

Evaluating Native and Plantation forest certification schemes in Chile: Beyond traditional governance

by

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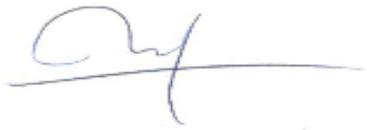
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Candidate's Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university. To the best of the author's knowledge, it contains no material previously published or written by another person, except where due reference is made in the text.

A handwritten signature in blue ink, appearing to read 'M. Tricallotis', with a long horizontal stroke extending to the right.

Marcos Antonio Tricallotis

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Abstract

The forestry sector globally faces many sustainability challenges. Forest certification arose two decades ago as a market-based mechanism to address these issues. Two forest certification schemes - the Forest Stewardship Council (FSC) and Program for Endorsement of Forest Certification (PEFC) - are now well-established. However, there is a lack of comprehensive studies about the impacts of these schemes on forestry businesses.

This empirical research investigated this issue for the case of Chile, which has a large export-oriented plantation sector and a smaller domestically-focused native forest sector. It used a framework modified from prior studies to assess the effectiveness of the FSC and the PEFC-endorsed CERTFOR schemes in both forest industry sectors, sampling 11 plantation forestry and 8 native forestry businesses. Seventy two in-depth interviews were conducted in 2013-4, with diverse industry actors and stakeholders from both small and large scale enterprises. Qualitative interview data were complemented by information from the literature and previous studies.

The results show that certification has yielded more substantial environmental changes in large plantation forestry businesses than in small plantation and native forest operations. These changes included cessation of deforestation, rehabilitation of natural ecosystems, and reductions in the size of clear-cuts. Socially, while in most cases certification has brought tangible benefits to communities and encouraged a positive process of dialogue between companies and their stakeholders, certification alone has not solved some long-standing conflicts, such as Indigenous claims and workers' rights. Economically, although certification has helped many companies to maintain/gain market access, some reported increased costs from modifying their operations to meet certification requirements. Companies did not report achieving price premiums for certified products.

The FSC enjoys a better reputation than CERTFOR with many actors, including respondents from the plantation forest industry, which adopted CERTFOR in the outset. The FSC initially faced fierce resistance from the large plantation forest industry, which had been targeted by some ENGOs. Paralleling industry responses elsewhere, large industry established its own standard, CERTFOR, as an alternative to the FSC. During the last 5 years, however, due to international market pressure, this industry sector also adopted the FSC scheme. In these cases, the FSC is deepening the changes initiated by CERTFOR. Therefore, in terms of the general effectiveness criterion of my analytical framework, the FSC is now more effective than CERTFOR.

Overall, certification in Chile is making more of a difference to plantation forestry businesses than to native forestry businesses. While both certification schemes have promoted legal compliance, the FSC is encouraging improvements beyond legal compliance.

Notwithstanding these positive impacts, some weaknesses remain in the governance of both schemes. Certification has, generally, proved a more effective policy instrument to address forest sustainability issues in Chile than public policies. Public agencies, therefore, should promote certification to help them to meet their sustainability goals. However, to fully achieve its potential in realising sustainability goals, certification also needs appropriate public policies to provide a minimum legal framework that sets clear rules, particularly to address social conflicts, otherwise its effectiveness will be eroded over time.

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List of Acronyms and Abbreviations

AIFBN	The Association of Foresters for Native Forests (Chilean ENGO)
BMP	Best Management Practice (in forestry operations)
CERTFOR	Chilean System of Forest Certification
CONAF	National Forest Corporation (Chilean Forest Authority)
CORFO	The Corporation for the Promotion of Productivity (Chilean state funding agency)
CORMA	Chilean Corporation of Timber (usually, large plantation forest corporations)
EMS	Environmental Management System
ENGO	Environmental Non-Governmental Organization
FMU	Forest Management Unit
FSC	Forest Stewardship Council
HCVA	High Conservation Value Area
HCVF	High Conservation Value Forest
IGI	International Generic Indicator (for the FSC scheme)
INFOR	The Forest Institute (Chilean research institution)
NGO	Non-Governmental Organization
NSMD	Non-State Market Driven (governance mechanism)
NTFP	Non-Timber Forest Product
OHSMS	Occupational Health and Safety Management System
PYMEMAD	(Chilean) Association of Small and Medium-Sized Timber Owners
RIL	Reduced Impact Logging
SFM	Sustainable Forest Management
SLIMF	Small and Low Intensity Managed Forest
SNASPE	National System of Wild Protected Areas by the State (Chile)
WTP	Willingness To Pay (for certified forest products)
WWF	World Wildlife Fund (in this thesis context, WWF Chile)

Chapter 1: Introduction

1.1 *The problem context of this thesis*

Unsustainable forest management is regarded as one of the most important environmental threats that arose in the past century. This unsustainable management has had negative environmental, social and economic consequences that no single or traditional policy measures have been able to address.

It is useful to provide first a definition of sustainable forest management (SFM): although there is no universally-accepted definition, the Food and Agriculture Organization (FAO, 2016) has stated that: “SFM can be viewed as the sustainable use and conservation of forests with the aim of maintaining and enhancing multiple forest values through human interventions.” The general concept of SFM can be interpreted to reflect a diversity of interests and trade-offs among stakeholders, forest types, and geographical scales.¹

The converse of SFM, unsustainable forest management, has become increasingly widespread over the past century. Unsustainable forest management has led to extensive deforestation and degradation of natural forests. Dauvergne and Lister (2011):2 have pointed out that to date more than half of the world’s original forestlands have disappeared, with deforestation since 1950 having the equivalent impact to all previous losses. But, even when natural forests have not been completely lost, they have often been fragmented or substantially replaced by industrial timber plantations. This is very relevant in terms of negative consequences for the ecosystems services provided by forests. For example, Fearnside (2005) has demonstrated that the Amazonian forests make crucial contributions in terms of ecosystems services such as biodiversity maintenance and carbon storage: such services might be lost because of deforestation.

Other negative environmental effects of deforestation have been addressed in a number of studies (Fearnside, 2005; Meher-Homji, 1992; Zheng, 2006; Chagnon and Bras, 2005), and they include changes in the hydrological regime (reducing the number of rainy days and, at the same time, bringing about occasional torrential rainfalls), soil erosion, and emission of greenhouse gases. Concerning the last effect, deforestation is regarded as the second largest anthropogenic source of carbon dioxide to the atmosphere (Van der Werf *et al.*, 2009) and a major contributor to adverse climate change (Wang *et al.*, 2009).

¹ The FAO definition certainly recognizes that a single definition of SFM is impractical. Rather, SFM is a multidimensional, multipurpose, multifunctional and dynamic construct that can suite a diversity of – sometimes competing – interests (e.g. conservation and cultural interests versus economic ones) to deliver a number of goods and services from forests. SFM can also be addressed at different geographical scales (global, national, subnational, landscape, forest management unit or forest stand) to suite different “sustainability” objectives (e.g. climate change mitigation at large scales versus timber production and local communities livelihoods at national/local scales). See FAO (2016).

Overall, the causes of deforestation cannot be attributed to a single cause but to different combinations of various proximate causes and underlying driving forces, which themselves frequently interact to exacerbate the damage caused (Geist and Lambin, 2002).

While much of the focus globally has been on tropical forests (Sloan and Sayer, 2015; Meyfroidt and Lambin, 2011), deforestation of temperate forests – which is one of the central environmental problems to this thesis – have led to negative impacts and degradation on biodiversity, fragmentation of habitats and nutrient losses from soils (Echeverría *et al.*, 2006; Hedin *et al.*, 1995).

Unsustainable forest management has also had negative social and economic impacts. The environmental degradation and lack of natural forest cover are also associated with social and economic problems such as migration to agricultural frontier areas due to unemployment and rural poverty (Vergara, 2006; Angelsen and Kaimowitz, 1999). Others (Tacconi, 2007: 5) have described the negative social and economic effects of unsustainable (illegal) forest logging, such as corruption of institutions, funding of local conflicts, increased poverty, and government revenues losses from taxes foregone.

Notwithstanding the negative effects of unsustainable forest management, native forests are essential for the livelihoods of many local communities worldwide: they can alleviate poverty (Sunderlin *et al.*, 2005) and provide important incomes including the poor and unemployed (Tacconi, 2007; Mamo *et al.*, 2007). Moreover, if managed sustainably, native forest enterprises can have positive environmental and social impacts in the long-term for many people, and for society in general. This has proved relevant, for example, in the management of boreal temperate forests (Bergeron *et al.*, 2002) and in developing countries (Bawa and Seidler, 1998). Additionally, some large native forest enterprises in the southern hemisphere (specifically, in Chile) have been able to manage extensive *Nothofagus* temperate forests in a sustainable manner, having a low environmental impact and positive social outcomes (Cruz and Schmidt, 2007; Schmidt, 1996).

In summary, unsustainable management of natural forests has major environmental, economic and social impacts and continuing deforestation on the scale of the last few decades may well have catastrophic long term consequences in terms of all three of these impacts. This analysis raises the obvious social and environmental policy question: what else can be done to halt or at the very least, to slow the rate of deforestation and to mitigate its social, economic and environmental consequences? This of course is an extremely complex question to answer, and one about which there is already a very substantial literature (see, e.g. as recent overviews, Meyfroidt and Lambin, 2011; Sloan and Sayer, 2015). But there are also other possible partial solutions, or means to ameliorate the problem, that are available in some countries and in some circumstances: these include the replacement of wood from some natural forests with that from plantation forests.

This is, of course, not a complete solution. It is well understood that plantation forests can have negative environmental and social impacts; these are more frequently associated with large-scale plantations and depend on the land use which plantations replace (Kanninen, 2007; Paquette and Messier, 2009). Plantation forests may have considerable social, economic and environmental benefits, *provided* (and this is a major qualification; see Gerber 2011) they are well-managed and address not only economic objectives but also social and environmental ones.

Put differently, industrial forestry plantations could replace natural forests as the source of industrial and other wood in many areas of the globe, providing sufficient amounts of timber to satisfy the increasing global demand for this product, without resorting to extraction from, and destruction of, natural forests (Barua *et al.*, 2014). Indeed, plantations have had an increasing role in the industrial supply of roundwood worldwide (Kanninen, 2007; Payn *et al.*, 2015). In this context, Kanowski and Murray (2008) have presented a set of recommendations as to how plantations should be designed and managed. Others have described how plantation forests can contribute to increase biodiversity values at a large scale, as well as to ecosystem and recreational services (De Groot and Van der Meer, 2007). There is abundant evidence that well-managed plantation forests can provide valuable habitat for some threatened and endangered species, and may contribute to enhance biodiversity, if they are properly managed (Brockerhoff *et al.*, 2008; Bausch and Schmerbeck, 2007).

Well-designed and –managed plantation forests, therefore, can also help to meet biodiversity objectives. They can harbour many species, ranging from invertebrates to mammals, when remnant native vegetation is left within the boundaries of plantations (Lindenmayer and Hobbs, 2004). The role and importance of plantation forests as part of a complex set of remnant native patches within a wider matrix that can help to improve biodiversity values has already been addressed in many studies (Lindenmayer and Franklin, 2002; Brockerhoff *et al.*, 2008; Lindenmayer and Hobbs, 2004). Furthermore, plantation forests may be designed for land rehabilitation purposes, protecting soils from erosion in degraded areas and allowing the development of rich native tree species in their understory (Lugo, 1997).

On the downside, plantation forests can pose a serious risk to native ecosystems, if plantations are established – as many of them have been – at the expense of native forests. Significant adverse social and environmental impacts that intensively managed planted forests can have on landscapes have been described in detail by many authors (Keenan and Van Dijk, 2010; Kanninen, 2007; Kanowski and Murray, 2008; Reyes and Nelson, 2014; Reyes *et al.*, 2014). Gerber (2011) similarly recognises that despite the fact that wood from industrial tree plantations can substitute for that from deforestation, they have caused numerous social conflicts between companies and local communities, particularly Indigenous groups and peasants in developing countries. Further, plantation trees also have been called as “invasive

aliens”, because they are often constituted of exotic species, and can impact the functioning of native ecosystems. For instance, Richardson (1998) has described how pine plantations have negatively impacted large natural areas of grasslands and shrub lands in the southern hemisphere, affecting biodiversity and nutrient cycling patterns.²

Notwithstanding that there are many potentially negative effects of plantation forestry, these effects are far from inevitable. On the contrary, many such negative effects could be addressed through more sustainable forestry practices, but achieving such changes might require a paradigm shift from unsustainable to sustainable forestry (see for example Lindenmayer *et al.*, 2015). While many of the necessary changes are at the macro level, for example, through the implementation of appropriate forest policies by state (McDermott *et al.*, 2010:333; Kanowski, 2007) or non-state actors (for example, payment for environmental services (PES) schemes) (see De Groot and Van der Meer, 2007), meso level changes may also be important. For instance, negative impacts on certain taxa (Bengtsson *et al.*, 2005; Donázar *et al.*, 2002) might be better addressed through a change in forestry practices. Moreover, important improvements in forestry management such as sustainable harvesting practices, avoiding intensive site-preparation, favouring native species of trees over exotics and polycultures over monocultures, can also result in a significant benefit for biodiversity (Hartley, 2002).

Socially and economically, properly managed plantation forests may have a positive impact on local communities and forestry workers. For example, planted forests may be an attractive economic option for small landowners in developing countries provided that they have access to markets for their timber products (Pokorny *et al.*, 2007).

In order to address these issues triggered by unsustainable forest management, in general, either in natural and plantation forests, a number of policy instruments have been developed. However, as we will see below, they have not been comprehensively applied to address the environmental, social and economic issues caused by unsustainable forestry and land use practices. This thesis aims to reach a better understanding about the impacts of one recently developed policy instrument, forest certification, in addressing unsustainable forest management.

1.2 Forest policies to address unsustainable forest management

Due to the nature and complexity of the problems prompted by unsustainable forest management, combinations of different policy instruments have been employed to address these effects. Most of those policy instruments are characterized by an overarching dominance of the state – as a central actor – that has traditionally gained legitimacy to exert its power (and thus its

² In Argentinian Patagonia, pine trees also have spread and become naturalized outside plantation areas, helped by wildfires. In turn, the presence of pine trees increases both the frequency and intensity of wildfires. This potential positive feedback between wildfires and trees invasion alters native species establishment. See Raffaele *et al.* (2015).

sovereign authority over a territory and a society) on other actors (and thus regulate their behaviour) through democratic consent (Green, 2013:28). In state-centric approaches, the state imposes rules – in the form of different policy instruments - to other actors to regulate their behaviour and achieve collective goals in the benefit of the entire society (Bell and Hindmoor, 2009:71). These rules include statute and common law, market mechanisms, and various evolving and innovative policy instruments. Some of those instruments are becoming more sophisticated as governments have become more focused on the importance of sustainability and the protection of environmental values in forest management practices (McDermott *et al.*, 2010).

However, to date, such policy instruments have not been applied either sufficiently broadly or effectively to successfully address many of the causes and negative impacts of unsustainable forestry practices (see, e.g. Humphreys, 2014). For example, command and control approaches frequently have lacked credible enforcement mechanisms to ensure compliance with forestry laws and regulations, particularly to stop illegal logging in developing countries (Tacconi, 2007).

Recognising the limitations of many conventional state approaches, self-regulation has been promoted by some in the forest industry as a viable alternative to government regulation, whereas other non-state actors such as NGOs and civil society members have proposed independent certification schemes of sustainable forestry practices. The result is that, over the last twenty-five years, new forest policy instruments in the form of forest certification schemes have emerged to address the environmental, social and economic problems caused by unsustainable forestry.

1.3 The rise of forest certification

Forest certification emerged from failing international efforts to protect global forests through a global agreement. Despite the many intergovernmental processes to protect forests had begun during the 1980s, led by the Tropical Forestry Action Plan (TFAP) and the International Tropical Timber Organization (ITTO), they were not sufficient to address global forest issues since they were mainly focused on the tropics (see for example Auld, 2014). Therefore, efforts to protect forests worldwide saw their starting point in the Statement of Forest Principles agreed at the 1992 Earth Summit (Humphreys, 2014; Humphreys, 2006). As this summit failed in securing a legally binding agreement to protect forests through sustainable forest management, some NGOs encouraged the development of private governance mechanisms. The resultant Forest Stewardship Council (FSC) represented the first alternative of a private governance mechanism to address unsustainable forestry practices worldwide (Cashore *et al.*, 2006).

The FSC is a forest standard and certification scheme that was born in 1993 at a Founding Assembly held in Toronto, Canada (FSC-International, 2012). The aim of the FSC has been to develop an “environmentally appropriate, socially beneficial and economically viable management of the world’s forests”. To date, this forestry scheme has been applied in some 190.5 million hectares of forests in 82 countries worldwide (see Table 1.1) (FSC-International, 2016b).

Although the FSC has been supported and continues to be supported by important NGOs and broad sectors of civil society (Auld, 2014:71-111), many industry associations and countries reacted against the FSC establishment as they felt that their economic interests and sovereignty would be threatened (Gale and Haward, 2011). Their reaction was manifested in the creation of their own alternative competing forestry certification schemes. Most of them have been subsequently grouped under the umbrella Program for the Endorsement of Forest Certification (PEFC) (Auld *et al.*, 2008b; Cashore *et al.*, 2006:7-23), under which some 300.7 million hectares are now certified worldwide (PEFC, 2016) (see Table 1.1).

Global forest certified area by major certification schemes, October 2016	
Forest Stewardship Council (FSC)	
Region	Certified area (ha)
Africa	7,608,875
Asia	8,061,231
Europe	95,117,590
Latin America and Caribbean	12,804,703
North America	68,500,164
Oceania	2,680,744
Total	191,773,307
Programme for the Endorsement of Forest Certification (PEFC)	
Region	Certified area (ha)
Asia	10,810,653
Central and South America	5,236,393
North America	163,251,270
Oceania	26,726,000
Europe	94,725,522
Total	300,749,838
Total, all certification schemes: 492,523,145 ha	

Table 1.1 Global certified area by major certification schemes and regions.

Source: FSC -International (2016b) and PEFC (2016).

Currently, there is a sharp competition between the FSC and PEFC-endorsed schemes. For example, there have been negative campaigns that represent competing standards in ways to persuade retailers that they should trade only FSC-certified products (Rotherham, 2011).

Moreover, important NGOs are only committed to support the FSC scheme (Auld, 2014). However, there is a trend towards convergence in the requirements of the forest certification schemes due to continual reviewing and changes on them (Masters et al., 2010).

FSC and PEFC endorsed schemes are also known as “Non-state market driven mechanisms” (NSMD) since they have distinctive features (see Figure 1.1) as compared with other forms of forest governance. Many of those forms (including NSMD) are grouped under the umbrella concept of Corporate Social Responsibility (CSR), a concept that comprises a mix of different self-regulatory approaches by which private enterprises commit themselves to develop socially and environmentally responsible investments. Unlike most self-regulatory approaches, the two main distinctive characteristics of NSMD governance are complex governance mechanisms – that encourages an active participation of social actors with dissimilar interests – and reliance on highly prescriptive rules to be followed by forestry businesses.

Role of the state	Institutionalized governance mechanism	Prescriptiveness of NSMD rules	Role of the market	Enforcement by a 3rd party
<ul style="list-style-type: none"> • NSMD standards are voluntary: they are not requested by state laws. • However, there is in practice a co-regulatory arrangement between states and NSMD governance. 	<ul style="list-style-type: none"> • NSMD governance would be more open and transparent than other self-regulation initiatives. • NSMD governance encourages the participation of a wide arrangement of stakeholders in its governance. 	<ul style="list-style-type: none"> • High prescriptiveness of their rules would ensure better sustainability outcomes than other self-regulation schemes (e.g. ISO 14001 scheme). • But, early certification adopters would already meet high compliance standards (as requested by state policies). 	<ul style="list-style-type: none"> • Legitimacy granted through the supply chain, viz. environmental and social concerns from sensitive markets. • Final consumers rely on second-hand information (through a certification stamp) concerning sustainable forest practices of primary producers. 	<ul style="list-style-type: none"> • External and independent audits provide validation and reliability to the certification process. • However, some may see the relation certifying body-firms not exempted from conflicts of interest or bias.

Figure 1.1 Key characteristics of NSMD governance.

Source: Modified from Cashore (2003) and Auld et al. (2007)

The information provided hitherto poses a number of questions about the effectiveness of this new form of forest governance – forest certification – because, as will be explained subsequently, many studies highlight the positive outcomes and impacts resulting from forest certification, such as enhanced forest management practices, biodiversity improvements, and better social and economic conditions (Cubbage *et al.*, 2010; Hagan *et al.*, 2005; Newsom and

Hewitt, 2005; Gullison, 2003). In contrast, other studies suggest that forest certification is not sufficient to mitigate the impact of deforestation or poor sustainable forestry practices, at least on a large scale (Rametsteiner and Simula, 2003; Marx and Cuypers, 2010). There is not a clear consensus about the effectiveness of this policy instrument, or about the effectiveness of different forestry certification schemes. Additionally, most studies lack a common and comprehensive framework to assess the effectiveness of certification. This study attempts to fill this gap, providing a comprehensive framework to assess the effectiveness of forest certification through assessing its impact on the environmental, social and economic performance of forest operations.

1.4 What is a certification standard?

The concept of a *standard* is important because is embedded in many of the new forms of forest governance addressed in detail in Chapter 2 and their appendixes. Thus, a *standard* is “a set of environmental, social and/or economic criteria” that organizations translate into concrete practices, and *certification* is “a means to ascertain that organizations comply with those criteria” for their products and services (Steering-Committee, 2012:6).

Overall, *certification standards*, more properly named *schemes*³, are non-governmental initiatives characterized by the fact that the requirements to be met by organizations (e.g. environmental, social and economic requirements) are defined by independent organizations (Steering-Committee, 2012). Once products or production processes achieve compliance against these standards – through being assessed by an independent third party - a certificate of approval is granted to these companies (see Figure 1.1). This may be used for external communication (Marx, 2011). For Eden (2011):172, certification schemes are also labels (e.g. eco-labels) where consumers “can exert their political power through their purchasing”.

³ “Standards” are usually part of “schemes” since they entail not only a suite of specific compliance criteria but also particular governance arrangements (see. e.g. Pattberg, 2007)



Figure 1.2 Continuous cycle to certify organizations' practices.

Source: author's interpretation.

1.5 The relevance of this research

Although many empirical studies have been conducted worldwide about the impacts of certification, the majority of them have lacked a comprehensive framework to evaluate such impacts, particularly in developing countries. As noted earlier in the chapter, most negative impacts of unsustainable forest practices have occurred in developing countries and the FSC, at its creation, was particularly concerned with unsustainable practices followed in such countries.

Second, this research contributes to resolving the lack of consensus about the effectiveness of certification among different studies. I argue that most studies do not compare the performance of different certification schemes against certain comprehensive criteria of effectiveness, which is a broader concept than simply addressing impacts, to understand *why* certification – as a private governance mechanism – has worked well in some contexts and badly in others. Furthermore, many studies do not compare the situation after and before the adoption of this policy instrument or in a counterfactual scenario, comparing certified and non-certified firms⁴.

Third, there are also considerations related to the type and size of the forestry businesses being researched. Therefore, most studies do not consider differences in forest types, that is, plantation and native forestry as compared performance across small, medium-sized and large forestry businesses.

⁴ Or what would have occurred in the absence of certification.

Hence, this study addresses those concerns and conducts an empirical research in what was until recently an emerging economy, Chile, as an excellent opportunity to investigate what difference have different certification schemes made to plantation and native forestry businesses' environmental, social and economic performance.

1.5.1 Research Objectives

This PhD thesis seeks to better understand forest certification impacts through answering a central empirical question: *What difference do different forest certification schemes make to forestry businesses?* This question is, in turn, answered by five research sub-questions. As discussed in Chapter 2, each of these represents a different measure of certification effectiveness:

- (1) What problems have been addressed in forestry businesses by forest certification?*
- (2) What were the companies/stakeholders' main goals in seeking certification? To what extent have they been achieved?*
- (3) Has forest certification changed the behaviour of companies towards various stakeholders?*
- (4) What are the attitudes of key actors in forest governance to the different certification schemes?*
- (5) What is the attitude of the public towards different forest certification schemes?*

As we will see below, this research uses a comprehensive research framework, and a qualitative data approach derived from in-depth interviews, to obtain rich insights of the effects of the introduction of a relatively new governance instrument, certification, in the Chilean context. Two different forest certification schemes are assessed against these measures of effectiveness: that based on the FSC scheme and that on the PEFC-endorsed Chilean CERTFOR scheme.

1.5.2 The Chilean forestry context

Chile is like a long and narrow land strip of around 756,096 km² (see Figure 1.3), relatively isolated from its neighbors by natural borders (the Andes mountains borders Argentina and Bolivia to the east and northeast, respectively; and the Atacama desert borders Peru to the north), and where forests and forestry are mostly concentrated in its southern regions.

Chilean forests comprise circa 19% of its total land area (INFOR, 2015c) and are constituted by native forests (a diverse mix of native tree species) and plantation forests (mainly exotic monocultures of pine and eucalypt species). Native comprise the majority of Chilean

forests (84.5%), totaling some 13,424,000 hectares; plantation forests occupy only 2.5 million hectares (15.5% by area), but provide most of Chile's forestry income (INFOR, 2015c). Private enterprises own almost all commercial plantation forests, with most (63%) owned by large and vertically integrated corporations exporting timber commodities (e.g. pulpwood) to Asian, North American, European and Latin American countries (INFOR, 2015a). Small and medium-sized plantation forest owners, in contrast, are less well-resourced and own forestlands that usually do not exceed 60,000 each (Colegio-Ingenieros-Forestales-Chile, 2014); most depend on timber supply chains that are controlled by large corporations.

In contrast, native forests managed for productive uses are owned mostly by private small owners; they mainly produce firewood and some sawnwood for the domestic market and, compared with plantation forests, their economic contribution to national GDP is modest (INFOR, 2015a; Gómez-Lobo *et al.*, 2006). More than 7 million hectares of native forests are owned by the state for conservation purposes (INFOR, 2015a; Leyton, 2009). Conversely, the unique biodiversity and cultural values, and recreational and certain economic uses of native forests, underlie the livelihoods of local and Indigenous communities (Neira *et al.*, 2002).

Private forest owners of both forest types also hold legal rights over land tenure; there are no forest concessions in Chile.

1.5.3 Overview of the research framework

In order to answer my research questions, this thesis uses mixed methods: it combines the research framework developed by Tikina and Innes (2008) for the forest sector and a counterfactual-like research design following that proposed by Blackman and Rivera (2010) and Blackman and Naranjo (2012).

Tikina and Innes (2008)'s approach identifies six measures of effectiveness, of which five are employed in this research; the reasons for this choice are discussed in Chapter 2. Such measures of effectiveness are particularly concerned with the ability of forest certification to: address the problems due to unsustainable forest management (problem solving effectiveness); achieve certain sustainability or forestry businesses goals (goal attainment effectiveness); modify the behaviour of forestry businesses in relation to their forestry practices and various stakeholders (behavioural effectiveness); change its level of adoption (with regards to different certification schemes) and the attitudes of different groups towards specific certification schemes (process effectiveness); and, change or increase its social acceptance by communities and general public (constitutive effectiveness).

The research framework is also inspired by the counterfactual research design proposed by Blackman and Rivera (2010) and Blackman and Naranjo (2012). I use a counterfactual-like design to identify whether the changes in companies' performance are due to certification or other causes. As they and others (Cashore and Auld, 2012) have warned, we must avoid selection-bias, which is the risk of overestimating the changes yielded by certification when selecting only the best performers. Thus, I compared relatively similar groups of certified and non-certified forestry businesses.

1.5.4 Summary of the research methods

The research methods I used in this research included Layder (1998)'s adaptive theory, the case study approach employed in the Chilean context, and primarily qualitative methods to collect and analyse data.

Layder (1998) uses an eclectic research approach to link theory and data as two interconnected elements that interact mutually and, as a consequence, are continuously reshaped. Under Layder's approach, the data collected in the field can be used to modify and adapt the pre-existing body of theory. Furthermore, following adaptive theory, I employ a "multi-strategy approach" through using multiple data sources to inform my interview findings, such as statistics, survey data, public databases, certification assessments, and government reports.

I used Chile as the case study country, within which I selected five forestry (southern and south-central) regions⁵ to conduct my research. The selection of Chile as a case study is not random but responds to many important considerations: it has a large temperate natural forest area and a well-developed plantation forest industry; a significant area of Chilean forests have been certified under two different schemes (FSC and the Chilean PEFC-endorsed scheme, CERTFOR); and it has significant environmental (deforestation of native forests and unsustainable logging) and social (conflicts with forestry workers and Indigenous communities) problems that may be addressed by certification. Figure 1.2 presents a map of the case study country and the forestry regions being selected.

⁵ "Region", in the Chilean context, is the largest political and administrative division for all Chilean territories.

Selection of sites

The selection of sites considered regions where it was possible to meet the necessary criteria to form matched groups of organizations, i.e., credible and reasonably doable “counterfactual-like” cases.

Therefore, I selected six forestry regions: VII (Maule), VIII (Biobío), IX (Araucanía), X (Los Lagos), XII (Magallanes), and XIV (Los Rios). They were selected based on criteria such as level of forestry activity (therefore, usually they were southern regions), variety of forest types (having native, plantation forests or both in the same region), characteristics of forest operations (including scale, market orientation, business structure and professionalization of the business), and presence of important environmental and social conflicts as well as some practical considerations (time and resources). A descriptive overview of each of the regions selected for this research is found in Appendix 3.

Selection of organizations

The purpose of this research was to construct approximate matched groups of very similar organizations in a number of characteristics (e.g. size, market orientation, forest type, area and so on), rather than constructing identical (and impracticable) sets of pairs.

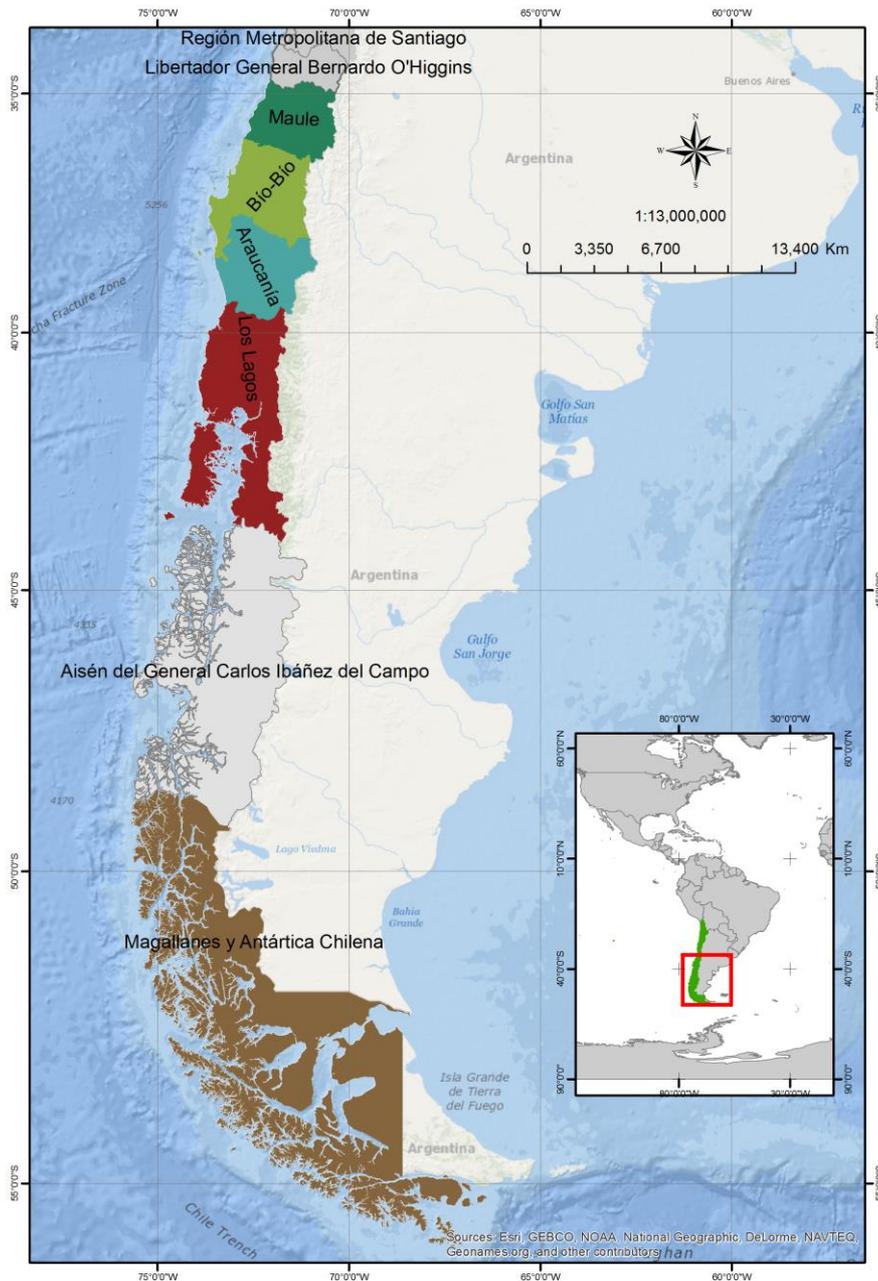


Figure 1.3 Map of Chile showing the six forestry regions (coloured) in which case study research was conducted.⁶

Most, if not all, Chilean large plantation forestry businesses are now certified under either the FSC or CERTFOR forestry schemes. This made the comparison between large certified and large “pure” non-certified firms particularly hard. In these cases, instead, I employed the *before-after* approach to seek differences between the adoption of the FSC and CERTFOR schemes, since many companies had implemented the FSC quite a long time after they implemented CERTFOR. In the cases of small and medium-sized forestry businesses,

⁶ “Los Lagos” (X) region includes another region in its northern part, that is, “Los Rios” (XIV) region.

comparison was more straightforward: I found very similar FSC certified and non-certified operations.

My interviews covered a broad range of stakeholders with diverse views of the impacts of forest certification; they included: forestry managers, CEOs and various industry officers, forestry workers, union representatives, NGO members, forestry association members, government officers and officials (forestry and labour issues), Indigenous community members, local community members, forestry consultants, researchers and contractors. Appendix 9 shows the list of people interviewed by category from a total of 72 participants.

1.6 Structure of this thesis

This thesis is organized in eight chapters. Chapter One provides an introduction to this entire work, describing the problems that motivated this research and the rise of innovative policy instruments to address such problems, particularly forest certification, which is central to this thesis. As such, certification has had important implications for the theory of “new governance” as well as significant impacts that are reviewed in detail in Appendixes 1 and 2.

Chapter Two focuses on the theoretical framework and research methods. It describes the research objectives in detail, methodological gaps in studies about certification and the research framework of this thesis. It also describes my research methods and the use of qualitative methods to collect and analyse my in-depth interviews.

Chapter Three introduces the Chilean forestry sector, drawing from both the literature and my fieldwork to outline the environmental, social and economic performance of native and plantation forestry businesses, and so contextualise this research.

Chapter Four explores the drivers of forest certification in Chile and how it evolved over the last two decades. It also explores the perceptions of actors in forest governance towards different certification schemes.

Chapter Five examines the capacity of certification to change the environmental, social and economic performance of plantation forestry businesses.

Similarly, Chapter Six examines the ability of certification to change the environmental, social and economic performance of native forestry businesses.

Chapter Seven discusses the relevance, contribution to the knowledge about certification, and broader lessons of the findings presented in Chapters Three, Four, Five and Six.

Chapter Eight presents the conclusions of this PhD thesis. It addresses in detail my five research sub-questions and some of their main implications. It also analyses critically the utility of the research framework in yielding new knowledge as well as discusses the main policy implications and areas for future research.

Chapter 2: Background, theoretical framework and methods

2.1 Introduction

The previous chapter provided, first, a description of the problem that gave birth to alternative policy instruments in forest governance. It showed how forest certification arose as an innovative policy approach to address environmental, social and economic issues.

This chapter is three-fold. First, I briefly address the literature concerning both the general theory about certification and the impact of certification on forestry businesses, identifying the gaps in our knowledge that need to be filled in.

Second, I outline the theoretical framework supporting my research, and then I explain in detail the methods employed to collect the data. The former, sometimes called “methodology”, proposes a theory of what can be researched, and how, justifying particular methods; and such methods are mechanisms to collect data (see Baxter, 2010:82).

In regards to the theoretical framework, I will first describe the objectives of this research through the lens of the key research questions. Then, I will discuss common gaps, in both methodology and methods, in studies of forest certification impacts. Third, I will explain why I employed a combination of methodologies to measure the effectiveness of forest regimes. My methodology is mainly based on Young (1994) and Tikina and Innes’s (2008) approach and inspired on the counterfactual analysis proposed by Blackman and Rivera (2010) and Blackman and Naranjo (2012). Fourth, I will justify the use of adaptive theory (Layder, 1998) to deal with my research process as a whole. Finally, I will explain why I decided to choose Chile as a case study.

Third, I will also discuss the qualitative methods used, in a multi strategy approach, to collect the data through in-depth interviews as the primary source. Then, I will describe how I developed the research questions, sampling considerations to select my interviewees, and the ethics procedure to conduct this research. Finally, I will describe how the data were analysed.

2.2 Theoretical Background

Overall, traditional forms of forest governance, under different forms of command and control approaches and economic instruments, have not been sufficient to address the environmental and social issues caused by forest operations worldwide. On the one hand, command and control approaches, for example, have frequently lacked credible enforcement mechanisms to make forestry businesses comply with state laws and regulations (McDermott *et al.*, 2010). The practical application of economic instruments have had modest outcomes in many cases, on the other (e.g. Bull *et al.*, 2006).

In this context, new forms of forest governance have arisen to address many of the above issues – under the form of self-regulation approaches. It is thus very notable that many – particularly large forest corporations – forestry businesses have adopted corporate reporting (Toppinen and Korhonen-Kurki, 2013) and environmental management systems (EMSs) (Tikina and Innes, 2008; Cashore *et al.*, 2005). Again, these self-regulation initiatives have not been sufficient either for large corporations or small and medium-sized forestry businesses to address their sustainability issues since they have not been necessarily associated with a better environmental performance, motivating some criticism (e.g. Poynton, 2015). Hence, as we will see in the next paragraph, new forms of forest governance emerged to address the significant limitations of a number of traditional and self-regulation approaches.

From the perspective of this research the most important forms of new forest governance are performance-based (i.e. outcome based) known as Non-State Market Driven (NSMD) mechanisms. They group different forest certification schemes. The term NSMD systems or mechanisms was firstly coined by Cashore (2002) to refer to approaches where “the state does not provide implicit or explicit, compliance incentives but a private organization develops rules designed for achieving pre-established objectives such as sustainable forestry in the case of forest certification” (Auld *et al.*, 2008a:424). They have a number of distinctive characteristics that were introduced in Chapter 1 and are described in detail in Appendix 1.

Importantly, the major focus of the literature has been on explaining the difference in performance of different forest certification schemes (see for example Cubbage *et al.*, 2010; McDermott *et al.*, 2008; Gulbrandsen, 2005; Masiero *et al.*, 2015). For the most part, such comparative studies have focused on the Forest Stewardship Council (FSC), which is often viewed as a benchmark against which other standards can be judged. In broad terms, the studies, far from moving towards a consensus view, are seriously divergent in their findings about certification impacts, and as a result leave many important questions unanswered. For example, one obvious first question is to identify to what extent NSMD mechanisms have yielded better

outcomes in forest management than other instruments of forest governance, and while this question has certainly been asked previously, no clear answer has emerged. A related question concerns what differences different forest certification schemes make to forestry businesses.

NSMD mechanisms have had substantial effects. Put simply, in terms of their internal effects, certification has largely influenced the environmental, social and economic performance of certified forestry businesses. Table 2.1 summarises the main conclusions of studies of certification impacts on environmental, social and economic issues; those impacts are also discussed in detail in Appendix 2. Overall, whereas many studies have reported important benefits in the environmental and social performance of companies, others have contradicted these results. Likewise, in economic terms, there is mixed evidence concerning the effects of certification on the performance of forestry businesses. These issues therefore warrant further investigation.

Aspect	Specific issues
Environmental issues	<ul style="list-style-type: none"> • Deforestation: certification does not address deforestation outside certified forest areas. Most certified forests are in temperate regions and developed countries, not in tropical and less developed countries where most deforestation and degradation occur. • Biodiversity and conservation issues: certification has encouraged better practices to protect biodiversity including identification, assessment and protection of flora and fauna species; some studies also suggest an improvement in the conservation status of endangered, threatened and vulnerable species. Conversely, other studies refute any claims concerning improvements in species conservation status. • Forest management practices: certification makes forest owners and their staff more aware of the environmental impact of forest operations; other changes are the implementation of reduced impact logging (RIL) techniques, and better documentation and monitoring of forest operations. In some transitioning countries (Russia and Estonia), certification has helped to improve forest practices but it has not reduced extensive clear-cuts. Other studies suggest that certification mimics standards set by state forest policies (best management practices [BMP] in developed countries, rather than going beyond legal compliance.
Social issues	<ul style="list-style-type: none"> • Impact on forestry workers: certification generally improves working conditions and workers' welfare. Some examples include: fair wage practices, Occupational Health and Safety (OHS) training, appropriate provision of Personal Protective Equipment (PPE), and proper accommodation and meals in forest camps. Certification has been perceived as a negotiation tool by forestry workers to get better social benefits. However, it is not yet clear whether these benefits are simply complying with social regulations or going beyond legal compliance, across the diversity of certification contexts (e.g. developed and developing countries, forest type). • Impact on local communities and other stakeholders: certification has empowered and given voice, through consultation processes, to NGOs, local communities and Indigenous peoples who inhabit forested territories; they have been able to leverage decision-making processes concerning forest operations. In some cases, traditional Indigenous peoples' rights have been formally respected and there are changes in the power balance between companies and their stakeholders. Notwithstanding those findings, other authors have not found compelling evidence of fewer conflicts with Indigenous peoples attributed to certification.
Economic issues	<ul style="list-style-type: none"> • Microeconomic effects: there is mixed evidence concerning both improved access to environmentally sensitive markets and the payment of premium prices for certified timber: in some cases, certified companies have obtained those competitive advantages, whereas in others not. Certification has imposed important associated costs, from modifying operations, for large forestry businesses; small forestry businesses have experienced both direct and indirect costs. In general, plantation forestry businesses would face lower costs than those operating in other forest types. • Macroeconomic effects: overall, there are two macroeconomic effects of certification; the first is that certification would encourage better transparency in the timber supply chain; and the second is that, in the long term, certification would reduce the worldwide timber supply as a consequence of curtailing illegal or unsustainable harvesting.

Table 2.1 Summary of the main certification impacts on the sustainability performance of forestry businesses.

Source: literature review (see details and references in Appendix 2).

Finally, certification has also had an impact beyond the forest management unit (FMU) level, in terms of broader forest governance (see Appendix 2). Perhaps, the most important effect is that it enforces legal compliance. Some scholars (Gale and Haward, 2011; Lister, 2011; Gulbrandsen, 2014) have noted this a “co-regulatory arrangement” between NSMD governance and public policies. Of course, much empirical research is needed to confirm this theory and to establish if and when certification is capable of providing an effective enforcement mechanism, or even going beyond legal compliance.

2.3 Research questions

This research aims to answer the central research question: *What difference do different forest certification schemes make to forestry businesses?* This question is focused on both plantation and native forestry businesses in Chile. A developing country has been chosen as a case study for reasons described in section 2.6.3. To answer this central research question, it is necessary to divide it in the following five research sub-questions:

1. *What problems have been addressed in forestry businesses by forest certification?* This question explores what specific environmental, social, and economic problems have been addressed or solved by certification. It looks at how the changes – if any – came about, their magnitude and the way they are measured. I also examine whether certification alone is able to bring about such changes, or whether policy instruments other than certification prompted those changes (e.g. new regulations or market instruments). In order to do that, it is important to uncover the differences in perceptions about similar phenomena but across different actors and organizations, as well as explaining such differences.

2. *What were the stakeholder’s main goals in seeking certification? To what extent have they been achieved?* This question attempts to identify the goals of various actors (not only from forestry businesses) when advocating for/supporting/promoting/seeking forest certification. I further examine underlying motivations (e.g. in response to internal or external pressures) and why and how such motivations have changed over time. Also, as this question attempts to measure the goal-oriented effectiveness of forest certification, it is particularly concerned to determine the extent (partial or full achievement) to which such environmental, social, economic or other kind of goals have been accomplished over time and how.

3. *Has forest certification changed the behaviour of companies toward various stakeholders?* This question explores the ways in which forestry businesses have changed their behaviour when dealing with different stakeholders in response to certification. I am particularly

interested in exploring how (and to what extent) certified companies have modified their behaviour to comply with certification requirements and whether or to what extent their behaviour has been different from that of non-certified companies in comparable circumstances. It is also important to know if other stakeholders (outside forestry companies) have had to modify their behaviour in response to forest certification and if so, in what ways. Lastly, I explore the different emphasis that different certification schemes give to certain aspects of their policies that lead to specific behavioural changes.

4. *What are the attitudes of key actors in forest governance to the different certification schemes?* This question explores the attitudes and perceptions that certification is able to bring about in different actors and what are the underlying reasons that account for such attitudes and perceptions. I also explore the attitudes that different schemes can elicit in various actors, conditioning their further adoption and success over time. I look at whether – in the view of key actors – different aspects of certification have been beneficial and/or undesirable, and in what ways their perceived positive or negative characteristics have influenced the commitment to a particular certification scheme. Also, this question allows me to compare the relative effectiveness of forest certification and regulation as policy instruments. In turn, answering this question may reveal how far environmental and forest legislation are from achieving their sustainability goals.

5. *What is the attitude of the public towards different forest certification schemes?* To what extent are various forms of certification accepted by various civil society groups, such as the community directly affected by forestry operations and the general public (e.g. particularly clients from timber retailers). I also attempt to discover how these perceptions arise and what their consequences might be. If socially accepted, forest certification may grant a “better social licence” for the forestry business so that they can operate in the long term.

Each of these research questions addresses a specific dimension of the effectiveness of forest certification, as I will discuss later in this chapter. These questions are strongly empirical; based on observations of the social world through disentangling the meanings and values that different key actors attribute to a particular phenomenon. I aimed to gain insights into their attitudes, perceptions, acts, thoughts and feelings within the borders of the particular case study. Finally, I employed a multi-strategy approach to maximize the likelihood of theory generation (see Layder, 1998:69), underpinning qualitative research methods with the use of multiple quantitative data sources.

2.4 Ontological and Epistemological considerations

All research methodology in social sciences relies on ontological (how we can see the reality) and epistemological (how we can know the world) assumptions. In that regard, this research employs qualitative methods as the primary tool to gather empirical evidence from the case studies; however, quantitative methods and data are also used to answer the research questions, combining both approaches in a process of “triangulation”. The attraction of this approach is that by examining a phenomenon from different angles, using diverse sources of data, more accurate conclusions are likely to be reached. Importantly, both ontological and epistemological assumptions provide different standpoints depending on the kind of approach being used throughout this study.

On the one hand, when relying on a qualitative approach to research, I will adopt a nominalist (subjective) approach from an ontological viewpoint, interpreting through the lens of subjectivity, the particular meanings that different actors give to a fact of their social reality (i.e. the introduction of a particular policy instrument). Epistemologically, this research rests on direct observations of the social world to test pre-existing theories, provide new knowledge and re-shape theory if necessary.

On the other hand, whenever I use a quantitative approach to back up qualitative information, I rely on more realist (objectivist) assumptions to examine the social reality. In this way, the information provided by “hard data” serves to inform the soft data gained from interviews, enabling a more complete understanding, and a basis for comparison from different viewpoints within each individual case-study (and across different units of “mini” case-studies). This approach also implies an empiricist approach to understand a social phenomenon (certification), from an epistemological point of view.

The thesis methodology is strongly influenced by Layder’s (1998) adaptive theory, which takes a pragmatic and eclectic stance that seeks to reconcile both objective and subjective aspects of social reality. In particular, it takes seriously the meanings and subjective understandings of people being researched towards while also recognising that some aspects of the research focus can be better explained by facts of natural phenomena or in more “scientific and objective” terms. In essence, adaptive theory embraces an epistemological position that is neither interpretive nor positivist.

This thesis is primarily intended to be explanatory in its purpose. It seeks to answer the ‘why’ questions and to identify the underlying reasons to explain why events occur. In doing so it aims to test, reshape and extend pre-existing theory (Neuman, 2011:40). However, this

primary purpose does not exclude the answer to the questions ‘what’, ‘how’ and ‘who’, that is, it also takes into account exploratory and descriptive approaches.

Turning to that exploratory purpose, this research also acknowledges the role of critical theory in uncovering the factors that explain certain social phenomena. Agger (1991) and Neuman (2011):108 pinpoint that role: critical theory goes beyond the appearance of given social facts to uncover new – and real – social facts considering domination and power structures. Therefore, critical theory helps us to uncover power asymmetries and dialectical processes that are central to explain social issues. For example, how do we explain the contentious relationship between companies and forestry workers as well as its implications?: through the use, as some theorists have suggested, of language interpretation, which disentangles the hidden meanings of people’s accounts (Buckler, 2010). This role in my research does not contravene Layder’s approach. Rather, adaptive theory has an affinity with critical theory (and its realist ontological stance) insofar as it recognises the importance of the analysis of power and domination as part of systemic phenomena, but rejects its application in all the aspects of everyday life (see Layder, 1998:147).

In short, the ontological and epistemological assumptions of this thesis provide the basis from which I approached the data collection and analysis, by using both qualitative and quantitative methods, to describe, explore and explain a social phenomenon – certification – in a particular context.

2.5 Analytical Framework

A substantial amount of empirical studies about the impacts of forest certification have been conducted worldwide, employing a mix of different methodologies and data-gathering methods – qualitative and quantitative. In the following paragraphs, I will discuss those different methodologies to assess the impact of forest certification (when addressing environmental, social, economic, and other issues) and analyse their strengths and limitations. Then I will introduce a methodology to overcome these shortcomings, which I employ in this research.

2.5.1 Assessing the environmental impacts of certification

By and large, the environmental impacts of certification have been more extensively studied than other kind of impacts. In this regard, we can distinguish five common data-collection methods to carry out such studies: analysis of corrective action requests (CARs), surveys, interviews, public databases, extensive reviews of the literature, direct field surveys, and empirical evidence. Importantly, these techniques are also employed to study social and

economic impacts, as well as other effects. As described below, each of these methods has both strengths and weaknesses.

From those abovementioned, CARs analysis is perhaps one of the most widely employed (and reasonably accessible) techniques to collect data. CARs are operational changes that firms have to engage in to meet the requirements to be certified by an independent third party. They provide considerable quantitative and qualitative information about the operational changes that companies have had to face to meet a particular certification scheme. Romero *et al.* (2013), believe that CARs can provide valuable information about the nature of a problem and its evolution over time. Therefore, a number of studies employing CARs have been conducted in developed countries (Newsom *et al.*, 2006; Masters *et al.*, 2010; Cubbage *et al.*, 2010; Hirschberger, 2005d; Hirschberger, 2005e), in developing countries (Schulze *et al.*, 2008; Roberge *et al.*, 2011a) and in transitioning countries (Hirschberger, 2005a; Hirschberger, 2005b; Hirschberger, 2005c). Other authors (Peña-Claros and Bongers, 2010; Newsom and Hewitt, 2005; Auld *et al.*, 2008b) have also used the analysis of CARs to gather evidence about the global impacts of certification.

However, CARs have some limitations. They can only provide indirect evidence of the positive impacts of certification, and this evidence largely relies on the interpretation of certification auditors' findings (Romero *et al.*, 2013) and on the consistency of each assessment process (Masters *et al.*, 2010; Rametsteiner and Simula, 2003). In addition, CARs may provide only a narrow view about what is really happening on the ground because they focus on changes in practices rather than on providing a comprehensive picture entailing other dimensions of forest certification impacts (e.g. its problem solving capacity or its effectiveness as a policy instrument). A limitation of CAR analysis is that it only easily applied to FSC audit reports, since the FSC process sets conditions or CARs after certification; in contrast, many PEFC-endorsed schemes (e.g. the Sustainable Forestry Initiative [SFI] in North America) require instead that all their requirements be met prior to certification being awarded; and they differ from the FSC both in number and focus of requirements (Moore *et al.*, 2012). Other PEFC-endorsed standards, like the Chilean CERTFOR, have audit reports that are not easily accessible to the general public and, when available, they often miss some reporting periods. These factors mean that CAR analysis is not necessarily equivalent between FSC and PEFC-endorsed schemes. Hence, CAR analysis should not be used as a "stand-alone" tool to evaluate the impacts of certification; instead, they should be complemented with other data-collection methods.

Surveys and public databases are common quantitative tools when collecting data concerning the impacts of forest certification on different types of forestry enterprises. They have been employed both in developed (see for example Newsom *et al.*, 2003; Auld *et al.*, 2003; Moore *et al.*, 2012), transitioning (Golovina, 2009) and developing countries (see Alves *et al.*, 2011; Basso *et al.*, 2011), particularly at the landowner and managerial level. At a larger scale, Marx and Cuypers (2010) analysed the macro-effectiveness of the FSC for 221 countries, employing a set of public world databases from different global organizations (namely, FAO, UNDP, the World Bank and FSC). Of course, surveys and public databases provide useful information about certain, very specific impacts (e.g. percentage of certified forestlands or some perceptions about certification), but do not provide much context as to how or why these impacts (public databases) or experiences (surveys), came about and in this respect they are constrained by the questionnaire framework itself. Also, Neuman (2011) highlights several limitations concerning the accuracy and respondent rate of surveys, which is especially important when relevant information over a wide range of different stakeholders is needed.

Literature reviews and in-depth interviews have been used in a number of studies as a means to collect relevant information about environmental impacts of certification, providing significant amounts of detailed qualitative information. Different reviews of the literature have paid more attention to particular issues than others. Some have focused on biodiversity implications of certification (Rametsteiner and Simula, 2003; Johansson *et al.*, 2013), constraints for certification uptake (Leslie, 2004), as well as meta-analysis comparing the different (theoretical) performance of forest certification schemes (Clark and Kozar, 2011; Masiero *et al.*, 2015). In contrast, interviews can provide richer data on, for instance, awareness of environmental issues among landowners (De Lima *et al.*, 2008) and influence (in different aspects) of certification on the environmental performance of forestry enterprises (Cubbage *et al.*, 2010; Roberge *et al.*, 2011a; Gomez-Zamalloa *et al.*, 2011; Hain and Ahas, 2007). Interestingly, some of those studies have narrowed the scope of their interviews using, for example, a variation of the Delphi method (that is, by using semi-structured interviews on a number of experts in forest issues) (Gomez-Zamalloa *et al.*, 2011). All of the abovementioned approaches give rich descriptions about certification impacts, but they should be complemented with other data-collection methods (e.g. public databases and statistics); and, importantly, researchers need to be aware of methodological constraints (discussed in section 2.5.5) when employing them.

Direct field surveys and empirical evidence have also been employed to assess certification impacts. This has been approached by an increasing number of studies since Hagan *et al.* (2005)'s assessment on biodiversity practices by using a structured field questionnaire in SFI- and FSC- certified North American forests. For instance, Hain and Ahas (2007) used field

visits, along with surveys and interviews, to assess forest management in FSC-certified Estonian forests. Sverdrup-Thygeson *et al.* (2008) compared biodiversity values before and after certification under the Norwegian “Living Forests” scheme by measuring the number of retention trees and mean width of buffer-strips along rivers; this was similar to Foster *et al.* (2008)’s assessment on forest structure in FSC-certified and non-certified forest stands in the US. Likewise, Johansson and Lidestav (2011) used indicators for “enhanced biological diversity” such as quantities of dead wood, broad-leaved trees and old forests in FSC- and PEFC- certified Swedish forests. Others (Dias *et al.*, 2013) estimated biodiversity values (viz. richness and irreplaceability) for vertebrate species in FSC-certified and non-certified areas in Portugal and, at a larger scale, Elbakidze *et al.* (2011) compared biodiversity conservation in Sweden and Russia by evaluating the structural habitat connectivity in FSC-certified areas. Overall, such studies have focused their attention on either specific environmental issues (in this case, biodiversity) or at limited spatial scales.

Finally, some authors emphasize the need for appropriate measures to assess the environmental impacts of certification, particularly when evaluating biodiversity issues. To illustrate this point, some researchers (Mekembom, 2010; Rodríguez and Cubas, 2010; De Jongh and Persoon, 2010) suggest that it is useful to complement professional monitoring (which is expensive and clearly not sufficient) of biodiversity impacts with those performed by – properly trained – local and Indigenous communities. Other authors such as Schulze *et al.* (2010) and Price (2010) recommend drawing up better guidelines to measure the impact of harvest operations on biodiversity, and evaluating different scenarios (with and without conservation measures given by forest certification), respectively. Notwithstanding the relevance of such measures, we must be aware of time constraints and other practicalities affecting their implementation.

To recap, a range of different approaches and methods have been used to assess the environmental impacts of certification. Most of them have proved useful in obtaining accurate estimations of such impacts. However, many fail in obtaining a comprehensive view of the phenomenon, because they adopt a narrow approach to measuring environmental impacts. Hence, a more comprehensive approach should consider a mix of different techniques complemented with an appropriate research design.

2.5.2 Assessing the social impacts of certification

The social impacts of certification have usually been studied in conjunction with environmental and economic impacts, in each of developed (Masters *et al.*, 2010; Newsom *et al.*, 2006; Gomez-Zamalloa *et al.*, 2011; Moore *et al.*, 2012), developing countries (Alves *et al.*, 2011; Cubbage *et al.*, 2010; De Lima *et al.*, 2008) and countries in transition (Hain and Ahas, 2007). Generally, such studies employ a mix of quantitative and qualitative approaches, as well as different data-collection techniques (as described above, in the study of environmental impacts).

A number of studies have specifically focused on identifying perceptions of the social impacts of certification in local and Indigenous communities, employing a number of methodologies (particularly qualitative). For example, in developed countries, these studies have focused their attention on aboriginal expectations about certification, through the use of quantitative models to analyse the data from surveys (Kant and Brubacher, 2008), as well as extensive literature reviews (Tikina *et al.*, 2010) to better understand the effect of certification on their livelihoods. In the case of local communities, Dare *et al.* (2011) studied the behavioural changes caused by certification, and Crow and Danks (2010) studied the perceptions of the changes required by the FSC to certify community forestry enterprises. The two last-mentioned studies employed qualitative methods to collect and analyse data, using semi-structured interviews and snowballing techniques so as to obtain a high participation rate and diversity of experiences.

Studies conducted in developing countries have also employed a mix of approaches. In Indigenous communities, De Pourcq *et al.* (2009) performed numerous fieldwork interviews choosing Bolivia as a case-study, whereas Humphries and Kainer (2006) focused their attention on the local communities of Brazil, through the use of structured interviews with key stakeholders other than forest owners, and document review. Zainalabidin *et al.* (2013) conducted surveys with the staff of four Malaysian forestry companies using a Likert Scale to assess the social impacts caused by the FSC.

Although many studies about the social impact of certification are qualitative and, therefore, provide rich descriptions such impacts, few of these studies have a research design adequate to make a comparison of different forestry operations with and without certification. So far, this kind of research approach has been mostly followed in environmental studies. In sections 2.5.5 and 2.5.6, I will discuss why it is important to carry out studies this way.

2.5.3 Assessing the economic impacts and other effects of certification

Many authors have conducted studies about the economic impacts of forest certification, specifically in the financial performance of forestry enterprises. Bouslah *et al.* (2010), for example, analysed and reviewed documents on a sample of certified firms in Canada and the US to study the short and long term financial effects of certification. Other authors have paid more attention to certification costs (Hartsfield and Ostermeier, 2003; Golovina, 2009; Busby *et al.*, 2007), impacts on markets of certified forest products (Schwarzbauer and Rametsteiner, 2001), the relationship between certification and wood supply (Eriksson *et al.*, 2007; Gan, 2005), and the economic benefits (Gomez-Zamalloa *et al.*, 2011; Hain and Ahas, 2007; Klooster, 2006) of certification. Researchers have employed a mix of tools to collect and analyse data: document reviews and statistics as inputs for econometric models, and surveys and semi-structured interviews to be quantitatively and qualitatively analysed, respectively.

Notably, a significant body of research focuses on the attitudes of forest owners and other stakeholders towards certification. Although these studies are not directly linked with the economic effects of certification, they are very relevant because the social acceptance of a regime is usually associated with its success and survival in the long term (Young, 1994). Some examples are the exploratory assessments of consumers (Archer *et al.*, 2005; Ozanne *et al.*, 2000; Toppinen *et al.*, 2013) and wood product manufacturers' (Chen *et al.*, 2011a) interest for certified products, through surveys and interviews, respectively. Other examples include the research on attitudes of family forest owners towards certification (Kilgore *et al.*, 2007; Leahy *et al.*, 2008; Lidestav and Lejon, 2011) employing surveys, focus groups and public databases, and; at a larger scale, surveys in three developed countries to explore the influence of export orientation in the certification decision of firms (Moeltner and van Kooten, 2003).

Other effects of certification include those influencing forest governance. Hence, many authors have carried out comprehensive literature reviews to explore the broader and unintended consequences of certification. For instance, reviews have looked at the impacts of the creation of competing certification schemes (see for example Cashore *et al.*, 2004; Auld *et al.*, 2008b; Cashore *et al.*, 2006), as well as a number of standards in a number of other sectors.⁷ Furthermore, the interaction between forest certification schemes (particularly, as a form of NSMD governance) and national governments has received much attention in the literature (Pattberg, 2007; Cashore *et al.*, 2004). Lister (2011) looked deeply into this area analysing

⁷ The Marine Stewardship Council (MSC) is the quintessential example in the fisheries sector, which is often termed as "the spill-over effect". See Auld *et al.* (2008b).

qualitative and quantitative data from three different case-study countries to explain forest co-regulatory strategies.

As seen above, a considerable number of studies, drawing on different research methods, have been conducted to investigate the economic impact of certification. While many of such studies provide accurate estimates of the economic performance of certified forestry firms, many of them lack comprehensiveness in their approaches. Most of them do not compare the economic performance of firms with and without certification, or according to different forest types (native/plantation forest) and business scales (small-medium/large operations).

2.5.4 Conceptual framework: effectiveness of forest certification

Before discussing approaches to assessing the impacts of certification, it is helpful to consider certification as an element of the international forest *regime*.

Krasner (1982) gives perhaps one of the most classic definitions of regimes, arguing that “regimes can be defined as sets of implicit or explicit principles, norms, rules and decision-making procedures around which actors’ expectations converge in a given area of international relations”. Later, other scholars complemented that definition adding that regimes can influence the behaviour of states through informal or formalized principles (Levy *et al.*, 1995). Regimes can also be considered examples of multilateral agreements and cooperative behaviour (Haggard and Simmons, 1987). Amid those definitions, Lidskog and Sundqvist (2002) point out that regimes are ways created/formed to politically manage problems that exceed the capacities of national states. For others, Bohman (1999), regimes are even more democratic and effective forms of global governance as they allow the participation of a myriad of different actors, and are open to the worldwide public scrutiny and international publicity in case they fail.

In the specific case of forests, forest certification can now be more considered as a part of the international forest regime complex (IFRC), in the sense discussed by Rayner *et al.* (2010) and Giessen (2013). They describe how the IFRC is characterised by institutional fragmentation (at multiple dimensions; e.g. local/international, private/public, and specific policy areas/universal concerns), and by hollowness (weak institutionalization), ineffectiveness (in achieving certain policy goals), and policy failure (see Giessen, 2013). Issues of impacts and effectiveness are central to analyses of the IFRC, and of its constituent parts.

As I will argue, the study of impacts is insufficient in and of itself without consideration of the central concept of *effectiveness* in relation to certification. Examining effectiveness is a central aim of this research and entails a broader definition, as addressed below.

The concept of *effectiveness* in forest certification is central to this PhD research since it entails a broader definition of what needs to be assessed, instead of focusing on narrow measures of certification impacts. Central concerns in this regard are *reliability* (consistency in the measurement of a construct) and *validity* (truthfulness of the measurement in a social reality) that are not necessarily included by the mere evaluation of impacts. The concept of effectiveness, therefore, helps us to understand why some regimes work well and why others largely fail in meeting their goals, regardless of the nature of their impacts. For Young (1999): a regime is effective when is capable to eliminate or substantially ameliorate the problems that led to its creation. Another key point is that added by Helm and Sprinz (2000); for them, the assessment of *regime effectiveness* involves an analysis that is also performed in the traditional realm of public policy evaluation (implying in this way a more comprehensive approach than only evaluating impacts).

Young's definition is strongly focused on the problem solving approach dimension of effectiveness (namely, the capacity of solving the problem that encouraged the creation of the regime), although he also recognises a number of other dimensions (Young, 1994; Young, 1999). Similarly, other authors have highlighted the importance of this approach (Levy *et al.*, 1995; Ward, 2006) as a way to measure effectiveness.

In addition to the problem solving approach, the expected outcomes of a regime can be also measured in terms of goal attainment. Bernauer (1995) explains this dimension of effectiveness as the difference over time or across cases between the outcomes of a regime and certain endpoints determined by the regime's goals. This approach links the theoretical concept of "*collective optimum*" raised by Helm and Sprinz (2000) which is the 'hypothetical state of affairs that would come about with a perfect regime'. However, there are no perfect regimes and we must measure the *regime effect* (that is, the improvements in the dependant variable, e.g. the environmental performance) through contrasting a situation in the absence of such a regime and its real performance, along a continuum (where the goal is the collective optimum). These last conceptualizations are particularly relevant, because they put forward the counterfactual reasoning (absence of a regime) which is of paramount importance in the development of this thesis, as we will see in the following subsections.

In short, the literature provides a number of approaches for defining and measuring the effectiveness of forest certification. Problem solving and goal attainment approaches are the most relevant for this study; however, a comprehensive evaluation should include other complementary – and necessary – measures of effectiveness, as I will discuss later in this section.

2.5.5 Methodological hurdles and possible solutions

In this section, I will discuss the main research design challenges. Many studies about the impacts of forest certification have been conducted looking only at certified operations – particularly at the Forest Management Unit (FMU) level. Such studies employ a number of different methodologies and data-collection techniques. However, they have two important limitations: first, it is not possible to know if any impacts observed have come about because of certification or other factors as we do not have a “control group” of similar non-certified forest operations. Second, some of such studies are conducted in different and hardly comparable spatial and temporal contexts.⁸ Table 2.2, adapted from Romero *et al.* (2013) summarises some of the possible solutions to overcome the most common methodological hurdles of studies addressing certification impacts. I will discuss each of those methods below.

⁸ For example, when analysing CARs across a range of different forest operations worldwide, some authors “put in the same bag” developed and developing countries. Also, as previously noted, CARs analysis mostly works for the FSC. Furthermore, collecting field data require significant expenses when conducted in large spatial contexts, and it is hard to tell if field differences concerning environmental impacts are due to different management.

METHOD	DESCRIPTION	LIMITATIONS
Experimental	Randomly selected FMUs are allocated to the forest certification intervention.	Selection bias is likely because certification is voluntary. A comparison based on the experimental approach is not feasible.
Quasi-experimental	Because the certification treatment was not randomly allocated, a comparison group of uncertified FMUs needs to be constructed (counterfactual). The treatment and control groups should only differ in their certification status.	Comparison group construction is data-intensive and technically difficult. Approaches include matching techniques (e.g., groups of certified and non-certified FMUs matched by factors that influence certification outcomes) and instrumental variables (e.g., correlated and easier-to-assess variables are used to infer impacts), among others.
Before–after	Baseline data on key outcomes related to the certification intervention are measured and compared with data corresponding to the post-certification condition.	Data are often not available for all the variables before certification was granted for both treatment (i.e., certified) and control groups.
Systematic review	Intensive analyses of certified FMUs, drawing on the history of the FMU and how the particular nature of the mechanisms and contextual factors produced change.	Time-consuming and knowledge-demanding: requires robust results of properly designed studies and thus fails to determine the integrated impacts of forest management certification unless available literature exists.
Expert judgment	Assess the impacts of certification through compilation and synthesis of statements of people with profound knowledge of certification and the contexts in which forest management occurs.	Because forest management certification is complex, this approach can be informative but may fail to capture the integrated effect of certification-driven changes and interactions with contextual factors.

Table 2.2 Potential advantages and pitfalls of approaches for understanding the impacts of certification.

Source: adapted from Romero et al. (2013).

Romero *et al.* (2013) describe an *experimental design*, in which we randomly assign a treatment (the independent variable, that is, forest certification) among forest certification operations or FMUs as well as employing a control group that does not receive any forest certification intervention. Therefore, we can control for the aspects of the experimental setting, isolating the effects of the intervention (the dependant variables, that is, certification impacts). In principle, this method seems the most appropriate as we can measure the outcomes of the intervention (and subsequently, the effectiveness of forest certification) with much more accuracy. However, comparisons based on this approach rarely occur in real-life (Ferraro, 2009) because certification interventions are usually not randomly allocated by the researcher (Romero *et al.*, 2013). Moreover, as Blackman and Naranjo (2012) point out, the risk of “positive self-selection” or “selection-bias” of participants⁹ can overestimate the impacts of the

⁹ In practical terms, firms with the highest performance or closest to the requirements of the regime (forest certification) will be the first ones in participating in the intervention. See Cashore and Auld (2012).

intervention, which may be caused by other factors, undermining the internal validity¹⁰ of this approach.

In *Quasi-experimental designs*, the treatments (certification) are not randomly allocated, rather they reflect what occurs in real-world situations¹¹; in other words, participants choose the treatment by themselves (Cook *et al.*, 1979). As in the case of experimental designs, the main limitation of this approach is the positive selection-bias. This limitation can be overcome with the creation of credible *counterfactual*¹² cases, which need to be carefully selected (Greenstone and Gayer, 2009) among very similar comparison groups (here, certified and non-certified organizations) in a number of traits. For this reason, Blackman and Rivera (2010) and Blackman and Naranjo (2012) suggest the use of different statistical techniques to match¹³ organizations. Thus, ‘the impact of certification is defined as the difference between actual outcome and counterfactual outcome’ (Blackman and Rivera, 2010). Some examples of this approach in forest certification are the studies conducted by Foster *et al.* (2008) assessing the FSC impact in post-harvested hardwood stands, De Lima *et al.* (2008) using paired sampling to assess the FSC socio-environmental impacts, Hagan *et al.* (2005) evaluating the effects of the SFI/FSC on biodiversity practices in US landowners, Dias *et al.* (2013) also evaluating the on-the-ground impacts of the FSC on biodiversity through using quantitative indicators (to estimate species richness), and the qualitative research of Kant and Brubacher (2008) about social impacts of the FSC on aboriginal communities in Canada.

The *before-after* approach considers a timeline in which the researcher can study the effect of the treatment in one or many organizations. In this case, the *pre-certification outcomes* are the *counterfactual outcomes*, while the *post-certification outcomes* reflect the impact of the regime intervention. However, the effect of certification may be biased upwards, neglecting the presence of other confounding factors that may affect the outcomes even more significantly (Blackman and Rivera, 2010). Another limitation is that data cannot be available for all variables before the regime intervention (Romero *et al.*, 2013), posing a practical and typical limitation. As an example, Hain and Ahas (2007) employed this design in their research on the effects of FSC in forest sustainable management in Estonia, through combining quantitative and qualitative methods of data collection.

¹⁰ The validity of a measure in social science is related with the precision of the research findings. Two types of validity are recognised: internal validity, which is related with the accuracy of the findings within a particular context and external validity, which accounts for the applicability of such findings to different contexts. See Miles and Huberman (1994).

¹¹ They are also called *natural experiments* so they explore comparisons about what happens across different areas or over time; see Levy *et al.* (1995). In the same way, Young terms this research design as *thought experiments*; see Young (1999).

¹² In other words, what would happen in the absence of the intervention (in this case, forest certification).

¹³ *Propensity score matching* techniques to control the selection bias effect have been used in sectors other than forestry. See the studies of Blackman and Naranjo (2012), and Takahashi and Todo (2013).

Systematic reviews are useful approaches (at least in exploratory studies) that can encourage, for example, the conduct of formal meta-analyses upon a number of particular issues and regions, and mixing different research designs depending of the available literature (Romero *et al.*, 2013). Regarding these and most studies on forest certification impacts, Cashore and Auld (2012) criticise the narrow focus on very specific issues¹⁴ and the consequent difficulty in extrapolation of their results. For instance, although Newsom and Hewitt (2005) focus on a huge variety of environmental, social and economic issues across a world review of certified operations, they may have overestimated the impacts of certification since they lack credible counterfactual cases (resting external validity to this study). Equally important are the limitations when conducting meta-analyses to assess the effectiveness of different schemes, so comparing numerous studies containing a range of different methodologies can be an insurmountable difficulty (Clark and Kozar, 2011). Overall, these studies provide an excellent starting point but they need to be complemented with other methodologies.

Lastly, Romero *et al.* (2013) put forward the *expert judgement* approach as a reliable method for assessing the impacts of certification. This comprises the evaluation of certification impacts by collecting and synthetizing the views of experts in forest management certification to usually reach a consensus among them around particular issues. But, as some (Woudenberg, 1991) have suggested, a high consensus among participants would not be necessarily related with a high accuracy of such a measure. In any case, this research strategy is usually complemented with other research designs (see for example Gomez-Zamalloa *et al.*, 2011; Hain and Ahas, 2007).

Overall, each of the above proposed methodologies have certain strengths that can contribute to a thorough evaluation of the effects of certification. Except for experimental approaches, all of them can be applied to real-world scenarios. Nevertheless, they are limited in considering all the possibilities of such real-world contexts (for example, there are some cases in which we may find both after-research and counterfactual cases). That is the reason why the need to be complemented with different research designs.

2.5.6 Research framework of this thesis

This thesis employs an integrated research framework: I draw on two different, but complementary approaches. First, I make use of Young (1994)'s approach that was modified by Tikina and Innes (2008) for forest certification. I complement this approach with the research

¹⁴ Although Gullison's (2003) scope is worldwide, he focuses exclusively on impacts on biodiversity; see Gullison (2003).

design proposed by Blackman and Rivera (2010) and Blackman and Naranjo (2012). I will discuss each of those approaches in the next paragraphs.

Tikina and Innes 's (2008) approach identifies up to six measures of effectiveness in forest certification: problem solving effectiveness, goal attainment, behavioural effectiveness, process effectiveness, constitutive effectiveness and evaluative effectiveness (see table 2.3).

Effectiveness	Young's definition	Measure of effectiveness in forest certification
Problem Solving	Problem that prompted the establishment of a governance system solved.	Negative impact from forestry is eliminated or minimized; biodiversity is preserved; deforestation is stopped.
Goal attainment	Achievement of certain specific goals.	Standard specific-goals (stated as principles, objectives or criteria) are achieved; non-stated or less often stated stakeholder goals (e.g. market share gained or retained, public pressure avoided, and influence over decision-making gained) are achieved.
Behavioural effectiveness	Differences in behaviour brought by a governance system.	Positive changes in forest practices, positive changes in consumer (end-user) behaviours, positive changes in customer (retailer and industrial user) behaviours.
Process effectiveness	Adoption of a particular system in an institution, region or country.	Commitment to certification by governance institutions (government and industry associations); adoption of certification by forest managing entities.
Constitutive effectiveness	Acceptance of a regime by social groups and their expenditures related to the operation of the system.	Licencees' or landholders' awareness of land-use issues, public awareness of certification and its influence over forest practices, tightening of requirements of similar instruments.
Evaluative effectiveness	Assessment of efficiency, equitability, sustainability and robustness of regime.	Is forest certification the best system to minimize the potential negative impacts of forestry on ecosystems and communities? How do its effects compare with hard law or other governance mechanisms?

Table 2.3 Aspects of regime effectiveness as applied to forest certification.

Source: adapted from Tikina and Innes (2008).

Young (1994)'s original approach is particularly interested in understanding why some environmental regimes work well and why others become largely ineffective. It does so by measuring how those regimes "score" on each of the measures of effectiveness described above.

The last measure of forest certification effectiveness (evaluative) is excluded from the scope of this work for a number of reasons that relate to practicality within the context of a PhD thesis. First, evaluative effectiveness addresses concerns that markedly differ from the other measures of effectiveness described above (Young, 1994). Addressing evaluative effectiveness might lead, for example, to an assessment of a number of variables involving the performance¹⁵ of the particular certification schemes to reach a better understanding about whether it is operating in a cost-effective manner. This would imply extensive and detailed evaluations of other variables (e.g. economic and social costs), going beyond the scope of this research. Second, evaluative effectiveness may also imply that there have been extensive evaluations of forest certification against existing legal requirements (soft-law versus hard-law comparisons) (Tikina and Innes, 2008) thereby widening the scope of this research to include other policy instruments. Hence, assessing the evaluative effectiveness of certification would be a study in itself.

One of the most important advantages of Young and Tikina and Innes's approach is its comprehensiveness. It entails a number of different dimensions to measure the effectiveness of a regime as a whole. In this regard, most studies on forest certification impacts are narrowly focused on one or two particular dimensions, or they address more than one dimension without acknowledging "the big picture". In contrast, this research makes explicit references to each dimension of effectiveness and its interactions with others. Importantly, this approach also includes some elements of the theory of change to assess forest certification as proposed by Romero *et al.* (2013), because it acknowledges short and medium-term outcomes (goal attainment dimension) towards final impacts of certification (problem solving dimension). For example, in environmental terms, it evaluates how the protection of certain environmental components (e.g. biodiversity and natural areas) may lead to a better environmental quality.

This study evaluates the capacity of forest certification to achieve concrete changes in the behaviour of plantation and native forestry businesses by investigating *what, why* and *how* those changes have impacted upon a range of stakeholders environmentally, socially and economically. In other words, it focuses on *how* different forest certification schemes impact on forestry organizations and other stakeholders and *the extent of change* in the relations among them.

¹⁵ For example, if we would evaluate the *efficiency* of forest certification we would need to know if the regime is operating in a cost-effective manner, collecting quantitative data about costs and contrasting this information with the outcomes of the regime. On the other hand, if we need to know about the *equitability* of certification we would need to assess if the outcomes of the regime are being delivered to a whole range of stakeholders rather than focusing on a narrow group (e.g. big forestry business at the detriment of small forest owners), by collecting qualitative and/or quantitative data.

Similarly, we need to know *how* and *why* those changes impacted on certified companies, and to address, as far as practicable, what would have happened if forest certification had not been implemented at all in those forestry businesses. As De Vaus (2001):27 points out “we need to be confident that the research design can sustain the causal conclusions that we claim for it” so as to reasonably eliminate alternative explanations and obtain unambiguous conclusions, that is, maximizing the *internal validity* of the study. Thus, constructing a reasonably credible *counterfactual* analysis between case studies should allow us to explain whether the changes are truly due to certification itself or other causes. We can achieve that goal by drawing on the counterfactual approach proposed by Blackman and Rivera (2010) and Blackman and Naranjo (2012). That is, by comparing very similar certified and non-certified forestry businesses, in terms of a number of criteria to construct a set of matched pairs so as to avoid the risk of selection-bias.

This research is inspired by the counterfactual approach rather than a literal implementation of it. Hence, due to the qualitative nature of this research and the real-world challenges to conduct a counterfactual analysis (see sub-section 2.6.3.1), I do not use statistical tools to construct matched pairs (e.g. propensity score matching), or more sophisticated counterfactual cases. Instead, I employ a less onerous and non-random approach to construct them, through forming four groups of forestry businesses (two certified and two non-certified), in which their environmental, social and economic performance are assessed against five measures of effectiveness, according to the framework proposed by Tikina and Innes (2008) (see Figure 2.1). I will discuss sampling criteria in detail in section 2.6.3 in this chapter.

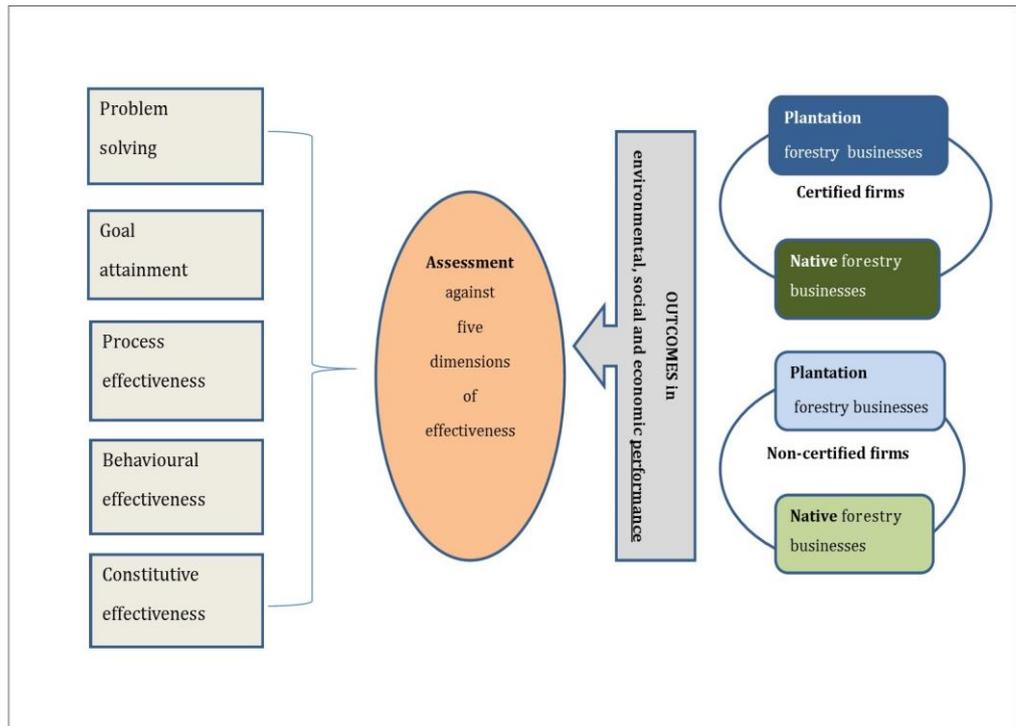


Figure 2.1 Scheme of the research framework used to assess the effectiveness of forest certification in this thesis.

Finally, I also drew on Moore *et al.*'s (2012) framework to understand the drivers of forest certification. They categorize those drivers into four broad categories: strategic position/corporate social responsibility (CSR); signalling stewardship commitment towards external groups (social licence to operate); improved market access/prices; and better internal/field management practices. This framework is useful since allows the researcher to group numerous “small individual reasons” to seek certification under those broad categories.

2.6 Research methods

The research methods employed in this research makes use of Layder's adaptive theory, the case-study approach and mainly, qualitative methods to collect data.

2.6.1 Layder's adaptive theory

Adaptive theory,¹⁶ as proposed by Layder (1998) suggests that theory and research are mutually interdependent processes that mould each other: the research data collected in the fieldwork can modify and adapt the pre-existing body of theory. Layder notes that we do not collect data with our minds free of theoretical assumptions, they rather guide – not dictate – our research process. Layder's approach is applied across this research through four distinctive strategies (see in Layder, 1998:132). They comprise: (1) the elaboration of theory through an iterative process between data and theory, (2) the influence on the whole research process (from data collection to theory generation), (3) the reconciliation between subjective and objective aspects of the social reality and (4) the explanation of such a reality in terms of their behavioural and systemic aspects. Adaptive theory has quite an eclectic and non-reductionist stance because it integrates a range of approaches to theorizing throughout the research process. It is able to draw upon the apparently antagonistic approaches employed by middle-range (focused on “forcing” the data to fit in pre-determined theory, to confirm or disconfirm such theoretical ideas) and grounded theory (which assumes that the theory must necessarily emerge from the data) (see Layder, 1998:15). In other words, adaptive theory seeks an eclectic stance through drawing on the advantages of disparate research strategies within the same fold (Layder, 1998:147).

Lastly, adaptive theory makes use of a “multi-strategy approach” (Layder, 1998:68) since it facilitates the process of theory generation, employing multiple data sources both qualitative (e.g. in-depth interviews,) and quantitative (e.g. statistics, survey data and so on) as well as collection techniques. For Olsen (2004) and Neuman (2011):164 this process is called “triangulation in social research” so it involves the mixing of data or methodologies, in which the aim is encouraging diverse standpoints to reach a better understanding about a topic.

2.6.2 Orienting concepts

This research is guided by what Layder (1998):101 refers to as “orienting concepts”. These orienting concepts are tools that inform and mould the analysis of data suggesting explanations of the empirical evidence through providing specific descriptions and “lines of

¹⁶ This theory can be widely applied in different fields: See for example Bessant and Francis (2005).

empirical enquiry” (Layder, 1998:111). Thus, orienting concepts steer and suggest (never impose) what might be the most relevant areas, topics or people that should be investigated.

Where do we get such orienting concepts from? The process of selecting orienting concepts entails the following strategies (Layder, 1998:104): (1) borrowing concepts from adjacent areas, such as existing bodies of theory and particular substantive or empirical areas of certain disciplines; (2) searching non-theoretical and non-technical literature sources, which of course are unlikely to be formally defined (e.g. from non-academic books, magazines, public documents, videos, movies and so on); and (3) intuition, perception and sensitivity (viz. depending on the researcher’s judgement). Equally important for Layder is the theoretical significance of these latter sources of orienting concepts, and its thorough examination in a planned and systematic manner.

Overall, the orienting concepts of this research have been extracted from several and diverse bodies of literature, the details of which are reported in Appendices 1 and 2: wildlife and conservation biology, political science, government studies, political ecology, environmental economics, environmental sociology, environmental policy, forest management and policy as well as international relations and international environmental law. Thus, I classified the relevant orienting concepts into two groups: NSMD governance theory and impacts of forest certification (FC). The summary of orienting concepts is presented in Table 2.4 below.

ORIENTING CONCEPTS	
NSMD Governance	<ul style="list-style-type: none"> • Some (little) influence of states on NSMD governance, mutual interaction between the two forms of governance. • Institutionalized governance mechanism. • Reliance on prescriptive rules. • Markets grant legitimacy to NSMD governance. • NSMD governance is enforced by third independent parties. • Growing convergence among different forest certification schemes. • FSC focuses on natural stand management and biodiversity protection, whereas other schemes focus on system elements. • Similar stringency in Nordic FSC and PEFC-endorsed standards. • Most certification schemes mimic government policies (developed countries). • Early certification adopters would be the best performers.
Impacts of forest certification (FC)	<p><u>Environmental impacts:</u></p> <ul style="list-style-type: none"> • FC does not avoid deforestation and its large-scale impact is limited. • FC changes forest management practices, making them more sustainable. • FC enhances biodiversity, encourages HCVPs protection and the conservation status of endangered, rare and threatened species. • FC encourages a long term sustainable planning in forestry operations. • FC does not completely eliminate clear-cuts (transitioning countries). • FC encourages the use of reduced impact logging (RIL) techniques. • FC would not go beyond legal compliance. • FC helps to expand the width of riparian buffer areas and improve their management. • FC makes companies to improve the management of chemical products and waste. • FC reduces pollution and the impact of forest operations on natural resources.
	<p><u>Social impacts:</u></p> <ul style="list-style-type: none"> • FC improves workers' conditions and OHS issues: staff training, living conditions, benefits, fair wages, and appropriate use of PPEs. The major improvements are in developing countries. • FC improves social and environmental awareness of forestry staff. • FC encourages the hiring of local labour. • FC positively impacts on communities: participatory approach and empowerment of local communities and other interested parties. • FC lowers social conflicts: it increases social dialogue and it is a conflict resolution mechanism. • FC formalizes the relations among various actors. • FC benefits Indigenous groups: it is a mechanism to settle land tenure disputes and/or other social benefits. • FC does not represent a benefit for Indigenous groups.
	<p><u>Economic and system effects:</u></p> <ul style="list-style-type: none"> • Small landowners face high direct costs and low indirect costs • Often small landowners are discouraged to certify because of technicalities and high costs. • Small landowners often already meet sustainable forestry practices. • Final consumers have a low impact on forest certification. • Mixed evidence concerning premium prices; mostly, they would not be sustainable in the long term. • FC allows market access and improves forestry sector's reputation. • High costs of certification in developing countries. • Positive attitudes towards FC in developed countries. • FC lowers wood supply and it does not improve firms' financial performance in the long term. • FC grants firms a social licence to operate, it encourages better transparency and improves firms' public image. • FC changes the power balance among forestry businesses and their stakeholders.

Table 2.4 Orienting concepts employed in this thesis.

Source: literature review (see Appendixes 1 and 2).

2.6.3 The case-study approach and Chile as a case-study

I employ a qualitative case study approach when investigating *how* and *why* the phenomenon of forest certification affects the environmental, social and economic performance of forestry businesses. In this regard, many authors have provided useful definitions of this approach, one of the most relevant being that of Gerring (2004) who points out that “a case study is an intensive study of a single unit for the purpose of understanding a larger class of (similar) units”. The intensive study of single units is one of the main aspirations of this PhD research so it aims to provide detailed insights derived from the existence of a certain phenomenon (certification) in forestry businesses. Frequently, case studies employ more than one unit to obtain an in-depth knowledge about a particular phenomenon and its context (Baxter, 2010; Gerring, 2004; Gerring and McDermott, 2007). My purpose, then, makes use – through an intensive research process – of a limited number of cases (certified and non-certified enterprises) so as to extract detailed descriptions and rich insights of the phenomenon in which I am interested.

The aim of using case studies is different to that when using quantitative research. Following Baxter’s (2010:93) recommendations, the emphasis of this research is not focused on the number of cases but on gaining a rich understanding of a certain phenomenon (certification) in different contexts. VanWynsberghe and Khan (2008) expand this teleological description. For them, case studies are not methods, methodology or research designs; rather they are approaches to carefully delineate phenomena for which all kind of evidence can be collected. Therefore, the context and boundaries of the phenomenon are very relevant here. In this regard Miles and Huberman (1994):25 clearly define “a *case* as a phenomenon of some sort occurring in a bounded context”, being the case even “defined as an *event*” and, at the same time, *the unit of analysis*. By the same token, we can understand this research as the study of a limited number of cases where forest certification was introduced within particular temporal and spatial boundaries (setting the context).

Another great advantage of case studies, as Baxter and Jack (2008) point out, is that they allow the use of a wide variety of data sources (qualitative and quantitative) to deepen the understanding of a phenomenon. For them, the use of multiple data sources is important because it improves the credibility of the research. Each data source is treated as a “piece of the puzzle”, making possible to understand the whole phenomenon.

The selection of Chile as a case study is not random but responds to a number considerations: first, most studies about the impacts of forest certification have been conducted in developed countries. Thus, central to this thesis is knowing how and the extent to which

forest certification is making a difference in such countries, with a much broader focus than simply social or environmental criteria. This study also aims to increase our current knowledge of certification in different contexts, so it looks at both forestry business sub-sectors in Chile: those based on native and plantation forests.

Second, Chile provides an interesting example because the country has a large native forest area (13.4 million hectares) and a plantation forest industry (covering 2.4 million hectares) (INFOR, 2015c) that is economically successful (Arnold, 2003). Of those two types, plantation forests are highly productive and the most relevant in economic terms, representing the third largest export sector in Chile (Banco-Central, 2015). Although of small relative scale in the world context (0.41% of the world and 1.87% of the Latin American and the Caribbean forests) (Raga, 2009), forest certification in Chile has gained significant momentum in the country: more than 2.3 million hectares are certified under the FSC (FSC-International, 2015a) and some 1.9 million hectares are certified under the PEFC standard (the CERTFOR scheme) (CertforChile, 2015a).

Third, the context in which forest certification arose in Chile, that is to address a number of sustainability issues, is quite remarkable. The most obvious environmental issue is the significant degradation of native forests by unsustainable logging (Donoso and Otero, 2005; Neira *et al.*, 2002). However, the distinctiveness of the Chilean case is the application of a globally competitive plantation forest model, established by the 1974 Forest Development Law (Miller Klubock, 2004). For Neira *et al.* (2002), this process provided generous subsidies to private actors to consolidate an economically efficient exporting model. Unfortunately, this process also implied the replacement of extensive areas of native forests for exotic pine and eucalypt plantations (Clapp, 2001; Echeverría *et al.*, 2006; Neira *et al.*, 2002). It also exacerbated long-standing land tenure conflicts with Indigenous communities in the southern Chile, forcing a significant number of them to migrate to poor urban areas (Gerber, 2011).

Studying the impacts of forest certification in Chile may help us to know whether this instrument is able to solve serious and ongoing environmental and social issues in developing countries. This is important, because firstly, this may allow us to improve our understanding about the underlying reasons of *why* the adoption of certification in developing countries is still behind of that in more developed countries and, secondly; it may help us to better understand the applicability that this policy instrument has in different contexts.

2.6.3.1 Selection of sites

The selection of sites for this study aimed to satisfy the necessary criteria to form *similar groups* of organizations, that is, construct credible “counterfactual-like” cases (between certified and non-certified firms). Hence, six Chilean regions (see Figure 1.3 in Chapter 1) were selected: VII (Maule), VIII (Biobío), IX (Araucanía), X (Los Lagos), XII (Magallanes), and XIV (Los Rios), based on the following criteria:

Level of forestry activity: the level of forestry activity considered the geographical areas (regions) where native and plantation forestry is mostly concentrated and economically relevant. This predominantly happens in the southern and south-central¹⁷ regions of the country, concentrating the greatest mass of temperate native forests in the southern hemisphere here, as well as those intensively-managed pine and eucalypt plantations (CONAF, 2013). However, the VI (O’Higgins) and IX (Aysén) regions were not selected because their level of forestry activity was insufficient to form groups of certified and non-certified organizations similar to those found in other regions.

Variety of forest types: this criterion entails the – ideal – presence in the same region (or at the very least, belonging to the same vegetative and climatic zone) of the two main forest types: native and plantation forests. In Chile, native temperate forests are mainly found in its southern territories: IX, X and XI regions, while plantation forests are mostly concentrated within the VIII region but range between the VI and IX regions (Neira *et al.*, 2002; INFOR, 2015c). Plantation forests are made up of monocultures of hardwood (mostly, *Eucalyptus globulus* and *Eucalyptus nittens*) or softwood (mostly, *Pinus radiata*) species, covering 93% of the total planted area (INFOR, 2015c). Native forests are classified in the Chilean legislation in twelve recognised types, each comprising a mix of different species. From those, at least six types were present in the researched regions.

Characteristics of forest operations: the selection of sites considered the construction of matched pairs of organizations with very similar characteristics and level of organizational and technological sophistication. Thus, I aimed to match these in very similar groups in terms of:

- (a) Scale: large, medium and small forestry businesses (in number of hectares).
- (b) Market orientation: domestic, export, or both.

¹⁷ Taking Santiago de Chile (the nation’s capital) as a reference point, all regions below Santiago’s latitude are classified as “southern” and “south-central”. This includes the VI (O’Higgins), VII (Maule), VIII (Biobío), IX (Araucanía), X (Los Lagos), XI (Aysén), XII (Magallanes) and XIV (Los Rios) regions.

(c) Business structure: individual, corporate or cooperative.

(d) Professionalization of the business: high or low degree, including factors such as staff qualification, machinery used and counselling by technical experts.

It is important to note two facts here: the first is that practically all commercial production in Chile originates from private forests (INFOR, 2015a); and second, that the Chilean plantation forestry sector is highly concentrated in very few companies due to government reforms in the 1970s (Frêne and Núñez, 2010). This contrasts with the situation of native forests' landowners, who are – in general – much smaller, less vertically integrated and unable to generate a similar level of economic benefits.

Presence of ongoing environmental issues and social conflicts: it is central to this research to know the capacity of forest certification in addressing environmental and social issues in the regions being sampled. Environmentally, most Chilean native and temperate forests have suffered ecological degradation due to different causes and in varying degrees. In the late 19th century, German colonizers extensively cleared native forests in southern Chile by burning so that the land could be used for agriculture (Armesto *et al.*, 1994). More recently, the Decree Law 701 (1974 Forest Development Law) also had the unfortunate indirect effect of using as much forestlands as possible, replacing significant areas of native forests (Reyes and Nelson, 2014). All these cycles of degradation and destruction of native forests have occurred across most of the central-south and southern regions of the country.

Socially, I selected the VIII and IX regions as study sites not only because they are where most plantation forests in the country are concentrated, but also because they are regions where ongoing and violent Indigenous conflicts over land tenure still persist, directed against large forestry enterprises. Overall, large forestry corporations have faced strong opposition from local Indigenous communities and also from the forestry workers of their contractor companies, who claim they should receive the same benefits and wages as those received by workers directly hired by the companies (Reyes and Nelson, 2014).

Credible construction of “counterfactual-like” cases: based on the criteria above, the aim of this study was to construct approximate matched groups rather than “identical” sets of pairs. To illustrate this point, in the VII and VIII regions, it was not possible to find non-certified large plantation forestry corporations as all are FSC and/or CERTFOR certified. Instead, I compared those companies with medium-sized forestry enterprises who had very similar species being cultivated, market orientation, professionalization of their businesses and geographical scope. In addition to those *external* comparisons, it is noteworthy that some of

those large forestry businesses had dual certification and that they initiated their FSC certification process quite a long time after being CERTFOR certified. This phenomenon allowed me to employ the *before-after* approach (Romero *et al.*, 2013) so as to obtain fruitful insights about this *internal* comparison in such large enterprises. In those cases, both in-depth interviews and CAR analysis across different periods of time were useful methods to obtain data from those organizations. The final set of matched groups obtained in this research, as well as detailed descriptions of the study sites (regions) and their sampled organizations, are shown in the Appendixes 3 and 4, respectively.

Practical considerations: practical considerations were important for selecting regions as study sites. A major consideration was not the access to the central-south and southern regions of the country, but the feasibility of obtaining sufficient sub-cases of organizations to appropriately construct comparable groups. Otherwise, the time and resources invested in carrying out effective fieldwork on those study sites could not be justified.

2.6.3.2 Selection of organizations: sampling considerations

The purpose of sampling a number of organizations was to create a sufficient number of *units* or *sub-cases* with certain features, so that we can understand a phenomenon occurring in a broader population. In this way, I sought samples of certified organizations to be compared with a set of two (or at least one) very similar non-certified organizations, creating reasonably *similar* cases. But, it was also necessary to be aware of certain caveats – besides site selection considerations – when choosing such sub-cases constituted by certified and non-certified organizations.

Why not sample randomly or choose “representative cases”? One objection to this approach is given by Seawright and Gerring (2008) and Flyvbjerg (2006), who point out that in qualitative research whenever we take small samples we fail to yield proper generalizations so these samples are unrepresentative and biased. Instead, Seawright and Gerring (2008) highlight the relevance here of *purposive sampling*: if this sampling is appropriately done it can make a substantial contribution to the inferential process. This is what usually happens in real life scenarios, as Bradshaw and Stratford (2010):72 illustrate: “sometimes we find a case, and sometimes a case find us. In both instances, selection combines purpose and serendipity”.

The sampling strategy of this research makes use of purposive sampling to obtain as diverse as possible samples so as to ensure all the aspects of a given phenomenon are considered. As Ritchie *et al.* (2003a):78 recommends, I chose certain sample units since they

had particular characteristics that deserved to be explored deeply so as to gain a better understanding of the central phenomenon that has guided my research.

This sampling approach was performed following different *cross-case* methods to construct different sets of sub-cases. Specifically, I employed the *diverse cases* and *most similar/most different cases* as methods to select cases as proposed by Seawright and Gerring (2008). *Diverse cases* seek to achieve a maximum variance along different dimensions (or variables) selecting a minimum of two cases so as to represent the full range of values that characterize a broader population. In *most similar/most different cases* we aim to choose at least a very similar pair of cases in most of their independent variables, with the exception of only one independent variable (namely, certification), in which its absence/presence can explain the differences in the outcomes of such cases. Seawright and Gerring (2008), again, emphasize the need to create *approximate matching* as an attainable approach to form pairs (rather, groups of similar pairs in this research). This is important because an exact matching is impossible in real-world contexts.

Finally, Table 2.5 shows how the companies were paired and the criteria used to match groups; this is discussed in Appendix 4.

Groups of paired organizations and some common characteristics			
Plantation forestry businesses			
Business scale	Certified organizations	Non-certified organizations	Some common characteristics
Small and medium-sized organizations	(1) PFB-VII-j (FSC) (2) PFB-VIII-l (FSC) (3) PFB-VIII-m (Dual) (4) PFB-VIII-n (FSC)	(1) PFB-VII-r (2) PFB-VII-s (3) PFB-VII-t	<ul style="list-style-type: none"> • Eucalypts and pine species. • ≤ 2,000 ha of plantation forests. • International (certified firms) and domestic (non-certified firms) market access. • Most small owners also owned agricultural businesses. • Less than 50 forestry workers.
Business scale	Certified organizations	Non FSC certified organizations	Some common characteristics
Large organizations	(1) PFB-X-o (Dual) (2) PFB-MB-p (Dual) (3) PFB-MB-q (Dual)	(1) PFB-VIII-k (CERTFOR)	<ul style="list-style-type: none"> • Eucalypts and pine species. • > 4,000 ha of plantations (usually over 50,000 – 80,000 ha). • International and domestic market access. • Use of sophisticated machinery. • Specialized and well-resourced forestry businesses (some firms exceeding c. US\$ 4,000,000 of total annual sales). • More than 100 forestry workers.
Native forestry businesses			
Business scale	FSC certified organizations	Non-certified organizations	Some common characteristics
Small and medium-sized organizations	(1) NFB-IX-a (2) NFB-IX-b	(1) NFB-XIV-e (2) NFB-XIV-f (3) NFB-XIV-g (4) NFB-X-h	<ul style="list-style-type: none"> • Most owners had a mix of native tree species (often <i>Nothofagus</i> species). • < 10,000 ha of native forests (usually c. 100 – 200 ha). • Usually small owners were also farmers. • Only domestic market access. • Less than 50 forestry workers (usually less than 10).
“Relatively” large organizations	(1) NFB-XII-c (2) NFB-XII-d	(1) NFB-XII-i	<ul style="list-style-type: none"> • Only <i>Nothofagus pumilio</i> forests • Between 10,000 – 50,000 ha of native forests. • Relatively sophisticated machinery. • International and domestic market access. • Specialized forestry businesses. • More than 50 forestry workers.

Table 2.5 Summary of paired groups of organizations.

2.6.4 Qualitative method, data collection and analysis

In this research, I have applied Tikina and Innes's (2008) framework by using a number of variables to qualitatively assess the effectiveness of certification and by employing different sources of evidence (Table 2.6). Notably, most of these environmental and social qualitative variables are related to sustainable forest management in terms of processes and outcomes that indicate whether or not there has been any improvement in the environmental and social values of forests.

Effectiveness	Research sub-questions	Main examples of qualitative variables*	Sources of evidence
Problem Solving	What problems have been addressed in forestry businesses by forest certification?	<ul style="list-style-type: none"> • Change in environmental issues (e.g. variation in soil and water quality; deforestation reduced or stopped; rehabilitation of ecosystems; biodiversity values enhancement; and, better conservation status of flora and fauna species). • Change in social issues (e.g. existence of better relationship between firms and local/Indigenous communities; tangible benefits for local/Indigenous communities; and, improved working conditions viz. wages, work shifts, occupational health and safety conditions/performance and so on). • Presence/absence of economic benefits from certification (e.g. increased or decreased returns, certification costs and so on). 	<ul style="list-style-type: none"> • In-depth interviews • CARs analysis • Document analysis • Empirical field-base evidence
Goal attainment	What were the stakeholder's main goals in seeking certification?	<ul style="list-style-type: none"> • Drivers of forest certification (e.g. improved market access; strategic position/corporate social responsibility; signalling stewardship commitment towards external groups; better internal/field management practices). 	<ul style="list-style-type: none"> • In-depth interviews
	To what extent have they been achieved?	<ul style="list-style-type: none"> • Degree of compliance with certification goals (drivers). • Possible causes preventing from achieving certification goals (drivers). 	
Behavioural effectiveness	Has forest certification changed the behaviour of companies toward various stakeholders?	<ul style="list-style-type: none"> • Changes in forestry practices on the ground (e.g. use of reduced impact logging techniques, presence/absence of slash-and-burn practices, buffer zone widths and so on). • Behavioural changes of companies in relation to various stakeholders (e.g. new dialogue processes, consultation with local communities, collaborative projects with NGOs and so on). 	<ul style="list-style-type: none"> • In-depth interviews • CARs analysis • Empirical field-base evidence
Process effectiveness	What are the attitudes of key actors in forest governance to the different certification schemes?	<ul style="list-style-type: none"> • Positive and/or negative perceptions and attitudes towards different certification schemes. • Perceptions about the effects of certification. • Impact of certification on legal compliance (viz. only legal compliance or beyond legal compliance). • Patterns of adoption of different certification schemes (number of hectares) by forest type (viz. plantation and natural forests). 	<ul style="list-style-type: none"> • In-depth interviews • Document analysis
Constitutive effectiveness	What is the attitude of the public towards different forest certification schemes?	<ul style="list-style-type: none"> • Perceptions of local/Indigenous communities on tangible benefits from certified businesses. • Perceived participation of local/Indigenous communities in decision-making processes concerning forest operations. • Knowledge/Awareness about certification among the general (Chilean customers) public. 	<ul style="list-style-type: none"> • In-depth interviews

Table 2.6 Application of the effectiveness framework to this research.

*Note: The rationale for selecting these variables is supported by the main orienting concepts guiding this research (see Table 2.5).

Having presented how my research sub-questions relate to the effectiveness framework, and how I have addressed them, I now describe the qualitative methods employed to answer those questions.

2.6.4.1 Asking and developing research questions

Developing “good” research questions implied to be aware of certain considerations that were challenging in the early stages of my research. In this regard, articulating the research sub-questions that flow from the major research question represented the hardest part of this process. Why? In part, because I needed to consider what Monk and Bedford (2010):319 highlight as the need to keep “the big picture in mind” and think about what are the central issues that need to be addressed to have a manageable project. Also, according to Lewis (2003):48, I had to take into account some requirements that my research questions should be:

- Sufficiently clear and free of ambiguity, allowing them to be responded through data collection,
- Focused but not too narrow to make difficult the understanding of a whole phenomenon,
- Relevant and useful, in this case for the development or reshaping of pre-existing theory,
- Feasible in practical terms, considering time and resource constraints, and
- Informed by and connected to the existing body of theory to fill a gap in knowledge.

Lewis (2003) acknowledges the importance of the early ideas that need to be tested out in different ways throughout the research process. Layder (1998):30 is more explicit and incorporates the role of previous assumptions (ideas) and findings (theory): therefore, pre-existing theory and sets of assumptions inform with each other so as to rough out an initial set of questions. Additionally, for Maxwell (2009) the research questions do not need to be so detailed during the initial stages, rather such questions are the result of an inductive and interactive process, which is finalised when the research design issues and goals are completely clarified (which, by the way occurred after my pilot study).

In the early stages of my research, I was tempted to use an excessively narrow approach to develop my research sub-questions (obviously, to answer the major question). More exactly, I based my strategy on an arbitrary “operational approach” to “measure” the degree of compliance with common principles and criteria of the major forest certification schemes. However, this turned out to be insufficient to understand the whole phenomenon (impacts) caused by forest certification and, at the same time, to make clear connections between the theory and practical issues. Hence, the research framework of this thesis provided the best starting point to develop appropriate research questions and also allowed me to address both theoretical and practical concerns.

2.6.4.2 Ethics considerations

The Australian National University (ANU)'s Human Research Ethics Committee approved the primary data collection – through in-depth interviews – of this research (Human Ethics Protocol No 2012/250). The purpose of this committee is to set out the responsibilities of researchers to carry out research in a responsible and ethical manner. In order to do this, the committee establishes guidelines to respect and protect the privacy of research participants and their rights and to minimise any harm on them. These provisions are addressed in detail in Appendix 5.

2.6.4.3 Pilot study

After an initial period of formulation of research questions, literature review, definition of the project scope and I conducted a pilot study in the state of New South Wales (NSW), Australia. This study took place over a couple of weeks (late June 2012), and I conducted semi-structured interviews once I identified all the potential informants and made the arrangements prior to this fieldtrip. The study was focused on just a single certified forestry business as a case study, spanning two places where the operations and activities of the forestry business took place in NSW. Finally, I interviewed eight people from that organization as well as three external stakeholders to obtain a sample as diverse as possible¹⁸.

The main purpose of pilot testing is help us to detect any problems with questionnaires and refine this collection method or interviewing process (Neuman, 2011:351). Also, the pilot study helped to test if the methods required some adjustments and to detect any potential issues for the main study. However, the questionnaire itself turned out to be very open and flexible, giving the possibility to be adapted for different contexts and types of interviewees. As a main outcome, the pilot study reinforced my confidence as interviewer during the research process as well as this stage gave me formal training and experience.

2.6.4.4 Sampling considerations for potential interviewees

The strategy for sampling potential informants was not different to that followed for the selection of organizations: I aimed to capture a richer heterogeneity of experiences among the interviewees I was sampling rather than simply large numbers of participants in my sample. As Bradshaw and Stratford (2010) illustrate, “the richness of information, its validity and meaning, is more dependent on the abilities of the researcher than of size of sample”.

¹⁸ Informants included a regional manager, an EMS manager, an operations manager, a compliance officer and a stewardship forester, all of them from a certified forestry business. Additionally, I interviewed a representative of a forestry association and a couple of NGO representatives.

The natural need in qualitative studies to deepen the understanding of a phenomenon usually collides with the constraints of time and financial resources. Additionally, in qualitative studies we do not have to determine the sample size beforehand and we will have a limited knowledge about the population from which the sample is being taken (Neuman, 2011:267). A number of *non-probability* sampling techniques, then, appeared as appropriate alternatives to answer my research sub-questions (see Table 2.7). Notably, purposive, snowball, sequential, and deviant case techniques were the most relevant.

Type of Sample	Principle	Application to this research
Convenience (Usually associated with opportunistic sample)	Get any cases in any manner that is convenient.	I chose as many relevant informants as possible, tapping into the unforeseen opportunities to interview them, as well as taking advantage of their ease of access – whenever was possible.
Quota	Get a present number of cases in each of several predetermined categories that will reflect the diversity of the population, using haphazard methods.	At least one person was interviewed from each predetermined category of informants (see Table 2.7).
Purposive	Get all possible cases that fit particular criteria, using various methods.	As appropriate databases were not available for unique cases with relevant information, I used this technique in hard-to-access informants (Indigenous groups) by mostly resorting to personal contacts.
Snowball	Get cases using referrals from one or a few cases, then referrals from those cases, and so on.	I began with a limited number of informants (in particular, consultants and researchers); then they led me to other cases by using their network of interrelationships.
Deviant case	Get cases that substantially differ from the dominant pattern (a special type of purposive sample).	For example, union representatives' view was completely divergent from workers suggested by the companies themselves (in some cases).
Sequential	Get cases until there is no additional information or new characteristics (often used with other sampling methods).	I accessed as many cases as possible until reaching a saturation point inside a category.
Theoretical	Get cases that will help reveal features that are theoretically important about a particular setting/topic.	I set different categories of informants to ensure diversity of views as well as to help me to reveal features, from different angles, about a common phenomenon.

Table 2.7 Types of non-probability samples and their application to this research.

Source: modified from Neuman (2011:267).

As shown in Table 2.7, I intended to interview a diverse range of informants inside and outside certified and non-certified forestry businesses, covering different viewpoints, accounts, experiences, and meanings (this is also reflected in Table 2.8 through the diverse types of

informants I finally interviewed). Moreover, the lack of complete databases of people (and organizations) within the forestry sector made non-probability sampling particularly apposite to this research. Therefore, I sought a sufficient number of informants in different contexts (e.g. different forest types and in certified/non-certified firms) until a saturation point was reached. The saturation point aims to guarantee enough diversity in a sample. The numbers sampled in my different groups frequently exceeded the principle described by Francis *et al.* (2010), of reaching the point when three consecutive interviews do not add new material.

Finally, the period of time in which I collected my primary data through interviews took over three months, in three fieldtrips during 2013, of one month each: March-April, August-September and December. A total number of 72 interviews (see Table 2.8) were conducted during 2013 and until early March 2014, due to the fact that some informants could only be reached by phone.

Type of informant	Number of interviewees	Number of firms
FSC-certified plantation forestry businesses: forest owners and industry officers	6	3
CERTFOR-certified plantation forestry businesses: industry officers	3	2
Dual-certified plantation forestry businesses: forest owners and industry officers	6	3
Non-certified plantation forestry businesses: forest owners/industry officers	3	3
FSC-certified native forestry businesses: forest owners and industry officers	5	3
Non-certified native forestry businesses: forest owners and industry officers	5	5
Members of forestry associations	3	n/a
Forestry contractors (certified plantation forests)	2	n/a
Forestry contractors (non-certified plantation forests)	2	n/a
Forestry workers (FSC certified native forests)	1*	n/a
Forestry workers (FSC certified plantation forests)	1**	n/a
Union representatives	4	n/a
Non-Indigenous community members	2	n/a
Indigenous community members	4	n/a
NGO members	7	n/a
Forestry authorities	8	n/a
Labour authorities	2	n/a
Researchers and forest consultants	5	n/a
Executives of forestry standard associations	3	n/a
Total	72	19

Table 2.8 Summary of interviewees by category.

Further details are shown in Appendix 9. Note: * and ** belonged to some of the companies shown above.

2.6.4.5 Interviewing

Interviews were the primary data collection method to answer the questions of this research. For Dunn (2010):102, the main strengths of interviewing are: they can investigate complex issues, through the understanding of people's motivations and behaviours; and they provide insights about divergent opinions or consensus within or across groups.

I employed a semi-structured questionnaire to hold my interviews. Semi-structured interviews employ an interview guide that is organized around flexible questions and prompts, guiding the direction of the interview (Dunn, 2010:110). This more interventionist role of semi-structured interviews was complemented later with a more in-depth approach during my data gathering process. An in-depth interview format allow the interviewees to talk freely and achieve a greater depth of answers, revealing their feelings, accounts, opinions and beliefs (Legard *et al.*, 2003:141).

Given the interactive nature of in-depth interviewing (Rapley, 2001), this process also forced me to interact more with my interviewees, encouraging them to reveal the explanatory factors of their answers, as detailed above. Also, it was essential to elicit a good rapport at the outset to go beyond the obvious questions and prompts, through a 'warming-up period' (pre-interview) so as to achieve a degree of relaxation and confidence in the interviewees (Dunn, 2010:115).

Notably, Legard *et al.* (2003):148 describe two main groups of questions to achieve breadth and depth across a number of key topics: *content mapping* and *content mining questions*. While the former group of questions are designed to open up a discussion about a topic, raising issues or dimensions relevant to the participants; the latter group of questions are designed to explore those issues in detail, uncovering their meanings.

Content mapping questions were convenient techniques to raise a number of issues in my interviewees to be explored in more detail later. Some of those questions allowed the identification of different topics, for example in relation to environmental and social issues:

- How do you protect the watercourses on your forestlands?
- I've heard that in some territories one of the big plantation forestry businesses have had good agreements with local communities whereas in others cases not, are they true?
- Do you think that conflicts with Indigenous communities may be addressed by certification?

On the other hand, content mining questions gave me the possibility to achieve depth in the responses of my interviewees through using different probes. Following similar examples:

- Why do you think that FSC is more credible than CERTFOR?
- Can you provide me an example of how sensitive elements for the industry of the Chilean FSC were left out during the standard setting process?
- Why do you think that forest certification is going beyond the Chilean environmental and forestry legislation?

In summary, content mapping and content mining questions provide me a reflexive framework to attain a better understanding about the phenomenon I was researching. These techniques strongly influenced my skills as a researcher especially after the pilot study and my first fieldtrip in Chile.

2.6.4.6 Document analysis

Additional data to support and at least not contradict that primary evidence provided by the interviews was necessary. Miles and Huberman (1994):266-67 point out that in the process of triangulating evidence, the strategy is “pattern matching”, that is, using several data sources so as to “point to the same conclusion and/or rule out other conclusions” which “provides repeated verification”. Therefore, I used a range of documents including but not limited to: audit reports of certified forestry businesses, corporate documents and firms’ websites, public reports and records, government documents and records, national laws and regulations, and official guidelines. Also, information from the media was also formally reviewed and analysed along with all the data above.

2.6.4.7 Data analysis

Transcription of interviews

Most of interviews conducted in the primary data collection process were audio recorded¹⁹. Following the recommendations of Dunn (2010):120, I attempted to transcribe them as soon as I finished each interview. However, I transcribed a considerable amount of audiotapes once my fieldwork was completed, because I often had to travel between different points of the country to collect my data, adjusting my – usually tight – time to that of my interviewees. I also employed a notebook to produce some handwriting notes reflecting my first thoughts and impressions about the interviews being gathered.

Once I returned from my fieldwork, I transcribed all the interviews not yet transcribed verbatim in Spanish, using the word processor MS Word. My hand writing notes were included in separated MS Word files but linked with their corresponding data as supporting material. As the process of interview transcription is time-consuming, the subsequent translation process to English could even have taken more time. Hence, following Layder (1998):53's advice, I began to selectively choose those relevant extracts from my audiotapes leaving out the bulk of information already transcribed in Spanish, but preserved for further use if needed.

The process of transcription also represented a form of analysis. Indeed, for Dunn (2010):121, 'immersion in the data provides a preliminary form of analysis'. Additionally, those handwriting notes provided a base to yield *analytic memos* (see Neuman, 2011:447) helping me to expand my ideas while even still in the field and once I returned from it. Layder (1998):58, complementing this approach, establishes that in *theoretical memos* we generate discussion and self-dialogue between theoretical reflections and practical concerns derived from the data collection and analysis. In short, transcription and memo writing meant for me an early approach in the process of theory-generation.

NVIVO Coding

A challenging task, since it was time consuming, to initiate my data analysis was the coding of my interviews by identifying and extracting relevant interview segments so as to make the data more manageable (Dey, 2003:85; Ritchie *et al.*, 2003b:229). As (Neuman, 2011: 510) suggests, qualitative coding is an integral part of data analysis because allow us to

¹⁹ That is, 70 interviews in total were audio recorded.

formulate new questions across the data as new evidence come through. Therefore, using the QSR NVivo computer software, I organized the data (text segments) into conceptual categories to create themes for further analysis. Each relevant sentence or paragraph from each interview transcript was categorized into specific codes (or nodes as named in QSR NVIVO) and sub-codes. Once completed this primary task, I transferred these relevant codes onto a MS Excel spread sheet so as to continue with my data analysis.

Of course, this was not a static process. Although my research sub-questions and orienting concepts were the initial guidelines to form the initial codes to fit the text segments from my raw data, the emergence of new contents from my data (which I had not been captured in the initial coding) led me to recode – to some extent – such initial categories. This process is consistent with what Layder (1998):55 has termed “pre-coding” or “provisional coding”, and it is useful since it allows the inclusion of new ideas and theoretical insights as well as the exclusion of the irrelevant material in the end.

Thematic Networks and Comparative Analysis

Once the coding of my interview transcripts was completed, I was able to proceed with the next stage of my qualitative analysis, which was the construction of thematic networks/frameworks. Importantly, as Ritchie *et al.* (2003b):232 have warned, in so doing I had to be cautious of the need to summarise such concepts from my codes but without losing the context and context of the data. The QSR NVIVO software was particularly apposite in this regard since allowed me to automatically retrieve the page of the interview transcripts from which certain contents came from.

So, employing the approach as set by Attride-Stirling (2001) and Ritchie *et al.* (2003b) to construct thematic networks/frameworks I summarised the main themes from my data to organize my analysis, going from a lower to a higher level of abstraction. Therefore, I first organized my themes in a low level of abstraction (Basic themes) from evident premises in the text. Then, I summarised those basic themes in more abstract concepts (Organizing themes) so as to encapsulate them, in turn, in more abstract concepts (Global themes). Figure 2.2 shows an example of a thematic network used in my research.

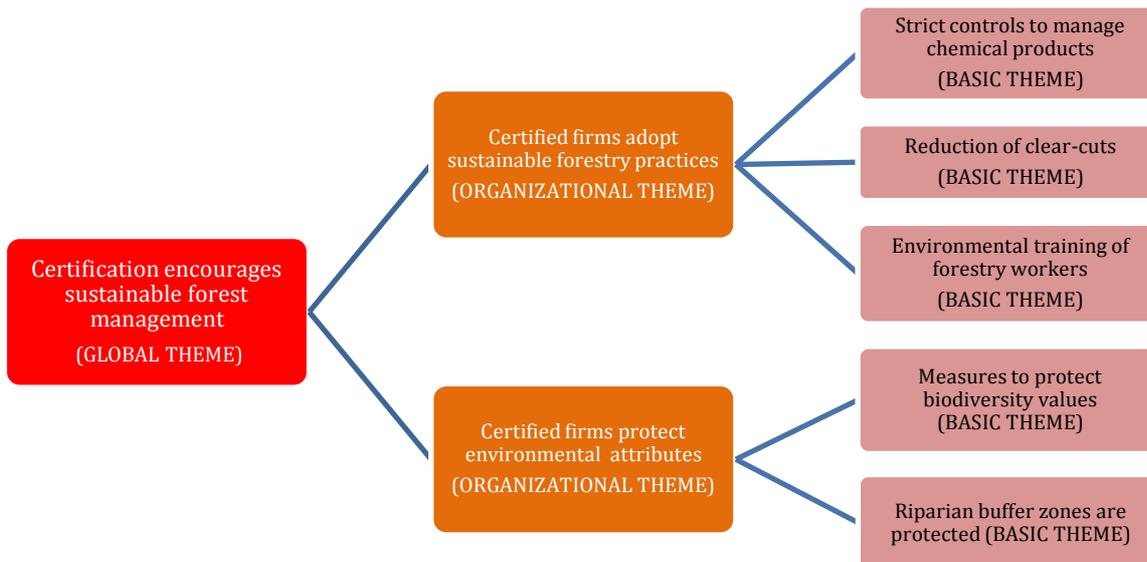


Figure 2.2 Example of a thematic network constructed during my data analysis.

Certainly, as Attride-Stirling (2001) points out, my data analysis resulted in more than one thematic network, and I finally grouped them into different “forestry groups”, according to what I wanted to compare. Hence, I created separate thematic networks (but covering similar themes) for non-certified plantation forestry businesses, non-certified native forestry businesses, certified plantation forestry businesses and certified native forestry businesses. Additionally, I replicated the same process for small/medium-sized firms and large firms within each group.

After performing this process and start writing up my results and discussion I also made use of the comparative method (Neuman, 2011:523; Hopkin, 2010) to refine the analysis of my findings. My aim was to find causal relationships and certain patterns according to the case studies I was analysing. Thus, I used the method of agreement to investigate case studies (for example, plantation forestry firms in comparison with native forestry firms), which were different in every respect, excepting for an independent variable (certification). Additionally, I used the method of difference to investigate case studies (for example, large or small plantation forestry businesses) which were very similar in every respect but differed only in respect to one variable (the presence of absence of certification).

2.7 Conclusion

Most studies about certification have raised the question of why certification is effective in certain contexts, whereas in others it has been largely unsuccessful. Moreover, there is lack of empirical studies addressing the differences that different certification schemes make to different types and scales of forest operations. This chapter addresses such concerns as it introduces the use of a comprehensive and comparative approach to reach a better understanding not only of the impacts but also the effectiveness – a broader concept – of certification. The selection of Chile, in this regard, provides an interesting example to study the effectiveness of certification: it has an important forest industry and, in tandem, significant environmental and social problems are caused by unsustainable forestry. But, before addressing the impacts of certification in the Chilean forest industry, it is necessary to know its sustainability performance in the absence of certification, as I will address in the next chapter.

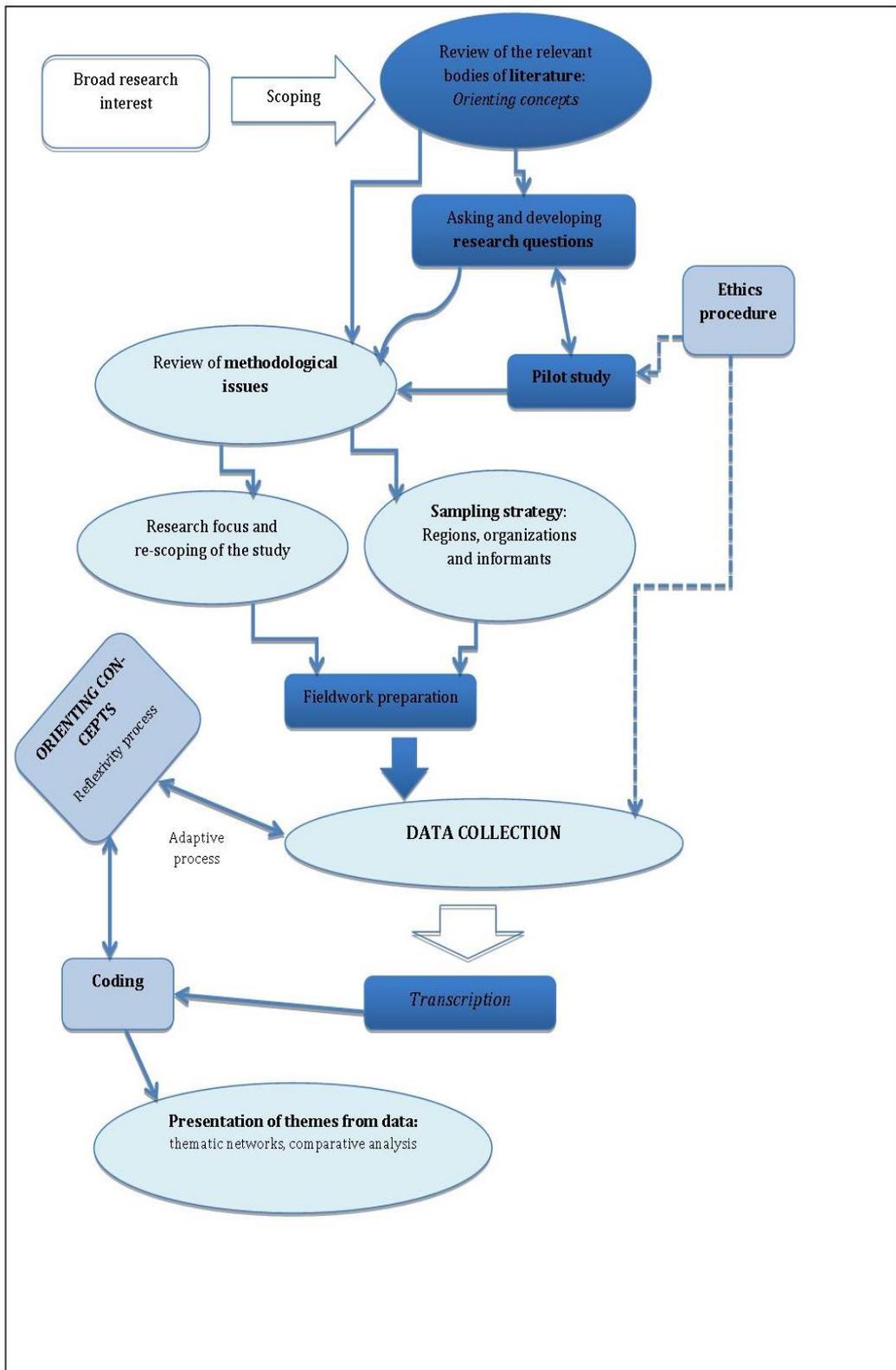


Figure 2.3 Overview of the research process

Chapter 3: The Chilean forest sector: a sustainable industry?

3.1 Introduction

In the previous chapter, I introduced the methodology and methods appropriate to address my research questions concerning the effectiveness of forest certification. I also highlighted the importance of comparing similar groups of firms so as to know whether the observed changes in sustainability issues are due to certification or other causes. Therefore, this chapter focuses on such “other causes” in the *absence* of certification, as well as *before* certification. Therefore, I present an overview of the Chilean forestry sector, and results of my fieldwork in non-certified²⁰ plantation and native forestry businesses across certain Chilean regions (see Appendixes 3 and 4).

The purpose of this chapter is to provide a better understanding of the environmental, social and economic issues in native and plantation forest industries in the absence of private governance mechanisms. In so doing, government documents, official reports, media information, public statistics, official guidelines, national laws and regulations, and empirical field-based evidence (in some cases²¹) also informed my interview findings. It is noteworthy that the viewpoints, experiences, attitudes, acts, perceptions, thoughts and feelings of actors within forestry firms were contrasted with those of external stakeholders such as authorities, NGOs’ officers, unions’ representatives, Indigenous groups and researchers. Finally, these findings were grouped into four sections.

Following an initial overview of the Chilean forest sector, the second section shows how forest governance is implemented in Chile, including the evolution and status of the forestry regulatory framework. The purpose of these sections is to provide, albeit briefly, the contextual factors that have influenced relevant forest management practices, including political, social, historical, economical and geographical factors.

In the third section I examine some characteristics of large plantation forestry businesses, including their economic performance. I describe their forestry practices as well as the implications for companies’ environmental performance. This section finishes with an analysis of social issues, particularly exploring companies’ relationship with workers and communities.

²⁰ That is, I present the findings concerning two groups of organizations: chiefly, non-certified forestry businesses and some organizations that were certified but provided valuable insights of their situation before certification.

²¹ I could not get empirical field-based evidence (by conducting forest cruises) in all cases. Mostly, I obtained this type of evidence from large native forestry businesses and small and medium sized plantation forestry businesses.

The fourth section addresses similar concerns, but for small and medium-sized plantation forestry businesses, showing why this sub-sector performs differently compared to large enterprises.

Finally, the fifth section explores, the economic, environmental and social performance of small and medium-sized native enterprises, exploring what makes them different from large native forestry businesses.

3.2 General background of the country

The Republic of Chile is a long-standing and prosperous democracy²² in the South American continent, which in its political constitution is defined as a unitary state. The country's economic growth strongly relies on the intensive exploitation of natural resources (particularly copper, followed by agricultural, fishing and timber products) without further processing (OECD, 2015). As of 2013, the Organization for the Economic Development and Cooperation (OECD) and the World Bank classified Chile as a high income economy (see World-Bank, 2015) due to its sustained economic growth, sound macroeconomic policies and international trade agreements. These public policies have led to improved welfare, reduced poverty and improved the access to education. In addition, Chile ranks: very high in its human development index (UNDP, 2015), relatively high in income per capita (nominal GDP of some US\$ 17,047, leading other Latin American nations) (World-Bank, 2015), top ten in economic freedom (The-Heritage-Foundation, 2015), high in globalization index (GED, 2014), and with a relatively low corruption index (Transparency-International, 2015).

Despite these positive indicators, the country is not yet in all respects a developed country as it needs to reduce inequality in terms of income, wealth and education quality (OECD, 2015). From this thesis viewpoint, Chile is still considered a developing nation, but it is much closer than most Latin American nations in becoming a developed country.

Further, the Chilean model – based on exports and neoliberal policies – has led to negative social and environmental externalities (OECD, 2015). This is the case with the Chilean forest industry: while it is an economically successful sector, it is usually blamed for environmental and social conflicts in the regions where these firms operate. But, before turning into these issues, I will describe this industry and other contextual factors in the following section.

²² This long-standing democracy was only interrupted by a military dictatorship between 1973 and 1990. The dictatorship headed by the General Augusto Pinochet had profound consequences for all kind of public policies, including forestry.

3.3 Overview of the Chilean forest sector

As mentioned above, the forest industry in Chile is an economically successful sector that is based primarily on exotic tree plantations, both softwood and hardwood²³. In contrast, native forests are less economically important, but they cover a larger area. The following two sub-sections describe the dynamics and evolution of land use and forestlands ownership (including historical, political, social and cultural factors), and provide an economic overview of the forest sector (including employment, production and demand/supply).

3.3.1 Dynamics and evolution of land use and forestlands ownership

Forests comprise c. 19% of the total Chilean land area (c. 756,096 km²) (INFOR, 2015c). Most productive forests are concentrated south of Santiago; forestry coexists, and often competes, with other land uses such as livestock farming, agricultural uses, diverse food industries, urban and rural developments, Indigenous settlements, and conservation uses (national parks and nature reserves). In Chile, only private businesses manage forests commercially for wood production, in both the native and plantation forestry sectors, and hence only these forests are relevant for this research²⁴. The main forest types and ownership of Chile are classified as in Table 3.1.

Forest ownership,	Forest type and area (ha) ²⁵	
Owner type ²⁶	Native forests	Plantation forests (net area) ²⁷
Large	2,000,000 (33%)	1,540,912 (63%)
Small and medium-sized	4,000,000 (67%)	904,980 (37%)
Public ownership	7,424,000 ²⁸	1,700
Total	13,424,000	2,447,592

Table 3.1 Chilean forest ownership by forest type and size.

Source: modified from Leyton (2009) and updated data provided by INFOR (2015c).

Native forests comprise most of Chile's forest area (84.5%) and, as shown in Table 3.1, they are predominantly owned by the state. Those forests have no productive uses; instead, they

²³ That is, pine (softwood) and eucalypt (hardwood) species.

²⁴ This PhD thesis is aimed to seek differences in companies' environmental, social and economic performance due to the adoption of forest certification and this only occurs in productive forests being managed for commercial purposes.

²⁵ Data usually vary among different public agencies since they lack commonly agreed methodologies across updating periods. Moreover, as noted by Leyton (2009), there are no detailed studies on forest tenure in Chile yet.

²⁶ According to the 1998 modification of the Decree Law (DL) 701, small forest owners own no more than 12 forest hectares and have annual sales that not exceed around US\$131,857; medium-sized forest owners are those who own more than 12 forest hectares and have annual sales not exceeding around US\$ 3,767,343. Large companies usually exceed this annual sales threshold and they mostly own forest estates of more than 50,000 hectares.

²⁷ This area does not include the area covered by forest roads, lumberyards, and so on; otherwise, this area would be much larger (up to 2.9 million hectares according to CONAF estimates). See CONAF (2013).

²⁸ This area is in the "National System of Wild Protected Areas by the State" (SNASPE).

are managed for conservation uses under the National System of Protected Areas (SNASPE²⁹). Conversely, private enterprises own less than 50% of native forests, and they include both productive (mostly owned by small owners) and conservation forests, i.e. private reserves. In terms of forest types, native forests are classified into twelve types according to the Chilean legislation³⁰ (see Table 3.2) and the latest inventory of forest resources (CONAF, 2011): *Siempreverde*, *Lenga*, *Roble-Raulí-Coihue* and *Coihue-Raulí-Tepa* are the predominant forest types constituted by diverse *Nothofagus* species.

Forest type	Hectares
Siempreverde (mix of <i>Nothofagus</i> species)	4,131,995
Lenga	3,581,635
Coihue de Magallanes	1,691,847
<i>Roble-Raulí-Coihue</i>	1,468,476
Ciprés de las Guaitecas	930,074
<i>Coihue-Raulí-Tepa</i>	556,189
Esclerófilo (mix of sclerophyll species)	473,437
Alerce	258,371
Araucaria	253,739
Roble-Hualo	205,974
Ciprés de la Cordillera	47,157
Palma Chilena	716
Total	13,599,610

Table 3.2 Chilean native forests area by forest type.

Source: CONAF (2011).

In contrast, plantation forests comprise some 15.5% of total Chilean forest area, are almost exclusively based on monocultures of hardwood (*Eucalyptus globulus* and *Eucalyptus nitens*, comprise 23% and 10%, respectively, of total plantation area) and softwood (*Pinus radiata*, comprise 60% of total plantations) exotic tree plantations (INFOR, 2015c). Most, if not all, plantation forests belong to private enterprises, predominantly large forestry businesses (63%) rather than small and medium-sized forest owners (see Table 3.1). Large forestry businesses are usually well-resourced and vertically integrated corporations that, through government subsidies, have accrued large land areas since the late 1970s.

It is also important to understand that in Chile the ownership of forests is also linked with the ownership of land; consequently, there are no forest concessions, all forestlands are titled lands. This arrangement has persisted with no major variations across the history of the country, and this also includes the dynamics of Chile's land ownership, as we will see below.

Traditionally, since the arrival of the Spaniards during the 16th century, the tenure of land and all the elements “attached” to the land (including forests, grasslands, native crops, wild

²⁹ Includes national parks, reserves and natural monuments.

³⁰ Decree No 259 of 1980; see further details in Appendix 13.

animals, water and mineral resources) belonged to the landowner. In terms of land property structure, during the early stages of Chile's conquest, the best available lands (usually fertile and irrigated valleys) were quickly occupied by a handful of owners in central Chile. Those first owners were generally the conquerors and their financiers who received extensive land entitlements, granted by the Spanish crown, to pay them off for their colonization services (Bengoa, 2015a). This originated and consolidated, across the 17th and 18th centuries, huge "haciendas"; that is, a particular form of land estate in which the owner had not only rights upon lands but also over their resources and – in practice – the workforce. However, due to the lack of workforce and the Spanish tradition over the use of certain resources, grasslands and forestlands had collective use rights and the landowner ought to tolerate these activities provided that they were notified³¹ (Bengoa, 2015a). Hence, although landowners were reluctant to allow peasants to trespass their properties, unauthorized logging in haciendas was relatively tolerated. Only the first Chilean Civil Code³², enacted in 1855, changed this by setting clearer property rights.

Haciendas were the predominant form by which the first native productive forests were commercially exploited (Folchi, 2001). Moreover, during the late 19th century, as the control over more territories progressed after Chile's independence from Spain in 1818, new southern territories – including the most exuberant of Chile's forestlands – were colonized; mainly by new European immigrants, mostly Germans, but also some Swiss and Dutch). Unfortunately, this immigration policy also brought about extensive deforestation for agriculture and livestock production in the new haciendas, and encroachment of the remaining Indigenous lands³³. This type of tenure over lands and forests continued up to the first half of the 20th century.

However, during the 1960s, this form of land tenure was challenged, along with the social order in rural areas, which was similar to a feudal system. This gave birth to the agrarian reform that redistributed lands among small farmers and peasants with no land rights, and who had often suffered diverse abuses and lived in precarious conditions as workers in the haciendas, the so-called "inquilinos" (Bengoa, 2015b). The agrarian reform did not, however, promote changes in historic, unsustainable forestry initiated during the colonial period.

³¹ In practice, this frequently did not happen and this triggered numerous conflicts over the use of grasslands and forests.

³² The jurist Andrés Bello, strongly influenced by the Romanic and Napoleonic codes, elaborated the first Chilean Civil Code. This is particularly relevant in terms of property rights.

³³ This process was initiated after the "War of Pacification of the Araucanía". During this military campaign initiated in 1861, the Chilean state occupied the southern territories – between the Biobío and Toltén rivers – that belonged to the *Mapuche* peoples – the most important Chilean Indigenous ethnic group. The *Mapuche* peoples had set a border along the Biobío River, between them and Chile, to prevent the colonization of Indigenous territories further south. However, the expansion of the agriculture and other historical events triggered the war for the control of these territories that ended with a major military defeat of the *Mapuche* between 1882 and 1883 and their subsequent capitulation. After the war, the Chilean state only recognised 510,387 ha as Indigenous lands (reservations) for the *Mapuche* peoples. See León (2011).

The 1960s was a decade of important changes. Between 1966 and 1970, emulating Keynesian policies, the state Corporation for the Promotion of Productivity (CORFO) took over some forestry industries and public lands to create many state forestry businesses (Julio, 2007), thereby making the state an important participation in the incipient forest economy. At that time, there was no significant participation of private actors in the forestry economy. To improve the enforcement of forestry regulations, the National Forest Corporation (CONAF) was founded in 1973 as the first national forest corporation; however, it was created with modest enforcement and sanctioning powers and all subsequent attempts to modify its status from a “corporation” to a “service”, with more complete responsibilities, have failed. In short, during the 1960s, the Chilean state became major actor in forestry and, through the Forest Research Institute (INFOR) established in 1965, promoted the establishment of the first exotic tree plantations in Chile (INFOR, 2015d; Julio, 2007).

The 1973 military coup catalysed major changes. The general Augusto Pinochet reversed the agrarian reform initiated during the governments of Eduardo Frei Montalva and Salvador Allende (Miller Klubock, 2004). However, this process did not restore the former social, production and land model known as the “Hacienda system”, which had declined during the previous decades (Rodríguez Weber, 2013). Rather, concerning forestry, its aim was to implement neoliberal policies to improve productivity, exports and national GDP, which had declined, by increasing the participation of private actors. Therefore, all forest state enterprises were sold to private actors between 1974 and 1976 and, as of 1980 (Julio, 2007); the Chilean Constitution also explicitly prohibited the creation of new state enterprises, and important workers’ rights were abolished by substantially changing the labour legislation (Miller Klubock, 2004). These processes that led to the large-scale establishment of forest plantations was not only highly controversial, due to corruption issues³⁴, but also had negative impacts on local and Indigenous communities as well as native forests, as I will address in the next sections.

3.3.2 Economic overview of the forest sector

Chilean plantation forestry businesses make an important contribution to the national GDP of some US\$ 4,829 million, in terms of both exports and domestic processing (INFOR, 2015a); forestry is the third largest export sector, after mining and the agriculture/food industry (Banco-Central, 2015). Thus, since 2014 this industry has exported c. US\$ 6,000 million of forest products annually (c. 80% was concentrated by large forestry businesses); the main exported products are chemical pulpwood (US\$ 2,902.9 million), sawn wood (US\$ 709.3

³⁴ Interviews with I-IX-01 and R-MB-01.

million), wood panels and veneers (US\$ 577.2 million), wood mouldings (US\$ 458 million), and planed wood (US\$ 208.1 million) (INFOR, 2015a). According to the same source, there is an increasing – but still small – international market for non-timber forest products valued at some US\$ 100 million. International markets for forest products totalled US\$ 6,094 million FOB in 2014, and included China (23.6%), US (13.5%), Japan (7.8%), South Korea (5.9%), the Netherlands (5.6%), Mexico (5.1%), Peru (3.9%), Italy (3.3%), Taiwan (3.2%) and “other” countries (28.2%). The main Chilean exports, that is, roundwood and pulpwood, comprise around 2.2 and 3%, respectively, of the global production. Overall, most Chilean forest exports are constituted by commodities, rather than value-added products and, despite a recent economic slowdown, the overall trend is towards an increase in forest exports from Chile (see Table 3.2).

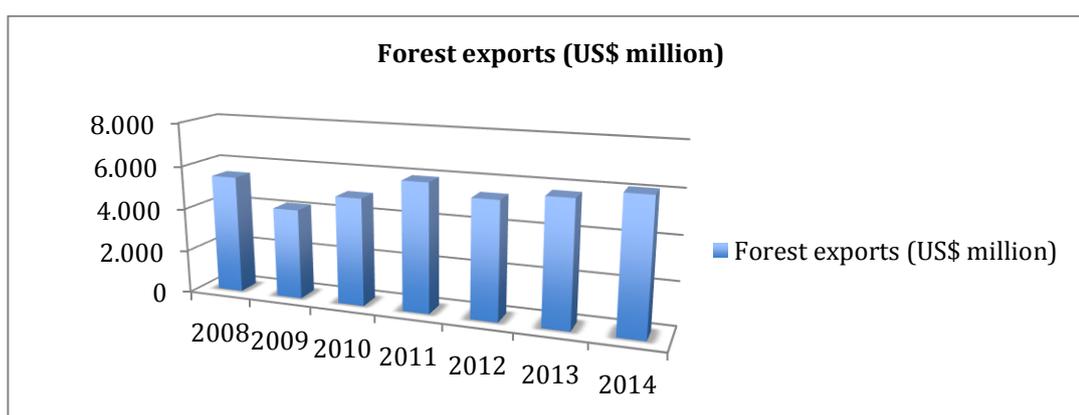


Figure 3.1 Chilean forest exports in US\$ million.

Source: INFOR (2015a).

The domestic market has been responsible for an important increase in the consumption of forest products during the last decade. From around 42.6 million m³ of roundwood produced in 2014, most eucalypt and pine pulpwood (87% and 93%, respectively) and eucalypt wood chips (83%) are exported, while most sawnwood is internally consumed (63% and 99%, pine and eucalypts, respectively) (INFOR, 2015a). According to the same source, in 2014 US\$ 1,394 million of forest products were imported, mainly paper, paperboard, furniture, construction lumber, manufacture goods and wood panels.

The large-scale plantation forestry industry has made a significant progress towards energy self-sufficiency, with implications for wood use. Today, much of post-harvest forest waste are used as biomass and biofuel sources to supply, respectively, energy for this industry needs (c. 975 MW estimated in 2014) and for residential heating uses as biofuel (replacing the traditional share of native forests in around 37%) (INFOR, 2015b; CORMA, 2016).

In contrast, native forestry businesses do not have the same economic value relative to plantation native forestry businesses (see Table 3.3), although they account for a larger percentage of forestlands in the country. Most native forestry business are operated by small and medium-sized forest owners (67%, as shown in Table 3.1), with properties under 50,000 hectares (as classified by decree law 701); the average property size is only 12 hectares (Leyton, 2009). The main forest product obtained from native forests is firewood for residential and industrial domestic uses, particularly in southern Chile (Bustamante and Díaz, 2010). Notwithstanding this, more than US\$ 4.5 million of sawnwood (Table 3.3) obtained from lenga (*Nothofagus pumilio*) forests were exported in 2014 to Latin American countries and the US (INFOR, 2015a). These amounts are far below those of the plantation industry, and the state's attempts to promote sustainable use of these resources while increasing their economic value have not been successful.

Rather, the main value of Chilean native forests is non-economic. They show high levels of endemism in their flora and fauna, and provide significant cultural and economic values to Indigenous and non-Indigenous local communities who depend on them for their livelihoods.

	2008	2009	2010	2011	2012	2013	2014
Species							
Lenga	9,990	5,478	6,450	5,517	4,290	3,415	4,528
Roble	505	496	340	305	408	596	253
Raulí	1,249	621	906	565	604	244	157
Coihue	2,312	330	66	166	152	65	7
Tineo	549	331	405	301	91	165	102
Laurel	341	85	67	140	385	135	75
Tepa	124	970	394	609	325	88	21
Mañío	91	7	14	-	-	-	5
Ulmo	18	6	(*)	6	-	-	-
Alerce	-	2	4	-	(*)	-	-
Pimiento	-	-	-	20	-	-	-
Canelo	-	57	1	115	1	-	-
Olivillo	-	26	19	5	1	-	-
Lingue	2	3	1	-	29	-	-
Quillay	49	38	-	-	30	-	-
Espino	-	-	(*)	2	(*)	-	-
Other native species	1,228	1,326	187	464	336	463	554
Total	16,457	9,776	8,855	8,214	6,653	5,171	5,702

Table 3.3 Export value (in US\$ thousands) of main Chilean native tree species.

Source: INFOR (2015a). Note: * = amount below US\$ 500.

In terms of employment, the forestry sector provides around 124,472 jobs according to INFOR (2015a) estimates, most of them associated with plantation forests. Other sources (UNTEC, 2014), however, estimate around 300,000 direct and indirect jobs provided by the

forestry industry. Many of those indirect jobs come from regional business clusters that have added value to regional economies (Felzensztein *et al.*, 2014).

3.4 Forest governance

This section describes how forests and forestry matters are governed in Chile; by describing the main forest institutions, forest policies and their regulatory framework.

3.4.1 Main forest institutions

Two main forest agencies govern forest matters in Chile. The first is the National Forest Corporation (CONAF), under the Ministry of Agriculture; this is by far the most relevant institution. CONAF is responsible of enforcing forestry laws and regulations, setting programs to avoid deforestation, granting exploitation rights over plantations established for restoration, and by requiring the design and implementation of a forest management plan for certain native forest species of, particularly, the genus *Nothofagus*, *Quillaja*, *Laureliopsis* and *Podocarpus*. This plan contains the detailed requirements to encourage sustainable forest management, such as cutting diameters, measures to encourage the regeneration of forest stands, measures to protect soils and water, slash disposal measures, and so on.

The second forest agency, INFOR, provides technical assistance to support decision-making processes in the forest sector by both public and private actors. Third, although it is not a specific forest agency, the Directorate of Labour (DT) enforces all the matters related to the working conditions and labour issues of forestry workers that are contained in diverse regulatory bodies and, particularly, in the Labour Code.³⁵

Lastly, the Ministry of Environment is involved whenever the magnitude of new –or of pre-existing – forest exploitation exceeds a certain threshold area. For instance, forest owners must present an Environmental Impact Assessment (EIA) study when forest operations, located in central and south.-central regions, exceed 500 hectares per annum.³⁶

3.4.2 Forest policies and regulatory framework

Table 3.4 shows the major laws and regulations that have shaped the Chilean forest policy. The first most relevant regulatory bodies were enacted during the first half of the 20th century; the Law N° 4363 established what kind of soils should be forested (by natural or planted forests), and restricted the use of fire and forest operations within 200 (flat terrains) and

³⁵ See further details in Appendix 13.

³⁶ See further details of the Environmental Law in Appendix 13.

400 metres (on slopes) from water courses and on over 45° slopes. The decree N° 2374 set additional restrictions to cut trees near watercourses. However, both regulatory measures were, in practice, poorly enforced.

Laws and regulations	Period/Year	Description
Law N° 4363	1931 - Present	The law defined what kinds of soils were eligible for forestation purposes and some restrictions for forest operations.
Decree N° 2374	1937 - Present	This regulation set additional restrictions to protect buffer zones and watercourses.
Decree Law 701 – Law of Forests Development	1974 - 2012	This law has been the most relevant for the development of plantation forests by providing subsidies and tax exemptions.
Decree No 259	1980 - Present	This regulation set general requirements for forest management for both plantation and native forests.
Decree No 193	1998 - Present	This regulation updated decree No 259 and made forest management plans compulsory.
1994 General Environmental Law No 19300	1994 - Present	This law determined that large forest interventions needed an environmental impact assessment (EIA).
Law No 20283 – Law of Recovery of Native Forests and Forests Development	2008 - Present	This law established incentives through subsidies to sustainably managed native forests.
Regulation on soils, waters and wetlands (DS No 82)	2011 - Present	This regulation operationalized the Native Forests Law, particularly concerning certain definitions and protection of buffer zones.

Table 3.4 Main regulatory instruments that have shaped Chilean forest policy.

Source: Chilean legislation (see Appendix 13).

The law that most shaped Chile's forest policy in the last 40 years was the Decree Law (DL) 701, enacted in 1974. This law encouraged the massive afforestation with exotic tree plantations of pine and eucalypts. Through generous subsidies (75 to 90%) and tax exemptions – at the second year of successfully established forest plantations – it promoted the participation of private actors in the forest economy. In 1998 this law was modified to support small forest owners, to establish plantation forests in degraded soils, since the earlier law had mostly benefited large companies (AGRARIA, 2005). On 31st December 2012, the law expired and, as a consequence, subsidies were no longer available. During the last four years, the Congress has discussed the extension of the afforestation incentives but without success so far.

The DL 701 has been operationalized by a number of regulations. The decree N° 259, enacted in 1980, specified the technical requirements that ought to meet forest management

plans as requested – but not specified – in the DL 701. Further, it set general forest management requirements for native forest types and, due to successive modifications (in the late 1990s), explicitly prohibited the conversion of native forests to tree plantations that was occurring after the implementation of the DL 701. As of 1998, the decree N° 193 upgraded to some extent the decree No 259 and, importantly, made compulsory the implementation of forest management plans for plantation and native forests. However, as it is the case of plantations, they were only compulsory on degraded sites covered by afforestation subsidies. In practice, therefore, not all plantation forests are subject to the enforcement of forestry laws and regulations; particularly in the case of small forest owners.

Another important precedent for the forest industry was the enactment in 1994 of the General Environmental Law (N° 19300). It established that large forest operations needed to be environmentally assessed, by conducting an Environmental Impact Assessment (EIA) study. EIAs were the only way by which local governance could be exerted to address both forestry and sustainable forest management (SFM) issues. The law only became operational in 1997, when its respective regulation was enacted. Meanwhile, some large companies followed voluntary state guidelines to assess their projects. Successive decrees have operationalized this law; the last one dates to 2012 (decree No 40). Also, the 2012 decree sought to improve the mechanisms of consultation of local communities about new projects.

Turning to specifically the native forest sector, the enactment in 2008 of the Law for the Development and Recovery of Native Forests (N° 20283) set incentives to promote sustainable forest management. In particular, it provided subsidies (between US\$ 350 to US\$ 700 per hectare depending of the type of forest operations being executed) to native forests managed sustainably. However, the law has not had the expected benefits, and the associated funding resources have barely been used (Lara *et al.*, 2013).

More recently, the decree on soils, waters and wetlands (DS N° 82) operationalized the Law of Native Forests. It set the specific requirements that native forest operations must follow for the protection of buffer zones (particularly, in high conservation value areas), specifying their widths from the edges of temporary/permanent water courses, water bodies and ravines.

Finally, it is noteworthy that, throughout their history, forest regulations and laws have shaped the Chilean forest policy, rather than a more explicit policy development process. Only during 2016 was an explicit forest policy, comprising four directives to achieve sustainable forest management: (a) sound forestry institutions; (b) productivity and economic growth; (c) social equity and inclusion; and (d) protection and restoration of forest assets,

3.5 Large plantation forestry businesses

In this section I will explore some of the main characteristics of this sector, its forestry practices and environmental outcomes, as well as the social issues these companies must deal with.

3.5.1 Some characteristics of large plantation forestry businesses

Large plantation forestry businesses and large forest corporations

Here I will examine three important characteristics of large plantation forestry businesses: the rapid and successful growth of plantation forests over the recent period as well as the contentious and arguably illegitimate basis for this growth; why plantation forests were established in Chile, and; some specific characteristics of large forest corporations.

The success of plantation forests is relatively recent and contentious: The successful – and relatively recent – establishment of plantation forests was precipitated by the enactment of the decree law 701 (DL 701) in 1974, during the first years of the military dictatorship of Augusto Pinochet. Initially, the aim of the law was to encourage afforestation in poor and eroded soils of formerly agricultural lands located in some southern and south-central Chilean regions. This goal was largely achieved, resulting in an exponential growth of plantation forests. This growth transformed Chile’s landscapes. From no more than 300,000 hectares around 1970 (OECD, 2008), the country’s plantation forest estate had reached c. 2.4 hectares in 2013 (INFOR, 2015c).

However, in the view of some interviewees³⁷, this process was illegitimate and subject to criticism for a number of reasons. First, changes in forest policy were made in the absence of any public debate. Chile was then ruled by a dictatorship that could freely enact laws and regulations without political opposition and, in consequence, new laws lacked any democratic consent. Second, this process allowed the privatization of significant forest resources, leading to an economic concentration of forest estates in the hands of a small number of “mega-owners” who amassed immense fortunes³⁸ through their monopoly of the timber market. And third, the establishment of plantation forests was at the expense of small peasants and Indigenous

³⁷ Interviews with R-MB-01, I-IX-01, N-RM-04 and PFB-VIII-r01.

³⁸ One of the most infamous new economic groups was the “Cruzat Group”, a business group linked with the military regime that made millions overnight. It is even estimated that their more than 100 businesses (including large forestry enterprises) represented approximately the 5% of the national GDP. Recently, the Chilean Superintendency of Stocks and Insurances and the Tax Service have investigated them because of tax fraud and irregular funding of political campaigns. Interview with R-MB-01. See also Prudent (2012).

communities: some interviewees agreed³⁹ that many peasants and Indigenous peoples were forced to sell their lands at “bargain prices”, under threats from private businesses in collusion with the military authorities.

This may explain the negative perception of plantation forests in some sectors of the Chilean society, even though there are also some positive impacts – such as the rehabilitation of eroded agricultural lands as I will examine below.

Plantation forestlands replaced other landscapes in central-southern Chile: Exotic tree plantations are well adapted to the climatic and soil conditions of southern and south-central regions of the country (see Table 3.7). The outstanding performance of these forests could not be emulated in the two most southern⁴⁰ regions of Chile or in its arid northern regions. Therefore, according to INFOR (2015b), most exotic plantation forests are concentrated between the VI (O’Higgins) and XIV (Los Ríos) regions, and pines (softwood) and eucalypts (hardwood) trees are the most widely used species (see Table 3.5).

Planted Forests Area in 2014, by Region (ha)	
O’ Higgins (VI region)	127, 306
Maule (VII region)	448, 513
Biobío (VIII region)	926, 530
Araucanía (IX region)	483, 482
Los Ríos (XIV region)	186, 883
Los Lagos (X region)	76, 844
Other regions (including, Aysén, Coquimbo, Valparaiso, and the Metropolitan region of Santiago)	177, 163
Total	2, 426,721 ⁴¹

Table 3.5 Chilean planted forests area by region (ha).

Source: INFOR (2015c).

In short, exotic tree plantations replaced other landscapes in the regions where they were established. On the positive side, consultants and industry informants⁴² seem to agree that significant benefits were realised, in terms of protecting eroded soils in former agricultural

³⁹ Interviews with R-MB-01 and I-IX-01.

⁴⁰ In order to provide subsidies to forest owners, the DL 701 requires plantation forests an overall performance of 75% (that is, 75% of the forest stands must be successfully established). In Magallanes (XII region) the overall performances are quite below 70% due to climatic reasons. Hence, the forest authority (CONAF) is testing new exotic tree species adapted to extreme weather conditions (strong winds and low humidity) and at the same time, able to attain better yields (interview with A-XII-01).

⁴¹ Data varies due to estimation bias associated with the information provided by small and medium size forest owners.

⁴² Interviews with PFB-VII-01j, PFB-VIII-02l, B-RM-01 and R-MB-02.

lands, and saving thousands of hectares from serious soil erosion⁴³. Therefore, while at one level the expansion of plantation forests might be seen as constituting an illegitimate grab for land by the large plantation forestry businesses, the establishment of plantation forests can also be seen as part of a desperate policy response to fight soil erosion.

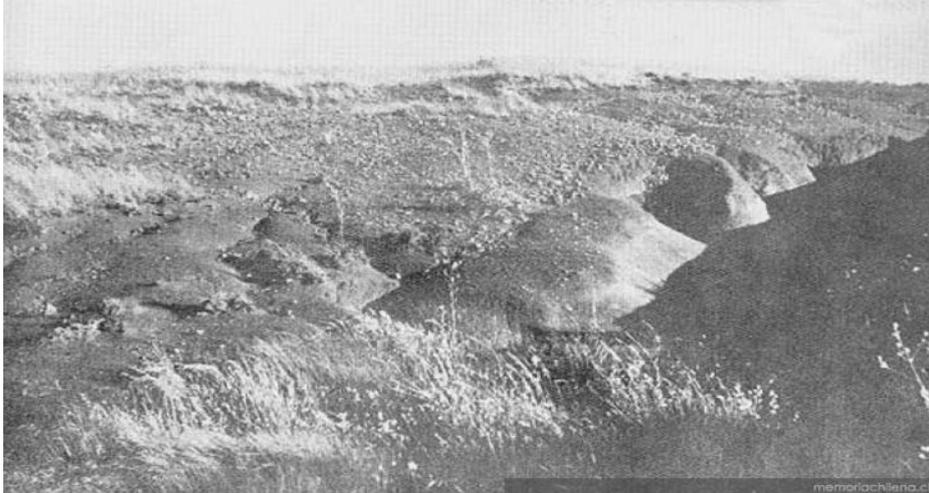


Figure 3.2 Slopes showing loss of agricultural soil, during the first half of the 20th century.

Source: courtesy of the National Historic Museum's Collection.

Unfortunately, there was another negative outcome in the success of plantations: significant portions of native forests were also cleared for the establishment of more productive exotic tree plantations⁴⁴. In particular, large forestry businesses took advantage of the loopholes⁴⁵ in forestry laws and regulations to establish exotic tree plantations at the expense of native forests. The amount of such replacement is still a matter of controversy. While conservative estimates from the plantation forest industry recognize no more than 33,000 hectares converted⁴⁶, some official reports estimate more than 81,463⁴⁷ hectares of converted native forests between 1995 and 2011 and 200,000 hectares between 1974 and 1992⁴⁸. They acknowledge nevertheless that the amount of such unsustainable practice had decreased significantly⁴⁹, at least during recent years.

Large forest corporations *are complex and highly visible organizations*: As indicated earlier, some large plantation forestry businesses can best be described as large forest

⁴³ Different scientific publications and books gave account of the critical situation for the country's natural resources caused by soil erosion. See (OIT-Chile, 2012).

⁴⁴ Interviews with PFB-MB-01q, PFB-VIII-r01, R-VIII-01, N-RM-04 and R-VIII-02.

⁴⁵ Before that the law for native forests was enacted in 2008, there was no clear definition of "forests". Hence, in practice, firms could easily clear a bush area where seedlings and young trees were growing up.

⁴⁶ Interview with R-VIII-01.

⁴⁷ See Lara *et al.* (2013).

⁴⁸ See OIT-Chile (2012).

⁴⁹ Interview with A-VIII-01.

corporations since they own most plantation forests distributed across many regions, from the VI (O'Higgins) and XIV (Los Ríos) regions. Three of these large plantation forestry businesses dominate the market, and are most accurately named large forest corporations: the ARAUCO, MASISA and CMPC conglomerates (INFOR, 2015b), as examined in the next paragraphs.

First, large forest corporations are vertically integrated and have outsourced and mechanized operations in their fast-growing plantations⁵⁰. These enterprises usually own or control the supply chain⁵¹ – across primary production of forests, its processing, transport and commercialization – so as to reduce costs and improve the economic efficiency of their operations. Also, they usually outsource most of their forest operations, as many forest managers and officers described⁵².

Second, large forest corporations follow self-regulation initiatives because of social concerns from civil society groups about their sustainability. Large enterprises are highly visible and targetable organizations⁵³, and Chilean forest enterprises were no exception, as activist groups often blamed them for a number of environmental problems⁵⁴.

Large forestry businesses are highly profitable companies that internalise the benefits

Large forestry businesses and, particularly, large forest corporations generate high profits from their forest operations, but the benefits seem to be confined to their shareholders and top executives. How do they achieve such substantial benefits and why are they confined to such a narrow group?

The answer may well be that *large forestry businesses are highly efficient monopolies, exporting to international markets*: Large forest corporations top – by far – the major exporters of timber products in the country (see, e.g. INFOR, 2015b), and it seems that these big corporations use an aggressive strategy to lower costs and gain market advantage in international markets. Some members of local Indigenous communities⁵⁵ and forest

⁵⁰ Chile and Brazil have the fastest-growing and lowest-costs plantation forests. See Chapter 1 in Dauvergne and Lister (2011).

⁵¹ For example, Forestal MININCO (they are part of the CMPC holding) supplies wood to different firms of the same holding: CMPC cellulose, CMPC timbers and CMPC papers. See in Forestal-Mininco (2015).

⁵² Interviews with PFB-VII-k01, PFB-VII-k02, PFB-VII-j02, PFB-VIII-n02 and PFB-MB-p02.

⁵³ See for example Chapter 6, “Regulating large enterprises” in Gunningham and Sinclair (2002).

⁵⁴ Perhaps one of the most recalled cases of environmental disasters was the massive death of wild populations of black-neck swans in the river Cruces in Valdivia, by 2004. This was caused by toxic waste poured from a large pulp mill, property of the CMPC conglomerate. Prior to any decision from the Environmental Authority, the community and some local ENGOs had already blamed the company for the disaster in the river Cruces. See Gonzalez and Roldan (2014).

⁵⁵ Interview with I-IX-01.

consultants⁵⁶ explicitly criticised this strategy. In their view, large plantation forestry businesses and large forest corporations exerted monopolistic pressure against their contractors and small timber suppliers so as to keep their costs as low as possible.

This critical view was also shared by union representatives and, less overtly, by contractor companies. They point out that, to maximize profits, large forestry businesses and large forest corporations used to set their own conditions at the expense of the interests of their contractors and suppliers; for example, setting low fees for forest operations, paying invoices up to three months after the due date, and meddling – inappropriately – in the financial management of contractors and suppliers⁵⁷.

Indeed, as some forest consultants⁵⁸ expressed, this unbalanced power relationship is one reason why large plantations forestry businesses have a high turnover of contractors (contractors had frequent financial downturns because they “ended up drowned by requirements that were hard to meet”).

Large enterprises and large forest corporations contribute modestly to the economies of forestry regions: Large forest enterprises were not likely to provide important benefits to the economies of the regions in which they were located. While some interviewees as diverse as Indigenous representatives⁵⁹ and chief forest officers⁶⁰ were of the view that this inhibited the development of such regions, they recognised that this issue was primarily a consequence of an excessive centralization of the country – a more general political, social, administrative and economic phenomenon. In this regard, in Chile, the executive power negotiates the public budget with the Congress in September each year for the next calendar year and, most national expenditure is usually concentrated in the metropolitan region. Therefore, even though the taxable incomes from forestry are generated in southern and south-central regions, companies are taxed in Santiago, and then these funds are mostly invested in the capital city and its associated provinces.

This point is illustrated by this senior officer in a large forestry business:

“...for example in Brazil, forestry companies are taxed, and half of the taxes remain in the communities within the affected areas; but everything that is taxed in Chile remains in Santiago. The forestry sector should be taxed in the

⁵⁶ Interview with R-VIII-02.

⁵⁷ For example, interview with IW-MB-01.

⁵⁸ Interview with R-VIII-02.

⁵⁹ Interview with I-IX-01.

⁶⁰ Interview with PFB-MB-q01.

same communes where the plantation forests are located, that's the logical thing to do, to see some benefits for the area you are impacting. We have discussed this with senators, representative members, but the copper is so important that they cannot legislate about it." (interview with PFB-MB-q01).

Thus, centralization affects the potential contribution made to regional economies by large enterprises in particular; and this may explain, at least in large part, the negative perceptions that large investments have in local communities and in broad sectors of the Chilean civil society.

As seen above, large plantation forestry businesses are an economically successful industry. However, many social actors do not see the origins of this industry as legitimate, and its operations reveal stark power asymmetries to the detriment of contractors, forestry workers, communities and local economies.

3.5.2 Forestry practices and environmental issues

Large forestry businesses and large forest corporations optimize forestry practices

As is self-evident, large plantation forestry businesses are well-resourced companies that can make more intensive use than smaller businesses of environmentally-friendly technologies to perform their forest operations. In contrast, the large extent of their operations may have a significant negative environmental impact.

Forest operations in large forestry businesses are more sophisticated and environmentally-friendly: Large forestry businesses and large forest corporations have employed different harvesting techniques⁶¹, tailoring them according to technical, economic, environmental, and social considerations. Before turning to this issue, it is necessary to clarify the different stages of timber harvesting, along with the machinery and methods that are commonly used in Chile to perform these operations, based on the framework of Corvalan *et al.* (2007) (Table 3.6).

⁶¹ Generally, much of the impacts of forest operations are caused by timber harvesting, both environmentally and socially.

Stages during the harvesting process				
Felling	Logging-extraction	Delimiting	Processing	Classification & loading
- Chainsaws - Feller-Buncher - Harvester	- Forwarder - Cable skidder - Grapple skidder - Logging towers - Animal power: usually oxen	- Chainsaws - Processing head/processor - Stroke delimiters - Chain-flail delimiters	- Chainsaws - Harvester - Processing head/processor	- Ergo loggers “tri-wheels” - Front-end loader - Cranes

Table 3.6 Machinery commonly used in Chile during forest harvesting.

Source: Modified from Corvalán *et al.* (2007).

Of these harvesting methods, interviewees from large enterprises⁶² noted that, according to the progress and mechanization of forestry operations, the use of the cut-to-length method (delimiting and cutting the tree to length at the stump) is widely used in large forestry businesses in most conditions. Put simply, highly mechanized methods based on a combination of feller-bunchers, harvesters and logging towers are preferred on rolling and flat terrains. This method is more cost-effective and less environmentally damaging than alternatives. In contrast, manual harvesting methods that use chainsaws and logging towers are still frequently used on steeper terrains (noting they can also be environmentally-friendly techniques):

“We were the first ones to implement mechanized harvesting methods; currently we do the job with fellers and on slopes over 35 degrees and the harvesting is being done with chainsaws but those types of operations are just a few.” (interview with PFB-X-o01).

One union representative⁶³ and interviewees from large forestry businesses⁶⁴, including large forest corporations, were of the view that more environmentally-friendly harvesting operations were a natural consequence of the mechanization of forestry operations, generating high profits as well as less invasive techniques with regards to the soil, one of their most valuable resources.

⁶² Interview with PFB-X-o01.

⁶³ Interview with IW-MB-04.

⁶⁴ Interviews with PFB-X-o01 and PFB-MB-p01.



Figure 3.3 Use of logging towers in Chilean forest operations.

Source: courtesy of the Forestry and Timber Forum.

In contrast, there is a negative impact of large forest operations on forestlands; specifically, *the size of operations determines their impacts on landscapes through the use of extensive clear-cuts*. In this regard, Chilean regulations⁶⁵ have not set very prescriptive or exacting requirements for the extent of clear-cuts in plantation forests: companies are only required to reforest, at the very least, the same surface they cut or exploited, according to the indications given in an approved forest management plan. My interviews⁶⁶ suggested that, in practice, large forest corporations have not had any restriction in the extent of clear-cuts, which may reach an extent of even 400 to 500 hectares yearly. The negative impact of these large-scale operations is widely documented in the Chilean literature⁶⁷.

Thus, two concepts are in tension: well-resourced large enterprises were able to make intensive use of more environmentally sustainable methods but, at the same time; this benefit⁶⁸ was counteracted with the extent of their operations, as their forest estates were larger.

⁶⁵ Specifically, this occurs when analysing the Decree No 259 of 1980 and the Decree No 193 of 1998, by which the law DL 701 works.

⁶⁶ Interviews with PFB-X-o01 and N-RM-01.

⁶⁷ For example, research on Chile's plantations have shown that clear-cuts can have negative impacts on soil quality properties (Gerding, 2009; Mohr *et al.*, 2013) and watersheds (Little *et al.*, 2009).

⁶⁸ It is interesting to note that respondents as diverse as industry forest officers, forest authorities, Indigenous and union representatives agreed that unsustainable forest practices were common in large enterprises 10 to 15 years ago. Such practices included, for example: establishment of exotic trees on the edge of watercourses and ravines, careless littering and aerial fumigations as well as poor management of chemical products and fuels. Interviews with A-IX-01, I-IX-02, IW-MB-02, PFB-X-o01, IW-MB-03 and IW-MB-01.

3.5.3 Social performance

In regards to the social issues associated with large forest operations, I grouped my findings into two sub-sections: forestry workers and local communities (including Indigenous peoples).

3.5.3.1 Relation with forestry workers

Working conditions have improved but the manpower seems unsustainable in the long-term

Based on my interviews with a range of stakeholders, there was considerable evidence to suggest that working conditions in the forest industries had improved in the last fifteen years; however, there will seemingly be a much diminished (and unsustainable) capacity to attract labour in the forest sector in the long-term, as we will see below.

Significant progress in OHS and working conditions: The tangible improvements in occupational health and safety (OHS) performance and working conditions were due to the role of diverse institutions, other than private forest enterprises. Three aspects account for this. First, most respondents⁶⁹ noted that OHS performance and working conditions, including wages⁷⁰, had largely improved compared with the poor situation experienced some 15 to 20 years ago. As stated by this forest consultant:

“...The conditions were completely inhumane in forestry companies. We started a project that has lasted 20 years to improve the quality of life of forestry workers; we focused on things such as the system of camps away from home, they had very bad conditions, poor meals, the staff training was very poor too, etc. And the workers’ performance was very low too. ...Then, there have been improvements because many forestry workers [organized in unions] did not accept such conditions along with the Directorate of Labour and the Ministry of Labour.” (interview with R-VIII-02).

⁶⁹ For example, interviews with S-RM-02, R-VIII-02, R-MB-03, La-IX-01 and IW-MB-01.

⁷⁰ The wages and other benefits such as bonuses and holiday leaves had improved to some extent in the last 15 years. As many respondents pointed out, the average minimum wage within the forest industry was around \$ 350,000 pesos per month (that is, US\$ 686 [exchange rate on 4 September 2013 – at the time of my fieldwork], whereas the legal minimum was \$ 210,000 pesos) and was more stable, regardless of the level of productivity. Notably, such improvements had been achieved due to the pressure of the union movement. Interviews with IW-MB-01, IW-MB-02, IW-MB-03 and R-MB-03. It is noteworthy that, ultimately, the legal minimum wages for all sectors were increased, by law, to \$ 225,000 pesos on the 1st of July of 2014.

As a second aspect, the above findings pointed to the role of unions, the public sector, academia, and – in the last ten years – the progress made by new laws⁷¹ and regulations in enhancing the OHS and working conditions. The latter factor, in the words of a labour authority⁷² was the “most important landmark” to improve working conditions. Third, all of the above factors that acted as the driving force behind all of those improvements seemed – to some extent – to have made workers more empowered and aware of their rights, as this researcher highlighted:

“As such, the forestry worker is interesting too, the worker in the year 2000 was rather a shy worker with strong agricultural roots; therefore, in forestry the mentality of ‘suffering’ was seen as part of the job, and ‘that’s it, things cannot be changed’ and ‘we must go on’. Today, a worker under 30 or 40 years is a guy who is more skilled from the point of view of having formal education and with much more awareness of their rights. Today we have a more empowered worker.” (interview with R-MB-03).

The greater awareness of forestry workers about their rights may also contribute to explain the critical attitude from some union representatives⁷³ towards the role of authorities in enforcing labour regulations:

“They only work based on complaints and practically, one has to be putting pressure on them [the labour authority] to make them do their inspections” (interview with IW-MB-01).

A government labour official⁷⁴ expressed a relatively similar view; while she did not recognize that the institution mostly relied on complaints to perform their inspections over firms, she agreed that they had limited resources and staff⁷⁵ to perform their activities, as well as covering the difficult – geographical – accessibility of most forest operations.

Mechanization of forest operations requires better-qualified workers: As noted earlier, forest operations had progressively evolved from rustic conditions in the early 1990s to mechanized operations, requiring fewer but more qualified forestry workers. This entails three closely intertwined aspects as analysed below.

⁷¹ Particularly, the impact of the Subcontracting Law (Law No 20123): this law played an important role in enhancing the working conditions of many contractor firms since the law forced large forestry enterprises to be responsible for the welfare of their contractor workers.

⁷² Interview with La-IX-01.

⁷³ Interviews with IW-MB-01, IW-MB-02 and IW-MB-03.

⁷⁴ Interview with IW-MB-01.

⁷⁵ This condition can be worsened after political elections, when there is a power handover from one political coalition to a different one. This brings about massive dismissals of skilled public officials and officers. Interview with IW-MB-03.

First, such mechanized operations needed not only highly qualified staff, but also workers willing to accept heavy working loads and comparatively modest benefits when compared with other sectors. While much of the working conditions had improved in the last fifteen years, such as forest camps, meals and OHS performance⁷⁶, forest enterprises' efforts to streamline ergonomics issues had not been strong enough: workers must deal with heavy workloads and much less than optimal machinery⁷⁷ and equipment to work with⁷⁸. One union representative illustrated this point as follows:

“In the team I’m working in there are 26 workers, but obviously my mates and I use to leave home at 5.30 am and get back home at 7.00 pm to earn some extra money, and we do the same to earn some extra money even when it is really hot outside. As I’m working in a lighter job I earn much less money but my mates that do heavy work [using heavy machinery] earn more. They grab the chainsaw and have a break at 10.00 am and then at 12.00 pm. At 14.00 pm there is another break, but apart from that the chainsaw doesn’t stop buzzing all day. They work overtime to earn some extra pesos [Chilean currency]. We just want to work normal shifts and not to kill ourselves to make extra money”⁷⁹. (interview with IW-MB-03).

A second aspect concerns – at least at the time of conducting my fieldwork – the growing scarcity of skilled and qualified workers to run forest operations with sophisticated machinery, since other sectors were more attractive economically⁷⁹. As a consequence of fewer people in forest operations, the remaining forestry workers faced bigger pressures to work overtime and not take holidays, showing signs of early fatigue and low productivity, in addition to family problems due to their long periods away from home.⁸⁰

The third aspect is the weakness of the qualification program for forestry workers under CORMA⁸¹. While this program represented an undeniable first step in 1994 for the forest industry’s progress, it also had important failures in the view of some respondents. The program was seen to have failed because of its deficient training, in both theoretical and practical terms (in practice, there was no formal training under this program), as one researcher explained:

⁷⁶ Besides reduced environmental impacts, large investments to mechanize large forest operations have greatly enhanced the OHS performance, reducing the frequency of occupational accidents (but now they are more severe). Interview with PFB-MB-q01. Also, contractor firms are supervised by large forest corporations to monitor their OHS performance. Interview with IW-MB-04.

⁷⁷ Even, this researcher carried out some measurements inside forest machineries during summer, noting temperature values of 45-Celsius degrees as well as the high exposure to vibes and noise. His findings were below the compliance with some occupational regulations (in particular, the Decree No 594 of 1999, which sets the basic sanitary conditions for workplaces). Interview with R-MB-03.

⁷⁸ Interview with R-MB-03.

⁷⁹ Interviews with A-VIII-01, R-MB-03 and IW-MB-01.

⁸⁰ Interview with R-MB-03.

⁸¹ The most prominent large plantation forestry firms are associated under the Timber Corporation “CORMA”. CORMA was created in 1952 and today its members own more than 55% of the 2.4 million hectares of plantation forests and are responsible for the 85% of Chile’s forest exports. One of their objectives is to professionalize – through qualifications systems – forestry to improve productivity issues (CORMA, 2015b).

“In theory, about why and how the machines work is learned through their [forestry workers] experience, only as they go. One day I was interviewing some workers and the skidder operator was absent. They handed over this machine to a person with no idea about how to drive it, and he was 5 times slower than an experienced operator would be. There are so many things that people have learnt as they go, but they have no technical understanding. I don’t know why more people have not died. There is a lot of improvisation.” (interview with R-MB-03).

One union representative⁸² expressed a similar view, stating that the theoretical component of the training is something “*that companies should improve most*”. Other critiques were directed against the program’s funding: in the experience of the above interviewee, forestry workers themselves mostly covered such costs, not the companies (the company charged the workers the percentage not covered by state subsidies⁸³).

High variation in working conditions amongst contractor firms: Contractor firms run most forest operations⁸⁴ of large forestry businesses. This is most marked in the largest businesses: most forestry workers are from contractor firms (OIT-Chile, 2012). Coupled with this, the working conditions, in terms of work environment and benefits, was very variable among different contractor firms, as many respondents described: while some of them had appropriate working conditions, others firms still had precarious working conditions, due to power asymmetries, as explained below.

As discussed in section 3.5.1, there were unequal power relations between large forestry businesses and their contractors that, in the view of some stakeholders⁸⁵, led to poor working conditions⁸⁶ in some contractor firms and good conditions in others, as some larger contractor firms were more financially sustainable than others (although, as one researcher⁸⁷ noted, this is not the only explanation for the variability between firms). As noted by one union representative:

“...We have complained about costs, because PFB-MB-p [a large forest corporation] imposes its own conditions when negotiating with their contractors...so when there is an imposed value, the weakest parties in this

⁸² Interview with IW-MB-03.

⁸³ SENCE (the National Service of Training and Employment) usually provides subsidies to private enterprises to cover the costs of training staff.

⁸⁴ According to official statistics the forest sector, in average, outsources up to 41.5% of their operations. These percentage increases as the firm increases its size. See Dirección-del-Trabajo (2011).

⁸⁵ Interviews with La-IX-01, R-MB-03, R-MB-01 and IW-MB-01.

⁸⁶ Despite that in general the OHS performance and some working conditions (viz. mostly meals, transport and accommodation for workers) had improved in many contractor firms of large plantation forestry businesses, some modest working conditions related to work environment still persisted. They included ergonomic aspects (including overtime and holidays) and availability of proper toilets and water for human consumption during forest operations. Interview with La-IX-01.

⁸⁷ It would also depend on the owner of the contractor firm (personal characteristics and management skills). Interview with R-MB-03.

relationship must juggle their costs and obviously they [the contractors] must reduce their costs [related to working conditions] to be able to meet some requirements when signing the contract...” (interview with IW-MB-01).

My case studies showed high variation in the working conditions among contractor firms as a result of these unequal power relations between large plantation forestry businesses (particularly, large forest corporations) and their contractors. While some of the wealthiest contractor firms showed the best working conditions, the less-resourced firms showed precarious working conditions.

Anti-union practices are common: Union representatives drew attention to the small percentage of forestry workers in unions and the persistence of anti-union practices. Only a small percentage of workers belonged to unions, according to both union representatives⁸⁸ and labour authorities⁸⁹. This finding is consistent with the most recent official reports for the agriculture and forestry sector combined, that is, only 7.2% of such workers⁹⁰ belong to unions (Dirección-del-Trabajo, 2011). Unions could have an important role balancing the power equation between workers and firms, as many union representatives noted: companies without unions had the poorest working conditions⁹¹:

Official reports⁹² have also provided some reasons to explain why most forestry workers showed little interest in belonging to labour unions. These reasons were mostly “being afraid of the consequences”, and a lack of awareness of the potential benefits of unions. To explain this, union representatives revealed the existence – and persistence – of anti-union practices aimed to weaken unions representing employees of contractor firms. Some contractor firms seemed to be pressured by large forest corporations to carry out this kind of practice, as claimed by this union representative: “Do you know what are some of the main clauses to comply with these contracts? [service supply contracts, signed between large plantation forestry businesses and their contractors]. Some clauses set that contractors must not be engaged in industrial actions otherwise they will be sacked. And they say [the large forestry businesses] to their contractors: ‘if you are engaged in a dispute with your union you have to get out, straight away’. It is a reason to terminate the contract.” (interview with IW-MB-04).

Other examples⁹³ of anti-union practices included: unjustified dismissals of workers; the existence of shared “blacklists” of workers amongst firms, to avoid hiring individuals; discrimination against workers who belong to unions, by providing more benefits to workers

⁸⁸ Interview with IW-MB-04.

⁸⁹ Interview with La-IX-01.

⁹⁰ According to the same official report, this percentage rises as the size of the firm increases. However, the outsourcing of most forest operations would lower the proportion of worker in unions since the vast majority of contractors were small and medium-sized firms.

⁹¹ Interview with IW-MB-04.

⁹² See Dirección-del-Trabajo (2011).

⁹³ Interviews with IW-MB-01, IW-MB-02, IW-MB-03 and IW-MB-04. Also, official reports claim that around 50% of unions are affected by anti-union practices (Dirección-del-Trabajo, 2011).

who did not; and obstacles “in every way imaginable” to discourage the creation of new unions as well as prosecution of union representatives.⁹⁴ These findings are also consistent with the information presented in Table 3.7.

Anti-union practices	Number of reported cases	Percentage (*)
To avoid the creation or membership of/to a union	2,220	36.9%
Unjustified dismissals of workers without union protection	1,307	21.7%
Prosecution against union representatives	1,280	21.3%
Obstruction to collective bargaining	943	15.7%
Obstruction to the job of union representatives through moving them to other places or changing their duties	915	15.2%
Illegal dismissals of union representatives	377	6.3%
Other anti-union practices	306	5.1%

Table 3.7 Type of anti-union practices in the Chilean forest sector.

Source: Adapted from Dirección-del-Trabajo (2011). Note: * = Multiple options for answers; they do not total 100%.

In this context, one union representative⁹⁵ claimed that collective bargaining was, in practice, weakened by the current labour legislation⁹⁶. Instead of a common negotiation process including all the contractors firms of one large forest corporation, the law forced companies to establish independent negotiation processes with each contractor firm, irrespective of their numbers⁹⁷. This may explain the low percentages of collective bargaining that official reports (Dirección-del-Trabajo, 2011) show: only 26.7% of workers within the forestry industry have collective bargaining agreements.

As seen above, although some working conditions have improved substantially in the last fifteen years in large plantation forestry businesses, forestry workers had important deficiencies in their training programs; experienced work overload; and many suffered from

⁹⁴ So widespread were such practices that trust between firms and forestry workers was, in many cases, seriously damaged. As an example, during my fieldwork I had an initial contact list of union representatives provided by a large forest corporation; however, it was impossible to interview them as they linked me with such a corporation. Finally I accessed a final sample of union representatives by using the snowballing technique, from a list provided by other informants.

⁹⁵ Interview with IW-MB-01.

⁹⁶ The labour legislation that this interviewee refers is the Labour Code, which dates back from the early 1980s, during the Pinochet era, when most public policies were influenced by neoliberal approaches. Recently, after more than 30 years of this Code, the government of Michelle Bachelet announced a major reform that would allow effective collective bargaining rights, but this has been strongly resisted by the political opposition, nevertheless.

⁹⁷ For example, the large forestry business “PFB-MB-p” ran its forest operations through 360 contractor firms (some of them were relatively large, hiring 200-300 forestry workers whereas others were smaller, hiring 40-50 workers). Therefore, these firms should have 360 unions and, subsequently, 360 independent collective bargaining processes.

anti-union practices due to unequal power relations between large forest corporations and contractor firms. Therefore, the tension between these deficiencies and the scarcity of skilled workforce, that could have acted as a driving force behind the improvement in working conditions, seem to have counteracted each other; in practice, economic cycles have apparently prevented mass exits from the workforce.

3.5.3.2 Relations with local communities and Indigenous peoples

Large forestry businesses face serious conflicts with Indigenous peoples and local communities

My findings suggested serious long-standing conflicts between large forest enterprises and Indigenous communities as well as with some local non-Indigenous communities, leading to a non-sustainable situation for these firms in the long-term, as explained below.

Large plantation forestry businesses face long-standing land tenure conflicts with Mapuche peoples: Large forest enterprises and, particularly, large forest corporations have faced, and continue to face, severe land tenure conflicts with *Mapuche* peoples (an Indigenous ethnic group concentrated in the VIII and IX regions⁹⁸). A number of aspects help to understand this long-standing and complex conflict faced by large plantation forest owners.

The first of these is related to the poverty in the regions where most large plantation forests are concentrated: while one respondent from the industry recognised the poverty in such regions, he did not blame the forest industry for this:

“Our company is present in 104 communes [Chilean administrative districts]. Within those communes the 80% of the people show the lowest human development index (HDI) of Chilean communes. It is always said that ‘forestry businesses have caused poverty in the neighbourhood’, but things don’t work that way, poverty already existed; we are placed on the 80% of the most eroded soils in the country and our neighbours, those who do not cultivate plantation forests, they carry on with their subsistence agriculture. ” (interview with PFB-MB-q01).

Consistently, the last official survey (Ministerio-Desarrollo-Social, 2014) of poverty in Chile showed a significant reduction in this problem compared with 2011, with 3.9% of the population categorized as extremely poor. Despite this positive change, the regions where both

⁹⁸ According to the last reliable census of Indigenous population, Indigenous peoples are mostly concentrated in the VIII, IX and X regions, being the *Mapuche* peoples the predominant Indigenous ethnic group in Chile (INE, 2002).

large plantation forests and the *Mapuche* peoples are concentrated, that is the VIII and IX regions, show the highest percentages of extreme poverty: 7.1 and 9.0%, respectively.

Second, as seen earlier in the Chapter, privatization policies applied during the late 1970s exacerbated a pre-existing conflict between the *Mapuche* peoples and the Chilean state, since many of them were forced to sell their lands (called “Merced titles”⁹⁹) (see Figure 3.4) (CONADI, 2014; Miller Klubock, 2004) to non-Indigenous owners in a questionable fashion, originating a conflict that continues to today.

However, it is also the case that large plantation forestry businesses have sold lands that overlapped with former Merced titles to the state, so they can be returned to Indigenous peoples.¹⁰⁰

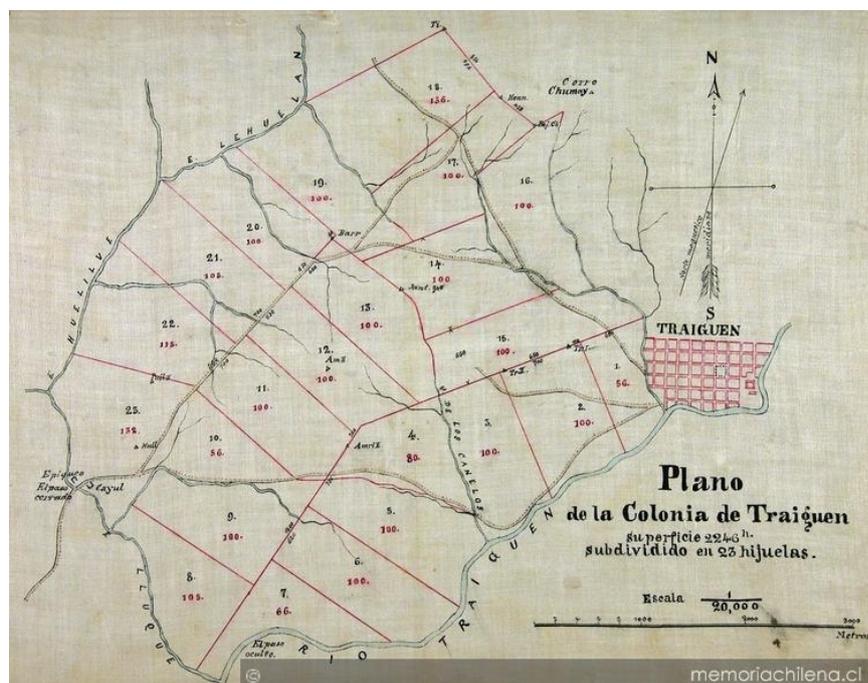


Figure 3.4 XIX century map of a Chilean colony (Traiguén) including some Merced titles.

Source: courtesy of the National Archive.

These new policies have made forest companies stop buying (or even considering buying) lands that may present some degree of overlap with such Merced titles¹⁰¹. But even not buying or retaining lands that overlap Merced titles was not a guarantee for a company of being free of conflicts, as this forest authority pointed out:

⁹⁹ “Merced titles” is the Chilean name for Indigenous reservations.

¹⁰⁰ Those lands are returned to Indigenous communities under the 1993 Indigenous Law (Law No 19253). See Appendix 13.

¹⁰¹ Interview with PFB-VII-j01.

“...but this [the land tenure conflict] is complicated in this region too, because Indigenous communities are always claiming more lands than the Merced titles”. (interview with A-IX-01).

Some specialized industry officers provided an explanation for this fact, taking into account that the original territory of *Mapuche* peoples spanned around 10 million hectares and that they had a nomadic life style:

“So the final result was that the Mapuche peoples were forced to live on few hectares, each family had around 20 hectares. Luckily today each family has half an hectare because land was divided for successive generations. They overexploited their native forests, not leaving anything to survive...then, and this is pretty obvious; if they no longer had forests they sought trees from plantation forests and that’s the reason why trees are stolen from our lands. But they have nothing, and so the solution is not easy.” (interview with PFB-MB-q01).

According to the above interviewee and official statistics (CONADI, 2014; Comisionado-Presidencial-Asuntos-Indígenas, 2008), the Chilean state recognised 2,918 Merced titles totalling c. 510,387 hectares, and they would be inhabited by approximately 800,000 people. Other reasons why finding solutions to this conflict is hard are the fragmentation of *Mapuche* communities and the multi-centric governance of Indigenous communities¹⁰².

Third, the *Mapuche* conflict has turned violent since the late 1990s. This violence has been translated into attacks on forest trucks; threats and assaults to the staff of forest companies, including shootings perpetrated by violent activists, and intentional bushfires¹⁰³. The vast majority of *Mapuche* peoples, however, are against violence, and the violent faction represents only a small proportion of this ethnic group, as claimed by this forest officer:

“My compromise is towards the communities, I consult them, I work along with them but I don’t want to be forced to work with that 1 to 2 % of violent peoples” (interview with PFB-MB-q01).

¹⁰² Very often, forest companies have had to negotiate, separately, with the *lonko* (male leaders), *machi* (usually, female leaders) and the formal president of such communities since they often have radically different viewpoints. Also, in many occasions, firms have also had to negotiate with each member of those communities as they could not agree on the decisions of their leaders. This has been highly time and resources consuming. Interview with PFB-MB-q01.

¹⁰³ Intentional forest wildfires had been particularly frequent in the last summers and they only seem to increase in magnitude and severity. Usually, the wildfires connected with this conflict are much more devastating than those that are not connected. Interview with PFB-MB-q01. The media have also reported profusely intentional wildfires (Sustentare, 2014). In addition, according to official reports, one the main causes of wildfires are caused by the intentional action of people (27%), being plantation forests (28%) more affected than any other forest type (Lara *et al.*, 2013).

Generally, an important part of the *Mapuche* conflict with large forests corporations has historical origins that have not been properly addressed by the state through effective public policies.

Large forest enterprises neglected Indigenous and non-Indigenous communities for a long time: Some respondents, even within the forest industry itself, felt that large forestry businesses had largely ignored their surrounding local communities, understanding that this would subsequently bring about a number of conflicts – including land tenure conflicts with Indigenous communities. As expressed by this forest officer:

“Fifteen years ago we started to mechanize our operations, not because of costs, actually it was expensive. The reason was because we wanted to improve our OHS indicators and they improved a lot when we mechanized. But this meant, and we didn’t realize it [until recently], that we caused more trouble on our operations: such unhappy people [who lost their jobs] started some wildfires on our plantations and cut native trees in areas in which we had native forests in retaliation¹⁰⁴. Also, many people that had traditionally entered into our forestlands to get some firewood [free leftovers from forest operations] found that we had restricted such permits because we despised of them. This event triggered a vicious circle: we made more people angry closing out doors to avoid wildfires, but instead it was self-defeating because more wildfires happened.” (interview with PFB-MB-q01).

The above interview also uncovered other motivations behind the deep resentment that many local communities and Indigenous representatives¹⁰⁵ felt against large forest enterprises: forestry workers, both Indigenous and non-Indigenous, from local communities that had participated in planting those trees suddenly were unemployed, and further, they had to stand the transit of heavy machinery on their roads, lifting dust, making noise, as well as causing a general deterioration in the quality of their everyday lives. Plantations used to be called “green soldiers” since in the view of Indigenous and local communities they have been “destructive, stand in straight lines and advance steadily forward” (Petermann and Langelle, 2006).

Similarly, one Indigenous villager¹⁰⁶ illustrated the loss of jobs provided by large forest firms stating that “the forestry company no longer needs people [from that local community] because they now have machinery”.

¹⁰⁴ In the Chilean culture, it is not unusual to find cases in which employees who feel they have been unfairly dismissed plot against their former employers. Such actions can include thefts, defamation, and, in the case of forestry businesses, arsons and intentional wildfires.

¹⁰⁵ Interviews with I-VIII-01 and I-IX-01.

¹⁰⁶ Interview with I-VIII-01.

In brief, the restrictive approach followed by large forest companies and the lack of appropriate public policies generated a number of tensions with Indigenous and non-Indigenous communities, with resistance ranging from simple thefts of firewood or illegal trespassing of forestlands to serious intentional wildfires, arsons and attacks.

3.5.4 Section summary

As seen in this section, although large plantation forestry businesses (particularly, large forest corporations) have been an economically successful export-oriented sector, they have caused significant negative environmental and social impacts in the territories in which they are located. Although large plantation forestry businesses have improved some of those impacts, they have also resorted to a number of self-regulation initiatives, as we will see in Chapter 4.

3.6 *Small and medium-sized plantation forestry businesses*

This section explores the characteristics that make small and medium-sized forest enterprises different from their larger counterparts. As in the last section, I will examine the forestry practices of these firms and their associated environmental and social issues, as well as the explanatory factors that account for their being very differently placed to large plantation forestry businesses.

3.6.1 Some characteristics and economic issues

Small and medium-sized plantation forestry businesses are dependent on large plantation forestry businesses

The circumstances of forest owners of small and medium-sized enterprises are quite different from those faced by large enterprises. Small and medium enterprises are less sophisticated technologically and organizationally than their larger counterparts, and this affects their environmental, social and economic performance. In understanding the circumstances of small and medium-sized plantation forestry businesses and their implications, I will examine four important aspects: the supply chain, the type of exotic trees being used, the level of specialization in forest operations and, the financial constraints faced by these companies.

Forest owners as suppliers of larger enterprises: Although most of exotic plantation forests are owned by large plantation forestry businesses, the timber needs of domestic and international markets exceed what their own forest assets can provide. Hence, small and medium-sized forest owners of plantation forests fill this gap between supply and demand,

usually by harvesting and then selling timber to sawmills and pulp mills of larger enterprises¹⁰⁷ – particularly large forest corporations – making use of existing supply chains that are controlled by the same large enterprises. However the prices they obtain are usually extremely modest, a situation that is strongly criticised by certain local communities' members:

“Here, the sawmill sells cubic metres of sawn timber for between 30,000 to 40,000 pesos [circa 58 – 78 US\$ dollars¹⁰⁸], possibly even more. And, do you know how much the people are paid to produce those cubic metres? Just 18,000 pesos [circa 35 US\$ dollars¹⁰⁹]. Then, the peasant is forced to sell them at this price because there is nowhere else to sell them. The saw mill owners are lords and masters, just taking care of their pockets.” (interview with I-IX-01).

The economic conditions imposed by large forest enterprises have provoked a strong resentment amongst small timber suppliers. They felt that they were practically forced to sell timber to large forest corporations since these corporations have monopolized the domestic market and limited their options.

A mix of hardwood and softwood species is employed: The type of exotic trees being cultivated by small and medium-sized forest owners largely depended on the financial situation (and size) of such forestry businesses. The smaller – and more financially precarious – firms are more dependent on hardwood species (eucalypts). This is unsurprising, because some small owners argued that they could obtain quicker returns from species showing high growth rates¹¹⁰ and short rotation cycles¹¹¹.

In contrast, medium-sized forest owners had a better financial outlook because they could afford to cultivate a mix of both hardwood and softwood species, with the latter having slower returns but obtaining better prices in the domestic market¹¹². Thus, it was relatively common to find forestlands of medium-sized forest owners in which pine plantations made up the majority¹¹³ (over 90%) of their exotic tree plantations.

Small and medium-sized forestry businesses are less specialized than large forestry businesses: Generally, small and medium-sized enterprises did not exclusively rely upon the cultivation of exotic tree plantations. Two aspects are relevant here.

¹⁰⁷ Interview with A-VIII-01.

¹⁰⁸ Exchange rate on 4 September 2013 – at the time of my fieldwork. Prices at the sawmill door (after processing).

¹⁰⁹ Exchange rate on 4 September 2013 – at the time of my fieldwork. Prices at the sawmill door (before processing).

¹¹⁰ Interview with I-VIII-02.

¹¹¹ Interview with PFB-VIII-l01.

¹¹² Usually, sawlogs of radiate pine reach better prices than pulp logs of eucalypts in the Chilean domestic market.

¹¹³ For example, one forest owner had 700 hectares of plantations forests, of which the 95% was made up of pine plantations and the remainder 5%, of hardwood species. Interview with PFB-VIII-m01.

First, small firms usually made use of forestry¹¹⁴ as an “add-on” to increase the productivity of their farms, to stabilise depleted soils from erosion (as noted earlier in the Chapter), and to obtain better profits from their farms as a whole.

Second, since many small and medium-sized firms were not exclusively engaged in forestry, many are grouped under common trade associations to trade their timber products and, even further, delegate the control of their forest operations.

The case of Forestal PROBOSQUE¹¹⁵, created in 1993, is an example of an association providing the administration, advice, supervision and control of the forest operations to their associated members (plantation forest owners whose forestlands ranged between 30 to 800 hectares), as well as the commercialization of their timber products under a common supply chain. Equally important was the creation, in 2009, of PYMEMAD A.G., which is the “Trade Association of Small and Medium-Sized Industrial Timber Owners”. PYMEMAD A.G. was established with the explicit goal of counteracting the high concentration in the ownership of plantation forests and in the timber supply chain, and to ensure free competition.¹¹⁶ This occurred because they needed technical assistance and, at the same time, they sought better market conditions in which to trade their timber products, ameliorating – at least partially – the monopoly exerted by large forest corporations.

Small forest operations face higher costs, and are usually temporary and outsourced: Outsourcing of forest operations was not exclusive of large enterprises; small and medium-sized companies also operated this way. One CEO¹¹⁷ of a medium forestry business pointed out that all the company’s forest operations were outsourced; during my fieldwork, I learnt of that the only persons directly hired by this firm were in administrative positions, viz. the CEO and the forest manager¹¹⁸.

The outsourcing of forest operations were justified since their forest operations were discontinuous throughout the year. As stated by the abovementioned CEO:

“There are years in which we do not cut any eucalypts at all, unlike other years when we do really work. This is a small company in financial terms”.
(interview with PFB-VIII-n01).

¹¹⁴ Some small (PFB-VIII-s and PFB-VIII-r) businesses combined agriculture and forestry to maximize the use of their resources and obtain better profits.

¹¹⁵ The firms PFB-VII-j, PFB-VIII-l, PFB-VIII-m and PFB-VIII-n were grouped under PROBOSQUE. See also their webpage on PROBOSQUE (2015).

¹¹⁶ See also on the webpage of PYMEMAD (PYMEMAD, 2013).

¹¹⁷ Interview with PFB-VIII-n01.

¹¹⁸ Interview with PFB-VIII-n02.

Small and medium forest enterprises make a less intensive use of the services provided by contractor firms due to the temporary characteristic of their operations. Similarly, they were not able to make use of economies of scale to the same extent of that of large enterprises. Indeed, some researchers¹¹⁹ pointed out that small forest owners must struggle with higher costs to establish plantation forests along with precarious financial conditions to appropriately perform their forest operations.

3.6.2 Forestry operations and environmental issues

Modest sophistication of small and medium-sized forest operations

As apparent from my case studies, small and medium-sized forest operations had less sophisticated means to execute their forest operations. This has had mixed outcomes in their environmental performance, depending on the type of operation and business orientation, as described below.

The smaller the firm, the less sophisticated means to perform their operations: Some forest owners and contractors¹²⁰ experiences revealed that forest operations combined different methods, and that these may be executed at any time of the year. Such methods – in the case of timber harvesting – would range from traditional harvest using animal power (oxen) and chainsaws, especially in small forest operations as well as Indigenous communities¹²¹, to more sophisticated means to perform those operations, including machinery such as skidders and “three-wheels” (Chilean term for ergo loggers) in medium-sized¹²² forestry businesses. It is important to note that such forestry machines would cause more environmental impact than the sophisticated machinery used by large forest operations, or traditional harvesting methods using animal power and chainsaws¹²³.

¹¹⁹ Interviews with R-VIII-01 and R-MB-03.

¹²⁰ Interviews with I-VIII-02, PFB-VIII-r01, CT-VIII-t01, CT-VIII-t02 and PFB-VIII-s01.

¹²¹ Interview with I-VIII-02.

¹²² Interview with PFB-VIII-t01.

¹²³ Interview with CT-VIII-t01.



Figure 3.5 Use of “three-wheels” (ergo logger) in medium-sized forest operations.

Source: courtesy of the Forestry and Timber Forum.

In addition, some operations neglected the impact of their operations on the environment. This was reflected, for example, in the period of the year when forest operations may be executed: some forestry businesses performed their operations at any time of the year¹²⁴, even during wet seasons, when negative impacts on the soil are more likely. One forest owner¹²⁵ argued that the availability of contractors was the main factor to consider when deciding to perform timber harvesting.

Therefore, some operations caused significant environmental damage, as stated by this contractor:

“Well, sole traders leave the minimum [buffer area] as nobody controls anything here. Sole traders are only interested in getting the most; they do not leave those required 10 or 20 metres [of buffer area]. There is no enforcement by CONAF, or by anybody else...they [small forest owners and their contractors] get to some places and just cut. They are not concerned about that [following regulations]. (interview with CT-VIII-t01).

The above example also reflected the financial pressures experienced by small forest owners, illustrated in the phrase “getting the most”. Another contractor disclosed another unsustainable forestry practice related to the management of buffer zones when performing timber harvesting:

¹²⁴ Interviews with PFB-VIII-r01 and PFB-VIII-s01.

¹²⁵ Interview with PFB-VIII-s01.

“Yes, because they [small forest owners] take much less care, leaving trees to fall into water courses, and nobody controls that. As they are small they do not have any care, they do what they feel that needs to be done, and that’s all.” (interview with CT-VIII-t02).

In the opinion of many respondents, some small plantation forest owners seemed to share a feeling of impunity due to the low possibility of law enforcement related to their activities.

A minority of small and medium-sized firms made efforts to meet regulations: Although a relatively high proportion of small forest owners appeared to engage in unsustainable practices, a minority of firms acted differently. Some small – and to a greater extent medium-sized – firms took legal compliance seriously, as much as they could. For example, one contractor observed:

“Yes, you still need to take care of the buffer zones, if there are trees inside those zones you have to leave them, to avoid damaging the environment. This is because of the nature; the native forests must be protected. Anywhere you find buffer zones, slopes and near watercourses you do not have to touch them at all”. (interview with CT-VIII-t02).

Many contractors working for large forestry businesses follow commonly accepted procedures when performing their work on small and medium-sized operations, including the felling, and extraction¹²⁶ of trees. This may be explained because many of these small and medium-sized enterprises sold their timber to sawmills and pulp mills of large enterprises, particularly large forest corporations, and they needed to demonstrate that they had harvested the timber legally.

Agroforestry is more environmentally-friendly: Forestry practices seemed to be more environmentally-friendly when combined with agriculture and livestock production. Two small forest owners¹²⁷ reported that this approach encouraged them to perform more sustainable practices. One of the forest owners summed this up as follows:

“For example, we take care not to spill oil everywhere; we try to recover part of the biomass that is left in the field. We don’t do slash-and-burn practices, we have an agreement with the CMPC [a large forest corporation] whereby they harvest our trees and clean up the field, and they take away the biomass and it is converted into energy. Of course, that you’re losing too much when you take that topsoil out from your soil because you remove an important amount...but if I managed to recycle all that stuff with worms it’d be a big business since it would increase the fertility of my soil. There are also

¹²⁶ Interview with CT-VIII-t02.

¹²⁷ Interviews with PFB-VIII-r01 and PFB-VIII-s01.

chemical products we do not apply because we have other crops, cows, calves, etc.”” (interview with PFB-VIII-r01).

Overall, my case studies showed mixed outcomes concerning the environmental performance of small and medium-sized plantation forestry businesses: while many forest owners gave little consideration to the environmental impacts of their forestry practices, a minority of forest owners, and particularly agroforestry businesses, followed sustainable forestry practices.

3.6.3 Social issues

To address the social issues faced by small and medium-sized forest operations, I grouped my findings into two sub-sections: forestry workers and local communities (including Indigenous peoples).

3.6.3.1 Relation with forestry workers

Small and medium-sized forestry businesses have modest working conditions

As previously noted, small and medium-sized forestry businesses were less organizationally and technologically sophisticated than large enterprises. This condition had also translated into more modest OHS performance and working conditions. I will explore two aspects accounting for this: the formality of this sub-sector, and the quality of its manpower.

More modest OHS requirements and working conditions: My findings suggested that small forest operations had the worst working conditions and OHS requirements; and this performance improved as the size of forest enterprises increased (usually, in medium-sized firms). As this union representative observed:

“Look, we always say that we have two realities: one is the reality of the large companies and the other one is the reality of the small companies. So you will be able to find luxury forest camps in some sectors that belong to those two large companies [large forest corporations] but there is another reality too, in small forest operations and sawmills where there are no such camps, where forestry workers have to sleep in very precarious conditions.” (interview with IW-MB-01).

This respondent provided an example of a small forest operation that carried people, animals and fuel on the same vehicle, which contravened the regulations on minimal working conditions¹²⁸. Other respondents¹²⁹ within the industry were of a similar view, claiming that

¹²⁸ Decree No 594 of 199, which sets the basic sanitary conditions for workplaces.

many small forest operations – specifically, those concerned with timber harvesting – were run without complying with the minimum OHS standards, such as no use of protective personal equipment (PPEs), lack of OHS training, and little supervision from OHS experts.

Consistent with this, INFOR (2015a) statistics show that the accidents rate of logging operations (c. 3.1%, per 100 forestry workers), although lower than that of the timber processing industry, is characterised by a greater severity: 22,103 average lost days caused by accidents were reported in 2014. Despite the lack of specific statistics at different forestry businesses scales, there are higher rates of accidents for small and medium-sized (over 4.7% per 100 forestry workers) than large enterprises in Chile (less than 3.2% per 100 forestry workers).¹³⁰ Therefore, the OHS performance may be even worse in non-formalized small forest enterprises since labour officials can, in most cases, only access formalized enterprises¹³¹ through planned inspections and public accusations.¹³²

The manpower is generally older and the sub-sector less attractive than large forestry businesses: Arguably, as my interviews with some respondents¹³³ pointed out, the poor benefits and difficult working conditions make this sector particularly unattractive to forestry workers, for two reasons.

First, qualified forestry workers in their most productive years do not choose to work in this sub-sector. Rather, as stated by this researcher, older workers usually choose this sub-sector:

“In large forestry businesses it is very hard to find forestry workers over 50 years old. This is because once over 50 years workers begin to show health problems and they are ‘invited’ to quit their jobs. They present medical certificates because of diseases or aches; then those medical certificates are no longer accepted and soon they migrate to small or medium-sized enterprises to make their living.” (interview with R-MB-03).

¹²⁹ Interviews with R-MB-03 and PFB-VIII-s01.

¹³⁰ See SUSESO (2015).

¹³¹ They consider the companies from which they have sufficient and “formal” information unless they received denunciations on non-formalized forest operations. Interviews with La-IX-01 and R-MB-03.

¹³² There is sufficient consistency between respondents (a labour authority and one union representative) to say that the frequency and quality of such planned inspections (through programs) were less than optimal (interviews with La-IX-01 and IW-MB-01). Additionally, in 2013 the website of the Labour Authority announced that these inspections would be held across many regions but during no more than a couple of weeks of the year – arguably, due to the lack of resources (Dirección-del-Trabajo, 2013).

¹³³ Interviews with R-MB-03 and IW-MB-01.

Also, very young (18-20 years old) and unskilled workers who cannot be hired anywhere¹³⁴ else chose jobs showing the poorest working conditions and OHS performance, as generally occurred in small forest operations.

Second, this sub-sector was less attractive than large forestry businesses because of their modest working conditions and benefits – particularly wages – as compared with large forestry businesses¹³⁵.

Since this sub-sector did not attract many forestry workers, it was particularly affected by the shortage of qualified labour, causing it to resort to less-skilled workers. Hence, it was usual that people from local communities, whether peasants and Indigenous¹³⁶, were hired in small forest operations, having little or no formal training at all in many cases.

3.6.3.2 Relations with local communities

Small and medium-sized forestry businesses: positive relations with local communities

My interview findings in small and medium-sized forestry enterprises provided a completely different picture from those with large forestry enterprises, in terms of their relations with their communities, as I will discuss below.

Collaborative agreements between companies and communities: Most respondents¹³⁷ within this sub-sector were of the view that the close relations they had with their local communities facilitated win-win agreements that benefitted both them and such communities. Usually, such agreements consisted of a number of actions spearheaded by the firm. They ranged from the maintenance of shared local roads and schools to providing jobs for communities and investment in projects for the development of communities. In turn, the community took care of the forest plantation, acting, for example, like informal forest rangers. A small forest enterprise's CEO illustrated this:

“In social terms we have always had good relations with the neighbours; we have provided them with jobs. We have also authorized them to collect non-timber forest products such as mushrooms and wild fruits, we allow them to pick up firewood as well.” (interview with PFB-VIII-n01).

¹³⁴ Interview with La-IX-01.

¹³⁵ Interview with IW-MB-01.

¹³⁶ Interviews with IW-MB-01 and L-VIII-01.

¹³⁷ Interviews with PFB-VII-j01, PFB-VIII-l02, PFB-VIII-n01, PFB-VIII-n02, PFB-VIII-t01 and PFB-VIII-s01.

These collaborative agreements acted, in practice, as a form of social licence to operate these forestry businesses since the disconnection with the views and needs of local communities may have serious consequences as some villagers suggested.¹³⁸

Finally, one forest manager¹³⁹ commented that his company was particularly concerned with the stability of the jobs they offered to local people, making all the necessary efforts within their financial and technical constraints (since most of their operations were temporary). For example, this company tried to provide at least casual jobs to local community members throughout different periods of the year. Therefore, the company made the effort to provide, at least, some sources of complementary incomes to help to sustain the livelihoods of their local communities.

3.6.4 Discussion of the Section

Notwithstanding some positive environmental impacts of exotic tree plantations, such as the alleviation of the soil erosion in certain regions, most negative environmental impacts in the forestry sector are those associated with plantation forestry businesses: conversion of natural forests to plantations, and environmental degradation and pollution due to widespread forest operations. These negative impacts have been identified by other authors (Nahuelhual *et al.*, 2012; Reyes *et al.*, 2014). Plantation forests expansion has also had negative social outcomes on local and Indigenous communities, forestry workers and many contractor firms who have not reaped the expected benefits of this model, which is strongly based on exports. Furthermore, the origins of this afforestation model have been perceived as illegitimate since my case studies reported that after the military coup an important number of peasants and Indigenous communities were forced to sell their lands to make room to plantation forestry expansion. This is consistent with other studies (Vergara, 2006; Frêne and Núñez, 2010; Reyes and Nelson, 2014) and has led to a serious land tenure conflict with Indigenous communities due to capitalist “accumulation by dispossession”, a phenomenon of which there is considerable evidence in the history of forestry worldwide (see, e.g. Gerber, 2011; Kröger, 2014). Overall, this model, based on neoliberal policies (Giljum, 2004; Fleming and Abler, 2013) and generous subsidies¹⁴⁰ to landowners¹⁴¹, has been economically successful¹⁴², but it has concentrated its economic benefits in few large companies.

¹³⁸ Interview with L-VIII-01.

¹³⁹ Interview with PFB-VIII-n02.

¹⁴⁰ Forest plantation subsidies have been used in many developed and developing countries worldwide (Bull *et al.*, 2006).

¹⁴¹ Subsidies have paid between 75 and 90% of the initial afforestation costs at the second year of successfully established tree plantations. See in Fiabane Salas (1998)

¹⁴² For example, it totalised US \$ 2,807,879 during 2013, becoming the third largest export sector.

My case studies showed important power asymmetries between large plantation forestry businesses and their contractors and local community stakeholders. These power asymmetries were replicated between contractor firms and forestry workers, who were mostly outsourced workers. This is consistent with other authors' work (Frêne and Núñez, 2010; Díaz *et al.*, 2007) who have also found that the outsourcing¹⁴³ to be an explanation of the poor benefits for forestry workers. Moreover, notwithstanding that the working conditions and, particularly, the OHS performance of the large-scale industry have significantly improved in the last fifteen years, as reported by other studies (Ackerknecht, 2010; Meyer and Tappin, 2014), the progressive mechanization of this industry had left many less-qualified workers unemployed. This is particularly relevant for local communities that, instead of benefiting from local hiring policies, suffer the negative impact of forest operations on their territories, as described by Andersson *et al.* (2016).

Overall, most of the negative environmental and social impacts of plantations had been caused by large forestry businesses. In contrast, the aggregate impact of small and medium-sized forest operations seems comparatively less than that of large firms because they own much less plantation area. However, it is not possible to make judgements on the basis only of business scale without considering other contextual factors (e.g. dispossession of Indigenous people and peasants, abolition of workers' rights and degradation of native forests) and temporal changes that have influenced the performance of large-scale forestry businesses.

3.7 Native forests: small, medium-sized and large forestry businesses

In this section, I will analyse my findings about native forestry businesses and discuss some of the main characteristics of this sector, including forestry practices as well as economic, social and environmental issues.

3.7.1 Characteristics of native forestry businesses

Native forest enterprises are a modest and strongly controlled sector

Collectively, small, medium-sized and large native forest enterprises pale economically, and in other technical, economic and productivity terms, compared to plantation forestry businesses. Why and how do native forest enterprises differ from plantation forests? My

¹⁴³ The outsourcing of most forestry workers was a process that began since the large state forest companies were privatized in the middle 1970s and this process reduced substantially the social benefits for those workers (Miller Klubock, 2004).

findings showed that a combination of technical complexities, microeconomic factors and state bureaucracy explained this difference. Each of these factors is developed below.

Native forestry businesses are an economically modest sector: The industry based on the exploitation of natural forests in Chile is modest in size. This sector, inclusive of both relatively large (in strict terms, they are medium-sized operations¹⁴⁴, but due to their forestry specialization, international market orientation, and organizational/technological sophistication they are classified as “large” forest operations here) and small firms, only accounts for a small share of timber exports, yielding low profits that are not relevant at the national level. A number of aspects explain this.

First, firewood is the main product harvested from native forests due to their low timber quality; the production of sawn timber, with a better economic value, is more limited. Most relevant interviewees¹⁴⁵ (including authorities, forest owners and managers) agreed that sawn timber recovery from native species was low, usually around 20%; this percentage rises¹⁴⁶ over time when forests are properly managed. The views of my respondents were supported by the most up-to-date public reports.¹⁴⁷ Some incipient and innovative initiatives based on the use of firewood as biofuel for the dairy industry are beginning to thrive, and delivering better prices; this is promoted by the forest authority¹⁴⁸, and a market niche that is usually exploited by small and informal forest owners.

Although some innovative projects encouraged a better use of the products obtained from native forests, a central feature of the native forest sector is the informality of firewood production and its supply chain. Most firewood is supplied by small traders in barely regulated conditions: traders rarely invoice their final clients (so evading taxes), firewood is sold with high variation in its moisture content and, hence, there is high likelihood of damaging heating systems and causing air pollution (Gómez-Lobo *et al.*, 2006). Moreover, formalized native

¹⁴⁴ See Appendix 4.

¹⁴⁵ Interviews with A-X-01, NFB-XIV-g01, NFB-XIV-e01, NFB-XII-d02 and NFB-IX-b01.

¹⁴⁶ For example, the forest enterprise NFB-XIV-g had mixed forests that allowed their owners to obtain percentages of sawn timber of approximately 35-40%. On the other hand, the forest owner NFB-XIV-e01 noted an increase in the percentage of sawn timber extracted from her forests, but after more than ten years of forest management.

¹⁴⁷ Firewood is by far, the main forest product of native forests and, due to the degradation of native forests by high-grading only 25% of sawn timber could be obtained from them (Lara *et al.*, 2013).

¹⁴⁸ Interview with A-X-01.

forest operations are strongly controlled by the forest authority. This makes illegal logging¹⁴⁹ and firewood smuggling a more convenient option to many small producers and traders¹⁵⁰.

As a second aspect, the same interviewees as above were of the view that the long rotation cycles of native forests made it hard to obtain quicker returns and better profits as compared with those of plantation forests. For instance, these rotation cycles can range from approximately 50 years¹⁵¹ in the southern *Siempreverde* forests (including *Roble-Raulí-Coihue* and *Coihue-Raulí-Tepa* mixes) to 120 years¹⁵² in the further south *Lenga* forests, as described by one southern forest owner.

Further, the profitability of forest operations in native forestry businesses was lower than that of exotic tree plantations, since firms had to work on a longer time scale and deal with poor timber yields, as illustrated by one local community representative working for a firm:

“Of course I think so [when asked about why he thinks the native forest sector in the XII region has low profits], that is because you don’t have a stand to be harvested in 12 years [in comparison with plantation forests]. Now, because of the management this company is doing, they are going to get higher yields in just 40 years. Actually, they have a work schedule until 2050; for example, they are going to harvest in 2045 the forests they are managing now” (interview with L-XII-01).

The third aspect that influenced the economic performance of the native forestry sector is that most productive forests were owned by (very) small owners with little capacity to industrialize and professionalize their forest operations. One forest government officer explained:

“You have [forest operations] from 10 hectares and larger, and that is the most frequent size. And they are only capable to exploit 1 to 2 hectares per year. We have managed to generate projects to build industrial drying ovens for firewood, etc. And those people have done well but it cost too much effort.” (interview with A-X-01).

¹⁴⁹ This condition is not necessarily consequence of thefts but since many small forest owners have not made the legal arrangements to assure their tenure over their claimed lands. As a consequence they cannot access to official management plans to manage their forests (Lara *et al.*, 2013).

¹⁵⁰ Some estimates point out that firewood that is transported with dockets do not exceed the 2% of the total firewood volume in the country (Lara *et al.*, 2013).

¹⁵¹ Interviews with NFB-X-h01 and NFB-XIV-e01.

¹⁵² Interviews with A-XII-01, NFB-XII-c01, NFB-XII-d01 and NFB-XII-d02.

This view was consistent with those of other actors (forest consultants and researchers) within the forest industry¹⁵³, that the supply chain of native timber had many “bottle necks” due to the absence of certain key actors in its commercialization.

All things considered, native forests could not provide a sufficient flow of incomes – at least not from small forest operations – over time to sustain the livelihoods of small or medium-sized forest owners and make them financially self-sustainable¹⁵⁴. Therefore, it was usual to find mixes of native forests with exotic plantation trees¹⁵⁵ to obtain better timber yields overall, or native forest enterprises associated with other economic activities such as livestock breeding and agriculture.

Large forestry firms are more economically sustainable: As previously noted, my findings showed that small and medium-sized forest enterprises account for the majority of native forests. They yielded, in most cases, only modest profits. These findings were partially contrasting with those of larger native forest enterprises. The latter did seem to be more organizationally/technologically sophisticated¹⁵⁶, professionalized, and able to make better use of economies of scale. However, they were less economically successful as compared with plantation forestry businesses.¹⁵⁷

Importantly, the Magallanes (XII) region concentrates the most important large native forest enterprises, in terms of production and forest cover. Forestry in this region focused exclusively on the management of lenga (*Nothofagus pumilio*) forests.

Native forest owners perceive numerous restrictions to operate: Most forest owners felt that their businesses were excessively controlled and that they were quite restricted in how they could perform their operations. There was a generalized perception among diverse respondents¹⁵⁸ that native forestry businesses were excessively controlled by forest authorities, and had to deal with insurmountable amounts of bureaucracy, as described by this forest owner:

“The other day we went to see a small landowner who had 30 hectares; this owner had been managing his forest for two years: he had this size folder! [She makes a hand gesture] about 7 centimetres thick of just stationery, just

¹⁵³ Interviews with N-RM-04 and R-MB-02.

¹⁵⁴ Interview with NFB-XIV-e01.

¹⁵⁵ Interview with NFB-XIV-g01.

¹⁵⁶ Throughout my fieldwork in Magallanes I could notice that large native forestry businesses made use of similar forest machinery (specifically, to perform harvesting operations) as those employed by medium-sized plantation forestry businesses. Also see interviews with NFB-XII-d01 and DW-XII-d01.

¹⁵⁷ Interviews with NFB-XII-d, NFB-XII-c and NFB-XII-i.

¹⁵⁸ Interviews with forest owners, one Indigenous representative (owning small forests) and one consultant: R-VIII-02, NFB-XIV-e01, NFB-XIV-f01 and I-VIII-01.

red tape, management plans, harvest notifications, etc. I don't know. It's too much bureaucracy, it's fine to enforce the law but they should find a better way, a not so restrictive way. They should rather focus on providing technical advice". (interview with NFB-XIV-e01).

Furthermore, forest landowners have few incentives to manage responsibly their native forest estates. In the words of one forest authority¹⁵⁹ "*the incentives were not as good as people expected*" (alluding to the law of native forests, Law No 20.823). Therefore, forest owners have not been particularly encouraged by subsidies to manage their forests sustainably. A plausible explanation for the failure of such incentives would be the low amounts of such subsidies per hectare and the long periods to recoup the invested money (Lara *et al.*, 2013).

As seen above, the characteristics of large native forestry businesses are quite different sector from plantation forestry businesses. This is a barely profitable sector. In addition, forest owners have little economic incentives to manage sustainably their operations.

3.7.2 Forestry practices and environmental issues

Native forest operations are managed as low intensity operations

In Chile, native forests are considered to be a completely "different world" from that of plantation forestry businesses, particularly in the way they are managed, in the context of an official management plan by CONAF for formalized operations. In this subsection, I examine some of those differences and their implications. My purpose is not to comprehensively examine all the forestry practices of this sector but, rather, to explore some of the most environmentally salient to provide a general picture.

Forest operations employ low intensity methods: As my case studies suggested, low intensity and more environmentally-friendly methods used to perform native forest operations were a natural consequence of the forest authority's requirements, as outlined below.

First, most respondents¹⁶⁰ asserted that harvest operations were performed with minimally invasive techniques, especially in small forest operations, "looking more like a thinning" instead of clear-cut harvesting, as one forest manager¹⁶¹ described: "we actually do thinning, this means that we extract a small percentage of wood from the forests and we do that traditionally, employing oxen and people." Technically, as interviewees described, these

¹⁵⁹ Interview with A-X-01.

¹⁶⁰ Interviews with NFB-IX-a01, NFB-XIV-g01, NFB-XIV-f01, NFB-X-h01, B-XIV-01 and NFB-XII-d01.

¹⁶¹ Interview with NFB-IX-a01.

alternative harvesting methods were focused on more dispersed and smaller clear-cuts blocks as well as the selection of single trees.¹⁶²

Therefore, the use of machinery would be restricted in small and medium-sized forest operations¹⁶³, being limited to – as we will see later – relatively large native forestry businesses (that is, the case of companies in the Magallanes region).

Second, forest owners were more engaged in natural regeneration methods than in onerous operations to establish seedlings to reforest their lands. As a generalized practice¹⁶⁴, native forest owners delimited certain areas inside their lands for native trees to regrow. They excluded grazing animals as the only management measure. However, some forest managers¹⁶⁵ noted that in some cases, “enrichment” operations (i.e. planting native tree seedlings) were a useful tool to strengthen the future yields.

Third, the protection of watercourses was a consistent practice amongst the forest owners and managers¹⁶⁶ of many native forest enterprises. Notwithstanding the minimum buffer zone widths as set by the most recent relevant regulation¹⁶⁷, some forest owners argued that in some cases it was justifiable to harvest some trees inside such buffer zones:

“I don’t cut anything around the edge of watercourses...but now, if there is a beautiful tree that you want to harvest in there, you have to see how you do it, using some kind of wedge tools to remove it, without causing damage, without disturbance.” (interview with NFB-XIV-f01).

Interventions inside buffer zones have been a matter of heated debate between landowners and authorities since such a regulation was introduced in recent years. However, in the view of one forest authority¹⁶⁸, there is room to reach a consensus in some – justifiable – cases, through presenting a “felling plan” as approved by the authority.

¹⁶² Those methods followed the guidelines of an official forest management plan, as requested by CONAF.

¹⁶³ They made more use of “traditional” harvesting methods employing animal power (oxen) and chainsaws. Interview with NFB-XIV-e01.

¹⁶⁴ Interviews with NFB-IX-a01, NFB-XIV-g01, NFB-XIV-f01, NFB-X-h01, B-XIV-01, and NFB-XII-d01 were consistent with the view of A-X-01 (forest authority).

¹⁶⁵ Interviews with NFB-IX-b01.

¹⁶⁶ Interviews with NFB-XIV-g01, NFB-XIV-f01 and NFB-X-h01.

¹⁶⁷ The new regulation on wetlands, water and soils (Decree No 82) about soils, waters and wetlands does not allow interventions within 20 metres from water bodies (rivers, lakes), 10 metres from creeks or temporary/permanent watercourses and 5 metres from ravines (with permanent or temporary water courses).

¹⁶⁸ Interview with A-IX-01. Also, one forest manager (interview with NFB-XIV-g01) commented that the modification of the Decree No 82 in 2013 allowed the intervention of buffer zones in justifiable cases, so as to encourage the growth of native vegetation.

Finally, it was usual for forest owners¹⁶⁹ to undertake road planning and timber harvesting during seasons other than winter (the wettest season) to avoid tree damage and compaction of soils. Other sustainable practices performed¹⁷⁰ included: logging using predetermined *skid trails*, careful felling to avoid the damage of buffer zones, road maintenance, restricted harvesting on slopes over 45%, and sustainable allowable cut rates.

Native forests are complex and challenging to manage: The management of native forests posed a number of complexities for landowners. Most respondents mentioned technical complexities during harvesting due to pre-existing forest degradation caused by high-grading.

Therefore, the common view amongst all relevant respondents¹⁷¹ suggests that high-grading¹⁷² that had occurred extensively during the 20th century was the primary cause of native forest degradation. For example, when asked about the main environmental problems caused by unsustainable forest operations, a senior industry officer stated that:

“Well, forest degradation was mainly caused by the infamous ‘floreo’ [high-grading], which was practised for a long time. ‘Floreo’ consists of the extraction of the best specimens without any kind of regeneration or sustainability. After that happened in all the Chilean native forests there was a subsequent degradation by cattle overgrazing. All those things ended up ruining the regenerative cycle of forests”. (interview with B-XIV-01).

High-grading would be still occurring in practice, particularly in the case of small forest owners who have little capacity to make a better use of all their forest resources due to financial and technical constraints, as noted earlier¹⁷³. Some now-dated estimates for the period 1991-1994 have estimated high-grading at between 34-60% of total forestry practices in native forests (CAPP, 2002).

In Magallanes, lenga forests are managed under a common view: In the XII region of Magallanes, there is a shared view among – at least – large firms¹⁷⁴, forest authorities and researchers from universities about how to manage native forests. Arguably, this mutual collaboration may be the reason why one industry respondent asserted that they rarely had to mitigate negative impacts caused by the company’s forest operations:

¹⁶⁹ Interview with NFB-XIV-e01.

¹⁷⁰ Interviews with NFB-XIV-e01 and NFB-XIV-f01.

¹⁷¹ For example, interviews with NFB-IX-a01, NFB-IX-b01, NFB-XIV-g01, NFB-XIV-f01, NFB-X-h01, NFB-X-e01, B-XIV-01 and A-X-01.

¹⁷² “Floreo” is a common Chilean term for high-grading.

¹⁷³ Interview with A-XII-01.

¹⁷⁴ In the region, at the moment of performing my fieldwork, I sampled two prominent large native forest firms (NFB-XII-d and NFB-XII-c) and one medium-sized firm (NFB-XII-i).

“No, we don’t think so [when asked about problems caused by their native forest operations]. Actually, the management of lenga forests in Magallanes is much researched; especially by the University of Chile that has been studying the silvicultural management of this species for more than 30 years... We have scientific support behind us and CONAF backing us up too. CONAF, the University of Chile and this firm are working together to manage the lenga forests in Magallanes. It’s good to know that things always worked that way. That is fundamental. There is no point if you work separately. Hence, CONAF applies those criteria in the interpretation of their management plans and they are approved.” (interview with NFB-XII-c01).

Other respondents within the native forests industry of Magallanes were of a similar view¹⁷⁵. For them, forest operations performed on *lenga* forests (*Nothofagus pumilio*) have been highly researched, and the recommendations of such studies are included in the official management plans of CONAF. For example, one interviewee¹⁷⁶ described how a number of studies in the field (conducted on the forests of the firm NFB-XII-d) determined the most appropriate harvesting technique considering a set of technical, silvicultural and environmental considerations: in his own words “there was a complete change in relation to how the firm was working, and this was done 15 years ago”.¹⁷⁷ I had similar responses from some forest authorities¹⁷⁸ in the same region, highlighting the nature of the collaborative work that was occurring between them and large enterprises

Hence, *lenga* forest management was also performed with low intensity methods. This was particularly true in the case of timber harvesting. Most industry respondents¹⁷⁹ identified a number of different practices to perform timber harvesting, including: the thorough planning of roads and other forest operations; “irregular felling” i.e. extracting sick trees to encourage the regeneration of healthy individuals; using a “fish-bone” approach to harvest forest stands; careful felling near watercourses and slopes; and, extraction of no more than 40-60% of the initial forest cover inventory,¹⁸⁰ by using “protection cuts”.¹⁸¹ According to some operations

¹⁷⁵ Interviews with NFB-XII-d02 and NFB-XII-i01.

¹⁷⁶ Interview with L-XII-01.

¹⁷⁷ Indeed, forestry practices seemed to be completely different (unsustainable) 15 years ago. For an industry respondent (NFB-XII-d01) some examples included no roads planning, no respect for buffer zones and slopes, “chaotically” performed timber harvesting and performing “aggressive” clear-cuts.

¹⁷⁸ Interviews with A-XII-01 and A-XII-02.

¹⁷⁹ Interviews with NFB-XII-d01, NFB-XII-d02, DW-XII-d01, NFB-XII-c01 and NFB-XII-i01.

¹⁸⁰ In the case of the firm NFB-XII-c, they even had a public corporate report on their website making publicly known these and other low-intensity forest practices. As another example, one operations manager (NFB-XII-d01) stated that his firm made a careful planning of their operations to not cut more than 700 to 1,000 hectares annually (from a total of 40,000 hectares of forest estates).

¹⁸¹ They consist in gradual and small clear-cuts to set appropriate conditions for new forest stands, under the protection of the remaining forest stands that will be cut in the next harvesting cycle. This is now requested by CONAF forest management plans.

managers¹⁸² such environmental considerations would also respond to economic considerations in such a way to make them more efficient.

Generally, my case studies showed that in environmental terms, most native forest operations executed sustainable forestry practices through low-intensity methods and thereby had a limited negative environmental impact. However, this finding does not account for a significant number of small native forest operations engaged in unsustainable forestry practices.

3.7.3 Social issues

As in the case of plantation forestry businesses, my findings are grouped into two subsections: forestry workers and local communities (including Indigenous peoples).

3.7.3.1 Relation with forestry workers

Forestry businesses' size determines the working conditions and workers' skills

In the case of plantation forestry businesses, the business scale influenced its OHS performance and working conditions. Native forestry enterprises showed a similar pattern, as analysed in the next paragraphs.

The smaller the enterprise, the more precarious are the working conditions and OHS performance: Most interviews held with industry respondents and labour authorities suggested that the poorest working conditions were in small and very small forestry enterprises.

First, my findings in small forestry businesses pointed to an informal management of their OHS issues as well as little supervision of their workers, particularly in very small forest operations, many of which did not involve more than five people. As described by this forest owner:

“They go to the forest and they work alone, they know what to do. One only needs to give them some instructions about what needs to be done; for example if I need them to harvest 25 m³ of firewood they will work on that mission. And as they know the forest it's not necessary for me to be there because I could be hindering them more than helping them”. (interview with NFB-X-h01).

¹⁸² Interview with NFB-XII-d01.

One labour authority¹⁸³ summed up some of the main characteristics of small native forestry firms in relation to their working conditions: most of them were family businesses, hiring family members and neighbours but without “doing the paperwork”, and they lacked the formality to plan both their forest operations and comply with OHS regulations. In many cases, they ignored these regulations.

The second case, of large native forestry businesses, revealed a different situation. Most respondents¹⁸⁴ from the forest industry and one labour authority agreed that they had, in general, appropriate working conditions and OHS performance. These working conditions included, for example, proper forest camps, meals, transport, shifts system as well as OHS appropriate supervision and training. As described by this labour government officer:

“They [the forestry workers] have good accommodation, the meals are good and the transport to their houses from forest operations is good too; that’s because those operations are in Tierra del Fuego and they get to Punta Arenas through ferries and buses” (interview with La-XII-01).

As noted earlier, staff training improved as the business scale increased¹⁸⁵. Indeed, although it was still not completely systematic, OHS and technical training to perform forest operations was relatively well provided by large forestry businesses.

All these large forestry enterprises that showed better OHS performance and working conditions were located in the XII (Magallanes) region, and focused on the exploitation of *lenga* forests. Notably, unlike other regions, the OHS and labour regulations were strongly enforced by the labour authority in Magallanes. Although I was not able to obtain official quantitative data to confirm this assertion, my interview findings¹⁸⁶ between industry respondents and one labour authority were highly consistent. They revealed, for example, that most inspections of companies were planned¹⁸⁷ allowing the authority to develop preventive actions to enforce legal compliance. Additionally, I found positive perceptions from the above respondents about the

¹⁸³ Interview with La-IX-01.

¹⁸⁴ For example, interviews with La-XII-01, DW-XII-01, NFB-XII-d01, NFB-XII-d02 and NFB-XII-c01. The interview with NFB-XII-i01 was also included here since his company showed characteristics of a large company (they belonged to a conglomerate). However, it was categorized as a medium-sized enterprise because of their sales volume and forest area.

¹⁸⁵ Interviews with NFB-XII-d02 and NFB-XII-c01.

¹⁸⁶ Consistent findings among interviews with La-XII-01, NFB-XII-d02 and NFB-XII-c01.

¹⁸⁷ The low population of workers (77,000) in Magallanes combined with a reduced number of firms (1,500) were argued as possible reasons to explain this situation. Interview with La-XII-01.

role of unions in reaching collaborative agreements through successful collective bargaining processes¹⁸⁸.

3.7.3.2 Relations with local communities and Indigenous peoples

Native forestry businesses have positive relations with local communities

My findings in native forestry enterprises, regardless of their size, suggested a similar situation with that of small and medium-sized plantation forestry enterprises. Native forestry businesses had a positive relationship with local Indigenous and non-Indigenous communities, as described below.

Native forestry businesses have collaborative agreements with communities: Many respondents from small native forest enterprises¹⁸⁹ expressed the view that providing locals with jobs was the most common form of reaching mutual collaboration between them and local communities. Small forestry businesses preferred local labour to workers from other places. One forest manager emphasized that the firm also employed people from Indigenous communities:

“Our communities are all Indigenous communities: *Mapuche* peoples. In my case all the workers I have are from *Mapuche* communities”. (interview with NFB-IX-a01).

Other forms¹⁹⁰ of collaboration between firms and communities were through donations (money or free firewood) to local schools and sports clubs, as well as building materials (timber) for households and social projects. The community, in turn, took care of the forests – as informal forest rangers.

In large native forestry businesses, this mutual collaboration was even more sophisticated. As this forest officer described:

“So this agreement helps us, actually, both parts have benefited: they are financially better off because they sell the firewood that take from the bedding sites to and we are better off because our sites have cleaned out. If the firewood were not removed, it would not only looks bad, but due to the weather conditions of Magallanes, would be slow to rot”. (interview with NFB-XII-d02).

¹⁸⁸ Actually, the positive working conditions named above were due to the existence of a collective bargaining agreement.

¹⁸⁹ Interviews with NFB-XIV-g01, NFB-IX-a01, NFB-IX-b01, NFB-XIV-e01 and NFB-XIV-f01.

¹⁹⁰ Interview with NFB-XIV-g01.

In short, my findings suggested that native forestry businesses were actively involved in the development of their local communities, reaching collaborative agreements at different levels, and showing little evidence of conflicts.

3.7.4 Discussion of the Section

Although Chilean native forests have been extensively degraded for many decades of illegal logging and high-grading (Klubock, 2006; Lara *et al.*, 2013), my case studies showed that, when formalized, forest operations caused less environmental and social impacts than did plantation forestry businesses.

Environmentally, such operations usually conducted low-intensity logging methods. This is relatively consistent with studies on large forest operations in farther-south Chilean regions (Cruz and Schmidt, 2007).

In social terms, companies had a collaborative relationship with local communities, but in contrast, they had modest working conditions for their forestry workers. Although little is known about social issues in native forestry businesses, Kausel and Vergara (2003) have pointed out that collaborative agreements (mainly, through firewood donations) are important for communities' livelihoods. Other studies (Otero, 2006) have pointed that OHS deficiencies are the most frequent social issues in native enterprises, particularly, small operations.

However, in economic terms, the native forest industry has had to struggle with low-quality forests, low prices and small profits. This is also recognised by a number of studies (Bustamante and Díaz, 2010; Emanuelli, 2006; Gómez-Lobo *et al.*, 2006).

Overall, setting aside the numerous illegal forest operations, these case studies show the relevance of sustainable forest management to maintain and enhance multiple forest values at different scales. Small native forestry businesses meet more holistic goals in terms of contributing to ecosystem services, recreational and cultural values, and to the livelihoods to local communities; in contrast, large native forestry businesses can achieve more purely economic goals while performing environmentally and socially sustainable forest operations.

3.8 Conclusion

In this chapter, I presented an overview of the Chilean forestry sector, and of my research findings concerning the environmental, social and economic performance of non-certified native and plantation forestry businesses, and the major contextual factors that have influenced certification. Table 3.6 provides a conceptualization of the main findings concerning companies' performance in the absence of forest certification: they summarise my interview findings, empirical field-based evidence, document analysis, media information as well as public and official statistics. I have subjectively classified them in "high", "modest" and "poor" performance as well as "hardly/poorly profitable", in the sense of economic performance. Table 3.6 also shows the interviewees' perceptions concerning the enforcement of environmental and social legislation:

Forestry businesses scale	Environmental Performance	Social Performance	Economic Performance	Laws and Regulations Enforcement	Summary of the sub-sector performance
Large plantation forestry businesses	Modest to Poor	Modest to Poor	Highly profitable	Low	<ul style="list-style-type: none"> • Larger areas affected by clear-cuts and pollution. Large firms own 63% of forestlands. • Conversion of native forests to plantations. • Use of environmentally friendly technology and rehabilitation of degraded soils. • Forestry workers: most working conditions are optimal (viz. accommodation, meals and forest camps); however, persistence of anti-union practices, work overload, and high variation of some working conditions in contractor firms. • Local communities: serious land tenure conflicts with Indigenous communities; nuisance caused by forest operations (e.g. noise, trucks speeding, dust lifting) on local communities. • Economic profitability: large firms (over 80%) concentrate forest exports valued in c. US\$ 6,000; monopoly of the timber supply chain.
Small and medium-sized plantation forestry businesses	Modest	Modest to Poor	Profitable	Very low	<ul style="list-style-type: none"> • Low intensity operations were common in agroforestry businesses; however, numerous forest operations had little environmental considerations. • They own, however, less than 37% of forestlands. • Conversion of native forests to plantations. • Forestry workers: modest working conditions; modest OHS practices; older/less skilled workforce. • Local and Indigenous communities: overall, collaborative relationship. • Economic profitability: some companies exported, others sold timber in the domestic market, which was monopolized by large forest corporations. Less intensive use of scale economies.
Large native forestry businesses	High	Modest to High	Lowly profitable	High	<ul style="list-style-type: none"> • Use of SFM practices to protect soils and watercourses as well as encourage natural regeneration. • Some degree of pollution caused by the operations of forest machinery. • Overall, appropriate working conditions in many cases; social benefits for forestry workers; more skilled workers than smaller operations (but training was still weak). • Companies usually had a mutual collaborative relationship with local communities. • Economic profitability: use of scale economies and sale of some <i>lenga</i> sawn timber as the most profitable product (over 90% of native forests exports). Also, firewood sale.
Small and medium-sized native forestry businesses	High to Modest	Modest to High	Hardly profitable	High	<ul style="list-style-type: none"> • Use of traditional low impact logging methods (by oxen) in many small firms. • Illegal logging and high-grading, called "<i>floreo</i>". • Precarious working conditions and high informality of the sector. • Companies usually had a mutual collaborative relationship with local communities. • Economic profitability: the main forest product is firewood, obtaining low domestic prices.

Table 3.8 Summary of the main findings about Chilean companies' performance in relation to environmental, social and economic issues.

Source: authors' interviews, secondary information and judgement.

Overall, my case studies show clearly two very different types of forest industries. On the one hand, plantation forestry businesses are economically successful and export-oriented enterprises, particularly large forest corporations. Notwithstanding their important improvements in environmental and social issues in the last fifteen years, their forest operations have caused most of the environmental and social impacts since they own larger forestlands than their smaller counterparts do. In contrast, except for agroforestry businesses, small and medium-sized forestry businesses were likely to have the worst environmental and social (concerning forestry workers) impacts associated with their operations. However, the negative impacts of plantation forestry on local and Indigenous communities are greatly reduced as the scale of the forest operation decreases.

On the other hand, native forestry businesses have a modest economic performance, particularly small enterprises. However, many operations had a comparatively better environmental performance than plantation forestry firms did. Socially, although they had modest working conditions, they practically did not face conflicts with their forestry workers and local communities.

Therefore, many firms from both forestry businesses types have sought new policy instruments to address their own sustainability issues. While plantation forestry businesses have focused their attention on their environmental and social problems, native forestry businesses have mostly focused their attention on economic issues. This has led these companies to seek different certification schemes, as we will see in the next chapter.

Chapter 4: Why? How? Who? Forest certification in Chile

4.1 Introduction

Chapter 3 described the environmental, social and economic performance of forestry businesses in the *absence* of certification. In the present Chapter, before turning to the capacity of certification to change companies' performance and thus evaluate certification impacts in the terms introduced in Chapter 5 and 6, it is also necessary to better understand the motivations of forestry businesses in seeking certification (why?), the ways in which this occurred (how?), and the attitudes of key stakeholders (who?) towards the different forest certification schemes.

This chapter draws principally from my interview findings to explore the viewpoints, attitudes, feelings, perceptions and experiences of the key actors within the forest industry, and those of key stakeholders. Where relevant, I will complement these findings with information from government documents, public statistics, media information and public reports.

I have grouped my findings into four sections. The first section describes how forest certification was introduced in Chile, why this happened, how the industry and the government reacted, which key actors were involved, and how certification evolved over time hitherto.

The second section examines the reasons why forestry businesses sought particular forest certification schemes and the extent to which those drivers (translated into goals) have met companies' expectations.

The third section explores the attitudes and perceptions of key actors in forest governance towards different certification schemes, as well as some interactions between firms and certain stakeholders due to certification.

Finally, the fourth section specifically addresses the attitudes of the general public towards forest certification.

4.2 Origins and evolution of certification in Chile

The early 1990s were the period in which the first international efforts to protect the world forests through a global agreement culminated in the Statement of Forest Principles agreed at the 1992 Earth Summit (Humphreys, 2014; Humphreys, 2006). The failure to secure a legally-binding agreement for conservation and sustainable management of the world's forests catalysed the development of private forest governance mechanisms. Thus, after a period of initial experimentation – and boycotts against timber products retailers procurement's policies (Auld, 2014:75) – with different “prototypes” of forest schemes, the Forest Stewardship Council (FSC) represented the first most widespread scheme to encourage sustainable forest management in forest enterprises (Cashore *et al.*, 2006:11). The FSC was – and it is still – promoted by important NGOs and broad sectors of the civil society (Auld, 2014:71-111). Largely in reaction to the establishment of the FSC, many forest industry associations and some national governments (particularly, in Europe and North America) established their own competitor schemes as they felt that the FSC may harm their industry interests (Gale and Haward, 2011), in the former case, or threaten their state sovereignty, in the latter (Lister, 2011:47). Most such national competitor schemes to the FSC have subsequently grouped under the umbrella Program for the Endorsement of Forest Certification (Auld *et al.*, 2008b; Cashore *et al.*, 2006:7-23).

This history of forest certification in Chile, similar to that which occurred globally, is focused around five main events (see Figure 4.1) that occurred within a space of approximately two decades (1995-2015). Initially, the large forest industry sector did not emulate the attitude of the firms that pioneered the adoption of the FSC in the early 2000s, and instead reacted against its introduction, creating its own standard (CERTFOR). Notwithstanding the pressure of international NGO campaigns, large plantation forestry corporations only adopted the FSC in recent years.

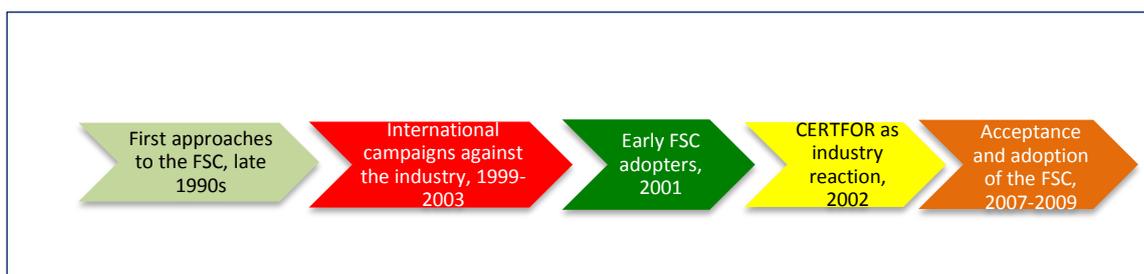


Figure 4.1 Main events in the evolution of forest certification in Chile.

4.2.1 First approaches to forest certification in Chile

The initial phase of forest certification in Chile— occurred in the late 1990s. In 1995, the Montreal Process¹⁹¹ participants had met in Chile to seek a definition of sustainable forest management (SFM) and agree on a set of criteria and indicators for national implementation. This process led to the “*Santiago Declaration*”, an international statement by which the signatory countries embedded such criteria and indicators¹⁹² into their forest policies; in the Chilean case, this was the first step for the promotion of SFM (CAPP, 1999:158).

Other regional initiatives to define SFM criteria and indicators were also influential,¹⁹³ such as the Helsinki Process. But, at least in formal terms it was the Montreal Process and the criteria and indicators that it defined that were the basis on which SFM was promoted in the Chilean case (Rodríguez, 2007:75; Oyarzún, 2004).

Not long after the Montreal process, a related but separate process known as “the working group for the sustainable forest management” was led by CONAF by 1997, to define specific indicators of SFM and the mechanisms to ensure their implementation (CAPP, 1999:155). In this regard, one researcher¹⁹⁴ described how CONAF undertook the task (including through different workshops) of defining the indicators of SFM, involving in this task many key actors (e.g. some peasant organizations, some universities, the Ministry of Foreign Affairs, CONAMA¹⁹⁵, CORMA¹⁹⁶ and the AIFBN¹⁹⁷) with different interests, but excluding others (e.g. *Mapuche* Indigenous peoples and forestry workers). In the view of the same respondent, this process allowed the generation of a comprehensive job since it defined the environmental and social aspects of SFM and how to measure them. However, this process was abruptly interrupted during the next years:

¹⁹¹ The Montreal Process set 7 non-legally binding criteria and 67 indicators for SFM in temperate and boreal forests. It entailed the participation of 12 member countries: Argentina, Australia, Canada, Chile, China, Japan, Republic of Korea, Mexico, New Zealand, Russian Federation, Uruguay and the US. See FAO (1995).

¹⁹² Those criteria included: (1) Conservation of biological diversity, (2) Maintenance of productive capacity of forest ecosystems, (3) Maintenance of forest ecosystems and health, (4) Conservation and maintenance of soil and water resources, (5) Maintenance of forest contribution to global carbon cycles, (6) Maintenance and enhancement of long-term multiple socio-economic benefits to meet the needs of societies and (7) Legal, Institutional and economic framework for forest conservation and sustainable management.

¹⁹³ These initiatives included, for example, the Helsinki process (for European forests), the Tarapoto process (for Amazonian forests) and the Lepaterique process (for Central American forests) (FAO, 2001).

¹⁹⁴ Interview with N-RM-05.

¹⁹⁵ The “Ministry of the Environment” replaced the “National Commission on the Environment” (CONAMA) in 2010.

¹⁹⁶ The “Corporation of Timber” (CORMA), mainly groups large Chilean plantation forestry businesses.

¹⁹⁷ The “Association of Foresters for the Native Forests” (AIFBN) is an ENGO.

“That was the starting point of the discussion, we even defined indicators but unfortunately this process, led by CONAF, was stopped by some reason, I think it was a political one”. (interview with N-RM-05).

The above interviewee also recounted how, Timothy Synnott, the first Executive Director of FSC international, arrived to Chile “*at some point between 1997 and 1998*”, as part of the FSC’s outreach activities. His visit had the purpose of explaining how the FSC scheme worked and the basis of its principles and criteria. This visit seemed to satisfy a number of questions on certification:

“...And we [some ENGOs members] saw that this [the FSC] was a method to concretize all those discussions, which were theoretical at that point in time. We didn’t know how to make companies to implement all that stuff [SFM principles, criteria and indicators]. But with the FSC scheme we had a clear instrument that could help us to implement those criteria and indicators so as to bring about a real change within companies.” (interview with N-RM-05).

Around the same time, INFOR pioneered a research project, funded by the European Union, on forest certification¹⁹⁸ to evaluate the feasibility of implementing the FSC in Chilean forestry firms, by exploring theirs and their stakeholders’ views. Although these events set the stage for the introduction of the FSC to Chilean forestry businesses, this was not a strong enough driver, as seen below.

4.2.2 International campaigns against the Chilean forest industry

The second phase of certification involved an international campaign against the Chilean forest industry. My findings suggested three intertwined elements contributed to this: the negative perception of the large plantation industry, the polarization between domestic NGOs and such companies and, the launch of international campaigns against the Chilean forest industry.

First, the negative perceptions of the Chilean plantation industry were grounded in the view of broad sectors of civil society that its origins were illegitimate and in adverse perceptions of its social and environmental impacts (as seen in Chapter 3). These negative perceptions have been grounded in land tenure conflicts with Indigenous peoples, the industry expansion at the detriment of native forests and, other externalities on communities, such as water scarcity¹⁹⁹ in the landscapes where plantations are located. The first two of these impacts were self-evident; the third was contested, as illustrated by this forest government officer:

¹⁹⁸ Interview with R-VIII-01.

¹⁹⁹ Interviews with A-VIII-01, I-VIII-01, I-IX-01 and N-RM-05.

“And ultimately, there is an apprehension about plantation forests and their links with water scarcity, on the part of communities of San Juan de la Costa. They blame plantation forests. However, we don't have studies supporting that conclusion; rather, it is a matter of perceptions. Actually, that doesn't work that way because we all know that eucalypts consume a lot of water but the annual rainfall here is around 1,800-2000 mm, and perhaps a bit more on the coast. I don't think that plantations are the main cause of water scarcity. By large, communities are against plantation forests.” (interview with A-X-01).

Although there are different views about the relationship between the establishment of exotic tree plantations (particularly, eucalypt forests) and water scarcity (see for Chile Little *et al.*, 2009; and for a global review Keenan and Van Dijk, 2010), my findings suggest that negative perceptions have largely predominated and harmed the reputation of the sector. This negative perception has been directed mostly against large plantation forestry businesses, which are usually targeted by domestic NGOs, unlike smaller firms, which are almost “invisible” to them²⁰⁰.

Second, during the mid-1990s, the strong polarization between the large plantation forest industry and some national NGOs had already drawn the attention of INFOR²⁰¹: to address this tension, INFOR initiated a dialogue process involving the forest industry, some NGOs, CONAF, CORMA, CONAMA and representatives of the Ministry of International Relations. The initiative was called the “*Permanent Committee for Forest Management*”, and its main aim was to achieve a common view about how SFM in Chile ought to look. Despite its short life of less than three years²⁰², the initiative encouraged a positive debate and dialogue among the industry and its stakeholders.

Third, while the large Chilean plantation industry was aware²⁰³ of the international concerns about forest degradation globally, from – amongst other sources – the 1992 Rio Conference, they did not adopt any kind of SFM standard. Instead, this was initiated because of an international campaign against this industry, spearheaded by the American ENGO Forest Ethics. On the 13 of September of 2002, following a 1999 campaign against unsustainable forestry, Forest Ethics published a half page advertisement in the *New York Times* showing a clear-cut and calling on US purchasers to stop buying wood products from the Chilean forest industry, unless they certified their forest operations under the FSC scheme (FAO, 2007). Forest Ethics criticised the large plantation forest industry to attract world attention to the fate of thousands of hectares of temperate native forests owned by such companies. So strong was the

²⁰⁰ Interview with PFB-VII-j01.

²⁰¹ Interview with R-VIII-01.

²⁰² Interview with R-VIII-01.

²⁰³ Interview with PFB-MB-q01.

impact of this campaign that some industry representatives met swiftly with members of Forest Ethics in the US, to seek a potential rapprochement between them²⁰⁴. The outcome was a widely known agreement in November 2003 by which the two largest plantation forest corporations, CMPC-Mininco and ARAUCO, agreed to not log their native forests. This agreement is known as the *Joint Solutions Project*, which was promoted by Home Depot, one of the world's top largest timber retailers (see Heilmayr and Lambin, 2016). Some critics have also called this agreement the "*padlock agreement*" for native forests.²⁰⁵ In essence, the agreement committed large plantation forestry businesses to preserve their native forests, leaving them only for conservation purposes and not exploiting them in any way.

These findings are, unsurprisingly, largely consistent with the experiences of other countries, in which the large-scale forest industries faced strong criticism from environmental groups and some members of the civil society. Consider the pressure exerted, in the late 1990s, by some major ENGOs targeting large retailers of timber products in the United Kingdom, Germany, the Netherlands, Belgium and the United States. These campaigns advocated - under the threat of boycott - for change to these firms' procurement policies, urging them to stop buying wood from controversial unsustainable-managed sources, and encouraging them instead to buy wood from FSC certified forests only (Lister, 2011:47; Pattberg, 2007:104; Cashore *et al.*, 2005; Leslie, 2004; Rametsteiner and Simula, 2003; Auld, 2014:95).

However, in Chile there are no domestic customers willing to purchase certified wood products. Rather, the large-scale plantation forest industry feared the adverse publicity caused by the international boycott spearheaded by Forest Ethics, as well as potential sanctions²⁰⁶, would impact adversely on its exports to developed country markets. Therefore, they endeavoured to take a number of additional steps to avoid further reputational damage, as discussed next.

4.2.3 Early adoption of the FSC by two plantation forestry businesses

The third phase of forest certification involved early adoption of the FSC by two plantation forestry businesses in early 2000s. Their decision and, particularly, the threat of an international boycott were sufficient stimuli to make the forest industry react. By 2001,

²⁰⁴ Interview with N-RM-05.

²⁰⁵ See Tobar (2003). The critics are mostly from native forestry associations. Interviews with B-XIV-01 and NFB-XIV-f01.

²⁰⁶ As an unfortunate reminder, on the 12th of March of 1989 the Chilean agriculture underwent a devastating blow: the FDA had allegedly detected cyanide in some Chilean grape exports in the US leading to millions of dollars in economic losses and thousands of lost jobs. Although in the subsequent lawsuit it was proved that the grape exports were not contaminated in Chile, such an industry took many years in recovering its credibility. See Gutiérrez and Serrano (2009).

following a directive from their headquarters in Europe, two plantation forestry businesses were the first ones in Chile in obtaining the FSC certification: Forestal Millalemu, owned by the Swiss magnate and sustainable development advocate Stephan Schmidheiny, and Forestal Monteaguila, owned, at that time, by Shell International, had a combined certified area of more than 180,000 hectares²⁰⁷. Previously, in 1997, those companies had also been the first to adopt the ISO 14001 standard.

The most important effect of this early adoption of ISO 14001 and the FSC was that set a precedent to be followed by the rest of the forest industry. As described by a researcher:

“Those firms were the first ones in adopting the ISO [14001] because it was like a minimum standard of environmental compromise at the international level. That was the first standard introduced in Chile and it brought about a lot of suspicion because some people thought that Shell was doing greenwashing. They [competing firms] didn’t understand how that company [Forestal Monteaguila] could be competitive having those higher environmental costs. And all of that triggered the entry of other actors because they said ‘if they can, why not us?’ Somehow this situation [the companies that certified first] put more social pressure on them [the large forest industry].” (interview with R-VIII-01).

Notwithstanding that the whole large plantation forest industry was being targeted to adopt more sustainable forestry practices, the processes described led to a division within the large-scale plantation forests industry. While some large forestry owners, adopted both the FSC and the ISO 14001 standard; the largest forest corporations that owned most Chile’s plantation estates only adopted the ISO 14001 standard and rejected the FSC creating its own alternative scheme, as discussed in the next sub-section.

4.2.4 Development of the Chilean CERTFOR scheme

By the early 2000s, a further phase was identifiable. Specifically, the reaction of the most important actors in the large-scale forest industry to the FSC was to create its own standard: the Chilean System of Forest Certification (CERTFOR). Since the FSC faced strong opposition from among the most important forest companies of the country, particularly from CMPC-Minimco and ARAUCO, the latter instead promoted the creation of its own sustainability scheme. As illustrated by one researcher:

“CERTFOR was mainly a response from the larger and more powerful industry groups such as CMPC-Minimco and ARAUCO because they deeply resisted the FSC and, through the support of Fundación Chile and with state funding they created the forestry scheme CERTFOR. In that sense,

²⁰⁷ Interviews with N-RM-05 and R-MB-01.

CERTFOR was a strategic decision of these large industry groups. And they tried to validate this alternative through the media saying that they didn't agree with that monopoly [the FSC] and that Chile should have its own forestry scheme because the FSC was a type of colonization and, this new scheme would attain the same outcome." (interview with N-RM-06).

In the view of some highly regarded industry respondents²⁰⁸, the monopoly exerted by the FSC and its excessively exacting requirements, which it was felt may harm the industry's interests, were consistently argued as important reasons to justify the creation of CERTFOR. Other common reasons argued by the industry appealed to the country's sovereignty: some industry officers used to comment that the FSC just was another "gringos' tale" to impose rules that had nothing to do with the Chilean reality²⁰⁹. There was also another reason: one industry respondent²¹⁰ noted that the poor development of the national FSC scheme was an important factor to not adopt this scheme in the first half of the 2000s. In words of this respondent "we hadn't the sufficient guarantees of governance with the FSC; the interested parties took too long in reaching consensus". Indeed, the process of creating the Chilean FSC scheme took more than 5 years from its initiation at the end of 1998²¹¹ (hence, the first two companies that adopted the FSC were certified through an interim standard). In contrast, the process to create CERTFOR was much faster and relatively obstacle-free, as described below.

Overall, the above reasons provided by respondents as to why they opposed the FSC and sought an alternative approach, are consistent with other studies: many forest industry associations developed their own standards in response to the perceived threat to sovereignty and increased regulatory burden they believed the FSC would impose on them (Lister, 2011:47; Auld *et al.*, 2008b; Cashore *et al.*, 2006:14). In addition, Gulbrandsen (2010) argued that the existence of well-organized landowners' associations would explain why some countries created and adopted their own competitor schemes to the FSC. The Chilean case, with a highly concentrated land ownership and vertically integrated firms, seems to confirm this hypothesis.

The creation of CERTFOR has not been the only self-regulation experiment that the large-scale forest industry has created. Prior to forest certification, the large-scale plantation forest industry had, in 1997, endorsed the creation of an industry code of conduct named "*Code of Forest Practices for Chile*" (see Appendix 12). This was a joint effort among the industry, academia and public and international agencies (particularly, the ILO recommendations) in response to social pressures (from workers unions).²¹² Whilst its level of adoption within the

²⁰⁸ Interviews with PFB-MB-p01 and B-RM-01.

²⁰⁹ Interview with R-VIII-01.

²¹⁰ Interview with PFB-MB-p01.

²¹¹ The national Chilean FSC initiative was finally recognised in 2005. Interview with PFB-MB-p01 and FSC-Chile (2015a).

²¹² See CORMA (2015a).

large forest industry has been a matter of debate among different actors²¹³, it certainly contributed to encouraging more sustainable forestry practices across the entire forest industry and paved the way for the largest members of the forest industry – associated under CORMA – to adopt the ISO 14001 standard as of 1999²¹⁴.

Turning to the development of CERTFOR, this scheme was initiated as a joint public/private partnership between Fundación Chile, INFOR and the large forest industry grouped under CORMA. The project was funded by CORFO (a state agency).²¹⁵ Technically, the rule-making process of CERTFOR drew on the previous work performed by CONAF when they, along with a number of other interested parties, defined SFM indicators in the late 1990s²¹⁶, as well as on the work of the “*Permanent Committee for Forest Management*”.²¹⁷

Since 2002, the CERTFOR scheme has been administrated by CertforChile, a corporation that must update CERTFOR schemes periodically, and provide technical advice to certified firms as required²¹⁸. The functions of accreditation and certification are carried out by different entities (see Figure 4.2).

²¹³ Interviews with R-VIII-02, R-MB-01, B-RM-01 and PFB-MB-p01.

²¹⁴ According to the data provided by CORMA, by 2012, more than 1.2 million hectares of plantation forests have been certified in the ISO 14001 environmental standard (CORMA, 2015a).

²¹⁵ Interviews with N-RM-06 and see also CertforChile (2015b).

²¹⁶ Interview with N-RM-05.

²¹⁷ Interview with R-VIII-01.

²¹⁸ Interview with S-RM-02 and see also CertforChile (2015b).

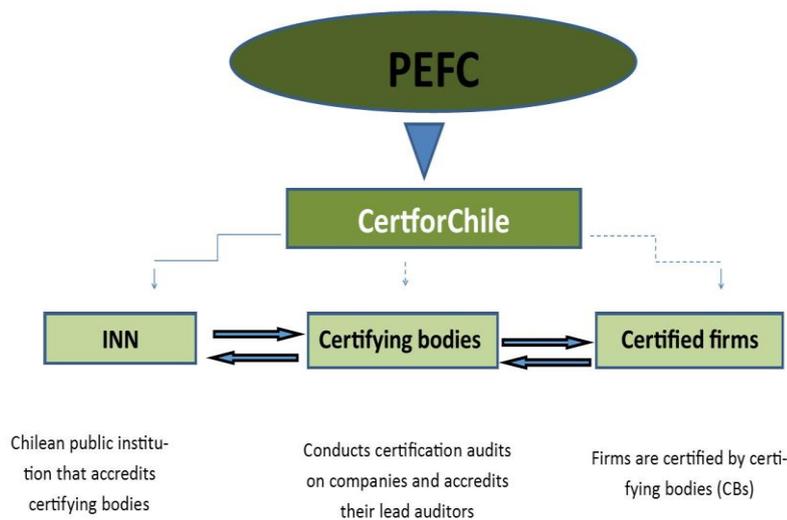


Figure 4.2 Flowchart showing how the CERTFOR scheme works.

Source: Modified from CertforChile.²¹⁹

At its establishment in 2002, CertforChile declared itself to be a non-profit organization with an aim of obtaining international recognition for CERTFOR; this was granted in 2004 under the PEFC umbrella scheme. It also states that its rule-making process included “the different views of forest sustainability so as to guide the system’s principles”.²²⁰ However, this statement was questioned by some respondents from NGOs²²¹ – particularly how the consultation process was performed. As described by this FSC social chamber representative:

“When they [The Certfor team] created the standard they consulted people with different views, even I was consulted and people who I know too. But it wasn’t really a consultation but an approaching to the people that they should consult with. Later, we appeared in a list of people who had been supposedly consulted but we weren’t, really. It never happened. They validated CERTFOR through the consultation process but it wasn’t a consultation at all... Actually, there was just a technical team validating such a standard. It wasn’t any democratic participation of social and environmental entities, Indigenous representatives, nothing at all.” (interview with N-RM-02).

My research suggests that the rule-making process of the CERTFOR scheme lacked the participation of actors other than the forest industry itself. An interview with one CertforChile officer²²² confirmed this; he stated that “...we try to encourage NGOs to participate but they are

²¹⁹ The solid arrows show the direct interaction between CertforChile and other entities, whereas the dashed arrows show the indirect interactions.

²²⁰ See “about CERTFOR” in CertforChile (2015b)

²²¹ Interviews with N-RM-02 and N-RM-05.

²²² Interview with S-RM-02.

not very willing to do so”. The natural consequence was that this process was perceived as illegitimate in the view of many respondents²²³, and subject to even further criticism because the standard’s governance included only the industry’s interests. There were some early attempts to modify the governance of CERTFOR, in such a way to make it more credible and legitimate, but these were largely fruitless. As described by one researcher who participated in its rule-making process:

“...There was an initial approach to the FSC to draw up a mixed standard, similar to what happened in the UK, but it wasn’t possible at all. The FSC imposed its rules and if they [CertforChile] didn’t have three chambers, that is, environmental, social and economic chambers with proper representatives they couldn’t ‘get on that bandwagon’. And if CERTFOR was mixed with the FSC, then the FSC scheme would prevail. Then, there were like two irreconcilable views: one view wanted this convergence, whereas others thought that since CERTFOR was funded by the state through CORFO they [CertforChile] thought that it was unacceptable to do that [a mixed standard] because they were already recognised by the PEFC. However, they had not included their stakeholders [in its governance]”. (interview with R-VIII-01).

It is likely that this initially weak consultation process undermined the possibility of stronger processes subsequently: many of the stakeholders whom I interviewed expressed dissatisfaction with CERTFOR, and a low willingness to participate in future rule-making processes. According to the above interviewee, CertforChile had – at least initially – an apparent unwillingness to make changes in its governance to enhance its reputation. However, this weakness at the time of writing may have been overcome to some extent, as some stakeholders²²⁴ recently expressed their willingness to participate in the rule-making process of the new version of the standard.

For many other respondents²²⁵, CertforChile had not adequately promoted some of CERTFOR main strengths, including its local orientation; its reputation as a standard that initiated important sustainability changes in the forestry industry (e.g. qualification system for forestry workers and community consultation); and its mix of performance and procedural based requirements.

Notwithstanding these negative views about its governance, CERTFOR has been largely successful in terms of the area covered by the scheme’s certificates: since its first pilot implementation between 2000 and 2002²²⁶, more than 1.9 million hectares had been certified in

²²³ Interviews with N-RM-02, N-RM-05, N-RM-06, PFB-VIII-n01, I-IX-02 and IW-MB-01.

²²⁴ Some union representatives.

²²⁵ Industry respondents from small, medium-sized and large forest enterprises.

²²⁶ Interview with S-RM-02.

January 2013, mainly by the large plantation forest industry²²⁷ (CertforChile, 2015a). However, there are no native forestry businesses certified under this standard yet.

4.2.5 The adoption of the FSC by most of the forest industry

The final phase occurred when most of the forest industry adopted the FSC, although notwithstanding that initially they had been very reluctant to do so for reasons discussed above. How did this occur? We must examine first how this standard was created and its evolution over time.

First, in contrast with the creation of CERTFOR, several respondents²²⁸ asserted that the creation of the FSC national standard was accomplished through an informed and public debate involving “lots of people” and a diversity of viewpoints. As a social NGO representative claimed:

“Well, I think there is no comparison at all [with CERTFOR]. Since the creation of the national FSC there was a marathon of participative and democratic activities. Lots of people participated. We had a lot of debate over the creation of the indicators, which didn’t happen in CERTFOR”. (interview with N-RM-02).

However, there is a link between the development of the FSC scheme and CERTFOR. As one researcher²²⁹ who participated in the technical committee to create CERTFOR explained, the process to create the CERTFOR indicators also had fed into the process to create the FSC national initiative because both rule-making processes shared some similar technical experts (although this could not be confirmed by other interviewees). It is unsurprising, therefore, that some respondents²³⁰ commented that both schemes were technically very similar (both schemes are presented in Appendixes 10 and 11).

Second, the creation of the FSC national initiative was lengthy, taking more than 5 years to conclude the definition of national indicators against the FSC 10 principles and 56 criteria. The initiative was first spearheaded by CODEFF²³¹ (a Chilean ENGO) – grouping other NGOs, part of the forest industry and some universities – and it was legally named as “the Chilean Initiative of Independent Forestry Certification A.G.” (ICEFI), undertaking the task of

²²⁷ See CORMA (2015a).

²²⁸ Interviews with N-RM-02, A-IX-01, N-RM-05, N-RM-06, N-RM-04, S-RM-01, N-XIV-01 and IW-MB-01.

²²⁹ Interview with R-VIII-01.

²³⁰ Interviews with PFB-MB-q02, PFB-MB-q03, R-MB-02 and S-RM-02.

²³¹ The Corporation for the protection of Flora and Fauna (a local ENGO).

creating the national standards for native and plantation forests²³². In 2005, this group publicly launched the first FSC Chilean initiative.

It is important to realize that this FSC scheme-setting process did not meet the expectations of everyone. For example, one industry officer²³³ noticed that “due to the hard negotiations when created, the FSC structure is technically chaotic and hard to be implemented”, whereas for one ENGO member²³⁴ “the FSC requirements weren’t sufficiently prescriptive and based mostly on Chilean regulations, which were lax and subject to misinterpretation”.

Third, although the FSC national standard was launched in 2005, it was not accepted by most of the large plantation forest industry (i.e., that owning most plantation forests) until some years later. This situation concerned some representatives of the environmental chamber who felt that the credibility of this young standard might be threatened since the interests of the social and environmental chambers were overrepresented. As this ENGO member commented:

“A small group of us who were working in the FSC’s board of directors realized that we had to co-opt [more] companies to have a proper power balance in the three chambers; otherwise the credibility of the system would be lost and the FSC would be like a wobbly table” (interview with N-RM-05).

However, this objective was largely met in subsequent years. The turning point for the FSC Chilean initiative occurred in 2007 with the appointment of Hernán Cortés, a member of the economic chamber, as the President of FSC Chile; this fact had a positive impact in the credibility of the standard from the large plantation forest industry’s viewpoint and spurred them to adopt it²³⁵.

Almost concurrently, the large plantation forest industry had received an ultimatum from their European markets (suppliers of printing companies) demanding that they certify their operations under the FSC since they would no longer accept the CERTFOR scheme as a valid alternative.²³⁶

Hence, in 2009 the most prominent plantation forestry businesses in the country, that is, CMPC-Minimco and ARAUCO announced that they endorsed the FSC and began an

²³² Interview with N-RM-04 and see also FSC-Chile (2015a).

²³³ Interview with PFB-MB-p01.

²³⁴ Interview with N-RM-06.

²³⁵ Interview with N-RM-05.

²³⁶ Interview with R-VIII-01.

implementation process that would last for the next four to five years, adding more than 1.2 million hectares of certified plantation forests to the system in 2013²³⁷, a remarkable increase from the previous situation of only 527,599 certified hectares of both plantation and native forests. Therefore, by 2014, a total of 2,355,427 hectares were covered by the FSC certification, including extensive new areas of native forests owned by these two large plantation forest enterprises.

Fourth, although the creation of the ICEFI group was necessary to establish the FSC and promote it as a credible alternative of SFM, by 2013 FSC Chile was a fully-fledged organization that was financially self-sustainable, with almost double the staff and with better technical and administrative capacities than in its first years²³⁸. Another important change was that the initial balance of the three chambers changed to the detriment of the environmental and social interests, particularly with the entry of CMPC-Mininco and ARAUCO to the FSC governance. As this ENGO member described:

“Four weeks ago we [the social and environmental chambers] had a meeting as there are new things that had come out, but we had reduced our work capacity to such an extent that we almost didn’t have any way to give an opinion. And you know that each certification process involves consultation work, training, a lot of different stuff, etc. But the problem is that our capacities are low, both within the social and economic chambers. This doesn’t occur in the economic chamber, which is governed by firms. For example, we had the chance to go through a document about controlled wood and in the meeting we held there were 10 people in the economic chamber and 2 people each in the social and environmental chamber. So you start to entirely lose the balance in the discussions” (interview with N-RM-05).

This new balance among the three chambers is evident from the Chilean FSC website²³⁹, which reports that the economic chamber, at 34 members, is more than double the social and environmental chambers, with 15 and 9 members, respectively). For another ENGO member, this situation was due to the lack of time and of financial resources of the actors within the social and environmental chambers:

“For example, if we are a group of stakeholders discussing forest conversion, which is a technical and political debate where the technical elements are really important, you have to give 2 to 3 days of your time, read documentation, get prepared and get there [to the meetings]. Of course, they [small organizations and NGOs] do all this stuff on a voluntary basis and for them this effort is not negligible. When I have to comply with the time required by FSC I can do it with some difficulties, but some representatives

²³⁷ See FSC-Chile (2015c).

²³⁸ Interview with N-RM-05.

²³⁹ See FSC-Chile (2015b).

of social organizations don't have the [financial] resources to travel by their own. If they are not participating, the FSC limps." (interview with N-RM-04).

Moreover, two NGO members²⁴⁰ of the FSC environmental and social chambers, respectively, expressed their concern about the limited capacity of the stakeholders to monitor the companies' behaviour once they obtained their certificate. For them, the FSC system was unable to provide any technical training or verify that the social and environmental actors had sufficient resources and expertise to perform their functions.

The evolution of the FSC governance and its acceptance by the large-scale Chilean plantation industry is not unique. Evidence from other case studies in Germany (Cashore *et al.*, 2004:187) suggests that the efforts to gain broader acceptance from "audiences" beyond their original "core" support group are a common path followed by both the FSC and its competitor standards. Indeed, in the British Columbia and in some US cases, industry associations have become involved "inside" the FSC governance, through their respective national initiatives, to leverage the rule-making processes (Cashore *et al.*, 2004: 87, 125), demonstrating how fragile can be the balance among the chambers²⁴¹ (Boström and Hallström, 2013; Boström and Hallström, 2010). This situation, in the North American cases, led to some environmental organizations to express their concern about the intervention of the industry in the FSC governance, so as to make FSC national standards less strict. The Chilean case, thus, shows a similar pattern to other forest industries: although initially rejected, the FSC was adopted and then co-opted by the large forest industry.

Finally, it is noteworthy that certification, in general, was also accepted by the state as a means to achieve sustainable forest management goals. As illustrated by this government forest officer:

"So when you know they [the firms] have an ISO system and are certified [under the FSC or CERTFOR] you feel confident that they are meeting the standard requirements and the legislation. You know they are performing their operations well and you focus your resources on people who are really breaking the law". (interview with A-IX-01).

Furthermore, at the time of conducting my fieldwork in 2013, CONAF and FSC Chile had embarked on a joint project to encourage small forest owners to implement the FSC

²⁴⁰ Interviews with N-RM-06 and N-XIV-01.

²⁴¹ For these authors, there is a significant global power imbalance among the FSC chambers (economic chamber: 338 members, environmental chamber: 272 members, and social chamber: 144 members) that may be harming the legitimacy of this standard. For them, the FSC should ensure not only a broad multi-stakeholder participation but also an appropriate power balance among the different interests (Boström and Hallström, 2013).

certification²⁴². Most forest officials expressed their reliance on forest certification – regardless of the scheme – as an instrument to enforce forestry laws and regulations and to achieve CONAF sustainability goals.

4.2.6 Contribution of EMSs and OHSMSs

While many of my respondents praised the virtues of certification in encouraging sustainable forest management, they also recognised the role played by environmental and occupational health and safety management systems (EMSs and OHSMSs, respectively) to improve companies' sustainability performance. The implementation of EMSs and OHSMSs represented a first step towards the adoption of more complex forestry schemes because they contributed to change companies' culture and attitudes²⁴³ and, in tandem, provided the necessary framework to integrate more complex and prescriptive requirements. As explained by this forest industry officer:

“At the outset we started implementing the ISO 14001. This is because we realized that in a company of this size [large], with so many people participating in its organizational structure, the challenge of implementing a performance standard without having first a management system was going to be a complete chaos. So we began implementing an EMS to provide us the structure to integrate more specific requirements. That's the reason we chose ISO 14001, so as to identify environmental aspects that were closely connected to legal aspects as a first step.” (interview with PFB-MB-p01).

EMSs and OHSMSs played a more important role to preparing large forest enterprises to adopt forestry schemes than in smaller – and less complex – organizations. In large enterprises, as another industry respondent²⁴⁴ noted, the absence of an EMS was one of the factors contributing to the failure in the implementation of the FSC principles and criteria: since his company lacked documented procedures (as requested by ISO 14001 or OHSAS 18001), it was harder to internalize such requirements compared with companies that had put these systems into place.

4.2.7 Section summary

To summarise this section, the Chilean case is illustrative of how in an emerging economy the large forest industry reacts when it feels that its interests are threatened by creating its own competitor scheme to the FSC. In the middle of this, the government response was to facilitate the adoption of forest certification. The FSC was only adopted by the large-scale forest

²⁴² Although CONAF and FSC Chile signed an agreement, this project was in its very initial stages, involving the training of forest officials by FSC Chile (through a lead auditor course) before proceeding with outreach activities towards forest owners. Interviews with A-RM-01, A-IX-01 and A-VII-01.

²⁴³ Interviews with R-MB-01, A-IX-01, PFB-MB-p02 and IW-MB-02.

²⁴⁴ Interview with PFB-X-o01.

industry when the pressure of the international markets became untenable, as well as when this industry took an active role within the FSC governance.

4.3 Why did Chilean companies certify?

In the above section I briefly introduced some reasons of why Chilean forestry businesses sought certification: companies sought a competitive advantage through signalling stewardship commitment towards external groups (social licence to operate) and maintaining/gaining international market access. But also, consistent with Moore *et al.*'s (2012) framework I identified two additional drivers: gaining strategic position by incorporating corporate social responsibility (CSR) as well as learning from better internal and field management practices. In this section I will examine each of those drivers and then analyse if their goals were achieved.

4.3.1 Social licence to operate and CSR drivers

Social licence to operate was an important certification driver that entailed obtaining consent from local and Indigenous communities to conduct forest operations; obtaining social licence usually involved delivering tangible benefits for communities. Frequently, social licence drivers were mixed with CSR drivers. CSR drivers favoured gaining strategic position as a kind of “preventive” social licence. Most respondents of certified companies explained that they sought certification as a consequence of a small number of individual CSR-related drivers: to improve their reputation, protect them against criticism from NGOs and boost their sustainability policies and public credibility. As illustrated by this implementation officer:

“We followed the example of larger companies [large-scale plantation forestry businesses]. Also we tried to enhance the reputation of the company. While it’s true that there are petty economic benefits, there is also the issue of how your [sustainability] performance as a forestry company is perceived by the Chilean society [external stakeholders].” (interview with PFB-VII-k01).

The above quote suggests CSR drivers since small and medium-sized plantation forestry businesses and the native forest industry were not pressured to seek certification by NGOs or other activist groups in any way. Instead, in words of some industry respondents²⁴⁵ “*getting on the bandwagon*” of certification was the foremost argument to adopt certification in the same fashion as the large plantation industry. Notwithstanding these CSR drivers, such forestry businesses also aspired to obtain “a preventive” social licence to operate, foreseeing

²⁴⁵ Interviews with PFB-VIII-101 and PFB-VIII-n01.

possible attacks from NGOs towards them²⁴⁶ that in practice, however, were more focused on the large plantation forest industry. We can recognize, concerning these drivers, two groups of businesses: the first is large plantation forestry businesses and the second small and medium-sized plantation and native forestry businesses.

The first group has been actively targeted by NGOs, and thereby needed protection against criticism and reputational damage. As noted earlier, large plantation forestry businesses experienced first, during the late 1990s, the pressure of international environmental groups and then in the last decade, a growing internal pressure from domestic NGOs and some members of the civil society. These findings are consistent with previous research in other countries (van Kooten *et al.*, 2005; Hartsfield and Ostermeier, 2003; Gulbrandsen, 2010:88): overall, large forest companies have adopted SFM schemes to be protected against reputational damage caused by negative publicity and boycotts²⁴⁷.

Protecting their social licence to operate was primarily the concern of large companies, although my interview findings suggested that the large-scale plantation forest industry had only mixed success in achieving this goal. Nevertheless, certification was relatively effective in reducing the number of conflicts between firms and, particularly, Indigenous communities. For example, a prominent large enterprise that had had more than 200 conflicts with Indigenous (*Mapuche*) communities reduced such conflicts to only 20 and stopped advocating that the Antiterrorist Law (Law No 18314) be applied to such communities.²⁴⁸ In many other cases, large companies reached mutually beneficial agreements with Indigenous communities.²⁴⁹ Conversely, certification failed to protect the social licence to operate of large plantation forestry businesses in a minority of radicalized hot spots²⁵⁰ where Indigenous communities only wanted to recover their claimed lands back; making mutually beneficial solutions almost impossible²⁵¹. In this case, the solution seemed to be beyond the scope of certification. As stated by this industry forest officer:

“As I told you before, they [some Indigenous activists] set fire to one of our forests, from everywhere, around forty wildfires. So when you have that

²⁴⁶ Interviews with PFB-VIII-101, PFB-VIII-102, PFB-VIII-m01 and PFB-VII-k01.

²⁴⁷ In the initial stages of certification, however, boycott campaigns were directed against wood retailer stores in Europe, rather than directly against forest companies. See for example “The Rise and Evolution of Forest Certification” in Auld (2014):77.

²⁴⁸ Interview with S-RM-01 and see also Astorga (2013).

²⁴⁹ Interview with N-RM-06.

²⁵⁰ Usually, such radicalized hotspots attracted much of the attention of the media and the general public in Chile. They were territories of intense conflicts between companies and certain Indigenous communities.

²⁵¹ In Chile, the National Indigenous Corporation (CONADI) is the state agency that settle – mainly, through buying lands for Indigenous peoples – land tenure disputes between Indigenous communities and firms or non-Indigenous owners (commonly, farmers). However, these processes can last for many years, as there are complex administrative procedures involved. Moreover, many legal owners are often reluctant to sell their lands.

situation, the certification [FSC] forces you to talk with them [the activists], listen to them, speak to them...I don't know what's the breaking point; my compromise is towards the communities, to consult with them and work with them; but forcing me to work with that 1-2% of violent people who support an armed solution, I don't know to what extent certification [the FSC] can force us to do that." (interview with PFB-MB-q01).

Similarly, other studies have reported mixed outcomes in achieving social licence in large-scale plantation forestry: for instance, some authors have found positive interactions between certified companies and Indigenous communities (Dare *et al.*, 2011; Kant and Brubacher, 2008), whereas others have reported that sustainability schemes have not represented a significant improvement in such relationships (McCarthy, 2012).

Concerning CSR drivers, many industry respondents²⁵² perceived certification as a tool to achieve better forest management, for plantation forestry businesses at different scales. For example, one industry respondent viewed the FSC as providing the best SFM practices guidelines:

"I think that the FSC is a contribution, it's like the 'push up' to attain in a better way all that stuff [sustainable management] through its principles and indicators. There is more information about how to do the right things and really make sustainable forest management in the long-term." (interview with PFB-VII-j01).

Notably, many respondents from the plantation forest industry, regardless their scale, viewed certification, particularly the FSC,²⁵³ as a tool to force companies to go beyond legal compliance in SFM matters. Those respondents expressed that the FSC was a tool that replaced the lack of the state enforcing government laws and regulations. This is quite understandable since the apparent superiority of the FSC over the forest authority lies in its enforcement mechanism that is more effective than the law enforcement carried out by authorities, according to those industry respondents. Therefore, in terms of achieving CSR expectations, certification helped most large companies to meet their goals, which is consistent with other studies (e.g. Cabbage *et al.*, 2010; Moore *et al.*, 2012).

For the second group of companies, most respondents from small and medium-sized plantation forestry businesses admitted that forest certification enhanced their reputation and public image. As a forest owner illustrated:

"Of course we met those goals [better public image and reputation], but at the domestic level it [certification] is unknown. Certification is well known and valued at the international and industry level. Certification is valued for those who really know about it." (interview with PFB-VIII-m01).

²⁵² Interviews with PFB-VIII-l01, PFB-VIII-l02, PFB-VIII-n01, PFB-VII-j01 and PFB-MB-q03.

²⁵³ Interviews with PFB-VII-j01, PFB-MB-q03, PFB-MB-q03 and PFB-X-o01.

Hence, these achievements in public image were mostly valued by the industry itself, forest authorities and international clients; but had little impact upon some stakeholders such as NGOs and the general public. Rather, the industry had CSR motivations to gain a competitive advantage. The relation with communities is more complex. While certification enhanced and formalized the relation between these firms and communities²⁵⁴, at the same time, this relation was in any event relatively conflict-free and therefore generally positive, as noted in Chapter 3. Put differently, certification helped them to deepen their social licence to operate while also offering tangible benefits to communities such as jobs, collection of non-timber forest products (NTFPs) and some financial support to social development projects.

Overall, small and medium-sized plantations and native forestry firms sought a slightly different kind of social licence. Due to their smaller size, these companies were not usually targeted by NGOs and their relationship with local communities was, generally, mutually collaborative. For them, FSC certification was more a proactive measure against potential criticism (“preventive” social licence) and to gain a competitive advantage (CSR motivations) over other firms due to benefits certification brought to their public image. My findings are consistent with other studies conducted for FSC-certified (small) land managers (Hartsfield and Ostermeier, 2003), and for community-based forestry enterprises (Crow and Danks, 2010).

Importantly, respondents from small and medium-sized plantation forestry businesses acknowledged recognised reputational benefits and many expressed their willingness to recertify in the FSC scheme. These benefits were mostly perceived in their relationship with authorities and clients, since they already had a positive relationship with their local communities. Consistent with the above, other studies have also found similar expectations in public image and recognition, as well as positive relationships with stakeholders, were achieved²⁵⁵ (Crow and Danks, 2010; Wiersum *et al.*, 2013; Hartsfield and Ostermeier, 2003).

Turning more specifically to the native forest industry, many respondents²⁵⁶ asserted that certification did not provide additional benefits in their public image. Rather, certification was a tool to formalize and reinforce the positive relationship between them and communities. Most native forest operations did not feel that their businesses were threatened by community pressure or subject to NGO criticism. One industry forest officer even claimed that their sustainability goals were aligned with those of some NGOs:

²⁵⁴ Interviews with PFB-VIII-n01, PFB-VIII-n01, PFB-VIII-l01 and PFB-VIII-l02.

²⁵⁵ Generally, these studies assessed to what extent the original expectations of the FSC scheme were met.

²⁵⁶ Interviews with NFB-IX-a01, B-XIV-01 and NFB-XIV-b01.

“They [NGOs] didn’t even know where we are located but today they do; that’s because we perform outreach activities through our association. We have field activities, approximately every four years we organize a big fieldtrip to know our forests inviting ministers, environmentalists, etc. Some time ago, the ex-minister of the environment, Adriana Hoffman²⁵⁷, was also invited and everybody was amazed. At the end of the day, it is [their forest management] what everyone wants [sustainable forest management] and we have been doing so.” (interview with B-XIV-01).

The views of respondents²⁵⁸ from the native forest industry thus mainly suggested that they had CSR motivations to gain a competitive advantage. For them, rather than imposing higher standards on SFM, they felt that the FSC was a means to show through a third party that “they were doing the right things” since they already had a strongly enforced regulatory burden.

To summarise, while in some cases the long-term sustainability of forestry firms may be reinforced by strengthening their social licence to operate by virtue of FSC or CERTFOR certification and consequent engagement with their publics, elsewhere this was not always the case. Why? The case studies examined so far suggest that the answer lies in the pre-existence of high-magnitude conflicts between large reputational-sensitive corporations and Indigenous communities, which were not amenable to resolution by mechanisms of non-state governance such as certification. Overall, the outcomes for both plantation and native forestry businesses were generally positive in terms of meeting their original expectations concerning certification drivers (viz. social licence and CSR) nevertheless: even in cases where certification apparently failed, companies had performed better than in the absence of certification.

4.3.2 Maintaining/gaining international market access

Access to international markets was one of the most important drivers indicated by forestry enterprises in seeking forest certification. Most, if not all, the companies that sought to be certified did so because they exported – or they aspired to do so – their timber products to environmentally sensitive markets in North American and European countries.

As described earlier in this Chapter, the large plantation forest industry sought to maintain market access that they traditionally had, endorsing by CERTFOR first and then the FSC.²⁵⁹ These findings support the conclusions of similar studies, pointing out at the access to environmentally sensitive markets – usually, in developed countries – as one of the main driving forces in pursuing certification by many large forest industries worldwide (Zainalabidin *et al.*,

²⁵⁷ She was the Minister of Environment during the first administration of the president Michelle Bachelet (2006-2010).

²⁵⁸ Interviews with NFB-XII-c01 and B-XIV-01.

²⁵⁹ Interview with B-RM-01.

2013; Ebeling and Yasué, 2009; Frost *et al.*, 2003; Takahashi *et al.*, 2003; van Kooten *et al.*, 2005; Araujo *et al.*, 2009; Cashore *et al.*, 2006; Moeltner and van Kooten, 2003). My case studies also showed that large Chilean corporations maintained dual certification as this allowed them to broaden the range of international markets to sell their timber products. While the *core-business* of such companies is influenced strongly by the FSC²⁶⁰ as the US is their second most important client (INFOR, 2015a), particularly for pulpwood; they also export to European and Asian markets whose supply chains accept PEFC standards²⁶¹. This is consistent with what Johansson (2014) has suggested: maintaining dual certification is a “defensive measure” to ensure the access to some European markets, particularly under PEFC-endorsed standards.

In contrast, gaining international market access was one of the main drivers of small and medium-sized plantation and large native forestry businesses in seeking certification, particularly the FSC certification. As described by the CEO from a small plantation forestry business:

“Economically, if the company isn’t FSC certified we would have trouble accessing international markets. Our clients in Japan require us to be FSC certified and that is the only forestry scheme (that can certify us), there are no other options” (interview with PFB-VIII-n01).

These findings are similar to the conclusions of Wiersum *et al.* (2013) for small forest operations. However gaining international market access proved a more elusive goal for large native forestry firms, which is consistent with results reported by Crow and Danks (2010). Indeed, only one of my sampled native forest enterprises reported gaining some international market access for their timber products.

Nevertheless, the access to environmentally-sensitive international markets was not the case for most small native forestry businesses that were unable to provide these markets with significant timber volumes as seen in Chapter 3. As succinctly put by this forest owner: “we only sell timber to local markets that don’t require certification and we haven’t evaluated that option either”.²⁶²

Overall, forest certification helped companies to meet their goals concerning market access. Most respondents²⁶³ from plantation forestry businesses asserted that certification helped their companies to gain or maintain international market access. This goal was mainly achieved

²⁶⁰ Interview with R-VIII-01.

²⁶¹ Interviews with R-VIII-01 and S-RM-02.

²⁶² Interview with NFB-XIV-e01.

²⁶³ Interviews with PFB-X-o01, PFB-VIII-n01, PFB-VII-j01, PFB-MB-p01, PFB-MB-p02 and PFB-MB-q01.

by large companies whose huge timber export volumes were particularly sensitive to any reputational damage, as described by this forest officer:

“Today it’s unthinkable that someone can sell timber at the rate we do without certification, it’s a basic condition. The level of our current operations make non-viable to work without certification. Why? It’s because certification conveys to our clients that we have a good reputation”. (interview with PFB-MB-p01).

The achievement of large forest corporations in maintaining markets thanks to an FSC and CERTFOR certification was a *sine qua non* to its long-term financial sustainability.

In slight contrast, small and medium-sized plantation forestry businesses gained international market access mainly through certifying under the FSC, with the Japanese markets particularly sensitive to this form of certification. As stated by the CEO of a small plantation forestry business:

“Our client, which is Japan, requests from us to be FSC certified. And that’s the only valid certificate, there’s no another option.” (interview with PFB-VIII-n01).

However, despite this achievement in maintaining or gaining market access, certification provided no premium or better prices, and indeed none were reported in any organization sampled.²⁶⁴ Typical was the response of the CEO of the company quoted above:

“There is no advantage in prices, however, only certified companies can access to those markets. We export [within an association] the chips of *Eucalyptus globulus*, the 100% is exported to Japan”. (interview with PFB-VIII-n01).

Respondents from certified native forest enterprises suggested some success in attaining better international market access. For example, one respondent from a large native forestry business²⁶⁵ asserted that certification allowed them to access international markets – but having a modest participation – of high-valued timber (*lenga* species). But whereas small native forestry businesses²⁶⁶ did not access international markets, they had the intention of exporting FSC certified timber in the future, which was one of the reasons by which they sought certification.

²⁶⁴ Interviews with PFB-X-o01, PFB-VIII-n01, PFB-VII-j01, PFB-MB-p01, PFB-MB-p02, PFB-MB-q01, NFB-XII-c01 and NFB-XII-d02.

²⁶⁵ Interview with NFB-XII-c01.

²⁶⁶ Interviews with B-XIV-01 and NFB-IX-a01.

4.3.3 Learning from better internal and field management practices

My case studies showed that reaching a better internal and field management practices was another important certification driver, mainly for plantation forestry businesses that sought FSC certification. The individual reasons most commonly argued by industry interviewees²⁶⁷ included learning from better SFM practices, contribution to improve companies' SFM performance, and better planning and implementation of internal practices (viz. forest operations).

Generally, the FSC encouraged positive attitudes in relation to its environmental requirements by most industry respondents. Indeed, one CEO²⁶⁸ of a small plantation enterprise stated: "if we had to start again this business we would implement the FSC again so as to guide us from the beginning". This suggests that for most companies the original expectations concerning learning from better SFM practices were achieved.

Consistent with those views, the perceptions from various stakeholders, linked with the forest industry, accounted for a generalized positive perception towards the FSC with regard to its environmental requirements. Some CONAF officers, for example, perceived the FSC²⁶⁹ as a tool to attain firms' SFM goals and reduce their enforcement costs. The FSC, hence, would ease their concerns and give "*a peace of mind*" that forestry businesses abide by or go beyond forestry laws and regulations, as expressed by this government officer:

"Of course it's good [forest certification]. In the case of companies working with exotic tree plantations we can be sure that they are complying with the best environmental and forestry management practices. At the end of the day, if they [the companies] are forced to meet those standards because of their markets, that's the biggest force [markets] they've ever had. For us, it saves us time and resources." (interview with A-X-01).

My findings are also consistent with other authors' conclusions. Consider the case of Brazilian forestry companies whose main drivers to seek certification included learning benefits from more transparent forest management (Araujo *et al.*, 2009). Similar drivers were found in Canada and the US (Moore *et al.*, 2012), in Russia (Ulybina and Fennell, 2013), and in previous studies (Cubbage *et al.*, 2010) on Chilean certified companies whose landowners had met their expectations of an improved SFM.

²⁶⁷ Interviews with PFB-VII-j01, PFB-VIII-I01, PFB-VIII-I02, PFB-VIII-m01, PFB-VIII-n01, PFB-X-o01, PFB-MB-p01, PFB-MB-p02 and PFB-MB-q01.

²⁶⁸ Interview with PFB-VIII-I01.

²⁶⁹ Interviews with A-VII-01, A-VIII-01, A-IX-01, A-IX-02, A-X-01 and A-RM-01.

4.3.4 Section summary

To recap, most findings suggest that seeking social licence to operate, CSR motivations and gaining or maintaining international market access were the main drivers of certification. While not so relevant as these drivers, learning from better internal and field management practices was also mentioned as an important motivation. Table 4.1 summarises these certification drivers. They do not significantly differ from certification drivers found in other countries. Notably, seeking a social licence to operate became a priority concern for large reputational-sensitive plantation companies having relatively mixed success; whereas gaining/maintaining market access, CSR and learning motivations were argued as drivers by respondents of companies of all sizes and forest types.

Type of forestry business	Identified drivers	Common statements
Large plantation forestry businesses	<ul style="list-style-type: none"> • Social licence • CSR • Market access • Learning 	<ul style="list-style-type: none"> • Protection against criticism and reputational damage from NGOs and the civil society. • A means to maintain international market access. • A tool to obtain the consent to operate from Indigenous and local communities. • Certification as the best SFM guidelines.
Small and medium-sized plantation forestry businesses	<ul style="list-style-type: none"> • CSR • “Preventive” social licence • Market access • Learning 	<ul style="list-style-type: none"> • A preventive measure to avoid NGOs attacks in the future. • A means to improve the reputational capital of the company and gain public recognition • A means to gain international market access. • To follow a “global trend” initiated by large plantation forest companies • Certification as the “right thing to do” and the best SFM guidelines.
Native forestry businesses (all scales)	<ul style="list-style-type: none"> • CSR • Market access 	<ul style="list-style-type: none"> • A means to improve companies’ reputational capital and gain public recognition. • A means to gain international market access.

Table 4.1 Motivations when seeking certification.

Source: author’s interviews.

4.4 Attitudes and perceptions towards forest certification

This section explores both positive and negative attitudes and perceptions of companies and their stakeholders towards different certification schemes, which entails measuring their process and constitutive effectiveness.

This section addresses specific characteristics and aspects of forest certification schemes using – to some extent – the framework proposed by Cashore *et al.* (2006) (Table 4.2). While using this framework proved useful, my interviews also uncovered other aspects not necessarily addressed in Table 4.2.

Characteristics	FSC	CERTFOR (PEFC)
Origin	Environmental and eco-forestry groups, NGOs, and socially concerned retailers	Large forest plantation industry, state agencies and research institutions
Type of standard: performance or procedural (system-based)	Performance emphasis	Combination
Territorial focus	International	Local focus
Third party verification of individual ownerships	Required	Required
Chain of custody	Yes	Yes
Eco-label or logo	Label and logo	Label and logo

Table 4.2 Comparison of FSC and CERTFOR schemes.

Source: Modified from Cashore et al. (2006).

An important area of discussion in the next sub-sections is how the different actors perceived governance arrangements under the different certification schemes. Of particular importance was whether there was balanced participation of diverse stakeholders representing environmental, social and economic interests to set the standard rules – for both FSC and PEFC-endorsed standards. Balanced participation of stakeholders, in terms of the governance of each standard, can be defined as the appropriate representation of diverse interest groups to ensure the equitable access and distribution of benefits of the particular certification system. This is very relevant as unbalanced participation of stakeholders may lead to capacity a disproportionate capacity for influence (given by larger numbers or major relative weight) of certain interest groups (e.g. economic interests) over others (e.g. social and environmental interests) favouring their own interests, as noted by Guedes Pinto and McDermott (2013). Consistent with this, noting the fragile nature of multi-stakeholders governance, Boström and Hallström (2013) concluded that the legitimacy of a scheme relies on a certain degree of power balance among diverse stakeholders, otherwise its authority to exert power over key forest actors (through markets) can be compromised.

Having clarified these concepts, it is now pertinent to turn our attention to the attitudes and perceptions concerning different certification schemes.

4.4.1 Attitudes and perceptions towards the FSC

As noted in Section 4.3.3, most industry respondents and their stakeholders perceived the FSC positively, in terms of its contribution to SFM practices. However, they also highlighted reputational and social change aspects, as seen below.

First, some industry respondents²⁷⁰ viewed the FSC as a standard that provided a better reputation due to its credible governance. Put it another way, industry respondents usually cited

²⁷⁰ Interviews with NFB-XII-d02 and PFB-X-o01.

how the FSC enjoyed a better reputation since it had the support of renowned NGOs and civil society behind it, unlike CERTFOR. As noted by this implementation officer:

“I think that the participation of the social chamber is one of the FSC strengths and it validates it. Then it’s very difficult to see the FSC failing over time because that stuff [FSC governance through the three chambers] is like democracy, it balances things. So even if one chamber is doing something badly, there are other two chambers seeking a consensus within that system. That’s a thing that always will be validated and has still room for improvement. ..Being honest, so far we don’t think that another standard can replace the FSC. CERTFOR doesn’t have too much life ahead; we are just going to keep it while our clients want it...” (interview with PFB-X-o01).

Furthermore, besides extolling the FSC’s virtues, those respondents expressed the view that CERTFOR “lived on a death sentence”, implying that this standard would disappear soon. Some industry respondents even put its current existence in doubt.²⁷¹

Second, diverse stakeholders²⁷² including authorities, NGOs, researchers, union representatives and Indigenous representatives perceived the FSC as a driving force of social change. The vast majority of such respondents perceived that the FSC forced companies to engage with communities through public consultation processes and dialogue initiatives. Thus, communities may be more engaged to participate in certification processes, as addressed in detail in Chapter 5.

4.4.2 Attitudes and perceptions towards CERTFOR

Overall, perceptions and attitudes of key actors in forest governance towards CERTFOR relegated this standard to a secondary position when compared with the FSC. Nevertheless, this was not only a generalized perception coming only from companies’ stakeholders but also from many industry respondents. Why? To answer this question we must explore three factors: CERTFOR technical value, its credibility and how it “ranked” compared with the FSC.

First, plantation forest industry respondents²⁷³ acknowledged that CERTFOR had been technically well-structured in such a way to offer a straightforward and relatively less onerous alternative to the FSC requirements: one that was readily capable of implementation. As one forest officer stated:

²⁷¹ Interview with NFB-XII-c01.

²⁷² Interviews with A-X-01, IW-MB-01, IW-MB-02, PFB-X-o01, I-IX-02, R-VIII-01 and N-RM-05.

²⁷³ Interviews with PFB-MB-p01 and PFB-X-o01.

“I think that CERTFOR is a technically well-structured- and well-organized standard, it’s how you expect that a normal standard should be. If you examine it, the principles are rationally and logically structured ...CERTFOR is an academically well-structured standard, with many rational indicators and verifiers for who must implement them.” (interview with PFB-MB-p01).

This argument was buttressed by other industry respondents,²⁷⁴ who perceived CERTFOR as an easier standard to work with, relatively unambiguous in what it required and accordingly, not leaving too much room for auditors to interpret it differently to the company itself. Moreover, and, since it was a local alternative to FSC, it was more flexible and adaptable to the Chilean industry needs.

Notably, CERTFOR contributed to filling the gap between process standards (viz. EMSs and OHSMSs) and performance-based forestry schemes such as the FSC scheme. Members of the industry²⁷⁵, NGOs²⁷⁶ and researchers²⁷⁷ recognised this contribution. For example, one NGO respondent²⁷⁸ noted that CERTFOR-certified firms were requested to identify their neighbours and any potential conflicts with them in such a way to prepare them for the FSC implementation as this standard provided alternative and more effective solutions to conflicts.

Second, most respondents²⁷⁹, irrespective whether they were industry respondents or stakeholders, concurred in recognising CERTFOR as barely credible, which some attributed to its manifestly partial governance structure. As stated by this researcher:

“In general the PEFC has been widely criticised because it came up from a non-plural initiative, from the European forest industry...Also, as they [PEFC and, consequently, CERTFOR] didn’t include any NGOs in its governance, this brought about a lot of suspicion.” (interview with R-VIII-01).

Other respondents²⁸⁰ cited other factors to explain the lack of credibility of CERTFOR: for example, they reported that the certification audits were not sufficiently deep and that the audit samples were neither diverse nor representative. Lastly, my findings suggest that the hardest blow to CERTFOR credibility occurred when the two largest CERTFOR certified companies underwent their first FSC certification audits and obtained an overwhelming number

²⁷⁴ Interviews with PFB-X-o01 and PFB-VIII-m01.

²⁷⁵ Interviews with PFB-VII-k02 and PFB-MB-q01.

²⁷⁶ Interview with N-RM-04.

²⁷⁷ Interview with R-VIII-01.

²⁷⁸ Interview with N-RM-04.

²⁷⁹ Interviews with PFB-X-o01, PFB-VIII-n01, PFB-MB-p01, PFB-VII-j01, NFB-XII-c01, PFB-VII-k01, PFB-VII-k02, R-VIII-01, I-IX-02, N-RM-02, N-RM-05 and N-RM-06

²⁸⁰ Interviews with R-VIII-01, I-IX-02, N-RM-05, and R-MB-01.

of major non-conformities. This manifested in stark terms, the large disparity between the two schemes.

And third, a common claim among many respondents²⁸¹ from the plantation forest industry was that CERTFOR was going “a step behind the FSC”. One respondent²⁸², in particular, felt that CERTFOR was out-dated in relation to some technical requirements and was far from being at the cutting-edge sustainability trends. For example, monitoring and follow up after certification and surveillance audits were poor. He regretted that his company was not FSC certified, adding: “to give you a colloquial example, we are dancing tango with CERTFOR but FSC certified companies are already dancing disco or pop music”.

4.4.3 Negative aspects of forest certification

In this sub-section, I address the various perceptions about the ways in which both FSC and CERTFOR schemes were considered by my interviewees to be failing to meet their needs. Respondents particularly expressed negative views about the heavy burden imposed on forestry firms and the failure to meet the expectations of stakeholders, as explored below.

Forest certification poses high costs on firms: Many industry respondents²⁸³ perceived that certification may cause a negative outcome in firms’ profits. Two ways can account for this to occur. First, as those respondents perceived, certification costs of implementation and audits (viz. direct costs) may be so high that some companies, particularly small forestry businesses, might see these costs as a barrier to entry or, in some cases, find it hard to maintain their certificates. As noted by one industry respondent of a large plantation forests corporation:

“That’s an issue [the annual financial costs] because the financial costs of certification cost us a bit more than 2 million dollars, so it’s not a trivial thing. And we have to consider that certification and surveillance audits are time-consuming. When they are carried out during one or two weeks, the company is practically paralysed, as you have to wait for the auditors, provide them with what they need, transport them, etc. For example in the last audit we spent around 25,000 US\$ dollars on helicopter flights, then the costs were really high”. (interview with PFB-MB-q03).

As noted above, certification is perceived as a costly policy option and, as some suggest²⁸⁴, small native forest owners’²⁸⁵ direct costs may only be funded through government subsidies. This negative aspect of forest certification, regardless of the standard, was not only the

²⁸¹ Interviews with PFB-X-o01, PFB-VII-k01, PFB-VII-k02 and R-MB-01.

²⁸² Interview with PFB-VII-k01.

²⁸³ Interviews with PFB-MB-q03, PFB-VII-k01, PFB-VII-k02, CT-VII-k01, PFB-X-o01 and PFB-MB-p01.

²⁸⁴ Interviews with NFB-XIV-f01 and B-XIV-01.

²⁸⁵ Interview with NFB-XIV-e01.

perception of forestry firms but also of contractors firms, who also noted an increase in their costs when working for certified forestry businesses²⁸⁶. These findings are consistent with similar studies concerning perceived disadvantages of certification (Moore *et al.*, 2012)

Second, some industry respondents²⁸⁷ perceived the FSC particularly as a scheme co-opted by extreme environmentalist groups, as imposing excessive and costly requirements and seeking to obtain a standard monopoly. Conversely, Moore *et al.* (2012) and Cabbage *et al.* (2010) have not found that capitulation to green groups be a relevant weakness of certification, even in Chile.

Furthermore, some industry interviewees complained about the excessive ambiguity of FSC criteria²⁸⁸. Specifically, they argued that such ambiguous requirements left too much room for the interpretation of auditors, who frequently proposed onerous solutions to address potential non-conformities. As one forest manager from a native forest enterprise claimed:

“It’s very easy to request all that stuff [referring to sophisticated environmental monitoring] but when you translate that into field activities it means organizing a person, the equipment, materials and transportation. Finally, all that stuff is translated into really high costs that native forestry companies, at least, are unable to afford.” (interview with B-XIV-01).

The social aspects of the FSC are subject to misinterpretation: Actors both from the industry and stakeholders seemed to interpret the FSC requirements in a different manner. While some large plantation corporations used to resort to paternalism to gain the consent of communities, some community members and some NGOs had different expectations about what a certified company should provide. In the former case, that paternalistic behaviour was translated into providing different “gifts” to local communities so as to obtain its certificate. As stated by this forest implementation officer:

“Nobody thought that PFB-MB-p [a large corporation] was going to get its FSC certificate as they had too many conflicts with communities. So they began to use a lot of paternalism when local communities wanted something. For example, in a certain community we donated 200 [US\$] dollars and they gave them around 2,000 [US\$] dollars.” (interview with PFB-X-o01).

Moreover, such practices from some companies seemed to have “whet communities’ appetite”, making for smaller companies hard to afford those, apparently, disproportionate requests for “gifts” by local communities. In words of the above respondent: “nowadays many

²⁸⁶ Interviews with CT-VII-k01 and CT-VIII-n01.

²⁸⁷ Interviews with B-XIV-01 and R-MB-02.

²⁸⁸ Interviews with PFB-X-o01 and PFB-MB-p02.

people ask you for microwaves, medals for a local sporting club, or even Christmas gifts.” More importantly, such practices, mutually reinforced between companies and communities, yielded unintended attitudes towards the FSC (perceived as a financial aid source) and thereby a misconception about what this scheme should really provide in social terms.

In contrast, some industry respondents, NGOs and some community members had different views²⁸⁹ about what the FSC should provide in social terms: they rejected these paternalistic practices as it only hampered community development. As suggested by this researcher:

“I think there are still some paternalistic practices [to communities] in certain situations. I think that this still persists when some company’s officer says: ‘let’s give them these things’. Now, this has changed a bit ... but it still persists with some communities and I don’t think of this as a good signal they are giving to the society” (interview with R-VIII-01).

Nevertheless, one industry respondent noted that the FSC was an opportunity to interact with communities through participatory approaches to create, for instance, environmental awareness at community level, to understand their development needs, to convey sustainability values to their children, and especially, to gain their social acceptance²⁹⁰.

Certification assessments may not be deep enough: Some respondents overtly criticised the assessment processes of certifying bodies. Put simply, some NGO members and researchers²⁹¹ questioned the insufficient depth of certification and surveillance audits as well as their follow up processes.

They specifically felt that auditors granted FSC certificates notwithstanding serious unresolved social aspects such as land tenure conflicts with Indigenous peoples, and various demands by forestry workers. One researcher, for example, criticised the granting of a FSC certificate to a large forest corporation, in circumstances when some of its contractors did not even comply with the minimal work environment regulations, stating that:

“As I told you before, although forest certification is not my realm, at least I can say that those initiatives are not really assessing labour aspects deeply enough. I gather, that compared with environmental issues, forestry workers are less relevant for companies. So those issues are sometimes left aside.” (interview with R-MB-03).

²⁸⁹ Interviews with R-VIII-01, R-VIII-02, N-RM-02 and PFB-X-o01.

²⁹⁰ Interview with PFB-X-o01.

²⁹¹ Interviews with N-XIV-01 and R-MB-03.

Therefore, the foremost issue was the quality of certification assessments, including the qualification of auditors in social matters, and the failure to detect breaches in compliance with the standard.²⁹² Nonetheless, the deteriorating quality of certification assessments has also been perceived for CERTFOR assessments, as noted earlier. Generally, these negative perceptions against the deteriorating quality of audits have pointed to both certification schemes in the Chilean case, whereas in transitioning countries (viz. Russia) they have been mostly directed to the FSC (Ulybina and Fennell, 2013).

The FSC needs empowered and trained stakeholders: As many non-industry respondents²⁹³ suggested, the FSC potential may be fully realised until such time as there are highly empowered and trained stakeholders capable of monitoring firms' operations and behaviour. However, realising FSC potential is challenging since, often, local and Indigenous communities are incapable of monitoring firms' operations in their territories. As expressed by this NGO representative:

“What happens is that companies make efforts [to improve their social and environmental performance] depending on the counterparts they find in each territory. If the counterparts are weak, badly informed, or don't have an important social and political networking or skilled leaders, the forestry companies don't make any efforts to solve their problems. But if the communities are well organized, have networking and leaders who are able to make their problems publicly known, the companies really care of them. I've seen this many times. That's one of the main problems of the FSC system. It doesn't guarantee the total control of companies' operations.” (interview with N-RM-02).

In short, FSC potential can be constrained since many stakeholders lack sufficient time, resources, and skills and are, therefore, unable to assume an active role within the FSC system.

4.4.4 Interaction between firms and stakeholders due to the FSC certification

Besides the perceived advantages and disadvantages of certification, my findings also suggested a mutual and reinforcing interaction between companies and stakeholders mostly due to the FSC scheme. They include mutual collaboration between the forest industry and NGOs, and between this industry and academia.

First, certification encouraged mutual collaboration between the forest industry and some NGOs. How? As my interviews suggest, the large plantation forest industry approached

²⁹² Interview with R-MB-03.

²⁹³ Interviews with N-RM-02, N-RM-04, N-RM-06, I-IX-02 and S-RM-01.

some NGOs since they needed to reach a better understanding of the FSC principles and criteria to enable better implementation²⁹⁴. Formerly, such a relation had been much more conflictive. However, by 2009, the situation had changed and large forest corporations actively sought to collaborate with some social and environmental NGOs pursuing their own sustainability goals. As claimed by this forest consultant:

“I used to attack the forest industry, and along with some NGOs, we used to denounce companies; anyway, we had no success in doing that and then certification came up. It was like magic, a virtuous cycle; because when I run into some forest officers, some of them tell me that they are deeply moved, after meetings with certain communities. For example they say: ‘do you know something? In the university I was only taught to see tree trunks but they didn’t teach me to see that behind all those trunks there were also people; I’ve acted carrying out operations with machinery neglecting them, without caring too much about them.’ This is just an example of many other situations of people [from companies] thinking and questioning themselves in retrospect.” (interview with R-MB-01).

This new relation entailed a major cultural change from both companies and NGOs that today is reflected in the common collaboration in different projects. The first project was the creation of the “National Forest Dialogue”, an initiative aimed to address sustainability impacts caused by the forest industry in areas other than only primary forest production (for instance, in sawmills and pulp mills).²⁹⁵ The “National Forest Dialogue” emerged in 2009 and it included the participation of Chile’s largest forest corporations (viz. CMPC-Mininco, MASISA and ARAUCO), important local NGOs such as CODEFF, WWF Chile, DAS (Department for Social Action of the Temuco’s Archbishop), and Ética en los Bosques (Ethics in Forests), as well as the CUT (the National Unitary Workers Union) and had the support of the ILO.²⁹⁶ The second project is another initiative, between the most important forest corporations and WWF Chile, that involves the companies recognising, and restoring thousands of hectares of substituted native rainforests: the “National Plan of Restoration of Native Forests”, formally launched in 2013.²⁹⁷

Second, the need of large forest companies for independent and accurate scientific information encouraged them to seek the technical advice of academia. For example, forestry companies now frequently hire university researchers to identify high conservation value areas (HCVAs). As described by this industry implementation officer:

²⁹⁴ Interview with R-VIII-01.

²⁹⁵ Interview with N-RM-04.

²⁹⁶ See OIT-Chile (2014).

²⁹⁷ See (WWF-Chile, 2013).

“This year, because of the problem we had [loss of the FSC certificate], we hired a research team from the University Austral. We are characterizing, defining monitoring guidelines, through using transects in our native forests to determine what things we are protecting and how to keep those values over time”. (interview with PFB-X-o01).

However, the relation of forest companies and academia is not something new; Chilean companies had traditionally sought scientific advice but in areas aimed to improve forests productivity, not in SFM matters.

4.4.5 Section summary

To sum up this section, most industry and non-industry actors coincided in pointing up that; generally, while the FSC provided a better reputation and public image to those certified companies than did CERTFOR, their disadvantages were relatively similar for both schemes.

4.5 Attitudes of the general public towards certification

In this section, I address the attitudes of the general public towards certification, evaluating thus its constitutive effectiveness. They mostly draw on retailers’ perceptions, as seen below.

Domestic retailers are aware of certification: Although certification is not well known among the general public, some domestic retailers were well aware of it and were preparing for a potential domestic demand for certified timber. Therefore, while there is no demand for certified timber within Chile, one large domestic retailer company of timber products²⁹⁸ was working with many small timber suppliers to improve its overall performance, including its environmental aspects, through a project funded by a government agency²⁹⁹. As stated by the CEO of this company:

“Today I am working with the CORFO in a program for the development of our suppliers, a PDP³⁰⁰, and with CORMA³⁰¹ in an APL³⁰², which is a cleaner production agreement. Then, what is the goal of doing this? The goals, in the short term, is to accredit our approximately 65 [timber] suppliers in those voluntary compromises so as to give the first step to certify them under the FSC scheme”. (interview with B-RM-02).

²⁹⁸ This retailer was also part of a multinational conglomerate present in many Latino American countries.

²⁹⁹ Interview with B-RM-02.

³⁰⁰ Program for the development of small suppliers, which is a public/private partnership between large companies and a state agency (CORFO).

³⁰¹ Corporation of timber (industry association, mostly administrated by large companies).

³⁰² Public/private partnership agreement on cleaner production, between the industry and a state agency.

Why would domestic retailers be interested in raising the environmental performance of their suppliers through forestry schemes? Apparently, as the above respondent argued, there is a similar driver to that of forestry businesses to be certified; that is to say, domestic retailers of timber products would be seeking a social licence to operate:

“We are interested in making our clients aware that the products they are buying are certified...look, we are very concerned with selling environmentally sustainable products... what happens is that this [clients’ behaviour] is changing and these changes are quicker. Today, we see that clients’ demands are increasing. Although people in Chile don’t care too much about this [certification], the younger generations will make us to meet these new standards.” (interview with B-RM-02).

Some domestic retailers believed, thus, that encouraging their suppliers to improve their environmental performance might help their own firms to be protected against potential criticism, coming from some environmentally concerned groups in the near future. This suggests, rather, a “preventive” type of social licence and hints CSR motivations. However, while there was a growing concern for environmentally-friendly products,³⁰³ some respondents³⁰⁴ noted little awareness about certification among the general public, as well as a lack of willingness to pay for certified products³⁰⁵.

4.5.1 Section summary

In the final analysis, while the general public is still relatively ignorant about forest certification, some domestic retailers of timber products were quite aware of it, which encouraged them to take some preventive measures against a potential demand for certified timber.

³⁰³ Interview with B-RM-02.

³⁰⁴ Interviews with PFB-VIII-n01, PFB-VII-k02, A-IX-02, R-VIII-02 and B-RM-02.

³⁰⁵ Interview with B-RM-02.

4.6 Conclusion

Perhaps the main lesson of this chapter is that, despite the strong opposition of the large plantation forest industry to the FSC, that initially led them to create their own alternative standard (CERTFOR), the FSC has ended up being perceived positively by different social actors, including the plantation forest industry. Both certification schemes have been sought by the industry motivated by four important drivers: social licence to operate, CSR motivations, learning from better internal/field management practices and maintaining/gaining international market access. While this chapter helped answer how certification emerged in Chile and whether the goals of companies in seeking certification were achieved, it is necessary to know the operational impacts of certification on environmental, social and economic issues. These impacts will be addressed in the next two chapters.

Chapter 5: What difference does certification make to plantation forestry businesses?

5.1 Introduction

In Chapter 4, I examined how forest certification evolved in Chile, why the forest industry embraced some forestry schemes over others and the attitudes and perceptions of key stakeholders in forest governance towards different certification schemes. Therefore, it is now appropriate to examine the capacity of certification to change the environmental, social and economic performance of plantation forestry businesses, in terms of addressing sustainable forest management issues (viz. measuring problem solving and goal attainment effectiveness), and changing companies' behaviour towards their stakeholders and their own operations (viz. measuring behavioural effectiveness).

This chapter draws on interview findings as primary sources of evidence from my case studies. They are also informed by their FSC and CERTFOR audit reports (specifically, through CARs³⁰⁶ analysis), some empirical field-based evidence³⁰⁷, media information, state laws and regulations, official forest management plans, government documents, public databases and statistics.

I have divided the chapter into two sections. First, I explore the changes experienced by certified small and medium-sized plantation forestry businesses in their environmental, social and economic performance.

In the second section, the above analysis is replicated in large plantation forestry businesses, making a detailed comparison between the changes encouraged by CERTFOR and those by the FSC scheme.

³⁰⁶ That is to say, Corrective Action Requests (CARs).

³⁰⁷ Mainly from small and medium-sized plantation forestry businesses.

5.2 Certification impact on small and medium-sized companies

This section explores the impacts of certification on the environmental, social and economic performance of small and medium-sized plantation forestry businesses.

My sample for this group of forestry businesses comprised four firms with relatively similar characteristics (see Appendix 4). Of those, three were FSC certified and only one had dual certification (FSC and CERTFOR certified). All these firms were FSC and CERTFOR certified under the “group certification” option.

5.2.1 Impact on companies’ environmental performance

Generally, certification impacted on the environmental performance of small and medium-sized forestry businesses by encouraging them, in three different ways, to undertake procedural and substantive measures concerning their operations that not only impacted on their processes but also on their outcomes.

More environmentally sustainable forest operations: Companies modified a number of forest operations to make them more environmentally sustainable by undertaking four specific measures. First, certification made companies thoroughly plan their operations to improve the protection of their natural resources and ecosystems. This was achieved through drawing up a better cartography identifying their natural areas and resources to be protected. As described by the CEO of a small FSC certified company:

“We commissioned a cartographic study so that we would know where we had our temporary and permanent water courses. All that stuff was transcribed into the maps by which we could define our buffer zones, associated with certain slopes, degrees and the water flow; that’s because all those water courses might be under forest cover or not, and, in that latter case we might carry out a recovery plan. This was extensively done for one of our forestlands. This allowed us to know what areas we ought to protect.” (interview with PFB-VIII-n01).

Consistently, one FSC audit report recommended to one of these companies to update its cartography, to include an inventory of their native forests³⁰⁸ and to identify their high conservation value areas (HCVAs) and high conservation value forests (HCVFs).³⁰⁹ This had a benefit in the sense of improving its relations with forestry regulators. For instance, one senior

³⁰⁸ The FSC audit report is available in FSC-International (2015c).

³⁰⁹ The FSC audit report is available in FSC-International (2015c).

officer³¹⁰ noted that certified companies usually improved the quality of the information provided to them (viz. detailed maps and records) facilitating ease of inspection. Lastly, a better delimitation between productive and non-productive areas facilitated the protection of their natural areas and improved environmental outcomes.

Second, certification encouraged many companies to modify specific forestry practices in such a way as to make them more environmentally-friendly. Here, there was a high level of consensus between industry respondents³¹¹ and regulators³¹² in identifying a number of such practices:

- (a) Substantial reduction of slash-and-burn practices (only employed in justified cases³¹³).
- (b) Thorough planning of skid trails and roads to limit their extension (avoiding impacts on soils).
- (c) Periodical maintenance of forest roads.
- (d) Timber harvesting operations concentrated during dry seasons to avoid soil compaction and roads damage.
- (e) Reduction of clear-cuts, making use of “clear-cut blocks” to harvest timber.

For the most part, these practices were encouraged by the recommendations of FSC surveillance audits³¹⁴. They suggested, for example, the use of low impact harvesting techniques by using oxen as the only means to skid logs through skid trails. Other recommendations included drawing up new procedures and updating forest management plans. Unsurprisingly therefore, one forest CEO³¹⁵ asserted that “the greatest certification impact for us has been on environmental issues”. For another (an agroforestry business forest owner³¹⁶), certification provided written guidelines that enabled them to standardize their practices ensuring that they did “not overlook certain aspects”, albeit it did not radically change their forestry practices

Third, certification made companies improve the management of their chemicals, including pesticides, fuels and their associated waste. Notably, all industry respondents in this sub-sector stated³¹⁷ that certification made their companies set stricter controls to apply chemical products, encourage the use of more “organic” or “environmentally-friendly” chemical

³¹⁰ Interview with A-VII-01.

³¹¹ Interviews with PFB-VIII-n01, PFB-VIII-n02, CT-VIII-n01, PFB-VIII-j01 and PFB-VIII-j02.

³¹² Interviews with A, VII-01, A-VIII-01 and A-IX-01.

³¹³ In such a case, companies must implement a “burn management plan” to reduce their forest waste and it must be approved by CONAF. Some justified cases include huge stockpiles of waste (that need to be shrunk to lower the likelihood of wildfires) or the close vicinity with conflictive (Indigenous) local communities. Interview with A-VIII-01.

³¹⁴ The FSC audit report is available in FSC-International (2015c).

³¹⁵ Interview with PFB-VIII-m01.

³¹⁶ Interview with PFB-VIII-m01.

³¹⁷ Interviews with PFB-VIII-n01, PFB-VIII-n02, CT-VIII-n01, PFB-VIII-m01, PFB-VIII-j01 and PFB-VIII-j02.

products and enhance the management of rubbish and toxic waste (from fuels and expired chemicals products). As an example, a small forestry business' contractor claimed that:

“Before that [certification] chemicals were just thrown away, anywhere, but today we are more cautious, it has changed. We respect the minimum distances around water courses when applying chemicals so we do not contaminate them.” (interview with CT-VIII-n01).

Remarkably, one CAR, issued during a 2009 FSC certification audit³¹⁸, recommended to my sampled companies that they design and implement a policy and a program to reduce the use of chemical products.

And fourth, the vast majority of my industry respondents³¹⁹ noted that certification made contractors and forestry workers, environmentally aware of the impact of their forest operations. I heard, during my interviews with some contractors³²⁰ and forest managers,³²¹ detailed accounts to justify, for example, the maintenance and enhancing of biological corridors. As this forest owner³²² summed up: “today we emphasize to our workers why they have to meet such [sustainable] practices. Especially because [they know] the main damage is done during timber harvesting.”

Measures to protect and enhance environmental values: Notably, certification made companies undertake some measures to protect natural or semi-natural values inside their forest estates as well as to enhance their environmental quality (unlike non-certified operations, see, e.g. Figure 5.1). Most of my interviewees, including industry respondents³²³, forestry regulators³²⁴ and ENGO members³²⁵, agreed that companies did so in two main ways. The first was through protecting and enhancing the soil quality, buffer zones and watercourses, as follows:

(a) Setting more restrictive buffer zone widths: 20-25 metres in permanent watercourses and 15 metres in temporary watercourses. (b) Avoiding the introduction of exotic tree species on buffer zones, and removing their seedlings in case of accidental spreading.

(c) Encouraging the rehabilitation of degraded buffer zones by replanting native tree species.

³¹⁸ The FSC audit report is available in FSC-International (2015c).

³¹⁹ Interviews with PFB-VIII-n01, PFB-VIII-n02, CT-VIII-n01, PFB-VIII-m01, PFB-VIII-j01 and PFB-VIII-j02.

³²⁰ Interview with CT-VIII-n01.

³²¹ Interviews with PFB-VII-j02 and PFB-VIII-n02.

³²² Interview with PFB-VIII-m01.

³²³ Interviews with P-VIII-n01, CT-VIII-n01, PFB-VIII-n02 and PFB-VII-j01.

³²⁴ Interview with A-VIII-01, A-IX-01 and A-IX-02.

³²⁵ Interview with N-RM-04.

(d) Independent monitoring of water quality (after timber harvesting) and soils (to evaluate the impact of herbicides on them).

Consistently, a 2009 FSC audit report³²⁶ confirmed these recommendations, and focused its attention on the implementation of more systematic monitoring procedures, particularly concerning chemicals.

A second way to protect and enhance environmental values was through establishing measures to protect biodiversity and HCVFs. Mainly, as some industry respondents³²⁷ assured me, they began to identify endangered, threatened and vulnerable species of flora and fauna on their forestlands; after which they protected them by controlling the unauthorized access of people and cattle onto their properties. Additionally, another measure that I personally observed in one company, during my fieldwork, was the presence of biological corridors around temporary watercourses³²⁸. The purpose of these corridors, in the words of the forest CEO³²⁹ was to “include into the management, the concept of ‘biodiversity under forest canopy’ and to join different native forests [and HCVFs] areas”.

Furthermore, the above respondent claimed that since her company rehabilitated and improved the connectivity among their natural areas, they had reported more wildlife sightings. While I could not confirm the accuracy of such a claim by examining audit reports, quantitative indicators or field-based data, the experience of one forest manager is illustrative:

“For example, you can always see [native] foxes and ‘quiques’ around [a mustelid species, a close relative of otters and minks] hiding themselves around there [showing a buffer zone covered by native trees and bushes]. You can also watch ‘pudúes’ [a small Chilean deer] sometimes, even with babies looking for shelter inside the native vegetation. So protecting the native vegetation is important. And pumas [cougars] only come down during winters, from those mountains”. (interview with PFB-VIII-n02).

Complementing this last measure, one audit report³³⁰ recommended certified companies to draw up and implement written guidelines to prevent damage on native vegetation by cattle.

³²⁶ The FSC audit report is available in FSC-International (2015c).

³²⁷ Interviews with PFB-VIII-n01, PFB-VIII-n02, and PFB-VIII-j01.

³²⁸ On-the-field visit held on the 2nd of April, 2013. Also, interview with PFB-VIII-n02.

³²⁹ Interview with PFB-VIII-n01.

³³⁰ The FSC audit report is available in FSC-International (2015c).



Figure 5.1 Photograph showing a pine plantation mixed with some native tree species on a slope.

Note: As this was a non-certified small operation, there were no major considerations concerning the protection of environmental values.

Source: Marcos Tricallotis' fieldwork (Tirúa, Biobío region).

Certification encourages greater openness and transparency: Some respondents including regulators³³¹ and a senior FSC officer³³² were of the view that certification made companies adopt a more open and transparent attitude concerning their forest operations. For them, this was a logical outcome of public consultation processes, which was confirmed by some audit reports³³³. These reports specifically encouraged small firms to call for a public consultation process to identify their HCVFs with their local communities.

Certification ameliorates the degradation of natural ecosystems caused by forestry: Certification was perceived as having a substantial effect in ameliorating the degradation of natural ecosystems. Many respondents, including industry officers³³⁴, some NGO members³³⁵ and one government forestry official³³⁶, agreed that certification had caused companies to stop degrading natural ecosystems in their influence areas. For example, when asked about what

³³¹ Interview with A-VII-01.

³³² Interview with S-RM-01.

³³³ The FSC audit report is available in FSC-International (2015c).

³³⁴ Interviews with PFB-VIII-n01, CT-VIII-n01, PFB-VIII-n02, PFB-VII-j01 and PFB-VIII-l01.

³³⁵ Interviews with N-RM-01 and N-RM-02.

³³⁶ Interview with A-VIII-01.

were the tangible environmental effects of certification on plantation forestry businesses, one NGO representative stated that:

“Look, rather than improving it [environmental performance], the FSC has been stopping the systematic degradation caused by the Chilean forest model. I think those effects [tangible environmental effects] are going to be seen over time. So, the FSC doesn’t improve the environmental quality of those areas but it sets a barrier against environmental degradation” (interview with N-RM-02).

More explicitly, one government official described how certification helped regulators to achieve their environmental goals concerning the protection of native forests:

“And when the first attempts to introduce certification came up, those attempts helped us, because companies [plantation forestry businesses] were no longer buying ‘cleared’ lands. That meant they didn’t buy lands where native forests had been removed [by illegal logging or burning]. By 2010, none of these companies bought lands to establish plantations where native forests were previously removed. In that sense, certification has helped us a lot because for many years now we haven’t seen companies [illegally] cutting native forests”. (interview with A-VIII-01).

Hence, according to my interviewees’ perceptions and audit reports, certification would not only impact on processes but also on environmental outcomes: this policy instrument, at least, had helped to ameliorate the environmental degradation of natural areas caused by forestry.

5.2.2 Impact on companies’ social performance

In this sub-section I will describe two main impacts of certification on the social performance of small and medium-sized forestry businesses, concerning forestry workers’ welfare and their relation with local communities.

Certification makes some contributions to improve workers’ welfare: Several industry respondents³³⁷ were of the view that certification made companies adopt both procedural and substantive measures to enhance the working conditions of their forestry workers. However, those measures did not extend beyond what was required for legal compliance. As the CEO of a small forestry business explained:

³³⁷ Interviews with CT-VIII-n01, PFB-VIII-n01, PFB-VIII-m01,

“Certification only required us to meet the labour code³³⁸, that’s it. One can’t get out of that. We have always complied with regulations; even without certification we already made our workers aware of the norms about hygiene and occupational safety anyway. It [certification] hasn’t changed the relationship with our own [direct] workers and with contractor’s workers. Without certification you have to meet those laws. But there is an added emphasis on occupational safety though.” (interview with PFB-VIII-m01).

Consistent with this view, another senior industry officer emphasised that the progress in OHS and labour issues was mostly due to the evolution of the Chilean legislation:

“It has improved the relationship with them [forestry workers] but this is not because of certification but because of the progress of this country concerning the Chilean labour legislation. For example, the OHS committees, the necessary amenities, dining rooms, and the mobile toilets inside forest operations...all that stuff has changed [for the better] during the last 10 years. We have to be in compliance with the law.” (interview with PFB-VIII-n01).

And those views accorded with that of a forest authority officer³³⁹, when he stated that “the [working] conditions are better, they [companies] can provide you the meals but there are no direct benefits for your pocket [better wages because of certification].”

Based on my interview findings³⁴⁰, some of the substantive and procedural measures encouraged by certification to maintain appropriate working conditions, as well as an acceptable level of OHS performance, were as follows:

- (a) Procurement of appropriate personal protective equipment (PPE) for workers,
- (b) Appropriate vehicles to transport forestry workers,
- (c) Hiring of an OHS expert,
- (d) Complying social security obligations in a timely manner (wages and superannuation expenses),
- (e) Proper amenities for the staff performing forest operations (including chemical toilets, dining rooms and so on), and
- (f) More emphasis on staff training.

All those measures were driven by the need to comply with the Chilean legislation. This is consistent with the focus of certification audits on some of my sampled organizations; they

³³⁸ See the labour code in Appendix 13. However, the law No 16744 about accidents and occupational diseases, as well as the Regulation No 594 establishing the basic sanitary and environmental conditions in work places are also relevant in this regard.

³³⁹ Interview with A-IX-01.

³⁴⁰ Interviews with CT-VIII-n01, PFB-VIII-n01 and A-IX-01.

encouraged firms to set measures to deal with some deficiencies in OHS practices and working conditions to meet labour laws and regulations, for example:

(a) 2010 surveillance FSC audit³⁴¹ findings: one vehicle transporting the staff did not carry its first aid kit and the right of workers to join unions was not publicly stated by some companies.

(b) 2013 surveillance FSC audit³⁴² findings: some companies had out-dated emergency preparedness plans and deficient training on these issues.

Unsurprisingly, these CARs for the most part only restated existing laws and regulations³⁴³. The only perceived exception involving a more tangible improvement (notwithstanding that it could have sounded more like a threat than a benefit), was better job stability, as expressed by some industry respondents³⁴⁴ and a contractor:

“You always have the option of working for sole traders [usually, non-certified small forestry businesses] but in this company [a certified one, included in my sample] there is always work to be done. There are more requirements but one must try to ‘get on the bandwagon’. I could have said ‘Ok, I don’t like those requirements’, but I would be unemployed.” (interview with CT-VIII-n01).

However, my interview findings showed other benefits, most notably, an improved environmental consciousness of forestry workers concerning the environmental aspects of forest operations.³⁴⁵ For example, as this forest CEO indicated:

“Forestry workers are today environmentally aware and have experienced a major cultural change. Forestry workers today have a different attitude, they know for example that it really matters where a tree falls when it’s cut. This cultural change by forestry workers has influenced the way they do things [forest operations].” (interview with PFB-VIII-n01).

Notwithstanding this positive change in environmental awareness, I found no significant evidence of a greater awareness concerning OHS issues. Furthermore, the circumstantial evidence found in some FSC surveillance audits³⁴⁶ (during 2013) suggested that forestry workers were not fully aware of OHS issues. As an example, such audits revealed one

³⁴¹ The FSC audit report is available in FSC-International (2015c).

³⁴² The FSC audit report is available in FSC-International (2015c).

³⁴³ We must recall, also, from Chapter 3, that the OHS performance and working conditions in non-certified plantation forest companies was rather poor: in that case, this sub-sector showed deficient OHS practices, less social benefits and an older manpower.

³⁴⁴ Interviews with PFB-VIII-n01 and PFB-VIII-n02.

³⁴⁵ Interviews with PFB-VIII-m01, PFB-VIII-n01 and PFB-VIII-n02.

³⁴⁶ The FSC audit report is available in FSC-International (2015c).

case where a forestry worker who was driving forest machinery, executed a risky manoeuvre without receiving his induction training.

Certification makes firms strengthen their relation with their stakeholders: Small and medium-sized plantation forest enterprises already had a collaborative relationship with their local communities. This is largely consistent with a 2010 FSC audit report³⁴⁷ that praised the social strengths of some companies, specifically pointing out that “*the company has a positive approach towards local communities and the collaboration is on very high-level*”. Yet although there might appear to be little room for further improvements in such a positive relationship, my interview findings showed three clear impacts of certification, on companies’ processes, as we will see below.

First, certification encouraged companies to engage their stakeholders in their forest management practices. This is quite a new change. The most common form of engagement, so most industry respondents³⁴⁸ agreed, concerned the consultation³⁴⁹ of local communities with regard to the execution of their forest operations. This served to increase the participation of such communities, who were now able to have their say concerning the impact of forest operations on them. As illustrated by this forest manager:

“Now I have to notify the neighbours if, for example, I’m applying chemicals. Especially if they had beehives producing honey or if they were storing water [without a cover]. And I notify them and they very much appreciate that.” (interview with PFB-VIII-n02).

Another forest officer described how certification made his company to take a more proactive attitude towards any potential complaints from their local communities:

“So, in this case the FSC encourages us to keep in touch with our neighbours, for anything that comes up. For example, if there’s a problem with our boundaries or whatever, we always know with whom we must be in touch. We know to keep them in the loop about what we are doing...and [because] to be aware any adverse effect that our operations could have in the community. Our supervisors are in touch with the neighbours; they are notified, for example, if we are going to put trucks on their roads ... allowing them to water those roads if there’s dust lifting.” (interview with PFB-VII-j01).

³⁴⁷ The FSC audit report is available in FSC-International (2015c).

³⁴⁸ Interviews with PFB-VIII-n01, PFB-VIII-n02, PFB-VIII-j01 and PFB-VIII-j02.

³⁴⁹ Interview with PFB-VIII-n01.

Similarly, one authority forest officer³⁵⁰ expressed the view that “the FSC [specifically] motivates companies to identify and make neighbours part of the business.” Perhaps one of the best examples of increased participation by local communities encouraged by certification was when companies consulted their neighbours in order to identify and protect their HCVAs and HCVFs. For instance, during one 2013 FSC certification audit³⁵¹, a minor CAR was issued to many small forest owners recommending them to open a public consultation to define their HCVAs (where many local families had water access through wells).

According to one government forest officer, cultural sites, as requested by certification, had to be identified, protected and accessible for local communities:

“There’s an important benefit for Indigenous communities. You have to identify the sites with ceremonial and historical meaning inside your forested landscapes, and the people must have full access to those sites, with no restrictions. That’s also a good thing because cartographers include communities as requested by CERTFOR and the FSC.” (interview with A-IX-01).

Second, for some companies that had a more modest social performance, certification consultation contributed even more to facilitate engagement with their communities. For example, a forest manager³⁵² noted that his company had “to collect rubbish [from public rural roads] and [to repair] the [rural] roads that were all damaged before.” Notwithstanding that, before certification, the relationship between this company and its local community was not, conflictive or frankly negative in any way, it was not mutually collaborative either. Now it is.

Third, certification made firms systematize and formalize their relations with their stakeholders. Several industry respondents³⁵³ asserted that, in the case of companies and local communities, rather than improving such a positive relationship, companies simply had to keep records of the different activities engaged in for the benefit of their communities. As described by this forest CEO:

“We haven’t had changes, in social terms we have always had a good relationship with our neighbours. We have provided them with jobs, we have authorized them to collect wild fruits or mushrooms and collect firewood [after harvesting operations]. We also take care to water rural roads when our trucks are circulating on them. The change is that all those activities are being recorded. That’s an administrative change.” (interview with PFB-VIII-n01).

³⁵⁰ Interview with A-IX-01.

³⁵¹ The FSC audit report is available in FSC-International (2015c).

³⁵² Interview with PFB-VII-j02.

³⁵³ Interviews with PFB-VIII-n01, PFB-VIII-n02, PFB-VIII-j01 and PFB-VIII-j02.

Although these companies were not usually targeted by NGOs, the systematization of relations with their stakeholders helped them to address their criticism in a better fashion, as well as be aware of potential reputational damage. As the above CEO added:

“I’d say that our attitude now is to be open with anyone who wants to talk with the company. For example, last year there was criticism from an NGO, about our practices...more precisely, it was a critique against the FSC. They [the NGO] believed that monoculture plantations of eucalypts shouldn’t be granted a certificate. However, if our company wasn’t certified you would still hear their critique but nothing would be done about it.” (interview with PFB-VIII-n01).

Impact on the social outcomes of certified companies: My findings suggest that certification impacted on relationships that some firms had with their stakeholders, although this impact was very uneven.

First, while some³⁵⁴ noted that certification helped them to increase their “reputational capital”, particularly with regulators, others³⁵⁵ did not report any change in their public image because of certification. One forest manager³⁵⁶ claimed, for example, when asked about changes that had taken place in the relationship with the forest authority, that “things have flowed in a quicker manner [the regulatory bureaucracy when processing a forest management plan], we are better listened to”. Consistent with this, a government forest officer³⁵⁷ expressed his confidence in certified companies because “there is a greater security that they are doing the right things”. However, other companies failed to see these tangible benefits on their public image since they had little interaction with authorities and, in general, with NGOs.

Second, some forest officers³⁵⁸ expressed that since their companies were certified, they had achieved a better relationship with their local communities through dialogue processes promoted by the FSC scheme. This was particularly relevant to companies with only a modest social performance (characterized by a relative apathy, not the existence of conflicts). As one forest manager³⁵⁹ put it: “before certification there were no conflicts, but the relationship wasn’t the best one with the neighbours”.

³⁵⁴ Interviews with PFB-VIII-l01 and PFB-VIII-l02.

³⁵⁵ Interviews with PFB-VIII-n01 and PFB-VIII-m01.

³⁵⁶ Interview with PFB-VIII-l02.

³⁵⁷ Interview with A-IX-01.

³⁵⁸ Interviews with PFB-VII-j01 and PFB-VII-j02.

³⁵⁹ Interview with PFB-VII-j02.

5.2.3 Impact on companies' economic performance

Overall, certification represents an economic advantage for small and medium-sized plantation forestry businesses, compared with their non-certified counterparts. Overall, these companies mainly benefited from international market access that usually exceeded certification costs. Nevertheless, I identified some disadvantages of certification; these are addressed immediately below before focusing on the considerable upside of certification in market terms.

Additional costs for companies and their contractors: My findings showed that some companies and their contractors had to incur some additional costs in order to be certified or to adapt to the changes requested by certification. First, although none of my industry respondents provided specifics or hard data³⁶⁰, some reported that the direct costs³⁶¹ of certifying their forest operations made this policy option barely affordable. As claimed by this forest owner:

“We have got some help, from the government. That’s the reason why we did it [adopt certification] at the outset; if not; we couldn’t have afforded the cost of implementing the FSC as we didn’t have any revenues selling timber [before the next cycle]. I only pay to maintain that certification standard, which is economically affordable...for people [forest owners] who are relatively solvent.” (interview with PFB-VIII-m01).

While the owner of that company expressed that certification’s (direct) costs were prohibitive for small forest operations, none of my sampled organizations reported increased indirect costs³⁶² or other costs associated with changes to comply with certification schemes³⁶³. Apparently, such costs did not significantly affect economic performance because of subsidies provided by government agencies. Moreover, in the case of low-intensity operations (such as were typical in small companies) no significant changes in forestry practices (and therefore no associated costs) were required.

Second, certification seemed to increase some (associated) costs for contractor firms. The owner of a small contractor company noted, for example, how, since his client was certified, he had to implement a number of procedural and substantive changes to continue working for such a company. Those requirements, in turn, were translated into higher costs:

³⁶⁰ While, in the Chilean culture, it may be possible for a high-profile and international researcher to obtain hard data concerning certification costs from companies, as an unknown and local researcher, the writer was unable to obtain such data, or at least not in a consistent fashion across firms. This is particularly relevant for large and reputational sensitive forest corporations but also for some small companies, the writer’s fieldwork experience confirmed.

³⁶¹ These costs include auditing fees (from the certifying body, usually in dollars per hectare) as well as other charges to maintain the certificate.

³⁶² Indirect costs include those costs associated to undertake an audit, such as accommodation and meals for the audit team.

³⁶³ For example, the costs of harvesting fewer trees per hectare, or reducing clear-cuts to reduce the environmental impact of forest operations.

“...certification makes a difference because there are a greater number of requirements you have to comply with, such as providing work gear, dining tables for the people, PPEs and keeping vehicles in good condition... in certified companies you have to spend much more money, for example you are requested to hire an OHS expert and to pay for OHS insurance for your workers.” (interview with CT-VIII-n01).

The above respondent claimed that those higher costs did not necessarily imply a better price for their services. However, he also asserted that working for a certified company ensured higher job stability for his company.

Certification allows companies to access international markets: The foremost economic benefit of certification claimed by most industry respondents³⁶⁴ was the access international markets. As stated by this industry forest officer:

“There are no advantages in terms of prices, but only companies that are certified can access the market. Of the *Eucalyptus globulus* wood chips we produce, 100% is exported to Japan.” (interview with PFB-VIII-n01).

In some cases, certified companies accessed international markets through their own supply chains (under cooperatives or associations of small forest owners).³⁶⁵ However, in others³⁶⁶ they did so through selling their certified timber to large sawmills. Importantly, none of my sampled organizations reported obtaining premium prices.

Lastly, some industry respondents³⁶⁷ asserted that large sawmills (owned by large forest corporations) encouraged their small timber suppliers to adopt certification. One forest officer³⁶⁸, for example, commented that the condition imposed on a group of small forest owners with which he was familiar (not included in my sample) in order to continue selling timber to a large sawmill, was to certify their forest operations. Similarly, according to another industry respondent³⁶⁹: “the only advantage is that the company has a permanent market access, and because there are just few certified companies they [the sawmills] try to make you [certify]...I have a competitive advantage being certified.”

³⁶⁴ Interviews with PFB-VII-j01, PFB-VII-j02, PFB-VIII-m01 and PFB-VIII-n01.

³⁶⁵ Interviews with PFB-VII-j01 and PFB-VIII-n01.

³⁶⁶ Interview with PFB-VIII-m01.

³⁶⁷ Interviews with PFB-VII-j01, PFB-VIII-m01 and PFB-VIII-t01.

³⁶⁸ Interview with PFB-VII-j01.

³⁶⁹ Interview with PFB-VIII-m01.

5.2.4 Summary of the section

To recap this section, according to mostly my interviewees' perceptions and audit reports, certification had changed the environmental, social and economic performance of small and medium-sized plantation forestry businesses.

First, certification, in general, improved the environmental management of forest operations in most of my sampled organizations. These case studies suggest that certification impacted on both companies' processes and outcomes. In general, their sustainable practices helped improve the environmental quality of natural areas and stopped their degradation.

Second, certification made companies undertake a number of measures to comply with social laws and regulations concerning their forestry workers' welfare. Although certification impacted less on companies' relationship with communities, it did make companies systematize and formalize previous collaborative agreements.

Third, certification impacted positively on companies' economic performance. Certified companies gained access to international markets and that benefit substantially exceeded certification costs.

5.3 Certification impact on large companies

In this section I describe the certification impacts on the environmental, social and economic performance of large plantation forestry businesses. These are addressed in three separate sub-sections. While my interviews were a primary source of data, I was also able to make extensive use of other sources, especially audit reports, public documentation, and media information (especially as these companies were highly visible and the targets of multiple pressure groups).

My sample for this group comprised four large forestry businesses (see Appendix 4). Of those, three had dual certification and one was only CERTFOR certified (although it aspired to seek the FSC certificate soon). I also included some FSC audit findings concerning one large corporation that was not included in my sample³⁷⁰. It was relevant to do so, because it was one of the first large forest operations to be certified by the FSC scheme in the early 2000s.

³⁷⁰ It was not included due to scheduling issues of the potential participants to be interviewed, during the time of my fieldwork.

5.3.1 Impact on companies' environmental performance

Certification impacted on the environmental performance of large forest corporations by making them adopt procedural and substantive changes to their forest operations that impacted on their processes and outcomes. The impact of certification was more significant on large enterprises since their prior environmental performance often fell substantially below the standards set by certification, due to the scale of their operations as discussed in Chapter 3.

In the following sections I will describe first the main measures undertaken to encourage more sustainable forest operations and, then, to protect environmental values and natural resources. I will also describe their effects on companies' processes and outcomes.

Measures to encourage more sustainable forest operations: Most industry respondents³⁷¹ agreed that certification encouraged them to adopt a number of procedural and substantive changes to make their operations more environmentally sustainable. Complementing my interview findings, Table 5.1 shows the main findings of audits³⁷² of large enterprises concerning their forest operations and their evolution, across three periods.

³⁷¹ Interviews with PFB-VII-k01, PFB-VII-k02, PFB-X-o01, PFB-MB-p01, PFB-MB-p02, PFB-MB-q03 and PFB-MB-q01.

³⁷² See CertforChile (2015a) and FSC-International (2015c).

Scheme	Forest operation	Findings found between 2004-2008	Findings found between 2009-2011	Findings found between 2012-2014
FSC	Stakeholder engagement in forest practices	<ul style="list-style-type: none"> Afforestation programs to economically help small farmers. Improved supervision of forest contractors' compliance with forestry laws. Better cartography to identify riparian areas. Failures in engaging local communities in identifying HCVFs and HCVAs. 	<ul style="list-style-type: none"> Still some companies failing in engaging stakeholders and consulting communities concerning forest operations. Need for better comprehensiveness of environmental impact assessments (EIAs). 	<ul style="list-style-type: none"> Enhanced training to the staff and contractors in environmental matters. Improved and formalized consultation processes with local communities (most sampled companies). Stronger supervision of contractors. Improved community engagement, including outreach activities. Improvement in EIAs.
CERTFOR		<ul style="list-style-type: none"> Failures in identifying and protecting HCVAs with high significance for Indigenous communities 	Audit reports were not available for this period.	<ul style="list-style-type: none"> Some companies introduced the "good neighbourhood" program to consult communities. Enhanced cartography to identify and protect productive/protection areas. Strict enforcement of forestry laws on contractors. Improved staff training. Deficiencies in monitoring still persisting.
FSC	Soils, water courses and forest roads	<ul style="list-style-type: none"> Prohibition of slash-and-burn practices. Forest slash was carefully sorted on sloped to prevent water run-off. Procedures to protect water courses. Failures in harvesting monitoring. 	<ul style="list-style-type: none"> Deficiencies in roads building and maintenance; in other cases this issue had been overcome. Need of more systematic measures to control soil erosion. Improvement in felling techniques. 	<ul style="list-style-type: none"> Better procedures and training to protect soils and water, but still persisting problems in some cases. Reduction in the extension of forest roads and skid trails.
CERTFOR		<ul style="list-style-type: none"> Collaboration with local universities to evaluate the impact on water courses. 	Audit reports were not available for this period.	<ul style="list-style-type: none"> Improved standards for forest roads building. Appropriate monitoring of water quality during forest operations.

				<ul style="list-style-type: none"> Some companies still showed, however, failures in the monitoring of forest operations.
FSC	Timber harvesting	<ul style="list-style-type: none"> Companies agreed to limit clear-cuttings on great land extensions. Timber harvesting monitoring was weak near ravines and water courses. 	<ul style="list-style-type: none"> Lack of measures to avoid visual impact on the landscape from harvesting. Harvesting still affecting buffer zones in some cases. Forest management plans needed better inputs from monitoring. New procedures to monitor the impact of forest operations. 	<ul style="list-style-type: none"> Extension of clear-cuts substantially reduced and beyond legal compliance. Persistent failures in monitoring (only one firm) of harvesting operations made a local NGO to publicly denounce these practices affecting riparian areas. Data from monitoring were included in forest management plans. Need to set better mitigation measures for environmental impacts.
CERTFOR		Audit reports were not available for this period.	Audit reports were not available for this period.	<ul style="list-style-type: none"> Extension of clear-cuts substantially reduced and beyond legal compliance. Proper forest resources cartography. Weaknesses in monitoring of environmental impacts.
FSC	Management of chemicals, rubbish and toxic waste	<ul style="list-style-type: none"> Implementation of procedures to manage chemicals products and waste (including proper equipment, handling, storage and waste disposal). 	<ul style="list-style-type: none"> Although appropriate procedures were implemented, some firms were still using non-authorized chemicals by the FSC. 	<ul style="list-style-type: none"> Improved implementation of procedures to manage chemicals and toxic waste. Staff training on this topic.
CERTFOR		Audit reports were not available for this period.	<ul style="list-style-type: none"> Some deficiencies persisting in the management of fuels. 	<ul style="list-style-type: none"> Overall, control of chemical products beyond legal compliance.

Table 5.1 Summary of changes in forest operations as noted by large companies' audit reports.

Source: CertforChile (2015a) and FSC-International (2015c) audit reports.

1) First, certification made large enterprises establish a number of procedural measures to exert more control over those of their contractors' operations that had significant environmental effects. For instance, one forest officer responsible for implementation described how the CERTFOR scheme made his company set certain procedural measures:

“I think that there is a greater control. Certification forces you to control your contractor companies, and their forestry workers. But for a few forest rangers, we only work with contractors, not directly with forestry workers. Certification obliges you to exert greater control on your forestry workers so that your company meets its principles. (...) For example, we use a check-list to control the operations being run by our contractors [shows a check-list on his laptop screen], we use it periodically and when we want to specifically supervise something.” (interview with PFB-VII-k01).

This view was largely consistent with those of one government forest officer³⁷³ and the owner³⁷⁴ of a small non-certified plantation forest company. For them, certification entailed “higher controls and rules to be followed” by contractor companies. Moreover, besides encouraging a better control of contractors, some FSC audit reports (Table 5.1) emphasized the need to improve contractors' training on environmental effects caused by large forest operations. But whereas in some areas some deficiencies remained, in most areas this control had led to improved forestry practices and outcomes, viz. soil erosion and slash-and-burn practices were greatly reduced (see Table 5.1).

2) Second, certification encouraged companies to change certain forestry practices through measures such as:

a) Setting procedural measures to improve the planning of forest operations: Some industry representatives³⁷⁵ acknowledged that both schemes helped their companies to identify and characterize their forest resources more efficiently. As a result, this improved their forest operations planning. As one implementation industry officer put it:

“If you ask me whether certification was useful for us or not, it really was [emphasis added]. It was useful in the sense of the land use, to systematize what the company has worked with; a better land use through the cartographic planning of the company's forestlands to know what we have and where we want to go in relation to our company management and our forest management”. (interview with PFB-VII-k01).

³⁷³ Interview with A-VII-01.

³⁷⁴ Interview with PFB-VIII-t01.

³⁷⁵ Interviews with PFB-VII-k01 and PFB-VII-k02.

Better cartographic planning allowed companies to have a better knowledge of their own resources, as described by this senior industry officer:

“And at that point [when the company implemented CERTFOR] we produced an inventory of our forest resources since we didn’t know about most of what we owned. So in this way we classified our forestlands into those having clearings and areas with permanent and temporary protections, etc. Based on this inventory we planned two rotation cycles of 25 years each for our forest operations, creating an integrated forest management plan.” (interview with PFB-VII-k02).

This was consistent with a senior forest regulator’s³⁷⁶ view, who stated that since large companies certified their operations they had substantially improved the quality of their cartography and forest management plans. Another forest government official added: “Companies have made important progress: they help us [with the quality of their information] being certified ... and the other thing is that we have started to request [from other companies, not necessarily certified] more technical and comprehensive procedures [referring to forest management plans and cartography]”. Likewise, between 2011 and 2012, one of the largest dual certified corporations published a series of leaflets on sustainability issues³⁷⁷; they showed a number of preventive measures to prevent the environmental impact caused by their operations, such as protection of buffer zones, watercourses and soils.

My interview findings confirm the audit findings shown in Table 5.1: certified companies had to develop inventory maps to improve the planning of their forest operations to know beforehand and accurately which areas should be protected from such operations.

b) Establishing substantive and procedural measures concerning soils, water streams and forest roads: My interviews with industry respondents³⁷⁸, union representatives³⁷⁹ NGO members³⁸⁰, forest consultants³⁸¹ and forestry regulators³⁸² suggested that large forest companies had undertaken a number of measures to protect soils and water streams: eradicating or limiting the use of fire to justified cases³⁸³ and eliminating slash-and-burn practices; leaving the slash generated during harvesting operations on-site to incorporate organic matter on soils; avoiding forest operations during wet seasons; classifying soils into different types to tailor harvesting systems to them (by using logging towers on slopes over 30-35%); disposing of contaminated

³⁷⁶ Interview with A-VII-01.

³⁷⁷ See the public summary in Forestal-Arauco-S.A. (2012a).

³⁷⁸ Interviews with PFB-VII-k02, CT-VIII-t01, PFB-VII-k01, CT-VII-k01, CT-VIII-t01 and PFB-MB-q03.

³⁷⁹ Interviews with IW-MB-03 and IW-MB-04.

³⁸⁰ Interviews with N-RM-05 and N-RM-02.

³⁸¹ Interview with R-VIII-02.

³⁸² Interviews with A-IX-01, A-IX-02, A-VIII-01 and A-RM-01.

³⁸³ In such a case, companies needed to implement a mitigation plan approved by CONAF.

soils in a proper fashion and; establishing measures to control soil erosion, for instance, through streamlining the building standard of forest roads and improving the planning of those roads, to reduce their extension. As one environmental industry officer illustrated:

“We used to build 400 to 500 kilometres of roads, during the summer...it was crazy. We planned how to build those roads and the planning was done using a productivity concept, how to build in a more efficient way... However, since we adopted certification we started to question ourselves about how to build forest roads, where to do it, how to manage riparian zones. ” (interview with PFB-MB-q01).

He then described how certification changed companies’ practices concerning forest roads building:

“Today we carry out studies on water quality, the dirt is not placed carelessly but it’s taken away on trucks. We build roads deviating from streams to build on a dry area, then we build bridges and culverts, and finally we restore the streams, placing filters, etc. That is, there are a number of considerations that we didn’t take into account in the past, from the point of view of the protection of riparian zones. It’s a stark change; we usually cut and planted even on riparian zones because there are no regulations on that aspect. ” (interview with PFB-MB-q01).

Turning to soils protection, the slash-and-burn method to reduce the harvest waste was pointed to by most industry respondents³⁸⁴ and various regulatory officers³⁸⁵, as a practice substantially reduced since companies adopted certification. According to one senior government officer³⁸⁶: “there is also research [in certified companies] on [how to manage] the harvest waste; because slash-and-burn practices have been pretty much eradicated.” Consistent with this, an ENGO member³⁸⁷ also recognised the eradication of these deficient practices.

Another government forest official³⁸⁸ commented how a large enterprise went beyond legal compliance by adopting “the regulation for soils, water and wetlands³⁸⁹, which was primarily intended to be applied on native forest enterprises but was not compulsory for

³⁸⁴ Interviews with PFB-VII-k01, PFB-VII-k02, PFB-X-o01, PFB-MB-p01, PFB-MB-p02, PFB-MB-q02 and PFB-MB-q03.

³⁸⁵ Interviews with A-RM-01, A-VIII-01, A-IX-01 and A-VII-01.

³⁸⁶ Interview with A-RM-01.

³⁸⁷ Interview with N-RM-05.

³⁸⁸ Interview with A-VIII-01.

³⁸⁹ See further details of the Decree No 82 in Appendix 13.

plantation forests.³⁹⁰ However, PFB-MB-p³⁹¹ adopted this regulation to comply with the FSC requirements. Then, when asked about what were the most important impacts of forest certification on forest operations, he answered: “the operations concerning soils. And the zones for the exclusive protection of water streams too.”

c) *Limiting the extension of forest operations:* Certification, particularly under the FSC, encouraged companies to rethink the magnitude of their forest operations to reduce their environmental and social impact. A subsequent change was a reduction in the extension of clear-cuts, going beyond legal compliance. As this industry forest officer explained:

“We used to say: ‘in this sector there are no limitations that stop us harvesting the maximum hectares authorized by the forestry law, that is, 500 hectares’. Now, with the FSC we realize that although we were technically able to harvest that amount, the people did not want us to harvest more than 100 hectares. Therefore, we harvested 100 hectares. That was the change.” (interview with PFB-MB-p01).

Overall, clearcutting reductions impacted more substantially upon the two largest forest corporations included in my sample, whose forest operations spanned hundreds of hectares every year. Hence, clearcutting extensions ranged now from 100 to 300 hectares continuously harvested.³⁹² Some Indigenous representatives³⁹³ also noted this change: “today, companies are concerned for clear-cuts, while the law allows them to cut 500 hectares, companies are aware that their neighbours don’t want that.” Likewise, one forest consultant³⁹⁴ reported that companies had begun to harvest more discontinuous than continuous blocks of forest stands. Overall, my interview findings accorded with those of many audit reports (Table 5.1), which found that two large companies had substantially reduced their clear-cuts by 2013-2014.

3) Third, certification made companies adopt procedural measures to improve the management of their chemical products, fuels and toxic waste. Importantly, as many industry respondents³⁹⁵ noted, both certification schemes put similar emphasis on the environmentally responsible management of chemicals. For example, when asked about specific changes to the

³⁹⁰ Although such a regulation had a broader scope to include all forest types, the focus was on native forests since, in practice, the protection of watercourses and buffer zones was regulated by the requirements set in forest management plans. Those plans were, in most cases, established well prior to the enactment of the Decree No 82 in 2011.

³⁹¹ A large plantation forestry business included in my sample.

³⁹² Interviews with PFB-MB-p01, PFB-MB-p02, PFB-MB-q02, PFB-MB-q03, R-MB-02 and I-IX-02. This was a reduction between 20 and 60% of the original clearcutting size.

³⁹³ Interview with I-IX-02.

³⁹⁴ Interview with R-MB-02.

³⁹⁵ Interviews with PFB-VII-k01, PFB-VII-k02, CT-VII-k01 and CT-VIII-t01.

management of chemical products required by CERTFOR, one industry forest officer answered that:

“In the case of chemicals, when we make use of them, then, the procedure we follow now is quite strict. I don’t think in the past [before certification] that this procedure was followed in detail like it is now. For example, we’ve been properly handling the containers, notifying the neighbours [when applying chemicals] and trying to use more organic products. All this stuff wasn’t so regulated before [certification].” (interview with PFB-VII-k02).

Except for a list of prohibited pesticides in forest operations, all the above procedural measures set by CERTFOR accorded with those as set by the FSC. As this industry implementation officer³⁹⁶ noted when asked about such a difference: “CERTFOR prohibits the use of many chemicals, but the FSC prohibits the use of even more chemicals.” Furthermore, one government forest officer³⁹⁷ commented that “the FSC certified companies are highly regulated on [the use] of chemicals: there are some chemicals they cannot use. It’s that simple [emphasis added].” My analysis of FSC audit reports (see Table 5.1) revealed that the use of highly toxic pesticides improved substantially during the 2012-2014 period.

4) Finally, certification made companies create procedural measures to improve the training of their forestry workers and contractors, on environmental matters. Most industry respondents³⁹⁸ reported that certification required their firms to follow a systematic training program to make their contractors and workers environmentally aware of the impacts of their forest operations, and how to minimize them. As illustrated by this industry forest officer:

“The felling techniques by which we train our forestry workers are associated with a better protection of the native forests and watercourses. Today, any worker is aware that throwing a tree over native vegetation is pretty much the same as throwing a tree on a house. That’s the kind of environmental consciousness we imprint on our workers’ minds.” (interview with PFB-VII-k02).

But whereas both certification schemes required that firms improve their training programs, some union representatives suggested that the FSC made them participate in a more active manner concerning environmental protection measures:

“By 2009 the company began to implement the FSC and that was different because they [the forest officers] made their workers participate [in the sustainable forest management], to safeguard the [environmental] conditions.

³⁹⁶ Interview with PFB-MB-p02.

³⁹⁷ Interview with A-IX-01.

³⁹⁸ Interviews with PFB-VII-k01, PFB-VII-k02, PFB-MB-q02, PFB-MB-q03, CT-VII-k01, PFB-MB-p01 and PFB-MB-p02.

For example, the people working on timber harvesting were told to be especially careful with rivers, or with downstream communities and also they were told to safeguard the protection [buffer] zones that weren't protected [before the FSC]. They [the forest officers] handed us out some forms to record that stuff and trained us how to do so.” (interview with IW-MB-02).

Moreover, the data collected suggested weaknesses in the quality of the CERTFOR training programs, concerning the protection of buffer zones and wetlands, as the above interviewee also noted: “what happens now is that those wetlands were planted with eucalypts 10 years ago and there's no way to fix that. And that was done when the company was CERTFOR certified.” In contrast the FSC was in most cases more demanding. For example, some FSC audit findings (see Table 5.2, 2009 and 2011 period) showed that one large enterprise (PFB-MB-q) had planted exotic trees inside buffer zones and wetlands in many places, but had been compelled by FSC to mitigate the damaged caused.

Despite some evidence showing differences in training outcomes for both schemes, what seems to be clear, at least during recent years, is that certification in general encouraged a higher environmental consciousness amongst the entire staff. An industry forest officer described how the CERTFOR scheme brought about behavioural changes in workers:

“Of course, nowadays forestry workers have a greater environmental awareness of environmental issues in general than they were before (...) our workers today are aware of topics such as the protection of water basins, the control of fuel spillages and that they must give notification of all the [environmental] incidents they have, etc. I think they a have better [environmental] knowledge now. (interview with PFB-VII-k02).

Moreover, this change of mentality seemed to be pervasive at all company levels, involving not only forestry workers but also their executives. As this ENGO member explained:

“What is interesting is that young professionals of these [large] companies are understanding the environmental impact of their operations in a much better way (...) one now realizes that the ‘environmental flag’ is no longer exclusive to us [the ENGOs] like 10 years ago but it also embraces those professionals working for those [large] companies.” (interview with N-RM-05).

Hence, while most certified companies established more systematic training programs making them more environmentally aware, in some cases negative issues still persisted which affected companies' environmental outcomes.

Measures to protect (and enhance) environmental values: Certified companies initiated a number of measures to protect or enhance some important environmental values of their operations as stated by industry respondents and diverse stakeholders. Those measures were to protect riparian buffer zones, streams, biodiversity and natural areas (including HCVPs and HCVAs). Table 5.2 complements my interviews by showing the main audit findings³⁹⁹ concerning large operations and reflects their protection efforts over time.

³⁹⁹ See CertforChile (2015a) and FSC-International (2015c).

Scheme	Environmental values	Findings found between 2004-2008	Findings found between 2009-2011	Findings found between 2012-2014
FSC	Riparian zone management	<ul style="list-style-type: none"> Weaknesses in rehabilitation of buffer zones, particularly around ravines. 	<ul style="list-style-type: none"> Failures to prevent the invasion of exotic trees on buffer zones and wetlands. 	<ul style="list-style-type: none"> Procedural and substantive measures to avoid unintentional invasion of exotic trees on natural ecosystems and to protect buffer zones.
CERTFOR		<ul style="list-style-type: none"> Failures to prevent the invasion of exotic trees on buffer zones. 	Audit reports were not available for this period.	<ul style="list-style-type: none"> Measures still insufficient to avoid spreading of exotic tree species on buffer zones in some firms.
FSC	Measures to protect and enhance biodiversity, HCVFs and HCVAs	<ul style="list-style-type: none"> Rehabilitation programs of native tree species in damaged areas. Weaknesses in inventories of flora and fauna species (some firms). More detail needed concerning protection areas in cartography. 	<ul style="list-style-type: none"> Lack of systematic and integrated measures to identify and protect HCVFs and HCVAs. Inappropriate identification, protection and no formal monitoring of endangered, threatened and vulnerable flora and fauna species. More control needed on non-authorized cattle grazing and collection of wild berries having a negative environmental impact. Identification of HCVFs required public consultation processes. 	<ul style="list-style-type: none"> Overall, better plans to protect rare, endangered and threatened flora and fauna species including educational activities in local communities. Companies recognised the conversion of native forests (after 1994) and agreed a plan to restore them. Improved monitoring programs to measure HCVFs and HCVAs attributes and to consult communities concerning HCVAs. More progress was needed to improve the connectivity among natural habitats (biological corridors). Better conservation plans for many HCVAs
CERTFOR		<ul style="list-style-type: none"> Companies agreed to not convert native forests into plantations. Identification of HCVFs and HCVAs. 	Audit reports were not available for this period.	<ul style="list-style-type: none"> Inventories of native forests and endangered species were commissioned to local universities/researchers. Participation in projects to set biological corridors along with the Ministry of Environment and CONAF.

Table 5.2 Summary of changes in the protection of environmental values as noted by large companies' audit reports.

Source: CertforChile (2015a) and FSC-International (2015c) audit reports.

1) First, certified large enterprises had to established measures to protect riparian buffer zones, as well as streams and other water bodies, from their forest operations. The majority of industry respondents⁴⁰⁰ pointed out a number of procedural measures they had implemented to protect such areas, such as documented procedures, management plans, specific training for forestry workers and monitoring programs. As described by an industry forest officer:

“Well, when we are harvesting we take care of the protection areas [buffer zones and streams] to prevent them from being damaged by our operations or by mistakes. We have operational controls [through documented procedures] to do so and that is a tangible change.” (interview with PFB-MB-q02).

Certification had also enriched the contents of forest management plans, concerning the protection of those areas, making them more comprehensive, as this government forest officer⁴⁰¹ put it: “in forest management plans we can find the measures to protect water courses and buffer zones (...) there is a change in comparison with non-certified firms.” Another government forest official went even further when saying:

“Then, companies have made progress. When I came to work here in 1989 [in the forestry department] the management plans didn’t request measures of that kind. But now, if forest management plans don’t have detailed prescriptions [of how companies are going to execute their forest operations] we don’t approve them.” (interview with A-VIII-01).

Likewise, many certification audits (see Table 5.2) recommended some companies to establish corrective actions⁴⁰², to rehabilitate damaged riparian buffer zones and watercourses. Particularly relevant were substantive measures to protect riparian buffer areas with specifications concerning width, as stated by this industry forest officer:

“Neither the FSC nor CERTFOR set a specified buffer zone width. But they say that you have to protect riparian buffer zones (...) and in the case of the FSC if we establish a specified width it needs to be [scientifically] justified. What we did is a study with a local university and we set those buffer widths. It was an agreement between us and that university (...) those buffer widths depend on a number of factors such as the country region, the water course width and whether the course is temporary or permanent, the slope degrees, etc.” (interview with PFB-MB-q03).

⁴⁰⁰ Interviews with PFB-VII-k01, PFB-VII-k02, CT-VII-k01, PFB-MB-q02, PFB-MB-q03, PFB-MB-q01, PFB-X-o01, PFB-MB-p01 and PFB-MB-p02.

⁴⁰¹ Interview with A-VII-01.

⁴⁰² In particular, such a company (PFB-MB-q) and CONAF, under the risk that (accidentally or not) planted exotic tree species on buffer areas were to fall down on buffer zones, agreed to allow the extraction of those trees. CONAF required special cautions to execute those operations, by implementing a mitigation and restoration plan with native species. This is also relatively considered (but not specifically for plantation trees) in the Decree No 82 of 2011, when setting that, after harvesting (in justified cases), forest cover must not be below 50% inside buffer zones. Interview with PFB-MB-q01.

Although there were no commonly defined buffer zone widths amongst certified firms, certifications encouraged companies to set their own prescriptions drawing on regulations that mainly applied to native forestry⁴⁰³ or on scientific data.

2) Second, certification made companies adopt procedural measures to protect biodiversity and natural ecosystems. Several industry respondents⁴⁰⁴, forest authorities⁴⁰⁵ and consultants⁴⁰⁶ were of the view that certified companies adopted a number of measures to identify, monitor and protect biodiversity values. For example, one government forest officer described that:

“So this [CERTFOR certified] [plantation] forestry business hired the services of CODEFF (an ENGO) to set the baseline of its native forests and fauna. Then they had to identify and monitor the fauna, using night cameras and noise detectors, to estimate the presence of certain species and their abundance. So that system [certification] effectively allows the monitoring of flora and fauna” (interview with A-IX-01).

Notwithstanding the adoption of procedural measures to identify and monitor flora and fauna, many audit findings suggest (see Table 5.2, FSC audits) that monitoring programs were seriously sub-standard, at least until very recently. Consistently, one FSC officer indicated that:

“There are many companies that had deficiencies in their monitoring programs but they improved them. In the case of monitoring programs for biodiversity, it’s too early to say that there’s been improvements in biodiversity.” (interview with S-RM-01).

Importantly, although certification also made most companies establish procedural measures to protect biodiversity values, their implementation was weak, at least initially (see Table 5.2). However, over time, most companies established more sophisticated plans and procedures to protect biodiversity, such as the enhancement of biological corridors and conservation strategies for each conservation attribute being identified. As noted by one forest consultant:

“I would say that now you can notice the protection areas [riparian buffer zones] in the middle of plantations; because companies have progressively taken more seriously the need to set biological corridors. This allows fauna species to move more freely around plantation forests and to mate in a more

⁴⁰⁴ Interviews with PFB-VII-k01, PFB-VII-k02, PFB-X-o01, PFB-MB-q01 and PFB-MB-q02.

⁴⁰⁵ Interviews with A-IX-01 and A-VII-01.

⁴⁰⁶ Interview with R-MB-01.

natural environment, not in an island surrounded by plantations.” (interview with R-MB-01).

Notably, many authorities noted and recognised the effort that companies made to protect natural areas.⁴⁰⁷

3) Third, the definition of HCVPs and HCVAs was another significant issue encouraged by certification. Certainly, this was an aspect on which the FSC focused much of its attention, emphasising the importance of developing definitions through a democratic consensus (between companies and their stakeholders) and based on scientific data.

However, some companies did not consider these aspects, at least at the outset. As this industry forest officer noted:

“We have around 5,000 hectares that are considered as high conservation value [native] forests [HCVPs] according to the [FSC] standard: they have biodiversity issues and homogeneous landscapes, etc. (...) and we are just merely working on the characterization of those forests to know the conditions of those forest resources because most of such a definition [of HCVPs] was made with a conservationist spirit, without specifically knowing what we were protecting. We didn’t seek advice from either ENGOs or universities to define such areas. We said ‘Ok, we just need to read the [FSC] standard in this way and we are set: this area matches here, those other ones in there and so on’.” (interview with PFB-X-o01).

A further problem was that once identified, HCVPs and HCVAs compelled companies to set a number of thorough procedural conservation measures, thereby requiring companies to invest more time and resources on their protection. This was often an onerous extra responsibility. As the above industry respondent regretfully added:

“Today we have questioned why we acted in such a way. I think that we wrongly defined HCVAs and HCVPs, some areas didn’t deserve that category. And those areas [HCVAs and HCVPs] have special requirements: they need monitoring, conservation, special management and an ongoing evaluation to know what kind of resources we are protecting.” (interview with PFB-X-o01).

This view accorded with that of an ENGO member⁴⁰⁸ who emphasized the need for comprehensive measures to protect these areas: “for example, in the case of HCVPs: they are areas requiring complex conservation actions to protect them, they need to be managed and monitored.”

⁴⁰⁷ Interview with A-VII-01, A-IX-01 and A-RM-01.

⁴⁰⁸ Interview with N-RM-01.

Additionally, some audit reports (Table 5.2) detected failures in the identification process of HCVPs and HCVAs, concerning the participation of local communities, although most of them were corrected in subsequent years.

In brief, certification, particularly the FSC⁴⁰⁹, encouraged companies to engage their local communities in their environmental management, by seeking a shared definition of their HCVPs and HCVAs, but this process was not without considerable challenges.

Certification ameliorates environmental degradation and changes companies' attitudes towards their stakeholders: The effects of certification on companies, not only impacted their processes but also, to some extent at least, their outcomes. As regards the latter, two issues were particularly important: the amelioration of the environmental degradation caused by forestry and companies' attitudinal change towards their stakeholders.

1) First, certification is capable of halting or slowing the environmental degradation caused by forest operations. My interviews with several industry respondents⁴¹⁰, ENGO members⁴¹¹, forest consultants⁴¹² and forest authorities⁴¹³ agreed that since companies began their certification processes they had avoided buying lands where native forests were previously cleared to make room for new plantations.

As this environmental industry officer stated:

“Well, I reckon that the FSC has contributed to solving conversion issues [on native forests]. All our land procurement policies have strict controls with regards to the original native forests. Even in cases where there are no native forests, but we know they existed through accessing original 1994 inventories, we don't buy those lands, and it's that simple. If you check how much land we have bought during recent years, it's been strikingly low. We are buying very little land in Chile, and when we do buy lands it is with lots of restrictions. One of those restrictions, undoubtedly, it's the conversion of native forests.” (interview with PFB-MB-q01).

This comment was largely consistent with that of a government forest official, who pointed to the 2000s as the period in which the degradation of native forests by plantation forest enterprises was substantially reduced:

⁴⁰⁹ Interviews with PFB-MB-q01 and PFB-MB-p01.

⁴¹⁰ Interviews with PFB-MB-q01, PFB-MB-q03, PFB-MB-p01 and PFB-MB-p02

⁴¹¹ Interview with N-RM-04.

⁴¹² Interview with R-MB-02.

⁴¹³ Interview with A-VIII-01.

“And then the first certification processes came up. And that was a great help because, in practice, nobody was buying land previously cleared of native forests. And by 2010 nobody was cutting native forests to substitute those lands with plantation forests. In that sense, certification helped us a lot as we haven’t seen companies cutting native forests for many years now.” (interview with A-VIII-01).

Moreover, in cases where native forests had been converted (during or after 1994⁴¹⁴) the largest forest corporations in the country agreed to restore those forests. In order to do so, such corporations recognised first, through research studies openly disclosed⁴¹⁵, the magnitude of this conversion⁴¹⁶ and then agreed to phase in a restoration plan. By 2013 this plan had been publicly announced⁴¹⁷.

Although the extent of such a conversion is still a matter of controversy between large companies and environmental NGOs (partly due to the different methodologies used to quantify this conversion and the different definition of “forest” between companies and ENGOS⁴¹⁸), it has been claimed that the FSC certification, “if properly enforced, [could bring about] the largest ecological restoration plan in Latin America”, in words of one ENGO member⁴¹⁹.

2) Second, certification, more exactly the FSC, made companies change their attitude towards their stakeholders. This encouraged more openness and transparency in large forest enterprises. Now it is possible to access public summaries from the websites of those firms, concerning their forest management, HCVAs and operational environmental management procedures⁴²⁰. Furthermore, the FSC certification engaged companies and NGOs in mutual collaborative agreements to address environmental issues. This issue, and material evidence relating to it, has been addressed in detail in Chapter 4.

⁴¹⁴ This is known as the “1994 FSC rule”, that is, after 1994 no forest management units that have converted native forests can be granted with the FSC certificate.

⁴¹⁵ For example, the “substitution report” of ARAUCO (the company that owned the largest amount of forest hectares) was commissioned to a local state university (Universidad Austral) (Forestal-Arauco-S.A., 2012b).

⁴¹⁶ For example, PFB-MB-p, PFB-MB-q and PFB-MB-u recognised the conversion (into plantation forests) of approximately 24,000, 8,000 and 1,200 hectares, respectively.

⁴¹⁷ During my fieldwork, on the 9 of September, 2013, I attended a workshop organized by the WWF Chile. In this workshop, the three largest forest companies of the country had already announced the implementation of their own restoration plans.

⁴¹⁸ For ENGOS the definition of “forests” includes vegetation in early successional stages such as seedlings and shrubs, whereas companies only recognize mature trees, of certain dimensions, as “forests”.

⁴¹⁹ Interview with N-RM-01.

⁴²⁰ See for example, the website of ARAUCO in Forestal-Arauco-S.A. (2012a)

5.3.2 Impact on companies' social performance

Certification seemingly impacted more on the social performance of large forest enterprises than on that of their smaller counterparts. I will describe, first, the impact of certification on forestry workers welfare, and then, upon local communities and other stakeholders.

Certification is a tool to improve working conditions but it is still far from realising its potential: Certified companies adopted a number of measures to improve their forestry workers' working conditions and OHS performance. Those measures largely impacted companies' processes and outcomes albeit with mixed success, as I will address below.

1) First, certification helped ensure compliance with various legal obligations concerning working conditions, labour and OHS issues. This was the consistent view among some forest authorities⁴²¹ and many industry respondents⁴²²; as one industry officer illustrated:

“The improvement is in ensuring that our contractors meet their labour law obligations. We make sure that forestry workers are provided with PPEs, duly and timely paid in their wages and superannuation expenses, etc. In that sense, there is a special care for forestry workers but we don't require our contractors to pay their workers better salaries because we are certified.”
(interview with PFB-VII-k01).

Another industry officer⁴²³, from the same CERTFOR certified company, added that: “Now the people have enough days off [abiding by the labour code], their meals are accredited by the National Health Service [a government agency].”

One government forest officer also shared these industry views for certified firms, stating that:

“What I've perceived when visiting certified companies is that they report and publicly declare, when expressly asked, their labour conditions, how many people they are working with, how much they pay those people, etc. (...) one can easily notice the effort that certified companies make to provide appropriate [as requested by laws and regulations] labour conditions.”
(interview with A-VII-01).

Furthermore, one union representative⁴²⁴ agreed with these views and stated that certification was making companies “comply with the law, [but] nothing more than that”.

⁴²¹ Interviews with A-VII-01, A-IX-02 and A-IX-01.

⁴²² Interviews with PFB-VII-k01, PFB-VII-k02 and CT-VII-k01.

⁴²³ Interview with PFB-VII-k02.

Consistent with this, a number of FSC and CERTFOR audit findings⁴²⁵ (see Table 5.3) enforced the legal compliance with certain labours laws and regulations.

2) Second, certification improved the working conditions and the gamut of social benefits for forestry workers as many industry respondents⁴²⁶ and a number of authorities⁴²⁷ and stakeholders⁴²⁸ suggested. Although some improvements were primarily taken to ensure companies' compliance with their legal obligations, in many other cases certification succeeded in providing better working conditions and benefits, going beyond legal compliance as we will see below.

⁴²⁴ Interview with IW-MB-01.

⁴²⁵ See FSC-International (2015c) and CertforChile (2015a).

⁴²⁶ Interviews with PFB-MB-q02, PFB-MB-q01, PFB-X-o01, PFB-VII-k02 and CT-VII-k01.

⁴²⁷ Interviews with A-IX-01, A-IX-02 and A-VIII-01.

⁴²⁸ Interviews with IW-MB-01, IW-MB-04, R-VIII-01, N-RM-02, N-XIV-01, N-RM-05, N-RM-04, S-RM-02, S-RM-03, R-MB-02, R-MB-03 and N-RM-06.

Scheme and Actors	Findings found between 2004-2008	Findings found between 2009-2011	Findings found between 2012-2014
FSC – Forestry workers	<ul style="list-style-type: none"> OHS training programs needed reinforcement. No comprehensive evaluation of social impacts. Modest working conditions in some operations (amenities and toilets). A better control was needed on contractors concerning workers' rights, wages, social benefits, superannuation payments, hiring policies and PPEs procurement. 	<ul style="list-style-type: none"> Staff members doing overtime under no agreements to do so. Lack of periodic health assessments and appropriate monitoring for working conditions. Deficiencies in OHS training and awareness. Inexistence of OHS committees in some cases (requested by Chilean laws). Anti-union practices in some contractor firms. <p>Lack of supervision on working conditions in contractor firms: inappropriate transport, accommodations, meals and sanitary conditions in forest camps.</p>	<ul style="list-style-type: none"> Most companies trained forestry workers in a systematic manner (OHS issues). Improved supervision and better incentives programs to encourage contractors to abide by social laws. Persistence of anti-union practices in some contractor firms. Most companies made substantial progress in protecting workers' rights (e.g. better working conditions in forest camps, cessation of controversial clauses in contracts to prevent industrial action in contractor firms, and procedures to get feedback from forestry workers); however, persistence of negative practices in some firms (e.g. overdue wages and superannuation payments, and modest working conditions in contractor firms).
CERTFOR – Forestry workers	<ul style="list-style-type: none"> Anti-union practices were reported in some contractors, viz. unjustified dismissals. Some companies did not make their workers aware of security issues when working near conflictive areas (Indigenous conflict). 	<p>Audit reports were not available for this period.</p>	<ul style="list-style-type: none"> Persistence of anti-union practices in some cases. Some weaknesses in OHS training, e.g. some workers not using protective personal equipment (PPEs). Overall, positive and improved OHS performance nevertheless. Lack of systems to evaluate the effectiveness of staff training. Public statements declaring the right for workers to join trade unions.
FSC – Communities and other stakeholders	<ul style="list-style-type: none"> Inappropriate management of land tenure conflicts with Indigenous communities, viz. use of coercive methods (police intervention), not dialogue. 	<ul style="list-style-type: none"> Most companies had set a collaborative relationship with many communities, but they needed to formalize such agreements. While most companies had initiated consultation processes with their local communities, some failures still persisted in some cases (e.g. not notified application of pesticides). 	<ul style="list-style-type: none"> Companies implemented procedures to prevent illegal activities inside their forest estates, viz. timber thefts and illegal logging. Most companies had set local hiring policies. Most companies had mitigated the impact of forest operations on local communities (e.g. notification of their operations, trucks speeding, noise, and dust lifting), but in some cases those mitigation measures did not reach all areas and they were not always consulted with local communities.

	<ul style="list-style-type: none"> Deficient monitoring of HCVAs and evaluation of social impacts. 	<ul style="list-style-type: none"> Most companies had begun to identify HVCAs concerning water-supply catchments and cultural sites of high significance for Indigenous communities. Weaknesses in socioeconomic evaluations and monitoring of social impacts. Although some setbacks were identified, most companies authorized the collection of NTFPs inside their forest estates. A minority of serious land tenure conflicts with Indigenous peoples (<i>Mapuche</i>) were not amenable to solution by dialogue; e.g. one company could not operate in around 2% of its forest estates as it was controlled by violent activists. Lack of proper procedures to solve conflicts with stakeholders and to manage complaints from local communities. 	<ul style="list-style-type: none"> Most companies had set consultation processes with local communities. Most companies still needed to develop a robust and mature social monitoring program and systematic plans to work with and consult communities. Persisting conflicts with local communities due to the use of local water sources by exotic tree plantations. Increasing number of win-win agreements between companies and local communities, e.g. control of illegal activities, cattle grazing, environmental education and collection of NTFPs. Important progress concerning the identification and protection of HCVAs, including cultural sites and water-supply catchments. Demands and complaints from local communities were still slowly processed (concerning not respected agreements). Companies set policies to avoid the purchase of former Indigenous lands. Significant reduction in the number of land tenure conflicts with Indigenous peoples by privileging the use of dialogue. Implementation of social development projects for local communities, but some failures were identified, viz. corruption issues among community leaders.
CERTFOR audit - Communities and other stakeholders	<ul style="list-style-type: none"> All land tenure conflicts with Indigenous peoples were filed as lawsuits by companies. Identification of HCVAs concerning cultural sites and water-supply catchments. 	Audit reports were not available for this period.	<ul style="list-style-type: none"> Identification of HCVAs along with communities, particularly water-supply catchments and sites of cultural significance. Local hiring policies and training provided in forestry occupational skills to community members. Monitoring of social impacts was still weak as well as consultation processes. Staff training in the Indigenous communities' culture.

Table 5.3 Summary of changes concerning social issues as noted by large companies' audit reports.

Source: CertforChile (2015a) and FSC-International (2015c) audit reports.

a) Workers' rights and certification as a negotiation tool: Certification was perceived by many union representatives as a more effective negotiation tool than labour laws in improving the working conditions of forestry workers. As this union representative put it:

“Well, we, as union representatives, have one perception [concerning certification] and workers have another. We think that forest certification, mainly the FSC, is an opportunity, a chance, a tool to improve [working] conditions, to improve the compliance with labour laws, to improve companies' environmental performance. It's an opportunity. ” (interview with IW-MB-01).

b) Benefits in working conditions: Some industry officers reported tangible benefits in working conditions specifically encouraged by certification. For example:

“Forest shifts used to be ‘deadly’ [really exhausting] shifts: the infamous ‘12x3’ were the traditional shifts: let's say that workers spent 12 days in a forest camp in a remote place, without phone connection and without contact with their families during those 12 days. (...) and we realized that all these [poor] conditions made workers worried about their families leading them to lack concentration on their tasks and increasing the rate of accidents. Today, forest camps have quite different conditions, like ‘mini’ hotels, satellite TV, obviously hot water, electricity and a phone signal (...) certification made us understand that all these things are interconnected: we want workers in better conditions and to get them in touch with their families, during the 10 days they are working [new shift system].” (interview with PFB-MB-q01).

Moreover, a government forest official⁴²⁹ commented that “I've had the experience of eating the meals provided for workers in forest camps [during inspections] and these menus are prepared by nutritionists, they have proper OHS equipment, they have other [better] conditions.” Another government forest officer⁴³⁰ told me of other benefits for forestry workers: “for example, another company was giving the chance to their workers to finish its primary education [through a special program], after working hours.”

Although many improvements in working conditions were underway since the late 1990s, these findings suggest that certification at least helped companies to deepen and embed such positive changes and in some cases may have done considerably more. With regard to other conditions however, certification had far less an impact, as discussed below.

⁴²⁹ Interview with A-VIII-01.

⁴³⁰ Interview with A-IX-01.

3) Third, although certification may have improved some working conditions and increased compliance with the law, companies may have failed to meet all their requirements. Now I will describe some cases, provided by union representatives⁴³¹, local community leaders⁴³², researchers⁴³³, forest consultants⁴³⁴ and labour authorities⁴³⁵, where there was no evidence that certification was helping companies to achieve a better social performance.

a) *Poor working conditions:* Some respondents claimed that many contractor companies still had poor working conditions, even when they were under the control and supervision of large certified forest corporations.

Chapter 3 noted the failure of some large companies to address the ergonomic aspects of forest operations run by their contractors. This wider problem was highlighted by one government labour official⁴³⁶ who asserted that many large certified companies still had significant deficiencies in working conditions, for instance, with regards to some basic sanitary conditions in forest operations (not forest camps) such as the provisions concerning (mobile) toilets and drinking water. Furthermore, a researcher⁴³⁷ also added that: “big companies have reduced their connection with workers, (...) in some areas, for example, they often had six supervisors and now there is just one.” Notwithstanding these persisting conditions, taken overall, certification mostly improved the behaviour of contractors with regard to these issues (see Table 5.3).

b) *Anti-union practices:* The persistence anti-union practices in most contractor firms working for certified large forest enterprises was consistent amongst my interview findings and audit reports. Particularly, the difficulties in establishing effective collective bargaining processes was an issue on which certification, particularly the FSC, did not make tangible progress. As one union representative claimed:

“Now, for example, PFB-MB-q is already FSC certified. Today they have non-conformities and a week ago we had a meeting with the people from the FSC concerning the same thing: they just now realized that there’s not too much collective bargaining, not too many workers joined unions, but a lot of anti-union practices. Then, dammit! At the end of the day one becomes sceptical of the policies [referring to the FSC certification] working in there.” (interview with IW-MB-04).

⁴³¹ Interviews with IW-MB-01, IW-MB-02, IW-MB-03 and IW-MB-04.

⁴³² Interview with I-IX-01.

⁴³³ Interview with R-MB-03.

⁴³⁴ Interview with R-MB-02.

⁴³⁵ Interview with La-IX-01.

⁴³⁶ Interview with La-IX-01.

⁴³⁷ Interview with R-MB-03.

Such a critique was consistent with other union members' experiences. For example, a union representative⁴³⁸ commented how, after certification, contractors continued explicitly threatening their workers with dismissal if they decided to create a union.

My interviews also provided some possible explanations for the apparent lack of success of certification in improving workers' rights, namely poor labour legislation and the lack of depth of certification surveillance audits. In the former case, as one union member⁴³⁹ pointed out "as far as we know, PFB-MB-p has around 360 contractors to run its forest operations (...) this means that 360 contractor firms should have 360 unions and, in turn, 360 collective bargaining processes⁴⁴⁰...". In the latter, another unionist pointed to certifying bodies' weaknesses during the consultation with forestry workers:

"We just meet them once a year, in meetings of no more than 30 to 45 minutes, they only ask for some data. And there's no follow-up, no work to be done in-the-field, none of that stuff." (interview with IW-MB-04).

My interview findings were consistent with those of a number of FSC and CERTFOR audit reports (see Table 5.3) that encouraged some companies to address persistent anti-union practices in their contractor firms.

Certification helped companies to improve the relationship with their stakeholders:

The adoption of certification encouraged large companies to undertake a number of procedural and substantive measures to improve their relationship with their stakeholders – usually local communities. While in most cases the relationship between companies and communities significantly improved, in a minority of cases, long-standing conflicts remained largely unsolved, as I will examine below.

1) First, certification encouraged companies to undertake a number of procedural measures to consult communities and stakeholders concerning the impact caused by their forest operations. Such consultation processes encouraged firms to adopt mitigation measures in accordance with their stakeholders (usually, local communities) wishes. The change was particularly substantial and well beyond legal compliance, as regards two particular aspects: forest operations and HCVAs.

⁴³⁸ Interview with IW-MB-03.

⁴³⁹ Interview with IW-MB-01.

⁴⁴⁰ The Chilean labour legislation hinders collective bargaining among contractor companies. Although the Labour Code (updated in 2002) allows contractor workers to create federations across contractor companies, large forestry company are not obliged to negotiate under such conditions. Therefore, in practice, collective bargaining rights in Chile are poor.

a) Forest operations: Most, if not all, industry respondents⁴⁴¹ as well as a number of stakeholders, including community representatives⁴⁴², NGO members⁴⁴³, union representatives⁴⁴⁴, forest authorities⁴⁴⁵ and consultants and researchers⁴⁴⁶ agreed in pointing out that both certification schemes made companies consult local communities concerning their forest operations. For instance, a harvesting contractor of a CERTFOR certified firm stated:

“Today we have to notify the neighbours of all the forest operations we are going to do, for example, when we are harvesting we notify them to prevent the occurrence of any accidents. If they have cattle [grazing on the company’s forestlands] they are asked to get them out from those forests because they could suffer an accident as sometimes happened before [certification]. All the community is now notified and because of that, there are no accidents.” (interview with CT-VII-k01).

The CERTFOR scheme was also capable of influencing the execution of some forest operations, through; for example constraining the application of chemical products in plantations⁴⁴⁷. But whereas this standard made companies identify, notify and, to some extent, consult their communities to avoid a significant impact on them, the FSC scheme went further⁴⁴⁸. As one forest officer, in a dual certified company, put it:

“With FSC came a change of mentality that influenced the way by which we build relationships [with their stakeholders] and how we listen to different points of view. CERTFOR helped us, anyway, to consider our interested parties but still from our own [emphasis added] point of view. For example, if I meet with my communities, identifying their problems as well as proposing them the solutions...that’s very unidirectional. Do you understand? If I have trucks circulating on some roads I can identify them lifting dust and that my neighbours also have activities so I implement the solutions putting trucks out to water those roads, putting signs, etc. But maybe the community has other needs, and that task of listening to them and providing them with solutions at their own pace comes from the FSC. That it’s been the great change.” (interview with PFB-MB-p01).

All those views accorded with those of other stakeholders. For example, for one senior government forest officer⁴⁴⁹, certification was a great benefit for communities since companies were now aware of who were their neighbours and their problems. That view was also shared by

⁴⁴¹ Interviews with PFB-VII-k01, PFB-VII-k02, PFB-X-o01, CT-VII-k01, PFB-MB-p01, PFB-MB-p02, PFB-MB-q01, PFB-MB-q02 and PFB-MB-q03.

⁴⁴² Interview with I-IX-02.

⁴⁴³ Interviews with R-MB-01, N-XIV-01, N-RM-02, N-RM-05 and N-RM-06.

⁴⁴⁴ Interviews with IW-MB-01 and IW-MB-02.

⁴⁴⁵ Interviews with A-RM-01, A-X-01 and A-IX-01.

⁴⁴⁶ Interviews with R-MB-02 and R-VIII-01.

⁴⁴⁷ Interview with PFB-VII-k01.

⁴⁴⁸ While CERTFOR would have triggered consultation processes, such processes were not sufficiently deep. Interview with R-VIII-01.

⁴⁴⁹ Interview with A-RM-01.

a forest researcher⁴⁵⁰ who suggested that certification changed the traditional apathy of companies towards their neighbours. Another researcher⁴⁵¹ added that “companies now understand, for example, that they cannot perform a timber harvesting operation if they don’t consult communities beforehand”. And, importantly, for a social NGO member, certification made companies be socially aware as “the FSC allowed companies to be involved in a better way in those territories [forestry regions] than they did before.”

Local communities appreciated companies’ consultation processes. As summed up by this Indigenous representative:

“I’ve seen how some people from Indigenous communities, despite the difficulties they have to get through [because of forest operations], appreciate the public consultation processes saying ‘in the face of the dust and the water scarcity, at least I can say that the forest company is at least talking with me’. I’ve never seen that before.” (interview with I-IX-02).

However, in some cases (FSC audit reports, Table 5.3) such consultation processes were still immature and needed a systematic approach to address social issues.

b) High conservation value areas (HCVAs) identification: certification involved a process of consultation with companies’ stakeholders to define their HCVAs. Most of these HCVAs were sites of paramount cultural and economic importance for local communities’ livelihoods. That was the case, respectively, with religious or ceremonial sites and water-supply catchments. For instance, one NGO member commented how the FSC made companies define their HCVAs along with their communities:

“There is a compulsory consultation procedure. For example, to define the HCVFs and the HCVAs, companies have had to identify their forests, cultural sites, and have a public consultation process including Indigenous communities.” (interview with N-RM-01).

The strong emphasis that the FSC put on defining HCVAs along with communities was illustrated by the experience of an industry implementation officer⁴⁵² during a certification audit:

“We have around 60 or 70 water-supply catchments; we have never made trouble for our neighbours by stopping their access our water (...) and we don’t plant those areas either because all those catchments are in protection

⁴⁵⁰ Interview with R-VIII-01.

⁴⁵¹ Interview with N-RM-06.

⁴⁵² Interview with PFB-X-o01.

areas of native forests where we never run forest operations (...) but the auditors asked us: ‘have you got a plan for HCVAs?’, ‘are they identified on the maps?’. We replied ‘no’ because we didn’t have any kind of points on the maps showing them. Being honest, we never considered either the cultural values or the water-supply catchments in our plans.” (interview with PFB-X-o01).

Coupled with this, for some respondents⁴⁵³ such as industry members, forest authorities and consultants, certification also made communities participate when defining protection and monitoring measures to such HCVAs (particularly, water-supply catchments), which is consistent with some audit reports (see Table 5.3). Lastly, although such a process was still incomplete, companies nevertheless protected a significant number of water-supply catchments and cultural sites.

2) Second, in most cases certification made large companies benefit their local communities as well as to change positively their behaviour in relation to their stakeholders. I will examine each of those cases below.

a) Positive changes for local communities: my interviews with most industry respondents⁴⁵⁴, as well as with a number of stakeholders⁴⁵⁵ (including NGO members, forest authorities and community leaders), suggested that both forestry schemes provided a number of tangible benefits for communities. Notably, some audit findings showed (Table 5.3) that the most usual complaints from communities were associated to forest trucks: dust lifting, noise, speeding and damage on public rural roads⁴⁵⁶. Hence, most companies set procedural and substantive measures to mitigate such impacts; as this industry forest officer claimed:

“...we put trucks to water roads so as to avoid dust lifting on [rural] roads and, as dust spoils the clothes of the people [of the communities]. We fix bridges and [public] infrastructure for the community and we are aware that is our responsibility. That’s a huge change in relation to what we were doing before.” (interview with PFB-VII-k02).

Some of the obvious measures that certified companies put into practice to mitigate the social impact on communities went beyond legal compliance; as this industry forest officer described:

⁴⁵³ Interviews with PFB-X-o01, A-RM-01, A-IX-01 and R-MB-01.

⁴⁵⁴ Interviews with PFB-VII-k01, PFB-VII-k02, PFB-X-o01, CT-VII-k01, PFB-MB-p01, PFB-MB-p02, PFB-MB-q01, PFB-MB-q02 and PFB-MB-q03.

⁴⁵⁵ Interviews with R-MB-01, N-XIV-01, N-RM-02, N-RM-05 and N-RM-06.

⁴⁵⁶ These are common complaints widely recognised by the forest authority as well. Interview with A-IX-01.

“For example, the noise of trucks. There are no specific regulations to limit the noise or the speed of forest trucks [concerning its impact on rural roads and communities]. Just meeting the [general road transport and safety] law we may work without any complication, but we drive at much lower speed limits than what is set by the law and we have stricter controls to reduce the noise from our trucks. And the people are aware of it.” (interview with PFB-MB-q03).

Many stakeholders also described a similar range of tangible benefits provided by certified large companies that contributed to the wellbeing of local communities. For example, one government forest officer⁴⁵⁷ confirmed the above measures to avoid dust lifting and added that “[certified] companies have also set the improvement of [public] roads, although they damage the roads, they also repair them by implementing a plan.” This was consistent with many audit reports (see Table 5.3).

Likewise, the FSC and CERTFOR schemes encouraged companies to contribute to the livelihoods of local communities. For example, companies⁴⁵⁸ encouraged their neighbours to collect non-timber forest products (NTFPs) and firewood leftovers from their forest estates, as common benefits mentioned by communities’ members⁴⁵⁹ and in audit reports (Table 5.3). Other benefits included the formalization and implementation of collaborative agreements to authorize cattle grazing inside companies’ forest estates, and social projects to provide new water-supply catchments and local job sources⁴⁶⁰.

Certification also made companies more open and transparent concerning the disclosure of their forest management practices towards local communities as many respondents⁴⁶¹, including industry respondents, NGO members, Indigenous and union representatives recognised.

b) Changes for Indigenous communities: The evidence suggests that, certification, or more exactly the FSC, encouraged companies to change their behaviour towards Indigenous communities. Many industry respondents⁴⁶² and a number of stakeholders including NGO members⁴⁶³, researchers⁴⁶⁴, community members⁴⁶⁵, consultants⁴⁶⁶ and forest authorities⁴⁶⁷ were

⁴⁵⁷ Interview with A-IX-01.

⁴⁵⁸ Interview with PFB-VII-k01.

⁴⁵⁹ Interview with I-VIII-01, who was an Indigenous villager.

⁴⁶⁰ Interviews with PFB-MB-q02, PFB-X-o01, PFB-VII-k01, R-VIII-01 and R-MB-02. See also audit findings in Table 5.3.

⁴⁶¹ Interviews with S-RM-01, PFB-X-o01, PFB-MB-q03, I-IX-02, R-MB-02, N-RM-04, IW-MB-02 and N-XIV-01. See also audit findings in Table 5.3.

⁴⁶² Interviews with PFB-MB-q01, PFB-MB-q03 and PFB-MB-p01.

⁴⁶³ Interviews with N-RM-02, N-RM-05, N-XIV-01 and N-RM-06.

⁴⁶⁴ Interview with R-VIII-01.

⁴⁶⁵ Interviews with I-VIII-01 and I-IX-02.

⁴⁶⁶ Interviews with R-MB-01 and R-MB-02.

of this view. As an outcome, the number of conflicts with Indigenous communities was substantially reduced.

This change allowed companies to develop a better connection with their surrounding communities, as noted by this social NGO member:

“The FSC system allows companies to be involved in their territories in a better fashion, which is something that never happened before. And many of those problems had an easy resolution, entailing a minimum effort for companies. (...) many [companies’ officers] have asked themselves ‘why didn’t we do this before’ [certification]?” (interview with N-RM-02).

Companies implemented, as with non-Indigenous communities, a number of measures to mitigate the impact of their operations on and to benefit Indigenous communities; consistently with many audit findings (Table 5.3). An example of those measures was provided by an industry forest officer, as follows:

“For example, our neighbours collect water from our lands. Today, we have 400 water-supply catchments for our neighbours, 400 [emphasis added] for [local] families. We are even supplying water for a small town near one of our forestlands and those water points are now protected. This was because of the FSC: those water-supply catchments are called HCVAAs or high conservation value areas. Also, we have learnt from the Mapuche [Indigenous] culture; and actually, today, our [cultural] sites are Mapuche sites. We have around 30 Mapuche sites inside our forests and we have learnt the meaning of cultural sites such as Mapuche cemeteries or ‘tralenkos’, the waterfalls or ‘menokos’ that are living watercourses where their spirits live, the ‘Ñen’. That didn’t exist before certification”. (interview with PFB-MB-q01).

Furthermore, certification (specifically, the FSC) caused some companies to implement hiring programs to provide some Indigenous communities’ members with jobs. In the words of this industry forest officer⁴⁶⁸: “of those 1,400 local forestry workers that we employ on our forest operations, 600 are Mapuche workers, working everyday with us [who make use of manual or traditional harvesting methods].” In addition, the owner⁴⁶⁹ of a contractor company commented that PFB-MB-p had “hired the services [timber harvesting] of a Mapuche contractor who provided jobs to his own people.” I heard of similar experiences from other stakeholders⁴⁷⁰, confirming these findings.

⁴⁶⁷ Interviews with A-IX-01, A-RM-01 and A-VIII-01.

⁴⁶⁸ Interview with PFB-MB-q01.

⁴⁶⁹ Interview with CT-VIII-t01.

⁴⁷⁰ For example, some union representatives and NGO members. See interview with IW-MB-04 and N-RM-02.

Finally, certification made companies to privilege dialogue as a means to settle land tenure disputes with Indigenous peoples. However, the FSC and CERTFOR schemes took different approaches: while both schemes encouraged the dialogue, the FSC made companies seek solutions beyond legal compliance. In contrast, for the CERTFOR scheme, land tenure claims from Indigenous communities were to be exclusively based on legal entitlements⁴⁷¹ (if the claimed land was a former “Merced title” such communities had legal rights on those disputed lands⁴⁷²). In contrast, the FSC made companies engage in a dialogue with Indigenous communities even in cases where land tenure claims had no legal grounds⁴⁷³. This allowed companies, as seen in Chapter 4, to reduce substantially their conflicts with Indigenous communities.

c) No changes for local communities in some cases: while certification impacted companies’ processes by making them implement a number of measures, these had little impact in improving their relationship with some communities. For example, some community leaders felt that certified companies did not mitigate their social impacts in some territories.⁴⁷⁴ This finding also accorded with that of a researcher who stated that “there are some cases in which certification hasn’t represented any change for certain Indigenous communities, but however, companies can show you cases in which they have achieved very good agreements.”

Some FSC audit reports (see Table 5.3) suggested as possible causes the immaturity of social monitoring programs to ensure the compliance of collaborative agreements. That was also the view of an FSC executive officer⁴⁷⁵ who suggested that most large corporations, at least initially, showed weaknesses in their monitoring programs but “they implemented it in a better fashion afterwards”.

⁴⁷¹ Interview with S-RM-02.

⁴⁷² Such a solution consisted in that the firm recognised first an overlapping of their forestlands with former “Merced titles” (Indigenous lands recognised as such by the Chilean state). Then the company may negotiate with CONADI (the National Indigenous Corporation, an state agency for Indigenous matters) the sale of those lands to the state. CONADI, therefore, would return such disputed lands to the Indigenous communities who claimed for them.

⁴⁷³ Interview with PFB-MB-q01.

⁴⁷⁴ Interview with I-IX-01.

⁴⁷⁵ Interview with S-RM-01.



Figure 5.2 Photograph showing ongoing police surveillance in conflictive areas with Indigenous communities.

Source: Marcos Tricallotis' fieldwork (Tirúa, Biobío region).

Apparently, the lack of a systematic and robust social program to control, mitigate and monitor the impact of forest operations over time had caused some large companies to breach some certification commitments, particularly, under the FSC scheme (see Table 5.3, 2012-2014 period). The relative immaturity of social programs also made companies commit mistakes when dealing with Indigenous communities, as when they did not spot some corruption issues inside such communities, according to one industry officer:

“That’s one of the reasons why the FSC [the certifying body] issued some major non-conformities to us. They said that we used to work only with the community president and that was true: such leaders finally monopolized those [social] projects and the benefits were shared between the leader and his or her friends, but the community hadn’t the remotest idea of it. So, what happened then? What happened is that those community leaders were appointed for just one year [they usually did not last longer once the community discovered that they were involved in corruption issues], and consequently, we had to start all the process again, and with very angry people.” (interview with PFB-MB-q01).

Furthermore, the FSC has not helped large forest companies to settle disputes with a small, but highly visible and radicalized, proportion of Indigenous activists. These interview data were consistent with some audit reports (see Table 5.3) that noted the persistence of some land tenure conflicts in certain areas (see, e.g. Figure 5.2). Notwithstanding these cases,

certification was generally successful in mitigating the impact of forest operations on most Indigenous communities.

5.3.3 Impact on companies' economic performance

Certification impacted on the economic performance of large forest corporations in two different ways. While by maintaining international market access certified companies avoided financial losses, they reported significant economic associated costs by modifying their operations.

Certification allows companies to maintain international market access: The main economic benefit of certification, as the vast majority of my industry respondents⁴⁷⁶ indicated, was that it allowed large forest enterprises to maintain their market access. This was apparently the only benefit since none of the companies included in my sample reported being paid premium prices for selling certified timber. As this environmental industry officer illustrated:

“Well, as I told you before, there are market reasons. More exactly, we wanted to maintain our [international] market access. Today we don't have premium prices and I don't think we are going to get them, we keep the FSC just to maintain markets.” (interview with PFB-MB-p01).

Consistently, one ENGO member⁴⁷⁷ commented to me that: “based on my conversations with [large] companies, I can say that certification only ensures better conditions to access markets due to the demands of European countries, for example, rather than earning more money.” Maintaining the FSC certification was particularly relevant in the case of FSC-oriented markets, according to my interview findings.

Indeed, losing the FSC certification had a strong negative impact on the economic performance of some companies that exported to such environmentally sensitive markets. That was the case of one company suspended of its FSC certification in 2012. As one implementation officer described:

“During the peak of our production we exported 650,000 cubic metres annually, but today we export half of that. That's because of the restrictions that Japan [the main client and owner] put on non-FSC certified timber. (...) this year we have reduced our operations to a minimum level to continue working since we have lost [international] markets with this [the suspension] (...) the reduction in forest operations has been very substantial we reduced

⁴⁷⁶ Interviews with PFB-X-o01, PFB-MB-q01, PFB-MB-q02, PFB-MB-q03, PFB-MB-p01, PFB-MB-p02 and B-RM-01.

⁴⁷⁷ Interview with N-RM-01.

the deliveries of timber from 25 cargo ships to only 4 of them.” (interview with PFB-X-o01).

It is noteworthy that this Chilean company was actually part of a larger Japanese conglomerate and, accordingly, followed its directives. Once FSC-suspended, its Chilean branch (PFB-X-o) only supplied “controlled wood”⁴⁷⁸ (at lower prices and volumes) to the pulp mills owned by the conglomerate in Japan⁴⁷⁹. Due to the directives from the Japanese headquarters, the type of tree plantations produced (eucalypts roundwood, mostly exported), and the financial problems expressed by this company after the FSC suspension, it is unlikely that the remaining wood was sold in the domestic market at better prices. Indeed, PFB-X-o reduced drastically their forest operations⁴⁸⁰. This company recovered its FSC certificate in 2014 nevertheless.

Certification represents a significant cost for forest operations: Although, due to the qualitative nature of this research and confidentiality issues, I could not access quantitative data to confirm my interview findings⁴⁸¹, many industry respondents⁴⁸² suggested that certification posed significant economic costs on companies’ operations. For them, both environmental and social certification requirements negatively impacted on their economic performance.

1) First, environmentally, companies faced higher costs associated with changes necessary to comply with certification schemes. That was the case, for example, of a contractor⁴⁸³ working for a CERTFOR certified company: “[after certification] I have more expenditures because, for example, to avoid fuel spillages I had to buy a spill kit, including sand, in case of some accidents.” Further, while one environmental officer told me that they had not estimated the exact costs of certification on forest operations, his perception was that such costs were “significantly high”:

“We’ll carry out an [economic] evaluation to know how much this [certification] means, after some time. Today it’s really premature, but I think there are some estimations to say that we have increased all our costs, all of them [emphasis added]; now, how much of those costs have been

⁴⁷⁸ Controlled wood is uncertified material that can be mixed, in different proportions, with FSC “pure” certified wood sources to manufacture goods showing “FSC Mix labels”. However, controlled wood must comply with certain requirements, including for example the legality of wood sources and respect for high conservation values (HCVs); all of which was met by PFB-X-o. See this definition in (FSC-International, 2016a).

⁴⁷⁹ But, in practice, the Japanese pulp mills acted as a client as they internally purchased their own timber produced in Chile and, arguably, to maintain the conglomerate’s public image in terms of corporate environmental responsibility. Interview with PFB-X-o01.

⁴⁸⁰ Interview with PFB-X-o01.

⁴⁸¹ It was not possible to obtain hard data concerning certification costs and/or companies’ financial performance associated with certification due to reasons given in footnote No 360.

⁴⁸² Interviews with PFB-MB-q01, PFB-MB-q02, PFB-MB-q03, PFB-MB-p01 and PFB-MB-p02.

⁴⁸³ Interview with CT-VII-k01.

increased by the FSC? Perhaps most of them, but I wouldn't be able to say exactly how much." (interview with PFB-MB-p01).

Then, the above interviewee criticised that the FSC neglected the economic pillar:

"There's also another issue caused by the FSC: the FSC system assumes that the economic pillar is indestructible and it doesn't work that way. You can manage your environmental and social aspects responsibly because you have an economic pillar that supports them. But if you push the economic pillar too much, then you can fall into bankruptcy. That's a paradox, while you are a very altruistic company with the community, you cannot afford your operations and financially survive. Certification systems only exist because profitable businesses support them." (interview with PFB-MB-q01).

Moreover, one forest consultant added: "the [economic] system of those [large] companies has been resilient they have profits and are working fine (...) but I don't know if a small company will have the financial conditions to [financially] sustain this."

Overall, the financial impositions on companies can be substantial. As noted in Section 5.3.1, only the three largest forest corporations of the country embraced a large ecological restoration plan to mitigate the conversion of native forests with plantations during the 1990s.

2) Second, socially, some certified companies implemented measures for the welfare of communities, particularly Indigenous communities. Such measures to favour local labour hiring also brought about higher economic costs. As this industry forest officer explained:

"We mechanized our forest operations fifteen years ago, and the mechanization was implemented to improve our OHS performance. The mechanization was [initially] more expensive than manual operations: it did cost us between 1.2 and 1.3 additional [US\$] dollars, per cubic meter, to harvest a forest. That was fifteen years ago. In contrast, today manual operations [using chainsaws operators and logging using oxen] are more expensive than mechanized ones: they are [US\$] 2 dollars more expensive per cubic metre. The 600 Indigenous forestry workers we employ on manual operations are an extra cost of US\$ 5 million dollars a year." (interview with PFB-MB-q01).

Although manual operations represented an important cost, the above company preferred to employ people from Indigenous communities, rather than mechanizing operations, to comply with the FSC requirements and to avoid conflicts with such communities.

5.3.4 Summary of the section

To sum up this section, certification had a substantial impact on the environmental, social and economic performance of large plantation forestry businesses.

First, certification changed the environmental performance of large certified companies as they systematically changed a number of substantive and procedural measures to make their forest operations more environmentally sustainable, changing their processes. The foremost positive environmental outcomes were the substantial reduction of clear-cuts and ecological restoration plans to mitigate their environmental damage occurred during the late 1990s.

Second, certification substantially changed companies' social performance, although far more so with regard to local communities than with forestry workers. Certification mostly helped companies to ensure their compliance with OHS laws and working conditions and achieve some benefits beyond legal compliance. However, certification made little progress in the case of anti-union practices.

Concerning communities, certified companies adopted substantive measures to improve community relations. Although certification was unsuccessful in settling disputes with a minority of communities, certification mostly had positive outcomes, including increased community participation in forest management, tangible benefits to mitigate the impact of forest operations, and the reduction in conflicts with Indigenous communities.

Third, certification impacted the economic performance of large forestry businesses in two different ways. Thus, while certification allowed companies to maintain their international market access; certification also posed them significant economic costs caused by modifying their operations to comply with their new environmental and social requirements.

5.4 Conclusion

This chapter presents my research findings concerning forest certification capacity to yield changes in the environmental, social and economic performance of plantation forestry enterprises. In so doing, I have described such changes in terms of their abilities to solve sustainable forest management problems, to attain sustainability goals and to modify companies' behaviour in relation to their stakeholders.

Type of Forestry Business	Environmental Performance		Social Performance		Economic Performance	
	Before certification	After certification	Before certification	After certification	Before certification	After certification
Large firms	Forestry practices: modest to poor	(+ + change)	Workers: mix between modest and high	(++change)	Highly profitable	Direct and indirect costs: (no significant change)
	Environmental values: modest to poor	(+++ change)	Communities: poor	(++ change)		Associated costs: (- change)
Small and medium-sized firms	Forestry practices: modest outcomes	(+ change)	Workers: modest outcomes	(++change)	Profitable	Direct and indirect costs: (possibly, - change)
	Environmental components: modest	(++ change)	Communities: high	(no significant change)		Associated costs: (no significant change)

Table 5.4 Summary of the main changes in certified plantation forestry companies after certification.

Source: author's interviews and judgement.

Table 5.4 summarises the main findings related to certified plantation forestry businesses after the implementation of certification. I classified the performance of companies, before certification, in “high”, “modest” and “poor” performance as well as “hardly/lowly profitable” in the sense of economic performance, as shown in Table 3.6 (see Chapter 3). Then, to assess the changes after certification on firms I made use of “negative”, “positive” or “no change” signs. In so doing, I drew on my qualitative, and subjective, assessment as researcher, the number and deepness of my interviews and other sources of evidence (e.g. audit reports and empirical field-based evidence).

Two important lessons are extracted from Table 5.4 and, in general, from this chapter. First, my case studies have shown that large plantation forestry businesses adopted, comparatively, more extensive and procedural changes to address their environmental and social problems than their smaller counterparts did. Nevertheless, certification had significantly reduced the environmental degradation caused by forest operations at different scales. Likewise, in social terms, certification had positive effects, particularly concerning the relationship with local and Indigenous communities. Economically, although market access benefited all companies, large companies reported significant economic costs that were not reported by small and medium-sized operations. In short, certification makes a difference to the overall performance of both types of forestry businesses.

Second, the implementation of both forestry schemes revealed important differences in the effectiveness of the FSC and CERTFOR. Overall, the FSC scheme deepened and driven most of the important changes in sustainable forest management in the plantation forest industry

that had the greatest gaps in environmental and social issues due to its extensive operations. This aspect will be discussed in Chapter 7. Thus, the question that will focus our attention next is the capability of certification in addressing those issues in native forestry businesses, as we will see in the next chapter.

Chapter 6: What difference does certification make to native forestry businesses?

6.1 Introduction

Having explored in Chapter 5 the impact of forest certification on plantation forestry businesses, now I turn to evaluate its impact on certified native forestry firms. Thus, in this chapter I examine certification's capacity in terms of addressing sustainable forest management issues (viz. measuring problem solving and goal attainment effectiveness) and to modify companies' behaviour (viz. measuring behavioural effectiveness) towards their stakeholders and their forest operations.

This chapter relies substantially on my interview findings as primary sources of evidence for each of my case studies, but it is also informed by audit reports (particularly, through CARs⁴⁸⁴ analysis), some empirical field-based evidence⁴⁸⁵, official forest management plans, government documents, public databases and statistics.

I have divided this chapter into three sections. In the first section, I briefly explain why Chilean native forestry businesses exclusively adopted the FSC, and provide some accounts of why it purportedly meets the needs of such enterprises, when compared with the preferences of plantation forestry businesses.

In the second section, I explore the changes experienced by small and medium-sized native forestry businesses in their environmental, social and economic performance due to certification. Finally, in the third section, the above analysis is replicated in large firms.

6.2 Why do native forestry firms adopt the FSC?

As noted in Chapter 4, some native forest industry's members⁴⁸⁶ adopted the FSC because they believed that this standard granted their firms reputational benefits superior to those of alternative schemes. For them, the diversity of interests represented in the FSC three chambers gave more credibility to this scheme, notwithstanding that they perceived it as having more exacting requirements than the CERTFOR alternative.

⁴⁸⁴ That is to say, Corrective Action Requests (CARs).

⁴⁸⁵ Mainly, for large native forestry businesses.

⁴⁸⁶ Interviews with NFB-XII-d02 and NFB-XII-c01.

Hence, FSC certified native forests now totals 86,802 hectares, although much of this certified area includes a mix of native forest and exotic tree plantations⁴⁸⁷ (see Table 6.1).

Basic information of Chilean FSC certified native forestry firms			
No	Certified area (ha)	Region	Species – main forest type ⁴⁸⁸
1*	25,521	VII, VIII, IX, XIV and X regions (central-south and southern Chile)	This company belongs to a group of 71 small owners, grouped under the option of “group certification”. Their forests include a mix of exotic tree plantations (eucalypts and pines) and “evergreen” native forest type (a mix of different species of <i>Nothofagus sp.</i>). Therefore, its percentage of productive native forests is even lower.
2*	16,015	XII region (Magallanes)	Lenga forests (<i>Nothofagus pumilio</i>)
3*	41,271	XII region (Magallanes)	Lenga forests (<i>Nothofagus pumilio</i>)
4	3,141	V region (central Chile)	Mix of native species of <i>Quillaja saponaria</i> , <i>Acacia sp.</i> , <i>Lithraea caustica</i> , <i>Peumus boldus</i> and <i>Cryptocaria spp.</i>
5	854	IX region (southern Chile)	<i>Nothofagus alpina</i> and <i>Nothofagus dombeyi</i> .
Total	86,802		

Table 6.1 Characterization of Chilean FSC certified companies.

Source: FSC-International (2015c).

Besides these perceptions to explain the preference for the FSC scheme, the international markets sought by (large) native forest enterprises⁴⁸⁹ included North American and European clients. These clients bought FSC certified softwood, specifically certain exotic “high quality wood products” such as sawn lumber and valued added pieces for furniture (for instance, flooring, cladding, laminated beams and solid wood doors and windows). This contrasts with the marginal interest that such companies had in producing commodities (viz. pulpwood for printing houses) for other markets.

Furthermore, some industry respondents⁴⁹⁰ asserted that “the FSC philosophy” was particularly apposite to their native forest operations, since they felt that their companies had always worked following sustainable forest management principles.

⁴⁸⁷ Much of those certified native forestry businesses are (with the exception of two large native forestry companies) small firms that own mixed forests. Forest owners usually employ a mix of *Eucalyptus nittens*, *Eucalyptus globulus*, *Populus sp.* and *Pinus sp.* See FSC-International (2015c).

⁴⁸⁸ Note that lenga forests (*Nothofagus pumilio*) comprise most of the certified area. It is also noteworthy that although some (particularly large) plantation forest companies own thousands of hectares of native forests, they are not used for productive purposes (much of them fall into the category of high conservation value areas). The asterisk (*) points out which organizations were sampled for this research. Source: FSC-International (2015c).

⁴⁸⁹ Interview with NFB-XII-c01.

⁴⁹⁰ Interviews with NFB-IX-a01 and NFB-IX-b01.

Notwithstanding this stark preference of all native forest owners for the FSC over the CERTFOR scheme, the area covered by certified native forest operations (86,802 hectares) was substantially less than the certified area covered by plantation forests (more than 2.2 million hectares, as seen in Chapter 4). Explaining these data, some respondents from a standard-setting institution⁴⁹¹ pointed to the little demand for certified native forest timber as the cause of the lesser uptake of any forestry standard, since most firms were small operations with limited possibilities to export their forest products to markets that demanded certification.

6.3 Certification impact on small and medium-sized companies

In this section I describe the findings related to the impact of certification on the environmental, social and economic performance of small and medium-sized native forestry businesses. Hence, this section is divided into three sub-sections, addressing each aspect abovementioned.

6.3.1 Impact on companies' environmental performance

Forest certification certainly yields changes in the environmental performance of certified native forest companies, although the extent of such changes was markedly different from those of plantation forestry businesses. Specifically, unlike certified plantation forestry businesses, certification resulted in little change in their forestry practices since their operations fell into the category of “slow and low intensity managed forests” (SLIMF) practices. However, as examined below, certification contributed with some important improvements.

Better planning of forest operations to protect certain environmental values: Respondents from the industry⁴⁹² and forest authorities⁴⁹³ felt that the major benefits of certification were two-fold and taken together, enabled better environmental planning of companies' forest operations. The first benefit is that certification made companies engage in a re-mapping of their forestlands allowing them to identify and protect their high conservation value forests (HCVFs) sites. As this forest manager stated:

“They [the auditors] requested from us to record any significant environmentally valuable aspect. For example, we have a small forest of Araucarias [Araucaria araucana] out there; it's a 40 hectares forest that we had to include in our [new] cartography. We even already had a conservation project [concerning such a forest]. So we had pretty much everything we needed [requested by the FSC]. (interview with B-XIV-01).”

⁴⁹¹ Interviews with S-RM-02 and S-RM-03.

⁴⁹² Interviews with NFB-IX-a01, NFB-IX-b01 and B-XIV-01.

⁴⁹³ Interviews with A-XII-01 and A-XII-02.

Moreover, one audit report⁴⁹⁴ of a certified company advised the need to establish specific measures to ensure a better protection of such HCVPs already identified in maps during the FSC implementation stage. Such specific measures should include the identification of potential threats to those HCVPs, preventive measures to deal with those threats, and public consultation with local communities that used some resources (specifically, water) from HCVPs.

The second major benefit is that certification made companies systematize and document their forest operations, providing further depth to those aspects already required by the official “forest management plans”. Although some industry respondents⁴⁹⁵ suggested that certification had not prompted any substantial modification of their forest operations, it did nevertheless encourage them to develop and create procedures or plans regarding their execution. For instance, one forest manager⁴⁹⁶ claimed that “now, we only are working with [documented] procedures...timber harvesting and road building practices haven’t really changed yet.” Another forest manager⁴⁹⁷ told me: “we met most of the stuff requested by the FSC, we did very little to certify our operations, excepting for more documentation [the creation of new documented procedures and records],” which was consistent with the claim of his colleague⁴⁹⁸ when asked about what changes had been encouraged by the FSC: “Well, basically, all the documentation requested by the FSC, as well as records of timber harvesting, regulations [printed copies] and everything what is needed [documentary support of the operations]. It was more a documentary change than a change in [forest] practices.”

However, the above industry respondents took the view that certification did not bring about any changes in the environmental quality of their forestlands. They particularly noted that FSC requirements did not make companies increase the width of buffer zones around watercourses more than as required in forestry regulations.

Change in some environmental practices: Most changes in environmental practices occurred specifically concerning the management of chemical products, toxic waste and fuels. Concrete examples provided by some industry respondents⁴⁹⁹ included:

⁴⁹⁴ Although this company commercially exploited a native forest, the owner exploited a mix of native and plantation forests and the firm was certified under the option “group certification”, along with other 70 small companies that mostly exploited plantation forests. Thus, the FSC scheme for plantation forests was adopted. The initial audit report was retrieved from FSC-International (2015c).

⁴⁹⁵ Interviews with NFB-IX-a01, NFB-IX-b01 and B-XIV-01.

⁴⁹⁶ Interview with NFB-IX-a01.

⁴⁹⁷ Interview with B-XIV-01.

⁴⁹⁸ Interview with NFB-IX-b01.

⁴⁹⁹ Interviews with NFB-IX-a01, NFB-IX-b01 and B-XIV-01.

- (a) Greater control of chemical products used as pesticides (in mixed forests),
- (b) Measures to identify, handle, collect, transport and dispose toxic waste (oils and fuels from forest equipment) and,
- (c) Accreditation of vehicles carrying fuels (under Chilean norms⁵⁰⁰).

For example, while one forest manager⁵⁰¹ recognised that changes encouraged by the FSC scheme in environmental practices were “minor”, he recognised new practices: “we have had to address things like fuel spills [through creating documented procedures] to avoid pollution when the workers are refuelling their chainsaws. We didn’t do those things before certification”.

Additionally, the audit report cited above suggested the implementation of preventive measures to handle fuel spillages (from chainsaw operations).

6.3.2 Impact on companies’ social performance

One may recognize two effects concerning the impact of certification on the social performance of small and medium-sized forestry businesses: the impacts on forestry workers’ welfare and on local communities.

Certification encouraged companies to make their workers aware of sustainability issues: Several industry respondents and one certification audit report suggested that certification encouraged companies to make their workers aware of OHS and environmental issues caused by forest operations. As some forest managers noted⁵⁰², certification put special emphasis on workers’ training programs, reinforcing them by targeting a number of poor practices and proposing improvements, including:

- (a) Appropriate use of personal protective equipment (PPEs),
- (b) Management of chemical products,
- (c) Waste and rubbish management and,
- (d) Risks and hazards associated with forest operations (e.g. logging, felling, transport and so on).

Notwithstanding the FSC focus on improving those companies’ OHS performance, the apparently weak training and the lack of appropriate OHS procedures led to poor OHS

⁵⁰⁰ Regulation No 160 of 2009 concerning the storage and transport of fuels. See Appendix 13.

⁵⁰¹ Interview with NFB-IX-a01.

⁵⁰² Interviews with NFB-IX-a01 and NFB-IX-b01.

outcomes. For instance, one audit report⁵⁰³ confirmed a company's shortcomings in its OHS performance that deserved attention, issuing three non-conformities:

- (a) Major non-conformity: absence of records to investigate incidents and accidents, deficient first aid training and expired fire extinguishers.
- (b) Minor non-conformity: lack of preventive OHS measures to operate chainsaws so as to deal with fuel and oil spillages.
- (c) Minor non-conformity: lack of preventive OHS measures when loading logs to protect vehicles and bystanders.

Although the FSC implementation emphasized the need to make workers aware of environmentally and OHS issues concerning forest operations, the actions taken by companies showed mixed outcomes. For some forest managers⁵⁰⁴, training proved to be more effective in making workers aware of the environmental implications of their operations, rather than in OHS matters. As one industry respondent⁵⁰⁵ noted, "the people working with us are highly aware of how to manage waste, rubbish, the natural regeneration of forests, etc." In contrast, making forestry workers aware of their occupational risks and hazards proved particularly challenging for forest managers, as reported consistently by certified companies. Overall, workers were apparently reluctant to comply with preventive measures;⁵⁰⁶ as one forest manager put it:

"What is more time and effort-consuming is to encourage workers to be aware of their occupational risks, this is clearly beyond teaching them how to use their PPEs. It is hard to make them aware. Workers' safety is a very complicated issue but we are constantly working to inform the risks and problems that might come up." (interview with NFB-IX-b01).

So far the evidence suggests that while certification encouraged workers' training in OHS and the implementation of appropriate OHS procedures, there remains a gap between processes (training and procedures) and outcomes, with many firms remaining weak in OHS performance.

No great changes in the relation with local communities: Forest managers⁵⁰⁷ from this industry sub-sector agreed that certification did not bring about any important changes in the relationship with their local communities. The positive relationship between firms and

⁵⁰³ The initial audit report was retrieved from FSC-International (2015c).

⁵⁰⁴ Interviews with NFB-IX-a01 and NFB-IX-b01.

⁵⁰⁵ Interview with NFB-IX-a01.

⁵⁰⁶ Interviews with NFB-IX-a01 and NFB-IX-b01.

⁵⁰⁷ Interviews with NFB-IX-a01, NFB-IX-b01 and B-XIV-01.

communities left, apparently, relatively little room for further improvements. As noticed by this forest manager:

“Not yet [when asked about changes]. Being honest, I don’t think there are too many changes because in one of our [certified] forestlands we are surrounded by large plantation forest companies, and we have one neighbour in there [a villager], we really get on very well with that neighbour and we help each other as we live in very remote areas. In another certified forestland, near Temuco [a southern Chilean city], *Mapuche* communities surround us and we have never had any kind of problems with them. Actually, the 80% of our workers come from that community. We have had a very good relationship with them.” (interview with B-XIV-01).

Also, looking back on Chapter 3, small and medium-sized native forest enterprises already contributed significantly to the development of their surrounding communities through a number of collaborative agreements.⁵⁰⁸

Rather, given that relations between companies and local communities were generally already positive, the greatest virtue of certification laid in its ability to translate such pre-existing practices into formalized procedures and records to provide objective evidence of the compliance with the FSC principles⁵⁰⁹. This was indeed the view of some managers⁵¹⁰.

6.3.3 Impact on companies’ economic performance

On the economic side, certification seems not to yield tangible benefits for small or medium-sized forest owners. The evidence found in these case studies along with the small number of certified operations in Chile, suggests that certification did not represent a significant economic advantage for them. But equally, neither did it apparently cause these firms to incur additional costs, whether direct or indirect. Why was this?

First, as many respondents⁵¹¹ within this industry sub-sector reported, there seemed no possibility of obtaining premium prices or better market access for certified native timber. In a sub-sector characterized by low profits and the absence of efficient commercialization channels, none of the small and medium-sized firms that I interviewed reported exports to markets requiring certified timber. Accordingly, it might appear surprising that they sought certification at all. However, as noted in Chapter 4, better public image and possible future entry into

⁵⁰⁸ Interviews with NFB-XIV-g01, NFB-IX-b01, NFB-IX-a01, NFB-IX-e01 and NFB-IX-f01.

⁵⁰⁹ Indeed, one audit report specifically required a socio-economic study of the local communities of a group of certified small forest enterprises (including native and plantation forestry businesses). The audit report was retrieved from FSC-International (2015c).

⁵¹⁰ Interview with B-XIV-01.

⁵¹¹ Interviews with NFB-IX-a01, B-XIV-01 and NFB-XIV-e01.

international markets requiring certification were plausible certification drivers for these companies.⁵¹²

Second, none of the industry respondents I interviewed claimed either higher costs due to certification. Even so, on the circumstantial evidence available, it would seem that the small organizations I sampled adopted certification only because a government agency financed their direct costs⁵¹³ through indirect subsidies.⁵¹⁴

6.3.4 Section summary

We can identify three kinds of certification impacts on the performance of small and medium-sized native forestry businesses. First, although certification did not significantly change the forestry practices of firms, it made some important contributions to ensure the protection of certain environmental values (HCVFs) and to minimize pollution issues.

Second, in social terms, certification had far greater impact on processes than on particular outcomes. Thus, there were mixed outcomes: while certification made most forestry workers aware of environmental issues, it did little to improve OHS performance since some poor OHS practices and a number of occupational problems still persisted. This may be explained by the relative immaturity of such OHS programs. In addition, although certification formalized the relationship between companies and communities, it did little to change outcomes since such a relationship was, for the most part, already strong.

Finally, certification is not making a difference to small and medium-sized native forestry businesses in relation to its economic performance, that is, there are neither economic benefits nor handicaps (that is, major costs) for certified firms.

6.4 Certification impact on large companies

Similarly to Section 6.3, this section examines the impact of certification but on the environmental, social and economic performance of large native forestry businesses. Likewise, this section is divided into three sub-sections, addressing each aspect abovementioned.

⁵¹² Interview with B-XIV-01.

⁵¹³ Interviews with NFB-IX-a01, NFB-IX-b01 and B-XIV-01.

⁵¹⁴ Although there are no direct subsidies to fund forest certification schemes in Chile, there are different state programs to indirectly fund different sustainability initiatives. For example, there are programs to improve the environmental and social performance of small timber suppliers under partnerships between a government agency (usually CORFO, the Corporation for the Promotion of Productivity) and large enterprises. See section 4.5 in Chapter 4.

6.4.1 Impact on companies' environmental performance

Overall, my case studies, suggest material differences between small/medium-sized native forestry businesses and large native forestry businesses. For the latter, although certification required relatively similar improvements to smaller operations, in practice, the magnitude of what was required of large companies was substantially higher, quality and quantity, and complexity. As we will see below, this was achieved in five different ways.

Certification deepens sustainable forest practices: Industry respondents⁵¹⁵ from this sub-sector reported that certification was a means of deepening sustainable forest practices that they already followed. As one forest authority explained:

“Well, the two FSC certified companies in the region were already working fine before certification. Both companies already had ongoing professional advice. Both companies had a technical team, both companies made use of their [official] management plans. They had technical supervision of their forests on the field. In practice, when they gained certification we believe that they had to make little effort, since they already had established procedures as requested by legislation ... However, when they were certified they implemented skid trails, which is a good thing so the less skid trails you have, the more you damage the trees ... anyway, through using skid trails the forest operations are more sustainable.” (interview with A-XII-01).

Hence, certification helped achieve the sustainability goals of the authority, reinforcing best management forest practices, particularly in the lesser performing of the two major companies in my sample. Other measures which certification emphasized, as noted by a forest government officer, included⁵¹⁶:

- (a) Proper identification of commercial trees to avoid harvesting outside approved stands,
- (b) Thorough road planning and proper skid trails to reduce trees damage, and
- (c) Felling using winches so as to reduce the contact of forest machinery with trees.

Moreover, as noted in Chapter 3, working on *lenga* forests and performing low intensity forest operations caused a reduced environmental impact when compared with that of plantation forestry businesses. Indeed, most audit findings⁵¹⁷ performed on those companies did not find serious weaknesses⁵¹⁸ in their forestry practices, focusing instead on other environmental impacts, as seen below.

⁵¹⁵ Interviews with NFB-XII-c01, NFB-XII-d01 and NFB-XII-d02.

⁵¹⁶ Interview with A-XII-01.

⁵¹⁷ Audit reports retrieved from FSC-International (2015c).

⁵¹⁸ For example, one of those audit reports highlighted the conservative harvest rates of one certified company.

Certification encourages companies to protect their natural resources: The foremost changes elicited by certification over large firms were measures to protect some environmental values, rather than measures to change their forestry operations. Thus, in order to meet those FSC requirements, most industry respondents⁵¹⁹ and forest authorities⁵²⁰ described a number of specific practices:

- (a) Protection of watercourses and wetlands: avoiding as much as possible the traffic of forest machinery near water bodies,
- (b) Protection of biodiversity values: control of poaching in forestlands through signs and environmental education directed towards neighbours and forestry workers and,
- (c) Protection of soils: reducing forest operations during wet seasons to avoid excessive soil compaction.



Figure 6.1 Photograph showing managed lenga forests in a large certified native forestry business.

Source: Marcos Tricallotis' fieldwork (near Punta Arenas, Magallanes region).

⁵¹⁹ Interviews with NFB-XII-d01, DW-XII-d01, NFB-XII-d02 and NFB-XII-c01.

⁵²⁰ Interviews with A-XII-01 and A-XII-02.

However, audit reports⁵²¹ consistently highlighted certain weaknesses in performance, translated into a number of CARs, which urged firms to change and/or incorporate some practices. Those audit findings are summarised in Table 6.2.

⁵²¹ The FSC audit reports were retrieved from FSC-International (2015c).

Changes in certified companies ⁵²²			
No	Issue	Findings found between 2009-2011	Changes found between 2012-2014
1	Protection of water courses and water bodies	<ul style="list-style-type: none"> • Lack of monitoring to detect changes in water quality, fish populations and seasonal water flows. • Lack of written guidelines to protect water resources. 	<ul style="list-style-type: none"> • Implementation of documented procedures to protect water resources. • Monitoring of water variables and fish populations included in an integrated environmental monitoring plan.
2	Protection of biodiversity	<ul style="list-style-type: none"> • Lack of explicit measures to protect rare, threatened, endangered species of flora and fauna, as well as their habitats. • Lack of monitoring of flora and fauna species. • Insufficient identification of high conservation value areas (HCVAs). • Lack of measures to protect HCVAs. • Insufficient measures to avoid poaching, illegal fishing and collection of plants. 	<ul style="list-style-type: none"> • Training of forestry workers to recognize some species of fauna and estimate their abundance. • Prohibition of hunting in forestlands. • Protection of trees where some endangered birds (black woodpeckers) make their nest. • Companies had received professional external advice to identify rare, threatened and endangered species of flora and fauna. • Monitoring flora and fauna species. • Pre and post-harvest tree inventories. • Leaflets provided to visitors including information about measures to protect biodiversity.
3	Protection of soils	<ul style="list-style-type: none"> • Lack of training for machinery operators in preventive measures to control soil erosion. • Non-compliance (one firm) of the measures contained in its Environmental Impact Assessment. • Deep furrows in the soil caused by machinery traffic around forest stands. 	<ul style="list-style-type: none"> • Both road planning activities and preventive measures to protect the soil were included in documented procedures (e.g. procedures about harvest in slopes over 35%, during winter and to assess the erosion in soils). • Training provided to forestry workers in relation to the control of soil erosion.

Table 6.2 Changes in certified Chilean native forestry companies as noted by their audit reports, for environmental values and resources.

Source: FSC-International (2015c) audit reports.

As shown in Table 6.2, most changes required by certification audits paid particular attention to the implementation of written and prescriptive procedures to protect environmental values and resources (viz. water, soils and biodiversity). They also focused on integrated and ongoing monitoring of such environmental values, and on the provision of education and training for visitors and forestry workers.

Better management of waste, fuels and other chemical products: My case studies confirmed that certification led large companies adopt better measures to manage their chemical products and waste. For example, two industry forest officers⁵²³ pointed out that FSC

⁵²² The FSC audit reports were retrieved from FSC-International (2015c).

⁵²³ Interviews with NFB-XII-d01 and NFB-XII-d02.

requirements encouraged companies to refuel their forest machineries and vehicles in specific facilities, away from forest operations, as well as to provide forestry workers with spill kits to prevent soil contamination from fuel or oil spillages. This was confirmed during my interviews with a forestry worker⁵²⁴, a villager⁵²⁵ and one forest authority⁵²⁶ who stated that those measures were particularly noticeable in “the implementation of the necessary PPEs and the handling and transport of fuels...they are important changes, and if we compared with the previous situation there is an important progress.” Consistently, one CAR⁵²⁷ issued to one company recommended to implement a procedure “to cover emergencies driven from spoilage, chemicals handling, residues and other dangerous substances that can affect people and the environment”, adding also the need to provide sawdust containers to control emergency spillages, and protection blankets to cover forest machinery under routine maintenance. Not long after, that company implemented such changes⁵²⁸.

Environmental awareness of forestry workers and firms: Notably, several industry respondents⁵²⁹ and forest authority officers⁵³⁰ confirmed that the FSC made managers and forestry workers more aware of the environmental aspects of their operations. As illustrated by this government officer:

“Well, my perception is that [certified] companies are motivated to be environmentally concerned about the activities they are performing, and to make a more sustainable use of their resources. So in that context, there is a complete change.” (interview with A-XII-02).

Likewise, while one industry officer⁵³¹ claimed that certification did not significantly change their forestry practices, he also acknowledged that certification was a means to make their forestry workers environmentally aware, and demonstrate that “they were doing the right things”. It is unsurprising, therefore, that one forestry worker⁵³² and one villager⁵³³ (who used to work for one of the firms as a contractor), when interviewed, explained why it was so important for the environment to meet the environmental procedures they were already executing, as required by the FSC scheme.

⁵²⁴ Interview with DW-XII-d01.

⁵²⁵ Interview with L-XII-01.

⁵²⁶ Interview with A-XII-02.

⁵²⁷ Audit report retrieved from FSC-International (2015c).

⁵²⁸ Audit report retrieved from FSC-International (2015c).

⁵²⁹ Interviews with NFB-XII-c01, NFB-XII-d01 and NFB-XII-d02.

⁵³⁰ Interviews with A-XII-01 and A-XII-02.

⁵³¹ Interview with NFB-XII-c01.

⁵³² Interview with DW-XII-d01.

⁵³³ Interview with L-XII-01.

More documentation and records: Some industry interviewees⁵³⁴ stated that another effect of certification on companies was increased bureaucracy. Specifically, the FSC requires documentation and recording of most operations in the form of, for example, written technical guidelines, documented procedures, and data sheets. Accordingly, it is clear that the documentation requirements are not just abstract or unenforced, but require substantial action in terms of procedural change.

6.4.2 Impact on companies' social performance

Similar to small and medium-sized native forestry businesses, while certification contributed to enhancing companies' working conditions and OHS performance, it apparently did little to improve their relations with communities. I will explore below how and why those limited impacts came about.

Improvements in OHS performance and working conditions: For large native forestry businesses, certification impacted positively on two social aspects: OHS performance and working conditions, in four ways.

First, certification made companies take actions to deal with occupational hazards and risks. For example, one forestry worker claimed that since his company was certified, it provided high quality PPEs, and in a timely manner:

“It has changed [company's behaviour] because when someone needs to replace some PPEs, it can be done straight away. Before certification, the company only procured us of safety shoes, one overall and that's it. Not now, there's more stability. If you spoil your PPEs you can replace them. Now there is an OHS expert to do the training, and before certification, we never had that advice. When company got its certificate, it began to meet all those norms”. (interview with DW-XII-d01).

However, while one labour government officer⁵³⁵ and one forestry worker⁵³⁶ agreed that certification was a driver to achieve those improvements, the above officer also expressed his concern about the negligent behaviour of some companies once they obtained their FSC certificate. Concretely, one company had been fined many times and one of their forestry workers had died due to an occupational accident.⁵³⁷ This latter view was largely consistent with the audit findings summarised in Table 6.3. Notwithstanding these issues, certification

⁵³⁴ Interviews with NFB-XII-c01, NFB-XII-d01 and NFB-XII-d02.

⁵³⁵ Interview with La-XII-01.

⁵³⁶ Interview with DW-XII-d01.

⁵³⁷ Interview with La-XII-01.

encouraged such a company to undertake corrective actions to address those problems, which is again positively reflected in Table 6.3 (2013-2014 period).

Changes in certified companies⁵³⁸			
No	Issue	Findings found between 2009-2012	Findings found between 2013-2014
1	OHS performance	<ul style="list-style-type: none"> • Poor compliance of safety standards: deficient transport of workers, lack of road signs, poor maintenance of vehicles and so on. • No formal identification of high risk-of-accidents zones within forest operations. • Lack of measures to prevent accidents. • Lack of training in OHS issues. • Workers are not aware of OHS issues, often showing unsafe behaviour. • Insufficient PPEs supply (both in quantity and quality). • Insufficient OHS supervision of workers. • Risky conditions seen at some forest machinery, example: smashed windows. • Incomplete first aids equipment. 	<ul style="list-style-type: none"> • Comments of some stakeholders: one of the firms is more aware of safety issues for its staff. • Hiring of a full-time OHS expert. • Transport of workers greatly improved: companies purchased/rented new vehicles. • Workers' Committee of OHS issues (legal requirement) was not working during the 2013 surveillance audit of one company. • High quality PPEs are provided in a timely manner. • Training programs for forestry workers in OHS issues (it was verified through records).
2	Working conditions	<ul style="list-style-type: none"> • Poor conditions of forest camps. • Job instability and little social benefits (workers had temporary contracts). Because of this, workers did not enjoy of annual leave and other social benefits. 	<ul style="list-style-type: none"> • Complete refurbishment of forest camps (e.g. heaters in common areas and dorms, new refurbished rooms and amenities, and, recreational areas). • Workers had permanent contracts.

Table 6.3 Changes in certified Chilean native forestry companies for forestry workers, as noted by their audit reports.

Source: FSC-International (2015c) audit reports.

Second, my interview findings pointed to an improvement in the working conditions of large firms and they were consistent with audit reports. As one government officer stated:

“Certified companies have had a remarkable change in their [working] conditions [for their workers]. For example, conditions in their forest camps were very poor; and we learnt that certification required them to meet labour and occupational health regulations, etc. Then their forest camps today have drinking water, chemicals toilets, etc. For example in the company NFB-XII-d it was surprising for us to find one forest camp with chemical toilets, this situation didn't happen before certification.” (interview with A-XII-01).

⁵³⁸ The FSC audit reports were retrieved from FSC-International (2015c).

Indeed, the accounts of industry forest officers⁵³⁹ and forestry workers⁵⁴⁰ were consistent with those of other well-informed players, such as local community representatives⁵⁴¹ and other (labour) authorities⁵⁴². They all claimed that certification made companies increase workers' welfare through improving their working conditions by:

- (a) Refurbished accommodations in forest camps,
- (b) Better comfort in workers' accommodations (viz. central heating systems),
- (c) Enhanced amenities (including recreational facilities),
- (d) Better vehicles to transport workers from and to their workplaces, and,
- (e) Better work shifts (Monday to Friday, allowing them to spend the weekends with their families).

Notwithstanding that such claims were widespread among respondents, one industry forest officer⁵⁴³ did express a somewhat different view. He suggested that his company had good working conditions before certification, thanks to a collective bargaining process negotiated along with the workers' union. For him, rather than enhancing working conditions, certification encouraged his company to document and record companies' labour practices. Another outlier was a labour government officer⁵⁴⁴ who suggested that some conditions outside forest camps still needed further improvement, but certification had already begun to put focus on them.

Overall, audit reports (see Table 6.3) consistently showed that the working conditions in forest camps and social benefits for workers had progressed significantly since the introduction of certification.

Third, certification improved forestry workers' awareness of OHS issues. This was the view of industry respondents, forest officers⁵⁴⁵ and forestry workers⁵⁴⁶, all of whom acknowledged that certification helped make forestry workers more aware of the occupational risks and hazards related with their activities. They specifically witnessed that staff training had become in a more rigorous and planned activity since certification. Similarly, some audit findings shown in Table 6.3 put similar focus on staff training in OHS issues.

⁵³⁹ Interviews with NFB-XII-d01 and NFB-XII-d02.

⁵⁴⁰ Interview with DW-XII-d01.

⁵⁴¹ Interview with L-XII-01.

⁵⁴² Interview with La-XII-01.

⁵⁴³ Interview with NFB-XII-c01.

⁵⁴⁴ Interview with La-XII-01.

⁵⁴⁵ Interview with NFB-XII-d01 and NFB-XII-d02

⁵⁴⁶ Interview with DW-XII-d01.

Fourth, tangible benefits of certification also included greater job stability, better wages and other social benefits. Although this was not the case for all my case studies, the change was particularly important for one firm. As this forestry worker stated:

“Yes, it is. Our salaries are better now. Our wages improved a bit, and they haven’t failed, we are always getting paid timely. Before [certification] we had delays of around 20 days to get paid, and with the new administration this changed. Actually, certification makes the company pay us on time.” (interview with DW-XII-d01).

This view accorded with that of two industry forest officers⁵⁴⁷. They both asserted that, since certification, the company had provided a number of social benefits to their workers, such as permanent contracts, holidays, and better work shifts and wages⁵⁴⁸; as confirmed by some audit reports (see Table 6.3).

No major change in the behaviour towards different stakeholders: Apparently, there were no major changes in the relation between companies and their stakeholders, particularly local communities and authorities. As illustrated by this government officer:

“We haven’t participated at all [in the certification processes of companies]. As I told you, sometimes, out of the blue, we learn that some companies are certified. And this happens only when certification auditors want to interview us so as to know our opinion, to check the behaviour of companies, and their compliance with laws, etc... so there hasn’t been such a thing as a change [in the relations]. However, we always have been in touch with certified companies, because traditionally they participate in silvicultural meetings and workshops along with us.” (interview with A-XII-01).

Consistently, many industry respondents⁵⁴⁹ suggested that their relations with authorities and local communities have changed very little because of certification. Notably, most respondents suggested a plausible reason to explain this: the low population density in Magallanes⁵⁵⁰ resulted in large companies interacting with no more than a handful of remote communities, most of whom were farmers who owned large territories. This encouraged a relation of mutual collaboration between companies and those communities, diminishing any possibility of conflicts. Another key point was noted by the above government officer⁵⁵¹ who

⁵⁴⁷ Interviews with NFB-XII-d01 and NFB-XII-d02.

⁵⁴⁸ Average wages in the Magallanes’ forestry sector were approximately between \$300,000 and 350,000 Chilean pesos a month, which is quite a high salary compared with the minimum wage as established by the Law No 20763 (enacted in 2014). Interview with La-XII-01.

⁵⁴⁹ Interviews with NFB-XII-d01, NFB-XII-c01, DW-XII-d01 and NFB-XII-d02.

⁵⁵⁰ The Magallanes’ population has been estimated in 163,748 people, inhabiting a regional surface of 13,187,948 hectares (INFOR, 2015b).

⁵⁵¹ Interview with A-XII-01.

suggested that the low intensity operations performed by such firms also impacted on a small number of communities, which made conflicts less likely to happen than in other regions.

Rather, the widespread perception, among industry respondents, was that certification helped companies to formalize their relations with their local communities. Thus, industry forest officers⁵⁵² noted that records and written procedures provided objective evidence of social assistance to communities (e.g. through firewood donations). Additionally, one local community member⁵⁵³ felt that the formalization of some agreements (chiefly, the donation of firewood, a central economic activity for communities' livelihoods) ensured that his community would continue to receive those benefits. Lastly and consistently with my interviews, audit reports recommended firms to:

- (a) Make communities aware of the adoption of certification,
- (b) Make communities aware of the measures to protect the Forest Management Unit (FMU),
- (c) Make stakeholders participate of the identification of HCVAs,
- (d) Draw up a written plan and procedures to mitigate any potential negative social impact,
- (e) Define a social monitoring plan, and,
- (f) Formalize and update agreements with neighbours through memorandums.

In brief, certification encouraged companies not only to formalize their relations with local communities, but also encouraged communities to participate in companies' forest management.

6.4.3 Impact on companies' economic performance

The evidence found so far, suggests that certification had a negative impact on the economic performance of large companies due to two aspects as addressed below.

No economic benefits for being certified: My interview data suggest that large operations did not gain significant economic advantage because of the FSC. Almost unanimously, industry respondents⁵⁵⁴ reported the absence of premium prices, as well as no greater sales or improved international market access for selling certified timber. As stated by this forestry business' CEO:

⁵⁵² Interviews with NFB-XII-d01, NFB-XII-c01 and NFB-XII-d02.

⁵⁵³ Interview with L-XII-01.

⁵⁵⁴ Interviews with NFB-XII-d01, NFB-XII-c01 and NFB-XII-d02.

“Now, in the case of the FSC, we have very negative numbers. By the fact of being FSC certified it doesn’t mean we get better sales. I think these SFM standards require companies to spend around 4% more; actually you have more costs than revenues, you don’t see more incomes.” (interview with NFB-XII-c01).

Importantly, while all these certified large native forestry businesses exported to US, Latin America and Europe, they did not report better market access or new clients. The major value of certification was in maintaining some FSC-oriented markets and in pursuing reputational gains and better corporate image in the eyes of public opinion⁵⁵⁵. This is because the commercial exploitation of native forests is a sensitive issue for environmental groups at the local and international levels, particularly when performed by (relatively, in this case) large enterprises, suggesting the importance of their social licence to operate.

The FSC represents an important cost for some certified companies: Unlike their smaller counterparts, certification represented an important cost for large native forestry businesses. Many industry officers⁵⁵⁶ provided examples of direct and indirect costs to support this claim: audit costs in the field, certifying body fees, new staff being hired (e.g. an OHS expert and an implementation officer), and the costs of new PPEs for workers.

However, arguably, the most contentious costs of certification for large companies were certain associated costs. This is controversial because the two large companies I sampled had very different perspectives. While one forest officer⁵⁵⁷ claimed that the FSC did not force them to leave certain forest areas unharvested, another forest officer⁵⁵⁸ asserted that the FSC forced them to do exactly the opposite when stating “it’s been [certification] a greater cost because we have to leave productive forests without being harvested.” How and why? The latter interviewee blamed the bad weather conditions (abundant rains) during the year preceding my fieldwork that had forced them to work on wet soils, putting them in a situation of relative non-compliance with the FSC scheme. However, he justified this situation claiming “you can’t go against a principle, which is the economic principle, because if you don’t do anything during a month, nobody earns money. So you have to work and the damage will be mitigated later on”. This situation was also reported in one surveillance audit⁵⁵⁹, in which a major non-conformity was issued. Fortunately for the company, the FSC auditors adopted a more flexible approach provided that the company took preventive and mitigation measures, balancing the economic and environmental FSC pillars⁵⁶⁰. Overall, although it was not possible to obtain quantitative

⁵⁵⁵ Interviews with NFB-XII-c01 and NFB-XII-d02.

⁵⁵⁶ Interviews with NFB-XII-d01, NFB-XII-c01 and NFB-XII-d02.

⁵⁵⁷ Interview with NFB-XII-c01.

⁵⁵⁸ Interview with NFB-XII-d01.

⁵⁵⁹ Audit report retrieved from FSC-International (2015c).

⁵⁶⁰ Interview with NFB-XII-d01.

financial data on indirect costs⁵⁶¹, these findings do provide significant qualitative evidence that certification may have a negative impact in the economic performance of large native forestry businesses.

6.4.4 Section summary

To recap this section, certification certainly has had an important impact on large native forestry businesses. Environmentally, certified companies witnessed major changes in the protection of their natural resources, the management of chemical products and toxic waste, their workers' environmental awareness and a better systematization of their operations. Overall, companies deepened their sustainable forest management.

Socially, certification is notably a means to improve the OHS performance and working conditions in such companies, notwithstanding some issues in some worst performers. In relation to communities, certification only contributed to formalize the positive relationship between firms and communities.

Third, certification had a negative impact on the economic performance of large companies, as companies had significant associated costs from modifying forest operations.

6.5 Conclusion

This chapter presents my research findings concerning forest certification capacity to change the environmental, social and economic performance of native forestry businesses. In so doing, I examined such changes in terms of their problem solving, goal attainment and behavioural effectiveness to address sustainable forest management (SFM) issues.

⁵⁶¹ It was not possible to obtain hard data concerning certification costs and/or companies' financial performance given similar reasons (trust issues) for plantation forestry businesses. See footnote No 360.

Type of Forestry Business	Environmental Performance		Social Performance		Economic Performance	
	Before the FSC	After the FSC	Before the FSC	After the FSC	Before the FSC	After the FSC
Large native forestry businesses	Forestry practices: high	(+ change)	Workers: modest to high	(+++ change)	Lowly profitable	Direct costs: (- change)
	Other aspects: modest	(++ change)	Communities: high	(+ change)		Indirect costs: (- - change)
Small and medium-sized native forestry businesses	Forestry practices: high to modest	(no significant change)	Workers: modest to poor	(+++ change)	Hardly profitable	Direct costs: neutral
	Other aspects: modest	(+++ change)	Communities: high	(neutral to + change)		Indirect costs: no significant change

Table 6.4 Summary of the main changes in certified Chilean native forestry companies after certification.

Source: author's interviews and judgement.

Table 6.4 summarises the main changes that occurred after the implementation of the FSC in native forestry businesses. In so doing, I have used the same system shown in Chapter 5 (see Table 5.4) to classify companies' performance before certification and to assess changes after certification. Thus, two broader conclusions are extracted from this chapter.

First, in small and medium-sized forestry businesses the FSC mostly deepened their sustainable forestry practices and improved, to some extent, their weaknesses in some working conditions. In contrast, in economic terms, certification did not provide an improved market access or premium prices. Second, my case studies in large enterprises showed a similar trend in environmental and social aspects; however, such changes were deeper and more numerous, even addressing forestry workers' issues. But, unlike small and medium-sized operations, some large forestry businesses reported increased economic costs from modifying their forest operations to comply with the FSC requirements.

Overall, although the changes encouraged by certification were less significant than in the case of plantation forestry businesses, certification helped native forestry businesses to reinforce their sustainable forest management practices. In the next chapter I will discuss the implications of these findings for both types and scales of forestry businesses.

Chapter 7: Understanding the impacts of certification

7.1 Introduction

In previous chapters I examined, first, the performance of non-certified forest operations along with the contextual factors and drivers that influenced the emergence of forest certification, and their capacity to address unsustainable forest management (Chapters 3 and 4). Then, I examined the environmental, social and economic impacts of certification on plantation (Chapter 5) and native forestry businesses (Chapter 6). This chapter discusses the overall significance of those findings, the contribution of my work to current knowledge, and some broader lessons extracted from the Chilean case studies presented here.

This discussion chapter is divided into three sections. In the first section, I discuss some hypotheses that might serve to explain the patterns of adoption of certification in Chile.

In the second section, I discuss the operational impacts of certification on Chilean forestry businesses. Since most studies on certification impacts are not methodologically comparable to my research, I will discuss my results for plantation and native forests in the same section but making the distinctions for each case, when necessary.

Finally, the third section discusses the impacts of certification on forest governance as compared with other policy instruments such as state laws and regulations. I also explore the role and interaction of state forest policies with certification.

7.2 Patterns of adoption of certification

As seen in Chapter 4, a number of drivers influenced the rise of certification in Chile during the last two decades; those drivers and certain contextual factors – as described in Chapter 3 – shaped dissimilar patterns of adoption, depending on the forest type and business scale. Figure 7.1 therefore, summarises patterns of adoption of certification according to the four broad groups of forestry businesses studied in this thesis.

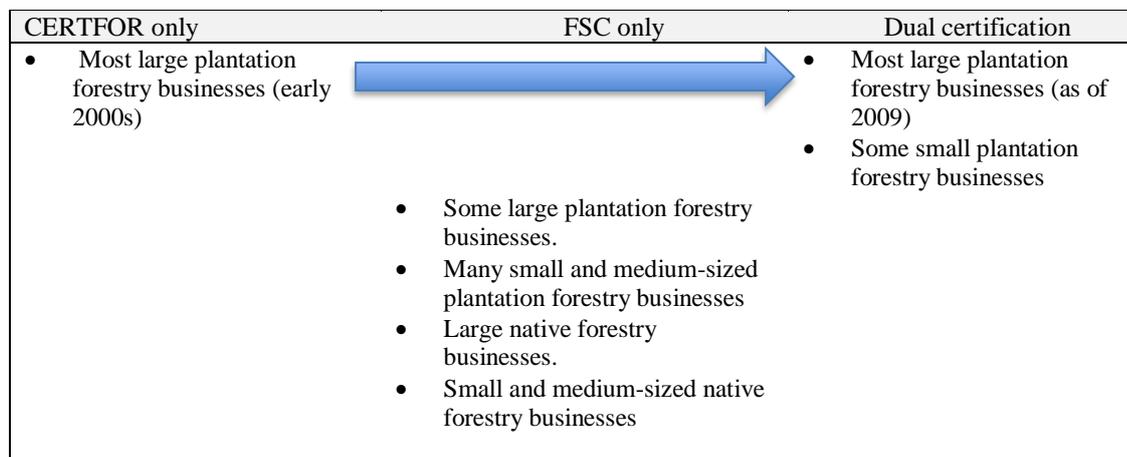


Figure 7.1 Certification patterns of adoption found across Chilean case studies.

Source: Modified from Lister (2011).

The first group, that is, most large-scale plantation forest industries, initially rejected the FSC and supported the PEFC-endorsed Chilean CERTFOR in the early 2000s. However, subsequently they endorsed the FSC and, by 2009; they had decided to recognise and comply with both schemes. In contrast, the second group of small and medium-sized plantation forestry businesses showed mixed outcomes: some of them adopted only the FSC while others decided to adopt both schemes. However, the evidence indicated that most of them were inclined to adopt the FSC over CERTFOR. Lastly, native forestry businesses of all scales only adopted FSC certification.

It is noteworthy that the FSC and its competitor schemes compete for *legitimacy* to gain acceptance and to be adopted by forestry companies. Legitimacy, in terms of this thesis, is the perception of key actors in forest governance that the authority of particular certification schemes is appropriate to make forestry companies change their behaviour according to their rules (see, e.g. Suchman, 1995; Green, 2013). Notably, NSMD governance authority originates from three types of legitimacy: *cognitive* (when certification adoption is a natural and socially accepted practice), *moral* (when superior values make organizations to adopt certification,) and *pragmatic* (practical reasons to adopt certification, e.g. market pressures) legitimacy (Cashore *et al.*, 2004).

In this regard, Cashore *et al.*'s (2007b) analytical framework (Table 7.1) is useful to help explain both the adoption of the FSC and the emergence of its competitor schemes (i.e. CERTFOR) in Chile. This framework establishes that the FSC adoption is more likely to happen if certain contextual factors supporting particular hypotheses (H_n) are present, as follows: (H1): high dependence of foreign markets for exports; (H2) high dependence on imports; (H3) concentration of forest industry; (H4) low level of non-industrial forest owner fragmentation; (H5) fragmented forestry associations; (H6) long history of unresolved forestry

conflicts; and (H7) industrial/non-industrial forest owners share access to state forestry agencies with non-business interests. These hypotheses also provide a structure to discuss the overall impacts of forest certification in Chile.

Chilean cases	Place in the Global Economy		Structure of the Domestic Forest Sector			History of Forestry on Public Policy Agenda	
	H1	H2	H3	H4	H5	H6	H7
Large plantation forest industry	√	χ	√	√	χ	√	χ
Small and medium-sized plantation forest owners	½	χ	χ	χ	√	½	√
Large native forest industry	½	χ	½	√	χ	√	√
Small and medium-sized native forest owners	χ	χ	χ	χ	√	χ	√

Table 7.1 Hypotheses explaining the patterns of adoption of certification across Chilean case studies.

Source: Modified from Cashore et al. (2007b). Symbol (√) denotes that the factor is present supporting the hypothesis, (½) denotes mixed support for the hypothesis; and, (χ) denotes the absence of the factor.

The first group analysed, large plantation forestry businesses, supported the hypotheses H1, H3, H4 and H6. While this large-scale industry was strongly dependent on forest exports, highly concentrated, vertically and horizontally integrated, and was targeted⁵⁶² by NGOs because of a number of sustainability issues (all conditions to favour the adoption of the FSC), this industry had sufficient global influence to convince its overseas clients (particularly Home Depot) about the soundness of its PEFC-endorsed option (CERTFOR) and to resist the FSC adoption, during the period 2000 – 2009 at least. Additionally, the large-scale forest industry has been highly organized, under a strong forestry association (CORMA), to lobby for its own interests and, as seen in Chapter 4, had close ties with governmental agencies (particularly CORFO and Fundación Chile), which helped them to create their own standard. All of those conditions (negating support for H2 and H5), along with the slowness of the FSC national standard-setting process (similar to the US case, see, e.g. Cashore *et al.*, 2004), had much stronger influence than the forces supporting hypotheses H1, H3, H4 and H6. But, ultimately, the much greater pro-FSC pressure exerted as of 2009 by some European clients (thus supporting H1) led large corporations to finally adopt the FSC.

The rise of CERTFOR in Chile is comparable, in Latin America, with the launching of CERFLOR (Brazilian Program of Forest Certification) standard in 2002, which was endorsed by the Brazilian Silviculture Society (see Pinto *et al.*, 2012). In contrast, the Ecuadorian and Bolivian cases differ substantially from the Chilean case. While those countries have vast extensions of productive native forests and their industries (particularly Bolivia) export to

⁵⁶² Large Chilean forest corporations have attracted the attention of many pressure groups since they are highly visible and identifiable, which is consistent with other studies. See, e.g. Sasser *et al.* (2006).

environmentally-sensitive markets, their industry structure is generally less well-resourced and technologically sophisticated as well as less concentrated than the Chilean case (supporting H4 and H5); therefore, no competitor scheme appeared (Ebeling and Yasué, 2009).

A number of reasons can explain the existence of dual certification (as distinct from FSC adoption alone) by the large-scale plantation industry. First, given the time and resources invested in CERTFOR by the large-scale forest industry and some state agencies, notwithstanding the apparent FSC superiority – in terms of moral and pragmatic legitimacy – perceived by most respondents (see Chapter 4), it seems unlikely that CERTFOR will disappear in the near future. Setting aside the competitive advantage of dual certification to broaden the range of international markets being accessed, non-continuation of CERTFOR may be seen as a failure of the industry and governmental institutions in the eyes of many actors⁵⁶³ in forest governance and a “capitulation” to green groups by the industry itself. Therefore, political reasons would also incline large forest corporations to opt for maintaining CERTFOR.

Second, it is more likely that the CERTFOR scheme will finally converge with the FSC, integrating similar performance-based requirements in such a way to make it comparable to PEFC programs that are little different from the FSC program, as is the case for the Living Forests standard in Norway (Gulbrandsen, 2010:90). This is already occurring very recently: the 2015 final draft version of CERTFOR now includes a number of requirements comparable with the FSC, e.g. restoration plans of converted native forests, better monitoring programs, and mitigation measures (CertforChile, 2016). As in other country case-studies (see the case of Germany in Cashore *et al.*, 2004), the Chilean case confirms that the FSC and its competitor programs usually change to gain acceptance beyond their original core audiences.

The third reason for the large-scale industry to maintain dual certification is, as noted in Chapter 4, seeking strategic gains by engaging in in the FSC national standard-setting processes in such a way as to make them less strict. Thus, the initial balance of the Chilean FSC chambers, in which environmental and economic interests were relatively overrepresented, evolved to favour economic interests. This is hardly surprising as large companies can obviously spend more resources and time than can the volunteers of the environmental and social chambers.

⁵⁶³ Particularly, NGOs, some political parties, Indigenous groups and some sectors of the Chilean civil society who have frequently criticised the plantation forest industry. See, e.g. Reyes *et al.* (2014).

Turning to small and medium-sized plantation forest owners, they predominantly adopted the FSC⁵⁶⁴. The reasons were the existence of some export-oriented companies, highly fragmented forestry associations⁵⁶⁵ (supporting H5), long-standing/unresolved land tenure conflicts (flowing over from those affected large corporations, thus providing mixed support for H6) and shared access with non-business interests to forestry agencies (as they had less influence than large corporations on state forest policies; thus supporting H7). Furthermore, international market access was one of the main certification drivers for small and medium-sized firms (seeking pragmatic legitimacy); unlike large corporations, these firms had little influence on their pro-FSC overseas clients, therefore inclining them to adopt the FSC.

The behaviour of the third group, that is, large native forestry companies, supported many of the hypotheses provided above: some of them exported to overseas markets that demanded FSC-certified high-value-added products in highly competitive market niches (providing mixed support for H1); they were relatively concentrated (mixed support for H3); they showed low levels of non-industrial forest owner fragmentation (their forest estates were relatively large, clearly supporting H4); and, unlike large plantation companies, they did not enjoy the same close relations with state agencies in such a way to influence forest policies (supporting H7). Moreover, they had been widely challenged by environmental problems in the past – particularly concerning the exploitation of *lenga* forests in Magallanes⁵⁶⁶ – and this encouraged them to adopt the FSC (supporting H6). It is thus unsurprising that they quickly embraced the FSC option over other schemes, seeking more moral than pragmatic legitimacy.

The behaviour of the fourth and small group of certified small and medium-sized native forest owners only supported hypotheses H5 and H7, as their forestry associations were fragmented and they had little influence on state forestry agencies and, consequently, on forest policies. Notwithstanding that they sought the FSC certification as a means to gain public recognition (CSR motivations) and international market access in the future, as seen in Chapter 3, their degraded forests and supply chain problems made it hard for them hard to achieve those goals. Thus, it is unlikely that more small forest operations will join certification in the future.

In short, the Chilean case provides an interesting example of how the processes that have resulted in the adoption of the FSC, and the emergence of alternative certification schemes, are relatively similar between developed and developing countries. Although the story in Chile

⁵⁶⁴ However, some of those firms depended on the supply chains of large forest corporations and, in turn, some of those corporations encouraged them to adopt the CERTFOR scheme instead of the FSC.

⁵⁶⁵ However, some of them exported under common trade associations. But this was more the exception than the rule.

⁵⁶⁶ Between the 1980s and 1990s there was a boom of pulpwood exports unsustainably extracted from native forests, motivated by Japanese markets. This led to growing opposition of civil society, local and international NGOs, thereby leading to the end of this type of Chilean exports. See Reyes *et al.* (2014).

became more complex over time, as the large-scale forest industry only adopted the FSC somewhat belatedly and after some reconsideration, it is apparent that some factors (most notably international market access) can play a much more important role than others to precipitating the adoption of the FSC.

7.3 The operational impact of certification on forestry businesses

In the following sub-sections I will discuss the impact of certification on the environmental, social and economic performance of both native and plantation forestry businesses. I will also discuss the differences among certification schemes and the contribution of certification to SFM – consistent with the theory on certification impacts.

7.3.1 The impact of certification on companies' environmental performance

Certification had important impacts on the environmental performance of forestry businesses, particularly in the case of large-scale plantation forest industry. Table 7.2 shows a summary of the main changes encouraged by certification, framed by the orienting concepts provided in Chapter 2 (Table 2.4).

Business type	Changes (data) that fit in pre-defined categories of orienting concepts	Changes (data) that reshape pre-defined categories of orienting concepts
Plantation forestry businesses	<p><u>Impact on processes:</u> procedural and substantive measures to improve:</p> <ul style="list-style-type: none"> • The planning of forest operations as well as the mitigation of their impacts. • The protection of soils and watercourses (e.g. by reducing slash-and-burn practices and enhancing forest roads building standards). • The management of chemical products. • The environmental training of the staff. • The protection of riparian buffer zones (e.g. by preventing exotic trees spreading), watercourses, biodiversity (e.g. by protecting flora and fauna species), and HCVFs and HCVAs inside plantation forest estates. 	<p>Impact on <i>processes</i>:</p> <ul style="list-style-type: none"> • A number of measures going beyond legal compliance, e.g. setting of buffer zone widths and ecological restoration plans.
	<p><u>Impact on outcomes:</u></p> <ul style="list-style-type: none"> • Use of reduced impact logging (RIL) techniques (small and medium-sized companies). • Environmental awareness among the staff. • Collaboration with NGOs in environmental matters. • Major openness and transparency concerning companies' environmental issues. 	<p><u>Impact on outcomes:</u></p> <ul style="list-style-type: none"> • Reduction of clear-cuts (large companies). • Restoration of converted native forests (large companies).
Native forestry businesses	<p><u>Impact on processes:</u> setting of procedural and substantive measures to improve:</p> <ul style="list-style-type: none"> • Forests roads/skid trails building standards (large companies). • The management of chemical products, • SFM practices, their planning, documentation and records. • The identification and protection of HCVFs and HCVAs. • The protection of biodiversity values (e.g. by controlling poaching, watercourses and wetlands). 	<p><u>Impact on processes:</u></p> <ul style="list-style-type: none"> • No new data to reshape/expand the existing body of theory were found.
	<p><u>Impact on outcomes:</u></p> <ul style="list-style-type: none"> • Environmental awareness among the staff (large companies). 	<p><u>Impact on outcomes:</u></p> <ul style="list-style-type: none"> • As above, no new data were found.

Table 7.2 Summary of the main certification impacts on the environmental performance of Chilean forestry businesses as framed by orienting concepts.

Source: author's interviews and secondary data.

As noted in Chapter 2 (Section 2.6.1), Layder's (1998) adaptive theory is the fundamental approach that has guided my research process. Thus, as shown in Table 7.2 and discussed below, while most of the data that emerged from my case studies have not substantially modified the existing body of theory, a number of findings have rather expanded

the theory concerning certification impacts. Figure 7.2 shows this iterative and dialectical process.

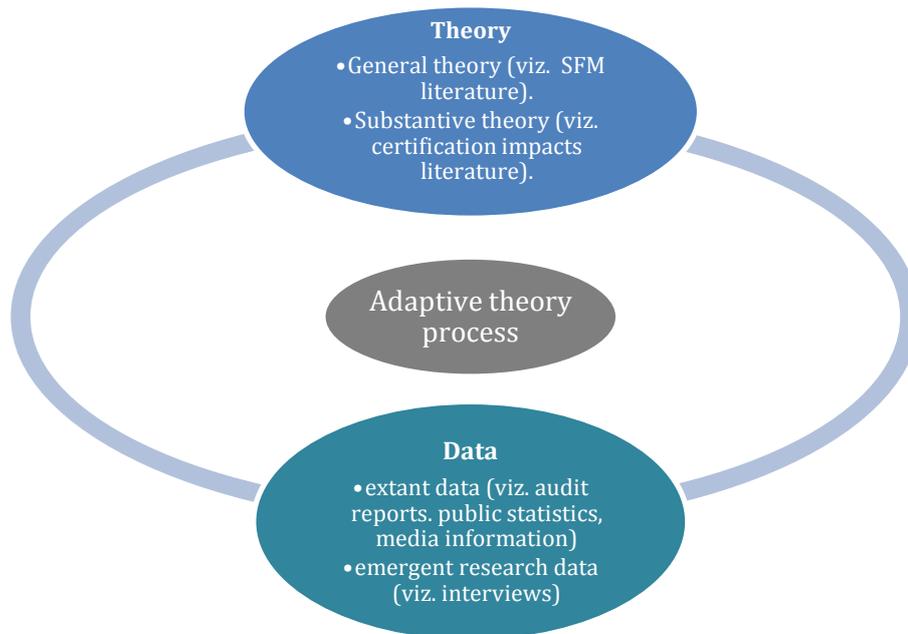


Figure 7.2 Iterative and dialectical process of adaptive theory applied to this research.

Source: Modified from Layder (1998).

Drawing on this research approach, a number of core lessons emerge from my case studies. On the one hand, most of my findings support what has been reported in the extensive body of literature on SFM practices and certification impacts for most forest types and business scales. First, certification encouraged companies to undertake a number of SFM practices, which is consistent with other studies noting: improved management of chemical products and toxic waste (Ahas *et al.*, 2006; Masters *et al.*, 2010); better environmental training for forestry workers (Rametsteiner and Simula, 2003; Ahas *et al.*, 2006; Quevedo, 2006); a better protection of riparian buffer zones, water bodies and soils (Shahwahid H.O., 2006; Carrera Gambetta *et al.*, 2006; Eba'a Atyi, 2006; Quevedo, 2006; Ham, 2006; Masters *et al.*, 2010); improved planning and building of forest roads (Quevedo, 2006; Newsom and Hewitt, 2005); a reduction of slash-and-burn practices (Hirschberger, 2005d); improved monitoring of forest operations (Hirschberger, 2005c); and better planning and management of forest resources (Carrera Gambetta *et al.*, 2006). Nevertheless, SFM practices were only limited to certified areas, which is consistent with other authors' conclusions (Quevedo, 2006; Hughell and Butterfield, 2008; Anta Fonseca, 2006).

Second, my findings on large native and small/medium-sized plantation forestry businesses suggest that certification is linked with the use of RIL techniques, which is consistent with Ulybina and Fennell's (2013) conclusions for Russian natural forests. However, as noted in Chapter 3, it is the case that the large-scale Chilean plantation industry introduced much of those logging techniques, including the use of more environmentally friendly machinery (e.g. skidders/cut-to-length methods instead of bulldozers), well before certification. Arguably, less extensive forestlands than those in the Russian case (with over 33 million hectares of FSC certified forests) and earlier international market pressures for Chile's timber commodities prompted Chilean corporations to seek more efficient methods to harvest and get the most out of their plantations.

In contrast, small native forestry businesses and some small plantation forestry businesses already performed low-intensity logging practices before certification. Similarly, Hayward and Vertinsky (1999) found that many small forest owners perceived themselves as already meeting sustainable practices. It would not be surprising if only the best performers of both groups adopted certification, as noted by Cashore and Auld (2012), but this has not been confirmed by empirical field-based research in Chile,

Third, plantation forestry businesses undertook a number of procedural and substantive measures to identify and protect their biodiversity values. These findings are consistent with a number of biodiversity practices found in certified firms by other authors, including: identification and inventorying of threatened, endangered and vulnerable flora and fauna species (Anta Fonseca, 2006; Golovina, 2009); identification and protection of HCVPs, natural ecosystems and threatened or endangered species (Tsyachniouk, 2006; Anta Fonseca, 2006; Golovina, 2009; MASRENACE, 2010; Carrera Gambetta *et al.*, 2006; Hirschberger, 2005c); poaching control and protection from illegal trespassing (Wanders, 2010); and monitoring of flora, fauna and areas of ecological relevance (Hirschberger, 2005c; MASRENACE, 2010).

While these findings are similar to the results of most studies concerning the environmental impacts of certification, this research also contributes – due to its comprehensiveness – to differentiate the type of impacts according to forest type and business scale.

This research also contributes, as shown in Table 7.2, to expanding and reshaping – to some extent – the theory concerning certification impacts. First, my findings show that large companies ameliorated the negative impact of their operations on natural ecosystems and, in some cases, rehabilitated natural forests previously converted to plantations. While this is

relatively consistent with a number of studies on certification (see, e.g. Cubbage *et al.*, 2010; Moore *et al.*, 2012; Ham, 2006; Hughell and Butterfield, 2008; Masters *et al.*, 2010; Newsom and Hewitt, 2005; Kalonga *et al.*, 2015; Miteva *et al.*, 2015), my interview findings (from both industry and stakeholder respondents) were triangulated with diverse documentation sources⁵⁶⁷ in order to support a robust conclusion. As of 2010, one year after large plantation firms adopted the FSC; forest conversion had been substantially reduced, according to my case studies. This result amplifies the results of Cubbage *et al.* (2010) who found that, by 2007, some Chilean companies had reduced forest conversions, and Heilmayr and Lambin (2016) who found that these conversions had been reduced between 2 and 23% by certification.

Certification also played a role in restoring ecosystem functionality inside plantation forest estates; consistent with the rehabilitation of riparian zones and wetlands found by Ham (2006). However, no connection was evident between these measures and the larger-scale rehabilitation of previously converted natural areas.

A second significant positive impact of certification on large-scale forestry was the reduction in clear-cut size. Here, my findings also amplify existing theory. Although Cubbage *et al.* (2010) had already noted that certification encouraged companies to rethink their clear-cut sizes, my research found that the largest Chilean firms reduced substantially the area of clear-cuts, going beyond legal compliance⁵⁶⁸. Again, I triangulated these conclusions – based primarily on interview findings – with audit and public reports to ensure their validity.

Nevertheless, despite following a thorough triangulation process, my research findings have some limitations. The first and obvious limitation is that the primary source of evidence relies primarily on interviewee perceptions that cannot be equated to measured effects on the ground; therefore, many of these findings (particularly those concerning biodiversity outcomes) need to be confirmed by further field studies. Second, this research assumes that the statements provided by my interviewees are accurate and there are no discrepancies between these statements and actual forestry practices followed by firms. To address this, I triangulated the interview data between different sources, by both forestry respondents and their stakeholders.

Third, it is likely that the greatest operational impact of certification has been in large plantation forestry businesses, as shown across my case studies; similarly, Mikulková *et al.* (2015) suggest there are much clearer effects of certification in forest estates over 500 hectares.

⁵⁶⁷ This included audit reports, media information, and public reports (from NGOs, e.g. WWF Chile).

⁵⁶⁸ The forest laws and regulations set a maximum, for plantations, of 500 hectares to be harvested continuously. My sampled companies reported voluntary reductions between 30 to 70% from such an amount.

However, a more nuanced comparison across business scales might also consider different trade-offs (e.g. economic, political and social, as noted in Chapters 3 and 4) that may influence the environmental (and social) performance of forestry businesses at different scales. For instance, the negative environmental impact per hectare of small and unsustainable forest operations may be greater, in their areas of operation, than those of large-scale corporations.

Finally, while in principle it should be possible to compare the impacts of certification for all types and categories of firms, this is practically difficult in the Chilean case for large plantation firms. This leaves the potential application of comparative techniques, such as those applied here, in Chile mostly to small and medium-sized forestry businesses.

7.3.2 The impact of certification on companies' social performance

Although certification did not solve all the social conflicts between companies and their stakeholders, in most cases certification helped companies to improve substantially these relationships. Table 7.3 shows a summary of the main certification impacts on the social performance of plantation and native forestry businesses.

Business type	Changes (data) that fit in pre-defined categories of orienting concepts	Changes (data) that reshape pre-defined categories of orienting concepts
Plantation forestry businesses	<u>Impact on processes:</u> <ul style="list-style-type: none"> • Enforcement of social laws and OHS practices. • Hiring of specialized staff on local community affairs (large companies). • Consultation with local communities concerning HCVAs, HCVFs and forest operations. • Alternative approaches to settle land tenure disputes with Indigenous communities (large companies). • Improved OHS training/working conditions (small/medium-sized companies). • Formalization of the collaborative relationship with local communities (small/medium-sized companies). 	<u>Impact on processes:</u> <ul style="list-style-type: none"> • No new findings were found.
	<u>Impact on outcomes:</u> <ul style="list-style-type: none"> • Improvement in working conditions and better social benefits (e.g. better work shifts and holidays) (large companies). • Certification is perceived as a negotiation tool by unions (large companies). • Substantial reduction of conflicts with Indigenous communities (large companies). • Collaborative relation with some NGOs (large companies). • Greater openness and transparency. 	<u>Impact on outcomes:</u> <ul style="list-style-type: none"> • Benefits for many local and Indigenous communities to mitigate the impact of forest operations, e.g. NTFPs and firewood collection, local jobs, protection of cultural sites and water-supply catchments. • Little improvements in some other cases (large companies) concerning anti-union practices and working conditions in some contractor firms and radicalized Indigenous conflicts. • Little progress in OHS performance (small/medium-sized forest owners).
Native forestry businesses	<u>Impact on processes:</u> <ul style="list-style-type: none"> • Improvements in working conditions are maintained, viz. forest camps. • Systematization of OHS training. • Consultation with communities concerning HCVAs and forest operations. • Enforcement of social laws. • Formalization of the collaborative relationship with local communities. 	<u>Impact on processes:</u> <ul style="list-style-type: none"> • No new findings were found.
	<u>Impact on outcomes:</u> <ul style="list-style-type: none"> • Improvement in working conditions and social benefits (e.g. proper holidays, wages and work shifts). 	<u>Impact on outcomes:</u> <ul style="list-style-type: none"> • No substantial improvement in OHS performance. • No significant change in the collaborative relationship with local communities. • Job stability in some large companies.

Table 7.3 Summary of the main certification impacts on the social performance of Chilean forestry businesses as framed by orienting concepts.

Source: author's interviews and secondary data.

Overall, in terms of its impact on processes, all changes due to certification (see Table 7.3) fitted with theoretical expectations and previous empirical results. Companies undertook a number of procedural and substantive measures to improve the welfare of forestry workers and their relationship with local and Indigenous communities. This was consistent with results of previous studies: for example consultation with local communities concerning the impact of forest operations (see, e.g. Ros-Tonen, 2004; Rahmad Muhtaman and Agung Prasetyo, 2006; Actins and Kore, 2006) in other countries and in Chile (Cubbage *et al.*, 2010). In short, no unexpected findings concerning the influence of certification on social practices (*viz.* processes) were found across my case studies.

Conversely, in terms of tangible outcomes, my results both confirmed pre-existing theory and helped to reshape it – by clarifying mixed evidence provided in previous studies. First, certification in general improved the working conditions of forestry workers, which is largely consistent with other authors' conclusions, who found that certified firms implemented a number of fair work practices (Eba'a Atyi, 2006; Azevedo and Freitas, 2003; Tsyachniouk, 2006; Hirschberger, 2005c), systematic OHS training programs (Hirschberger, 2005c; Masters *et al.*, 2010), local hiring policies (MASRENACE, 2010), and substantive measures (Azevedo and Freitas, 2003; Nussbaum and Simula, 2004; Ham, 2006) to improve the working conditions of their forest staff. It is noteworthy from my case studies that, whenever social benefits existed before certification (e.g. appropriate working conditions in large forestry businesses), certification encouraged companies to engage in practices to maintain such benefits over time.

Second, my cases studies demonstrated that, similarly to the studies of Cubbage *et al.* (2010) and Kalonga *et al.* (2015), communities obtained tangible benefits from certified firms such as impact-mitigated forest operations and a number of mutually beneficial agreements. However, the benefits for communities associated with native forestry firms and small and medium-sized plantation firms were limited to formalizing and maintaining mutually beneficial agreements, because they already had a collaborative relationship due to their comparatively low social impact.

In contrast, in a minority of cases, certification was not capable of making significant progress in improving the relationship between companies and Indigenous communities. Furthermore, certification did not help small forestry businesses to improve their modest OHS performance or, in large plantation forestry businesses, to address anti-union practices identified in some of their contractor firms. Why does certification seem largely ineffective to address these issues? The answer may lie in the interaction between NSMD and state governance as noted by other authors (Gale and Haward, 2011; Lister, 2011; Gulbrandsen, 2014); however,

this research expands their views, as it does not only consider that state responses influence the adoption and widespread support of non-state NSMD governance. State governance is also very relevant to allow certification schemes to thrive in operational terms. Therefore, while for issues that can simply rely on private authority (e.g. improvements in working conditions and impact-mitigation of forest operations), certification may enforce regulations or even go beyond legal compliance; but in highly sensitive issues that depend on state authority, certification largely fails. For example, current Chilean public policies have been not only insufficient to address land tenure disputes between companies and Indigenous communities, but have also aggravated by them: since the Indigenous Law (No 19523) was enacted in 1993 (to mitigate the dispossession of Indigenous communities), violent conflicts proliferated, which eroded the capacity of the state and, subsequently, NSMD governance to address such conflicts, particularly in recent years. Additionally, certification has failed to ensure effective collective bargaining rights since, in practice, the existing state regulatory framework hampers most certification efforts in that direction.

7.3.3 The impact of certification on companies' economic performance

In general, my research findings outlined microeconomic effects caused by certification for, particularly, large forestry businesses. Table 7.4 shows a summary of the main certification impacts on the economic performance of forestry businesses.

Business type and scale		Changes (data) fitting in pre-defined categories of orienting concepts
Plantation forestry businesses	Large companies	<ul style="list-style-type: none"> • Maintaining of international market access. • Increased associated costs from modifying forest operations (e.g. clear-cuts, ecological restoration and measures to protect buffer zones). • Increased social costs due to local hiring policies favouring traditional harvesting methods over mechanized operations.
	Small and medium-sized companies	<ul style="list-style-type: none"> • Gaining international market access. • Direct and indirect certification costs were more relevant.
Native forestry businesses	Large companies	<ul style="list-style-type: none"> • Modest access to international market access due to certification. • Associated costs from modifying forest operations, viz. harvesting during wet seasons) and hiring of specialized staff.
	Small and medium-sized companies	<ul style="list-style-type: none"> • Direct and indirect certification costs were more relevant. • No access to international markets or better domestic markets either.

Table 7.4 Summary of the main certification impacts on the economic performance of Chilean forestry businesses.

Source: author's interviews and secondary data.

Therefore, large forestry businesses reported important costs associated with, particularly, FSC certification. They were related to the implementation of SFM practices rather than to audit fees or hiring specialized staff⁵⁶⁹; as other authors' research suggests (Cubbage *et al.*, 2009; Cashore *et al.*, 2004): associated costs are often more relevant for large forestry businesses⁵⁷⁰, whereas direct and indirect costs are less relevant due to economies of scale. Conversely, although many authors (Cashore and Auld, 2012; Nussbaum and Simula, 2004; Chen *et al.*, 2010) have noted that small and medium-sized forestry businesses must face higher direct and indirect costs, the circumstantial evidence of my sampled organizations showed that they circumvented those costs: first, they certified under the "group certification⁵⁷¹" option, thereby reducing the certification fee for each member; and, second, many of them accessed certification through government subsidies to cover direct and indirect costs of the FSC certification.⁵⁷²

Although these results did not provide quantitative data to support the above conclusions, given the constraints noted in Chapters 5 and 6, most certified companies were plantation forestry businesses suggesting that they were more likely to afford certification costs, which is consistent with other authors' conclusions (see Nussbaum and Simula, 2004; WWF-International, 2015).

Access to environmentally sensitive markets continues to be the main driver of certification, as revealed by my case studies and noted by recent studies (Holopainen *et al.*, 2015). However, here, certification benefited plantation companies more than native forestry businesses. It is likely that some contextual factors, noted in Chapter 3, remain an insurmountable barrier for certification to thrive for most native forestry businesses: supply chain issues (particularly for small owners), degraded forests and low timber yields make the native forestry sector less economically attractive and poorly competitive against timber products from other countries.

My research also confirms what other authors (Araujo *et al.*, 2009; Quevedo, 2006; May, 2006; Anta Fonseca, 2006; Chen *et al.*, 2011b; Klooster, 2006; Crow and Danks, 2010;

⁵⁶⁹ As seen in Chapter 5, although some large plantation forestry enterprises resented some indirect costs associated with certification audits, the most important costs were those associated with complying SFM practices.

⁵⁷⁰ One WWF report has estimated that large forest operations had slightly higher associated costs (US\$3.73) than small and medium-sized operations. (US\$3.71). See WWF-International (2015).

⁵⁷¹ This alternative has become a popular option for small landowners in the last years. See FSC-US (2013).

⁵⁷² Indeed, one forest owner commented that without such subsidies, the direct costs of certification would have been unaffordable for him. Interview with PFB-VIII-m01.

Toppinen *et al.*, 2013) have found: the absence⁵⁷³ of premium prices for certified timber. Neither the timber from plantation forests nor that one from native forests attracted premium prices. Arguably, the plantation industry's focus on the export of commodities (i.e. pulpwood, as for some other countries that reported the lack of premiums), and, as noted above, the absence of high export volumes of high quality timber from native forestry businesses, which in addition also compete with high quality tropical timber, may explain the absence of premium prices.

The evidence from my case studies is not sufficient to make conclusions about the macroeconomic effects of certification on Chilean forestry, such as broader effects on the supply chain and on the long-term timber supply. Nevertheless, while the certification benefits of a better public image and reputation in, particularly, large forestry businesses might arguably have attracted new investors, this does not appear to have been the case. Despite having some 2.6 million hectares of degraded soils that could potentially be reforested with plantation forests (Grosse, 2016), the loss of appropriate government incentives and land ownership insecurity – due to land tenure conflicts – suggest that such reforestation is unlikely in the foreseeable future.

7.3.4 Differences between forest certification schemes

This research showed substantial differences between the extent of the impacts of different forest certification schemes. Overall, the FSC scheme apparently deepened the sustainability changes initiated by Chile's PEFC-endorsed CERTFOR and encouraged companies to seek alternative solutions to address some environmental and social problems, going even beyond legal compliance. Table 7.5 shows a summary of some of the main changes initiated or deepened by different forest certification schemes and their interaction with state governance. The ticks (✓) and crosses (×) indicate if the changes given in each row were or not were initiated by a particular certification scheme; they also show which were only enforcing and which were going beyond legal compliance. When changes were deepened by a particular scheme, this is denoted by (✓✓).

⁵⁷³ There is, however, mixed evidence to explain why some markets reward certified timber with premium prices, whereas in other cases not. See for example the case of Malaysia's enterprises that reported premium prices for their certified timber in Shahwahid H.O. (2006).

Environmental Changes		FSC	CERTFOR
Enforcing Legal Compliance	Riparian buffer zones management*	√	√
	No slash-and-burn practices	√	√
	Setting of buffer zones widths in native forests	√	χ
	Management of chemical products	√	√
Beyond Legal Compliance	Better planning of forest operations	√	√
	Better environmental training for workers	√	√
	Setting of buffer zones widths in plantation forests	√√	√
	Reduction of clearcuttings in plantation forests	√	χ
	Restoration of converted native forests	√	χ
	Changes to improve SFM practices to protect soils and watercourses*	√	√
	Better forest roads building standards	√	√
	Identification and protection of HCVMs and HCVAs	√√	√
Measures to protect biodiversity	√	√	
Social changes		FSC	CERTFOR
Enforcing Legal Compliance	Improvement of working conditions and OHS issues	√	√
Beyond Legal Compliance	Ensuring collective bargaining rights	√√	χ
	Tangible benefits for local and Indigenous communities	√√	√
	Consultation processes with local and Indigenous communities	√√	√
	Measures to mitigate the impact of forest operations on communities	√	√
	Qualification system for forestry workers	χ	√

Table 7.5 Summary of the main changes encouraged by certification in Chile and their interaction with state governance.

Note: (*) While the execution of some forest operations need to be relatively detailed in official forest management plans, certification has in general required more prescriptions, beyond what was required by law in, particularly, plantation forests.

Source: author's interviews.

Table 7.5 shows that, in general, the FSC deepened many of the sustainability changes initiated by forest certification. This is a new result: although other studies had found differences in the orientation of different certification schemes, the empirical evidence to date had not found much difference in the environmental and social operational performance of the FSC and competing alternative schemes. Thus, while some authors (see, e.g. (Newsom and Hewitt, 2005) and ENGOs have considered the FSC as the strictest scheme, the evidence mainly pointed to the orientation of the certification schemes: for example, some studies (Masters *et al.*,

2010; Cubbage *et al.*, 2003; Moore *et al.*, 2012) suggested that the FSC required more changes in all SFM aspects (environmental, social and economic ones) of companies than competing schemes (that is, the CSA and SFI North American standards) which were focused on management systems and on management of natural ecosystems. This situation is evolving quickly, however. As seen in section 7.2, competing schemes are tending to converge.

More specifically for the Chilean case, Cubbage *et al.* (2010) did not find significant differences in the changes encouraged by the FSC and CERTFOR certifications. Recent meta-analysis (Masiero *et al.*, 2015) found that there was not a large gap in the FSC and CERTFOR schemes did, in terms of number of issues covered by each. In contrast, by using quasi-experimental methods, Heilmayr and Lambin (2016) found that the FSC was more effective than CERTFOR in reducing deforestation.

My research expands the above studies in terms of its comprehensiveness. While an obvious limitation of my approach is that it mainly relies on subjective perceptions gained through interviews, I triangulated a diversity of views (among firms and stakeholders) and secondary data (e.g. audit reports, public reports and statistics and media information) to enhance its validity. My findings confirm there are operational differences in the performance of both schemes: they favoured the FSC scheme over the PEFC-endorsed CERTFOR alternative.

In short, this research contributes to the general knowledge about certification schemes as it describes that both schemes differed in the extent of their environmental and social impacts. However, further work is still needed to evaluate the on the ground impacts, over the long term, of both forestry certification schemes.

7.3.5 Leaders and laggards

Cashore and Auld's (2012) research has highlighted a conundrum that explains much of the support, opposition and the impact of NSMD governance on sustainability – particularly concerning the FSC: "*those firms already closest to the standards will be the first to join*". This dilemma is illustrated in Table 7.6: if the requirements of the certification standard are perceived as too high, only few members will join certification (usually the top performers); conversely, the standard will receive widespread support if the requirements are low.

Requirements of Certification Systems		
	High	Low
Level of firm support	Low	High
Impacts on Sustainability	Low *	Low **

Table 7.6 The dilemma of High and Low Certification Requirements at initiation.

Notes: *Too few members, improvements are focused on top performers while worst performers are unaffected. ** Status quo is maintained, the very worst performers are excluded, encouraging some of the worst performers to improve.

Source: Adapted from Cashore and Auld (2012).

The above dilemma explains much of the adoption patterns shown by Chilean forestry businesses. The group of high-impacting large-scale plantation forestry businesses that created their own standard (CERTFOR) were the last to join the FSC due to, mainly, external market pressures. In contrast, only a couple of – arguably – top plantation performers were the first to join the FSC in the early 2000s, as seen in Chapter 4. Therefore, initially, the operational impact of certification on sustainability was initially rather limited, but this clearly changed since 2009, as seen earlier in this thesis.

On another hand, most of Chile’s native forestry businesses are small owners whose forest management practices may not be sustainable: but they are not pressured in any way by external markets and do not need to obtain a social licence to operate. To date, the few companies that have adopted certification were those – as noted in Chapter 6 – already closest to the FSC, which sought certification as a competitive advantage in CSR terms, and a potential means to access international markets. Thus, while certification certainly contributed to reinforce SFM practices and address social issues in this group, the overall positive impact on sustainability is relatively modest in this sector.

7.4 Certification’s impact on broader forest governance

Drawing on the empirical evidence presented across Chapters, 4, 5 and 6, we might conclude that forest certification has also had substantial impacts on broader Chilean forest governance. As discussed below, certification has changed the power balance among forest governance actors, involved the government in certification development, and supplemented the role of the state by enforcing or going beyond legal compliance with regard to SFM issues.

7.4.1 Change in the power balance

An important impact of, particularly, the FSC certification was the change in the power balance between forestry companies and their stakeholders. This was more marked for large forestry businesses. Although CERTFOR pioneered consultation processes with communities and other stakeholders, the FSC certification deepened such processes and, very importantly, engaged communities and NGOs in developing certification goals. This is consistent with other authors' findings (Roberge *et al.*, 2011b; Shahwahid H.O., 2006; Tsyachniouk, 2006; Eba'a Atyi, 2006; Ulybina and Fennell, 2013; Ros-Tonen, 2004; Richards, 2004). Open consultation processes with communities, NGOs and forestry workers might be the first step to address the unequal balance of power between firms and stakeholders; this is one of the most serious issues for the sustainability of the plantation industry, considering the long-standing history of weakening of workers' rights, dispossession, and land use changes, as noted in Chapter 3. Today, the FSC has catalysed an improved multi-stakeholders dialogue between the plantation forest industry and their stakeholders, allowing interested parties to gain greater power in the decision-making processes of forestry businesses.

7.4.2 Government involvement in forest certification development

My results showed that a number of Chilean state agencies were actively involved in the development of forest certification from the early stages of its development. These engagements evolved over time, and differed between the FSC and CERTFOR schemes. Figure 7.3 illustrates this evolution, distinguishing – following Lister's (2011) framework - four types of government interventions in the rule-making, implementation and enforcement of certification schemes. Lister (2011) also identified the range of possible responses as observing (without intervening at all, just leaving certification to market forces), cooperating (providing information and technical advice about certification), enabling/endorsing (providing subsidies or adopting certification in state forests), and mandating (setting certification as mandatory requirement in laws or regulations).

Spectrum of government intervention

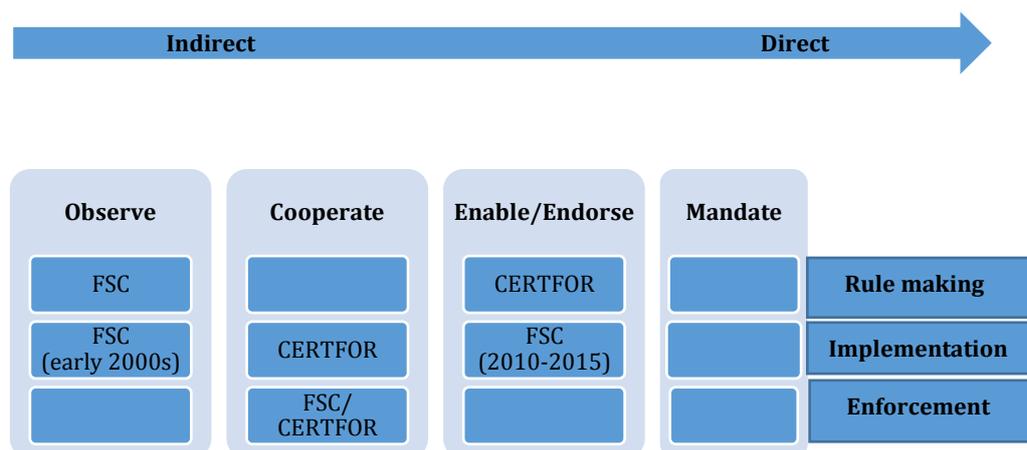


Figure 7.3 Spectrum of government intervention on certification in the Chilean case.

Source: Modified from Lister (2011).

First, concerning rule-making processes of certification schemes, during the early 2000s the Chilean government participated with the large forest industry in the development of the national initiative CERTFOR. In so doing, it provided technical advice and financial support through two state agencies (INFOR⁵⁷⁴ and CORFO⁵⁷⁵). Conversely, the forestry agency CONAF was limited to observing the development of the FSC in some early FSC adopters, and acquiring more knowledge about this new policy instrument. Similar government responses at this stage were reported by other authors but for FSC competitor schemes: the CSA standard in Canadian provinces (see for example Lister, 2011:115), for the CERFLOR scheme in Brazil (May, 2006), for the PEFC-endorsed standard in Norway (Gulbrandsen, 2005), and for the MTCC standard in Malaysia (Shahwahid H.O., 2006). But while in the Chilean case the government response towards the FSC was initially limited to observing its rule-making process, this changed in subsequent stages of the FSC policy cycle, as described below.

The second stage of the certification policy cycle in which the government intervened was in its implementation. In the case of CERTFOR, CONAF limited the scope of their participation to cooperate in the implementation of the standard by providing technical advice and information to small forest owners. Nevertheless, in the past five years, CONAF shifted from acting only as an observer to one of enabling the adoption of the FSC: At the time of my fieldwork, CONAF and FSC Chile had signed an agreement to endorse its implementation by small forest owners. Notwithstanding these findings, CONAF had not, at least publicly, favoured any certification scheme over others; rather, certification in general was usually

⁵⁷⁴ The Research Forest Institute.

⁵⁷⁵ The Corporation for the Promotion of Productivity.

perceived as a positive instrument to help them to meet sustainability goals. There were similar government responses, in endorsing the implementation of certification, in Latvia (Actins and Kore, 2006) and Estonia (Ahas *et al.*, 2006); but whereas in the Chilean case, forestry agencies endorsed the FSC certification through providing – to some extent – some small owners with technical and financial support, Latvia and Estonia implemented the FSC scheme extensively in their state-owned forests.

Third, although the predominant view of the forest authority on certification was positive, government agencies in general had no intention of going beyond a technical cooperation (providing technical information about certification to small forest owners) for either standard. More direct forms of government intervention in certification might involve, for example, the integration of government inspections and certification audits⁵⁷⁶, but the Chilean forestry authority had no plans, at the time of my fieldwork, to undertake such integration. It is noteworthy that while certification is not legislated or explicitly aligned with laws and regulations⁵⁷⁷, the Chilean legislation progressed substantially during the last decade along with certification – as well as the prescriptiveness of forest management plans required by CONAF (see Figure 7.4).

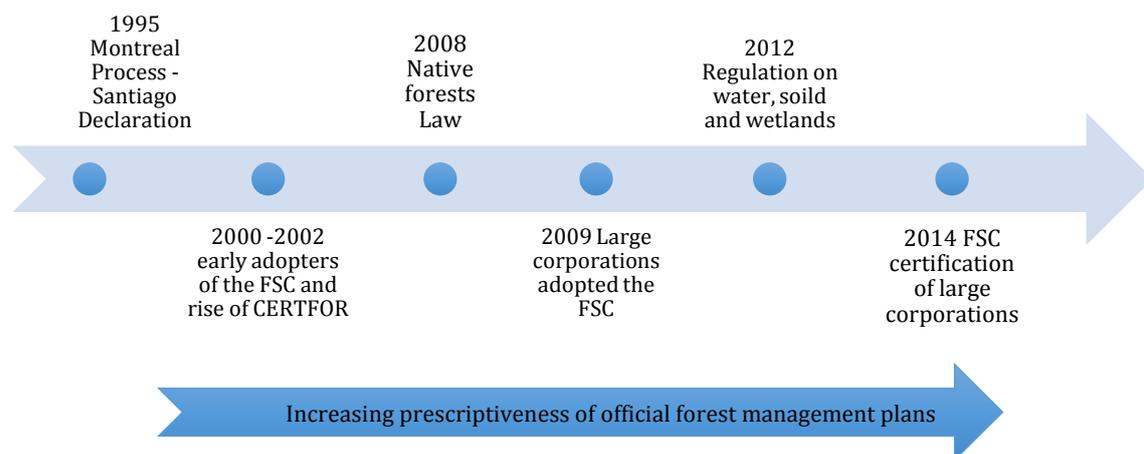


Figure 7.4 Key milestones in the development of certification in Chile and progress of Chilean forest legislation, 1995-present.

Source: author's analysis.

However, there is only circumstantial evidence to suggest that the emergence of certification may have influenced the progress of the Chilean forestry legislation. Only a couple

⁵⁷⁶ For example, in the Canadian province of New Brunswick, the authority commissioned studies to evaluate this possible integration (Lister, 2011:117).

⁵⁷⁷ Conversely, that was the case of the Department of Forest and Natural Resources in Norway (Koleva, 2005).

of respondents made interview statements suggesting this. One CONAF official⁵⁷⁸, for example, stated that since companies began to certify their operations, their forest management plans became more technically complex and CONAF, accordingly, requested similar plans for non-certified companies. Likewise, one CONAF senior officer⁵⁷⁹ commented that they aspired to modify forestry legislation to include more exacting requirements, in such a way to tailor them to certification schemes. Further research is needed to investigate specifically this aspect.

7.4.3 Supplementing the role of the state

My case studies support the theory that certification works as a co-regulatory approach in a hybrid model of forest governance. Such a governance model would be shared between non-state actors and government forest agencies. Thus, as shown in Table 7.5, certification was capable of enforcing compliance with forestry, environmental and social laws and regulations. This is consistent with a number of studies in other countries (Elbakidze *et al.*, 2011; Newsom and Hewitt, 2005; Basso *et al.*, 2012; Basso *et al.*, 2011; Cerutti *et al.*, 2011; Ebeling and Yasué, 2009; Alves *et al.*, 2011), especially in developing nations lacking appropriate enforcement mechanisms, such as Cameroon and Brazil. As seen in Chapter 3, the Chilean plantation forest sector has been a poorly enforced sector, in the view of the vast majority of my respondents. The case of the native forest sector is different; it is comparatively highly regulated sector with stronger enforcement of forestry regulations, for historical reasons associated to long-standing illegal logging. Certification, therefore, certainly contributes less to enforce legal compliance – concerning environmental issues – in native forestry than in the case of plantation forestry.

Hence, the capability of certification in facilitating compliance with laws and regulations may explain the range of positive responses towards certification on the part of the Chilean state, which as Lister (2011): 69 noted, has seen certification as a supplementary enforcement mechanism.

This analysis also shows that certification is capable, at least to some extent, of replacing the role of the state in SFM issues where it is largely absent. Environmentally, before certification, clear-cuts limits on the plantation industry were particularly generous, and were reduced due to the FSC implementation. Socially, excepting for certain large forest operations⁵⁸⁰, consultation with communities is not required by any Chilean legislation. However, although certification goes beyond the law in many aspects, it also strongly relies on

⁵⁷⁸ Interview with A-VIII-01.

⁵⁷⁹ Interview with A-RM-01.

⁵⁸⁰ According to the 1994 General Environmental Law (No 19300), clear-cuts exceeding 500 hectares per annum require an Environmental Impact Assessment (EIA) study. However, in practice, large companies have circumvented these prescriptions by harvesting as much as possible but taking care of not exceeding this threshold.

pre-existing regulatory requirements. This has been noted by McDermott *et al.* (2008): certification schemes usually mimic public forest policies. In the Chilean case, while there are no specific prescriptions of riparian buffer zone widths in the legislation for plantation forestry, some of Chile's largest forest corporations adopted the prescriptions set in the Decree No 82 for soils, water and wetlands, which was originally focused on native forestry businesses. Hence, while still based on national forestry regulations, in practice it was certification that encouraged companies to go beyond legal compliance.

We may conclude, thus, that certification works as private forest governance mechanism to supplement the role of the state by enforcing and/or going beyond legal compliance. As Gale and Haward (2011) have pointed out, voluntary certification has introduced a "hybrid governance" arrangement, in which states, markets and civil society share forest governance. The major challenge however, in the Chilean case, relies in the capacity of the state and its institutions to address forest, environmental and social issues by setting clear public policies to allow certification to thrive. Bell and Hindmoor (2009) emphasizes how important are sound state institutions to ensure appropriate market governance: when they fail, NSMD governance is largely ineffective for some social issues, as discussed in section 7.3.

7.5 Conclusion

In this Chapter, I discussed the overall contribution, significance and limitations of the results presented in Chapters 3, 4, 5 and 6. First, the Chilean case demonstrates that forest industries with a strong export-oriented forest sector reacted in a relatively similar manner against the FSC as did others elsewhere: by creating alternative certification schemes. However, in the end, the large Chilean forest industry adopted the FSC scheme pressured by its overseas markets. This was different to the case of industries in developed countries, in which most generally maintained their alternative standards without necessarily adopting the FSC.

Second, most of the positive impacts of forest certification were focused on large plantation forestry businesses since their clearer effects on large forest operations. The positive impacts of certification were more marginal, but not less important, for native forestry businesses. Further, certification has helped to achieve state sustainability goals since it enforces legal compliance and, at the same time, goes beyond legal compliance in some cases. On this basis, "governing through markets' approaches", as noted by some authors (see Bell and Hindmoor, 2009), would thus enhance the governance capacity of the state than weakening it. However, sound government institutions would be necessary to make certification work effectively in the long term.

In brief, we may conclude that certification in Chile is really making a difference for both plantation and native forestry businesses. But in order to understand the systematic effectiveness of forest certification in Chile, it is necessary to answer the research questions that motivated this thesis, as well as some broader policy implications and recommendations for this innovative policy instrument. Those issues will be addressed in the following chapter.

Chapter 8: Conclusions

8.1 Introduction

This chapter is divided in five sections. In the first section, I briefly review my thesis objectives and research framework. The second section addresses in detail what I found in response to each of my five research sub-questions. The third section evaluates critically my research framework and its capacity for yielding knowledge. The fourth section discusses a number of policy implications and recommendations about certification and general forest governance. Finally, in the fifth section I describe areas for future research.

8.2 What this thesis set out to do, and how

The main aspiration of this thesis was to evaluate the environmental, social and economic impacts of forest certification on plantation and native forestry businesses in Chile, employing a research framework in which five different measures of effectiveness were applied to answer the central question: *What difference do different forest certification schemes make to forestry businesses?* The five research sub-questions corresponding to these measures of effectiveness were as follows:

- (1) *What problems have been addressed in forestry businesses by forest certification?*
- (2) *What were the companies/stakeholders' main goals in seeking certification? To what extent have they been achieved?*
- (3) *Has forest certification changed the behaviour of companies towards various stakeholders?*
- (4) *What are the attitudes of key actors in forest governance to the different certification schemes?*
- (5) *What is the attitude of the public towards different forest certification schemes?*

The research framework to address these questions was introduced in Chapter 1 and explained in detail in Chapter 2. The original, more generic research framework was developed by Young (1994), and subsequently modified for the forest sector by Tikina and Innes (2008). This research framework helped me to develop the five research sub-questions. I complemented the approach of Tikina and Innes with a research design inspired in counterfactuals, as outlined by Blackman and Rivera (2010) and Blackman and Naranjo (2012). I discuss the utility of this research framework to answer my research sub-questions in section 8.3.

8.3 Answers to the research sub-questions

In the next sub-sections, I summarise my findings with regard to each research sub-question as described earlier, addressing, in turn, each of the aspects of certification effectiveness.

8.3.1 What problems have been addressed in forestry businesses by forest certification?

The first research sub-question addresses the problem-solving dimension of certification. In order to be effective as a forest regime, certification must address or solve the problems that stimulated its adoption. Hence, the first research sub-question, *what problems have been addressed in forestry businesses by forest certification?*, has been addressed by examining the environmental and social impacts of certification. To answer this question, it is important to remind the reader the environmental, social and economic problems that certification should address and mitigate (see Table 8.1), and then, as addressed below, develop the answers.

Sustainability issues	
Environmental problems	<ul style="list-style-type: none"> • Conversion of native forests to exotic tree plantations • Negative impact of extensive clearcuttings on soils, biodiversity and watercourses (plantation forests) • Pollution (e.g. aerial spraying) caused by chemicals upon soils and watercourses (plantation forests) • Illegal logging and high-grading (native forests)
Social problems	<ul style="list-style-type: none"> • Poor working and OHS conditions in many companies (plantation and native forests) • Anti-union practices (plantation forests) • Land tenure conflicts with Indigenous communities (plantation forests) • Negative impact on local communities caused by forest operations (plantation forests)
Economic problems	<ul style="list-style-type: none"> • Supply chain problems and poor economic performance (native forests).

Table 8.1 Summary of the main environmental, social and economic problems in Chilean forestry businesses prior to certification.

Source: author's interviews and secondary data.

Problem-solving ability of certification to address environmental problems

For the most part, certification has been able to address the environmental problems that led to its adoption. Certification, therefore, has been a relatively effective policy instrument in ameliorating, albeit not entirely preventing or resolving, the environmental degradation caused by plantation forestry businesses and to a far lesser extent, by native forestry. This has occurred in three different ways.

First, although plantation forestry businesses cleared extensive areas of native forests to establish exotic tree plantations, certification (particularly, the FSC scheme⁵⁸¹) led such companies to embrace various voluntary measures to rehabilitate some native forests. Those commitments have been closely monitored by some NGOs, as an oversight mechanism. While the deforestation of native forests has not been completely stopped, two effects of certification on native forests are evident: certified forest operations stopped forest type conversions and, at the same time, rehabilitated some of their previously converted natural areas. Therefore, the restoration of some degraded natural ecosystems that had been converted to plantations is a significant achievement of certification.

Second, certified plantation forestry businesses have had to reduce the negative impact of their forest operations. This was achieved by implementing SFM practices and reducing the area of clear-cuts, as encouraged by the FSC. Although it is difficult to demonstrate the causative link between adoption of more SFM practices and the problem-solving ability of certification by evaluating on the ground improvements in soils, water quality and biodiversity, the significant reduction of the size of clear-cuts may help us as an indirect indicator⁵⁸² to demonstrate the problem-solving ability of certification.

Third, it is self-evident that limiting the extent of plantation forest operations and, particularly, rehabilitating natural ecosystems may have a positive outcome on some biodiversity issues. Put differently, if better environmental protection is achieved, and additionally, more natural areas are rehabilitated, it is very likely that some biodiversity values will improve, e.g. the conservation status of endangered flora and fauna species, and tree species richness and frequency. While more field studies are needed to support this conclusion, certification certainly may be helping to address some biodiversity issues.

Overall, certification has enhanced the problem-solving ability of forestry businesses in relation to important environmental problems: it is unlikely that in the absence of certification, plantation forestry businesses would have undertaken various measures to mitigate the environmental impact of their operations. However, these positive outcomes seem confined to the FMUs, and have little effect on SFM of contiguous natural areas. Here, state forest policies can and should play an important role in protecting those areas by complementing certification programs. This is particularly relevant for the new developments of the FSC scheme in which the landscapes aspects are becoming more important (e.g., see FSC-International, 2015b).

⁵⁸¹ Prior to the FSC adoption, the large scale plantation companies had agreed with international NGOs (particularly, Forest Ethics) and Home Depot to not convert their native forests to plantations. This was known as the Joint Solutions Project. See Chapter 4.

⁵⁸² Indeed, the size of clear-cuts is one of the indicators of the type of environmental forest policies. See McDermott *et al.* (2010).

Problem-solving ability of certification to address social problems

Although certification seems less effective in its engagement with social issues, it has at least addressed most of the social conflicts between companies and their stakeholders. Therefore, certification – in this respect at least – has been a relatively effective problem-solving mechanism.

First, where certification has been perhaps most effective socially, is in addressing the conflicts between companies and local, particularly Indigenous communities: while certification did not solve all land tenure conflicts, the level of most conflicts decreased significantly since the FSC was adopted. Hence, the relationship between companies and local communities, as well as with NGOs, improved substantially. This indicates that certification is effective in addressing many of the social problems that encouraged its adoption. However, to what extent can certification help companies to achieve *their* social goals? Although certification alone is not capable of solving the underlying causes of social conflicts (viz. an illegitimate afforestation model based on dispossession⁵⁸³), certification is at least able to mitigate the social impact of companies' operations as a relatively effective mechanism.

Second, evidence from my case studies in relation to certification's ability to address social problems concerning the working conditions of forestry workers is mixed. Although certified companies addressed, and in many cases improved, the modest or precarious working conditions in plantation forestry and native forestry businesses respectively, certification did not significantly improve some OHS issues in native forestry businesses or some OHS-related working conditions (viz. ergonomic issues) in plantation forestry businesses. Nor did certification solve various anti-union practices in plantation forestry businesses.

The above examples demonstrate that to an extent, certification is able to address social issues that motivated forestry firms to adopt certification as an instrument of forest governance. However, although certification was successful in many cases, it failed in some others. Certification is clearly not a panacea for solving all the social conflicts between companies and their stakeholders; rather, certification can only facilitate companies addressing complex social issues, when underpinned by effective state governance. Nevertheless, the role of the Chilean state in addressing social issues is relatively weak in many areas. For example, certification cannot ensure effective workers' rights in circumstances where labour laws in practice obstruct any collective bargaining process. Or, in the case of the relationship with Indigenous

⁵⁸³ See for example the history of the *Mapuche* Indigenous conflict in Waldman (2012).

communities, certification cannot guarantee the absence of land tenure disputes if public policies do not address their underlying causes. Since many certification requirements rely on state laws and regulations, such failures are beyond the scope of what certification can do. Unfortunately, the neoliberal policies applied from the late 1970s to date in Chile, have shrunk the role of the state and in its capacity to regulate the behaviour of private actors (see, e.g. Silva, 1993; Kurtz, 2002) .

Second, both forestry schemes need engaged stakeholders to ensure that forestry businesses, especially large ones, meet the sustainability commitments they made when adopted certification. In this context, the training of local communities in monitoring programs to act as environmental and social “watchdogs”, or surrogate regulators, would be particularly relevant. As discussed in Chapter 4, third-party audits seem not sufficient to ensure that companies will maintain their environmental and social commitments, as many of the audits have lacked enough depth to detect important non-compliance situations, making effective community engagement an essential underpinning for the success of the social component of certification.

Problem-solving ability of certification to address economic problems

Overall, certification did not benefit most native forestry businesses with improved market access or premium prices for certified products. Rather, large forest operations reported increased associated costs and only a handful of them gained modest market access. Nevertheless, it is largely due to the adoption of certification that large and small/medium-sized plantation forestry businesses maintained and gained overseas market access, respectively. In brief, while certification has certainly helped plantation owners by improving their market access; it has not brought better economic performance for small native forest owners – those who are particularly more troubled economically.

Recapping the answer to this sub-question, although certification has not solved all sustainability issues, what certification has achieved in general terms has been considerable, since it improved substantially the environmental and social performance of certified companies, particularly plantation forestry businesses. Moreover, my case studies suggest that the FSC certification has driven or deepened the vast majority of the sustainability changes occurred in the Chilean forestry sector.

8.3.2 What were the companies/stakeholders' main goals in seeking certification? To what extent have they been achieved?

The second research sub-question addresses the goal attainment dimension of forest certification, that is, the capacity of certification to achieve certain sustainability goals of forestry businesses. Thus, the second research sub-question, *what were the companies/stakeholders' main goals in seeking certification? To what extent have they been achieved?*, has been answered by examining the main drivers of companies seeking certification. In summary, the certification goals (syn. drivers) of forestry businesses were a social licence to operate, corporate social responsibility (CSR) motivations, access to international markets and learning from better SFM practices.

Goal attainment of social licence to operate

Social licence to operate was an important certification driver that was closely related to the social demands of communities and NGOs in mitigating the impact of forest operations, particularly land tenure disputes between, particularly, large plantation forestry businesses and Indigenous communities. However, while in most cases FSC certified plantation forestry businesses improved their relationship with local communities and NGOs, whose members facilitated such a social licence, in some cases this did not occur. The existence of long-standing conflicts between companies and Indigenous communities prevented both parties from achieving a better relationship and thereby the facilitation of a social licence in certain areas: those companies could not even run their forest operations in their own forest estates occupied by some Indigenous communities, since the conflicts in such areas turned particularly violent. Notably, most of these achievements were predominantly catalysed by the FSC, rather than by the CERTFOR scheme.

Goal attainment of CSR motivations

Most forestry businesses also sought certification as a means to gain competitive advantage and the evidence from my case studies suggests that these expectations were met in most cases. This was particularly relevant for large native forestry businesses and small and medium-sized plantation forestry businesses that already had a positive relationship with local communities. For them, the FSC certification, particularly, helped them to gain reputational benefits and competitive advantage with clients and, apparently, government authorities.

Goal attainment of international market access

The access to environmentally-sensitive international markets by plantation and large native forestry businesses was another important goal. Overall, my case studies showed that certification allowed certified large plantation forestry businesses, and small/medium-sized plantation forestry businesses, to maintain and gain international market access, respectively. While certification was effective in meeting the economic expectations of plantation forestry firms, this was a more elusive goal for large native forestry businesses: only one organization from my case studies reported gaining some international market access for their certified products. This modest outcome would be linked with the domestic circumstances of most of the Chilean native forest industry: low timber volumes, supply chain deficiencies, and highly competitive market niches in overseas markets; none of which were amenable to being solved by certification.

As regards the effectiveness of each forestry scheme, large plantation forestry businesses maintained dual certification not only to – as apparent – broaden the range of international markets being accessed but also, as discussed in Chapter 7, for political reasons. Conversely, native forestry businesses and small and medium-sized plantation forestry firms relied exclusively on the FSC scheme to access international markets that demanded the FSC scheme only. Hence, in terms of goal-oriented effectiveness, the FSC would be more effective as it provided less restrictive market access than CERTFOR, the PEFC-endorsed scheme.

Goal attainment of learning from better SFM and internal management practices

Overall, certified plantation forestry companies sought certification, particularly FSC certification, as a means of learning from better SFM guidelines to apply on their own operations. The evidence from my case studies suggests that most certified companies met their expectations concerning learning from better SFM and internal management practices.

To summarise, certification – in terms of its goal-oriented effectiveness – is a relatively effective forest regime in helping organisations achieve most of the goals they had when they initially sought certification. However, contextual factors such as economic realities in the native forests sector, historical dispossession, and political decisions concerning land tenure and Indigenous policies, can hamper the attainment of such expectations.

8.3.3 Has forest certification changed the behaviour of companies towards various stakeholders?

The third research sub-question addresses the behavioural effectiveness of forest certification, that is, the capacity of certification to modify the behaviour of companies in relation to their stakeholders and their own forestry practices. The third research sub-question, *has forest certification changed the behaviour of companies towards various stakeholders?*, has been answered through examining the forestry practices adopted by certified companies that tell us about possible changes in their processes, and how these changes have modified their behaviour towards various stakeholders.

Behavioural change in relation to forestry practices

Overall, certification can be judged to be behaviourally effective, since most of my case studies organizations modified – in varying degrees – their forestry practices. There are a number of examples. First, plantation forestry businesses usually undertook a number of procedural and substantive measures (see Chapter 7) to improve their SFM practices, including the planning and execution of their forest operations to mitigate their negative environmental impacts. Native forestry businesses whose operations already followed SFM practices mostly modified their behaviour concerning specific issues, viz. the management of chemicals, fuels and toxic waste.

Second, both plantation and native forestry businesses adopted procedural and substantive measures to protect environmental values such as riparian buffer zones, biodiversity, high conservation value forests (HCVFs), and implement enhanced monitoring programs. All of which demonstrate positive behavioural changes in forestry practices due to certification. Notably, as seen in Chapters 5 and 7, the FSC scheme deepened the changes initiated by the CERTFOR scheme in those companies that had previously adopted the latter. However, as Young (1994):145 notes, it is necessary to demonstrate a causal connection between the problem-solving ability of certification and its behavioural effectiveness. For example, how do we relate the positive changes in the management of chemicals, fuels and toxic waste to improvements in water quality over a certain period of time? Are they attributed only to certification or a combination of policy instruments or to factors entirely extraneous to certification? Further work is needed to establish a specific causal connection between these two measures of certification effectiveness.

Behavioural change in relation to various stakeholders

Certification was capable in most cases, and particularly for large plantation forestry businesses, of changing the behaviour of companies in relation to some of their “critical” stakeholders, viz., those who may facilitate their social licence to operate: local communities and NGOs. Certified firms also positively changed their behaviour in relation to forest authorities, although this was less relevant than their influence on their critical stakeholders; for example, companies usually invited government officials to participate in their certification processes as witnesses, so as to demonstrate transparency and openness concerning their forestry practices. While both certification schemes contributed to alter companies’ behaviour in relation to their critical stakeholders, the FSC was more effective than the CERTFOR scheme in deepening such behavioural changes. Therefore, the FSC usually deepened the consultation processes led by large plantation companies to address local communities and NGOs’ concerns about the impact of their forest operations. Furthermore, while the CERTFOR scheme aimed to seek solutions based on companies’ viewpoints, the FSC scheme instead required companies to consider the viewpoints of the local communities and NGOs in designing impact mitigation actions.

I also identified an apparent positive correlation between the positive behavioural change of certified companies towards their stakeholders and the certification problem-solving effectiveness to address social issues, as the outcome was an improved and collaborative relationship. This behavioural change led to positive behaviour from critical stakeholders towards certified companies, equating to a bidirectional change. Nevertheless, such positive changes occurred mostly due to the implementation of the FSC scheme as NGOs, particularly, showed little predisposition to modify their behaviour towards non-FSC certified companies.

Finally, my cases studies suggest that certification has been behaviourally effective. Certified forestry businesses have positively changed their forestry practices and behaviour towards a number of stakeholders – particularly towards those “critical” for the sustainability of companies’ operations. Generally, most respondents observed that principles concerning the mitigation of the environmental and social impact of forest operations, as well as the monitoring of those mitigation measures, were particularly influential in achieving behavioural change, for both forestry schemes.

8.3.4 What are the attitudes of key actors in forest governance to the different certification schemes?

The fourth research sub-question concerns the process effectiveness of forest certification, which addresses the commitment to certification by a number of entities, including governments, the forest industry, and diverse stakeholders. . Therefore, the fourth research sub-question, *what are the attitudes of key actors in forest governance to the different certification schemes?*, has been answered by examining the patterns of adoption of the FSC and CERTFOR schemes, and the attitudes and perceptions of key actors in forest governance towards different forest certification schemes.

To date, both certification schemes have been successful in gaining support from Chilean forestry businesses. Initially, in the early 2000s the industry-supported CERTFOR scheme was more process-effective than the FSC scheme in terms of certified forest area: by January 2013 more than 1.9 million hectares had been certified under the CERTFOR scheme, whereas by 2012 only 528 thousand hectares had been certified under the FSC scheme (FSC-Chile, 2015c). However, as noted in earlier chapters, when the large-scale plantation industry was pressured to adopt the FSC scheme, they then made the decision, in 2009, to embrace it; this led to certification of a total of 2.36 million hectares by 2014 (FSC-Chile, 2015c). Additionally, the CERTFOR certified forest area has not significantly grown since 2013. Therefore, while both schemes have relatively similar process effectiveness in terms of certified area, we may conclude that the FSC has a greater advantage over CERTFOR by a number of reasons as discussed in the next paragraph.

As mentioned above, the FSC now enjoys a greater advantage than CERTFOR. The first reason is that CERTFOR is, in practice, only supported by the large-scale plantation industry that had maintained dual certification for political reasons, as noted earlier. Second, in the Chilean case, FSC certification has granted less-restricted access to international markets than has CERTFOR. It is, therefore, logical that most small/medium-sized plantation forestry businesses, and practically all native forestry businesses, have adopted the FSC scheme only. Third, my case studies also suggested that, although many plantation industry members saw technical virtues in the CERTFOR scheme, this scheme ranked lower in many aspects in comparison with the FSC scheme. For instance, most respondents from the plantation industry and stakeholders perceived the FSC providing more reputational gains to certified companies, since its governance based on a chamber structure and “internal democracy” were perceived more credible than CERTFOR. Many saw that the support of important NGOs for the FSC scheme in Chile granted it a necessary moral legitimacy⁵⁸⁴ over other schemes. Further, the

⁵⁸⁴ The concept of moral legitimacy hinges on what is “the right thing to do” (Cashore *et al.*, 2004).

FSC was seen as taking a more rigorous approach to address environmental and social problems, requiring companies to go beyond legal compliance.

However, the flexibility of the CERTFOR scheme, because it was developed for local needs, and the clarity of its criteria and indicators, were seen as positives by the forest industry, particularly when compared to the FSC, which was seen by some industry members as excessively ambiguous and leaving too much room for the auditors' interpretation. Notwithstanding these perceptions, the relative weight of positive perceptions about the FSC, and its better international reputation, meant that overall, it trumped the credibility of the CERTFOR scheme. Hence, judged in terms of their commitment to a particular certification scheme by different entities, the FSC was more effective than CERTFOR.

Notwithstanding the generally positive views on certification, there were also some negative perspectives, although these were not predominant. On the one hand, large-scale industry respondents perceived certification as an economically onerous policy instrument to achieve their sustainability goals. For instance, many claimed that the FSC scheme, particularly, adversely impacted companies' profits by modifying forestry practices and by imposing direct and indirect costs (e.g. certification fees and audits costs, respectively). Furthermore, the FSC particularly was perceived as co-opted by green groups, forcing companies to adopt unaffordable environmental and social requirements. Some industry and social actors perceived that these requirements gave excessively high expectations to some local communities, leading to a misinterpretation⁵⁸⁵ of the FSC principles.

Moreover, many non-industry respondents believed that the certification assessments by third-party auditors, under both forest certification schemes, might be insufficiently deep to provide a credible evaluation about how the standards were implemented in practice. Some stakeholders even criticised the fact that companies were granted FSC or CERTFOR certification in cases where they had outstanding social conflicts, with either or both forestry workers or Indigenous communities. Indeed, Poynton (2015) suggests that a significant failure of certification is that it relies heavily on external third-parties who are "outsiders" to the process, and with insufficient knowledge to detect standard breaches.

Such negative views, however, did not outweigh the positive views and benefits perceived by the vast majority of my respondents – particularly in the FSC case.

⁵⁸⁵ For example, many community members thought that in order to facilitate forestry businesses with a social licence to operate, companies should provide them with "gifts", encouraging a paternalistic behaviour from forestry businesses, rather than real development of local communities.

Certification also proved to be a relatively effective policy instrument to pursue sustainability goals compared with forestry, social and environmental laws and regulations. As some authors have noted (Lister, 2011; Gale and Haward, 2011; Gulbrandsen, 2014), NSMD governance works alongside state governance in a hybrid model of co-regulatory governance. Notably, while my case studies showed that many certification requirements were based on state laws and regulations, certification under both schemes was – in the case of plantation forestry - a more effective legal enforcement mechanism than state agencies' mechanisms. Moreover, when such state regulations were largely absent, certification – particularly the FSC – was important in providing (and enforcing) standards that were much higher than the weaker or absent state laws and as such, provided an important mechanism to encourage beyond legal compliance behaviour (e.g. concerning riparian buffer zone widths, clear-cuts, and relations with local communities). Certification, therefore, plays an important role by supplementing the enforcement capabilities of the state.

In brief, in terms of process effectiveness, certification has been effective due to its adoption by the most important and influential of Chile's plantation and native forestry companies, generating a relatively large certified area. Most actors in forest governance generally saw certification as a widely effective policy instrument supplementing the role of the state.

8.3.5 What is the attitude of the public towards different forest certification schemes?

The final and fifth research sub-question addresses the constitutive effectiveness of certification, which concerns the acceptance of this policy instrument by social groups. Thus, the fifth research sub-question, *what is the attitude of the public towards different forest certification schemes?*, has been addressed by examining the attitudes of communities and the general public towards different certification schemes.

There were mixed outcomes concerning the constitutive dimension of effectiveness. On the one hand, local communities were aware of the influence of certification over the behaviour of companies to their benefit. For example, some Indigenous communities aware of FSC certification engaged large plantation forestry businesses in local hiring policies to include Indigenous labour in some forest operations. More than usually, local communities, both Indigenous and non-Indigenous, exerted their power of veto on certified companies against certain forest operations to which they did not consent. As a last resort, communities made public accusations against such, particularly FSC certified, companies. Overall, local

communities realised the value of their consent to certified firms, which facilitated a social licence for those forestry businesses to operate on their territories.

On the other hand, certification was not well-known by the general Chilean public or the final customers of timber products. Although the domestic demand for certified timber was practically non-existent, some large domestic timber retailers encouraged their small timber suppliers to adopt the FSC. In so doing, these retailers sought protection against potential criticism from environmental groups, and to obtain reputational gains suggesting CSR motivations. This was, however, more the exception than the rule.

Generally, my case studies showed that certification has been relatively effective in constitutive terms. While certification is still not well-known by the general Chilean public, local communities living in the close vicinity of certified forestry businesses were quite aware of the value of their consent to these companies, and recognised certification as a socially accepted non-traditional policy instrument.

8.4 The utility of the research framework

In this PhD thesis I employed a mixed research framework, derived from that developed by Tikina and Innes (2008) for the forest sector and inspired by the counterfactual approach set by Blackman and Rivera (2010) and Blackman and Naranjo (2012). This research framework proved particularly useful for a number of reasons as detailed below.

First, this research framework allowed an understanding of why certification – as a part of the international forest regime complex (IFRC) – worked as an effective policy instrument according to a number of measures of effectiveness (*sensu* Tikina and Innes, 2008). On this basis, I answered my research sub-questions by examining interview findings concerning the operational impacts of certification on the environmental, social and economic performance of forestry businesses. In so doing, I also examined the behavioural changes, perceptions, and attitudes towards certification. Due to the qualitative nature of this research, my case studies provided rich and detailed descriptions of the accounts of diverse forest governance actors, to understand how certification impacted on companies' performance and why companies sought certification.

This research framework also allowed me to obtain valuable conclusions concerning the impact of this policy instrument on broader forest governance and its implications for NSMD theory (e.g., in relation to certification patterns of adoption, certification drivers, and the interaction of NSMD systems with Chilean state policies). In brief, the value of this research

framework lay in its comprehensiveness, since it allowed me to study the effectiveness of certification from different perspectives, and using diverse information sources, to contribute to the different fields of knowledge on NSMD governance.

Second, by using an approach inspired by counterfactuals, I could not only understand the certification impacts by examining the different performance between comparable groups of certified and non-certified forestry businesses, but also I could maximise the value of real-world case studies. Importantly, while many SFM practices may have spread outside certified areas, the case studies analysed in this thesis have demonstrated that this has not necessarily occurred. Complementing this approach, the use of the *before-after* approach (see, e.g. Hain and Ahas, 2007; Romero *et al.*, 2013) allowed me to investigate the differences in performance in CERTFOR-certified large forestry companies that implemented the FSC scheme only after 2009.

Importantly – due to real-world practicalities in the Chilean forestry sector and the constraints of PhD research – it was not possible to match exact pairs of certified and non-certified organizations. Consequently, I employed a less onerous approach that considered the most similar comparisons possible between groups of organizations, – as detailed in Chapter 2.

A research design inspired by the counterfactual approach, as noted above, proved useful to compare both forestry types (*viz.* native and plantation forestry businesses) and different company scales (small/medium-sized and large forestry businesses). Hence, it was also comprehensive in scope, examining impacts on environmental, social and economic issues respectively. On this basis, this research revealed important differences in the impact of certification on sustainability issues, depending on the forestry business type and scale.

Third, my thesis also implicitly acknowledged the contribution of other frameworks to gain a better understanding of certification. Therefore, it recognised and integrated the evaluation framework⁵⁸⁶ proposed by Romero *et al.* (2013) to assess the quality of certification implementation (process evaluation) and certification outcomes. Additionally, I used the framework proposed by Moore *et al.* (2012) to group numerous individual reasons in seeking certification into broader categories of certification drivers.

Fourth, while these results are not intended to be extrapolated to other countries or to represent the situation of the entire Chilean industry, they represent a reasonable number (19) of

⁵⁸⁶ This was performed, for example, by examining the impact of certification on companies' processes and outcomes.

certified and non-certified organizations from forestry regions and from plantation forestry businesses with the greatest extent of forest operations in Chile. They are therefore likely to be robust.

Altogether, the research framework employed in this PhD research proved to be a useful, systematic, comprehensive and flexible approach to assess the effectiveness of certification in different case study contexts, and capable of integrating different and ostensibly inconsistent approaches (see Chapter 2).

8.5 Policy implications and recommendations

What are the broader implications for forest policy, and what recommendations may be drawn from the case studies examined in this PhD thesis? How can certification contribute to reaching better sustainability goals? What are the hurdles that certification must overcome to achieve their sustainability goals? What are the implications for the NSMD theory? This section addresses some of the main lessons that can be drawn from the research reported in this thesis for the adoption of certification by forestry businesses. To facilitate this discussion on broader forest governance, I have divided this section into challenges for native forestry businesses and for plantation forestry businesses.

Native forestry businesses

Most native forestry businesses are domestically oriented firms and, leaving aside a significant number of illegal operations – not included in my sample – they performed low intensity forest operations. Thus, as noted in Chapter 7, it is very unlikely that this group will adopt certification in the near future. Certainly, they have very little incentive to do so, given that they do not currently trade on environmentally-sensitive international markets. On the contrary, their low profitability, their relative absence of significant environmental and social issues (those related to local communities), and the absence of appropriate supply chains to trade their timber products, all suggest that certification is unlikely to be a priority unless conditions change.

One issue specific to the native forestry sector is that of illegal native forest operations. While there are also larger issues of legal compliance, these operations also need to address similar environmental and social issues (e.g. those related with precarious working conditions) also evident in legal operations.

Improving the environmental, social and economic performance of native forest operations will require very different approaches to reverse this situation. Government agencies⁵⁸⁷ should invest more effort in encouraging the purchase of environmentally and socially sustainable goods from native forestry businesses. Green procurement policies along with domestic advertising campaigns for forest products following “sustainable consumptions and production patterns” (as established in RIO+20 programs) (UNCSD, 2012) as well as the example of the UK in choosing “deforestation-free” supply chains (through requiring FSC/PEFC certified products) (see for example CDP, 2014) are particularly apposite in this regard. In the absence of any universally-accepted definitions on “deforestation-free” policies (see Beckham *et al.*, 2014), green procurement policies should highlight the positive trade-offs between the economic development of small landowners, through SFM, and conservation goals, to counteract any negative effect of “zero-deforestation campaigns”⁵⁸⁸.

So far the efforts of Chilean government agencies, however, in establishing green procurement policies have been relatively modest⁵⁸⁹ (Inostroza, 2013), and they are still insufficient in avoiding illegal logging. Likewise, other related measures such as the promotion of the “best environmental and labour practices” have already been initiated by government to address environmental⁵⁹⁰ and social issues⁵⁹¹ in this group, but their effectiveness seems questionable, given the poor OHS performance found in some of my case studies and the low percentage of legal timber extracted from native forests (Lara *et al.*, 2013). Moreover, as the latter authors point out, the implementation of government subsidies⁵⁹², to encourage SFM practices have largely failed hitherto.

Certainly, the Chilean state will need to put its focus on improving those policies, through encouraging, on the one hand, the participation of the private sector (all types of industries) in green procurement policies, via taxes or subsidies; and on the other hand, developing more straightforward procedures to allow small owners to access SFM subsidies. This will require reducing the barriers of access for small owners to subsidies available, in order to encourage SFM in the worst performers; and enhancing the supply chain channels and the cooperation among forest owners to trade under producer associations. This latter imperative

⁵⁸⁷ Chilean government agencies such as CONAF, INFOR and CORFO.

⁵⁸⁸ While there is an obvious fear about some groups pressing for “zero-deforestation” or “no deforestation” at all commitments, in practice there is no clarity about what exactly is being committed. Moreover, many actors have noted that the main goals of these commitments is reaching SFM, not an end of deforestation *per se* (see Beckham *et al.*, 2014).

⁵⁸⁹ Part of this failure may be explained because the public sector does not represent more than the 3.5 to 4.0 of the national GDP.

⁵⁹⁰ CONAF (the forest authority) has drawn up and promoted a number of relatively prescriptive guidelines to train small and medium-sized forest owners in the elaboration of their own forest management plans (CONAF, 2015).

⁵⁹¹ The Labour Authority in a number of industry sectors, including forest owners, actively promotes the initiative of “best labour practices” (Dirección-del-Trabajo, 2015).

⁵⁹² Through the specific Law No 20283 for Native Forests, enacted in 2008.

represents, however, a huge challenge, given the fragmentation of most small Chilean forest owners. Whilst international institutions and some NGOs in southern Chile have supported community forestry managed by small landowners (Alarcón, 2006), these experiences have not been sufficiently large in scale, or systemically supported by government institutions, to impact significantly on the unsustainable logging of the Chilean temperate native forests.

Once these recommendations are implemented, forest owners and state agencies may get the most out of certification in native forest enterprises. They, for example, may export under common supply chains to environmentally-sensitive international markets some added value products (e.g. furniture products). Likewise, state forestry and labour agencies may benefit if they integrate their regular inspections and administrative requirements through certification's own enforcement mechanisms (i.e. third-party audits). This would ease the regulatory burden on those companies already in compliance and would redirect agencies' efforts to the worst performers. This integration is not new and it has already been evaluated by some Canadian regulatory agencies Canada (see Lister, 2011:117).

However, such efforts are still at an embryonic stage in Chile. Due to the reasons mentioned above, although some valuable "pre-certification" experiences with the FSC scheme have been run by some NGOs to benefit Indigenous communities who own community forests (Otero, 2006), they have lacked continuity over time and faced significant hurdles in overcoming social issues – particularly concerning working conditions. In brief, in order to thrive and to benefit native forestry, certification would require different state policies and the opening of attractive market niches for certified timber.

Plantation forestry businesses

Two groups of plantation forestry businesses can be identified from my case studies: certified and non-certified businesses. The group of non-certified forestry businesses were mostly oriented to the domestic market and many performed poorly in environmental and social issues – as did large operations prior to certification. Conversely, certified forestry businesses were international-market-oriented, and had improved substantially their sustainability issues following certification. .

These findings have a number of policy implications. First, although some Chilean government agencies have provided indirect subsidies to allow small plantation firms to cover certification costs, they might also focus on controlling the monopolies exerted by large forest corporations on supply chains. As noted by some authors (Reyes *et al.*, 2014; Reyes and Nelson,

2014; Frêne and Núñez, 2010), this contextual factor has hindered the profitability of small-scale forestry, and unfortunately, this situation seems difficult to address since large Chilean forest corporations have significant influence on state policy-making processes. A more plausible approach would be facilitating the trade of timber for small and medium-sized producers through reduced taxes or specific subsidies to this sector. Further, small and medium-sized forest owners might be supported technically and financially through government agencies (e.g. CORFO and Fundación Chile) to strengthen their own supply chains. Thus, by having more favourable conditions, more landowners would certify their forests; in turn, this major state expenditure would be an acceptable trade-off for better potential tax revenues from small businesses, and improved environmental and social sustainability of this sector.

Second, this research revealed the existence of significant power asymmetries in the relationship between large-scale forest corporations and their stakeholders such as forestry workers, contractors and local communities. Such power asymmetries have been addressed, to some extent, by the rise of FSC certification, which has changed the power balance among such actors, allowing them to participate more effectively in companies' decision-making processes. However, as noted in Chapter 7, in order to allow certification to succeed in addressing social sustainability goals, adequate state policies are required, otherwise the credibility of certification, particularly the FSC scheme, will be eroded. Since many requirements of certification in relation to social issues rely strongly on state laws and regulations, policy-makers should address the adequacy of social legislation, as noted in Section 8.3.1. Certainly, this poses a major challenge for Chilean politics, since *laissez-faire* policies concerning social⁵⁹³ actors have been the overarching strategy of the Chilean state since the late 1970s.

Although at the time of writing, a major labour reform was underway, it is still unknown how it will impact on the sustainability of the forest industry and, more importantly, on the effectiveness of certification.

Hence, these case studies suggest that governance through markets needs certain minimum conditions of state governance to be successful. This argument is consistent with Gullbrandsen's (2014) conclusions, who has pointed out that the conditions in which states engage in non-state governance can lead to either strengthening or weakening – in terms of adoption – of these certification programs. My results, however, expand these conclusions since show how pre-existing weak policy arrangements might undermine the functioning of NSMD governance once adopted; and thus its effectiveness.

⁵⁹³ The Chilean state is ruled by the principles of its 1980 Political Constitution (modified in 2005) and it is defined itself as a “subsidiary state”, which has implied in practice that any issue among social (i.e. private) actors must be solved among them before resorting to the state intervention.

Third, governance through markets (particularly, through the FSC) shares certain similarities with governance through community engagement, in terms of sharing forest governance amongst diverse social actors. Therefore, NSMD governance also seeks to govern through community engagement by empowering communities concerning decision-making processes about forest operations. But this partnership among different entities such as governments, communities and forestry businesses needs to be carefully managed, as noted by Bell and Hindmoor (2009):160, otherwise its outcomes will be poor; for example non-equitable access to consultation processes by all community members would lead to the subsequent loss of legitimacy of certification. The example of community-based forestry in the US (see Cromley, 2005) illustrates how multiple levels of decision-making can find a consensus among dissimilar interests (from communities, NGOs, authorities and the industry) to strengthen multiple forest values in the long-term.

Thus, the above case highlights the necessity of policy-makers adapting national (economic) needs to more local-based interests for the benefit of all actors in forest governance (e.g. by implementing decentralization reforms).

Notably, the introduction of International Generic Indicators (IGIs) for the FSC scheme it is likely to be significant since they raise the requirements for certified companies concerning the consultation with their stakeholders⁵⁹⁴.

Fourth, the imbalance among the FSC Chilean chambers is an issue that should be addressed by FSC International, as it may erode the credibility of this standard among, particularly, plantation industry stakeholders. Possible solutions have already been explored by Boström and Hallström (2013), who recommend measures to empower the weakest stakeholders such as economic compensation, training and social networking to increase their participation capabilities in the standard-setting process. Although they are still insufficient, some of those measures have been partially addressed in the Chilean case, by providing funds to assist social stakeholders

Finally, it seems clear that the effectiveness of traditional state forest governance approaches, based on command and control, in the Chilean case, has been limited. Such approaches have offered little innovation and provided only modest incentives to go beyond legal compliance, which is consistent with the conclusions of other authors (Gunningham *et al.*, 1998; Gunningham and Sinclair, 2002). More attention from policy-makers, therefore, should

⁵⁹⁴ IGIs set common minimum requirements that must be met by all forest operations worldwide. See FSC-International (2015b).

be paid then not only to using better incentives to encourage the adoption of certification schemes by small and medium-sized plantation forestry businesses, but also to some contextual factors that undermine the effectiveness of NSMD governance once adopted.

8.6 Areas for further research

While the case studies presented in this thesis and their findings and conclusions have provided insights into the effectiveness of certification, there are other areas that would benefit from further research.

First, one important question is whether the significant changes initiated by Chilean plantation forestry businesses to improve the environmental and social sustainability of their forest operations have had a substantial impact on the environmental quality of natural areas – as measured effects on the ground. For example, future work might consider measuring certification effects on biodiversity (e.g. by estimating forest structure, species richness and so on), soils and water quality over time. Moreover, there is an obvious need for more detailed studies on the social performance of small Chilean certified/non-certified native and plantation forestry businesses, of which we still know very little.

Second, the economic performance of certified forestry businesses in Chile may be investigated further. Although this qualitative research provided valuable insights about the economic performance of certified forest enterprises, a complementary quantitative research project might provide hard data on the costs of certification, comparing the performance of native and plantation forestry businesses. It would be also valuable to know the impacts on the short and long-term economic viability of companies' operations, as previously conducted by other studies on certification.

Third, more research is needed to understand the possible influence of NSMD governance, given a variety of contextual political, social and economic factors, on state forest governance. It is unclear, for example, if certification has leveraged – to some extent – Chile's state forest policies since its rise in the early 2000s.

Lastly, it would be useful for the NSMD governance theory and that concerning the operational impacts of certification on SFM to apply this thesis's research framework to different contexts and countries. For example, it would be informative to apply this comparative study to Brazil, with an important forest industry based on both plantations and natural forests, but having different contextual factors to the Chilean case. Furthermore, our knowledge about

NSMD governance would improve by employing this research design to compare cases in developed and developing countries.

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Appendix 1: Non-state market driven mechanisms (NSMD)

A1-1 Forest certification as a NSMD system

As introduced broadly in Chapter 2, NSMD mechanisms are the empirical focus of this thesis and they are relatively novel forms of governance that have been widely employed to address sustainability issues in forest governance. NSMD mechanisms (syn. NSMD governance, schemes or systems) arose in response to the failure of traditional forms of intervention and the futile efforts to achieve a global forest convention to address unsustainable forestry practices and deforestation. In hindsight, these unfortunate failing attempts (see, e.g. Lister, 2011; Pattberg, 2007; Auld, 2014; Cashore *et al.*, 2006) represented the starting point in the search for alternative paths to cope with global deforestation and its adverse environmental, social and economic aspects.

NSMD mechanisms are also considered as “Private Sector Hard Law” by Auld *et al.* (2008a). This is because they impose prescriptive requirements on organizations, as it is the case of the Forest Stewardship Council (FSC) standard, where the scheme focuses on substantive rules which are translated into *on the ground* requirements, in a similar way to that described by McDermott *et al.* (2010):10 in terms of their forest policy classification system. In essence, and unlike government regulations, NSMD mechanisms are voluntary but they share their hard law characteristics in terms of their level of prescriptiveness.

As a consequence of being so onerous in terms of compliance with their requirements, NSMD systems (particularly, the FSC) have not been as widely adopted as competitor standards, which are – in most cases – by their nature much less demanding on participants but may offer some of the same benefits in terms of legitimacy. For these reasons, in the forestry sector, there are multiple competitors to the FSC scheme, many of which attract a larger membership (Rotherham, 2011).

The aim of this appendix is to provide a descriptive analysis of the theory concerning NSMD mechanisms to support the overall framework of this thesis by describing their main characteristics as below.

A1-2 NSMD systems have distinctive characteristics

NSMD systems have distinctive characteristics that make them unique from other forms of non-state or private governance. We must analyse how those relevant characteristics of NSMD schemes have played a role in shaping a distinctive body of theory for NSMD governance and how those systems have gained legitimacy (that is, in general terms, the power to make others to obey their rules through gaining their consent) over time. This is important in terms of

identifying their strengths and limitations in addressing environmental, social and economic issues of forestry businesses.

Therefore, NSMD systems have five common key characteristics that will be explored in detail in the next paragraphs.

The first characteristic of NSMD systems is the general little role of the state demanding their adoption. Thus, at least in theory, the adoption of certification schemes is absolutely voluntary: markets, not governments, drive their adoption. Moreover, as Cashore *et al.* (2004) have suggested, NSMD systems can be defined as a form of governance through markets, in which markets by using price mechanisms may guarantee a better allocation of resources, as well as through harnessing individual self-interests market forces for the collective good (i.e. environmental and social goals) (Bell and Hindmoor, 2009). In this regard, Jane Lister suggests that:

“When governments use their sovereign authority to require adherence to private standards, then the concept of NSMD governance will cease to exist, as the system will no longer be market-driven but rather government-driven. The absence of public authority is a categorical condition of NSMD governance. Although government’s role in certification is acknowledged as important, NSMD theory limits state engagement to actions that are deemed as not invoking government’s sovereignty authority” (Lister, 2011:58).

However, government can also play an important role in shaping the success or failure of this policy instrument. The government responses can range from simply observing to mandating (or blocking) the adoption of certification through enacting specific legislative requirements (Lister, 2011; Rametsteiner, 2002) to support it. Similarly, Gulbrandsen (2014) has noticed a range of state responses towards NSMD systems (particularly, the FSC scheme) by supporting the adoption of the FSC scheme or the creation and adoption of alternative producer-dominated schemes. Others (Gale and Haward, 2011; Lister, 2011) have pointed out that NSMD mechanisms – through voluntary forest certification – have introduced a “hybrid governance” arrangement or co-regulatory forest governance in which the governance is shared between state and non-state actors.

Reasonably, one would expect that government responses – particularly in developing countries – would favour forest certification as having the potential to improve sustainable forest management (SFM) practices in areas where states have limited capabilities to enforce classic “command and control” rules. Therefore, NDMS mechanisms may have their greatest potential in developing countries, where there is an absence of prescriptive environmental government regulations or a lack of enforcing and implementation mechanisms (McDermott *et al.*, 2010).

In contrast, in developed countries governments sometimes set minimum sustainable forest management standards through laws and regulations and these might form an underpinning to more ambitious standards established by NSMD schemes (beyond legal compliance),

(Rametsteiner, 2002). Therefore, the governments' strategy of encouraging forestry enterprises to foster certification systems could be complementary to their own forest sustainability initiatives.

Turning to the second characteristic of NSMD governance, the authority of those systems is granted through an institutionalized mechanism entailing the participation of different actors with dissimilar interests. NSMD governance embraces broader participation and inclusiveness and in doing so may provide for a more reliable, open and transparent process, especially when creating – in the case of the FSC – national or regional standards.

Lister (2011) has suggested, however, that some statist viewpoints may see NSMD governance lacking the key components of democratic consent and accountability that can only come from regular political elections. Indeed, in the last decade, many of NGOs have been accused of lack of representativeness, accountability and transparency rather than advocating for the democratization of global governance (Bexell *et al.*, 2010).

Despite those concerns, in practice NSMD governance can provide a framework where some elements of deliberative democracy can be present. These are public access to information (a necessary condition to deliberate) about their decisions, the existence of open forums of discussion (whereby relevant decisions are analysed by actors representing environmental, social and economic interests) and in general, all the necessary elements to legitimate its decisions through a democratic consensus and public debate⁵⁹⁵. This argument is supported by Bernstein (2004) who believes that NSMD systems combine elements of stakeholder democracy (much higher than other standards or self-regulation experiments) and accountability – legitimated by market forces – bestowing them with significant authority which is independent of international agreements among states.

Moreover, although many FSC competitor schemes have been criticised by representing only industry interests, they have also sought legitimation in the struggle to attract clients and gain public approval⁵⁹⁶. Therefore, the Sustainable Forest Initiative (SFI) in the US also includes a wide arrangement of stakeholders ranging from the forest industry and loggers to academics and environmentalists, and explicit public participation requirements (Roberge *et al.*, 2011b; McDermott *et al.*, 2008).

In the final analysis, NSMD governance does not strictly adhere to the traditional concept of self-regulation⁵⁹⁷ but actively encourage the participation of a wide range of stakeholders – through an institutionalized and legitimized mechanism – with different and often opposite interests, instead of relying exclusively on the *bona fides* of the industry. NSMD systems are

⁵⁹⁵ For useful definitions about different models of democracy to be applied in global (and forest) environmental governance see Bexell *et al.* (2010).

⁵⁹⁶ In regards to the FSC and its competitor schemes, Errol Meidinger points out: “the programs play significant roles in shaping each other as they compete for clients and public legitimacy” (Meidinger, 2011).

⁵⁹⁷ Self-regulation implies that corporations decide to regulate themselves by the failure of traditional state approaches. See Gunningham *et al.* (1998).

somehow a counterbalancing force in the global governance arena, in times where the power of multinational corporations has concentrated not only economic but also social and political power (Rabet, 2010) influencing policy-making processes across the globe.

The third feature of NSMD governance is the prescriptiveness of the rules that this form of environmental governance imposes on the organizations that have adopted NSMD systems. Arguably, this might be an important strength since participating enterprises would be required to meet demanding rules the breach of which will be readily identifiable. However, in practice this may not be the case. Instead, as Cashore *et al.* (2007a) point out: “if the requirements are too high, they will be ineffective as few firms will join. If the requirements are too low, they will be ineffective because their requirements will not be enough to solve enduring environmental problems.”

This dilemma has been further explored and refined by Cashore and Auld (2012) in terms of what they call the “the evolutionary conundrum”. They argue that the initial certification joiners are unlikely to further raise their standards as a result of certification because they already meet high sustainable practices (which is why they were willing to join so early). In contrast, as the same authors highlight, the worst performers will be the last to join a certification scheme and will only do so because of growing external market pressures.

The result may be that certification does not generate significant sustainability improvements in firms already meeting high levels (or beyond) of compliance with existing regulations, the “leader” companies.

This distortion makes problematic many of the studies evaluating the impacts of forest certification to the extent that they do not take account of, and control for, this factor.

Likewise, Blackman and Rivera (2010) believe that commodity producers (e.g. timber) have strong incentives to join certification programs because they already meet high environmental standards and consequently, they do not need any significant additional investments in order to meet the requirements set by certification bodies. Thus, the prescriptiveness of NSMD systems is not a guarantee of improvement in sustainability performance because of the risks of selection bias.

The fourth feature of NSMD governance highlights the role of the market in granting legitimacy to NSMD systems. Pattberg (2007), in this regard, believes that the private authority of NSMD governance is different because, unlike state governance, it does not entail the possibility of coercion if the rules are not obeyed but its authority is based on persuasion. This characteristic is similar to that which can be observed in other FSC competing standards but the legitimacy of the FSC scheme may be even greater since it is endorsed not only by NGOs but also by a diversity of other stakeholders.

Hence, NSMD authority rests on the market forces within the supply chain, rewarding those firms that adhere to certification systems by providing them with better market access or a

price premium (the “carrot”), while those that are not willing to adopt these schemes risk the “stick” of boycott campaigns spearheaded against large retailers (see, e.g. Cashore *et al.*, 2004). In this regard, Brammer *et al.* (2011) point out that both consumers and NGOs have the capacity by threatening to exert such pressure to influence companies to adopt more sustainable practices. In short, as Pattberg (2007) argues, the legitimacy of this form of governance comes from the market chain, including the consumer, producer, trader and retailer.

As an illustration of this point, Lister (2011):47 provides the following example:

“In order to generate certification demand, ENGOs launched market campaigns targeting large forest products customers in the United Kingdom, Germany, the Netherlands, Belgium, and the United States. Buyers were approached and advised that unless they stopped buying wood products from “endangered” forests and insisted that their wood products purchases were sourced from FSC-certified forests, their stores would be boycotted. In response, customers turned to their forest product suppliers and requested FSC certification.”

Nevertheless, according to Eden (2011) the role of the market in granting authority to NSMD governance is limited to the extent that the final consumers of forest products are separated from producers by a considerable distance in the supply chain. This author believes that as a result, consumers do not know from first-hand information whether or to what extent forest product companies engage in sustainable practices. Instead, for Eden (2011) they rely on second-hand information (through the certification mechanism) about the products they purchase. Moreover, Rametsteiner and Simula (2003) have suggested that it is not possible ask customers to make assessment of the credibility of the certificate stamped on products they are purchasing because determining credibility is complex and demanding and usually requires specific knowledge they do not usually have (see, e.g. Teisl, 2003). Notwithstanding these arguments, there is also empirical evidence to suggest that certification programs are positively perceived by final consumers, particularly in developed countries (Archer *et al.*, 2005).

The fifth characteristic of NSMD governance is the existence of external verification procedures to ensure that firms adopting NSMD schemes comply with their rules.

The existence of verification procedures being run by third party evaluations – more usually called *third party audits* – is a characteristic that help to increase the reliability and credibility of NSMD schemes. Auld *et al.* (2009) for example, believe that this is a way to provide the necessary validation for a certification program to achieve legitimacy. Similarly, Rotherham (2011) views third party audits as excellent tools for enhancing forest management practices provided that forest certification schemes that are the subject of such audits have been developed by means of a transparent and democratic process.

However, third party audits also have some limitations. First, there is a risk of inconsistencies in the audit results when the assessments are carried out by multiple auditors or different certifying bodies (Rametsteiner and Simula, 2003; Masters *et al.*, 2010), with the result

that different certifying bodies or auditors assessing the same firm might come to different conclusions.

Furthermore, Rametsteiner and Simula (2003) adds that in many cases, the requirements of certification schemes are usually overlooked and that the quality of those assessments may vary considerably amongst certifying bodies.

A second limitation may be that third party assessments are not completely free from conflicts of interest or subjectivity. For example, if financial incentives are provided for maintaining the certification status of firms then this can compromise the reputation and credibility of the most rigorous certification systems but this has been rather unusual (Steering-Committee, 2012). In addition, if auditing companies also provide remunerated non-auditing services to the same firm (as it has occurred in the financial sector) (Salehi, 2009) this too will compromise the auditor's independence; however, this may be countered to some extent by internal codes of conduct developed by most certifying bodies. There also remains a further concern that when auditor firms develop a long-standing relationship with their clients, this too could undermine auditor independence.

Notwithstanding these limitations, overall, an external verification by a third party can enhance the reliability, independence and quality of the process of compliance evaluation.

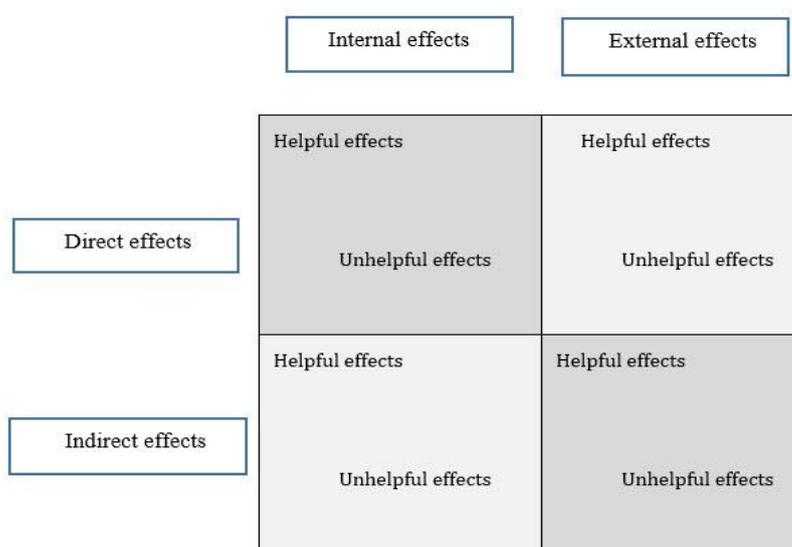
To summarise this appendix, unlike other self-regulation initiatives, NSMD systems are characterized by a complex governance mechanism. These mechanisms have had mixed results in their application in forest governance as we will see in Appendix 2.

Appendix 2: The impacts of forest certification

A2-1 Types of effects

In this Appendix, I review what the literature reports about the consequences of the introduction of forest certification in forestry businesses. While I will mostly focus my analysis in describing the effects of certification inside forest management units (FMUs) (concerning its environmental, social and economic effects), I will also address the implications outside FMUs, particularly on broader forest governance.

In order to describe the impacts of certification I will make use of the conceptual framework provided by Young (1999) who distinguished three dimensions of effects being caused by an environmental regime, as follows:



Source: Adapted from Young (1999).

First, Young recognises effects inside or outside the complex of problems that the regime is intended to solve, that is, internal and external effects. For instance, changes in the environmental performance of certified enterprises would be categorized as internal effects of certification and, changes in forest governance and in other industry sectors, as external effects.

Second, regimes would be linked to their effects through short or long causal chains, that is, they would have direct or indirect effects. As an example, positive effects of certification on working conditions may also be attributed to other factors, such as those of caused by new state regulations or better law enforcement, that would make hard to link directly such an improvement to certification.

And third, as a regime, forest certification would have “helpful” or “unhelpful” effects in the sense that those effects would be capable to make the solution of a problem easier or harder. Certification, for example, may have internal effects in encouraging companies to adopt

prescriptive rules to protect riparian buffer zones, as well as may have indirect effects on public forest policies to request from non-certified firms the same prescriptions set by certified firms (being more difficult to establish a causal chain). Thus, the final effect would be positive or “helpful”, making easier to solve the initial problem (environmental damage) and as Young (1999) points out, this illustrates how all these dimensions can be intersected with one another.

As a forest policy instrument, certification is capable to yield the above mentioned effects by two different ways: through establishing substantive (also called prescriptive or performance-based requirements) or procedural/planning (systems-based) measures (Cashore, 1997). As an example, the setting of specified limits for clear-cuts fall into the category of substantive measures, but if such measures are left to be addressed in harvesting procedures or management plans, without specifying detailed prescriptions, they are procedural.

In the following sub-sections I will describe the impacts of certification mostly guided by their internal and external effects. In addition, I will also distinguish whether certification has had direct or indirect effects as well as helpful or unhelpful effects, when necessary.

A2-2 Internal effects

The *internal* effects of certification include tangible on-the-ground impacts on forest management practices. These on the ground effects may include changes in the environmental, social and economic performance of forestry businesses.

A2-2.1 Environmental impacts

Much of the research on forest certification has paid particular attention in the study of its impacts on environmental issues. After all, forestry schemes were originally created to address deforestation and a number of other environmental threats caused by poor sustainable forestry practices and illegal logging. Hence, we can recognize three distinctive impacts of certification upon specific environmental issues: deforestation, biodiversity and conservation issues, and forest management practices.

Deforestation: Deforestation in developing countries was the paramount reason behind the development of the FSC and other standards, but can we say that certification has stopped or ameliorated this threat? The evidence presented below suggests that certification has not hampered deforestation and illegal logging, at least, not at a large scale. For Marx and Cuypers (2010) this policy instrument can do very little for tropical forests, as most of them – mainly located in developing countries – are not certified. Moreover, in certified forests, certification only seems to reduce the impact of deforestation (as well as wildfires) within certified forest management units (FMUs) (Quevedo, 2006; Hughell and Butterfield, 2008) and, certainly, it

does not prevent from illegal logging outside those certified areas⁵⁹⁸ (Anta Fonseca, 2006). Therefore, so far the evidence points to forest certification having at best a modest role in reducing deforestation at a larger scale (Gan, 2005), and making little impact on solving a global problem.

While certification has not significantly ameliorated deforestation, management within certified FMUs is not without controversy: some controversial practices such as clear-cutting practices still persist in certified forests in some transitioning⁵⁹⁹ countries (Hain and Ahas, 2007).

In essence, two reasons account for this failure. First, to date the certified area in developing countries is still too low compared with that of developed countries (see, e.g. FSC-International, 2015a), which limits the potential of this instrument. Second, even having sufficient certified forestlands, a better large-scale management of the contiguous non-certified areas is necessary to attain a broader landscape conservation goal and this would not be the case in many certified territories (Nussbaum and Simula, 2004).

Biodiversity and Conservation issues: Many studies have addressed the biodiversity implications of certification. In such studies it is necessary to distinguish the certification impacts on *processes* (what certified enterprises do to attain a sustainability goal by implementing certain practices) and on *outcomes* (the net results of those practices implemented by certified enterprises). Gullison (2003), thus, recognises three potential ways whereby certification may contribute to improve biodiversity conservation, considering positive impacts on *processes* and *outcomes*:

(a) Through improving forest management, that is, enhancing forest practices (influencing companies' processes) that could potentially lead to enhance biodiversity values,

(b) Preventing deforestation (an outcome) so forests are sustainable managed allowing them to be regenerated, and,

(c) Through 'taking pressure off' from High Conservation Value Forests (HCVFs) so commercial timber production is concentrated in areas other than HCVFs (an outcome).

Empirical studies have found positive findings in the contribution of certification to improve biodiversity and conservation *practices*. For example, Hagan *et al.* (2005) found that certified firms usually had stronger biodiversity practices than non-certified firms. Furthermore, a number of authors (Golovina, 2009; Anta Fonseca, 2006; Carrera Gambetta *et al.*, 2006; Wanders, 2010; MASRENACE, 2010; Tsyachniouk, 2006) have found that certification impacts positively on a number of practices: usually, the identification and assessment of

⁵⁹⁸ Moreover, certified timber faces an unfair competition from illegal sources, for example in Brazil. See in FSC-International (2009):39.

⁵⁹⁹ For example Russia, Lithuania and Estonia as their economies have transitioned from a socialist to a free-market model.

biodiversity values and natural resources are one of the first practices in being implemented by certified firms, which are subsequently followed by monitoring and protection measures.

The impact of such practices on specific *outcomes* is less clear than on companies' processes. While the evidence provided by some studies (Wanders, 2010; Poulsen and Clark, 2010; Dias *et al.*, 2013) suggest an improvement in the conservation status (*viz.* those endangered, threatened or vulnerable species) of certain species and ecological values of forests; other studies (May, 2006; Lidestav and Lejon, 2011) refute them: they argue no significant statistical differences between certified and non-certified forests concerning biodiversity and conservation issues. Methodological considerations, in this regard, would play an important role to settle this controversy since the research design may significantly affect the conclusions of such studies. These methodological aspects are detailed in Chapter 2.

Forest management practices: Forest certification would have a positive effect on forest management practices as it engages companies in more sustainable operations, having little disagreement about this issue among different studies (see, e.g. Shahwahid H.O., 2006; Carrera Gambetta *et al.*, 2006; Eba'a Atyi, 2006; Quevedo, 2006; Ham, 2006; Masters *et al.*, 2010). Notably, certification would change the mentality of forest owners in such a way to make them environmentally aware about the impact of their operations (Cubbage *et al.*, 2010). This change of paradigm had led firms to identify and plan their forest operations in a better manner (Carrera Gambetta *et al.*, 2006). Critical environmental components, in this regard, such as soil, water courses and their associated riparian areas are usually protected and restored during forest operations (specifically, during timber harvesting and road building) (Quevedo, 2006; Newsom and Hewitt, 2005).

In general, today many certified companies make use of reduced impact logging (RIL) (Wanders, 2010; Azevedo and Freitas, 2003) techniques through incorporating new and more environmentally-friendly machinery (e.g. logging towers) or returning to traditional low-impact timber extraction (e.g. through animal traction) (May, 2004); and second, certification forces firms to document, record and monitor their operations having thereby a better management of their forest resources – a secondary gain.

While there are evident improvements in forest management practices, it seems that in some countries certification still lags in reaching its potential. Transitioning countries, for example, show some improvements in their forest management, but this is still not significant (Hirschberger, 2005c). For example, certification has certainly helped to improve forest practices in Estonia but not to the extent of reducing extensive clear-cuts, as noted earlier (Hain and Ahas, 2007).

Notably, forest management practices of certified forestry enterprises seem to differ significantly from those of non-certified enterprises. This is particularly relevant for harvesting operations (Lidestav and Lejon, 2011), and this is also perceived by forest owners (Roberge *et*

al., 2011a). But, as Newsom *et al.* (2006) suggests, the level of such changes may largely depend on the previous implementation of best management practices (BMPs) as required in some states of the US. Forestry firms that have previously adopted mandatory state BMPs, may experience little change compared to those without such BMPs. Therefore, the extent of the changes in forestry practices may largely vary among states or countries, according to the development of state forest policies. Likewise, McDermott *et al.* (2008) have pointed out that forest certification schemes usually tend to mimic state forest policies, suggesting that in some contexts certification would not necessarily go beyond legal compliance.

Lastly, some authors suggest that community forest owners – and small and low intensity managed forest (SLIMFs) – operate under the same principles of SFM as promoted by forest certification (Anta Fonseca, 2006). Further, small forest owners perceive themselves already meeting SFM practices (Hayward and Vertinsky, 1999). Thus, certification had a much greater potential to yield significant changes in SFM practices in the worst performers or in countries with poor regulatory frameworks, weak law enforcement, or both.

A2-2.2 Social impacts

Researchers have focused their attention on two kinds of social impacts caused by forest certification: impacts on forestry workers (that is, impacts on their working conditions and OHS issues) and communities (effects on the relationship with Indigenous and non-Indigenous groups) and other stakeholders.

Impact on forestry workers: Certification may yield positive impacts both on companies' *processes* and *outcomes* concerning forestry workers' welfare. In so doing, firms usually must modify a number of practices to meet what certification schemes require from them.

Overall, the outcomes of new practices as required by forest certification on workers' issues seem to be, by large, positive. Thus, some examples include: tangible benefits in social welfare and general working conditions, such as fair wage practices, OHS training, appropriate provision of PPEs, work-suited meals, and comfortable forest camps with proper amenities and leisure areas (see Zainalabidin *et al.*, 2013; Nussbaum and Simula, 2004; Hirschberger, 2005a; Ham, 2006; Azevedo and Freitas, 2003). This had led to a *win-win* situation: while certification had helped companies to reduce their social conflicts (MASRENACE, 2010) improving their productivity (Azevedo and Freitas, 2003), forestry workers had gained a negotiation tool to obtain a better job stability and other social benefits (Tsyachniouk, 2006). However, certification may be used as a negotiation mechanism provided that workers are empowered and aware of its potential.

Forest certification seems to reach its greatest potential in making a difference in developing countries. For Newsom and Hewitt (2005), positive social impacts would be more prevalent in less developed countries to their poor regulations or weak enforcement mechanisms, where it is likely that certification can cover a much greater gap.

Impact on local communities and other stakeholders: The relationship between forestry enterprises and communities – particularly Indigenous communities – is in general a very sensitive issue. A large number of dramatic conflicts worldwide⁶⁰⁰, mainly related to land tenure and forests access, between forestry firms and Indigenous communities have made this relationship hard (see, e.g. Gerber, 2011). However, the rise of certification had brought broader participation and voice to Indigenous groups (see Ros-Tonen, 2004). This greater participation in forest stewardship had also brought tangible benefits for aboriginal peoples: for example, traditional Indigenous rights have been formally respected (Ros-Tonen, 2004; Hirschberger, 2005d) and sites of historical and cultural significance within certified areas preserved (Hirschberger, 2005c). Moreover, as found by Dare *et al.* (2011), Indigenous communities and certified firms can share common sustainability goals, under a shared forest stewardship, in some cases.

However, McCarthy (2012) has argued that forest certification does not reduce social conflicts with Indigenous communities. Poschen (2003) adds that certification can only require companies to improve conditions of people living inside forests, but this is limited to large firms and within certain limited territories. Hence, the question that underlies these findings is: is certification a sufficient instrument per se to settle long-standing conflicts between communities and forestry businesses? As far as the evidence suggests, there are no clear answers yet.

What seems relatively clear is that certification changes the power balance between firms and both communities and a wider diversity of stakeholders. Some ways used to achieve this outcome is through encouraging greater participation of civil society and local communities in decisions about forests (Roberge *et al.*, 2011b; Shahwahid H.O., 2006; Tsyachniouk, 2006; Eba'a Atyi, 2006; Ulybina and Fennell, 2013; Ros-Tonen, 2004; Richards, 2004). , In order to meet certification requirements, firms need to open public consultation processes by receiving significant feedback from NGOs and other actors (Actins and Kore, 2006; Rahmad Muhtaman and Agung Prasetyo, 2006). Moreover, as the above authors suggest, certification introduces a multi-stakeholder dialogue,⁶⁰¹ sitting actors with different interests around a common table to discuss and find solutions to conflicts. Therefore, certification engages – through participatory policy approaches – a number of different actors affected by firms' performance in their decision-making processes. As Nussbaum and Simula (2004) note, social and environmental interests gain more influence over decision-making processes of forestry businesses.

⁶⁰⁰ Gerber provides two examples of violent conflicts between forestry firms and Indigenous peoples. The first is in Indonesia, where Indigenous peoples were displaced from their territories and their human rights violated (local peoples were evicted and, in many cases, killed). The second is the *Mapuche* conflict in southern Chile, which turned particularly violent in the last decade (including attacks to farmers and private property, riots, police interventions into Indigenous communities, and shootings involving the police and activist groups).

⁶⁰¹ Multi-stakeholders dialogue plays also an important role in the participation of such stakeholders in national standard-setting initiatives. This is the case, for example, of the FSC national initiatives.

A2-2.3 Economic impacts

Forest certification can have significant effects on the overall economic performance of firms as well as in the entire forestry sector. They are conveniently grouped into macroeconomic and microeconomic effects.

Microeconomic effects: Perhaps the most well-known impact of certification is the improvement in firms' *market access* – especially access to international markets. Indeed, access to European and North American markets is recognised as the main certification driver of firms from developing countries (Njovu, 2006; Zainalabidin *et al.*, 2013; Lidestav and Lejon, 2011; Moeltner and van Kooten, 2003) since those markets give preference to certified timber (Quevedo, 2006). Further, some companies seek a dual certification (usually, under PEFC-endorsed standards and the FSC) so as to broaden the range of markets they can access (see Johansson, 2014). The benefits of international market access entices companies to certify their forest operations, and most have benefited this way – that is the case of firms in developing nations, for example (Frost *et al.*, 2003; Zainalabidin *et al.*, 2013); although no significant market advantage has been found in some cases (Ham, 2006). Therefore, these studies suggest mixed outcomes concerning access to environmentally-sensitive markets: while in some cases forestry businesses gained or retained market access, in other cases they did not.

The second economic impact of certification is the payment of *premium prices* for certified timber. Here, the evidence provided is more ambiguous. On the one hand, for some forest operations (see, e.g. Shahwahid H.O., 2006; Nebel *et al.*, 2005; Kollert and Lagan, 2007) certification has been economically positive, bringing better timber prices. On the other hand, others did not report premium prices for certified timber (Araujo *et al.*, 2009; Quevedo, 2006; Anta Fonseca, 2006; May, 2006; Chen *et al.*, 2011b; Klooster, 2006; Crow and Danks, 2010; Toppinen *et al.*, 2013). As noted above, these findings are rather ambiguous and do not follow a clear pattern⁶⁰²; and, if present in some markets, premium prices would be not sustainable in the long term, as some have noted (see for example Shahwahid H.O., 2006). It would be unsurprising; therefore, to expect a decrease in premiums as more firms are certified and supply more certified timber into international markets.

Equally important is the willingness to pay (WTP) premium prices by final consumers. Some studies (see Carrera Gambetta *et al.*, 2006; Toppinen *et al.*, 2013) show that in general there is a low WTP premium prices for certified timber.

The third economic impact of certification is that on the *costs* of certified operations. It is necessary to distinguish between direct/indirect (auditing and certifying body fees, as well as other costs necessary to meet the standard, for example hiring specialized staff) and associated costs (those necessary from modifying certain forest operations to comply with certification

⁶⁰² There are not sufficient studies to say why some countries receive premium prices and, in other cases, the opposite situation occurs. Moreover, there are contradictory findings in the same country. That is the case of Brazil. See Oliver (2006) and Araujo *et al.* (2009).

requirements: for example harvesting less trees per hectare). Overall, forest certification has represented important costs for firms (Carrera Gambetta *et al.*, 2006; Shahwahid H.O., 2006; Hartsfield and Ostermeier, 2003). Moreover, the evidence suggests that certification direct and indirect costs are a heavy burden for small forest owners (Albrecht, 2010; Nussbaum and Simula, 2004) making this policy instrument unaffordable for them in many cases, unless they can count on financial support from external subsidies (Nussbaum and Simula, 2004; Carrera Gambetta *et al.*, 2006). This situation is completely different to that of larger forestry enterprises where direct and indirect costs are proportionally smaller, and associated costs would be more relevant (Cubbage *et al.*, 2009), as larger firms can take advantage of their economies of scale. Additionally, the forest type would also influence costs: as Nussbaum and Simula (2004) and a recent report (WWF-International, 2015) point out, plantation forestry firms would face lower costs than those of natural or semi-natural forests. In short, certification can impact negatively on costs, and the extent of such an impact will vary depending on the forestry business scale and type.

Finally, certification may have a negative impact on the financial performance of companies in the long term, as some studies in the US and Canada have found (Bouslah *et al.*, 2010).

Macroeconomic effects: there are two important impacts of certification over macroeconomic issues. First, certification brings about better transparency in the supply chain (Carrera Gambetta *et al.*, 2006; Cashore *et al.*, 2006). This is of paramount importance for firms in developing countries where a better transparency and more sustainable operations may attract new investors since certified firms would enjoy a better public image and reputation (Chen *et al.*, 2011b; Cashore *et al.*, 2006). A better transparency throughout the supply chain would be a consequence of an improved traceability of certified timber to ensure its origin, which is particularly relevant in South Africa and South America cases (Frost *et al.*, 2003). Second, certification may cause a reduced worldwide wood supply in the long term (Schwarzbauer and Rametsteiner, 2001). For Gan (2005), this may be a consequence of firms' adaptation to SFM that, as far as we know from microeconomic effects, increases their operational costs.

A2-3 External effects

The effects of forest certification also include effects on broader forest governance, leveraging therefore a number of different policy-making processes and in many cases, mutually interacting with them. These effects are described below.

A2-3.1 Effects on broader forest governance

One of the most studied certification effects is its interaction with forest governance processes across national governments, and a myriad of other actors affected by the performance of forestry enterprises. In the first place, certification impacts on forest policy-

making processes of national governments through what Lister (2011) describes as “hybrid co-regulatory forest governance arrangements” between governments and NSMD governance, which is also supported by Gale and Haward (2011) and Gulbrandsen (2014). She summarises and explains the range of government responses and mutual interactions of this “overlapping governance” as follows:

- Observing: national governments leave certification to market forces without intervening at all.
- Cooperating: national governments provide information about certification and provide technical support.
- Enabling: governments provide incentives (e.g. financial subsidies) and lower political and administrative barriers to facilitate the implementation of forestry schemes.
- Endorsing: national governments can adopt certification in public lands.
- Mandating (or blocking): governments can legislate about certification or obstruct its development.

Within this spectrum of possible government responses, national governments can respond in different ways, modifying such actions over time. To illustrate this point⁶⁰³, in Canada, the provincial governments showed a range of different responses: while Quebec only *cooperated* with certification, Ontario and New Brunswick mandated certification on public forestlands (aligning province’s forest legislation and regulations with certification requirements). According to Lister (2011), in the US the responses have mainly moved towards *endorsing* certification (by certifying state-owned forests), whereas Sweden has responded through *enabling* certification, that is, introducing legislation to encourage the adoption of this private initiative but within a mix of different policy options.

Why do national governments interact with this private governance alternative? Because there is an important effect of forest certification: it enforces law compliance. A number of studies (May, 2004; Elbakidze *et al.*, 2011; Basso *et al.*, 2012; Basso *et al.*, 2011; Cerutti *et al.*, 2011; Alves *et al.*, 2011; Ebeling and Yasué, 2009) show that certification is able to enforce existing legal and regulatory requirements, related with social, environmental and forestry issues. This would be very important for developing nations where law enforcement is less than optimal as it is the case of Brazil (Basso *et al.*, 2012; Basso *et al.*, 2011). Lister (2011): 69 reinforces this point when she states that certification is usually integrated in public forest policies so as to enforce law and meet the goals of forest monitoring programs, which is done by certification audits – as a supplementary mechanism.

Other empirical studies have also studied this phenomenon. As noted earlier, McDermott *et al.* (2008) studied the interaction between certification and public policies in some US states,

⁶⁰³ See chapters 4 (Canada), 5 (The United States) and 6 (Sweden) in Lister (2011).

concluding that in practice certification schemes are largely shaped by existing state-based regulatory norms.

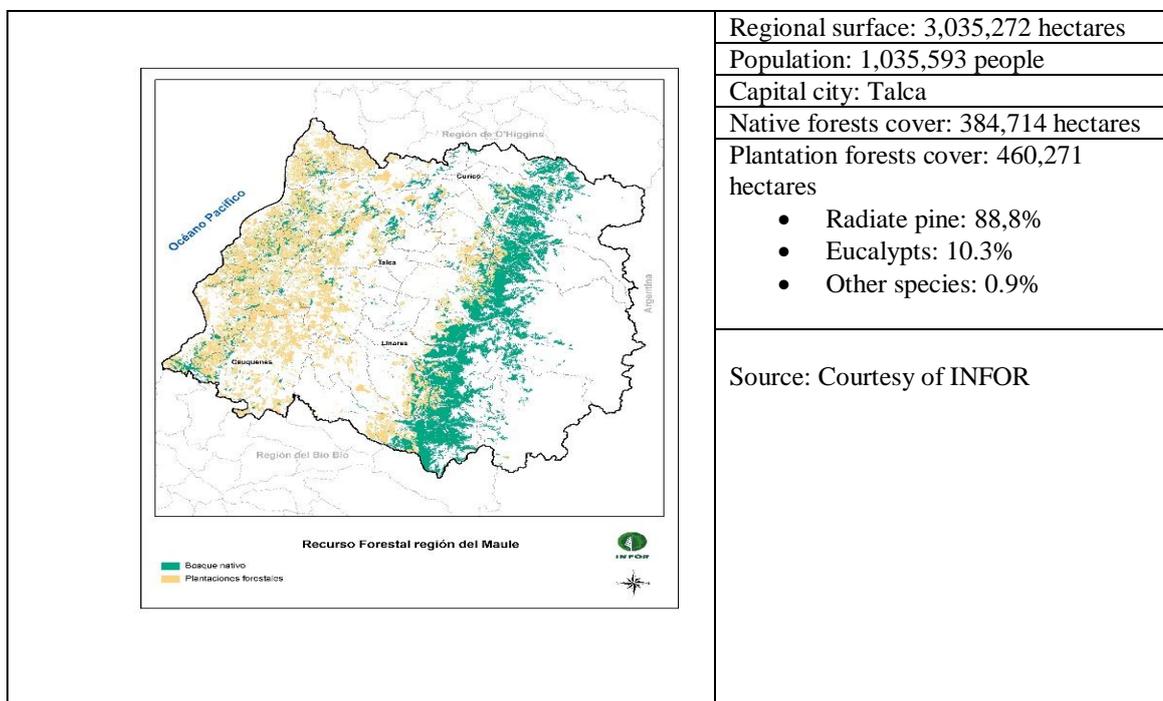
Therefore, the aligning of certification requirements with public forest policies would be perhaps the foremost interaction between public and private forest policies (within the range of government responses). However, what do we know of the potential of certification in going beyond law compliance? Of course, there is still a huge gap in the knowledge concerning this aspect and much work is needed to answer this question, particularly in developing countries in which certification would have its greatest potential.

To conclude this appendix, NSMD mechanisms have had substantial internal and external effects. In terms of its internal effects, certification has largely influenced the environmental, social and economic performance of certified forestry businesses. However, as seen in the examples provided above, much work is needed to reach a better understanding about why certification is capable – in some contexts – to address sustainability issues, whereas in others it is not.

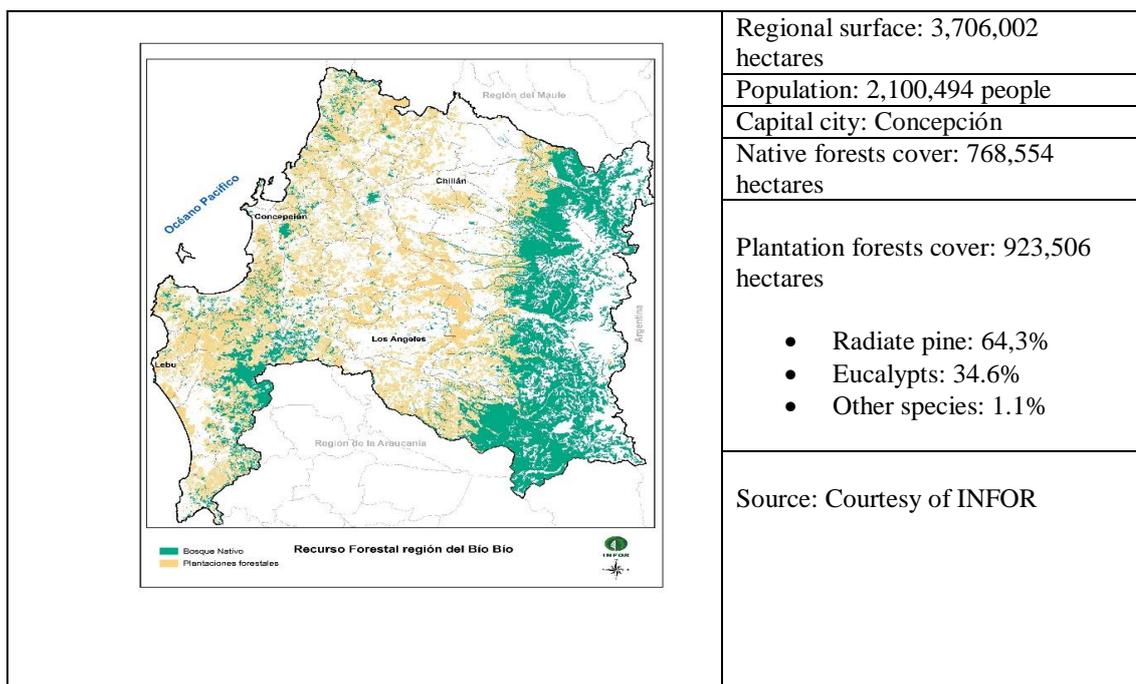
Finally, certification has also had an impact beyond the FMU, that is, in terms of broader forest governance (external effects). Perhaps, the most important effect of certification is that related to legal compliance with state laws and regulations, and some scholars have noted, in this regard, a “co-regulatory arrangement” between NSMD governance and public policies. Of course, much empirical research is needed to confirm this theory and to know whether, in certain contexts – particularly developing countries – certification is capable of going beyond legal compliance.

Appendix 3: Characterization of the study sites

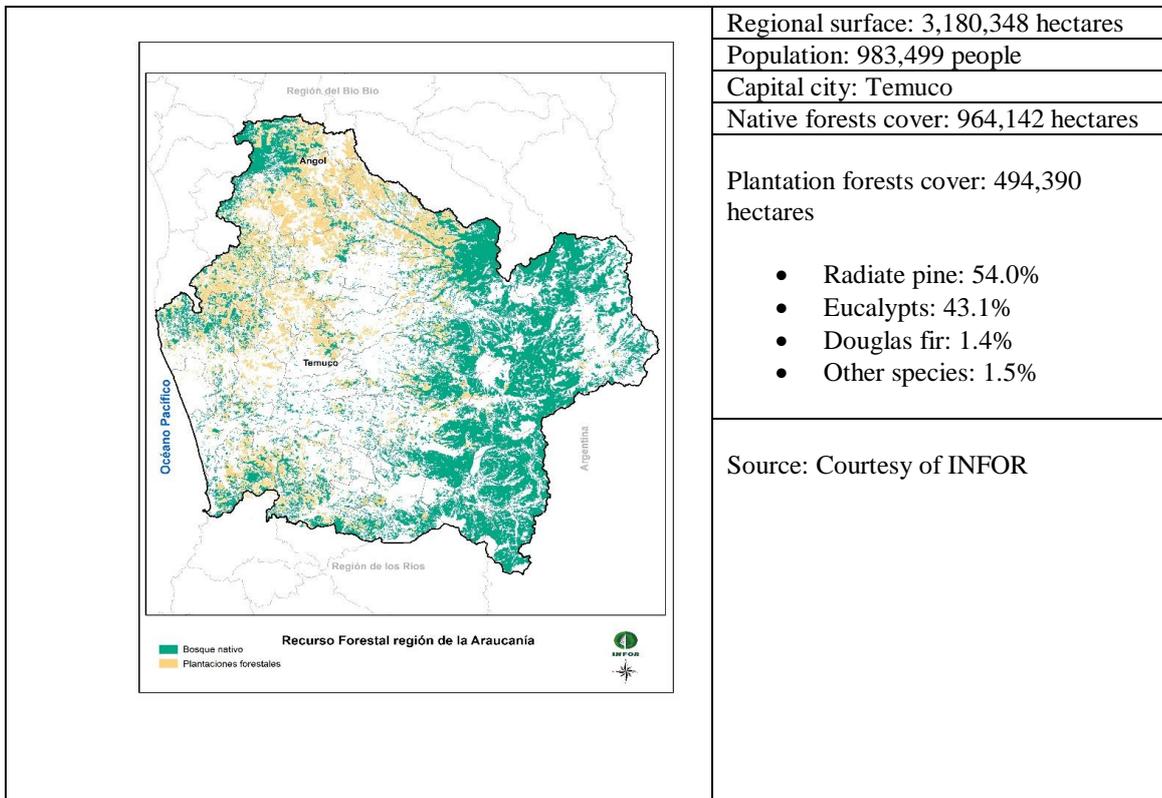
Six Chilean regions with important levels of forestry activity were selected as study sites: VII (Maule), VIII (Biobío), IX (Araucanía), X (Los Lagos), XII (Magallanes), and XIV (Los Ríos). Their characteristics are described in the following boxes.



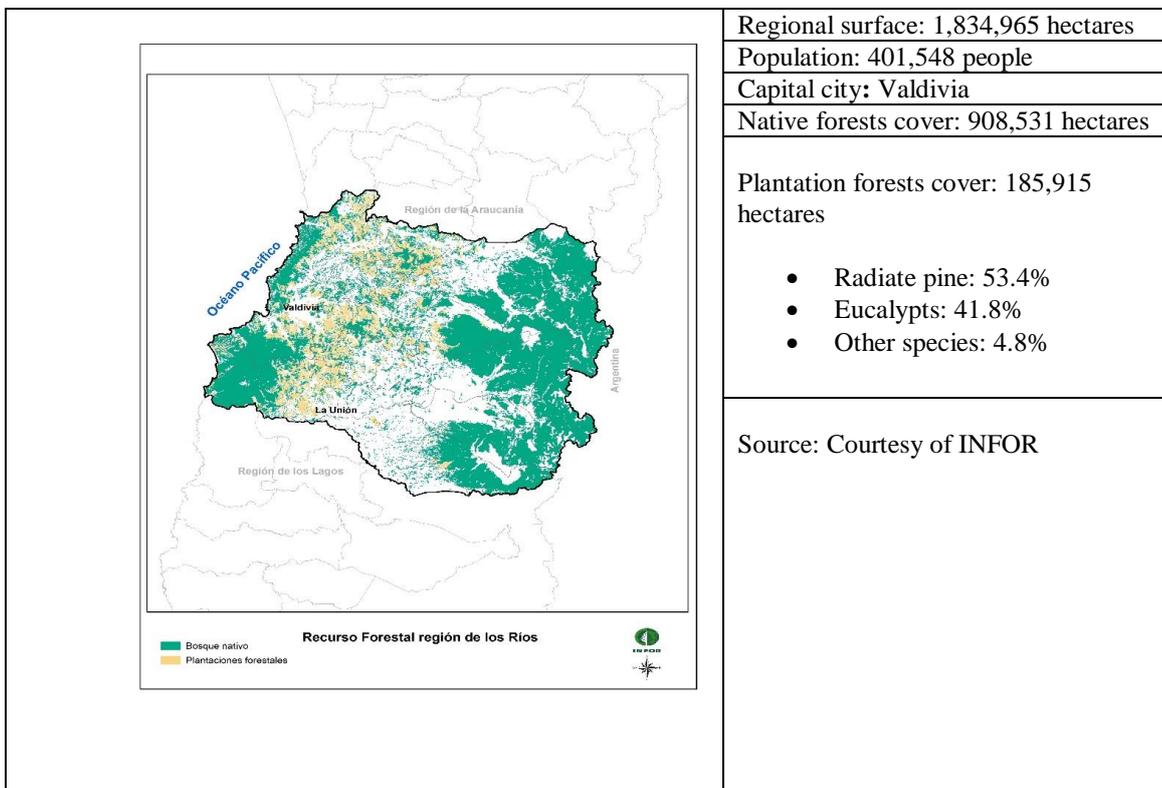
Box 1 A3-1 Characteristics of the VII (Maule) region, showing native (green) and plantation (yellow) forests cover.



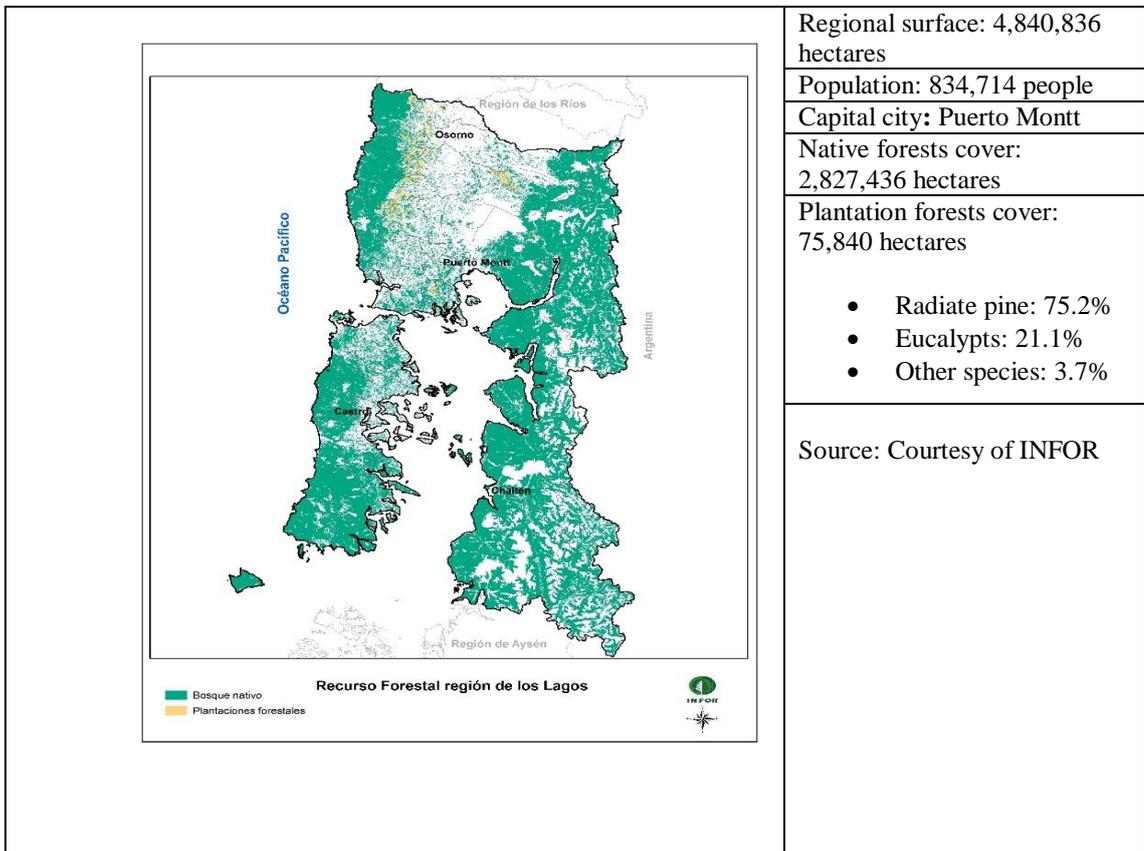
Box 2 A3-2 Characteristics of the VIII (Biobío) region, showing native (green) and plantation (yellow) forests cover.



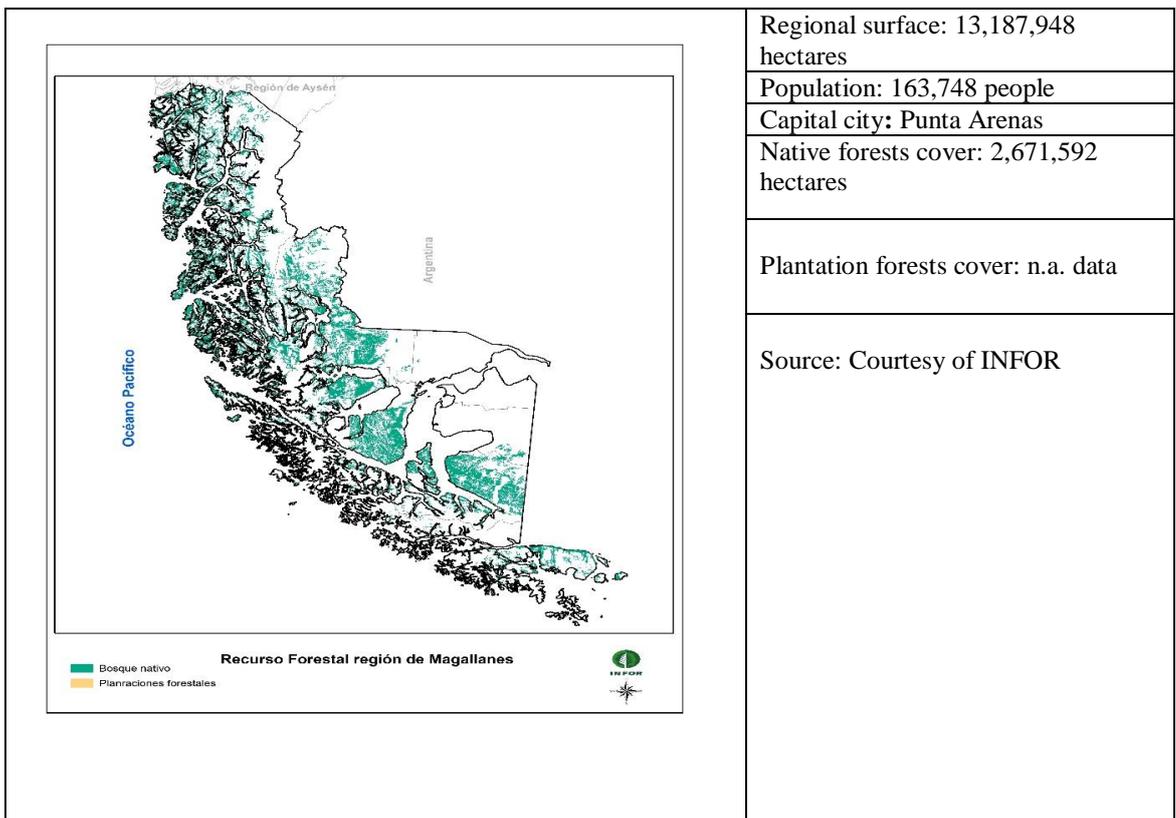
Box 3 A3-3 Characteristics of the IX (Araucanía) region, showing native (green) and plantation (yellow) forests cover.



Box 4 A3-4 Characteristics of the XIV (Los Ríos) region, showing native (green) and plantation (yellow) forests cover.



Box 5 A3-5 Characteristics of the X (Los Lagos) region, showing native (green) and plantation (yellow) forests cover.

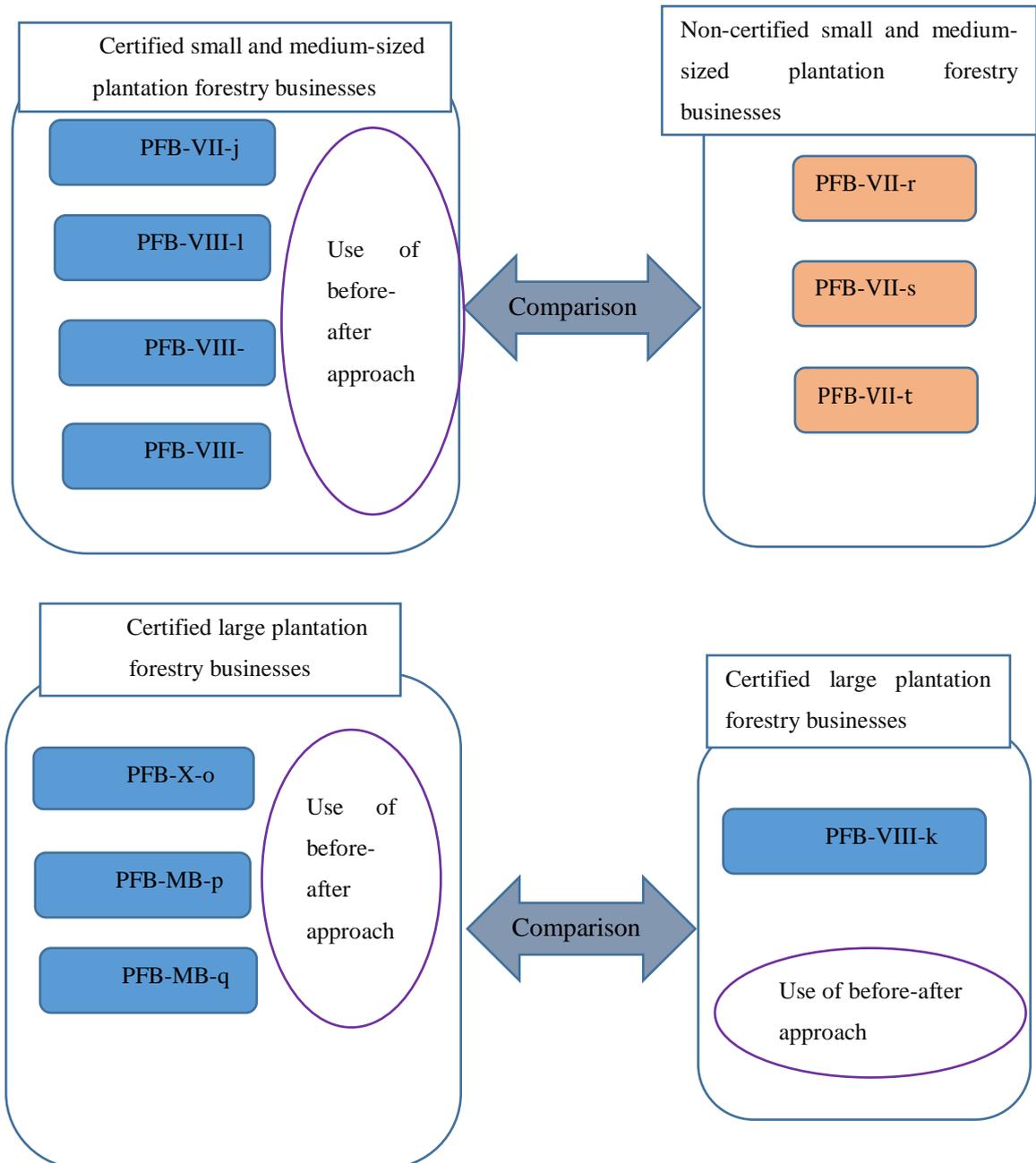


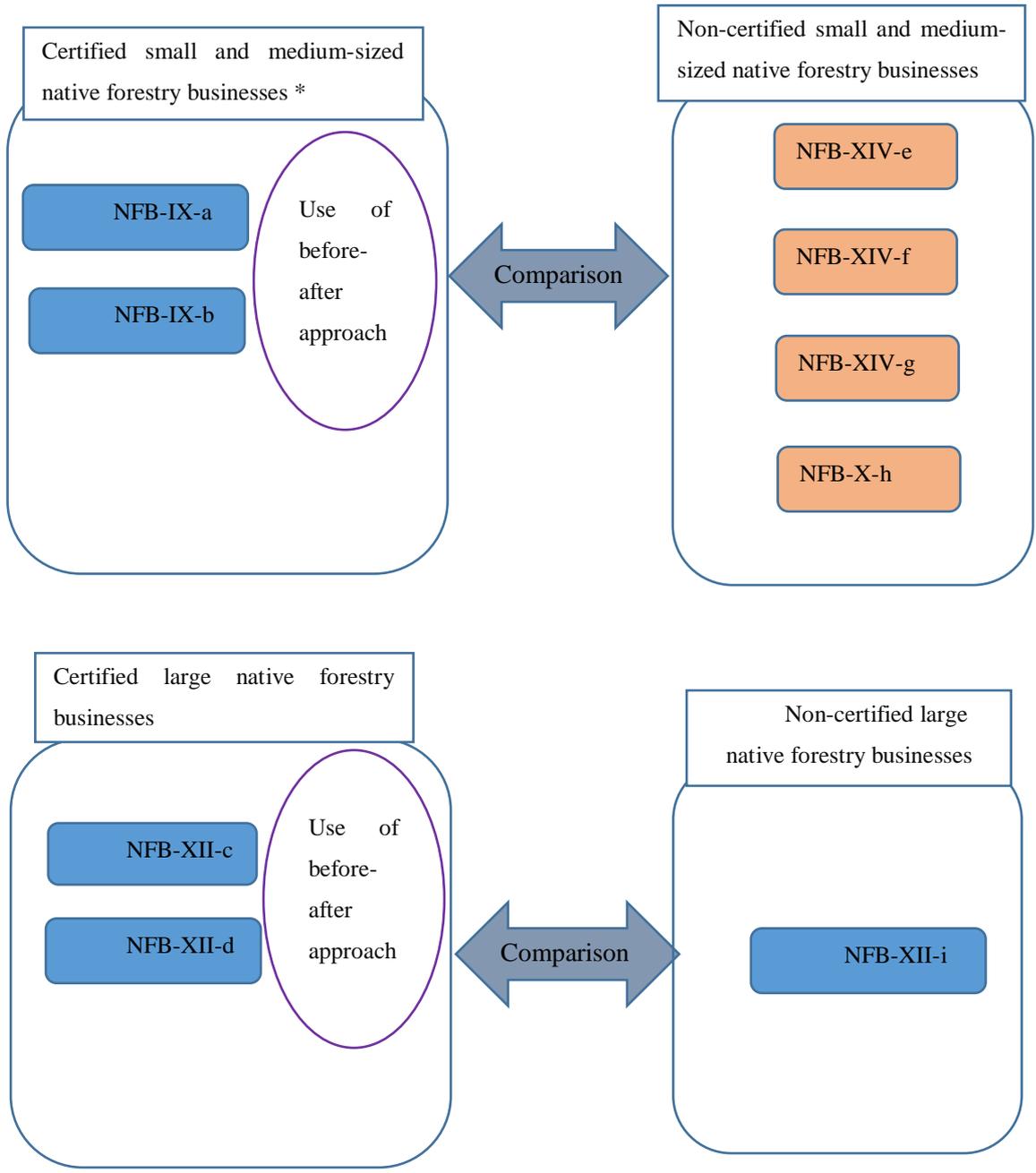
Box 6 A3-6 Characteristics of the XII (Magallanes) region, showing native (green) and plantation (yellow) forests cover.

Appendix 4: Matched pairs of sampled organizations and their characteristics

A-1 Matched pairs

The aim of this PhD research was to construct credible “counterfactual-like” cases. Therefore, while in the real context of the Chilean forestry sector it was not possible to match identical pairs, it was possible instead to construct approximate matched groups of organizations to avoid as much as possible the selection bias, as shown below.





Note: * These two forest operations were part of the same company.

A-2 Characteristics of sampled organizations

The characteristics of the sampled organizations are shown in the following four tables. In order to classify among small, medium-sized and large forest operations I used the “Guide for standard setting according to the scale, intensity and risk” (or in Spanish: Guía de Escala, Intensidad y Riesgo (EIR) para los Encargados del Desarrollo de Estándares - FSC-GUI-60-002 V1-0 ES) (see FSC 2015b).

Category	Number of hectares of the FMU
Small scale	≤ 1,000 ha
Medium scale	Between small and medium scale
Large scale	> 80,000 hectares (plantations) > 300,000 hectares (non-plantation forests)

However, that was not the only criterion. Hence, as it was particularly the case of native forestry businesses, I also grouped companies according to their level of technological and organizational sophistication (based on my judgment during my fieldwork). For example, some large native forestry businesses may be categorized as medium-sized operations following the above classification, but some characteristics, e.g. major resources, sophisticated machinery, market orientation, and specialized staff, made them belong to the group of “relatively” large enterprises.

Firm	Location	Main species and productive area	Production (m ³) and size	Conservation Areas	Type of certification	Market orientation
PFB-VII-j	VII region (Maule)	Between 1000- 2000 hectares of <i>Pinus radiata</i> < 100 hectares of <i>Eucalyptus globulus</i>	Average harvest 12,000 m ³ /year (ranging between 20,000 – 50,000 m ³) – 10 years cycle.	n.a. data	FSC certification	International (Japan)
PFB-VIII-l	VIII region (Biobío)	< 100 hectares of <i>Eucalyptus nittens</i>	n.a. data	Apparently, less than 15 hectares of native forests.	FSC certification	International
PFB-VIII-m	VIII region (Biobío)	<1000 hectares of <i>Pinus radiata</i> <100 hectares of <i>Eucalyptus globulus</i>	n.a. data	Apparently, some undetermined hectares of native forests Agroforestry business	FSC and CERTFOR certification	International
PFB-VII-n	VIII region (Biobío)	< 500 hectares of <i>Pinus radiata</i> < 500 hectares of <i>Eucalyptus sp.</i>	n.a. data	300 additional hectares of native forests and grasslands	FSC certification	International (Japan) Domestic (softwood)
PFB-VII-k	VII region (Maule)	Between 1000- 2000 hectares of <i>Pinus radiata</i> < 500 hectares of <i>Eucalyptus globulus</i> Between 1000- 2000 hectares of “stump” pine forests (the firm owned the forests but not the land)	n.a. data	64.4 hectares of native forests left for conservation purposes.	CERTFOR certification (However, they admitted to be seeking the FSC certification)	Domestic market (but seeking international markets)

PFB-X-o	X region (Los Lagos)	c. 25,000 hectares of <i>Eucalyptus nittens</i> .	Production (2013): 350,000 m ³ / year of pulpwood. Maximum (historic): 650,000 m ³ /year of pulpwood.	25,000 hectares of native forests 4,000 undetermined hectares of natural areas 5,170 hectares of HCVPs	CERTFOR and FSC certification (However, they had recently lost their FSC certification)	International (Japan)
PFB-MB-p	Multiregional	c. 125,000 hectares of <i>Eucalypts sp.</i> c. 600,000 hectares of <i>Pinus radiata</i>	Large-scale corporation (more than 15,731,000 m ³ /year)	206.010 hectares of native forests 75,917 has of riparian buffer zones	FSC and CERTFOR certification	International and domestic markets
PFB-MB-q	Multiregional	c. 600,000 hectares of plantations: Mixes of <i>Pinus radiata</i> , <i>Eucalyptus nittens</i> and <i>Eucalyptus</i> <i>globulus</i>	Large-scale corporation (more than 8,142,614 m ³ /year)	Around 150,000 hectares of natural areas (including native forests)	FSC and CERTFOR certification	International and domestic markets

Certified Plantation Forestry Businesses

Firm	Location	Main species and productive area	Production (m³) and size	Conservation Areas	Type of production	Market orientation
PFB-VIII-r	VIII region (Bío Bío)	<50 hectares of <i>Pinus radiata</i> < 50hectares of <i>Eucalyptus globulus</i>	n.a. data	Some hectares of native forests (<i>Nothofagus obliqua</i>)	Agroforestry, cattle and other businesses	Domestic
PFB-VIII-s	VIII region (Bío Bío)	< 50 hectares of <i>Eucalyptus sp.</i>	n.a. data	No	Agroforestry, cattle and other businesses	Domestic
PFB-VIII-t	VIII region (Bío Bío)	Between 2000-3000 hectares of <i>Eucalyptus globulus</i>	n.a. data	Mix of 100 ha of native forests including <i>Nothofagus</i> , coihue, canelo, arrayan	They had a sawmill and bought timber to small forest owners	Domestic

Non-Certified Plantation Forestry Businesses

Firm	Location	Main species and productive area	Production (m ³) and size	Conservation Areas	Type of certification	Market orientation
NFB-IX-a	IX region (La Araucanía)	c. 200 hectares of native forests: mixes of various <i>Nothofagus</i> species In addition, c. 200 hectares of <i>Pinus radiata</i> forests (mixed forests production)	n.a. data (mainly firewood)	Native forests were managed for commercial purposes. Only riparian buffer zones were left for conservation purposes	FSC certification	Domestic (but seeking international market access in the future)
NFB-IX-b	IX region (La Araucanía)	< 5000 hectares of native forests: mixes of various <i>Nothofagus</i> species	n.a. data (mainly firewood: 80%; the remaining 20% was sawn timber)	Native forests were managed for commercial purposes. Only riparian buffer zones were left for conservation purposes	FSC certification	Domestic (but seeking international market access in the future)
NFB-XII-c	XII region (Magallanes)	Between 10000 and 20000 hectares of lenga forests (<i>Nothofagus pumilio</i>)	n.a. data sawn timber (for furniture) and firewood	Native forests were managed for commercial purposes. Only riparian buffer zones were left for conservation purposes	FSC certification	International
NFB-XII-d	XII region (Magallanes)	< 50000 hectares of lenga forests (<i>Nothofagus pumilio</i>)	Exploitation of 700 - 1,000 hectares per year, sawn timber and firewood	Native forests were managed for commercial purposes. Only riparian buffer zones were left for conservation purposes	FSC certification	Domestic market (but seeking international market access at the time of my fieldwork)

Certified Native Forestry Businesses

Firm	Location	Main species and productive area	Production (m3) and size	Conservation Areas	Type of production	Market orientation
NFB-XIV-e	XIV region (Los Ríos)	c. 100 hectares of native forests: mixes of various <i>Nothofagus</i> species	n.a. data sawn timber and firewood (mostly)	Native forests were managed for commercial purposes. Only riparian buffer zones were left for conservation purposes	Agroforestry, cattle and other businesses	Domestic
NFB-XIV-f	XIV region (Los Ríos)	< 100 hectares of native forests and also a mix of < 100 hectares of plantation forests	n.a. data firewood production	Native forests were managed for commercial purposes. Only riparian buffer zones were left for conservation purposes	Agroforestry, cattle and other businesses	Domestic
NFB-XIV-g	XIV region (Los Ríos)	< 4000 hectares of native forests comprising various <i>Nothofagus</i> species. The firm also had c. 1,000 hectares of plantation forests (<i>Pseudotsuga menziesii</i>)	n.a. data Production of sawn timber no more than 60%, pulpwood (30%), and a small proportion of firewood (10%) for internal consumption	Native forests were managed for commercial purposes. Only riparian buffer zones were left for conservation purposes	Agroforestry, cattle and other businesses	Domestic
NFB-X-h	X region (Los Lagos)	<50 hectares of native forests comprising various <i>Nothofagus</i> species	n.a. data	Native forests were managed for commercial purposes. Only riparian buffer zones were left for conservation purposes	This forestry business was part of other businesses (house building contractors)	Domestic
NFB-XII-i	XII region (Magallanes)	Between 1000 - 20000 hectares of lenga forests (<i>Nothofagus pumilio</i>)	n.a. data sawn timber for furniture	Native forests were managed for commercial purposes. Only riparian buffer zones were left for conservation purposes	The firm was part of a larger company conglomerate	Domestic

Non-Certified Native Forestry Businesses

Appendix 5: Research ethics procedure

As noted in Chapter 2 (section 2.6.4.2), my research was conducted under the procedures of the ANU Human Ethics Committee (Human Ethics Protocol No 2012/250).

The first step in the conduct of interviews was the initial contact with prospective interviewees through e-mails and phone contact, sending each of them an information sheet and consent form to explain them the aims and purpose of the research, clarifying any doubt the participants had, before consent was given. The information sheet and the consent form provided a general description of the research: the sorts of issues to be explored and what was expected from the interviewees as well as their rights and contact information (see Appendixes 7 and 8). This method allowed the potential participants to give their voluntary consent in private and without any kind of pressure. All this information was given in advance prior to each interview, and read loud again just before conducting any interview (face-to-face or by phone). The provisions given in the information sheet and consent form to ensure that informants were aware and able to exercise their rights were:

- (a) Let them know that all transcribed material would be anonymous.
- (b) Audiotapes and transcripts from the interview would be available to participants who request them.
- (c) Informants had the right to change an answer and the possibility to contact the research team at any time in the future to alter or delete any statements made.
- (d) Informants may discontinue the interview at any stage and request that the audio recorder be paused at any time during the interview.

I collected the data through semi-structured interviews based on a flexible questionnaire as guidelines (see Appendix 6). The questions were not of a sensitive or a personal nature but concern matters of public policy relating to the plantation forest industry. In order to do this, I employed audiotapes as a main means to record the interviews. In general, no interviewees expressed concerns in being recorded using audiotapes. Only two interviewees asked me to not use audiotapes (due to personal apprehensions), so I had to resort to note-taking instead.

All the information obtained from the participants was kept anonymous. Information in the public domain provided only general information such as sex and position, and nor revealing the specific place where the interviews were held. Also, the name of the organization was not given. These provisions helped to assure a good rapport, allowing the participants to be more open and relaxed when giving their opinions, no matter its kind, and without being afraid of potential negative consequences.

The confidentiality of the electronic transcripts and other similar documents (e.g. contact details of participants) obtained from the participants was protected through the storage

of them on a password-protected computer. Audiotapes and printed records were stored in a locked drawer in the office of the researcher. All the gathered data was transferred to an electronic storage device at the end of the study, keeping them securely stored for a five years period.

Once the interviews were held, participants were asked if they would want to get a copy of the transcripts, the audiotapes or a summary of the research. In this way, any comments, even those vetting or modifying the transcripts, in regards to the original sources were considered. Only a couple of organizations asked to do this to check the truthfulness of the transcripts, but they did not present any objections. Rather, an important number of interviewees belonging to research institutions, large forestry businesses and standard setting organizations asked to know the conclusions of the study. This process of participant checking has been described in the literature as one example of continuing the involvement of the informants in the research process (see, e.g. Kindon, 2010).

Appendix 6: Questionnaire

There are five research questions. In relation to each research question there are a number of specific questions that will be asked at interview.

1) What problems have been addressed in forestry businesses by forest certification?

An opening question will be “Forest certification was introduced because there were perceived to be social, economic and environmental problems with forestry practices that other approaches such as regulation weren’t addressing adequately. What problems do you think there might have been? Can you give examples? Do you think that the implementation of certification has improved plantation/native forestry, and addressed these problems successfully?”

Then, further detail will be requested, using further “probes” to explore different sub-questions concerning environmental, social and economic issues.

- a. Has the FSC/CERTFOR improved environmental conditions? If yes, in what ways? How/why did these improvements come about? (E.g. soil & water quality, biodiversity enhancement).
- b. The FSC/ CERTFOR are also intended to contribute to social issues (such as empowering a wider range of stakeholders, and ensuring a fairer sharing of benefits derived from the forest). Do you think the FSC/ CERTFOR has influenced social issues? If yes, in what ways? How/why did these improvements come about? E.g. are:
 - i. Has the relationship between the local community and the company changed as a result of forest certification?
 - ii. Has the wellbeing of workers changes as a result of forest certification?
- c. Has the plantation organization benefited economically from FSC/CERTFOR (If so how)? If not, what were the costs/issues? *Asking this question only for forest managers.*
- d. An alternative question for communities/NGOs/other stakeholders could be: Do you think that forest certification allowed forestry businesses to achieve greater economic success than other organisations?
 - i. Do you think that forest certification has enabled forestry businesses to become more successful (economically) than other forestry businesses?

2) What were your main goals in seeking* certification? To what extent have they been achieved?

The above question would be a starting question, but would need to be modified for different stakeholders (i.e. the word “seeking” would have to – necessarily – change, because there are other groups such as NGOs and communities. In this case the word could be “promoting”, “supporting”, “advocating” or “claiming for”).

The following sub-questions are specific to the forest operator.

- a. Can you indicate whether, and in what ways, you aimed to increase/maintain market share in seeking certification?
- b. Can you indicate whether, and in what ways, you aimed to improve your organization's reputation in seeking certification?
- c. Can you indicate whether, and in what ways, you aimed to protect the business against criticism from proponents of FSC (in case of CERTFOR) in seeking certification?
- d. Can you indicate whether, and in what ways, you aimed to protect the business against public pressure in seeking certification?

** Consider changing the wording depending on the stakeholder to be interviewed.*

To complete the general question:

- i. In relation to these goals, to what extent have they been achieved?
- ii. Why was it only not/partially/mainly achieved?
- iii. What prevented it being fully achieved?

3) Has forest certification changed the behaviour of companies in relation to various stakeholders?

- a. Has forest certification changed the behaviour of companies in relation to NGOs?
- b. Has forest certification changed the behaviour of companies in relation to communities?
- c. Has forest certification changed the behaviour of companies in relation to costumers?
- d. Has forest certification changed the behaviour of companies in relation to regulators?
- e. Has forest certification changed the behaviour of companies in relation to forestry workers?
- f. Has forest certification changed the behaviour of companies in relation to forestry operation practices?

Subsequent questions:

If so in what ways? (And what aspects of certification that led to these behaviour changes?)

4) What are the attitudes of key actors in forest governance to the different certification schemes?

- a. What are your views of the different certification schemes?

As a "prompt", interviewees will be asked: do you think the schemes have worked well/badly; do you think they are economically/socially/environmentally desirable/ Do you think they have undesirable side effects?

- i. Which particular aspects of the certification scheme do you think have had benefits?
- ii. What have been the undesirable consequences of certification?, Why do you think they have come about, could have they been avoided?

- iii. Do you think certification has been an effective policy instrument compared to, for example, stronger regulation?

This question is to be asked to: Governments (state, local), NGOs (e.g. WWF & AIFBN), Plantation managers, Peak business associations, Communities.

5) What is the attitude of the public towards different forest certification schemes?

- a. From the perspective of the community, has the introduction of FSC/CERTFOR been beneficial?

If so, in what ways. Have there been negative aspects to certification? If so what have they been?

Appendix 7: Information for potential participants

What difference do different forest certification schemes make to plantation forestry businesses?

This information sheet provides information about the purpose and significance of the study being carried out to assess the impact of potential environmental, social and economic changes due to the implementation of different forest certification schemes. The PhD student Marcos Tricallotis at the Australian National University is conducting the research.

What is the purpose of the study?

In the last 20 years many forest certification schemes have arisen in order to promote a more sustainable forestry industry. These standards require participants to comply with a set of standards in order to get a certificate of approval. The purpose of this study is to identify the environmental, social and economic implications of certification.

This study involves five main questions

1. What problems have been addressed in plantation forestry businesses by forest certification?
2. What were the main goals of the plantation forestry business in seeking certification? To what extent have they been achieved?
3. Has forest certification changed the behaviour of companies in relation to various stakeholders?
4. What are the attitudes of key actors in forest governance to the different certification schemes?
5. What is the attitude of the public towards different forest certification schemes?

Why have I been chosen?

To better understand the implications of plantation forest certification and its social, economic and environmental consequences it is valuable to obtain the views of the widest range of stakeholders possible, particularly since different stakeholders often have different perspectives. Participants in the research will include forest managers, CEOs, forestry officers, ENGOs representatives, government authorities at different levels (local, state and federal), forestry workers and forestry industry representatives. Information from potential participants will be collected through contacts within the forestry industry and public databases.

What research methods will be used?

Interviews with potential participants employing a semi-structured questionnaire will be used as the main source of information for this research. Interviews will be taped, with your permission; otherwise only note taking will be employed. I will seek written consent from each interviewee immediately prior to conducting an interview. You can be provided with a copy of the interview transcript on request, enabling you to make suggestions or changes to your earlier answers.

A report of the findings of the research will be summarised once the interviews have been held. These findings will be used as part of Marcos Tricallotis' PhD thesis and in publications such as journal articles and conference presentations. If you wish, a copy of this report can be provided to you. In addition, if you would like to know more about the research findings please let Marcos Tricallotis know, either at the time of the interview, or using the contact details given in this information sheet.

This study is voluntary

This research involves a completely voluntary participation from potential interviewees. If you agree to participate by signing the consent form, you are still able to decline to respond to any particular questions, pause the interview at any time during the interview and withdraw from the study at any point in time.

With your permission, notes will be taken and recordings from the interviews be made. This material will be securely stored in a locked drawer and on a password-protected computer; also, this material will not be shown to anyone else, with the exception of the researcher's supervisors, being stored for up to 5 years. ***In any publications or publicly available document arising from this research, your identity will not be revealed unless you specifically state, in writing, that you wish to be identified and particular statements attributed to you.***

Who can I contact for further information?

If you have any queries about the research, or would like further information, please contact to **Marcos Tricallotis on 04 08027326** or marcos.tricallotis@anu.edu.au.

Please pass this information sheet on to anybody who you think would like to participate in this study.

Details of other people you might wish to contact, including the Ethics Committee or the academic research supervisors, Professor Peter Kanowski and Dr Neil Gunningham at the following addresses:

ANU Research Ethics Committee The Secretary Human Research Ethics Committee Chancellery 10B The Australian National University ACT 0200 T: 02 6125 7945 E: Human.Ethics.Officer@anu.edu.au	Academic Supervisor Dr Neil Gunningham CAP School of Regulation, Justice and Diplomacy, ANU The Australian National University ACT 0200 T: 02 6125 1516 E: neil.gunningham@anu.edu.au	Academic Supervisor Dr Peter Kanowski Fenner School of Environment and Society The Australian National University ACT 0200 T: 02 6125 2667 E: peter.kanowski@anu.edu.au
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Appendix 8: Written consent form

What is the effectiveness of forest standards on plantation forestry businesses?

I....., agree to be interviewed by Marcos Tricallotis regarding my background and experience as a key stakeholder of the forestry industry, and I agree to be part of his research about the effectiveness of different forest standards on plantation forestry businesses.

I understand the purpose and significance of the research and I agree with the following information:

1. I have read the information sheet, and understand that this interview will contribute to a better understanding of the social, economic and environmental impacts of forest certification on plantation forestry businesses.
2. My participation in the research is voluntary and that I can decline to answer any questions, or withdraw from the research at any time without any negative consequences. Also, I have the right to contact the researcher at any time in the future to alter or delete any statements made.
3. I understand that written notes and recordings (audiotapes) will be taken from the interviews. A copy of the interview transcript can be made for me and I might make further comments. Also, I can request that the audio recorder be paused at any time during the interview. All transcribed material will be anonymous, without any identification of the interview participant in any publications or reports, except if I decide to be identified.
4. The notes and recording audiotapes will be securely stored in a locked drawer and a password-protected computer by Marcos Tricallotis for five years. This interview material will not be shown to anyone else, with the exception of the researcher's supervisors.
5. The information obtained during the interviews will be used to prepare the research report, Marcos Tricallotis' PhD thesis and in related publications, journals and conferences.

If you have any queries about the research, please contact to Marcos Tricallotis on 04 08027326 or marcos.tricallotis@anu.edu.au. Details of other people you might wish to contact, including the Ethics Committee or the academic research supervisors, Professor Peter Kanowski and Dr Neil Gunningham at the following addresses:

<p>ANU Research Ethics Committee The Secretary Human Research Ethics Committee</p> <p>Chancellery 10B The Australian National University ACT 0200 T: 02 6125 7945 E: Human.Ethics.Officer@anu.edu.au</p>	<p>Academic Supervisor Dr Neil Gunningham CAP School of Regulation, Justice and Diplomacy, ANU The Australian National University ACT 0200 T: 02 6125 1516 E: neil.gunningham@anu.edu.au</p>	<p>Academic Supervisor Dr Peter Kanowski Fenner School of Environment and Society The Australian National University ACT 0200 T: 02 6125 2667 E: peter.kanowski@anu.edu.au</p>
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I give permission for the interview to be recorded (please circle) YES NO

.....

Signature

Date

THANK YOU FOR YOUR PARTICIPATION

Appendix 9: List of interviewees by category

Guidelines for using the codes

Each **interviewee** is given a specific code using 3 groups of characters.(a) The first character(s) indicate(s) the type of informant:

A: Forestry authority (CONAF), including government officers and officials

B: Representative of associations such as sawmills, pulp-mills, forestry associations (primary production) or timber retailers

C: Community representative or local villager

CT: Owner of a contractor firm

DW: Directly hired forestry worker

I: Indigenous representative or member of an Indigenous community

IW: Indirectly hired forestry worker (from a contractor firm working for a specific plantation forestry business)

L: Representative of a (non-Indigenous) local community

La: Labor authority, including government officers and officials

N: NGO representative

NFB: Native forestry business manager, officer or CEO

PFB: Plantation forestry business manager, officer or CEO

R: Academic/Researcher/Consultant

S: CERTFOR or FSC representatives in Chile(b) The region is indicated in the second group of characters:

RM: Metropolitan region (Santiago of Chile)

MB: “Mega” forestry business, usually large-scale plantation forestry businesses (2 in the sample) involving VII, VIII, IX and XIV regions

VII: Maule (VII) region

VIII: Bío Bío (VIII) region

IX: La Araucanía (IX) region

XIV: Los Ríos (XIV) region

X: Los Lagos (X) region

XII: Magallanes (XII) region

Also, there is a letter after each number to distinguish specific organizations within a category.

Additionally, a correlative number denotes the order of an informant under a specific category.

For example, PFB-VII-b01 indicates an interview held with a plantation forestry business' officer (PFB) in the Maule VII Region (VII), in the "b" firm (b), and being the first interviewee in this category (01).

Certified Native Forestry Businesses

Position	Institution	Interview date	Code	Notes
Forest manager of a small forestry business	Native forestry business –IX region	11-02-2014 Phone interview	NFB-IX-a01	
Forest manager of a medium-sized forestry business	Native forestry business –IX region	09-01-2014 Phone interview	NFB-IX-b01	
CEO of a medium-large forestry business	Native forestry business –XII region	18-12-2014 Face to face interview	NFB-XII-c01	
Operations manager (harvest) – large forestry business	Native forestry business –XII region	16-12-2013 Face to face interview	NFB-XII-d01	
Forestry worker – large forestry business	Native forestry business –XII region	16-12-2013 Face to face interview	DW-XII-d01	
FSC implementation officer – large forestry business	Native forestry business –XII region	16-12-2013 Face to face interview	NFB-XII-d02	Also former FSC auditor and forester

Non-certified Native Forestry Businesses

Position	Institution	Interview date	Code	Notes
Small forest owner	Native forestry business – XIV region	05-12-2013 Face to face interview	NFB-XIV- e01	Also forester and researcher
Small forest owner and forester consultant	Native forestry business – XIV region	10-12-2013 Face to face interview	NFB-XIV- f01	Also forester consultant and board member of a native forestry association
Forest manager of a medium size forestry business	Native forestry business – XIV region	27-02-2014 Phone interview	NFB-XIV- g01	
Small forest owner	Native forestry business – X region (Chiloé)	26-12-2013 Face to face interview	NFB-X- h01	
CEO of a medium size forestry business	Native forestry business – XII region	30-01-2014 Phone interview	NFB-XII- i01	

Certified Plantation Forestry Businesses

Position	Institution	Interview date	Code	Notes
CEO of a small forestry business	FSC certified plantation forestry business – VII region	02-04-2013 Face to face interview	PFB-VII- j01	
Forest manager – small forestry business	FSC certified plantation forestry business – VII region	03-04-2013 Face to face interview	PFB-VII- j02	
Forest ranger	FSC certified plantation forestry business – VII region	03-04-2013 Face to face interview	PFB-VII- j03	Also villager
Implementation officer – large firm	CERTFOR certified plantation forestry business – VII region	04-04-2013 Face to face interview	PFB-VII- k01	Also internal CERTFOR auditor
Senior officer – large forestry business	CERTFOR certified plantation forestry business – VII region	04-04-2013 Face to face interview	PFB-VII- k02	
Contractor of the “k” firm	CERTFOR certified plantation forestry business – VII region	04-04-2013 Face to face interview	CT-VII- k01	Harvesting operations
CEO	FSC certified plantation forestry business – VIII region	10-04-2013 Face to face interview	PFB-VIII- l01	
Forest manager and deputy CEO	FSC certified plantation forestry business – VIII region	05-04-2013 Face to face interview	PFB-VIII- l02	
Small forest owner and CEO - family business	FSC & CERTFOR certified plantation forestry business – VIII region	10-04-2013 Face to face interview	PFB-VIII- m01	Agroforestry business

CEO of a small forestry business	FSC certified plantation forestry business – VIII region	02-04-2013 Face to face interview	PFB-VIII- n01	Also board member of an association of small plantation forest owners
Contractor of the “n” firm	FSC certified plantation forestry business – VIII region	02-04-2013 Face to face interview	CT-VIII- n01	Harvesting operations
Forest manager	FSC certified plantation forestry business – VIII region	02-04-2013 Face to face interview	PFB-VIII- n02	
Implementation officer – large firm	CERTFOR certified plantation forestry business – X region	27-12-2013 Face to face interview	PFB-X- o01	
Senior environmental officer – large forestry business	FSC (as of 10-09-2013) & CERTFOR certified plantation forestry business – MB	28-08-2013 Face to face interview	PFB-MB- p01	
Implementation officer – large firm	FSC (as of 10-09-2013) & CERTFOR certified plantation forestry business – MB	28-08-2013 Face to face interview	PFB-MB- p02	
Senior officer – large forestry business	FSC & CERTFOR certified plantation forestry business – MB	12-12-2013 Face to face interview	PFB-MB- q01	
Forest manager area “A”	FSC & CERTFOR certified plantation forestry business – MB	08-01-2014 Phone interview	PFB-MB- q02	Conflictive area
Forest manager area “B”	FSC & CERTFOR certified plantation forestry business – MB	13-01-2014 Phone interview	PFB-MB- q03	Non-conflictive area

Non-certified Plantation Forestry Businesses

Position	Institution	Interview date	Code	Notes
Forest owner – family business (small firm)	Plantation forest business – VIII region	29-08-2013 Face to face interview	PFB-VIII- r01	agroforestry
Forest owner – family business (small firm)	Plantation forest business – VIII region	29-08-2013 Face to face interview	PFB-VIII- s01	agroforestry
CEO and forest owner small forestry business	Plantation forest business – VIII region	30-08-2013 Face to face interview	PFB-VIII- t01	
Contractor “A” of the “t” firm	Plantation forest business – VIII region	08-11-2013 Phone interview	CT-VIII-t01	Harvest operations
Contractor “B” of the “t” firm	Plantation forest business – VIII region	24-10-2013 Phone interview	CT-VIII-t02	Harvest operations

Non-Indigenous local community representatives

Position	Geographical location	Interview date	Code	Notes
Villager	<i>Loncopangue</i> community, Province of Bío Bío – VIII region	02-04-2013 Face to face interview	L-VIII-01	Also working as a forest ranger for the “n” firm
Local community representative	Villa Renovales – XII region	17-12-2013 Face to face interview	L-XII-01	Part of the local community of the “d” firm

Indigenous representatives

Position	Geographical location	Interview date	Code	Notes
Villager – ethnic group <i>Pehuenche</i>	<i>Loncopangue</i> community, Province of Bío Bío – VIII region	05-04-2013 Face to face interview	I-VIII-01	Part of the local community of the “n” and “q” firms
Villager – ethnic group <i>Mapuche</i>	Tirúa – VIII region	31-08-2013 Face to face interview	I-VIII-02	Also farmer and small forest owner. Part of the local community of the “p” and “q” firms
Councillor – ethnic group <i>Mapuche</i>	Lumaco – IX region	28-09-2013 Phone interview	I-IX-01	Part of the local community of the “p” firm
Local representative – ethnic group <i>Mapuche</i>	Temuco – IX region	03-09-2013 Face to face interview	I-IX-02	Also forester

Forestry authority (CONAF)

Position	Institution	Interview date	Code	Notes
Senior officer	CONAF – VII region	24-05-2013 Phone interview	A-VII-01	
Forest official	CONAF – VIII region (Province of Arauco)	07-02-2014 Phone interview	A-VIII-01	
Forest officer	CONAF – IX region	19-08-2013 Face to face interview	A-IX-01	Former private plantation forestry business executive
Senior officer	CONAF – IX region	19-08-2013 Face to face interview	A-IX-02	
Senior officer	CONAF – X region	02-09-2013 Face to face interview	A-X-01	

Senior officer	CONAF – XII region	16-12-2013 Face to face interview	A-XII-01	
Forest official	CONAF – XII region (Province of Ultima Esperanza)	05-02-2014 Phone interview	A-XII-02	
Senior officer	CONAF – Metropolitan region	23-08-2013 Face to face interview	A-RM-01	

Labor authority – Dirección del Trabajo (DT)

Position	Institution	Interview date	Code	Notes
Labour official	Dirección del Trabajo (Labor authority) – IX region	05-03-2014 Phone interview	La-IX-01	
Senior officer	Dirección del Trabajo (Labor authority) – XII region	20-03-2013 Phone interview	La-XII-01	

Non-Governmental Organizations (NGOs)

Position	Institution	Interview date	Code	Notes
Officer	Social NGO – Observatorio Ciudadano	22-03-2013 Phone interview	N-XIV-01	
Officer (program of forests)	WWF Chile – National Level	25-03-2013 Phone interview	N-RM-01	Former FSC auditor
Officer	Social and Indigenous NGO – LEFTRAL	05-09-2013 Phone interview	N-RM-02	Board member of the FSC social chamber
Senior officer	FIMA (Social NGO) – RM region	20-03-2014 Phone interview	N-RM-03	
Officer	CODEFF (ENGO) – RM region	03-10-2013 Phone interview	N-RM-04	Board member of the FSC environmental chamber
Senior officer	AIFBN (Association of foresters for native forests) (ENGO) – RM region	10-09-2013 Face to face interview	N-RM-05	Board member of the FSC environmental chamber and researcher
Officer	AIFBN (Association of foresters for native forests) (ENGO) – RM region	29-08-2013 Face to face interview	N-RM-06	Board member of the FSC environmental chamber and researcher

Forestry workers unions' representatives

Position	Institution	Interview date	Code	Notes
Senior officer	CTF (Forestry Workers Association)	13-12-2013 Face to face interview	IW-MB-01	Linked with large-scale plantation industry
Union representative (officer)	Union of logging truck drivers	28-12-2013 Phone interview	IW-MB-02	Linked with large-scale plantation industry
Union representative (officer)	ANTILLANCA (it includes unions that group different forest operations)	28-12-2013 Phone interview	IW-MB-03	Linked with large-scale plantation industry
Union representative (officer)	Federation of unions of logging truck drivers	31-01-2013 Phone interview	IW-MB-04	Linked with large-scale plantation industry

Forestry schemes institutions

Position	Institution	Interview date	Code	Notes
Senior officer	FSC Chile	18-04-2013 Face to face interview	S-RM-01	
Officer	CERTFOR Chile	13-09-2013 Face to face interview	S-RM-02	
Official	CERTFOR Chile	13-09-2013 Face to face interview	S-RM-03	

Consultants and researchers

Position	Institution	Interview date	Code	Notes
Researcher	INFOR (Research Institute of Forests) – VIII region	10-08-2013 Face to face interview	R-VIII-01	
Social consultant	Private consultant of large (mega) plantation forestry businesses	12-12-2013 Face to face interview	R-MB-01	Former NGO member
CERTFOR consultant	Private consultant of plantation forestry businesses and of the Chilean timber processing industry	26-02-2014 Phone interview	R-VIII-02	Former researcher and CEO of a plantation forestry business
CERTFOR auditor and consultant	Certifying body	21-03-2014 Phone interview	R-MB-02	Also forester
PhD researcher (ergonomics)	Developing a research on ergonomics in Chilean forestry workers	03-03-2014 Phone interview	R-MB-03	

Forestry associations

Position	Institution	Interview date	Code	Notes
Senior officer	CORMA (association of large/mega plantation forestry businesses) – RM region	19-03-2013 Face to face interview	B-RM-01	
Senior officer	APROBOSQUE (association of small and medium size native forestry businesses) – XIV region	10-12-2013 Face to face interview	B-XIV-01	Also forester
Senior officer	SODIMAC (Chilean Multinational timber retailer) – Present in most of the country and part of South America	18-03-2014 Phone interview	B-RM-02	

Appendix 10: Chilean CERTFOR scheme for plantation forests

Version 2007

<p>PRINCIPLE 1: PLANNING AND LONG TERM OBJECTIVES (The use of forest resources must be planned and managed to provide a continuous flow of products and services in successive rotations, according to a Long-term Forest Management Master Plan based on the scale of the operations and applicable to the FMU).</p>	<p><u>Criterion 1.1</u> Those who are responsible for the forest management are formally engaged with the Sustainable Forest Management and they shall demonstrate their compromise to continue with forestry in successive rotations in the area.</p>
	<p><u>Criterion 1.2</u> There is a Forest Management Master Plan that is documented and updated, in which the management objectives of the FMU are clearly specified.</p>
	<p><u>Criterion 1.3</u> The Master Plan has clearly defined the soil use within the FMU.</p>
	<p><u>Criterion 1.4</u> Harvest levels of forest products are clearly justified in the Master Plan of management and they must maintain or increase the production of goods and services over time, subject to the productive capabilities of the FMU and market conditions.</p>
	<p><u>Criterion 1.5</u> Forest management is performed on the basis of the potential of forest sites and their features.</p>
	<p><u>Criterion 1.6</u> The great scale application of new technologies, species or varieties thereof, will be assessed and monitored by the responsible of the FMU and will be used as long as there is no scientific evidence of significant and negative economic, environmental or social impacts.</p>
	<p><u>Criterion 1.7</u> Prior to the start of forest operations, an environmental impact assessment shall be completed according to the scale and intensity of forest operations.</p>
<p>PRINCIPLE 2: BIODIVERSITY AND NATIVE ECOSYSTEMS (The use of forest resources shall be planned and managed in a way in which native ecosystems in the FMU will be protected and significant negative impacts to biodiversity minimized).</p>	<p><u>Criterion 2.1</u> Plantations cannot be established on landscapes covered by native forests or other types of vegetation having high environmental value.</p>
	<p><u>Criterion 2.2</u> The planning of forest management in the FMU takes in consideration the existence, environmental value and management practices according to the different types of endangered flora and fauna species.</p>
	<p><u>Criterion 2.3</u> The high value environmental areas are managed in a way to ensure its biodiversity.</p>
	<p><u>Criterion 2.4</u> Forest operations in plantations are performed in order to minimize the impacts on the landscape and on the biodiversity of the surrounding areas.</p>
	<p><u>Criterion 2.5</u> All direct and indirect staff working in the FMU is aware of the importance of protecting the biodiversity, and has been trained so that their activities do not harm the protection zones and they know the location of the FMU.</p>
<p>PRINCIPLE 3: PRODUCTIVITY MAINTAINING (Forest resources shall be managed in order to maintain their health, vitality and productivity, protecting them from</p>	<p><u>Criterion 3.1</u> There are effective measures for the prevention, detection, suppression and control of wildfires, employing internal or external resources.</p>
	<p><u>Criterion 3.2</u> The control of pathogen and harmful agents follows the guidelines of an integrated control system for plagues and diseases, planning the activities in such a way to minimize their negative environmental effects.</p>

harmful agents).	<p><u>Criterion 3.3</u> In forest operations will be encouraged the use of environmentally-friendly chemical products. Chemical products, fuels, oils, containers and other potentially pollutant are managed and disposed in a safe way for people and the environment.</p>
	<p><u>Criterion 3.4</u> The weed control in plantations must be held in a way to optimize the trees growth and minimizing the negative effects of the use of herbicides.</p>
<p>PRINCIPLE 4: WATER AND SOIL PROTECTION (Forest resources shall be managed in such a way to encourage the conservation of the soil resource and minimize the adverse impacts on the quality and quantity of water, particularly concerning the needs of the communities downstream).</p>	<p><u>Criterion 4.1</u> There is a characterization of the soil types and water streams that are present in the FMU.</p>
	<p><u>Criterion 4.2</u> The productivity potential of the soil is maintained and recovered when it is necessary.</p>
	<p><u>Criterion 4.3</u> Forest operations are planned and implemented so as to minimize the erosion and lixiviation of sediments over water streams.</p>
	<p><u>Criterion 4.4</u> Chemical products, fuels and lubricants are employed preventing the pollution of the soil and water streams.</p>
	<p><u>Criterion 4.5</u> The planning of forest management is performed regarding the water availability of streams and water bodies that supply communities downstream.</p>
	<p><u>Criterion 4.6</u> All the staff involved in the planning of forest operations must have an appropriate knowledge about the fragility of soils and the most suitable management practices in these cases, according to their responsibility. Also, knowledge of the measures to protect water courses and the way that forest operations are performed near water bodies and streams shall be shown.</p>
<p>PRINCIPLE 5: LOCAL COMMUNITIES (All those responsible for the forest management respect the uses, traditional costumes and rights of the surrounding communities, maintaining good relationships with them and supporting the development of their capacities, in order to contribute with the improvement of their quality of life).</p>	<p><u>Criterion 5.1</u> All those responsible for the forest management in the FMU have knowledge about the impacts of their activities over local communities.</p>
	<p><u>Criterion 5.2</u> All those responsible for the forest management in the FMU contribute to improve the quality of life of the local communities.</p>
	<p><u>Criterion 5.3</u> All those responsible for the forest management in the FMU protect local communities from the risks of forest operations.</p>
	<p><u>Criterion 5.4</u> All those responsible for the forest management in the FMU have good relationships with local communities.</p>
	<p><u>Criterion 5.5</u> All those responsible for the forest management in the FMU provide periodic information about their management practices to third interested parties.</p>
<p>PRINCIPLE 6: ORIGINAL ETHNICS (All those responsible for the forest management shall respect the signed agreements, the written compromises and the rights legally established. Also, they shall consider the traditional knowledge of the original ethnics for their use and management of their land and resources)</p>	<p><u>Criterion 6.1</u> All those responsible for the forest management in the FMU identify the presence of Indigenous peoples on the areas where the activities are performed and respect the rights and traditions of these communities.</p>
	<p><u>Criterion 6.2</u> All those responsible for the forest management in the FMU are willing to solve the conflicts with Indigenous peoples in a mutual collaborative environment.</p>
	<p><u>Criterion 6.3</u> Indigenous peoples are adequately compensated for any application of their traditional knowledge concerning the use of forests and specific use of native forest species by the responsible staff of the FMU.</p>

<p>PRINCIPLE 7: LABOR RELATIONSHIP (All those responsible for the forest management shall respect the forest workers' rights (directly and indirectly), benefiting them in an appropriate and equitable way, safeguarding their occupational health and safety).</p>	<p><u>Criterion 7.1</u> All those responsible for the forest management in the FMU shall ensure that their forestry workers are trained to improve their skills and provide them with better job opportunities.</p>
	<p><u>Criterion 7.2</u> All those responsible for the forest management in the FMU respect the rights of the workers and ensure the benefits of collective bargaining.</p>
	<p><u>Criterion 7.3</u> Forest workers are provided with a fair and equitable compensation for their work.</p>
	<p><u>Criterion 7.4</u> All those responsible for the forest management in the FMU safeguard the health and safety of their workers.</p>
	<p><u>Criterion 7.5</u> All those responsible for the forest management in the FMU provide appropriate transport, accommodation and feeding conditions to their workers</p>
<p>PRINCIPLE 8: LAWS, AGREEMENTS AND TREATIES (All those responsible for the forest management shall respect the Chilean laws, agreements, international binding treaties and not binding agreements will be respected, provided that they are signed by the Chilean state).</p>	<p><u>Criterion 8.1</u> All those responsible for the forest management in the FMU shall know and respect the national legislation that applies to their activities.</p>
	<p><u>Criterion 8.2</u> All those responsible for the forest management in the FMU shall know and respect all the binding international agreements and treaties. Non-binding agreements will be considered.</p>
	<p><u>Criterion 8.3</u> All the taxes, permits, patents, royalties, fees, rights and others expenses are paid on a regular basis.</p>
	<p><u>Criterion 8.4</u> The tenure and rights upon the use of the land and forest resources are clearly defined, documented, and legally established.</p>
<p>PRINCIPLE 9: CONTROL AND MONITORING (A monitoring will be held on forest resources, management systems, companies and owners who are responsible for the FMU to assess the level of compliance with the principles).</p>	<p><u>Criterion 9.1</u> There are procedures to periodically assess the condition of forest resources and the most significant environmental, social and economic impacts of forest operations. Monitoring procedures are consistent, replicable over time to allow comparison of results and assessment of change.</p>
	<p><u>Criterion 9.2</u> Forest management shall incorporate and respond to the results of periodic evaluations to enable continuous improvement in the forestry operations. The effectiveness and efficiency of the forest management system shall be assessed on a regular basis.</p>
	<p><u>Criterion 9.3</u> There is a procedure to trace and estimate the amount of timber from either the FMU itself or third parties supplying to industrial plants or other claimants, from the point of origin to destination (process known as the "chain of custody").</p>

Source: CertforChile (2015b).

Appendix 11: FSC national scheme

Standard for plantation and native* forest operations

Version 2011

<p>Principle 1: COMPLIANCE WITH LAWS AND FSC PRINCIPLES (Forest management shall respect international treaties, national laws & FSC principles and criteria)</p>	<p><u>Criterion 1.1</u> Forest management shall respect all national and local laws and administrative requirements</p>
	<p><u>Criterion 1.2</u> All applicable and legally prescribed fees, royalties, taxes and other charges shall be paid.</p>
	<p><u>Criterion 1.3</u> In signatory countries, the provisions of all binding international agreements such as CITES, ILO Conventions, ITTA and Convention on Biological Diversity, shall be respected.</p>
	<p><u>Criterion 1.4</u> Conflicts between laws, and the FSC principles and criteria shall be evaluated for the purposes of certification on a case by case basis, by the certifiers and the involved and affected parties.</p>
	<p><u>Criterion 1.5</u> Forest management areas should be protected from illegal harvesting, settlement and other unauthorized activities.</p>
	<p><u>Criterion 1.6</u> Forest manager shall demonstrate a long-term commitment to adhere to the FSC Principles and Criteria.</p>
<p>Principle 2: TENURE AND USE RIGHTS AND RESPONSABILITIES (Long-term tenure and use rights to the land and forest resources shall be clearly defined, documented and legally established).</p>	<p><u>Criterion 2.1</u> Clear evidence of long-term forest use rights to the land (e.g. land title, customary rights or lease agreements) shall be demonstrated.</p>
	<p><u>Criterion 2.2</u> Local communities with legal or customary tenure or use rights shall maintain control, to the extent necessary to protect their rights or resources, over forest operations unless they delegate control with free and informed consent to other agencies.</p>
	<p><u>Criterion 2.3</u> Appropriate mechanisms shall be employed to resolve disputes over tenure claims and use rights. The circumstances and status of any outstanding disputes will be explicitly considered in the certification evaluation. Disputes of substantial magnitude involving a significant number of interests will normally disqualify an operation from being certified.</p>
<p>Principle 3: INDIGENOUS PEOPLES' RIGHTS (The legal and customary rights of Indigenous peoples to own, use and manage their lands, territories, and resources shall be recognised and respected)</p>	<p><u>Criterion 3.1</u> Indigenous peoples shall control forest management on their lands and territories unless they delegate control with free and informed consent to other agencies.</p>
	<p><u>Criterion 3.2</u> Forest management shall not threaten or diminish, either directly or indirectly, the resources or tenure rights of Indigenous peoples.</p>
	<p><u>Criterion 3.3</u> Sites of special cultural, ecological, economic or religious performance to Indigenous peoples shall be clearly identified in cooperation with such peoples and recognised and protected by forest managers.</p>
	<p><u>Criterion 3.4</u> Indigenous peoples shall be compensated for the application of their traditional knowledge regarding the use of forest species or management systems in forest operations. This compensations shall be formally agreed upon with their free and informed consent before forest operation commence.</p>
<p>Principle 4: COMMUNITY RELATIONS AND WORKER'S RIGHTS (Forest management operations shall maintain or enhance the long-term</p>	<p><u>Criterion 4.1</u> The communities within, or adjacent to, the forest management area should be given opportunities for employment, training and other services.</p>
	<p><u>Criterion 4.2</u> Forest management should meet or exceeds all applicable laws and/or regulations covering the health and safety of employees and their families.</p>
	<p><u>Criterion 4.3</u> The rights of workers to organize and voluntarily negotiate with</p>

<p>social and economic well-being of forest workers and local communities)</p>	<p>their employers shall be guaranteed as outlined in Conventions 87 and 98 of the International Labour Organization (ILO).</p> <p><u>Criterion 4.4</u> Management planning and operations shall incorporate the results of evaluations of social impact. Consultations shall be maintained with people and groups (both men and women) directly affected by management operations.</p> <p><u>Criterion 4.5</u> Appropriate mechanisms shall be employed to resolve grievances and for providing fair compensation in the case of loss or damage affecting the legal or customary rights, property resources, or livelihoods of local peoples. Measures shall be taken to avoid such losses or damage.</p>
<p>Principle 5: BENEFITS FROM THE FORESTS (Forest management operations shall encourage the efficient use of the forest's multiple products and services to ensure economic viability and a wide range of environmental and social benefits)</p>	<p><u>Criterion 5.1</u> Forest management should strive toward economic viability, while taking into account the full environmental, social and operational costs of production, and ensuring the investments necessary to maintain the ecological productivity of the forest.</p> <p><u>Criterion 5.2</u> Forest management and marketing operations should encourage the optimal use and local processing of the forest's diversity of products.</p> <p><u>Criterion 5.3</u> Forest management should minimize waste associated with harvesting and on-site processing operations and avoid damage to other forest resources.</p> <p><u>Criterion 5.4</u> Forest management should strive to strengthen and diversify the local economy, avoiding dependence on a single forest product.</p> <p><u>Criterion 5.5</u> Forest management operations shall recognize, maintain, and, where appropriate, enhance the value of forest services and resources such as watersheds and fisheries.</p> <p><u>Criterion 5.6</u> The rate of harvest of forest products shall not exceed levels that can be permanently sustained.</p>
<p>Principle 6: ENVIRONMENTAL IMPACT (Forest management shall conserve biological diversity and its associated values, water resources, soils, and unique and fragile ecosystems and landscapes, and, by so doing, maintain the ecological functions and the integrity of the forests)</p>	<p><u>Criterion 6.1</u> Assessment of environmental impacts shall be completed - appropriate to the scale, intensity of forest management and the uniqueness of the affected resources --and adequately integrated into management systems. Assessment shall include landscape level considerations as well as the impacts of on-site processing facilities. Environmental impacts shall be assessed prior to commencement of site-disturbing operations.</p> <p><u>Criterion 6.2</u> Safeguards shall exist which protect rare, threatened and endangered species and their habitats (e.g. nesting and feeding areas). Conservation and protection areas shall be established, appropriate to the scale and intensity of forest management and the uniqueness of the affected resources. Inappropriate hunting, fishing, trapping and collecting shall be controlled.</p> <p><u>Criterion 6.3</u> Ecological functions and values shall be maintained intact, enhanced, or restored, including:</p> <ul style="list-style-type: none"> a) Forest regeneration and succession, b) Genetic, species, and ecosystem diversity. c) Natural cycles that affect the productivity of the forest ecosystem. <p><u>Criterion 6.4</u> Representative samples of existing ecosystems within the landscape shall be protected in their natural state and recorded on maps, appropriate to the scale and intensity of operations and the uniqueness of the affected resources.</p> <p><u>Criterion 6.5</u> Written guidelines shall be prepared and implemented to: control erosion, minimize forest damage during harvesting, road construction, and all other mechanical disturbances; and protect water resources.</p> <p><u>Criterion 6.6</u> Management systems shall promote the development and adoption of environmentally-friendly non-chemical methods of pest management and strive to avoid the use of chemical pesticides. World Health Organization Type 1A and 1B and chlorinated hydrocarbon pesticides; pesticides that are persistent, toxic or whose derivatives remain biologically active and accumulate in the food chain beyond their intended use; as well as any pesticides banned by international agreement, shall be prohibited. If chemicals are used, proper equipment and</p>

	<p>training shall be provided to minimize health and environmental risks.</p> <p><u>Criterion 6.7</u> Chemicals, containers, liquid and solid non-organic wastes including fuel and oil shall be disposed of in an environmentally appropriate manner at off-site locations.</p> <p><u>Criterion 6.8</u> Use of biological control agents shall be documented, minimized, monitored and strictly controlled in accordance with national laws and internationally accepted scientific protocols. Use of genetically modified organisms shall be prohibited.</p> <p><u>Criterion 6.9</u> The use of exotic species shall be carefully controlled and actively monitored to avoid adverse ecological impacts.</p> <p><u>Criterion 6.10</u> Forest conversion to plantations or non-forest land uses shall not occur, except in circumstances where conversion:</p> <ul style="list-style-type: none"> a) entails a very limited portion of the forest management unit; and b) does not occur on high conservation value forest areas; and c) will enable clear, substantial, additional, secure, long term conservation benefits across the forest management unit.
<p>Principle 7: MANAGEMENT PLAN (A management plan -- appropriate to the scale and intensity of the operations -- shall be written, implemented, and kept up to date. The long term objectives of management, and the means of achieving them, shall be clearly stated)</p>	<p><u>Criterion 7.1</u> The management plan and supporting documents shall provide:</p> <ul style="list-style-type: none"> a) Management objectives. b) Description of the forest resources to be managed, environmental limitations, land use and ownership status, socio-economic conditions, and a profile of adjacent lands. c) Description of silvicultural and/or other management system, based on the ecology of the forest in question and information gathered through resource inventories. d) Rationale for rate of annual harvest and species selection. e) Provisions for monitoring of forest growth and dynamics. f) Environmental safeguards based on environmental assessments. g) Plans for the identification and protection of rare, threatened and endangered species. h) Maps describing the forest resource base including protected areas, planned management activities and land ownership. i) Description and justification of harvesting techniques and equipment to be used. <p><u>Criterion 7.2</u> The management plan shall be periodically revised to incorporate the results of monitoring or new scientific and technical information, as well as to respond to changing environmental, social and economic circumstances.</p> <p><u>Criterion 7.3</u> Forest workers shall receive adequate training and supervision to ensure proper implementation of the management plan.</p> <p><u>Criterion 7.4</u> While respecting the confidentiality of information, forest managers shall make publicly available a summary of the primary elements of the management plan, including those listed in Criterion 7.1.</p>
<p>Principle 8: MONITORING AND ASSESSMENT (Monitoring shall be conducted -- appropriate to the scale and intensity of forest management -- to assess the condition of the forest, yields of forest products, chain of custody, management</p>	<p><u>Criterion 8.1</u> The frequency and intensity of monitoring should be determined by the scale and intensity of forest management operations as well as the relative complexity and fragility of the affected environment. Monitoring procedures should be consistent and replicable over time to allow comparison of results and assessment of change.</p> <p><u>Criterion 8.2</u> Forest management should include the research and data collection needed to monitor, at a minimum, the following indicators:</p> <ul style="list-style-type: none"> a) Yield of all forest products harvested. b) Growth rates, regeneration and condition of the forest. c) Composition and observed changes in the flora and fauna. d) Environmental and social impacts of harvesting and other operations.

activities and their social and environmental impacts)	e) Costs, productivity, and efficiency of forest management.
	<u>Criterion 8.3</u> Documentation shall be provided by the forest manager to enable monitoring and certifying organizations to trace each forest product from its origin, a process known as the "chain of custody."
	<u>Criterion 8.4</u> The results of monitoring shall be incorporated into the implementation and revision of the management plan.
	<u>Criterion 8.5</u> While respecting the confidentiality of information, forest managers shall make publicly available a summary of the results of monitoring indicators, including those listed in Criterion 8.2.
Principle 9: MAINTENANCE OF HIGH CONSERVATION VALUES (Management activities in high conservation value forests shall maintain or enhance the attributes that define such forests. Decisions regarding high conservation value forests shall always be considered in the context of a precautionary approach)	<u>Criterion 9.1</u> Assessment to determine the presence of the attributes consistent with High Conservation Value Forests will be completed, appropriate to scale and intensity of forest management.
	<u>Criterion 9.2</u> The consultative portion of the certification process must place emphasis on the identified conservation attributes, and options for the maintenance thereof.
	<u>Criterion 9.3</u> The management plan shall include and implement specific measures that ensure the maintenance and/or enhancement of the applicable conservation attributes consistent with the precautionary approach. These measures shall be specifically included in the publicly available management plan summary.
	<u>Criterion 9.4</u> Annual monitoring shall be conducted to assess the effectiveness of the measures employed to maintain or enhance the applicable conservation attributes.
Principle 10: PLANTATION MANAGEMENT (Plantations shall be planned and managed in accordance with Principles and Criteria 1-9, and Principle 10 and its Criteria. While plantations can provide an array of social and economic benefits, and can contribute to satisfying the world's needs for forest products, they should complement the management of, reduce pressures on, and promote the restoration and conservation of natural forests)	<u>Criterion 10.1</u> The management objectives of the plantation, including natural forest conservation and restoration objectives, shall be explicitly stated in the management plan, and clearly demonstrated in the implementation of the plan.
	<u>Criterion 10.2</u> The design and layout of plantations should promote the protection, restoration and conservation of natural forests, and not increase pressures on natural forests. Wildlife corridors, streamside zones and a mosaic of stands of different ages and rotation periods shall be used in the layout of the plantation, consistent with the scale of the operation. The scale and layout of plantation blocks shall be consistent with the patterns of forest stands found within the natural landscape.
	<u>Criterion 10.3</u> Diversity in the composition of plantations is preferred, so as to enhance economic, ecological and social stability. Such diversity may include the size and spatial distribution of management units within the landscape, number and genetic composition of species, age classes and structures.
	<u>Criterion 10.4</u> The selection of species for planting shall be based on their overall suitability for the site and their appropriateness to the management objectives. In order to enhance the conservation of biological diversity, native species are preferred over exotic species in the establishment of plantations and the restoration of degraded ecosystems. Exotic species, which shall be used only when their performance is greater than that of native species, shall be carefully monitored to detect unusual mortality, disease, or insect outbreaks and adverse ecological impacts.
	<u>Criterion 10.5</u> A proportion of the overall forest management area, appropriate to the scale of the plantation and to be determined in regional standards, shall be managed so as to restore the site to a natural forest cover.
	<u>Criterion 10.6</u> Measures shall be taken to maintain or improve soil structure, fertility, and biological activity. The techniques and rate of harvesting, road and trail construction and maintenance, and the choice of species shall not result in long term soil degradation or adverse impacts on water quality, quantity or substantial deviation from stream course drainage patterns.

	<p>Criterion 10.7 Measures shall be taken to prevent and minimize outbreaks of pests, diseases, fire and invasive plant introductions. Integrated pest management shall form an essential part of the management plan, with primary reliance on prevention and biological control methods rather than chemical pesticides and fertilizers. Plantation management should make every effort to move away from chemical pesticides and fertilizers, including their use in nurseries. The use of chemicals is also covered in Criteria 6.6 and 6.7.</p>
	<p>Criterion 10.8 Appropriate to the scale and diversity of the operation, monitoring of plantations shall include regular assessment of potential on-site and off-site ecological and social impacts, (e.g. natural regeneration, effects on water resources and soil fertility, and impacts on local welfare and social well-being), in addition to those elements addressed in principles 8, 6 and 4. No species should be planted on a large scale until local trials and/or experience have shown that they are ecologically well-adapted to the site, are not invasive, and do not have significant negative ecological impacts on other ecosystems. Special attention will be paid to social issues of land acquisition for plantations, especially the protection of local rights of ownership, use or access.</p>
	<p>Criterion 10.9 Plantations established in areas converted from natural forests after November 1994 normally shall not qualify for certification. Certification may be allowed in circumstances where sufficient evidence is submitted to the certification body that the manager/owner is not responsible directly or indirectly of such conversion.</p>

Source: FSC-Chile (2015a).

* The standard for native forest operations does not include the principle 10.

Note: The Chilean FSC scheme includes 4 different national schemes that have specific indicators:

- FSC scheme for large plantation forest operations
- FSC scheme for small plantation forest operations
- FSC scheme for large native forest operations
- FSC scheme for small native forest operations

Appendix 12: Code of forestry practices for Chile

The following table summarises the main contents of the “code of forest practices for Chile”, a voluntary code created in 1997 by the plantation forest industry and state (Ministry of Labour) and non-state social actors (researchers, forestry unions and the ILO). The aim was to perform more environmentally and socially sustainable forest operations in the large-scale plantation industry. Therefore, the code contains prescriptive requirements grouped under seven main topics.

<u>Silviculture practices</u>	<ul style="list-style-type: none"> • General regulations • Environmental regulations • OHS regulations • Silviculture practices • Slash-and-burn practices • Slash management • Site preparation • Plantations establishment and management
<u>Timber harvesting</u>	<ul style="list-style-type: none"> • Planning • Environmental measures to be followed during timber harvesting • Harvesting operations • Felling • Logging • Timber stockpile operations
<u>Forest roads</u>	<ul style="list-style-type: none"> • Roads • Roads building • Roads maintenance • Location of logging towers
<u>Wildfires management</u>	<ul style="list-style-type: none"> • Wildfires management • Wildfires management • Use of fire • Basic concepts
<u>First aids, Forest camps, Meals and Workers Transport</u>	<ul style="list-style-type: none"> • Trauma management • First aid officers • Emergency preparedness plan for contractors • Emergency preparedness plan for forestry firms • Support of Insurance Entities • Minimum forest camp conditions • Meals: nutrition needs and forest operations • Forestry workers transport: minimum conditions of vehicles • Drivers: minimum qualifications
<u>Forestry workers training</u>	<ul style="list-style-type: none"> • Forestry practices • Trees nursery management • Site preparation • Forest operations: thinning, pruning. • Timber harvesting • Wildfires management • Plantations

Source: Comisión-Tripartita-Forestal (1997).

Appendix 13: Chilean legal instruments relevant to this thesis

Legal instrument	Period/Year	Ministry	Matter being regulated applicable to this research
Law N° 4363, Law of Forests	1931 – Present	Ministry of Lands, National Assets and Colonization	Forestry operations and environmental protection.
Decree N° 2374, regulation on forests	1937 – Present	Ministry of Lands, National Assets and Colonization	Forestry operations and environmental protection.
Decree Law 701 – Law of Forests Development	1974 – Present	Ministry of Agriculture	Forestry operations and economic incentives to afforestation.
Decree No 259, regulation on DL 701	1980 – Present	Ministry of Agriculture	Forestry operations including both plantation and native forests.
Decree No 193, regulation on DL 701	1998 – Present	Ministry of Agriculture	Forestry operations concerning both plantation and native forests.
1994 General Environmental Law No 19300	1994 – Present	Ministry of General Secretary of the Presidency	Forestry operations at a large scale (over 500 ha).
Law No 20283 – Law of Recovery of Native Forests and Forests Development	2008 – Present	Ministry of Agriculture	Native forestry and incentives to promote SFM in native forest owners.
Regulation on soils, waters and wetlands (DS No 82)	2011 – Present	Ministry of Agriculture	Forestry operations and environmental protection of soils, water and wetlands.
Law N° 16744, Compulsory OHS Insurance	1968 – Present	Ministry of Labour and Social Welfare	Occupational Health and Safety, the law makes OHS insurance compulsory.
Decree N° 594, Minimum OHS conditions	1999 – Present	Ministry of Health	Minimum sanitary and environmental conditions in the workplace.
Decree N° 40, OHS risks	1969 – Present	Ministry of Labour and Social Welfare	Prevention measures to reduce OHS risks
Law N° 20763, Minimum wage	2014 – Present	Ministry of Labour and Social Welfare	National minimum wage for Chilean workers.
Decree N° 160, Liquid fuels	2008 – Present	Ministry of Economy, Promotion and Reconstruction	Security requirements for facilities and operations to store, transport, distribute and supply liquid fuels.
DFL (Decree with the Force of a Law) N° 1	2002 – Present	Ministry of Labour and Social Welfare	Labour Code, it regulates all matters concerning workers' rights, their duties and social benefits.
Law N° 20123, Subcontractors Law	2007 – Present	Ministry of Labour and Social Welfare	Relation between large firms and contractors: firms are responsible for their contractors' behaviour towards outsourced workers.
Law N° 18314, Antiterrorist Law	1984 – Present	Ministry of Interior	Terrorist conducts and their sanctions.
Law N° 19253, Indigenous Law	1993 – Present	Ministry of Planning and Cooperation	Promotion and Development of Chilean Indigenous communities.