

Forest Certification in Bolivia: A Status Report and Analysis of Stakeholder Perspectives

Omar Espinoza
Michael J. Dockry

Abstract

Forest certification systems are voluntary, market-based initiatives to promote the sustainable use of forests. The assumption is that consumers prefer sustainably sourced wood products. One of the major drivers for the creation of forest certification was to prevent deforestation in tropical forests. However, after 20 years of certification, only 10 percent of the global forest area is certified, mostly in temperate regions. Only 2 percent of tropical forests have been certified, and deforestation proceeds at alarming rates in those same areas. Africa and Latin America are the only regions with a net loss of forest area in the 2000 to 2010 decade. In this article, the status of forest certification is analyzed, and challenges and opportunities are evaluated using the case of Bolivia. After an initial period of successful implementation of certification, the area of Bolivian forest under certification has fallen sharply, and deforestation has actually increased in the 2000 to 2010 period, compared with the previous decade. This research uses qualitative research methods to uncover the reasons for the rapid initial growth of certification in Bolivia, its subsequent decline, and prospects for the future of certification in this South American country from the perspectives of people living and working in Bolivia's forestry sector. Participants concurred that a strong regulatory framework and international support were key factors to the initial success of certification in Bolivia. Benefits from certification commonly cited were improvement in the standard of living of timber-reliant communities, better markets for certified products, and an improvement in the image of the forest products industry.

Forests, in addition to being a major resource for human sustenance, provide carbon sequestration, temperature regulation, protection against erosion, flood control, water storage, and habitat to half of all known plant and animal species (Lenz 1967, Böswald 1996, Chlebek and Jařabáč 1996). However, deforestation has been taking place at an alarming rate in some regions of the world, mostly due to conversion of forested areas to croplands and pasture lands (Bowyer 1997, Lindsey 2007). While most boreal and temperate forest areas have been stabilized lately, the annual loss of 13 million hectares per year during the last decade occurred almost entirely in tropical forests, some of the most valuable areas with respect to biodiversity and natural regeneration. In fact, the deforestation of tropical forests is estimated to contribute about 15 percent of global total carbon dioxide emissions (Achard et al. 2010). South America and Africa account for most of the deforestation (7.4 million hectares of net loss per year in the 2000 to 2010 period) and continue to have the highest net loss in forest cover (−0.45% and −0.49% annually, respectively, in the 2000 to 2010 period, calculated as loss in percentage of the remaining forest area each year within the given period; Food and Agriculture Organization of the United Nations [FAO] 2010).

As one response to these challenges, government regulation and nongovernmental systems of forest management have been established. The former include laws, restrictions, and taxes, among others, while nongovernment initiatives include, prominently, forest certification systems (McGinley and Cabbage 2011). Forest certification systems are market-driven initiatives with the purpose of promoting the sustainable utilization of forests from an environmental, economic, and social point of view (Hansen et al. 2006, Bowyer 2008). Forest certification grew out of a worldwide concern for the environmental and social impacts of tropical deforestation in the 1980s (Cashore et al. 2003). One main driver for the creation of forest certification was addressing

The authors are, respectively, Assistant Professor, Dept. of Bioproducts and Biosystems Engineering, Univ. of Minnesota, Saint Paul (espinoza@umn.edu [corresponding author]); and Research Natural Resource Specialist, Strategic Foresight and Rapid Response Group, USDA Forest Serv., Northern Research Sta., Saint Paul, Minnesota (mdockry@fs.fed.us). This paper was received for publication in October 2013. Article no. 13-00086.

©Forest Products Society 2014.

Forest Prod. J. 64(3/4):80–89.

doi:10.13073/FPJ-D-13-00086

the need of communicating the environmental quality of forest products to consumers. The underlying assumption for the establishment of forest certification systems is that consumers prefer products manufactured in an environmentally responsible manner. The hope is that such preference creates a “pull” effect by which companies are incentivized to adopt environmentally responsible practices (Vidal et al. 2005).

The first third-party forest certification system with a global scope was the Forest Stewardship Council (FSC), formed in 1992 by several major environmental nongovernmental organizations (NGOs) and global retailers (Nussbaum and Simula 2005, Van Kooten et al. 2005). Shortly after, the Sustainable Forest Initiative (SFI) was established in the United States in 1994 (SFI 2011). The American Tree Farm System (ATFS) was developed for small US woodland owners and incepted in 1941 (ATFS 2010). Canada’s Standard Association developed its own certification system in 1996 (Canadian Standards Association [CSA] 2011). In 1999, European small forest owners founded the Programme for the Endorsement of Forest Certification systems (PEFC 2013), which is an umbrella organization that endorses 33 national forest certification systems, including SFI, ATFS, and the CSA system (PEFC 2013). Other national certification systems include the Indonesian Ecolabeling Institute (Lembaga Ekolabel Indonesia [LEI] 2011), the Brazilian Programa Brasileiro de Certificação Florestal (CERFLOR 2011), the Malaysian Timber Certification Council (MTCC 2006), and Chile’s Sistema Chileno de Certificación de Manejo Forestal Sustentable (CERTFOR 2011). These national systems were developed based on other standards and guidelines; for example, the Malaysian MTCC is based on the International Tropical Timber Organization (ITTO 2011) criteria, as is the Brazilian CERFLOR, while the Indonesian LEI system incorporates criteria from the ITTO and FSC (Perera and Vlosky 2006).

To be able to capture the benefits from sustainable management of forest resources (higher demand for certified products, price premiums, or a better corporate image), both the source of the material and the supply chain need to be certified to provide customers with verifiable information about the origin of the material and its transformation and distribution. Thus, a system is needed to ensure that claims made about the origin of a particular piece of wood harvested from sustainably utilized forests are still valid when the product reaches the end customer. For this purpose, chain-of-custody (COC) certification has been introduced (Howe et al. 2005). A COC system includes all the technology, processes, and documentation used to monitor the origin, current location, and destination of wooden materials (Dykstra et al. 2002). All major forest certification systems also include a COC system.

Background

Forest certification: 20 years after

After 20 years of forest certification, 416 million hectares of forests have received certification from either FSC or PEFC, the two global certification systems (FSC 2013, PEFC 2013). This is approximately 10 percent of the global forest cover (FAO 2010). A great majority (92%) of this certified area is in the northern hemisphere, and only 2 percent of the tropical forests have been certified (Ramet-

steiner and Simula 2003, United Nations Economic Commission for Europe [UNECE]/FAO 2012). North America and the countries of the European Union (EU) contain more than three-quarters of the total certified area (UNECE/FAO 2012). Furthermore, a net loss of forest area occurs only in Africa, Latin America, and the Caribbean. Arguably, the countries where most of the certified area is located had well-managed forests before certification (Howe and Fernholz 2012). Table 1 lists the distribution of certified forest by continent from 2010 to 2012.

Deforestation in Latin America and Bolivia

Latin American countries have rich forest resources, covering 49 percent of the total land area of countries in South America (FAO 2010), and this region contains about one-fifth of the total global forest cover (FAO 2011b). Unfortunately, deforestation is very high in this region, most of it due to conversion of forested areas to agriculture and ranching (Bowyer 1997, Lindsey 2007). Bolivia, Brazil, and Venezuela are among the 10 countries with the largest loss of forest area during 1990 to 2010 (FAO 2010). While Brazil has made significant progress in curtailing deforestation, the problem is particularly acute in Bolivia. This country’s forest loss is the highest in the Amazonian basin (Forero 2012), and it is the fifth highest in the world when its population is considered (deforestation per capita calculations based on population and forest loss figures found in FAO 2010). As with other countries in the region, much of the deforestation in Bolivia is caused by land conversion to agriculture, and this in turn is due to the expansion of large-scale farming and ranching as well as the migration of people from the western regions to the lowlands (Steininger et al. 2001, Programa de las Naciones Unidas para el Desarrollo [PNUD] 2008, Urioste 2012, Müller et al. 2013). According to the Food and Agriculture Organization, the annual rate of deforestation in Bolivia during the 2000 to 2010 decade has been almost 0.5 percent of the remaining forest area. Another recent study that used satellite images and the Normalized Difference Fraction Index, estimates a much higher annual forest land loss figure of 0.56 percent in the 2000 to 2005 period and of 0.78 percent in the 2005 to 2010 period, with a deforestation rate for the 2000 to 2010 decade of 0.67 percent (Cuéllar et al. 2012). According to Bolivia’s Regulatory Agency for the Social Control of Forests and Lands (ABT 2013), deforestation’s major contributors are cattle owners and agro-industry (66% of total deforestation), foreign land

Table 1.—Distribution of certified forest area (United Nations Economic Commission for Europe/Food and Agriculture Organization of the United Nations 2012).

Region	% distribution		
	2010	2011	2012
North America	56.0	53.6	51.3
Western Europe	23.8	22.8	24.7
CIS ^a	8.4	11.8	12.3
Oceania	3.3	3.3	3.4
Africa	2.0	2.0	1.9
Latin America	4.0	4.3	3.8
Asia	2.4	2.2	2.5

^a Commonwealth of Independent States (CIS) is a regional organization that includes former Soviet Republics.

owners (15%), and *campesinos* (12%; *campesinos* are indigenous highland farmers who have migrated to the Bolivian lowlands and are not necessarily landowners), with the remaining attributed to lowland indigenous communities (5%) and Japanese colonizers (2%; see Gustafson 2002 for detailed definitions of *campesino* and indigenous communities).

Forest certification in Bolivia: A success story?

Given the importance of forest resources for the Bolivian economy and society, their responsible management is of utmost importance for the prosperity of one of the poorest countries in Latin America (The World Bank 2013) and is even more significant for the well being of many indigenous communities that are closely linked to the survival of the forests (FAO 2011a). With the purpose of ensuring sustainable utilization of its rich forest resources and pressure from lowland indigenous communities (Dockry 2012), Bolivia passed what many regard as a highly successful Forestry Law in 1996, introducing sweeping changes to the way forests were used until then (Quevedo 2004). Some of the most important changes implemented by the 1996 Forestry Law were (1) the creation of the Forestry Superintendence, a government agency charged with enforcing the 1996 Forestry Law; (2) the implementation of a system of forestry concessions, with fee payments based on area, which discouraged the highly selective harvesting of only the valuable species; (3) the elaboration and approval of forest management plans (Hjortsø et al. 2006); and (4) the establishment of legal recognition of new actors in sustainable forest management, notably indigenous and local communities (Quevedo 2004, Urioste et al. 2010). According to Colchester et al. (2006, p. 21), with the 1996 Forestry Law, Bolivia had the “most progressive legal framework in terms of its accommodation of rural livelihoods in forest,” compared with many countries.

Voluntary third-party forest certification in Bolivia was implemented simultaneously with the Forestry Law, in what was considered by many as a success story of certification (Duery and Vlosky 2005, Nebel et al. 2005, Ebeling and Yasué 2009). International organizations played an important role in the promotion and implementation of forest certification in Bolivia. The US Agency for International Development (USAID) provided financial, marketing, and technical support to these efforts (Chemonics International Inc. 2004). The first certification in Bolivia was granted to the indigenous community of Lomerio in 1996 (Birk 2000). From there the area of certified forest under the FSC (the only certification system existent in the country) in Bolivia grew at a high rate, reaching 2.2 million hectares in the year 2005, representing at one time the largest certified tropical forest area of any country (Duery and Vlosky 2005). According to a final project report presented to the USAID, certification led to reduced environmental degradation, more control over illegal logging, and positive economic impacts from increased export market opportunities (Chemonics International Inc. 2004). On the other hand, success has been limited in the promotion of community participation in forest management and certification (Cashore et al. 2006). However, data from the last few years suggest that forest certification has not been sustainable, resulting in a sharp drop in certified area, as illustrated in Figure 1.

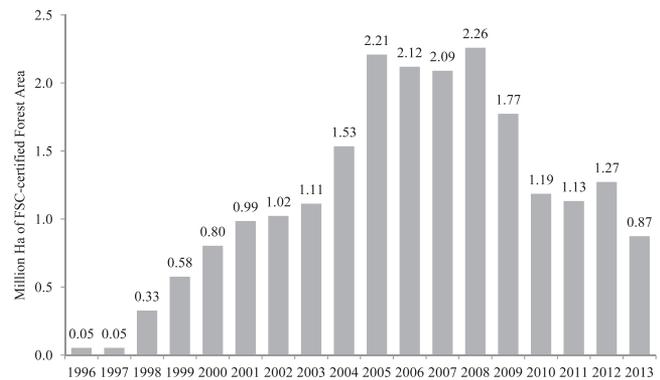


Figure 1.—Forest Stewardship Council (FSC)—certified forest area in Bolivia, in million hectares, from 1996 to 2013. Sources: FSC (2012) and the Bolivian Forestry Chamber (Camara Forestal de Bolivia 2011). Figure for 2013 updated to May.

Research objectives

Reasons for the sharp decrease in forest under certification in Bolivia are not known. The purpose of this research was to fill this information gap by surveying major stakeholders in forest management and certification in Bolivia to assess the state of forest certification in Bolivia. The specific objectives were (1) to determine the state and trends of forest certification in Bolivia; (2) to understand the roles and perspectives of different stakeholders—private businesses, community enterprises, government, educational institutions, and NGOs—about forest certification; and (3) to identify major benefits and challenges of certification.

Methods

Primary and secondary sources of information were used. To identify trends in certification in Bolivia, certified area statistics were collected from FSC’s publicly available database (FSC 2012), along with other sources, such as the Bolivian Forestry Chamber (Camara Forestal de Bolivia [CFB] 2011), which maintains statistics about exports of certified products and other topics. Government sources were consulted to obtain policy documents and laws. Secondary sources of information were also used to understand the market forces currently present in Bolivia and the region, which may have an effect on forest certification. Some of the sources consulted were the National Institute of Statistics (INE), the Bolivian Institute of International Trade (IBCE), the Regulatory Agency for the Social Control of Forests and Lands (ABT), scientific journal articles, newspaper articles, and others. To gain insight into how stakeholders perceive certification, primary data were collected through semistructured personal interviews with major stakeholders of forest certification. During the summer of 2012 and spring of 2013, we conducted 25 interviews, including 10 representatives of NGOs involved in the promotion and implementation of forest certification, 7 company representatives with interest or history of certification (including forest management certification and COC certification), 1 government official representing the agency that oversees forest and land issues (ABT), 1 scholar whose expertise is forest management and forest certification, group interviews with representatives of 3 indigenous communities (two communities that at one time

held forest certification and one that is interested in certifying their operations), and 3 individuals representing companies or organizations that provide certification services. Participants were selected by considering the importance of the interviewees' contribution to the forest certification process in Bolivia, past and present, and then through snowball sampling (asking each interview participant who else should be interviewed; Biernacki and Waldorf 1981). Interviewing continued until a representation from the majority of stakeholder groups of forest management and certification were part of the sample, when participants no longer suggested new names to interview, and when the answers to interview questions became repetitive (interview data saturation; Guest et al. 2006). The interviews were conducted in Spanish, audio-recorded, transcribed by a professional service, and then proofread by the authors (both fluent in Spanish). The quotations used in this publication were translated to English by the authors. Additionally, six Spanish language presentations from a 2013 Forestry Conference (EXPOFOR) held in Santa Cruz in March 2013 were audio-recorded and transcribed. Established qualitative research methods for thematic content analysis using the constant comparative method as outlined by Glaser and Strauss (1967), Berg (2001), and Robson (2002) were used to analyze the transcripts and identify major themes emerging from the data. Data analysis was aided and organized through the use of qualitative analysis software (NVivo, by QSR International 2012).

Market and Social Aspects of Certification

Market forces: Exports of Bolivian forest products

As mentioned earlier, forest certification systems are market-based, nonregulatory (i.e., voluntary) schemes to promote sustainable utilization of forest resources; therefore, their success depends on the promise of economic advantages to encourage adoption by industry participants. Such economic advantages can originate from (1) growing market demand for certified products, (2) the ability of producers to charge price premiums on certified or standard-conforming products, or (3) benefits from creating access to attractive markets at home or abroad, among other things (Espinoza et al. 2012). In Bolivia there is very little or no domestic demand for certified products, thus certification is sought only by operations that sell, or intend to sell, to international markets, traditionally Europe and the United States (in 2008, these two destinations received 44 and 46 percent, respectively, of the total exports of Bolivian products with certification; Instituto Boliviano de Comercio Exterior [IBCE] 2009). During the growth of certification in Bolivia, the increases in certified area were accompanied by growth in the exports of certified products, with the latter growing sixfold in the 1999 to 2002 period (Duery and Vlosky 2005). This included not only unprocessed lumber, but also value-added products, such as millwork and flooring (Nebel et al. 2005). However, exports of Bolivian forest products (including certified and noncertified products) declined significantly since 2010, falling 26 percent in 2011 and then again 19 percent in 2012 (INE 2013). For the first time, the department of Santa Cruz, which represents the majority of the timber products economic output, imported more timber products than it exported in 2012, mostly from Brazil (Bolpress 2012). This fall in exports has

been attributed to the US and European economic downturn (Los Tiempos 2012).

Although overall exports declined during the 2010 to 2012 period, it is also worth noting that there has been a shift in international markets for Bolivian timber products. Regional markets have grown in importance, in part due to a period of robust economic growth. South America has been experiencing a sustained growth during the last years, with an average growth in economic output of 4.1 percent per year in the 2005 to 2012 period (compare this with average growth in advanced economies, which averaged 1.4 percent during the same period; International Monetary Fund [IMF] 2013). This is reflected in the increasing share of Bolivian forest products exports that are shipped to countries in the region. Chile, Venezuela, and Argentina were the most important regional markets for Bolivian timber products in 2012 (Los Tiempos 2012). Asia has become a more important buyer of Bolivian timber products. Bolivian exports to China have increased more than 4,600 percent in the 2002 to 2011 period (Xinhua 2012). China buys mostly low value-added products, such as rough lumber, which it then uses to manufacture goods, which in most part are exported to other markets such as Europe (Bolpress 2012).

Another potential contributing factor for the decline of exports of Bolivian timber products, and particularly products carrying forest certification, is the construction boom that is taking place within Bolivia. The economic output from the construction industry has grown at an average annual rate of 9.1 percent in the 2005 to 2012 period (INE 2013). This has increased domestic demand for wood products and consequently prices of timber and timber products (for example, the price for *ochoó*, a species commonly used in construction, has increased 2.5-fold in the 2006 to 2012 period; INE 2013). Companies that otherwise would have targeted export markets produce for the domestic market instead, which as mentioned before, does not require certification. It is expected that, as the construction industry decelerates, exports markets will become more attractive.

One last market factor that may act as an incentive for certification is the implementation of more stringent controls for illegally sourced timber, such as the Europe's Forest Law Enforcement, Governance and Trade, or FLEGT Action Plan (FLEGT 2012). The FLEGT program aims at excluding illegal timber from European markets. The basis for FLEGT's implementation is a voluntary agreement between the EU and governments of exporting countries (known as voluntary partnership agreements, or VPAs), by which a government agrees to ensure that timber exported from its country complies with the country's laws (Carden et al. 2012). As of April 2014, only six countries have signed VPAs, and nine are in negotiations (FLEGT 2012); Bolivia is not part of either group. Another important component of FLEGT is that it requires importers to apply "due diligence," which means providing access to information about the origin of the timber and implement a risk assessment procedure to evaluate the risk of timber coming from a specific country being illegally sourced, and also implement risk mitigation measures to keep the risk at a minimum. In the absence of a VPA between the EU and Bolivia, it is expected that FLEGT will encourage forest certification in the short term, as a certificate will most

likely be accepted as a due diligence system (Carden et al. 2012).

Forest tenure regime and community-based forest management in Bolivia

The 1996 Forestry Law in Bolivia established a new forestland tenure regime, awarding the following forest rights: (1) concessions to private enterprises, (2) concessions to local social groups (ASLs), (3) utilization authorizations in lands with forests of collective property, or indigenous community territories (TCOs), and (4) utilization contracts in fiscal lands (Gutiérrez and Quevedo 2008). Concessions to businesses were particularly successful, since they provided legal security (they lasted 40 years, subject to 5-year audits), and reduced deforestation by allowing companies the long-term management of these areas. The 1996 Forestry Law also enabled Bolivian indigenous communities to form forestry enterprises for the first time, forestry administration was decentralized, and land tenure reform took place on a large scale. As a result, communities controlled about 40 percent of the forestlands, and 18 percent of the total forest under management is in the hands of indigenous communities or ASLs (Gutiérrez 2006, Pacheco 2006, Zenteno et al. 2013). The importance of community-based forest management has grown as a result of these changes, and communities have become the most important players in Bolivian forestry, as Figure 2 shows. For this same reason, organizations supporting sustainable forestry in Bolivia have provided technical and financial assistance for the certification of community-managed forests (Chemonics International Inc. 2004).

Stakeholders' Perceptions on Certification

The 25 semistructured interviews and the discussions during the 2013 EXPOFOR Bolivian Forestry Conference were analyzed around three major questions: (1) what were the reasons for the success of certification in Bolivia? (2) what has caused the decline in area of certified forest management operations in Bolivia? and (3) what is the future for certification in Bolivia? Ten themes emerged from the analysis: the role of government and regulations, land tenure and legal security, the role of NGOs and international support, community-based forest management, social aspects of certification, environmental benefits of certification, markets for certified products, international and external factors, role of private companies, and the certification process itself. These themes are further aggregated into four categories, listed in Table 2. The following subsections of this article summarize and discuss the interview participants' perceptions about the past, present, and future of certification in Bolivia.

Stakeholders' perspectives on drivers for initial success of certification

The interview participants generally agreed upon several important drivers for the high rates of certification in Bolivia during the 2000s (see Fig. 1). Almost every participant explained that the 1996 Forestry Law provided the regulatory framework to support sustainable forest management by involving new actors (indigenous and community forestry operations), by clearly defining sustainable forest management practices, and by developing a national

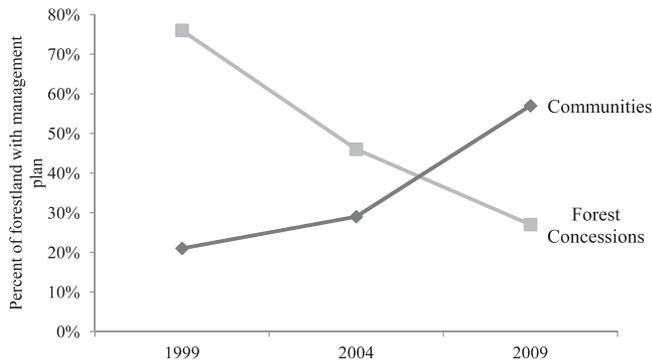


Figure 2.—Percentage of forestland with management plan, by type of tenure rights holder. Communities include local social associations (ASL), indigenous lands (TCO), and campesino communities. Source: Bolivia's National Institute of Statistics (Instituto Nacional de Estadística 2013).

forestry institution based on sound technical forestry practices and with regulatory control over the forestry sector. Certification standards, according to interview participants, were very similar to the regulations under the 1996 Forestry Law. One participant from the consulting industry explained, “The forestry law has been a very important tool [for certification] because everyone had to comply with it and from there it went hand-in-hand with certification” (Certification Services participant). Participants also indicated that the forestry legislation created positive market forces for certification. An interview participant from an NGO explained that these market forces also helped bring community forest management into the system because there were “positive [market] forces that helped indigenous and *campesino* communities [because they] only had to pay a fee based on the area actually harvested within a year,” while private forestry businesses were required to pay based on the total forest management area. Businesses were also seen to benefit financially from certification. Another participant, from the business sector, indicated that the government of Bolivia recognized certification audits as a substitute for forest management audits required in the 1996 Forestry Law, thus avoiding the need and cost of carrying out additional inspections. In summary, the interview participants viewed the 1996 Forestry Law as instrumental for the success of certification in Bolivia.

Along with the 1996 Forestry Law, participants said that there were other important factors that explained the initial success of certification in Bolivia. First, there was a lot of financial, technical, and legal support from both NGOs and national and local governmental institutions, as well as international cooperation, for sustainable forest management and forestry certification. There were many NGOs and foreign governments working with communities, industry, and the Bolivian government itself on implementation of the 1996 Forestry Law as well as supporting certification efforts. Participants also explained that there were both real and perceived economic, environmental, and social benefits from certification and sustainable forest management under the 1996 Forestry Law, and these benefits helped foster interest in certification.

Table 2.—Summary of participants' perspectives about the initial success of voluntary forest certification, current downward trends, and the future of forest certification in Bolivia.

Major themes	Drivers identified by interview participants
Drivers for initial success of certification in Bolivia	<ul style="list-style-type: none"> • 1996 Bolivian forestry regulations supported certification • Government support for certification • Nongovernmental organization (NGO) support for certification • International (financial and technical) support for certification
Benefits from certification	<ul style="list-style-type: none"> • Environmental benefits of certification • Social benefits of certification • Access to stable and (sometimes) more profitable markets for certified products
Drivers for the decline of certified forest area in Bolivia	<ul style="list-style-type: none"> • Lack of governmental support and active criticism of forestry certification • Lack of land tenure and legal security • Price premiums for certified wood products not realized • Global economic crisis decreasing demand for certified wood products • Increased local demand and increased prices for uncertified wood products • Decreased support from nongovernmental and international governmental institutions • High costs associated with certification • Increased deforestation and illegal forest products entering the market
Perspectives on the future of certification in Bolivia	<ul style="list-style-type: none"> • Community-based forest management will continue to increase in importance in Bolivia • Legal requirements of global trade networks will increase incentives for certification • Local market for noncertified wood products will continue to provide disincentives for certification • Legal and land tenure insecurity coupled with a lack of government support will continue to provide disincentives for certification • Deforestation and illegal forest products will continue to distort markets

Stakeholders' perspectives on benefits from certification

Participants identified several major benefits from certification for Bolivia. The most frequently cited or emphasized are discussed in this section.

Forestry professionals interviewed for this study agreed that one of the most important benefits from forest certification is the improvement in standard of living of communities dependent on forest utilization and the work conditions of forestry field personnel. This is consistent with principles of certification, which require forest managers to “comply with all laws, regulations, treaties, conventions and agreements, together with all FSC Principles and Criteria” (first principle), and “to maintain or enhance forest workers’ and local communities’ social and economic well-being” (fourth principle; FSC 2013). What is more remarkable, according to representatives of communities with certification experience interviewed for this study, the sustainable forest management practices and their benefits tend to stay even when these communities decided not to renew their certificates. Very importantly, these participants indicated that certification has allowed them to raise the standard of living and educational level of their members.

Business and NGO participants to this study agreed that the new forestry regime started by the 1996 Forestry Law and the implementation of forest certification have contributed to improving the image and credibility of this important sector of the Bolivian economy by demonstrating it is capable of meeting internationally recognized standards of sustainable forest management, from environmental, social, and economic perspectives (Nebel et al. 2005). Historically, forests have not been well managed in Bolivia. Until 1996, harvest operations were extremely selective, with over 90 percent of harvested timber focused on three species (Espinoza et al. 2007). The benefits from the forest reached only a few, and work conditions were poor at best (Pacheco et al. 2010). Despite efforts to reduce it, illegal logging is still a big problem (Harvey 2013); some estimated that half

of the timber consumed domestically is illegally sourced (Pacheco n.d.). All this contributed to create a negative perception of the industry and has led to conflicts with indigenous people, which in part motivated the state to start promoting communal participation in forest management in the mid-1990s (de Jong et al. 2006).

Regarding direct financial benefits from certification, most participants agreed that forest-certified products did not command a significant price premium compared with noncertified products in international markets, but allowed companies access to more stable markets for certified products. A lack of price premiums for certified products has been confirmed by other studies (Anderson et al. 2005, Hubbard and Bowe 2005, Espinoza et al. 2012). However, participants explained that certification allowed for market stability for both the seller and buyer—stability that was not common in the unregulated market before the 1996 Forestry Law. One NGO interviewee mentioned that, in one recent meeting about the forest products businesses in Bolivia, it was concluded that the drop in demand from European and US markets did not affect certificate holders as severely as other businesses.

In summary, the 1996 Forestry Law focused attention and resources from many sectors of the forestry community that fostered certification and provided economic, social, and environmental benefits from forest management. These results are consistent with other research results on forestry in Bolivia (Nittler and Nash 1999, Fredericksen et al. 2003, Nebel et al. 2005, Ebeling and Yasué 2009, Pacheco et al. 2010).

Stakeholders' perspectives on the reasons for the decline in certified forest

While interview participants in the study indicated that there were many overlapping and interconnected reasons for the decrease in forest certification, according to the majority of participants, there were three main reasons for the decline of certified acreage in Bolivia. First, and often the most

important factor according to the interviews, was what was described as “legal and land tenure insecurity.” Industrial forestry operations were not sure if the long-term investment in forestry certification would be a safe investment and wondered if their lands would be taken over by agricultural settlements or given to community forestry operations. For example, one participant said, “The government favors and recognizes the rights of communities . . . and they give preference to [community] rights over existing rights [of industry]” (NGO participant). These concerns appear to be based on several perceptions. First, from the NGO perspective, they are seeing public lands dedicated to forest management—permanent production forest—being turned over to communities that are more dedicated to agriculture and forest clearing than long-term sustainable forest management. Conversion of Bolivia’s permanent production forest to nonforest uses has been shown in other studies (Killeen et al. 2008, Müller et al. 2012, Andersen 2013). Second, interview participants from the business community fear that lands they had previously had under forest management are either going to be transferred to community forestry operations or be converted from forestry to agriculture. In either case, based on the frequency in which they were mentioned and emphasis placed on the topics, land tenure and legal insecurity are seen as the major driving factors for the decline in forestry certification in Bolivia.

While land tenure and legal insecurity were the reasons most often mentioned by NGOs and business interview participants, the government participants indicated that they were working on strengthening the forestry sector, were exploring new ideas for forestry regulations, and that they were not at fault for the increases in deforestation. Indigenous community members also did not view the land tenure issue as a large concern because they believed their land tenure rights were secure within their legally defined territories. In contrast to the other interview participants, one of the main reasons cited by our indigenous community participants for the decrease in certification was the high cost associated with forestry certification. Indigenous communities did not typically have the resources needed to certify or recertify their forestry operations. One of the indigenous communities interviewed for this study explained that they chose not to renew their certificate because their 5-year certification audit was due the same year that their legally required management plan needed to be revised, and they were not financially able to do both. The community representatives remarked that forestry certification was based on having a legal management plan, and thus they were planning to recertify once they had finished renewing their forest management plan (community participant). Also, when asked about the reasons for not renewing certificates, representatives of the communities interviewed for this research indicated that they have not always received fair treatment from their private-business partners; some of the issues mentioned included disagreements in price and quantity, disagreements on how to handle observations from the certifying agencies, and the simple lack of demand for certified timber. On the other hand, the business representatives and NGO participants listed some of the difficulties of working with communities, such as internal conflicts within the communities, lack of training, contract breaching by selling timber to other higher bidders, and even accusing some community leaders and government officials of corruption.

The second main reason identified by participants for the decline in forest certification in Bolivia was a lack of support from the government, international community, and NGOs. While government and NGO support was mentioned by all participants as critical contributors to the initial success of certification in Bolivia, interviewees were equally consistent in citing lack of government and NGO support as one factor for the subsequent decline in certified forest area. As mentioned before, participants indicated that there was a concerted effort from the Bolivian government and NGOs in support of forestry certification in the initial years. This support included using certification audits in lieu of governmental audits, NGOs financing certification projects, and NGOs working to develop partnerships and markets for certified products. According to some participants, it is currently difficult to find financing for certification. Furthermore, the government has been perceived as vocally opposed to certification systems. For example, the Bolivian vice president explained in an interview with a local newspaper that he recognized two kinds of environmentalism: the “good environmentalism” and the “bad environmentalism,” or “environmentalism of the right, driven by multinational companies whose sole purpose is to obtain financial gain by showing environmental responsibility credentials through the certification of forests” (Soruco and Osorio 2012). The representative of the government agency in charge of forest control (the ABT) interviewed for this study indicated that the sustainable use of forests may be better served by developing a national certification system, which would be less costly and provide easier access for those who do not have the financial capability for international certification. According to other participants, this approach was tried by other countries with different levels of success. The lack of support from the government also helps explain some of the concerns raised by interview participants about the lack of legal security. Several participants explained that the government was going to develop a new law to replace the 1996 Forestry Law, which adds to the uncertainty of certificate holders.

The third main reason for the decline of certification according to most of the interview participants was the economic downturn of world markets and the rise of the domestic and regional markets for noncertified wood products. It is worth noting that some events coincided with the sharp drop in certified forest area in Bolivia (starting in 2008). The global economic crisis had a major effect on US and European economies, which are major destinations for Bolivian wood products (CFB 2012). Imports of all goods to the United States in 2009 and 2010 dropped by 26 and 10 percent, respectively, relative to 2008 (Bureau of Economic Analysis 2013). The monetary value of the imports of the 27 EU countries in 2009 and 2010 dropped by 22 and 3 percent, respectively, from 2008 levels (Eurostat 2013). Also, a new political regime started in Bolivia in 2006, when Evo Morales became president, implementing profound changes such as land redistribution and nationalization of strategic companies. US involvement was also curtailed, with the expulsion of the US ambassador in 2008, and more recently the expulsion of USAID (British Broadcasting Corporation 2013).

Export markets, particularly for the business interview participants, fluctuated and would return eventually; however, the rise of local Bolivian markets was such that they commanded prices comparable or in excess of those for

certified products. These market shifts combined with little to no price premium for certified products have created an environment that favored noncertified products and hence discouraged the certification of new forestlands. Furthermore, with the local markets for noncertified products, participants believed that market distortions caused an increase in illegal logging and allowed illegal wood products to enter the market. While market-related factors were one of the major drivers of the decrease of certification in Bolivia, interview participants often took pains to indicate that the legal insecurity and lack of governmental and NGO support for certification did more to drive this decrease.

Stakeholders' perspectives on the future of certification

Interview participants had a range of ideas about the future of certification in Bolivia. While there was no clear consensus among interview participants, no one believed that Bolivia would once again become the world leader of tropical forest certification. Two participants volunteered that the certified area would plateau on about 1 million hectares and stay there (total certified area was 908,000 hectares as of September 2013; FSC 2013). Furthermore, all of the interview participants believed that community and indigenous forest management was going to play an increased role in the Bolivian forestry sector, and hence they would be key players if certification had any future in Bolivia. Reasons given for this by participants mainly had to do with the current government's focus on community and indigenous rights and economic equality (see the introduction). Interview participants did not see this focus changing in the future. According to these perspectives, future forestry certification efforts should focus on community forestry and community–industry partnerships. This also means that if forestry certification is going to increase through community forestry, certification must address community goals for forest management. Community goals for forestry in Bolivia have included using forestry for territorial protection, economic opportunities, and social and cultural practices (see, e.g., Dockry 2012). If certification cannot achieve these goals, it is unlikely that there will be many more communities seeking certification in the future.

Interview participants also indicated that the future of forestry certification in Bolivia would depend on the resolution of land tenure and legal insecurities. Legal insecurity has created a disincentive for new forestry certifications and for the maintenance of certification. A related disincentive for certification has to do with the increased deforestation and illegal forest products. If forestry certification is to increase or maintain itself in Bolivia, according to participants, there needs to be a change in how the government regulates the forestry industry. Some participants indicated that they would welcome new forestry regulations as long as they were clear and transparently enforced irrespective of whether forestry certification were part of the regime or not (community participant).

Finally, participants indicated that there were two opposing market forces that would drive certification trends in the future. International laws like the Lacey Act Amendments of 1981 in the United States (2008) and Europe's Forest Law Enforcement, Governance and Trade (FLEGT 2012) will create market incentives for certification

in Bolivia because they have not signed treaties to abide by these laws. Therefore, it will be incumbent upon the producer and exporter to guarantee that the product is legal. Certification systems can provide that guarantee, at least in the short term. The opposing market forces that will continue to impact forestry certification are local and international markets that do not require or favor certified wood products. The internal Bolivian market is strong due to a local housing and construction boom currently taking place. Also, Bolivian exports to China have increased over the past number of years, and this market does not typically require certified forest products either. According to some participants, if these two markets continue to command large portions of the Bolivian forest products output, there will be a continued disincentive for forestry certification. On the other hand, as the domestic construction market slows down, the export market is going to look more attractive for forest products industries, and as the North American and the European markets recover, demand for Bolivian forest products (and certified products) may start to increase.

Conclusions

Gaining understanding about the causes for success or failure of forest certification and its challenges and opportunities is of great importance, because forest certification is recognized as a “potentially revolutionary policy approach” that is market based and encourages the socially and environmentally responsible utilization of forests (Yale Program on Forest Policy and Governance 2011). Forest certification is also of interest for international business, because certification was conceived as a market-driven approach for the sustainable use of forests, with one of its advertised benefits being the access to new international markets for forest products (Pacheco et al. 2010). Social scientists are also interested in forest certification, because it relates to the economic well-being of timber-reliant communities and effective and functioning governance institutions (Marx and Cuypers 2010). Forest certification is of global interest, for the reason that the health of forests, particularly tropical forests, is recognized as important not only for the countries that contain them, but also for global climate change mitigation; rainforests act as major carbon sinks (FAO 2011a). Furthermore, most tropical forests are located in developing countries.

While interview participants in this study used different words to describe the reasons for the decline of certification in Bolivia, they all described a complex social, political, and economic process that would be difficult to explain using quantitative research methods. This research, however, uses qualitative research methods to understand the situation in Bolivia from the perspectives of people living and working in Bolivia's forestry sector. Interview participants in this study indicated that the major drivers for forestry certification trends in Bolivia are legal insecurities, a lack of governmental support, and market forces that provide disincentives for certification. More research needs to be done in Bolivia and other countries to understand stakeholders' perspectives on the complex social, economic, and political environment in which forestry certification operates throughout the world. By incorporating stakeholder perspectives into research, it is possible to develop more effective policy, regulations, and certification systems.

Acknowledgments

This research was supported by University of Minnesota's Global Spotlights Grant Program. The authors would like to thank all of the interview participants for sharing their knowledge, expertise, experiences, and time. Special thanks go to Edwin Magariños and Orlando Melgarejo for their help during the data collection phase of this research.

Literature Cited

- Achard, F., H. J. Stibig, H. D. Eva, E. J. Lindquist, A. Bouvet, O. Arino, and P. Mayaux. 2010. Estimating tropical deforestation from Earth observation data. *Carbon Manag.* 1(2):271–287.
- American Tree Farm System (ATFS) Web site. 2010. <http://www.treefarmssystem.org/>. Accessed September 5, 2011.
- Andersen, L. E. 2013. The drivers, causes and actors of deforestation in Bolivia. *Sintesis—Policy Brief Inst. Adv. Dev. Stud. (INESAD)* (8):2–8.
- Anderson, R. C., D. N. Laband, E. N. Hansen, and C. D. Knowles. 2005. Price premiums in the mist. *Forest Prod. J.* 55(6):19–22.
- Autoridad de Fiscalización y Control Social de Bosques y Tierra de Bolivia (ABT) Web site. 2013. <http://abt.gob.bo/>. Accessed April 13, 2013.
- Berg, B. L. 2001. *Qualitative Research Methods for the Social Sciences*. Allyn and Bacon, Boston.
- Biernacki, P. and D. Waldorf. 1981. Snowball sampling: Problems and techniques of chain referral sampling. *Sociol. Methods Res.* 10(2):141–163.
- Birk, G. 2000. Dueños del Bosque: Manejo de los Recursos Naturales por Indígenas Chiquitanos de Bolivia. In: *Pueblos Indígenas de las Tierras Bajas de Bolivia*. J. Riester (Ed.). APCOB-CICOL, Santa Cruz, Bolivia.
- Bolpress. 2012. Caen las exportaciones de productos madereros en 20% y las importaciones suben 34%. <http://www.bolpress.com/art.php?Cod=2012121807>. Accessed May 5, 2013.
- Böswald, K. 1996. Zur Bedeutung des Waldes und der Forstwirtschaft im Kohlenstoffhaushalt: eine Analyse am Beispiel des Bundeslandes Bayern. PhD dissertation. Forstliche Forschungsberichte München 159. Frank, München. 147 pp.
- Bowyer, J. 2008. The green movement and the forest products industry. *Forest Prod. J.* 58(7/8):6–13.
- Bowyer, J. L. 1997. Strategies for ensuring the survival of tropical forests. *Forest Prod. J.* 47(2):15.
- British Broadcasting Corporation (BBC). 2013. Bolivian President Evo Morales expels USAID. *BBC News*. <http://www.bbc.co.uk/news/world-latin-america-22371275>. Accessed May 19, 2013.
- Bureau of Economic Analysis. 2013. International economic accounts. <http://www.bea.gov/international/index.htm>. Accessed April 13, 2013.
- Camara Forestal de Bolivia (CFB) Web site. 2011. <http://www.cfb.org.bo/>. Accessed November 10, 2011.
- Camara Forestal de Bolivia (CFB). 2012. Exportación de Productos Forestales de Bolivia Enero–Marzo 2012 [PowerPoint presentation]. CFB, Santa Cruz, Bolivia.
- Canadian Standards Association (CSA) Web site. 2011. <http://www.csasfeforests.ca/home.htm>. Accessed September 5, 2011.
- Carden, C., R. Wijers, and P. Zambon. 2012. FLEGT, VPA, EUTR and their possible impact on the Bolivian timber sector. CBI—Ministry of Foreign Affairs of The Netherlands, The Hague.
- Cashore, B., G. Auld, and D. Newsom. 2003. Forest certification (eco-labeling) programs and their policy-making authority: Explaining divergence among North American and European case studies. *Forest Policy Econ.* 5(3):225–247.
- Cashore, B., F. Gale, E. Meidinger, and D. Newsom (Eds.). 2006. *Confronting sustainability: Forest certification in developing and transitioning countries*. Yale School of Forestry and Environmental Studies, New Haven, Connecticut.
- Chemonics International Inc. 2004. Bolivia sustainable forest management—BOLFOR final report. Chemonics International Inc., Washington, D.C. 98 pp.
- Chlebek, A. and M. Jařabáč. 1996. The importance of forests for flood control. *Lesnická Práce* 75(3):80–82,106.
- Colchester, M., M. Boscolo, A. Contreras-Hermosilla, F. D. Gatto, J. Dempsey, G. Lescuyer, K. Obidzinski, D. Pommier, M. Richards, S. N. Sembiring, L. Tacconi, M. T. Vargas Rios, and A. Wells. 2006. Justice in the forest—Rural livelihoods and forest law enforcement. Center for International Forestry Research (CIFOR), Bogor Barat, Indonesia. 116 pp.
- Cuéllar, S., A. Rodríguez, J. Arroyo, S. Espinoza, and D. M. Larrea. 2012. Mapa de Deforestación de las Tierras Bajas y los Yungas de Bolivia 2000–2005–2010. Fundación Amigos de la Naturaleza (FAN), Santa Cruz de la Sierra, Bolivia. 2 pp.
- de Jong, W., S. Ruiz, and M. Becker. 2006. Conflicts and communal forest management in northern Bolivia. *Forest Policy Econ.* 8(4):447–457. DOI: <http://dx.doi.org/10.1016/j.forpol.2005.08.011>
- Dockry, M. J. 2012. Indigenous forestry in the Americas comparative environmental histories in Bolivia and Wisconsin. PhD dissertation. University of Wisconsin, Madison.
- Duery, S. and R. Vlosky. 2005. Bolivia: A global leader in certification. *Forest Prod. J.* 55(5):8.
- Dykstra, D. P., G. Kuru, R. Taylor, R. Nussbaum, W. B. Magrath, and J. Story. 2002. Technologies for wood tracking verifying and monitoring the chain of custody and legal compliance in the timber industry. <http://assets.panda.org/downloads/woodtrackingreportfinal.pdf>. Accessed December 16, 2011.
- Ebeling, J. and M. Yasué. 2009. The effectiveness of market-based conservation in the tropics: Forest certification in Ecuador and Bolivia. *J. Environ. Manag.* 90(2):1145–1153.
- Espinoza, O. A., B. H. Bond, and P. Araman. 2007. A survey of Bolivian lumber drying operations. *Forest Prod. J.* 57(6):88–92.
- Espinoza, O., U. Buehlmann, and B. Smith. 2012. Forest certification and green building standards: Overview and use in the U.S. hardwood industry. *J. Cleaner Prod.* 33:30–41.
- Eurostat. 2013. International trade in goods. http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/International_trade_in_goods. Accessed April 13, 2013.
- Food and Agriculture Organization of the United Nations (FAO). 2010. *Global forest resources assessment 2010—Main report*. FAO, Rome. 378 pp.
- Food and Agriculture Organization of the United Nations (FAO). 2011a. *Forestry*. <http://www.fao.org/forestry/en/>. Accessed June 26, 2011.
- Food and Agriculture Organization of the United Nations (FAO). 2011b. *State of the world's forests 2011*. FAO, Rome. 179 pp.
- Forer, J. 2012. Guess who's chopping down the Amazon now? *National Public Radio*. September 6, 2012. <http://www.npr.org/2012/09/06/160171565/guess-whos-chopping-down-the-amazon-now>. Accessed September 12, 2012.
- Forest Law Enforcement, Governance and Trade (FLEGT). 2012. FLEGT Action Plan. <http://www.euflegt.efi.int/portal/>. Accessed July 23, 2012.
- Forest Stewardship Council (FSC). 2012. Facts and figures. <http://ic.fsc.org/facts-figures.19.htm>. Accessed January 8, 2012.
- Forest Stewardship Council (FSC). 2013. *Forest Stewardship Council*. <http://www.fsc.org/en/>. Accessed April 11, 2013.
- Fredericksen, T. S., F. E. Putz, P. Pattie, W. Pariona, and M. Peña-Claros. 2003. Sustainable forestry in Bolivia: Beyond planned logging. *J. Forestry* 101(2):37–40.
- Glaser, B. G. and A. L. Strauss. 1967. *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Aldine Publishing Co., Chicago.
- Guest, G., A. Bunce, and L. Johnson. 2006. How many interviews are enough? An experiment with data saturation and variability. *Field Methods* 18(1):59–82.
- Gustafson, B. 2002. Paradoxes of liberal indigenism: Indigenous movements, state processes, and intercultural reform in Bolivia. In: *The Politics of Ethnicity: Indigenous Peoples in Latin American States*. D. Maybury-Lewis (Ed.). Harvard University Press, Cambridge, Massachusetts. Chap. 9, pp. 267–306.
- Gutiérrez, R. A. G. 2006. *Forestería comunitaria, el reto de sostenibilidad con desarrollo social*. PowerPoint presentation at the Forest Transparency Workshop, September 19–22, 2006, Lima, Peru.
- Gutiérrez, R. G. and L. Quevedo. 2008. *El Sistema de Concesiones Forestales en Bolivia*. CADEFOR. 12 pp.
- Hansen, E., R. Fletcher, B. Cashore, and C. McDermott. 2006. *Forest certification in North America*. College of Forestry, Extension

- Publication EC 1518. 12 pp. http://yale.edu/forestcertification/pdfs/2006/OSU_SFI-CertComparStudy.pdf. Accessed December 16, 2011.
- Harvey, F. 2013. Interpol arrests 200 and seizes \$8m worth of timber in illegal logging raid. *The Guardian*. February 21, 2013. <http://www.guardian.co.uk/environment/2013/feb/21/interpol-arrest-seize-illegal-logging-raid>. Accessed May 4, 2013.
- Hjortso, C. N., J. B. Jacobsen, K. B. F. Kamelarczyk, and M. Moraes Ramirez. 2006. Economía Forestal en Bolivia. *Bot. Econ. Andes Centrales* 2006:553–557.
- Howe, J., J. Bowyer, P. Guillery, and K. Fernholz. 2005. Chain-of-custody certification: What is it, why do it, and how? Dovetail Partners, Inc., White Bear Lake, Minnesota. 12 pp.
- Howe, J. and K. Fernholz. 2012. Beyond certification. Dovetail Partners, Inc., Minneapolis, Minnesota. 2 pp.
- Hubbard, S. S. and S. A. Bowe. 2005. Environmentally certified wood products: Perspectives and experiences of primary wood manufacturers in Wisconsin. *Forest Prod. J.* 55(1):33.
- Instituto Boliviano de Comercio Exterior (IBCE). 2009. Certificación Forestal en Bolivia: Beneficios para las comunidades, empresas y bosques IBCE, Santa Cruz de la Sierra, Bolivia. 19 pp.
- Instituto Nacional de Estadística (INE) Web site. 2013. <http://www.ine.gov.bo>. Accessed May 5, 2013.
- International Monetary Fund (IMF). 2013. World economic outlook April 2013—Hopes, realities, risks. IMF, Washington, D.C. 204 pp.
- International Tropical Timber Organization (ITTO) Web site. 2011. <http://www.itto.int/>. Accessed September 26, 2011.
- Killeen, T. J., A. Guerra, M. Calzada, L. Correa, V. Calderon, L. Soria, B. Quezada, and M. K. Steining. 2008. Total historical land-use change in eastern Bolivia: Who, where, when, and how much? *Ecol. Soc.* 13(1):36.
- Lacey Act Amendments of 1981. 2008. 16 USC Sect. 3371–3378. <http://www.fws.gov/international/laws-treaties-agreements/us-conservation-laws/lacey-act.html>. Accessed April 2014.
- Lembaga Ekolabel Indonesia (LEI) Web site. 2011. <http://www.lei.or.id/>. Accessed June 28, 2011.
- Lenz, H. 1967. The economic importance of forests. Instituto Mexicano de Recursos Naturales Renovables 30. 24 pp.
- Lindsey, R. 2007. Tropical deforestation. http://earthobservatory.nasa.gov/Features/Deforestation/deforestation_update.php. Accessed November 9, 2011.
- Los Tiempos. 2012. Cae exportación boliviana de productos de madera. *Los Tiempos*. November 17, 2012. http://www.lostiempos.com/diario/actualidad/economia/20110802/cae-el-volumen-de-la-exportacion-de-madera_136048_277413.html. Accessed May 5, 2013.
- Malaysian Timber Certification Council (MTCC) Web site. 2006. <http://www.mtcc.com.my/>. Accessed January 15, 2014.
- Marx, A. and D. Cuypers. 2010. Forest certification as a global environmental governance tool: What is the macro-effectiveness of the Forest Stewardship Council? *Regul. Governance* 4(4):408–434.
- McGinley, K. and F. W. Cubbage. 2011. Governmental regulation and nongovernmental certification of forests in the tropics: Policy, execution, uptake, and overlap in Costa Rica, Guatemala, and Nicaragua. *Forest Policy Econ.* 13(3):206–220.
- Müller, R., D. Müller, F. Schierhorn, G. Gerold, and P. Pacheco. 2012. Proximate causes of deforestation in the Bolivian lowlands: An analysis of spatial dynamics. *Reg. Environ. Change* 12(3):445–459.
- Müller, R., T. Pistorius, S. Rohde, G. Gerold, and P. Pacheco. 2013. Policy options to reduce deforestation based on a systematic analysis of drivers and agents in lowland Bolivia. *Land Use Policy* 30(1):895–907.
- Nebel, G., L. Quevedo, J. Bredahl Jacobsen, and F. Helles. 2005. Development and economic significance of forest certification: The case of FSC in Bolivia. *Forest Policy Econ.* 7(2):175–186.
- Nittler, J. B. and D. W. Nash. 1999. The certification model for forestry in Bolivia. *J. Forestry* 97(3):32–36.
- Nussbaum, R. and M. Simula. 2005. The Forest Certification Handbook. Earthscan, London.
- Pacheco, P. 2006. El régimen forestal boliviano—Una mirada retrospectiva a diez años de su implementación. *Recursos Nat. Ambiente* (49–50):58–67.
- Pacheco, P. n.d. Law compliance: Bolivia case study. Food and Agriculture Organization of the United Nations, Rome. 25 pp.
- Pacheco, P., W. de Jong, and J. Johnson. 2010. The evolution of the timber sector in lowland Bolivia: Examining the influence of three disparate policy approaches. *Forest Policy Econ.* 12(4):271–276.
- Perera, P. and R. P. Vlosky. 2006. A history of forest certification. Working Paper 71. Louisiana Forest Products Development Center, Baton Rouge. 14 pp.
- Programa Brasileiro de Certificação Florestal (CERFLOR) Web site. 2011. <http://www.florestal.gov.br/snif/producao-florestal/certificacao-florestal>. Accessed January 14, 2014.
- Programa de las Naciones Unidas para el Desarrollo (PNUD). 2008. Human development report—The other frontier: Alternative uses of naturales resources in Bolivia. PNUD, La Paz, Bolivia. 508 pp.
- Programme for the Endorsement of Forest Certification (PEFC) Web site. 2013. <http://www.pefc.org/>. Accessed January 14, 2014.
- QSR International. 2012. NVivo10 [software]. QSR International Pty Ltd., Victoria, Australia. http://www.qsrinternational.com/products_nvivo.aspx. Accessed January 14, 2014.
- Quevedo, L. 2004. Forest certification in Bolivia. Paper presented at the Forest Certification in Developing and Transitioning Societies: Social, Economic, and Ecological Effects, New Haven, Connecticut.
- Rametsteiner, E. and M. Simula. 2003. Forest certification—An instrument to promote sustainable forest management? *J. Environ. Manag.* 67(1):87–98.
- Robson, C. 2002. Real World Research: A Resource for Social Scientists and Practitioner-Researchers. Blackwell Publishers, Oxford, UK.
- Sistema Chileno de Certificación de Manejo Forestal Sustentable (CERTFOR) Web site. 2011. <http://www.certfor.org/>. Accessed July 5, 2011.
- Sorucu, J. C. and M. J. Osorio. 2012. Bolivia, una potencia [Bolivia, a power]. Interview with Bolivian vice president Alvaro Garcia Linera, *Los Tiempos*. August 11, 2012. http://www.lostiempos.com/diario/actualidad/nacional/20120812/%E2%80%9Cbolivia-una-potencia%E2%80%9D_181845_384799.html. Accessed January 14, 2014.
- Steininger, M. K., C. J. Tucker, J. R. G. Townshend, T. J. Killeen, A. Desch, V. Bell, and P. Ersts. 2001. Tropical deforestation in the Bolivian Amazon. *Environ. Conserv.* 28(2):127–134.
- Sustainable Forest Initiative (SFI). 2011. Sustainable Forest Initiative certification database. <http://64.34.105.23/PublicSearch/MainSearch.aspx>. Accessed September 2011.
- The World Bank. 2013. Poverty and equity data. <http://povertydata.worldbank.org/poverty/home/>. Accessed September 18, 2013.
- United Nations Economic Commission for Europe/Food and Agriculture Organization of the United Nations (UNECE/FAO). 2012. Forest products annual market review, 2011–2012. Geneva Timber and Forest Study Paper 30. United Nations, New York and Geneva. 178 pp.
- Urioste, J. L., L. Quevedo, R. Guzmán, and R. Rojas. 2010. Evaluación del Régimen Forestal Implementado por la Superintendencia Forestal de Bolivia (1997–2008). Centro de Investigación y Manejo de Recursos Naturales Renovables (CIMAR) and Escuela de Ciencias Forestales de la Universidad Mayor de San Simón (ESFOR), Santa Cruz, Bolivia. 169 pp.
- Urioste, M. 2012. Concentration and “foreignisation” of land in Bolivia. *Can. J. Dev. Stud.* 33(4):439–457.
- Van Kooten, G. C., H. W. Nelson, and I. Vertinsky. 2005. Certification of sustainable forest management practices: A global perspective on why countries certify. *Forest Policy Econ.* 7(6):857–867.
- Vidal, N., R. Kozak, and D. Cohen. 2005. Chain of custody certification: An assessment of the North American solid wood sector. *Forest Policy Econ.* 7(3):345–355.
- Xinhua. 2012. Exportaciones de Bolivia a China crecen más de 4.600% en nueve años. <http://cl2.mofcom.gov.cn/article/bilateralvisits/201208/20120808299257.shtml>. Accessed May 4, 2013.
- Yale Program on Forest Policy and Governance. 2011. Yale School of Forestry and Environmental Studies. <http://www.yale.edu/forestcertification/index.html>. Accessed November 11, 2011.
- Zenteno, M., P. A. Zuidema, W. de Jong, and R. G. A. Boot. 2013. Livelihood strategies and forest dependence: New insights from Bolivian forest communities. *Forest Policy Econ.* 26:12–21.