmental Quality Management agency, and the Departmental Territorial Planning and Basin Management agency. Of these, only the Territorial Planning and Basin Management agency is run by the departmental government, and with the new constitution it is likely to be delegated to national level administration. The marginalization of the departmental government is perhaps most critical with regards to the police force. According to the law, the departmental government controls the police, however the police have proved to be loyal to La Paz, answering only to the central government, thus eliminating any departmental ability to enforce the forest law in El Chore.

These issues have limited the presence of the departmental government in El chore to the founding of Salvemos El Chore (El Chore Defense Committee). The Sustainable Development Secretary of the department government leads this committee whose members include the Forest Chamber, the Mayor of Santa Rosa representing the three municipalities in El Chore, Santa Cruz Soy Producers, University Gabriel Garcia Moreno, Fundacion Natura Bolivia, and the ASLs. The committee creates a space to generate possible solutions to avoid deforestation in el Chore and has tried, unsuccessfully, to present its demands to the central government. The committee is the only organization linking the institutional actors relevant to El Chore, however, the committee has three weaknesses that undermine its capacity o influence avoided deforestation in El Chore:

First, the Central government is not represented; second, Campesions have been explicitly left out of the committee because including them implies recognizing them as a legal entity; and

third, as stated previously, the Mayor of Santa Cruz is not particularly powerful in the municipality. Salvemos El Chore could play a significant role in facilitating an avoided deforestation project in El Chore, but these weaknesses would have to be addressed.

(v) NGOs

NGOs can play a significant role in the design and implementation of an avoided deforestation project in El Chore, providing technical assistance, access to funding, and managerial assistance. Fundacion Natura Bolivia, CEPAC and SEGIS are active Bolivian NGOs facilitating PES projects and community development strategies in Santa Cruz. Natura has had successful experiences developing payment for watershed services projects and has been granted funds to develop a project in El Chore. CEPAC has worked for a long time in Yapacani, and has been involved in developing agreements to curb deforestation; CEPAC also has experience identifying and developing alternative sources of income for the region such as fisheries and agroforestry. SEGIS also has a long history of working with and supporting the Campesinos.

7.3. Socio-Cultural Considerations

Socio-cultural predispositions must also be factored into the construction of a carbon storage project in El Chore. The local Forest Superintendence estimates just 10% of settlers even know there is a Forest Law, and are thus unaware of the illegality of their behavior as well as the potential benefits to them the law could provide (Marco Antonio Lopez 2009). Further, there will

be challenges getting the settlers to try a new economic activity (Marco Antonio Lopez

2009). Marcos Achacollo[9], President of the Municipal Council of Santa Cruz, insists there is no way of asking the campesinos not to do agriculture because they are so tied to the practice (Marcos Achocollo 2009). Further, the campesinos are accustomed to being supported by the state. INRA's granting of the disaffected are a to illegal settlers in 2000 proved to them they will ultimately get what they want if they are willing to wait long enough; they may have little incentive to reach a cooperative agreement. The solution to these socio-cultural issues is a complex process of empowerment aimed at slow, incremental change.

[9] Achaco

llo ‟s sis ter is B o livia ‟s Minis ter o f J ustice .

8. Policy Recommendation

Several legal and institutional constraints remain in Bolivia and in El Chore which undermine the viability of a REDD project in the reserve. The central government has legal title to the land in the reserve as well as the right to sell the ecosystem service – in this case carbon storage. In the end, any REDD project will have to go through the central government. The government is working on creating a national REDD system, however the system is still limited by technical and institutional limitations and it is unclear when the system will be ready. This situation blocks any possibility of establishing a REDD project in the voluntary market without the consent of the central government.

The proximate cause of deforestation in El Chore is illegal settlements by western migrants in search of agriculture land. The underlying cause is the high incidence of extreme poverty in the country and the need for new economic opportunities. To mitigate this problem the government must address two important policy areas: the need for economic opportunities for displaced campesinos and the need for clear land tenure laws and regulation. Until the government has accomplished these goals, El Chore will be under constant threat of deforestation.

Even if the central government were willing to establish a REDD project in El Chore now, the institution and political situation in the area is such that negotiating and enforcing the project is not feasible. Campesinos are already settled inside and along the periphery of the reserve. Further, the forest is a vast area; it would be exceedingly costly to try to force the campesinos out and prevent them from invading the forest again. The way to get a REDD project off the ground

is to incentivize the campesinos not to deforest the reserve by providing them with alternative productive capacities such as sustainable forestry, non-timber forest product extraction, and

possible fisheries. Since the central government is not actively supporting REDD activities at this time, the only way to get a project such as REDD off the ground is if the campesinos demand it, and this will only happen if they believe it is in their best interest.

It is therefore essential to build trust within the campesino communities. They must believe that if they do stop their agricultural activities to avoid deforestation, they will receive adequate compensation and social services. Since economic hardship drives their migration, we believe they will respond to economic activity. There exist some institutional and legal opportunities that may facilitate such a project, and these opportunities should be exploited to begin to build the social foundation for a cooperative REDD agreement.

We recommend the following long-term steps:

1. **Initiate pilot projects in Santa Rosa and/or San Juan:** Municipal leaders in Santa Rosa and San Juan are actively looking for avoided deforestation and reforestation projects to address the social tension in their respective constituencies. Both the Mayor of San Juan and the President of the Municipal Council of Santa Rosa del Sara have initiated negotiations with Sindicatos in their municipalities and have some idea of what the project design could be; they understand the necessary incentive structure to be effective. In order to capitalize on these ideas, *Natura* should use its current resources to engage these communities in non-REDD cooperative agreements to avoid deforestation based on the existing agreements forged in the municipalities. This may involve a traditional conservation approach until the central government allows for a market-based

approach.

2. **Use pilot projects to develop trust in the community:** Pilot projects can set a precedent in the El Chore community and can model the benefits of a payment-for-ecosystem services approach to improving community livelihoods. The success of the pilot project will serve as an example to the surrounding communities that payments for ecosystem services are real and generate higher incomes than swidden agriculture or illegal timber extraction. The pilot projects will also inform *Natura* about the distribution scheme appropriate to place the resources in the community. The project may not be able to earn CERs or VERs in the short term, but the institutional arrangements can be put in place in order to scale up when, and if, the national system is in place. If a national system never comes to fruition and the government ultimately allows a third party to sell the ecosystem service, the institutional arrangement will also facilitate a transaction on the voluntary market.

3. **T ie th e p il ot p roject to t h e cou n try's Nation al D evelop men t Plan** : The central government has made it clear that community development is a priority. If it can be demonstrated that a PES project can accomplish community empowerment and economic development, the government may be willing to support a carbon storage project in advance of the national system. We propose to use the municipalities to construct a Community Development Strategy for avoided deforestation engaging the campesinos, local NGOs such as *Natura*, and other government agencies.

4. **Create a Community Development Strategy:** Start a community development process in the community whose resources will come from a future REDD project. This action

has two purposes: first, to address the distribution issue before the project is in place and second, to generate the demand from the campesinos towards the central government for

a REDD project in El Chore. We recommend that this community development plan focus its resources at three levels: family, community, and municipality. Engaging the community in developing a strategy for community cooperation, including enforcement and alternative sources of income will facilitate a successful transformation of the productive capacity of the region.

We also recommend the following specific actions *Natura* should take right now to capitalize on institutional opportunities for cooperation among actors in the reserve area:

1. Act as a facilitator to bring together the leadership of the San Juan and Santa Rosa municipalities to understand the specific necessary incentive structures.
2. Coordinate the drafting of specific Community Development Strategies by the municipalities in concert with their communities.
3. Start conversations with the Sindicatos in Yacapani including the mayor of Yacapani and the Federacion de Sindicatos de Yacapani.
4. Start conversations with industrial agricultures south of the reserve who are benefiting from the ecosystem services provided by the reserve (Andes Elbow Effect). This could provide a cash flow that could help to sustain the project until a REDD project is more feasible.
5. Coordinate technical assistance which can come from the Universidad Gabriel Moreno, the Departmental Government, World Bank, USAID, and other NGOs

9. Conclusion

There is uncertainty in the international community concerning whether a REDD regime will be a part of a post-Kyoto global climate change regime. In the meantime, the voluntary market for verified emissions reductions is growing rapidly and is including avoided deforestation into its standards and certification methodologies. Opportunity costs assessments suggest that in some places – where deforestation is driven by subsistence agriculture in remote areas – economics will not constrain implementing REDD projects. Transactions costs and institutional capacity will vary across countries an d will li kel y d etermi ne a countr y‟ s, or a project‟s, R EDD r eadine ss.

In this report, we examined the economics of REDD and the specific institutional opportunities and constraints to developing a REDD project in El Chore National Forest Reserve in Santa Cruz Bolivia. We conclude that economics is not likely to be the binding constraint to RED in El Chore, however, a number of institutional and legal issues constrain the feasibility of establishing a REDD project in the short term. We were able to ascertain, however, a set of actions that can exploit existing institutional opportunities on the ground in El Chore and establish the foundation for a future cooperative payment for ecosystem services project. These actions are aimed towards ameliorating social conflicts within the reserve that threaten the forest. The ultimate objectives of our recommended actions are to build trust among and between the interested communities and to demonstrate that conservation though payments for ecosystem services can be used to redefine the productive capacity of the region and generate higher incomes than current economic activities. Our diagnosis also concludes that if this set of actions is not performed, even with a national REDD system in place, El Chore will be unable to benefit

from this potential revenue source.

If this set of actions is implemented and the national government is able to coordinate a national REDD system, the El Chore project will be in an ideal situation to scale up and to begin receiving certified emissions reductions payments.

Annexes

Annex One: REDD - Reducing Emissions from Deforestation and Forest Degradation

This paper concerns carbon storage as an ecosystem service[10]. The amount of carbon that can be stored in a forest depends on several factors including the age and density of the forest which vary over time and space. Forests capture and store carbon through photosynthesis in both above ground and below ground systems. Above ground, carbon is stored in live trees, understory, dead vegetation, and the litter layer; below ground, carbon is stored in the roots and soil (Swallow et al 2007 page 4). Degrading or destroying these systems result in the reduction of carbon sinks and if burned or manufactured the release of carbon into the atmosphere. It is estimated that approximately 20% of global CO2 emissions are the result of deforestation.

REDD refers to payments for the ecosystem service of carbon dioxide (CO2) sequestration in forests through actions that avoid deforestation and mitigate forest degradation.

Defor estatio n‟s contribut ion t o gre enhouse gas (G HG) con centrati ons i n the atm osphere has led

climate change policy makers and forested countries to lobby for the inclusion of avoided deforestation into a global climate change regime, and it was debated during the Kyoto negotiations. Afforestation[11] and reforestation were included in the Clean Development Mechanism (CDM) of the Kyoto protocol, however avoided deforestation was ultimately excluded from Kyoto due to several technical and institutional concerns detailed below. In 2005, however, Papua New Guinea and Costa Rica at the Eleventh Conference of the Parties (COP 11) of the UN Framework Convention on Climate Change (UNFCCC) in Montreal, suggested

[10] For more on Payments for Ecosystem Services see Annex 1.

[11] The process of creating a forest on land that has never been fo r ested o r hasn ‟t b ee n fo r este d in a lo ng ti me.

revisiting avoided deforestation in future meetings of the Subsidiary Body for Scientific and Technical Advice (SBSTA) to attempt to overcome previous implementation concerns.

The COP 11 resolved to discuss REDD (reducing emissions from deforestation and forest degradation) for two years during subsequent meetings of the SBSTA (Swallow et al 2007 page 7). And in 2007 at the COP 15, a decision was made to include REDD in the voluntary carbon market and developed countries were to initiate and fund REDD pilot projects to explore their viability for possible inclusion in a post-Kyoto regime.

REDD was left out of Kyoto and the CDM due to the technical and institutional challenges it presents; thus while deforestation is the "low-hanging fruit" of climate change policy in theory, the actual creation of international standards for monitoring and implementing REDD schemes presents a tremendous challenge to policy makers at all levels of governance. The major challenges to REDD are:

- **Baselines:** Credible baseline deforestation rates must be established in order begin assessing the carbon value of the project and additionality.
- **Additionality:** The methodological challenge of gauging baseline deforestation rates to ensure that emissions reductions would not have occurred in the absence of the REDD project.
- **Leakage:** The process by which conservation efforts in one region are offset by increased exploitive activity in another region. If the scheme is offsetting, leakage will result in an increase in emissions; if the scheme is not for offsetting, leakage will only result in less reduction of emissions.
- **Permanence:** The need for adequate insurance mechanisms to account for natural threats to forests such as fires and floods
- **Monitoring and Enforcement:** National carbon accounting mechanisms including ground-based data on carbon stocks and satellite data analysis to measure changes in forested areas as well as on the ground enforcement teams are needed ensure the integrity of reductions.
- **Issues of Scale:** The possibility of carbon credits flooding the market, thereby reducing industrialized countries' incentive to reduce emissions

The subsequent meeting of the SBSTSA last May 2008 acknowledged great improvement in tackling these challenges, however, several issues persist particularly concerning establishing baselines, access to remote sensing data to monitor changes in forest area, and the need for capacity building (FCCC/SBSTA 2008).

Boucher (2008 page 3) points out that REDD is more than just avoided deforestation, although avoided deforestation may be a part of a REDD scheme. UNEP defines three alternatives to deforestation included in REDD: actions to limit drivers of deforestation, protection of Forests, and Sustainable Forest Management (SFM). Drivers of deforestation may include avoiding building roads and other transportation infrastructure into undeveloped forested areas. Protection of forests may include creating traditional forest reserves wherein no activity is allowed within the protected area or may refer to multiple-use forestry that allows for subsistence activity within the project area. The Food and Agriculture Organization defines S FM as "the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfill, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause dam a ge to ot her ec os ystems" (FAO).

Those in the development and conservation fields are particularly concerned that REDD schemes include the p rov isi on of "co -ben efits" (Ebeling 2007 page 4). Co-benefits refer to R EDD‟s potenti al t o gen erate incom e for low -income forest-dwellers and to preserve biodiversity. Funds generated from the sale of carbon bonds can be used to fund protected area creation, community management zones, and eco-tourism ventures to maintain ecosystem int eg

rity and protect biodiversity while increasing incomes.

Traditional conservation, which prohibits any use of the forest, can be detrimental to indigenous and local communities who have inhabited the forest for many years; removing these communities from the land deprives them of their livelihoods and identity. Loss of traditional land can have long-term consequences that cannot be ameliorated quickly or easily (Asquith et al 2002 page 331).

In 2005, the Noel Kempff Mercato Climate Action Plan - a partnership between The Nature Conservancy, Fundacion Amigos de la Naturaleza, the Government of Bolivia, and three energy companies: American Electric Power, BP Amoco, and Pacificorp - became the first certified carbon sequestration project to receive third-party verified emissions reductions. The project used the carbon payment to remove logging concessionaires from the park area, compensating them for their losses and obligating them to practice sustainable extraction elsewhere in the country. Some indigenous and local peoples were displaced by the project as no subsistence or commercial activity of any kind is allowed on the reserve[12]. A cost-benefit analysis of the project‟s im pact on l oc al communi ti es revealed a net gain for the comm unit ies as a whole unit, largely due to project funding for education, health care, and microenterprise; however, one community suffered significant employment losses due to the closure of the logging concessions and bore an u nequal prop orti on of the project‟s co sts to t he local peoples (Asquit h et al 2002 page 332). NKMCAP has successfully compensated for the loss to the communities through its outreach programs, however, the project illustrates the challenges of strict conservation strategies

[12]“The park expansion decree included two provisions that are critical for compensating the local communities. Ar ticle Six o f Dec r ee 2 4 4 5 7 „r ec o gnize s and guarantees the subsistence use and exploitation of renewable natural resources by the towns and communities (of Bajo Paragua), within the expansion zone, as agreed by the corresponding r

eg ulatio n s p r o vid ed in the P ar k ‟s ma nage me nt p lan ‟. Ar ticle Se ven o f the Dec r ee „estab lis he s the necessity to implement within the term of one year communal reserves for the(se) populations. . . (and) with limits defined through a participatory study, an exclusive territory with rights to use resources in a sustainable manner to i mp r o ve the ir q ualit y o f li fe‟. Ho we ver , as o f J ul y 2 0 0 0 , fo u r years after the Decree was signed, the three communities were prohibited from using almost all resources in the expansion area, and had only recently received limited use-r ig ht s o n o ther ter r ito r y" (Asquith et al 2002).

for forest protection. NKMCAP plans to introduce an ecotourism operation to the project as well as an investment fund for ecologically sensitive enterprises.

The challenge for REDD is to create a balance between land use and conservation in order to maximize stakeholder interest. We define stakeholders here to include government interests, commercial interests, and communities. Smith and Scherr (2003 page 2148) recommend a spatial distribution of land whereby some of the project area is devoted to sustainable commercial activities, some of the project area is withheld for strict conservation, and some of the area is used by local communities for subsistence economic and social activities. Further, some control over project design and implementation should be delegated to local communities, thereby linking the development and conservation goals of the project; if communities have a stake in the project they will have an interest in maintaining the integrity and sustainability of the project (Asquith et al 2002 page 333 and Smith and Scherr 2003 page 2149).

A pilot REDD project in Indonesia attempts to achieve the development-conservation balance by integrating a multiple-use community carbon sequestration scheme in the Makira Forest Project. A partnership between the Wildlife Conservation Society (WCS) and the Government of Madagascar, the project divides the forest area into three usage zones: the Zone of Strict Protection, the Multiple Use Zones, and Co-Management zones (Holmes et al 2008 page 18). The Zone of Strict Protection is the largest area and allows no removal or cultivation whatsoever. The Multiple Use Zones comprise the smallest area and include Zones of Controlled Use and Zones of Controlled Occupation; no commercial activity is permitted within this zone, but people allowed to live within the ZSP may use the natural resources for

subsistence. The Co-Management Zones lie along the perimeter of the forest where the majority

of deforestation has occurred and would occur in the absence of a REDD scheme; this zone is

where the additional carbon credits will accrue. The zone is managed by communities inhabiting the forest perimeter, an arrangement contracted between the communities and the government of Madagascar. WCS co-manages the co-management zones, providing technical assistance with monitoring and enforcement mechanisms. The project is in its early stages so there are no impact assessments yet available.

The most important aspect of providing co-benefits in REDD schemes is the creation of the appropriate enabling environment (Smith and Scherr 2003 page 2149). Such an environment would include clear and fair land tenure for indigenous and local communities, rights of communities to at least a portion of carbon payments received for REDD, and mandatory social im pact st udies to m onit or R EDS‟s im pact on communi t y li veli hoods and b i odiversity.

The development of a global REDD regime is likely to take many, many years and depends on international consensus as well as resolutions to the institutional and technical barriers. In the meantime, the voluntary market has been testing pilot programs, such as the Makira Project, run by NGOs and conservation organizations to try to better understand these barriers and to test project design.

Annex Two: The Voluntary Market

The Kyoto protocol signed in 1997 provided the basis for the development of a carbon market wherein avoided emissions could be traded. Under this agreement, the Clean Development Mechanism (CDM) is the link between industrialized countries and developing ones. The CDM was supposed to help reduce emissions in the north in a cost effective way and also provided a link between carbon markets and sustainable development in the south. Through the CDM, developed countries can buy emission credits from carbon offsetting projects in the third world. For a project to be acceptable, emissions reductions must be additional, and one way to prove additionality is to demonstrate that the project would not be economically feasible without carbon finance.

Unfortunately, the CDM has not met the original sustainable development expectations. The highly complex and bureaucratic procedures to certify carbon emissions have set high transaction costs for these projects. These high costs have caused most emissions purchasers to bypass local community projects in favor of low cost, high volume projects such as capturing methane from landfills and hydro fluorocarbon destruction that provide low social value (Taiyab et al 2006 page 7). Further, as mentioned in Annex One, avoided deforestation was left out of the original CDM document and there is still no approved methodology for certifying carbon offsets due to reduced emission due to deforestation and degradation (REDD) under the CDM.

However, parallel to the CDM a voluntary market for carbon offsets has been developing for several years. This market consists of companies, organizations and governments who buy carbon offsets for reasons other than complying to a certain regulation. Among the advantages of the voluntary market is the possibility to include project types for which there is no approved C

DM methodology (such as REDD), thereby reducing transaction costs and enabling the

development of small-scale community based projects as well as projects that value social impact or ecological services. These types of offsets, called Verified (or Voluntary) Emissions Reduction (VERs), still aim to meet the same additionality, leakage and permanence requirements; however the methodologies to prove the requirements can be softer.

These benefits do not come without a cost. Lack of regulation of the voluntary market makes it difficult for buyers to clearly identify the quality of offset or emissions reductions they are buying (Taiyab et al 2006 page 28). This problem is augmented by the presence of a wide range of projects, which can go from renewable energies, to avoided deforestation to energy efficient cooking stoves in very poor communities. In order to address this problem, several institutions have developed certification methodologies, which focus on the different types of co-benefits a project may have.

The Voluntary Carbon Market is broadly divided into two main segments. On one hand there is the Chicago Climate Exchange (CCX) and on the other the over the counter offset market (OTC). The CCX is based on a membership cap and trade system, where the companies who choose to work with them are required to set reducing emissions goals. Here the offsets are highly commoditized and third party verification is required. The high commoditization of the offsets do not allow to value other aspects of the projects, making the CCX unattractive for REDD initiatives (Hamilton et al 2008 page 40). For this reason we will focus our analysis in the OTC market.

In the OTC market we found companies, non-governmental organizations, governments and individuals. Since there is no cap in thi s market, bu ye rs‟ mot ivations ar e usuall y related to so ci al co rp or at

e responsibility, willingness to manage their emission impacts, preparing for

future regulation or as an investment to be resell at a higher price (Hamilton et al 2008 page 18). There are four major types of sellers:

1. **Project Developers**: People or institutions that develop emission-reducing projects.
2. **Aggregators/Wholesalers**: Intermediaries that establish a portfolio of credits by buying offsets from sev eral p rojects. The y a ggre gat e VE R ‟ s and sell them as a package.
3. **Retailers**: Also own a portfolio of credits but specialize in selling small amounts of offsets. Theirs usual buyers are individuals or small organizations.
4. **Brokers**: Act as transaction facilitators.

In 2007, sixty-five million tonnes of carbon dioxide equivalent were transacted in the voluntary market reaching a value of $330.8 million[13]. Of these, 42.1 million tonnes correspond to the OTC and 22.9 million tonnes correspond to the CCX. Even though these numbers are still small compared to the 2,918 million tonnes CO_2 traded in the regulated market, it represents an increase of 240% over the $91 million traded in 2006. Also, the volume traded in the Voluntary Market increased in 165%, over the period 2007-2008 whereas the regulated market grew by just 71% (Hamilton et al 2008, page 6).

In particular, avoided deforestation projects accounted for 5% of the volume transacted representing an increase of 66% with respect to the 3% they represented in 2006. The price of VERs for avoided deforestation was on average $4.8/tonne CO2 exhibiting a high and low peak of $30/tonne CO2 and $2.5/tonne CO2 respectively. This average is lower than the market average of $6.1/tonne CO2 (Hamilton et al 2008 page 34).

On the buyer side, private business bought 80% of the VERs while governments were only

responsible for .05%. (Hamilton et al 2008 page 67). The primary motivations for purchasing

[13] Estimate, there is no official record for the voluntary carbon market transactions.

VERs in 2007 were social corporate responsibility and public relations (Hamilton et al 2008 page 68). Buyers cited additionality, social and environmental benefits, certification and sellers reputation as the most important price determinant and convenience as the least important one (Hamilton et al 2008 page 70). This suggests that in the OTC market, buyers are looking for attractive projects with a good "story" behind it. For these buyers, REDD projects should be increasingly attractive as they usually include conservation, biodiversity and local development into their design.

For the future, even though the price per tonne of carbon dropped at the end of 2008, the market is expected to continue its expansion in the long run. Before the financial crisis, the CCX reported an increase of 240% for the first quarter (Hamilton et al 2008 page 72). Of course there is no clear trend for 2009, but as long as public awareness about climate change continues to grow and the establishment of emission regulations is seen as inevitable in several regions of the world, the voluntary carbon market should continue to grow.

Annex Three: List of Individuals Interviewed

Widen Abastoflor, Executive Director CEPAC, Centro de Promocion Agropecuaria Campesina www.cepac.org.bo Marco Achacollo, President of the Municipal Council Santa Rosa Del Sara, Department of Santa Cruz, Bolivia Nigel Asquith, CID Fellow Harvard University Jorge Avila, Head of Legal Department and Environmental Affairs Forest Chamber of Bolivia Katsumi Bany, Mayor San Juan Municipality, Department of Santa Cruz, Bolivia Ricardo Israel, Dean School of Political Science and Law, Universidad Autonoma Chile Marco Lopez, Forest Engineer Portechuelo Office Forest Superintendent Bolivia Carlos Roca, Director of Territorial Planning and Basins Department Government of Santa Cruz Sindicato 8 December Gisela Ulloa, Coordinator of the National Climate Change Program REDD Secretariat Government of Bolivia, La Paz Rodrigo Valenzuela, Head of Community Empowerment Programa Origenes, Santiago, Chile Jose Luis Vega, Director *Salvemos El Chore* Committee Dr. Rolf Wachholtz, General Expert CIM-GTZ and Consultant for the Control of Deforestation and Forest Fires Forest Superintendent Bolivia

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