

**AN EXAMINATION OF CHALLENGES AND ISSUES  
FACING SUSTAINABLE FOREST MANAGEMENT AND  
FOREST CERTIFICATION IN CHINA**

by

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# Abstract

This study investigated the challenges facing the adoption of sustainable forest management (SFM) and forest certification in China. To achieve this goal, the perceptions of four influential direct and indirect stakeholders were examined to reveal the awareness, understanding, interest, motivation, and barriers to adopting SFM and forest certification. The four stakeholders consisted of Chinese small-scale forest farmers who have received small forest land from the collectives through the new forest tenure reforms, Chinese market officials working for forestry property markets, Chinese wood products manufacturers, and Canadian wood products retailers. In addition, the new forest tenure reforms and their supporting mechanisms, including forestry property markets, were assessed in terms of their impacts on the promotion of SFM and certification in China. The study revealed general low levels of awareness and understanding about SFM and forest certification amongst various stakeholders in China, with forest farmers having particularly low awareness. Several challenges to the adoption of SFM and forest certification in the period before the new forest tenure reforms were identified by the small-scale forest farmers, including insecure and unclear forest tenure, inconsistent forest policies, inadequate finances, under-developed infrastructure and transport system, and lack of efficient knowledge and technical transfer. Market officials were found to have limited knowledge of SFM and forest certification but their role in educating forest farmers and promoting SFM and certification is particularly important, as government support is considered to be critical to the early and rapid uptake of SFM and certification in China. Chinese manufacturers expressed immense interest in forest certification despite the identified barriers. From their perspectives, the biggest barrier was the lack of market demand for certified wood products. Canadian retailers were chosen as a substitute of Chinese retailers to gain insights into how a more advanced market for certified wood products might evolve, and

how the demand might evolve in China. The new forest tenure reforms and forestry property markets are likely to overcome many of the challenges and enable forest farmers to adopt SFM and certification. That said, the widespread adoption of SFM and certification amongst various stakeholders has a long way to go.

# Preface

A version of Chapter 2 has been published. Chen, J., Innes, J.L. and Tikina, A. (2010) Private cost-benefits of voluntary forest product certification. *International Forestry Review*. 12 (1): 1–12. I conducted all the literature collection and reading and wrote most of the first draft of the manuscript.

Chapter 3 concerns interviews with small-scale forest farmers and market officials working for forestry property markets and is not yet submitted to a peer-review journal. This work was approved by UBC Research Ethics Board (with Certificate Number H09-01065).

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# 1. Introduction

Forests are widely recognized as a vital component of global ecosystems and as being essential for the sustenance of forest-dependent humans. This is reflected in the criteria and indicators of sustainable forest management that have been adopted in Canada (CCFM 1995, 2003), China and elsewhere. By providing a wide range of timber and non-timber forest products (UNECE/FAO 1997), forests are viewed as being of vital importance to the well-being of forest-dependent communities. They can play a major role in the economic and cultural sustainability of communities, providing a source of income generation, enhancing community cohesion and stability, and helping to maintain cultural integrity. In addition to the provision of economic and social values, they play a critical role in the maintenance of environmental services, such as soil and water protection, biodiversity conservation, carbon sequestration and climate change mitigation (UNECE/FAO 1997). That said, since the turn of the twentieth century, numerous challenges have emerged in the forest sector, many of which require global solutions. Such challenges include illegal logging, conflicts over land use (e.g., mining, bioenergy), loss of biodiversity, carbon emissions, and climate change. These issues are becoming increasingly prominent with the globalization of the forest products trade and the availability of a well-developed international transport system.

As a result, there is increasing debate over the extent to which forests and forestry can better serve ecosystems, civil society, communities, and humans in general. Managing forest wisely, responsibly and sustainably has received growing attention worldwide, with a major peak in activity in 1992 when at the United Nations Conference on Environment and Development, the Non-legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of all Types of Forest was agreed. There has also been a recent resurgence

of interest in forests with the realization in the policy community that halting deforestation and forest degradation could play an important role in climate change mitigation. There is a widespread recognition that sustainable forest management could ensure the continuous use, management, and conservation of the world's forests (Schanz 2004), and sustainable forest management is seen as a critical component of the adaptation of forests to climate change (Ogden and Innes 2007).

## **1.1 Sustainable forest management**

Sustainability had been closely related to forest management since as early as the beginning of the 1950s (Kellomäki 1998). In fact, concepts that we would now closely relate to sustainable management have been advocated by central European foresters for over 200 years. Since the 1950s, the concept and practice of sustainable forest management have continued to evolve. Previous concepts regarding SFM linked to sustainable timber production or an alternative term “sustainable timber yield”, which required that timber exploitation should not exceed its growth (Hahn and Knoke 2010). During the 1960s and 1970s, increasing environmental awareness amongst the public and forestry stakeholders had great impacts on the forest sector, leading to the widespread recognition of the use of forests not only for sustained timber production but also for a range of other goods and services. Then the concept of SFM evolved into sustainable forestry or multiple-use forestry (Hahn and Knoke 2010). However, both concepts reflected the narrow definition of SFM during that time.

In the 1980s, environmentalism became a major issue, as highlighted by the publication of *Our Common Future* in 1987, where the concept of sustainable development was first introduced to the world. In 1992, at the United Nations Conference on Environment and Development (UNCED), SFM was broadly advanced through the Non-legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of all Types

of Forest, generally referred to as the Forest Principles. These proposed that forest resources and forest lands should be managed in a sustainable way to meet the social, economic, ecological, cultural and spiritual needs of present and future generations by providing for their multiple and complementary functions and uses (UN 1992). This marked a significant peak in the global attention and efforts that SFM has received and demonstrated the international cooperation required to promote SFM at the national and international levels.

Generally speaking, the idea of SFM is to tackle the ethical principle about the relation between human beings and forests rather than technical issues in forest management (Schanz 2004). The emergence of SFM can be explained by the frequent conflicts between timber production and ecological welfare in forests, which are very often linked to overexploitation and illegal logging, causing loss of forest area in many parts of the world. The loss of forest cover is also triggering other problems associated with forests, such as carbon emissions and loss of biodiversity. There is no single definition of SFM that has been universally accepted, primarily because SFM is highly context-specific, largely depending on the local political, social and cultural context. In addition, both the spatial and the temporal dimensions of SFM need to be considered (Schanz 2004). To date, the most commonly-accepted concept of SFM involves the integration of ecological, economic, and social considerations of forest management (Wang 2004), based on the Forest Principles developed at the United Nations Conference on Environment and Development (UNCED) in 1992.

Since 1992, the concept of SFM has evolved through a large number of initiatives at international, national and local levels aimed at translating the concept into practice under a range of different circumstances. The various different initiatives include Criteria and Indicator (C&I) schemes, national forest programs, participatory/community forestry, adaptive co-management and reduced-impact logging, amongst others (UNECE/FAO 2003). 'C&I' frameworks are an approach taken to

monitor and assess progress towards SFM in forest management, with the Montreal Process C&I being considered to be the most inclusive and comprehensive C&I for the sustainable management of temperate and boreal forests. The Montreal Process identifies seven criteria associated with 67 indicators (The Montreal Process 2010), although one criterion remains under revision. The C&I generally reflect a set of key environmental, social and economic aspects of forests that define the scope of SFM (Brand 1997). Amongst the Montreal Process participants, several countries, including Australia, Canada, China and the United States, have developed their own C&I reflecting the special situations of those countries.

## **1.2 Forest certification**

Forest certification emerged as a response to the concerns over the excessive deforestation occurred in the tropics and its associated biodiversity loss after the inability of establishing a global forest convention in the Earth Summit in 1992 (Auld et al. 2008; Vogt et al. 1999). In the 1980s, the growth in public environmental awareness of the loss of tropical forests, particularly in developing countries, drove boycott campaigns supported by environmental groups. Purchasers were urged to refuse to buy tropical forest products. However, this was considered by the tropical countries as a discriminatory and protectionist mechanism used by consuming countries to control the importation of tropical timber (Vogt et al. 1999). It was also considered that the boycott might hasten the conversion of forest lands to other uses, such as agriculture, because of the lack of demand for tropical timber in the market (Bartley 2003). At the same time, increasing concerns for social issues, such as the rights of indigenous groups, was also a driver for the emergence of forest certification (Vogt et al. 1999). From the demand side, some large retailers (e.g., B&Q in the UK, Ikea in Sweden, and Home Depot in the US) have been forced to give preference to forest products from well managed forests in order to avoid criticisms and boycotts from the environmental groups (Cashore et al.

2005). In addition to these large retailers, some forestry companies started claiming the legality of their products, claims that were quickly questioned by environmental groups (Bartley 2003). As a result, a more credible and legitimate form of verification was needed to demonstrate that wood was being derived from well-managed forests. Third-party forest certification was advocated as a means of providing credible proof for purchasers of the origin of forest products.

In contrast to forest regulations, forest certification was developed as a voluntary market-driven mechanism to promote sustainable forest management by providing direct and indirect market-derived incentives (Cashore 2002; Durst et al. 2006). Instead of using traditional “command and compliance”, the advocates of forest certification attempted to influence forest owners and companies by using “carrots and sticks” method (Cashore et al. 2004). The economic carrots used included improved market access and/or potential of price premiums, whereas the sticks referred to the market-based boycott campaigns aiming at pressuring companies to support forest certification and, in particular, the certification scheme advocated by the Forest Stewardship Council (Cashore et al. 2004).

Currently there are two widely-used global forest certification schemes, namely the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC). The FSC has been strongly promoted by Environmental Non-Governmental Organizations (ENGOs) (e.g., World Wide Fund for Nature) together with other core stakeholders, including indigenous groups, forest worker organizations, and timber traders. It emerged in 1993 after the failure to achieve a binding global forest convention at the United Nations Conference on Environment and Development (UNCED) (Auld et al. 2008). It is represented by tripartite structure sharing equal votes, including economic, environmental and social chambers with equal stakeholders from developing and developed countries. The FSC standard currently includes 10 principles and 56 criteria that aim to promote improved forest management of the world’s forests.

An independent third-party certification body conducts the audits and decides on the issuance of a certificate, a complex process involving a series of steps. However, the FSC encountered initial resistance from forestland owners and forest industry, purportedly because of the leading role that environmental groups had played in its development (Cashore et al. 2004). As a result, a number of forest certification programs have emerged, some of which have been endorsed by the Programme for the Endorsement of Forest Certification (PEFC) (previously the Pan-European Forest Certification) (Auld et al. 2008). The earliest industry-led forest certification scheme was the Sustainable Forestry Initiative, created by the American Forest and Paper Association (AF&PA) in the United States. In Canada, the Canadian Standards Association Sustainable Forest Management Standard (CSA-SFM) was initiated by the Canadian Pulp and Paper Association (now the Forest Products Association of Canada) together with a number of industry associations under the auspices of the Canadian Standards Association (CSA) in 1996. Later, in 1998, the European forest owners' associations formed the Pan-European Forest Certification (PEFC) scheme to facilitate the mutual recognition of national schemes in the Europe. In 2003, it changed its official name to the Programme for the Endorsement of Forest Certification and re-positioned itself as an umbrella organization endorsing national certification schemes globally. To date, PEFC has 34 national members and 29 endorsed national certification systems. Both SFI and CSA-SFM have been endorsed under the PEFC umbrella to collaboratively promote the sustainable forest management of global forests. China's national forest certification standard is currently under the review of PEFC. PEFC endorsement is also used as a standard for various public timber procurement policies, such as those in the United Kingdom, Germany and Japan. Despite, or perhaps because of the competition between the FSC and PEFC, they have become increasingly similar in terms of the scope of the issues that they address (Auld et al. 2008). There are however remaining differences. For instance, the FSC is more prescriptive than the standards endorsed by the PEFC

(McDermott et al. 2008) and has greater emphasis on the maintenance of ecological health (Clark and Kozar 2011). CSA-SFM requires extensive involvement of public stakeholders in the development of the standard (Cashore et al. 2003).

Since its inception, forest certification has grown rapidly in the developed economies (Elliott and Schlaepfer 2001), particularly in North America and Europe where favorable institutions and forest policies were already in position. Worldwide, as of October 2010, the forest area certified under national standards accredited by the PEFC had reached 229 million ha (PEFC 2010a), and 134 million ha in 81 countries had been certified to the FSC standards (FSC 2010a). However, in China, as with the rest of Asia, forest certification is still at a very early stage. The total area of forestland certified under the FSC standard in China is almost 1.4 million ha (FSC 2010a), which is the largest area for any country in Asia. Although a national certification standard was adopted in 2007, this has not yet been implemented operationally (although some test sites exist); the standard is currently undergoing review for PEFC endorsement.

Given this achievement in certification uptake, recent research has been examining the impacts and efficacy of forest certification on forests and forestry. Cubbage and Moore (2008) found that in North America FSC has incurred more changes in forest management (e.g., sustained yield, forest management plans, chemicals, and soil protection) and social aspects (e.g., stakeholder meetings and consulting with communities) than SFI, which, in contrast, has caused more economic and system changes (e.g., logger training and management review). The difference can be explained by the different emphases of the two schemes, with FSC placing greater emphasis on the maintenance of ecological health (Clark and Kozar 2011) while PEFC is generally perceived as being more favorable to the interests of commercial forest industry and forest owners (Auld et al. 2008; Cashore and Stone 2010). Auld et al. (2008) have argued that forest certification could induce improvements at the forest management unit level, but that it was of much more limited impact in relation to halting global deforestation.



Marx and Cuypers (2010) reaffirmed that the macro-effectiveness of forest certification in terms of halting deforestation was marginal due to the inability of weaker actors in developing countries to participate in the certification process.

One of the issues need to be addressed before forest certification can gain broader success in the developed world is the lack of participation of non-industrial private forest owners due to various reasons, including the high costs, limited access to the market of certified timber products and the large amount of data required for forest certification (Vogt et al. 1999). Efforts have been attempted to engage them in certification (UNECE/FAO 2010). Globally, the biggest issue is the unequal development of forest certification in the developing and developed countries as indicated in the unbalanced uptake of FSC and PEFC worldwide (Auld et al. 2008). This disparity contrasts with the original intention of forest certification to halt deforestation in the tropics. Some argued that it would cause land-use to shift from forestry to agriculture in the developing countries and that temperate forest products would replace those from tropical regions due to the import restrictions on non-certified products imposed by some consuming countries (Gan 2005). However, neither of these fears appears to be found, at least at a larger scale. Concerns about forest certification have centered on the market incentives associated with its uptake, given that it was advanced and promoted as a voluntary market-based tool to achieve SFM. To be effective, economic benefits generated from forest certification should outweigh the additional costs incurred, so that forest companies or owners have adequate incentives to engage in the process (Humphries et al. 2001; van Kooten et al. 2005). The costs of forest certification vary widely in developed and developing economies due to a range of factors. In general, forest certification in developing countries, such as China, is harder to achieve and more expensive given the lack of the necessary technical, financial and human resources (Leslie 2004) and the amount of change necessary to achieve the standard. Globally, certification costs may be unaffordable for small- and medium-sized

forest companies and owners because of the variations in size, location, and facilities, amongst other factors (Aguilar and Vlosky 2007; Carter and Merry 1998; Ghazoul 2001; Leslie 2004; Sedjo and Swallow 2002). Thus, early-adopters of forest certification have tended to be industrial groups whose costs are lower than the industry average (Atyi and Simula 2002; Stevens et al. 1998). Wider acceptance of forest certification is therefore dependent on the market incentives that it provides. Maintaining access to current markets or entering more environmentally-sensitive markets has been confirmed by numerous studies as one of the most important and practical incentives for forest companies to obtain forest certification (Cashore et al. 2005; Stevens et al. 1998). It is particularly effective when approaching some niche markets, such as specific government purchasing departments, environmental groups, and buyers' groups (Espach 2006; Vidal et al. 2005), that often seek wood or wood products from sustainably managed forests. Currently, 12 countries have their operational public timber procurement policies in position, including 6 EU member states and 6 countries outside the EU (including China, Japan and Mexico) (Simula et al. 2009). They are increasingly becoming the primary driver of recent developments in forest certification given their substantial expenditures and the influence of their purchasing power (Preuss 2009).

Another important benefit of forest certification is the improved public image that is associated with it, demonstrating strong environmental responsibility and social improvement (Leslie 2004; Vidal and Kozak 2008). Price premiums on certified wood products, in contrast, are contentious and their extent and even their existence has been disputed (Aguilar and Vlosky 2007; Forsyth et al. 1999; Grönroos and Bowyer 1999; Kozak et al. 2004; Owari and Sawanobori 2007; Ozanne and Vlosky 1997; Stevens et al, 1998). In addition, despite customers' expressed willingness to pay the price premiums, little evidence of actual purchasing behaviour was found in early studies (Ruddell and Stevens 1998), although as demonstrated in this study, this appears to have changed in recent years. As price, quality and convenience remain the three most influential factors

affecting actual purchasing behavior, more efforts should go towards factoring environmental considerations into the decision-making process of the majority of customers (Chen et al. 2010). Eco-labeling has been advanced as a way to inform customers about the environmental commitments behind products, although not all certified products reaching the market carry a certification logo, as some large wood products retailers prefer to use their own logo, and place greater faith in the marketing value of their brand name than in that of the certification schemes (UNECE/FAO 2008). In addition to the market incentives, non-market benefits of forest certification are important, such as commitments to social improvements and environmental responsibility (Humphries et al. 2001; Owari et al. 2006).

Several challenges need to be addressed in attempting to extend forest certification to developing economies, such as China. For instance, low levels of awareness and knowledge of certification, a challenge not only in developed economies but also in developing economies, are often reported (Jayasinghe et al. 2007; Ratnasingam et al. 2008a; Stone 2006; Vlosky et al. 2003; Wang et al. 2005a; Zheng and Jiang 2002). Although some groups (e.g., forest companies, forest managers) have noticed and recognized the importance of SFM and certification, it is not yet widely accepted by other groups, particularly the general public. Surveys have revealed a lack of awareness in the market place, which, in turn, has been resulting in a lack of demand for certified wood products from customers, including wood products retailers and end-consumers. More comprehensive and all-inclusive publicity campaigns (such as through advertising and eco-labeling) are needed to enhance the recognition of SFM and forest certification (Archer et al. 2005; Kozak et al. 2004; O'Brien and Teisl 2004; Owari and Sawanobori 2007; Zhu et al. 2007).

The lack of market demand is believed to be partly attributable to the uncertainties over price premiums associated with certified wood products, which some authors claim are rarely realized in the market place (Ratnasingam et al. 2008a). This

however depends very much on the product: a significant price premium on low-grade lumber is much more difficult to achieve than on a specialized piece of hand-made furniture. The lack of affordability of forest certification, including direct and indirect costs, is also an impediment to the uptake of forest certification, being particularly obvious in developing economies where environmental issues and poverty are often present together (Bass et al. 2001; Chen et al. 2010; Innes and Hickey 2005; Leslie 2004). Other constraints limiting the adoption of forest certification in developing economies include the lack of appropriate institutions to administer certification schemes, inadequate incentives, under-developed infrastructure and transportation systems, limited professional personnel and facilities, poor management practices, conflicts between the voluntary features of forest certification and the processes associated with collective forest ownership, the absence of a culture of stewardship, and the lack of a cohesive system of governance that would enable SFM and forest certification (Stone 2006). Within China, the path and direction that forest certification will take is unclear, including whether it will become a major feature of the Chinese forest sector, and the degree to which forest owners and companies are willing to obtain forest certification and how long it will take.

### **1.3 The Chinese context**

China has 176.8 million hectares of forest, of which 99.4 million ha are collectively owned, accounting for nearly 56% of China's forest cover, with the remaining forests being state-owned (SFA 2007). China can be divided into four forest regions and two major management regimes, one state-run, and the other being collective ownership (Rozelle et al. 2003; SFA 2007; Yi 2004). State-run forest farm management covers almost all the northeastern provinces, including Liaoning, Jilin and Heilongjiang, which have the richest timber resources in China (Rozelle et al. 2003). Almost 75% of the collectively-owned forests are located in South China, with Fujian and Jiangxi being

particularly important (Xi 2007). Using Fujian as an example, prior to forest tenure reforms, 88% of the forests were collectively owned (Yang and Ming 2006), and the average area of arable land per capita in the province was less than 0.04 ha, while the average area of forested land per capita was 0.27 ha. In the city regions of Nanping, Sanming and Longyan, the forested land per capita can be as high as 1 ha (Sun 2007). As 56% of the population lives in mountainous and heavily forested rural areas where poverty is widespread, economic development is a priority although it has been recognized that this should not occur at the cost of environmental degradation (Jia 2007).

Half a century of over-exploitation of forest resources and creation of monoculture plantations in China has had catastrophic consequences, such as an increase in flooding severity in the upper Yangtze River, the degradation of natural forests and associated deforestation, soil erosion, desertification, climate change and loss of biodiversity (Zhang et al. 2000). These are believed to be the drivers of the unprecedented drying-up of the Yellow River in 1997 and the massive flooding in the Yangtze River in 1998. In response, the central government has pursued ecological rehabilitation (Xu et al. 2006), including a series of key national programs and forest policy reforms, such as a logging ban in natural forests and forest tenure reforms. The result of the logging ban has been a dramatic decrease in timber supply. This has driven China to acquire wood from outside its borders, with Russia being one of the major sources because of the low tariffs imposed on exported wood. However, when Russia increased its log tariffs, China started to focus on building its domestic timber supply, mainly through the development of large areas of plantations. The new forest tenure reforms transferred collectively-own forest land to individual farmers, making them the biggest potential timber suppliers for the forest industry. It is hoped that by 2020, China will be self-sufficient in domestic timber, despite the increasing demand of the forest industry. During this era of reforms, China's forest sector has experienced rapid progress in environmental stewardship. For instance, the number of personnel employed to plant

trees and to protect and manage forests tripled between 1998 and 2002 (Xu et al. 2006). However, local governments continue to favour economic growth over the environment, making these reforms hard to achieve (Wang et al. 2007).

China's forests and forest sector have received national and international attention throughout the last decade. Domestically, there have been significant changes in forest tenure, with the transfer of collectively-owned forests to individual farmers. Yong'an City in Fujian province is one of the pioneers of these reforms and has been copied by other forestry-dependent cities. Internationally, the global economic crisis affected China and had substantial impacts on China's forest sector, particularly for those forest product companies targeting foreign markets. The increasing awareness of forest degradation and climate change together with the advocacy for the worldwide sustainability of forest management have brought China and China's forest sector to the centre of global environmental efforts. As a result, there has been increasing attention devoted to the implications of sustainable forest management (SFM) and forest certification for China's forest sector and the possibilities of successfully implementing both.

Since 1994, China has taken a number of steps towards the promotion of SFM and forest certification, initiating in 1994 a process to develop national level Criteria and Indicators for SFM (The Montreal Process 1994). In July 1999, the State Forest Administration (SFA) and WWF held a seminar on SFM and forest certification to improve the understanding and recognition on SFM and forest certification amongst various audiences, including government, academics and forestry enterprises. In 2000, it hosted the 12th meeting of the Montreal Process working group (The Montreal Process 2000). The following year, a Forest Certification Service was founded within the SFA, and a working group was established to guide the promotion of forest certification across China. A national standard was developed and officially released in 2007 and currently is under the review by the Programme for the Endorsement of Forest Certification (PEFC).

Forest Stewardship Council certification is the other widely accepted certification scheme in China, with nearly 1.4 million hectares of FSC certified forests and 1393 FSC CoC certificate holders (FSC 2010a), despite the absence of a national or regional FSC certification standard. Although both the area of FSC-certified forest and the number of FSC CoC certificate holders are the biggest in the Asia, they represent only a small proportion of the global figures.

The various levels of government in China have attempted several strategies to build capacity for SFM and forest certification, including the ongoing forest tenure reforms and their associated supporting mechanisms, such as the forestry property markets. Collective forest ownership has been criticized for impeding the progress of poverty reduction as well as the development of SFM. It has also been alleged to be a major cause of the lack of incentives for forest farmers to manage forests, primarily because of the separation of ownership and management practices (Xu et al. 2006). Numerous disputes existed prior to the initiation of the forest tenure reforms, including over insecure and unclear forest tenures, the lack of explicit economic incentives to become involved in forest management, illegal logging (mostly in the form of timber theft and forest encroachment), unequal responsibility and benefit sharing amongst villagers, inadequate economic rewards stemming from forest-related activities, the lack of capital investment in forests, and the unequal distribution of lack of timber revenues (Jia 2007; Liu et al. 2007; SFA 2007). Many of these have greatly hindered the potential adoption of SFM and certification in China. Forest tenure reforms were advanced to help resolve these disputes.

Forest tenure reforms were introduced to enhance forest farmers' incomes as well as to maintain the health of forest ecosystems. Two primary objectives of the reforms are to stop illegal logging and to enhance the motivation of forest farmers to use the forests allocated to them sustainably (Yang and Ming 2006). The underlying mechanism is to transfer the rights to use collective forest land to individual forest farmers who are

dependent on the forests for income generation, with each receiving rights to a small land area (less than 2 ha). Forest farmers are empowered with full usufruct rights to ensure that they are able to derive the benefits from the forest land allocated to them, with ownership of the land remaining with the State (SFA 2007). The greater sense of security that the reforms engender is likely to boost the willingness of forest owners to support and invest in SFM and forest certification in return for sustained and long-term economic rewards.

In 2002, a pilot tenure reform was attempted in Wuping in Fujian; one year later it was successfully replicated in other areas of Fujian. After five years, the forested area in Fujian province had increased 2.4%, reaching almost 63%, and positioning it as the most heavily forested province in China (SFA 2007). The same approach and measures have been adopted in other provinces, including Jiangxi, Yunnan and Liaoning. Fujian, Jiangxi, Liaoning, Zhejiang and Yunnan had completed the tenure reforms by October 2009, and Hebei, Jilin, Anhui, Hunan, and Sichuan had undertaken to transfer most forest property rights. The process has now been extended to the remaining provinces in China, where the reforms have been tested in several places and will take effect in the near future (Xu and Zhu 2009). Forest tenure reforms have now covered 19 out of 32 provinces in China and almost 85 million ha of collective forestland have been transferred to individual farmers across China, accounting for 50% of total collective forest land (Xu and Zhu 2009).

Some outcomes of forest tenure reforms identified by previous studies are likely to promote the future development of SFM and forest certification in China, such as clear and secure forest tenure, greater willingness to tend and manage forests and to protect forest resources, more capital investment, a dramatic increase in forest farmers' income and village revenues, optimized forest economics structure, improved community cohesion and stability, improved infrastructure and transport system, and improved social welfare and security (SFA 2007). This study tested this by examining



the perceptions of forest farmers who have already benefited from these reforms and by exploring the impacts of the reforms on the development of SFM and forest certification in China.

Forestry property markets were introduced as a supporting mechanism for the forest tenure reforms and are intended to provide a one-stop service for forest farmers. They are intended to provide a platform for forest farmers with small areas of forest land to fully realize the usufructs over their forest property. Yong'an Forestry Element Market, established in 2004, was the first of its kind and was followed by Tonggu Wood and Bamboo Trading Center one year later. So far, the centres have provided six major services, including forest property registration, forest property mortgage, wood and bamboo trading, forest resources evaluation, forest technology and regulations consulting, and the training of forest labour. The forestry property markets enable smallholders to convert their forest assets into capital and facilitate transparent and fair transactions with lower exchange costs (Zhu et al. 2010). Considering their frequent and direct contact with forest farmers, they may be one of the most effective channels for conveying knowledge about SFM and forest certification to forest farmers. As such, they also have the potential to further promote SFM and certification.

Despite the numerous efforts to promote SFM and forest certification in China, many impediments still exist. These differ among stakeholders. When attempting to examine the challenges facing China's forest sector, four influential actors are involved in the process. These four actors include two direct potential adopters of SFM and certification, small-scale forest farmers as the timber suppliers who have received forest land from the collectives and Chinese wood products manufacturers, who are the potential purchasers of certified wood and are the potential suppliers of certified wood products. The two others are indirect participants that either do or could significantly influence the adoption of SFM and certification: market officials working for the forestry property markets and Canadian wood products retailers (who can indicate the market

demand for certified wood products in a more mature market). Forest tenure reforms and forestry property markets will significantly change timber ownership and the mode of timber supply and purchase; as a result, their role in the promotion of SFM and certification has also been assessed.

Small-scale forest farmers who have received forestland from the collectives are emerging as critical players in the development of SFM and certification in China, despite the small land areas initially obtained (less than 2 ha). As potential adopters of SFM and certification, their acceptance and interest has substantial implications for the future uptake of SFM and certification in China. The coexistence of poverty and environmental problems represent the biggest potential challenge to the adoption of SFM. Currently, 58 million people in China are considered to be below the poverty line, and this figure would be considerably higher if the United Nations threshold for poverty (<\$1.25 a day) was adopted. As a result, poverty reduction and improvement of local livelihoods are pivotal concerns for various forest-related policies reforms and initiatives, although much attention has also been given to the maintenance of ecosystem welfare. Poverty reduction is often linked to increased timber harvesting or other intense forest-related activities undertaken to generate economic gain. Many poor forest farmers survive on income derived from unsustainable and short-term activities that have detrimental impacts on the environment and compromise the sustainable development of forestry in China (Zhang et al. 2002). In such situations, the absence of capital means that the potential costs incurred within SFM and certification would be prohibitive. This is particularly true when management practices need to be improved in areas such as the upgrading of equipment or facilities, or where experts need to be hired to develop management plans.

Insecure forest tenures and poor forest management practices are further deterring the adoption of SFM and forest certification in China. This is because of the inconsistent forest policy reforms that have arisen as a direct result of the various tenure

reforms undertaken in collective forests. As a result, forest farmers have lost confidence in the forest authorities (Xu et al. 2008). A lack of explicit economic return has resulted in farmers having little interest in managing the forest sustainably and has led to illegal logging (White and Martin 2002). Other impediments include poor infrastructure and transport system, lack of local organizations, and weak knowledge and technology transfer. The introduction of forest tenure reforms is expected to help overcome some of these barriers, even though the original goals of the reforms were not intended to promote SFM and forest certification.

Two case study sites were selected to examine whether the reforms might encourage SFM and certification. One involved Yong'an and Yong'an Forestry Element Market in Fujian province, the other one was Tonggu and Togngu Wood and Bamboo Trading Centre in Jiangxi province. Small-scale forest farmers who have already received forest land through the tenure reforms and market officials working for the two affiliated forestry property markets were interviewed to gain insight into their awareness and understanding of SFM and certification and to uncover the obstacles hindering their further adoption.

Chinese wood products manufacturers, as another potential adopter of forest certification, play a critical role in the pursuit of SFM and forest certification in China's wood products industry. They are important partly due to the dual roles they play. One role involves the purchase of timber from forest farmers, and they could be pushing for SFM and certification. The other is the role they play in selling value-added wood products into markets demanding certification or at least sourcing from sustainably managed forests. Taking advantage of the ready supply of cheap labour, China's wood processing industry has experienced exponential growth, resulting in a rapid growth in the demand for timber. The limited supply of domestic timber cannot meet this demand largely due to the logging ban imposed on natural forests, the major source of timber supply in the past. The discrepancy between fibre supply and demand has led to the

procurement of fiber from other countries (Sun et al. 2004a). Over 70% of the timber is imported from countries in the Asia Pacific region, and many of these countries have been plagued with issues such as unsustainable forest management or inadequate operational practices, high levels of illegal logging, and negative impacts on community livelihoods (Katsigris et al. 2004). This makes China's forest industry particularly important to the global development of forest certification. However, China is currently adopting a "wait and see" attitude, as the market benefits that will be derived from forest certification are far than clear. The uncertainty over the availability of potential benefits related to forest certification is a problem that extends to both developed and developing economies (Rametsteiner and Simula 2003). It is particularly true for Chinese wood products manufacturers given that the costs incurred in obtaining forest certification could be much higher than for their counterparts in developed economies (Leslie 2004). Thus far, most forest certificate holders in China have been focused on foreign markets with higher environmental consciousness and higher market acceptance of certification, such as in North America and Europe (Zheng and Jiang 2002). The barriers to the future adoption of forest certification by the Chinese wood products industry are however unknown so as are the extent of any certification intentions amongst companies focusing on the domestic, given the lack of market demand for certified wood products from customers. This section of the study was conducted to fill a gap in our knowledge of wood manufacturers in China by conducting personal interviews with the managers of 20 selected wood products companies, aiming to explore their awareness of forest certification, to reveal the barriers to their uptake of certification, and to identify the potential motivations for such uptake.

A purported lack of market demand has been suggested as the primary impediment to the development of forest certification (Durst et al. 2006; Huang et al. 2009a; Huang et al. 2009b; Merry and Carter 1997; Owari and Sawanobori 2007; Rametsteiner et al. 1998; Vlosky and Ozanne 1999; Yan et al. 2003). Given that there is

almost no market demand for certified wood products in China, it is too early to examine Chinese customers' preference and demand for certified wood products. However, customer requests for certified wood products and their recognition of certification are of considerable interest to certified wood products suppliers. In view of this, a more mature and environmentally-conscious market was chosen to assess customers' perceptions on forest certification and its efficacy, namely, Canadian wood products retailers. There were several reasons for choosing this group. Firstly, Canada was one of the earliest adopters of SFM and forest certification and has claimed to be the world leader in both fields (Canadian Council of Forest Ministers 2006). Thus, it has a wealth of experience that could be used in informing China's pursuit of forest certification. Secondly, forest certification has become a major trend for forest companies in North America and Europe, and Canada is considered to be leading this development, as judged by the following figures.

- Canada has 417.6 million hectares of forests, representing about 10% of the world's forests, of which 234.5 million hectares are considered "commercial forests" (Canadian Forest Service 2001). As of March 2010, 150 million ha of forest had been certified, accounting for more than 40% of the 344 million ha of certified forestland in the world (FSC 2010b; PEFC 2010b).
- Canada has the largest area of third-party independently certified forests in the world, when FSC and PEFC are taken together.
- Canada accounts for over one third of the certified forest areas with PEFC-endorsed certification and more than one fourth of all FSC certification worldwide (CSA 2010; FSC 2010a).
- The Forest Products Association of Canada (FPAC) committed to have all its members' forestry operations certified to one of the three dominant third-party certification schemes, and achieved this by the end of 2006 (Forest Products Association of Canada 2007).

In order to stimulate market demand for certified forest products, many publicity activities have been conducted to better inform and educate end-consumers of the benefits of forest products derived from sustainably-managed forests. A range of instruments have been adopted, including advertisement, eco-labeling, point-of-sale display, and other approaches (Archer et al. 2005; Kozak et al. 2004). Some of the strategies are likely to influence customers' purchasing decisions (Anderson and Eric 2004; O'Brien and Teisl 2004; Sedjo and Swallow 2002; Teisl et al. 2000, 2002). In addition, certain niche markets have expressed willingness to purchase certified forest products and to pay a price premium (Forsyth et al. 1999; Kozak et al. 2004). As all these studies were conducted several years ago, they do not reflect the current situation of Canadian wood products retailers. To better understand the Canadian situation, a nation-wide survey was conducted to assess the current uptake of forest certification amongst Canadian wood products retailers, to reveal the reasons for stocking certified products, and to determine presence and extent of price premium. This research has relevance to Chinese wood products manufacturers who are obtaining or considering obtaining forest certification. The results provide evidence of the current demand for certified wood products in Canada and predict the potential demand from Chinese domestic markets. The results will facilitate further uptake of forest certification amongst Chinese wood products manufacturers interested in entering Canadian markets.

Collectively, these four actors along the timber and wood products supply chain will be assessed in order to better predict the prospects for SFM and forest certification in China's forest sector, which were still far from clear at the time the study was being conducted. It is very difficult to predict the direction that SFM and certification will take and how they will affect forest industry, forest owners and various levels of government, given that no in-depth studies have been undertaken of the relevant stakeholders to identify the uncertainties and their potential solutions. The levels of awareness and acceptance amongst various stakeholders are unknown. The barriers hindering the future

development of SFM and forest certification in China are also unknown. SFM and forest certification have yet to be widely adopted in China. This study aimed to help resolve some of the uncertainties surrounding this adoption by investigating these four influential actors involved with SFM and forest certification.

## **1.4 Research rationales, objectives and methods**

The concept and practice of SFM has continued to evolve, and has been influenced by two types of policy instruments, namely hard and soft laws (Hickey 2004). Hard law is defined as agreements on principles that have a high degree of legal security based on a constitution and ratified by parliament, and which are characterized by higher levels of obligation, precision and delegation than soft law (Hickey and Innes 2003). The most prominent advantage of hard law is that it is universally applicable within a particular jurisdiction (Hickey 2004), enabling a jurisdiction to deal with illegal forest practices that pose a threat to the achievement of sustainable forest management (Kishor and Rosenbaum 2003). It is commonly acknowledged that the enforcement of hard law is frequently compromised by corruption and lack of enforcement (Hickey 2004), making many of the benefits of hard law difficult to realize.

The observed weaknesses of hard law facilitated the emergence of soft law, particularly in the absence of effective national and intergovernmental regulations and legislation (Fanzeres and Vogt 1999). As a forestry hard law is only applicable within a particular jurisdiction, and there is no consensus on a legally-binding international forestry convention, soft law has been advanced as a flexible, bottom-up, transnational instrument to address the global environmental and social issues related to the forest sector. In this regard, soft law refers to commitments that are not legally binding, but which have effects that evoke a legal process or form (Christians 2007). Although not viewed as law, soft law still generates a law-like sense of obligation in states (Christians 2007). In addition, soft law can dramatically influence the future development of hard

law, as many of the elements of soft law can later be morphed into legislation. Another benefit associated with soft law is that it is a flexible option for states when they are reluctant to commit to environmental initiatives being advanced to balance environmental, economic and social goals. In the context of the forest sector, soft law covers amongst others third-party forest certification, non-binding international treaties, and industry-led initiatives (Hickey 2004; Hickey and Innes 2006). In this study, only forest certification was taken into consideration. Certification is very relevant to the Chinese context given that the Forest Stewardship Council (FSC) has been operating in China and its national scheme has been released and pilot-tested.

The underlying rationale of certification is a market-based incentive for sustainable forest management forest producers and companies (Cashore 2002; Cashore et al. 2004; 2005), with improved forest management securing market access and share. The market-driven approach makes use of the influence of market players to pressure forest owners and companies to adopt forest certification. This theory was used as a guideline for the study, which examined the adoption of forest certification among Chinese forest farmers and wood products manufacturers. Numerous studies have been conducted that examine the participation of forest products manufacturers. As early as 1998, Vlosky and Ozanne (1998) examined US manufacturers and found that they were not willing to adopt and bear the additional costs of forest certification. Then, in 2003, Vlosky et al. (2003) suggested why value-added wood products manufacturers might be participating in forest certification. These reasons included seeking to increase sales volumes and market share, improved company image, and the commitment of business owners to environmental issues. Vlosky et al. (2003) also found around 20% of respondents were willing to pay a premium of up to 3%. Later, Vlosky et al. (2009) conducted a comparative study regarding the participation of the US value-added wood industry in forest certification in 2002 and 2008. The study revealed the reasons for getting involved in certification, amongst which were business owners' commitment to



the environment, taking advantage of growing markets, increased sales, and enhanced company image.

In developing countries, some studies have been conducted to identify the reasons deterring the adoption of forest certification. For instance, a study of Malaysian wooden furniture manufacturers revealed that the lack of price premiums, limited market potential and high cost were the three most cited reasons deterring them from adopting CoC certification (Ratnasingam et al. 2008). In addition, a poor understanding of CoC certification amongst Malaysian manufacturers was also an important reason for the slow uptake of forest certification. One study conducted in China (Huang et al. 2009) examined the factors influencing forest products manufacturers' adoption of forest certification and found that the recognition of forest certification was the most important. Huang et al. (2009) proposed that this recognition should be coupled with strong government support in order to increase uptake of certification in the forest industry. All the studies have found that market incentives (e.g., price premium, market access) were important but lacking. In the developed economies, it is the commitment of business owners to environmental issues that is reported as the most important reason for adopting forest certification, whereas in the developing economies this may be impossible due to the low awareness of certification. With the expectation of the study by Huang et al. (2009), little else is known about Chinese manufacturers' attitudes towards forest certification. An interview-based exploratory assessment of Chinese manufacturers' views on forest certification was therefore conducted. By using the theory of market-driven approach, the study identified the reasons and motivations for Chinese wood products manufacturers to engage in forest certification.

There have been no studies examining the involvement of smallholders (including small-scale forest farmers) in forest certification in China. This is partly because on-going tenure reforms have only recently put forest lands in the hands of private individuals. Some authors have discussed the potential reasons for forest

certification among smallholders elsewhere. For instance, Vogt et al. (1999) have identified why smallholders might be interested in forest certification, including visible confirmation of operating the highest standards of forest management practices (also in Taylor 2001), readiness to acquire price premiums if there are any, a reduction in the need for additional regulations (also in Taylor 2001), and alleviating some of the tensions between public interests and private rights. Kruedener (2000) has also revealed that certification was able to improve relations with governments and outside donors and to impact on negotiations with government authorities regarding tenure and use rights. Taylor (2001) found that certification might enable community-based enterprises to access high-value export markets.

Udo de Haes et al. (2008) went much further than earlier authors, and divided the potential benefits for forest managers regarding forest certification into three types, namely, direct economic benefits of higher profits such as price premium and donor support, indirect economic benefits of better access to markets and long-term sales agreements, and non-economic benefits such as improved forest management by technical or commercial support and improved labour conditions leading to more safety and more secure tenure rights. They found that only indirect economic benefits including improved market access and sales agreements were particularly relevant to forest certification. These studies suggested that in addition to economic incentives (e.g., price premium, improved market access and more consistent sales agreements), forest certification is also viewed as an effective way to circumvent additional government regulations and to alleviate actual and potential conflicts with the public. In China, it is still uncertain whether forest certification as a market-driven approach would provide adequate incentives for forest farmers to engage in the process. It is against this backdrop that this study, involving two case studies and a range of personal interviews, was conducted to examine the perceptions of forest farmers with small forest holdings on forest certification and sustainable forest management.

Thus far, the provision of environmental services in China relies more on regulatory than market approaches, as witnessed by the growing number of national policies and strategies focusing on the environmental services of forests, with the logging ban on natural forest in China being an example. The ongoing decentralization of forest management in the collective forest is another prominent strategy adopted by Chinese forestry authorities with the purposes of stopping illegal logging and enhancing farmers' incentives to manage the forest more sustainably. The theory of decentralization suggests that it may lead to improved forest management (Larson and Ribot 2004), which is expected to be conducive to sustainable forest management. It is based on the following logic: common property seems to lead to the tragedy of the commons (Hardin 1968) whereas private ownership ensures that owners have higher incentives to manage their resources well and sustainably (Gibson et al. 2002; Tucker 1999). In addition, decentralized forest management would increase productivity and secure returns and long-term incentives (Capistrano 2008). It would also enable enhanced conservation and environmental improvements (FAO 2006; Sayer et al. 2005). These assumptions formed the basis for my study, and I presumed that the decentralization of forest management to individual farmers would facilitate the adoption of sustainable forest management in China.

In my study, I attempted to explore the challenges facing the adoption of forest certification and sustainable forest management in China using the above-mentioned two theories as guidelines, namely, the theory of market-driven approach and the theory of decentralization. The primary objective of the study is to understand the factors influencing the acceptance and implementation of sustainable forest management and certification among small-scale forest farmers and wood products manufacturers in China through investigating their perceptions and attitudes on both issues. The basic hypothesis underlying the study was that the development of certification and sustainable forest management in China is attainable among Chinese wood products

manufacturers and small-scale forest farmers, despite numerous impediments. In addition to the two theories, my research hypothesis was also constructed taking into account a number of other factors: China's national forest certification scheme has been released and pilot-tested in 13 provinces in China, the certified forest area and the number of CoC certificate holders are increasing every year in China, and the successful implementation of forest tenure reforms is providing these potential for the adoption of sustainable forest management and certification. My hypothesis was tested by addressing the following questions:

- What are the costs and benefits associated with forest certification given that it was promoted as a market-based mechanism to motivate forest managers and companies to become involved voluntarily in the process? How might the costs and benefits affect the propensity for the uptake of SFM and certification? These questions were examined through a comprehensive literature review of the costs and benefits associated with certification (Chapter 2).
- What perceptions do forest farmers with small forest land areas have of SFM and forest certification, and what might be the barriers to their acceptance of SFM and forest certification in China? To what extent might the ongoing forest tenure reforms and their supporting mechanisms, specifically forestry property markets, be promoting the adoption of SFM and certification in China? What have been the impacts of the two selected forestry property markets (Yong'an in Fujian province and Tonggu in Jiangxi province) in China and what is their role in facilitating the transfer of knowledge and technical know-how pertaining to SFM and forest certification, in securing greater financial availability, and in promoting transparent and fair tenure transactions? A case study approach was used to gain detailed information and develop a thorough and comprehensive description and analysis of the

two selected markets. The questions were answered through interviews with small-scale forest farmers who had obtained forest land through the process of forest tenure reforms as well as with market officials working for the two selected forestry property markets (Chapter 3).

- How are wood products manufacturers in China responding to certification? This involved gaining an understanding of their wood sources, their knowledge of SFM and forest certification, their willingness to accept forest certification, their motivations to do so, and their expectations of the market demand for certified wood products. These questions were tackled through interviews with forest managers of wood products companies in China (Chapter 4).
- What role are wood products retailers playing in driving SFM and forest certification? What are their perceptions of the effectiveness of forest certification as a means to achieve SFM? To what extent are they willing to promote SFM and forest certification and what motivates them to do so? What are the implications for the adoption of certification in the Chinese forest sector? These questions were addressed through an assessment of Canadian wood products retailers' attitudes toward SFM and forest certification. Canadian retailers were assessed because the Chinese certification process is not sufficiently advanced to examine this in China. The perceptions of Canadian wood products retailers were considered to be indicative of likely future directions in wood products retailers worldwide. This work was fulfilled through a nation-wide questionnaire survey administered across Canada (Chapter 5).

## **1.5 Thesis framework**

The research presented here proceeded in four phases and was completed in four years.

It involved work with Chinese small-scale forest farmers, market officials working for forestry property markets in two forestry-dependent areas in China, wood products manufacturers in China, and forest products retailers in Canada. The following flowchart indicates how the thesis is organized.

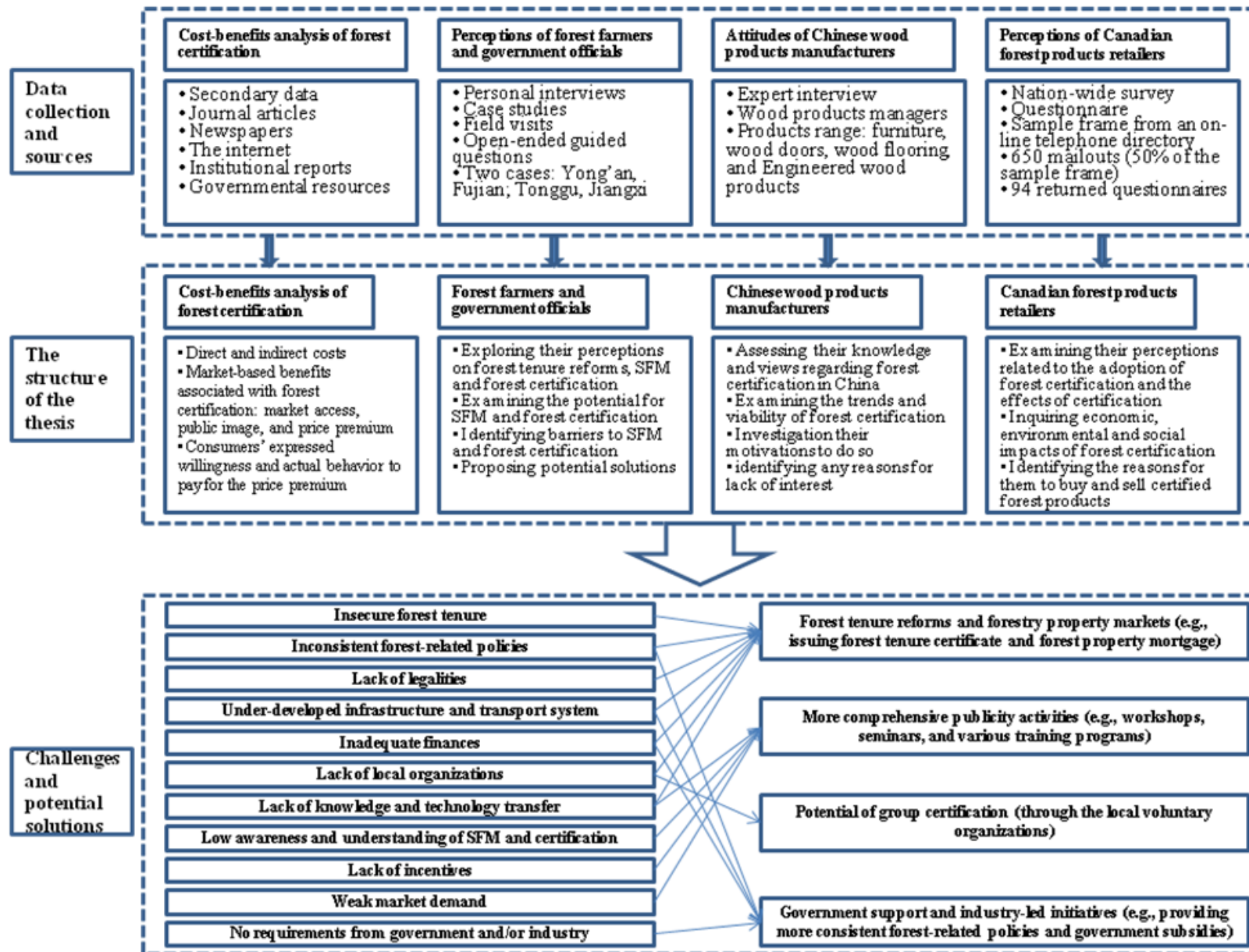


Figure 1.1 Flowchart for the research

The thesis is organized as follows:

Chapter 2 contained a synthesis of the existing literature aimed at assessing the cost-benefits associated with forest certification. Information has been drawn from a range of sources, including journals, newspapers, institutional reports, governmental resources and the internet.

Chapter 3 examines the implications of the ongoing forest tenure reforms and their associated supporting mechanism, the forestry property markets, on the potential adoption of SFM and forest certification in China. This part of the study was undertaken using case studies of two forest-dependent cities with affiliated forestry property markets, Yong'an in Fujian province and Tonggu in Jiangxi province. The case studies were developed from interviews with small-scale forest farmers and market officials working for the forestry property markets. Two field visits were conducted to the two selected markets. Perspectives on sustainable forest management and forest certification were sought using open-ended questions in order to gain a better insight into the key elements contributing to further adoption of SFM and forest certification.

Chapter 4 explores the attitudes of Chinese wood products manufacturers towards forest certification. Interviews were conducted to gain insights into their views and attitudes, their motivation for uptake and reasons for not doing so. This assessment was restricted to the managers of 20 selected wood products manufacturers located in China. Purposive sampling was employed to develop the list of potential participants based on a diversity of professional knowledge and a willingness to participate in the study.

Chapter 5 assesses the perceptions of Canadian wood products retailers pertinent to forest certification and its effects through a nation-wide questionnaire survey. Four widely accepted forest certification standards were taken into account: ISO 14001, Forest Stewardship Council (FSC), Sustainable Forestry Initiative (SFI), and the Canadian Standards Association Z809 Standard (CSA). The survey inquired about the



economic, ecological, and social impacts of forest certification, namely wood purchasing policies and price premiums on certified wood products.

Collectively, I examined four actors significantly involved in influencing the uptake of SFM and forest certification. While there have been some surveys undertaken in China, this represents the first systematic attempt to assess the feasibility and propensity for the adoption of SFM and forest certification in China. It is also the first attempt to examine the influence of the new forest property markets on the acceptance of SFM and certification in China.

## **2. Private cost-benefits of voluntary forest product certification**

### **2.1 Introduction**

Forest certification was initially developed as a response to concerns about the degradation of forests and the social, economic and environmental consequences of forestry (Leslie 2004; Rametsteiner and Simula 2003), particularly in the tropics. Since then, it has been widely adopted as a means to demonstrate that a forest is being managed sustainably, with the majority of certifications occurring in temperate and boreal forests (Durst et al. 2006). Weaker uptake has been found in the tropics, the top priority of forest certification, because of the enduring challenges facing tropical forest degradation (Cashore and Stone 2010; Vogt et al. 1999). The additional costs incurred could make forest certification prohibitive for tropical countries, despite in many cases substantial financial subsidies from outside donors. The underlying rationale of certification is that it is a market-based incentive for sustainable forest management undertaken by the forest industry (Cashore 2002), with the improved forest management securing market access and share, while at the same time various public and market-based campaigns have pressured forest companies to support forest certification (Cashore et al. 2004). However, while premiums for certified wood products have often been sought, relatively few examples have been documented.

There are many different certification schemes, although internationally they are increasingly dominated by regional or national schemes endorsed by the Programme for the Endorsement of Forest Certification (PEFC) or the Forest Stewardship Council (FSC). The different schemes can be broadly classified into two types, one being process-based, typified by ISO 9000 and ISO 14000, and the other being performance-based, typified by the FSC standards (Haener and Luckert 1998). Although

the procedures for these two approaches are dissimilar, the distinction between them is unclear as almost all certification schemes contain some elements of both (Bass et al. 2001) and there has been considerable convergence amongst different schemes. In addition, the nature of forest certification can also vary according to the standards being adopted and the degree of implementation of these sets of standards. The requirements of certification are continuously evolving; in the past, three types were recognized, namely, first-party certification, second-party certification and third-party certification (Innes and Hickey 2005). Today, third-party certification, whereby a forest management operation is certified by a completely independent party as meeting the requirements of a particular standard, is increasingly considered to be the only credible form of certification (Rametsteiner and Simula 2003).

Since its first adoption in the 1990s, forest certification has experienced phenomenal growth. Although it was initially viewed with skepticism, it did not take long to gain widespread acceptance in the developed world (Elliott and Schlaepfer 2001). Worldwide, as of October 2010, certified forest areas with PEFC certification had reached 229 million ha (PEFC 2010a), and 134 million ha of forests in 81 countries had been certified to the FSC standards (FSC 2010a). In Canada, as of September 2009, more than 150 million ha of forests had been certified to the three major certification programs in use in Canada, including 73.7 million ha under CAN/CSA-Z809 SFM Standard (PEFC 2009a), 48 million ha under the SFI standard (PEFC 2009a) and 28.8 to the FSC standards (FSC 2009).

As a voluntary market-based tool, the future of forest certification is dependent on market-derived financial incentives, access to markets specifying certified wood as a requirement and the ability to avoid criticism over management practices. To be effective, economic factors affecting both direct and indirect profits (Humphries et al. 2001), such as a market premium for certified products or market access, must provide sufficient incentives for wood producers and forest owners to bear the costs of certification (van

Kooten et al. 2005). Numerous studies have been conducted to examine the price premium existing in the market and the extent to which customers show willingness to pay (Aguilar and Vlosky 2007; Forsyth et al. 1999; Grönroos and Bowyer 1999; Kozak et al. 2004; Ozanne and Vlosky 1997; Owari and Sawanobori 2007; Stevens et al. 1998). There is indeed a market niche that places greater emphasis on the sourcing of the wood than on the price. For example, Ozanne and Smith (1998) found that approximately 25 million Americans may seek out environmentally certified wood products. Bigsby and Ozanne (2002) identified two market segments for outdoor furniture in New Zealand that considered environmental aspects as foremost, accounting for 58% of the respondents. More often, premiums are highly dependent on the nature of the products. For instance, high-end forest products (e.g., a handmade piece of furniture) can more easily generate a premium than commodity goods (e.g., lumber and pulp and paper products) (Auld et al. 2008).

However, there has been controversy over whether willingness to pay price premiums driven by the environmental concern about how the forests should be well managed can be translated into actual purchasing behaviour (Anderson et al. 2005; Hansen 1997; Ruddell and Stevens 1998; Sedjo and Swallow 2002). Some authors measured actual purchasing behaviour and found that the majority of consumers preferred certified plywood than uncertified plywood on the condition that all the other aspects of the products were the same, including price (Alboher 2004; Anderson and Eric 2004). Other researchers implied that the current use of simple eco-labels without any description from a variety of certification organizations precludes a price premium (O'Brien and Teisl 2004; Teisl 2003). Teisl (2003) argued that displaying detailed information about environmental attributes on the label would be a more effective way than simple eco-seals, thereby providing consumers with an adequate basis for product differentiation. However, the proliferation of different forest certification schemes and their associated eco-labels in the marketplace could confuse consumers from effective

distinction among certification schemes and making well-informed decision (Bass et al. 2001). This chapter focuses on the economic aspects of forest certification and associated costs and market incentives, including gaining or maintaining market access, promoting public image, and the ability to obtain a price premium from consumers. We review the current state of knowledge on the economics of certification and offer suggestions on the possible trends and research gaps. Several influential actors involved with forest certification and impacting on the costs and financial benefits are included in this chapter, including forest products manufacturers, retailers, end consumers, government purchasing policies, and influential buyers.

## **2.2 Cost of certification**

The costs are divided into direct and indirect costs. This applies to both the cost of certification preparation and the cost of undergoing certification.

### **2.2.1 Preparation costs**

Preparation costs associated with forest certification refer to the additional costs incurred in preparing management practices, facilities, the resources and the staff for an external audit (Merry and Carter 1997). In particular, the documentation requirements may be quite onerous (Hayward and Vertinsky 1999), depending on the certification scheme. If a company has already obtained ISO 14000 certification and implemented the required Environmental Management System, the costs of preparation for a further forest management certification may be substantially reduced, and many companies therefore first undertake an ISO 14000 certification and then proceed to a specialized forest management certification. In addition, the costs of preparation for certification can vary extensively depending on the nature of the management being conducted prior to certification (Bass et al. 2001; Simula et al. 2004). This is because the more remedial measures are required, the greater the cost will be. This has been convincingly

demonstrated by Murray and Abt (2001) who found that in the southeastern US, non-industrial private forest owners incurred fewer costs than their industry counterparts when adopting certification. This was attributed in part to their less intensive management practices and greater species (Murray and Abt 2001). In contrast, De Graaf et al. (2003) noted that more intensive management had lower certification costs than extensive forestry after taking into account such factors as costs of land acquisition, log transportation, infrastructure and machinery.

Direct preparation costs include:

1. Data collection;
2. Management plan preparation;
3. Costs of organizing the process of public participation and public communication. Aboriginal consultation, where relevant, can also be costly;
4. Monitoring costs (active monitoring is required by all standards); and
5. Staff training.

As ISO 14001 and CSA require a dedicated staff person whose responsibilities include working with certification and the environmental management system, staff time or contracting the work is also an issue for cost calculation.

The indirect costs include loss of revenue from the timber locked-up on site with the changing practices, as standards impose some limitations on forest management. In general, the changes could mean:

- Smaller cut-block size and the retention of trees that would otherwise have been harvested. Retaining trees is known to be more expensive than clear cutting with not only some volume left on site, but also with the need for a more intensive cruise prior to harvest and more work on the site layout, the need to meet operational safety concerns and the increased fuel consumption for machinery (Franklin et al. 1997; Smith et al. 1997). Where certification requires partial harvesting rather than clear-felling, harvesting costs (roads,

skidding, forwarding) may be higher because of the greater area of forest involved per unit of harvested timber.

- Change in harvesting methods and technology, when more expensive methods for yarding (e.g., helicopter or cable) are used instead of ground skidding; or forwarders are used instead of skidders. The switch to more expensive technology can be a response to retention, visual or terrain stability requirements (Schulze et al. 2008).
- Restrictions on operations in riparian zones.
- Limitations on harvesting to meet the required seral stage distribution and rotation length.
- Avoidance of plantation characteristics.
- More expensive and intensive regeneration techniques. The widespread application of chemicals is an issue for obtaining certification from some FSC standards, and avoidance of herbicide applications can lead to longer regeneration delays or problems with coppicing in some species.

Chain of custody (CoC) certification leads to additional costs in assessment fees and in paperwork and tracking or the allocation of physical space for separating the CoC-certified products from other products. A mixed source of raw wood materials would greatly deter the willingness of producers to undertake CoC certification as very often it is extremely difficult for them to track where the wood comes from, particularly true in the United States (Vogt et al. 1999). In addition, the requirements for better woodyard operations, such as clear separation between certified and non-certified wood and better wood receiving and handling, might significantly increase the expenditures for obtaining CoC certificate (Vogt et al. 1999).

The specific costs of this phase are extremely difficult to determine, varying substantially from large, well-managed companies to small, less-rigorous companies and from developed countries to developing countries. There are two reasons for this

difficulty. First, as a result of variations in company size, location, the number of the facilities, the complexity of the process, and the nature of the forest management, amongst other factors, the cost per hectare differs significantly (Aguilar and Vlosky 2007; Carter and Merry 1998; Ghazoul 2001; Leslie 2004; Sedjo and Swallow 2002). Cubbage et al. (2003) reported that preparation costs per hectare ranged US \$ 1.4–3.7 for certification of public lands in North Carolina. Early adopters of forest certification were those whose management practices were already at or close to the certification standards, so their costs were undoubtedly less than the industry average (Stevens et al. 1998). Secondly, forest companies operating in developing countries often lack the technical, financial and human resources needed to meet the certification standards. Consequently, they spend more resources on upgrading their management system and operational process (Leslie 2004) than companies located in countries with developed infrastructure.

### **2.2.2 Certification costs**

A significant component of the costs of certification is incurred in obtaining the certification. The charges made by third-party auditors constitute a direct cost and vary substantially between jurisdictions, depending only partly on the nature and size of the management unit being certified (Innes and Hickey 2005). As a result, the costs per hectare of the actual audit vary. They are considered to be “commercially sensitive” and are rarely released (Innes and Hickey 2005). In principle, the costs per hectare of certification should be quite small for large companies (Vidal et al. 2005) – as low as less than US\$1 per ha – but may be very large for small companies (Murray and Abt 2001). According to Cubbage et al. (2003), the auditing costs in North Carolina varied from US \$ 2 to \$3.6 per hectare, whereas, Cubbage et al. (2008) compared the median total costs between larger ownerships of more than 400,000 ha and those less than 4,000 ha, finding considerable differences (\$0.07–0.49 per hectare versus \$6.45–39.31 per hectare, respectively). It is not surprising that small-scale forest operations can rarely



afford the costs of certification unless they take part in a group certification scheme (Fischer et al. 2005). More recently, Simula et al. (2004) analyzed certification costs in Brazil, Indonesia and Malaysia, and found that the unit area costs varied from US \$3 to \$32 per hectare, of which a significant component was the initial costs of obtaining certification (which comprised of around 50 percent of the total costs). Such figures need to be examined in relation to initial and on-going certification costs: Cubbage et al. (2003) identified that initial costs varied from less than \$2.5 to \$24.7 per hectare in North Carolina, USA, whereas the costs for subsequent years were only one fifth of the first-year costs.

The economic differences between developing and developed countries lead to different certification costs. To date, it has only been the financial intervention of outside institutions such as aid agencies and Environmental Non-Governmental Organizations (ENGOs) that have enabled smaller management units in developing countries to adopt forest certification (Bass et al. 2001). For example, the UK Department for International Development (DFID) has helped to develop an FSC certification scheme in Mexico by assisting with the costs of training and accreditation procedures and the marketing expenditures for certified wood products (Innes and Hickey 2005). Similarly, in developed countries, small forestry companies run by Aboriginal peoples have only been able to pursue certification with outside help due to the high preparation and certification costs (Tikina et al. in press). Another disincentive for small forest companies in developing countries to engage in certification is the apparent lack of tangible benefits deriving from forest certification (Rametsteiner and Simula 2003). Some larger industrial groups, such as PT Erna Djuliawati and PT Sumalindo Lestari Jayo, have pursued FSC certification in Indonesia, but many companies are adopting a “wait and see” attitude while the cost-benefit aspects of certification remain unclear (Eba’a Atyi and Simula 2002).

## **2.3 Motivation for certification**

While there is much evidence that non-market benefits of certification, such as commitments to social improvements and environmental responsibility, are a major driver for companies to adopt certification (Humphries et al. 2001; Owari et al. 2006), the promise of greater market security is another important incentive (Bass et al. 2001).

### **2.3.1 Market access**

According to a survey conducted in 1998, the five main reasons for obtaining certification included market access, promoting the environmental responsibility of companies, improving public image, and maintaining market share and price and costs (Stevens et al. 1998). Cashore et al. (2005) have conducted a more recent study of forest certification choices in Canada, the United States and Germany, confirming that in these countries at least, market access (or concerns about the loss of market access) continues to be an important incentive for forestry companies to obtain certification.

Forestry companies tend to view certification as an opportunity to maintain existing markets and/or to expand into more lucrative niche markets (Irvine 1999; Nelson and Vertinsky 2005). Most importantly, it is an effective way to enter into some of the environmentally-sensitive niche markets (Espach 2006; Vidal et al. 2005), such as those created by governments and public bodies with procurement policies that require responsible management or those represented by large retailers and buyers' groups who are increasingly specific about the nature of the products that they purchase (Cashore et al. 2005; Klooster 2005; Stevens et al. 1998; van Kooten et al. 2005).

Public procurement policies are emerging as a major driver to ensure the legality and sustainability of wood sources and wood products, especially in Western Europe, the United States and Japan (Durst et al. 2006; Howard 2006). This can take the form of procurement policies established to control the purchase of wood by public bodies, or

may take the form of national legislation. An example of the latter is the amendment of the Lacey Act in the USA by the 2008 Food, Conservation, and Energy Act. The amendment makes it unlawful to import, export, transport, sell, receive, acquire, or purchase any wood product taken in violation of the laws of a U.S. State or any foreign law that protects plants (Federal Register 2009). Currently, several countries including Belgium, Denmark, France, Germany, Japan, the Netherlands, New Zealand, Switzerland and the UK, have operational timber procurement policies. Additionally, several others are in the process of establishing such policies relating to forest products or have established guidelines that recommend such purchase. Government procurement policies are important as the public sector consumes roughly 10 to 20% of total forest products consumption, varying by country and product type (Simula 2006).

The public sector demand and the worldwide emergence of green building markets, which specify the use of certified wood and wood products, are two principal driving forces of forest certification due to the considerable amount of wood consumed in the construction and public sector (UNECE/FAO 2008). However, the UNECE/FAO (2008) report draws attention to the potential damage to certification caused by the policy of some green building schemes to reward the use of only one certification scheme, rather than all those that reach a specified standard. In cases where the latter policy has been adopted, the ranking scheme for the certification assessment is extremely complex, potentially pushing architects and builders to adopt other materials such as steel and concrete. For example, both the US-based LEED system and the Green Building Council of Australia have both committed in the past to purchasing wood from a single certification scheme, despite the presence of multiple certification schemes. Other green building schemes, such as the ANSI National Green Building Standard (US), BREEAM (United Kingdom), Built Green Canada, Built Green Colorado, CASBEE (Japan) and Green Globes (US and Canada), all recognize multiple forest certification standards. Despite these issues, the available evidence reveals the significant role that

governments and institutions play in promoting the adoption of forest certification.

Buyers groups have become an important player in driving the market for certified forest products. According to Ozanne and Vlosky (2003), “buyers groups are independent associations of businesses, primarily retailers, who have committed to purchasing and/or stocking certified forest products”. The Certified Forest Products Council is a leading buying group in the United States whereas the long-established Global Forest and Trade Network, an initiative of WWF, encourages the sale of FSC certified products from around the world. Some organizations have decided that only certified wood products should be purchased, such as VANOC (Vancouver Olympics Organizing Committee) and its partners, who all used only wood certified by the FSC, CSA or SFI certification schemes in the venues for the 2010 Winter Olympics (Lee 2008).

In the United Kingdom, the Olympic Delivery Authority (the organizers of the 2012 Olympic Games in London), has indicated that all timber used for Olympic construction must conform to the requirements laid down by the United Kingdom’s Central Point of Expertise on Timber (CPET) (Olympic Delivery Authority, 2008). Only some of the many certification schemes available have been recognized by CPET, and several factors, in addition to certification, are taken into account. In Canada, the Forest Products Association of Canada (FPAC) is committed to foster and develop the forest products industry in Canada in a sustainable way, which means “economically viable, environmentally responsible and socially desirable”. One of the conditions of its membership is that the forest management practices of its member companies must be third-party certified (FPAC 2008). The American Forest and Paper Association has a similar policy.

Most public procurement policies for wood products go beyond certification, as they are concerned with a range of different issues. These include sourcing and legality aspects, environmental aspects and social aspects, with the relative emphasis varying

between policies. Certification matches the need to demonstrate that the forests have been sustainably managed and that the products have been harvested legally, but there are many other issues that need to be addressed, such as climate change and the needs of local communities and indigenous peoples, only some of which are covered by certification (World Business Council for Sustainable Development and World Resources Institute 2008). With increasing concerns about the carbon footprints associated with particular products, it seems likely that the distance that wood has to be transported will be factored into many decisions, a trend that will be accelerated by the rising costs of transport. Also, with world attention now focused on carbon associated with forests, the traditional certification schemes have missed an opportunity to broaden their scope and ensure that forests managed for carbon are managed to sustainable standards. Instead, a new suite of certification schemes is emerging, such as that of the Climate, Community and Biodiversity Alliance (2008).

### **2.3.2 Public image**

Many forest products companies have supported and adopted forest certification in order to alleviate pressure from advocacy organizations and to enhance their overall public image (Aguilar and Vlosky 2007; Leslie 2004; Stevens et al. 1998). Leslie (2004) has pointed out that a public image that suggests strong environmental responsibility or social improvement is an important bonus of certification that has enabled companies to enhance customers' confidence and reduce stakeholder conflict. According to a survey of FSC international certificate holders in 2006, 69% of respondents agreed that certification helped them to improve or protect their company's reputation (FSC 2008). At present, the forest, paper and packaging industries are under pressure to demonstrate their green 'pedigree' across the entire value chain, not only assuring their customers of their commitment to social improvements and environmental responsibility but also making sure any wood or wood products are derived from sustainably managed forests

(Anonymous 2008). Sustainability and/or corporate social responsibility reporting is increasingly common amongst the world's more progressive forestry companies and certification plays an important role in demonstrating environmental and social responsibility (Vidal and Kozak 2008). The financial benefit associated with such reporting is the possibility of being included in national and international lists of environmentally responsible companies such as the FTSE4GOOD and Dow Jones Sustainability indices and the Storebrand SRI register, opening up access to ethical/environmental investment funds such as Swedband Robur's Ethical Fund and Storebrand Principle Funds. Weyerhaeuser in the USA and Holmen in Sweden provide good examples of forestry companies that have actively pursued such recognition in addition to their management practice certifications.

An important issue is the varying levels of confidence in which different certification schemes are held by consumers, as those who make a decision based on certification are also likely to be aware of differences between the certification standards. Vlosky and Ozanne (1997, 2003) have indicated that from the consumers' perspective, an ENGO is the most credible certifying body while the wood products industry is the least. Most environmental groups favour the FSC, partly because the FSC was founded by a coalition of environmental groups, foresters and timber companies, and is one of the few certification schemes operated by environmental groups (Cashore et al. 2005; van Kooten et al. 2005). However, there has been considerable convergence amongst the different standards, and the differences between them are being progressively reduced. This has led to vigorous marketing campaigns by the different standards as each tries to promote its particular benefits. For example, in North America, FSC has captured much of the certified paper market in Canada, but SFI dominates this market in the USA.

Another issue surrounding public image is how to convey a positive company reputation to the public and especially the targeted market, thereby influencing the purchasing decisions of potential customers. Here, it is important to recognize that for

some producers of certified products, the primary target for marketing may not be the general public; rather, they concentrate on forest products wholesalers and large retailers. This has been the strategy of, for example, the SFI Standard. It is beneficial for a forest products company to incorporate a range of media and marketing techniques to provide sufficient background information to the public to gain customer retention and satisfaction (Archer et al. 2005; O'Brien and Teisl 2004; Owari and Sawanobori 2007). Kozak et al. (2004) identified several marketing techniques that can be used effectively in promotional campaigns to influence the public over benefits of purchasing certified wood products, including point of purchase displays in home centres, brochures, print advertisements, in-store displays, public education seminars, trained sales staff and media advertisements. Of these, advertising and labeling are generally recognized as the most frequently used tools. Archer et al. (2005) found that both labeling and advertising are effective ways to increase public awareness of forest certification and to influence the purchasing decision and behaviour. However, they play different roles at different stages. At an early stage, advertising is generally used to communicate to customers the corporate environmental commitment and to enhance general awareness of forest certification. Compared to advertising, labeling is a more effective tool to influence the final purchasing decision, as verified by O'Brien and Teisl (2004). There have been many studies of the effectiveness of eco-labeling in conveying the information that is likely to influence a customer's purchasing decision (e.g., Anderson and Eric 2004; O'Brien and Teisl 2004; Sedjo and Swallow 2002; Teisl et al. 2000, 2002).

### **2.3.3 Price premium**

In the context of forest certification and the sale of forest products, the price premium is the difference in price between a certified and an identical non-certified product. To date, with the increasing environmental awareness, forest certification has been rapidly and widely recognized as a means to maintain sustainability (Aguilar and Vlosky 2007; Bass

et al. 2001; Merry and Carter 1997). However, the price premium associated with certified wood products remains one of the most contentious issues of forest certification as while many studies have suggested the existence of premiums (Aguilar and Vlosky 2007; Forsyth et al. 1999; Grönroos and Bowyer 1999; Kozak et al. 2004; Owari and Sawanobori 2007; Ozanne and Vlosky 1997; Stevens et al. 1998), there is little evidence of the premiums in the marketplace. However, according to Aguilar and Vlosky (2007), consumers are willing to pay a premium of between 10% and 25%, suggesting that consumer behaviour may be changing. Several factors may be contributing to this, including increasing public education and better recognition of forest certification, more availability of and higher exposure to certified wood products (Aguilar and Vlosky 2007), and the presence of certified wood in “green” buildings sold at a premium.

There is now increasing evidence showing that the willingness to pay a price premium varies amongst wood products and over a price range (Archer et al. 2005; Kollert and Lagan 2007; Ozanne and Vlosky 1997). There are two ways in which price premiums can be calculated: percentage-based premiums and absolute premiums. A higher percentage premium does not necessarily result in a higher absolute premium, depending on the price range of the wood products. In developed countries, Ozanne and Vlosky (1997) have examined the price premiums associated with various price ranges, and implied an inverse relationship between price and premium, with higher priced wood products having lower percentage price premiums. The percentage price premium that consumers may be willing to pay is as high as 18.7% for an item costing \$1, but for higher value certified wood products, it can drop to as low as 4.4%. This is probably because for high-end products, a considerably higher absolute premium would be required, even if the percentage premium was reduced compared to low-priced items. However, Kollert and Lagan (2007), in a recent study of the prices of certified logs in Malaysia, found that higher premiums (27–56%) were attached to high quality timber destined for export than to lower quality timber (2–30%) premiums. Furthermore, they



indicated that the higher sale prices were likely to cover the additional costs associated with certification, which ranged from \$0.5 to \$2.5/m<sup>3</sup>/year, although this did not include the indirect management costs. Similarly, Nebel et al. (2005) found a range of price premiums (5–51%) for certified wood products being exported from Bolivia. Using the Santa Cruz Department as an example, they suggested that the price premiums could cover at least the direct costs associated with certification (Nebel et al. 2005). In the case of the 702,416 ha of forest in the Santa Cruz Department, they assumed that the average certification costs were \$0.18/ha/year, leading to total costs were \$144,000 per year, considerably lower than the total premiums being obtained (\$1.1 million). While the producer will benefit from such premiums, other beneficiaries will depend on the nature of the value-added chain. For example, Ratnasingam et al. (2008a) found that local furniture manufacturers in Malaysia were unlikely to benefit from the increased values because of the very low uptake of chain-of-custody certification in the Malaysian furniture manufacturing sector.

At the other end of the market for wood-based products, Anderson et al. (2005) found that for some low-price products, such as pencils, consumers were willing to pay a 20% price premium. This reflects the relatively low absolute premium associated with the certified pencils. Additionally, a study undertaken by Mohamed and Ibrahim (2007) has examined the willingness of Malaysian consumers to pay a price premium for certified wood products. They found that 32% of respondents had a tendency to pay more for environmentally certified wood products, and that the average price premium obtained was 14.4%.

An additional factor is that the willingness to pay a price premium is also greatly influenced by income level, with willingness to pay increasing with income (Aguilar and Vlosky 2007). Consumers in more affluent developed countries tend to show a higher awareness of environmental issues and have greater purchasing power, so are more likely to seek out certified wood products (van Kooten et al. 2005).

Although there is much research documenting a willingness to pay in certain segments, this does not directly match actual purchasing patterns (Ruddell and Stevens 1998). In practice, it tends to be the suppliers of certified wood products that absorb the additional costs, with very few of the costs being passed on to the consumer (Humphries et al. 2001; Owari and Sawanobori 2007; Vlosky and Ozanne 1997). However, retailers, especially the larger home centres, are amongst the most unwilling to absorb the extra costs, even though they may gain many benefits from certification (Bass et al. 2001; Vlosky and Ozanne 1997). This is further complicated by the phenomenon that many large retailers prefer selling certified wood products using their own logo rather than the specific certification logo (UNECE/FAO 2008). Both these factors mean that many certified wood products are sold by smaller, more specialized retailers; these retailers are often avoided by large-scale wood suppliers and their agents because of the relatively high transaction costs involved, and may also be missed in many of the research studies that have been conducted, which have tended to focus on larger retailers.

Theoretically, certified wood products should fetch a higher price due to the extra costs incurred in obtaining certification, which means that additional costs should be passed on to consumers in order for the companies to operate in a profitable and viable way. However, most frequently, this price premium is not being realized in the market place, as price, quality and convenience are still the three most influential factors affecting the actual purchasing behaviour of the majority of individuals, despite their increasing environmental awareness. Consequently, more efforts now need to be placed on how environmental factors can be factored into the decision-making process of the majority of consumers.

## **2.4 Research in a rapidly changing field**

Certification is a rapidly evolving field, and is continuously changing as the individual standards adjust and respond to criticism (such as the proportion of wood from certified

forests in a product labelled as certified), political movements (such as the recent focus on illegal logging), market opportunities and the rapidly changing nature of global forest production (such as the increasing proportion of wood supplied from plantations). Much of the research completed even five years ago is no longer valid, especially given the normal publication delays associated with academic publishing. For example, there has been a rapid increase in chain-of-custody certificates in 2009, apparently driven by the amendments to the US Lacey Act, although other procurement initiatives are also having an impact on this facet of certification. The increasing demands for more ecologically friendly buildings, as evidenced by the rise in certifications by LEED and other 'green building' standards, will also increase the demand for certified wood products.

It is also evident that some aspects of certification may have been missed by researchers dealing with the traditional forest products trade. Forest products, particularly in North America (where the majority of research has been undertaken), are considered to be commodities with low per unit profit margins associated with high shipment volumes. Many researchers are accustomed to working in this environment, since this is where the majority of activity is located. However, certification has often been associated with niche products, with relatively low sales volumes handled by smaller, specialist retailers. Such companies are much more difficult to identify and research than the larger chain stores.

It is also evident that in order to make valid comparisons, great care is needed in ensuring that the same aspects of certification are being compared. For example, when talking about certification costs, it is possible to refer to the cost of obtaining a certification for the first time, or the recurring cost over a period of time, including the cost of certification renewals. The cost can be expressed in absolute terms, per unit area, or per unit volume of harvested product. Similarly, premiums can be expressed in absolute terms, or as a percentage. However, given the range in the prices of wood products, it makes little sense to examine premiums except in the context of the same

product, certified or uncertified. Since the greatest absolute premiums may be associated with unique higher end wood products (e.g., pieces of furniture), such comparisons may be extremely difficult unless it can be shown that the products are in all other respects identical (as with, for example, flooring).

In Table 1, we reflect on possible trends and related possible future research associated with costs and benefits of forest certification. While the answers to some questions can be found in the “grey” literature or private sources, the presence in the public domain of a great deal of misleading or erroneous information about forest products certification suggests need for additional research. Such research would not only be of academic interest: it will help clarify the issues for both producers and consumers of certified forest products.

**Table 2. 1** Summary of forest certification costs and benefits

<b>Costs</b>
<ul style="list-style-type: none"><li>● Forest certification is harder to achieve and more expensive in developing countries. The certification standards do however attempt to accommodate operations in countries with fewer resources and infrastructure. Future research should search for examples of barriers to trade and assess how to eliminate these, if they exist. In the case when more adaptive standards or more accommodating local standards are developed, the question of the standard legitimacy among relevant stakeholders will remain. Research is also needed on whether the higher costs are in part caused by differences in the basic standards of forest management among countries.</li><li>● Certification can be prohibitively expensive for small- and medium-sized forest companies. The standards had been and will continue to have some flexibility in order to engage smaller companies. Various methods have been attempted and employed, but the extent to which these imply changes in behaviour beyond the changes in the amount of paperwork related to certification needs to be studied. This will involve research into a range of different certification approaches, such as the use and effectiveness of group certification.</li><li>● The indirect costs of certification preparation can be significant. If sustainable forest management becomes more widely adopted than at present, the costs will gradually diminish. This could happen in two ways: a) convergence of forest practices and standards requirements, or b) convergence of certification standards and governmental requirements. The barriers to such convergence need to be examined and resolved.</li><li>● The costs of obtaining certification are apparently increasing rapidly. Certification has created a job in itself: certifiers (auditing companies) will remain in business as long as forest certification is used as a management assessment tool. Will competition among auditing companies eventually drive the cost down and the quality of audits up? So far, very little research has been devoted to differences in the quality of auditors, and how this might affect certification.</li><li>● The direct and indirect costs associated with different standards need to be assessed. Such as assessment needs to take into account the differences both between standards, and within standards. The latter is particularly true for the FSC regional standards, which vary tremendously within and between countries.</li></ul>

## Benefits & Future Challenges

- Market access
  - 1) Government procurement policies will play an increasingly important role as a driver of certification. What will happen to forest certification when many governments legally mandate compliance to forest certification standards?
  - 2) Maintaining market access has remained a major driver for certification. However, this is only valid for environmentally-sensitive markets. The markets can be defined geographically (e.g., Europe with higher level of environmental awareness) or among buyer strata (e.g., influence in the supply chain). Are there examples (including international examples) of lost or limited access to certain markets? If forest companies are unable to gain access to a specific market, what can they do? Has the globalization of the timber trade influenced markets for certified timber? How do procurement rules, especially those established by governments, relate to the rules associated with GATT (General Agreement on Trade and Tariffs)? More research is also needed on the impacts of influential buyers (e.g., publishers) on the uptake of forest certification.
- Public image
  - 1) Forest certification has been found effective in improving company image to reduce stakeholder conflict. How does this differ between standards? There is little evidence that it has influenced the perceptions of the general public. The efforts to advertise various certification standards and to educate the general public will continue. Given the perceived disinterest of the public, should greater attempts be made to educate the general public? If so, how might this best be done given the great expense of public information campaigns?
  - 2) The competition among the standards will continue, and has been and will result in convergence of their requirements. The public image issues will become less evident due to the increased similarity among various certification standards. What issues should be included into forest certification in order for it to “catch the public eye”? Will certified forest products ultimately marketed as such, rather than being associated with a particular standard, as has happened with organic food products?

## **Benefits & Future Challenges**

- Price premium
  - 1) The indirect benefits of forest certification prevail. The price premium exists only in certain markets and for certain products. It is definitely unavailable for most commodity products in most developed countries. This trend will become more obvious and will continue as long as cheaper non-certified products are available. If a company has allowed costs to rise in anticipation of a price premium for its products, how does it succeed when it fails to achieve it?
  - 2) There is a lack of demand for certified forest products from the majority of the general public. A willingness-to-pay for such products is present among the environmentally-aware public, but has rarely transformed into purchasing behaviour. Are there ways to engage the general public?
  - 3) Not all certified products reach markets carrying a certification logo. It would be interesting to research retailers' perspectives on placing an eco-label vs. their own logo. How much of a role does the retailers' public image play in this process?
  - 4) The existence of perverse taxation policies needs to be examined. For example, while a government may advocate the sustainable management of forests and the elimination of illegal logging, consumers may not only be asked to pay a premium on legal and sustainable forest products, but the premium may also attract a sales tax. In some jurisdictions, such premiums may be incorporated into house prices, and the premiums may then increase property taxes at the same time as governments are attempting to persuade consumers to adopt more environment-friendly practices. This is an area where further research could be fruitful.
- Timeliness and accuracy of the literature
  - 1) Much research on certification has become relatively dated in what is an extremely fast-moving field. What may have been the case five years ago is no longer true, and the results of surveys and other research may no longer be relevant. Objective research is needed on the currency of many of the established ideas about certification, such as the reputed lack of public interest, the lack of a price premium, the differences in the standards and many other aspects.
  - 2) Certification was established as a market-based mechanism to identify timber and fibre from well-managed forests. The rise in importance of many other goods and services from forests, such as water and carbon, and the failure of the existing certification schemes to address these adequately, has led to the emergence of new certification schemes. Attention needs to be given to these, and the possibilities for streamlining them with existing certification standards require examination.

## 2.5 Conclusion

Although a large number of studies have been done to investigate the economic aspects of forest certification from the perspectives of both demand and supply, many uncertainties remain. For instance, from the point of view of consumers, any discrepancies between actual and expressed willingness to pay a price premium need to be identified and explained and more research is needed on the price premiums actually being paid in the market place. Other market or financial incentives, market access to some environmentally-sensitive niche markets and the overall public image of the producer companies all need to be taken into account when considering the economic motivations for forest products companies to adopt forest certification.

Forest certification has moved from a relatively small phenomenon ten years ago to a major phenomenon, with over 300 million ha of forest land currently certified to PEFC or FSC standards, and further land certified to other standards. Countries without certification standards are currently developing them (e.g., China), and further growth is likely in the future. For many companies, certification is increasingly seen as a cost of doing business (particularly in relation to maintaining market access), and it is therefore likely that the costs will eventually be transferred to the customer. However, this has not yet happened as customers are still faced with a choice between certified and (cheaper) uncertified wood, and the majority seems to favour the latter. It seems likely that for a premium to be realized, much greater efforts will need to be devoted to informing customers of the products they are buying, both in relation to the advantages of certified wood and the potential problems associated with uncertified wood.

In developing countries, environmental issues are increasingly gaining attention due to the degradation of the environment, climate change, and continued deforestation. However, surprisingly few studies have been undertaken to examine how forest certification fits into these trends, or of the financial benefits associated with forest certification. Certification was originally envisaged as a method to reduce the rate of



deforestation and forest degradation in developing countries. With the new focus on these processes that concerns about carbon emission have generated, it seems likely that there will be renewed interest in encouraging the more sustainable management of forests in developing countries. Certification provides a means to ensure that the appropriate forms of management are occurring, and could be tied into other efforts to monitor forest management in such situations.

# **3. The implications of new forest tenure reforms and forestry property markets on sustainable forest management and forest certification in China**

## **3.1 Introduction**

Forests are increasingly recognized as a critical element of the global ecosystem given their importance in providing multiple environmental services, such as carbon sequestration and storage, biodiversity conservation, climate change mitigation, poverty alleviation, and watershed protection (Agrawal et al. 2008). However, continued deforestation could interrupt these functions. This is partly because a growing population and per capita consumption is leading to alternative land uses that provide higher benefits than forests, such as bio-fuel plantations (Dietz et al. 2003; Kaimowitz and Angelsen 1998; Tacconi 2007). The challenges facing the forest sector have become global, such as climate change, reducing carbon emissions caused by deforestation and forest degradation (REDD) and the globalization of timber and forest products markets. These challenges require discourse and synergies among various levels of interested groups, including the state, local governments, institutions, communities and the local population. The decentralization of forest management could, to some extent, reduce the impacts of deforestation and forest degradation (Gibson and Lehoucq 2003; Larson 2003; Ostrom and Nagendra 2006) through power transfer to local actors, which would allow greater local autonomy and participation in decision-making (Agrawal and Ribot 1999), although some studies have pointed to mixed outcomes (Tacconi 2007).

Forestry-related decentralization began in the 1980s, and has now become a

major feature of forest governance around the world (Anderson and Gibson 2007; Ribot et al. 2006). Many developing countries have experienced some form of decentralization in forest management (Larson 2005), and decentralization has been identified as one of the three major trends in forest governance in the 21st century (Agrawal et al. 2008). In the context of forestry, decentralization is a process of transferring some aspects of authority and power over forest resources from the state to lower levels, such as local communities (Agrawal and Ribot 1999). Decentralized forest management is highly context-specific and, so far, there has not been any fixed path for decentralization in forest governance applicable in all contexts (Agrawal and Ribot 1999; Ferguson and Chandrasekharan 2005). It is still a work in progress and a step-wise approach has therefore been advocated (Ferguson and Chandrasekharan 2005). Despite this, decentralization generally reflects efforts to improve the equity and efficiency of resource allocation so that disadvantaged groups are included, a key concern in relation to poverty reduction and sustainability of forest management (Ferguson and Chandrasekharan 2005).

Sustainable forest management (SFM) is one of several ideas that have been advanced by the forest sector, with support from environmental groups and other stakeholders. There is an expectation that the move to SFM will reduce the environmental impacts caused by deforestation and forest degradation. Since SFM was first introduced, uptake has been rapid. Numerous efforts have been made to ensure the better utilization of forest resources and the realization of the full range of values associated with forests. Several mechanisms, including forest certification, have been developed to promote SFM (Durst et al. 2006). Forest certification has been widely adopted amongst the developed economies, particularly in Europe, North America, Australia, and New Zealand, whereas its adoption in the developing economies has been slow (Durst et al. 2006; Pattberg 2005). This disparity is also reflected in the uneven geographic distribution of certification (Pattberg 2005). Taking Forest Stewardship

Council certificates as an example, as of December 2010, certified forest areas in North America and Europe each accounted for 40% of the total global certified area, whereas Asia had less than 4% (FSC 2011).

The links between decentralized forest management, sustainable forest management and certification, and livelihood improvement are unclear (Tacconi 2007). Previous studies have examined the potential and practical implications of decentralization for the improvement of local livelihoods (e.g., Sunderlin et al. 2005). Concerns have arisen when local governments favour short-term profits stemming from deforestation activities over the provision of environmental services (Tacconi 2007; Wang et al. 2007). There is no clear evidence that the decentralization of authority to lower levels would reduce or halt deforestation. Other studies have given rise to the expectation that decentralized forest management could be conducive to the adoption of SFM (Ferguson and Chandrasekharan 2005), yet this remains to be fully confirmed. Forest certification is recognized as a market-based incentive for SFM, in that it should generate net economic benefits for those getting certified. Although such tangible benefits have been difficult to document, a few examples exist. Despite these uncertainties, there is the potential for synergies between decentralization, SFM and poverty reduction.

China can be divided into four forest regions and two major management regimes, one state-run, and the other being collective ownership (Rozelle et al. 2003; SFA 2007; Yi 2004). State-run forest farm management covers almost all the northeastern provinces, including Liaoning, Jilin and Heilongjiang, which have the richest timber resources in China (Rozelle et al. 2003). Collective forests account for more than half of China's forests, which is of particular importance to the sustainable development of China's forest sector. About 75% of the collectively-owned forests are located in South China, with Fujian and Jiangxi being particularly important (Xi 2007), and these have often been selected as the pilot sites for new forest policies and reforms. Prior to the new

forest tenure reforms initiated in the southern collective forests, several forest-related reforms had previously been attempted in the regions (SFA 2010). Previous reforms intended to transfer rights of use over the collective forest land to individual households, helping them to generate sufficient and sustained forest-derived incomes. However, the rapidly changing policies led to a lack of security of forest tenure and a loss of confidence in the forestry authority and forest policies, resulting in the rapid harvesting forests allocated to forest farmers (Yan and Chen 2010). Other problems caused by the earlier forest policy reforms included the lack of incentives to invest in the forest land, inadequate availability of finance, and lack of legality of forest management and local organizations (SFA 2010). With these problems unresolved, it was realized that a modern forestry strategy, consisting of three key components (healthy forest ecosystems, a sustainable but profitable forest industry with high energy efficiency, and multiple-function forests with particular attention being given to the cultural and spiritual needs of forest-dependent communities), was almost impossible (Jia 2009). In addition, poverty and environmental problems coexist in China's forest sector due to the extent of poverty in rural areas. Many forest-dependent people survive on the income derived from unsustainable, short-term forest activities that have detrimental impacts on the environment (Zhang et al. 2002).

Since 1998, the central government has pursued ecological rehabilitation (Xu et al. 2006), including a series of key national programs and forest policy reforms, such as a logging ban in natural forests and new forest tenure reforms in collective forests. The latter were first attempted in Wuping in Fujian province. The tenure reforms aimed to return some property rights over forest lands from collectives to individual farmers in the hope of stopping illegal logging and encouraging farmers to operate and manage their lands more responsibly, whilst the land remained under the ownership of the state or collectives (Yang and Ming 2006). In addition to widespread poverty, other obstacles include the conflict between the voluntary features of forest certification and the

processes associated with collective forest ownership, the absence of a culture of stewardship, the shortage of adequate finances to start forest management, the inefficiency of knowledge and technical know-how acquisition, and the lack of a cohesive system of governance that would enable SFM and forest certification (Stone 2006).

The new forest tenure reforms in China were first introduced in 2003 and have had profound impacts on forests, forest-dependent communities and people, local livelihoods, and SFM and certification (Hong et al. 2006). The first trials were undertaken in Fujian and Jiangxi provinces and were followed up with a series of supporting and auxiliary mechanisms, including the introduction of forestry property markets where property rights over forest assets could be fully realized (Wang et al. 2007). The reforms have involved a transition of forest tenure from village collectives to individual farmers. A phased approach to the reforms has been adopted to enable public acceptance to develop and to avoid the pitfalls of decentralization, such as elite capture (Hong et al. 2006). A large amount of research has been undertaken on the effectiveness and efficacy of the new forest tenure reforms, particularly as the reforms are approaching completion (e.g., Huang and Lv 2010; Wang et al. 2010; Yang et al. 2010; Zhang 2010a). Some of the outcomes of the reforms have the potential to assist SFM and certification, such as secure land tenure, more consistent forest-related policies, and greater availability of financial support and subsidies (Zhang 2010a). A wide range of studies have explored the feasibility and potential for SFM and certification in China, as well as the underlying drivers to motivate various stakeholders to engage in the endeavour (e.g., Feng et al. 2009; Huang et al. 2009; Huo 2009; Zhang 2009). However, the extent to which decentralized forest management will impact on SFM and certification remains unclear. It is also unknown whether decentralized forest management will assist in reducing or lifting rural poor people out of poverty, although the management of the forest is tightly linked to poverty reduction. This case study aims to narrow these

knowledge gaps. Using evidence from interviews with individual farmers and government officials working for the forestry property markets, the study investigates the implications of decentralized forest management and its associated mechanisms on poverty alleviation and analyzes the impacts of the tenure reforms on SFM and the promotion of forest certification in China.

## **3.2 Methods**

The case study method enables an exploratory investigation of a phenomenon that is not adequately understood, thereby gaining a relatively full understanding of the nature and complexity of the phenomenon under examination (Yin 2009). The focus of this study is an exploration of the perspectives of small-scale forest farmers and market officers on SFM and certification as well as the development of an understanding of how the new forest tenure reforms are affecting their adoption. Thus, the case study method is an appropriate approach for the proceeding research objectives. Two forest-dependent cities with forestry property markets in China were selected as case studies, with one being Yong'an in Fujian province and the other being Tonggu in Jiangxi province. The case studies were developed from personal interviews and field visits. Two field visits were completed under the guidance of market officers from the two selected markets between May and August 2009. Market officers and local farmers with small forest holdings who have or have not used these markets were interviewed. Semi-structured interviews with open-ended questions were used to seek their perspectives on issues related to forest tenure reforms, forest property markets, sustainable forest management and forest certification. Through detailed contextual analysis, these two case studies offer an opportunity to better understand the complexity of the issue.

### **3.2.1 Case study selection**

Two forest-intensive cities and their affiliated forest property markets were selected as

case studies. One is located in Yong'an, Fujian province, and the other is in Tonggu, Jiangxi province. The primary reason for selecting these two cities was that both were considered to be illustrative of the rapid evolution of SFM and forest certification in China. They are both heavily forest-dependent cities located in two forest-dominated regions in China, where a series of pioneer forestry policies and measures have been implemented, including forest tenure reforms. They were the first markets of their type in China, and provide an interesting contrast in their operational set-ups. One is located in eastern China, where the economic setting and forestry industry are well developed. The other is located in mid-China, which is less developed than eastern China (SFA 2007). They are typical and revelatory because their models of various forest-related reforms have been copied by other forestry regions in China. As a result, the success of implementing SFM and forest certification at the sites may provide an indication of the improvements to forest management and the economic rewards that develop in other forest-dependent regions.

### ***Yong'an City***

Fujian province, in southeast of China, is a major forestry region, and 88% of its forest land has been held collectively (Yang and Ming 2006). It has abundant wood supplies and numerous wood manufacturing and trading enterprises. However, the implementation of sustainable forest management is complicated by the diversity of tree species and forest property ownership (Anonymous 2008b). Without established mechanisms to pay for the environmental services provided by forests, such as habitat protection, carbon sequestration, or water supply, or to reward sustainable forest management (Liu and Edmunds 2003), the separation of forest property and forest operations discourages forest farmers from investing in managing the forest actively and productively, making many aspects of sustainable forestry impossible.



Yong'an City<sup>1</sup>, with an area of 2941 km<sup>2</sup> and a population of 318,400, is located in north-western Fujian province. More than half of the population lives in rural areas and 60% are associated with forest-related industries. With 83% forest cover and 22 million m<sup>3</sup> of timber reserves, forestry is the dominant industry in the city's economy and of significant influence to both local social and cultural development as well as to environmental protection. The city is renowned in China as a hometown of Moso bamboo. This grows twice as fast here as in the northern part of China due to the better climate and more fertile soil. As one of the key forestry areas in the south of China, Yong'an was selected as the pilot site for forest tenure reforms by the State Forestry Administrative. Since its inception, around 170,000 farmers have benefited from land allocations in the city region.

In May 2004, Yong'an City became the first to complete the forest tenure reforms in Fujian province and the Yong'an Forestry Element Market was established in October 2005 to allow farmers to trade freely in forest property (e.g., forest tenure) and forest land. The development of an appropriate market system is an important step in enabling forestry to reduce poverty (Scherr et al. 2004), but is still at a very early stage in China. In order to promote the concept of sustainable forest management, Yong'an was selected as the pilot site for southern China by the State Forestry Administration in 2006. Two years later, three types of products (including wooden laminate floor, medium density fibreboard, and high density fibreboard) manufactured by the Fujian Yong'an Forestry (Group) Joint Stock Co., Ltd. were certified as meeting the FSC Chain-of-Custody (CoC) standard, under the auspices of World Wildlife Fund (WWF) who intended to set up the company as a model for other forest enterprises in the south of China (Anonymous 2008b; FSC 2010c).

As of April 2006, the total forest land area traded had reached 2 million ha, valued at more than 267 million yuan (Yong'an Forestry Element Market 2010).

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<sup>1</sup> Data were obtained from the Yong'an government official website: <http://www.ya.gov.cn/>

Although many difficulties have been encountered, 21 counties adjacent to Yong'an have already benefited from the development of the market, including Sanyuan, Meilie, Mingxi, Qingliu, Ninghua, Shaxian, Jiangle, Taining, Jianning, Yanping, Shaowu, Wuyishan, Jian'ou, Jiangang, Shunchang, Pucheng, Guangze, Songxi, Zhenghe, Liancheng and Yongchun. In addition, a series of centres covering forest and forest land registration, forest resource evaluation, forest mortgage, timber and bamboo exchange, forest legal and technical services, and forest labour training have been set up to provide more transparent and updated information on the forest property trade and reduce the investment risks as a result of the long operating turnover (Yong'an Forestry Bureau 2005).

### ***Tonggu County***

Jiangxi province is located in southern China, with an area of 166,900 km<sup>2</sup> and a total population of 43.39 million. With 60% forest cover, it ranks as one of the more forested provinces in China. The province has a large number of timber species, including both common and rare, valuable species, with bamboo, pine and fir being the most widespread.

Tonggu County<sup>2</sup>, is located in the northwest of Jiangxi province, and comprises 1547 km<sup>2</sup> of land and a population of 131,000. 86% of the land area is forested, and the growing stock is 8 million m<sup>3</sup>. Farmers comprise 72% of the population, amongst whom most are considered to be dependent on forests. It is the most forested county-level administration unit in Jiangxi province and is regarded as one of the key forestry counties in the south of China. Being chosen as a pilot site for sustainable forest management, ecological forestry is and will continue to be a goal for the administration, with a focus on achieving a balance between economic rewards and ecological wellbeing. The primary purpose of the ecological forestry concept in Tonggu is to create sufficient

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<sup>2</sup> Data were obtained from the Tonggu government official website:  
<http://www.tonggu.gov.cn/index.asp>

jobs for farmers and to increase their incomes without compromising the ecological provisions offered by forests. In 2004, forest tenure reforms directed at the collectively owned forest lands were officially initiated in Tonggu. After a ten-month implementation period, the boundary demarcation on all forest lands was completed and 34,800 forest tenure certificates were issued to farmers, covering 98.9% of the total forest area. Its success has positioned it as the model county for forest tenure reforms, attracting more than 300 visiting groups from 15 provinces around China. The proposal to create ‘green banks on the mountain’ (see further details of this scheme below) earned itself more than 40 million dollars in subsidies from the higher levels of government. A new development model, known as ‘manufacturers – forest base – farmers’, has been utilized, and is enhancing the forest industry. By connecting farmers directly to the market, timber prices have increased three times since 2001, which in turn has lifted a large number of farmers out of poverty.

Tonggu Wood and Bamboo Trading Centre was developed one year later than the Yong’an Forestry Element Market. It is one of the biggest traditional commodity markets in the region and extends into the neighbouring provinces of Hunan and Hubei. Seven adjacent counties have benefited from the current market, including Wanzai, Yifeng, Fengxin and Xiushui in Jiangxi province, Liuyang and Pingjing in Hunan province, and Tongcheng in Hubei province. To date, 90,000 farmers have received land allocations.

### **3.2.2 Interviewees**

Non-probability sampling was used to select both the case study villages and the interviewees, primarily through the use of purposive sampling. Purposive sampling allowed the selection of the respondents most appropriate to the purpose of the study (Bailey 1994). Since SFM and forest certification is an under-studied phenomenon in China. It selected villages that were judged to be the leaders in this area in China, with the help and collaboration of the key informants from Fuzhou Forestry Bureau, the

Mayor of Hongtian County, Yong'an Forestry Working Station, Tonggu Forestry Bureau, and Jiangxi Agriculture University. Before interviews were conducted, initial contacts with the markets were established and during this time the key informants had the opportunity to review the study and the associated questionnaire design and research protocol. A list of forest market employees was obtained from each of the markets and the listed individuals were approached through an initial letter of contact. Market officers who expressed an interest in the project and willingness to participate and collaborate in the study were chosen as the initial interviewees. Depending on the initial response, further efforts were made to engage with market officers who had not responded. A list of forest farmers was selected based on advice from the key informants. An attempt was made to obtain a broad spectrum of respondents reflective of the various perspectives on SFM and forest certification from each of the case study villages. As one participant only spoke a local dialect, translation was required. During the study, farmers showed genuine interest in the research and clearly hoped that the results would improve their situation. However, results from the interviews should be viewed with caution due to the potential sampling bias associated with the selection method.

### **3.2.3 Data collection**

Data collection was interview-based, complemented by field visits. Using semi-structured interviews with open-ended questions as a guide, the interviews were designed to solicit the key elements needed to achieve SFM and forest certification from the perspectives of market officers and small-scale forest farmers. Care was taken to minimize any bias, inconsistencies, and inaccuracies (Bailey 1994). A letter of introduction would normally be sent to each potential interviewee a few days in advance to inform them of the purpose of the study. However, for those interviewees who were poorly educated or illiterate, a face-to-face conversation was held to explain the study to them and to obtain verbal consent for the study. After a positive response was received

from the potential interviewees, a formal consent form was signed before the interview conducted. For illiterate householders, it was assumed that they could turn to a literate person in the immediate vicinity who could confirm the nature and contents of the consent form to them. All interviews were recorded digitally and all communication was in Mandarin (except one in local dialect). Apart from conducting interviews with market officers and small-scale forest farmers, field visits to forest areas were made with participants as these added significantly to the information given in interviews.

The NVivo (NVivo 2010) qualitative analysis package was used to assist coding the large volumes of data, including field notes, transcripts and audio recordings. The logical relations between key concepts and themes were identified using NVivo to build the model, which would indicate the capability of the various strategies (e.g., the forest tenure reforms and forestry property markets) taken by central and local governments to overcome the barriers to the adoption of SFM and forest certification.

## **3.3 Results**

### **3.3.1 Forest farmers**

Five locations were visited in Yong'an city and 33 forest farmers were interviewed (Table 3.1). In Tonggu county, two villages, Fujia and Dacao, were visited and 12 farmers were interviewed. The average area of forest land held by each individual varied widely, with the smallest being 0.2 ha and the largest being 1.33 ha. Some common trees planted in the forests of both areas include *Cunninghamia lanceolata*, and various *Eucalyptus* species, as well as the bamboo *Phyllostachys pubescens*. Two forest management methods were identified in Yong'an, independent and joint management, whilst only independent management was found in Tonggu.

**Table 3.1** Comparative table between Yong'an and Tonggu

	Yong'an <sup>1</sup>	Tonggu <sup>2</sup>
Location	Western Fujian province	Northwestern Jiangxi province
Area	2941 km <sup>2</sup>	1548 km <sup>2</sup>
Population	319,000	140,000
Forest cover	83.2%	87.4%
Key species	Bamboo, pine and fir	
Forest land area	2460 km <sup>2</sup> (83.6%)	1306 km <sup>2</sup> (84.5%)

<sup>1</sup> Yong'an government website: <http://www.ya.gov.cn/>

<sup>2</sup> Tonggu government website: <http://www.tonggu.gov.cn/index.asp>

In this study, independent management refers to forests managed by an individual household, whilst joint management refers to forests managed by a group of households that have voluntarily joined together. The adoption of either method depends largely on the area of forest received in the property distribution. From the perspectives of the participants, by grouping small parcels of forest land (usually less than 0.67 ha per capita) together, participating households could take advantage of economies of scale, allowing them to apply more scientific and professional management plans applicable to large forest areas. Other benefits associated with joint management included less financial investment and labour input. The most common ways to manage the forest mentioned by participants were selective cutting within the maximum quota set by government, reforestation after logging, weed removal, fertilizing, and pest and disease control (detail shown in Table 3.2). In some cases, participants collected bamboo shoots to increase their incomes, such as in Changchuan village in Yong'an. This is a seasonal activity largely depending on the price of bamboo shoots. There were no major differences in the dominant tree species planted or management methods adopted at the two sites.

**Table 3.2** General information gathered at the two case study sites

Villages	Yong'an					Tonggu	
	Hongtian	Tuanshi	Sangxi	Changchuan	Station <sup>1</sup>	Fujia	Dacao
No. of interviewees	6	8	4	5	10	6	6
Average forest land area obtained (ha)	0.4	1-1.33	0.2	0.4-0.53	0.4-1	1	0.8
Tree species	Mainly Chinese fir and some eucalypts	Mainly Moso bamboo and some Chinese fir	Moso bamboo combined with Chinese fir	Mainly Moso bamboo and some Chinese fir	Mainly Moso bamboo, and some Chinese Fir and eucalypts	Moso bamboo and Chinese fir, as well as some livestock cultivation in the forests	Moso bamboo and some Chinese fir
Management method	Joint	Independent	Joint	Independent	Both	Independent	
	Weed removal, fertilizing, replanting after logging	Using scientifically sound methods, such as the high-yield approach, pest and disease control	Weed removal, fertilizing, pest and disease control	Weed removal, fertilizing, excavation of bamboo shoots	Weed removal, fertilizing, replanting after logging	Replanting after logging, logging within the allocated limit; one person disagreed with bamboo shoot digging as this activity would probably damage the growth of young bamboo	Getting rid of shrub regularly; one thing is worthy to mention is that no fertilizing in this village as no one mentioned that.

<sup>1</sup>Station: Hongtian forestry station is where an affiliated submarket of Yong'an Forestry Element Market located in Hongtian Town. Participants interviewed here are those frequent visitors of this market, and thereby it is a more convenient place for them.

### *Perceived outcomes regarding forest tenure reforms*

Most of the documented positive outcomes associated with forest tenure reforms were identified by asking participants about the perceived benefits. The most frequently cited benefits related to the dramatic reduction in illegal deforestation activities, which had been rampant before the reforms, a greater sense of security on forest property, fewer boundary disputes (and easier settlement of any disputes that did occur), extensive policy support and substantial government subsidies, particularly for fertilizers and training programs focusing on the application of high technology methods of bamboo silviculture, the cancellation or reduction of taxation and other payments associated with timber or bamboo harvest and sales, the right to transfer tenure (in whole or in part) to another party, the direct economic rewards stemming from increased timber and bamboo prices and from increased land values, a major increase in the motivation to manage forest land well, and improved infrastructure, including roads and residence construction.

Participants most often identified three reasons for the perceived benefits: 1) the possibility of 50–70 year forest tenures; 2) the more stable and consistent forest policies and regulations; and 3) the strong resolution expressed by central government to transfer authority and power in relation to forest management and usufructs to local farmers. In addition, improvements to livelihoods were observed, including more vehicle owners, access to the Internet, increased awareness of physical health (demonstrated by the purchase of treadmills), and more children receiving higher education through increased affordability of tuition.

In addition to the benefits, participants also pointed to the pitfalls associated with the forest tenure reforms. For example, some participants worried that forest property trading would result in them losing their land if land and power were gradually concentrated into the hands of a few elites. Some participants complained that the amount of land they obtained was smaller than in other villages. Some participants observed that forest tenure policy should be sufficiently flexible to adapt to changing demographics. For example, a change in the population structure might predicate



redistribution of forest land.

Some villages have been able to adapt to the reforms more rapidly than others. For example, Hongtian village, which has been recognized as a model village and copied by other villages in Fujian province and other forest-dependent areas, has established a number of bamboo products factories. Local government and other administrative institutions in Hongtian have been better positioned to enforce forest tenure reforms, such as the establishment of an affiliated forestry property market in the Hongtian forestry working station. The convenience of a local market has been exploited by farmers in this area. In other villages, such as Fujia, there have been stronger concerns about the environment, and the importance of the role of forests in water protection and soil retention was repeated by several participants during the interviews.

#### ***Knowledge of forestry property markets***

Farmers had a relatively low knowledge of the forestry property markets. For the Yong'an Forestry Element Market, the majority of participants had heard about it prior to the study, whereas general understanding about the functions and services provided by the market was fairly limited. Only a few (five participants in Yong'an) admitted they were unaware of its existence. Considering that there is a submarket in Hongtian, it is possible that participants were unaware of the connection between the submarket and the Yong'an Forestry Element Market. There was greater awareness in Tonggu, as virtually all participants had heard about the Tonggu Wood and Bamboo Trading Centre at the time the study conducted. However, there was still considerable variation in the general understanding of the trading centre, with some participants showing greater knowledge than others about the functions and services provided by the Centre.

#### ***Issues related to sustainable forest management and certification***

In general, few participants at either location had any awareness of sustainable forest management or certification. Three aspects of sustainable forest management, including the economic, environmental and social components, were examined to determine the

level of understanding about SFM. Given that the economic benefits derived from forests were the pivotal consideration for participants, and the lack of awareness of the concepts of sustainable forest management and certification, the language was adjusted to refer to environmental concerns and social issues. Despite the lack of understanding, all participants at both locations considered their management activities to be sustainable. On completion of each interview, the definition of and detailed information about SFM and certification were provided to participants expressing an interest. In Yong'an, SFM was equated to longer forest tenures, sustainable economic rewards generated by forest land, long-term management planning, and high soil quality (resulting in high-quality timber and bamboo). In Tonggu, there was confusion between sustainable forest management and regular forest management, such as fertilizing and weed removal. Sustainable forest management was related to long-term management planning, as opposed to clearcutting and a focus on short-term economic rewards. It was also associated with reasonable and sustainable land utilization. Additionally, stable and consistent policy and government support and subsidies were considered highly important in achieving SFM. There was a widespread belief that most forest activities would not affect the ecosystem as clearcutting was not involved.

A sizable proportion of the participants from Tonggu referred to the forest as a “green bank” being maintained for the benefit of the environment and ecosystem as long as there were no immediate financial needs.

### ***Major concerns and motivations of individual farmers***

In Yong'an, economic rewards were expressed by most participants as the principal concern and motivation to manage forests. Usually, participants separated ecological welfare forests from commercial forests or bamboo forests. From their perspectives, the former was set aside to maintain ecological welfare. In contrast, commercial forests were allocated to serve as the major source of income for individual farmers dependent on the forest. They strongly believed that their management activities would have no impacts

on the ecosystem provided that there was no clearcutting or deforestation.

Similar perceptions were held by most participants in Tonggu. SFM could only be adopted provided they had stable and consistent economic returns to support their subsistence. They expressed willingness to manage the forest sustainably, but only after alternative economic sources that could generate sufficient income were in place. Most participants in rural areas were aware of increasing environmental problems, such as air pollution, lack of safe and clean water, and higher temperatures (global warming). They were aware of the role of forest in contributing to ecosystem health. Clean air and prevention of landslides were the two most cited elements related to environmental protection. One participant was more concerned about ecological welfare; he had a higher standard of living than the other participants, and owned a vehicle and newly-built house.

### **3.3.2 Market officials**

#### ***Yong'an Forestry Element Market***

Yong'an Forestry Element Market was established in 2004 and currently has six affiliated centres, including a forestry property registration centre, forestry property mortgage centre, wood and bamboo trading centre, forest resources evaluation centre, forest technology and regulations consulting centre, and forestry labour training centre. In this study, six officials were interviewed, one from each of the centres. During the interview, some participants were reluctant to answer certain questions. Such questions included whether the market had achieved its anticipated goals, whether the market had realized its original functions, any aspects that needed to be improved, and any perceived obstacles. Almost all participants had minimal awareness or knowledge of SFM and certification.

With one exception, the participants had been conducting forest-related work prior to their present positions in the market. Their previous working experience was

considered to be useful for their current activities. All participants, with one exception, had moved to the market one year before the study and had been employed there since its establishment. Generally, they were pleased with the market in terms of functions and services, although some aspects were identified as being in need of improvement. For instance, the working conditions were poor because of the large number of study groups that had and will continue to visit the market. Financial issues were noted to be the major impediment and will continue to be so as long as the current system is in place. As the market does not charge fees for its services, the only financial source has been government subsidies; this has deterred the further development of the market and prevented the upgrading of the current facilities (e.g., computers). One participant considered that it had been unnecessary to separate the market from the forest bureau given that the market was still an affiliated but quasi-independent institution of the forest bureau. The combination of the forestry market and forest bureau was expected to not only better serve local farmers but also to facilitate collaboration. Other improvements mentioned by participants included enlarging the exhibition area and releasing more forest-related regulations about the issuing of forest tenure certificates and their renewal.

Since the establishment of the market, market officials perceive its impacts to have been immense and far-reaching. Important roles of the market have been to publicize updated regulations amongst local farmers and to guide forestry property transactions. This has assisted farmers in obtaining higher than average prices and in avoiding disputes. Due to the wide-ranging publicity and greater availability of the newest information, more people have been competing in the land auctions, sometimes from adjacent provinces. The prices of forest land and timber have increased, improving farmers' livelihoods. With the advent of forest property mortgages, pressures attributable to inadequate financial resources have been alleviated, and small-scale forest farmers have had access to start-up capital, greatly boosting the local economies. The initial goal of the market was to provide one-stop services without charge, covering all services that

forest farmers might need, and the participants confirmed that this has been achieved.

The level of awareness of and understanding about SFM and certification was fairly limited. There was no mention of ecological values. After explaining the main characteristics of SFM and certification, participants identified some core elements that could contribute to the promotion of SFM and certification, such as clear and undisputable land ownership, adaptation to local context and conditions, and a sustainable yield and timber stock. One participant was concerned that the use of fast-growing high-yield plantations could slow down the uptake of SFM and certification, given that the aim of such plantations is to maximize incomes for farmers. To achieve SFM, synergies between various related stakeholders were needed, including between small-scale forest farmers, government officials, local organizations (such as the various self-organized entities in existence), and central government. The role of central government was seen as being particularly important.

### ***Tonggu Wood and Bamboo Trading Centre***

Compared to Yong'an Forestry Element Market, Tonggu Wood and Bamboo Trading Centre is smaller and has only two working areas, an office area and a bidding area. Two participants were interviewed, one being the director of the trading centre and the other being an employee. The director provided much information about the trading centre and its associated supporting measures. The other participant had no decision-making power and was cautious in responding, avoiding contradicting the director. Consequently, the information should be treated with caution, as it is dominated by the responses of the director of the trading centre.

Both participants had a moderate understanding about SFM but had not heard about forest certification prior to the interview. They gave more emphasis to the ecological functions of forests, emphasizing that no long-term economic benefits could be achieved unless a sound ecological system was maintained.

The director worked as an administrative manager for private companies before

working for the market, so had been able to gain a better understanding of forest farmers, forest bureaus and government officials, particularly the genuine/fundamental needs of farmers. The other participant had also worked for a private company, but was unable to use this experience in the current position.

According to the study participants, as the process of privatizing forest land developed, there was evidence of a reduction in illegal logging and timber thefts, and greater financial investment in forest land. As a result, the local economy and forest industry had been enhanced. In addition to the economic development, the forest ecosystem was considered to have been better protected. The establishment of Tonggu Wood and Bamboo Trading Centre simplified and facilitated the procedures needed for local farmers to acquire forest tenure certificates and forest land, and trade in timber. However, a core issue remained, namely the integration of all functions and services into a single market and one-stop service.

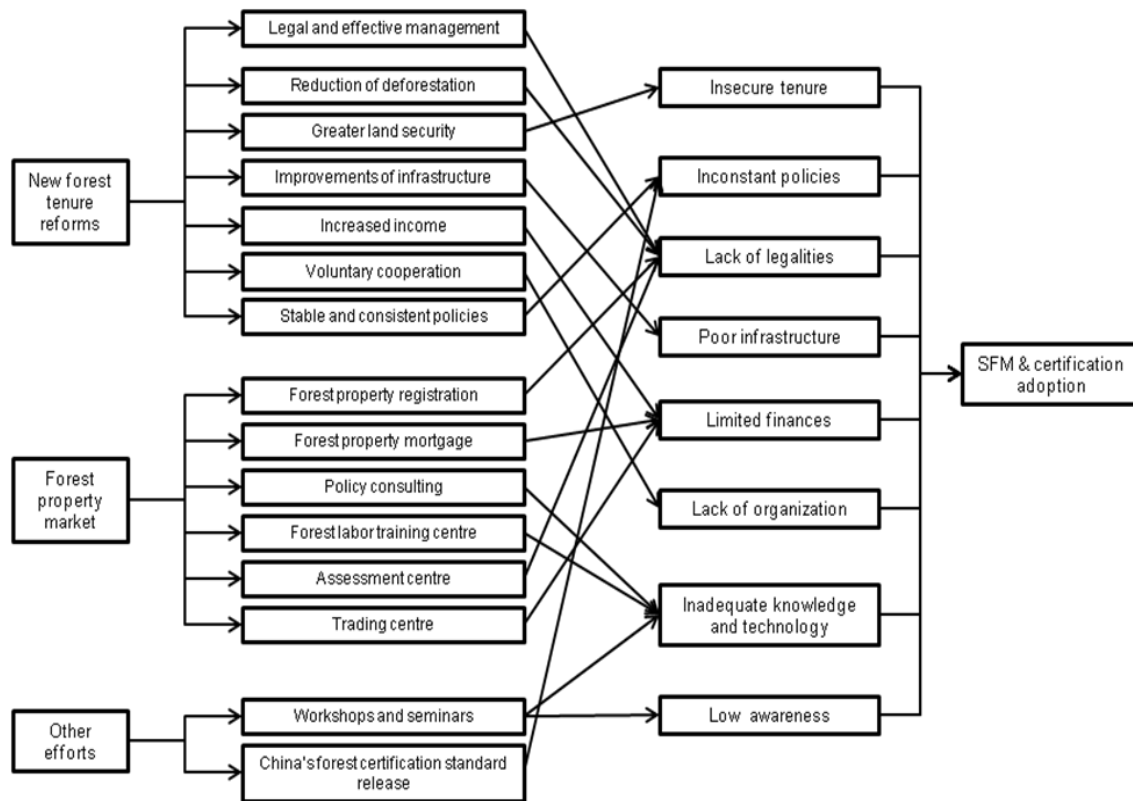
Both participants favoured ecological welfare over economic rewards. They felt that the costs incurred in implementing SFM and certification would be better subsidized by either central or local governments, or by outside donors. If logging was more expensive than importing timber, then SFM might be more possible because of less demand for domestic timber. In addition, SFM and certification would be more affordable if there was a better positioned compensation mechanism for adopting them, similar to the forest fire insurance currently effective in some areas in China.

### **3.4 Discussion**

Several challenges to the implementation of SFM have been identified in the literature, including insufficient market demand, high costs, weak policies and inadequate enforcement, limited capacity to implement SFM, and poor forest management standards (Durst et al. 2006). These also existed in China prior to the new forest tenure reforms and the establishment of forestry property markets. Previous forest-related reforms

occurring in the collective forests resulted in several challenges that might constrain the widespread adoption of SFM and certification in China. Such challenges included inconsistent forest policies (Yan and Chen 2010), illegal logging and timber theft because of the insecure forest tenure (SFA 2010; Yan and Chen 2010), inadequate start-up finance (Yang et al. 2010), lack of incentives to invest in the forest land and manage the forests responsibly and sustainably (SFA 2010), poorly-developed transport and infrastructure (Yang et al. 2010), a lack of legitimacy of forest management (SFA 2010), low levels of knowledge and technology know-how (Yang et al. 2010), and a lack of local voluntary cooperation to achieve the economies of scale (SFA 2010). When combined with the results of this study, a limited public awareness of SFM and certification was identified to be greatly hindering the development of SFM and certification. Three strategies to address these were introduced by central and local governments, including forest tenure reforms, the establishment of forestry property markets, and other efforts introduced by the state forestry authorities, mainly aimed at knowledge and technology transfer. Most of the challenges could be directly or indirectly overcome with the assistance of the new forest tenure reforms and forestry property markets.

Using the results obtained from the farmers and market officials, a model (Figure 3.1) has been constructed to display how the ongoing forest tenure reforms, forestry property markets, and other efforts can address the challenges facing the adoption of SFM and certification. The first level indicates the various efforts made by central and local governments. The second level demonstrates the outcomes arising from those efforts. The third level represents the challenges facing the adoption of SFM and certification in China prior to the new forest tenure reforms. The fourth level is the ultimate goal, namely, the adoption of SFM and certification. Arrows connecting the outcomes and challenges indicate the linkages between each component.



**Figure 3.1** Outcomes of forest tenure reforms and forestry property markets and challenges to the development of SFM and forest certification in China

***Stable and consistent forest-related policies and government support***

Stable and consistent forest-related policies and government support were perceived by the participants as the key elements to SFM and certification. Decentralization is a cyclical process seeking a dynamic balance between decentralizing and centralizing forces in various contexts (Capistrano and Colfer 2005). Strong government support and consistent forest policies are conducive to a desirable setting for decentralization, including accountability, responsibility, and revenue-sharing amongst different groups of stakeholders (Capistrano and Colfer 2005). Prior to the new forest tenure reforms, fast-changing forest legislation, laws and regulations greatly discouraged farmers from using forests sustainably, as there was uncertainty over the continuing rights to forest resources. This is partly why the new forest tenure reforms initially encountered local resistance; farmers had lost confidence in the forestry authorities. Yet, with forest tenure



reforms going deeper and deeper, more policies favourable to forest farmers have been developed, such as the issuing of forest tenure certificates. In addition, at the local level, forestry property markets have been established to engage all farmers (including those marginalized, less-educated and illiterate) in the process and to allow them to benefit from the reforms. Through close collaboration between central and local governments, promising outcomes have been achieved, such as forest tenure certificates being issued for more than 95% of the transferred forest land in Yong'an and Tonggu.

### ***Transferrable land tenure and legitimate forest management***

Longer forest tenures were perceived by the participants as enabling them to engage in SFM and forest certification, which would also enable them to make long-term forest management plans. Clear and secure forest land tenure and legitimate forest management authority are key elements for the improvement of livelihoods and the introduction of SFM and forest certification. Insecure property rights have been reported as undermining sound forest management and as a critical driver of deforestation throughout the world, mostly due to the lack of incentives to invest in the land (White and Martin 2002). The nature of collective ownership requires shared responsibilities, with the benefits associated with forest resources accruing to the whole village. In China, the benefits are not genuinely shared amongst all constituents within the village, discouraging individual farmers from tending their forest land responsibly. In addition, farmers do not have equal access to the resources and lands, making sustainable forest use and protection difficult. As a result, illegal logging has become a long-standing and recurrent issue.

Massive forest loss is also considered as the dominant driver of many ecological problems. The new forest tenure reforms have empowered local farmers by providing them with property rights over the forest land, greatly reducing the occurrence of illegal logging and timber theft. Such rights include land and tenure transfer, giving farmers full control over the resources. By issuing official forest tenure certificates, effective for 50 to 70 years depending on the areas and local regulations, farmers have formal proof of

tenure and rights of use over the forest land. They are able to renew the certificate beyond the tenure period as long as the required documents are provided. Economic gains derived from the land have been reaped by individual owners, enabling them to improve their lives. As a result, additional personal capital is available to invest in forest operations, making SFM and certification more feasible.

### ***Finances and physical infrastructure availability***

Inadequate finances and minimal infrastructure are also major impediments to SFM and certification. SFM and certification could be costly due to the management upgrades or corrections required to meet the certification standards (Chen et al. 2010; Murray and Abt 2001). Such upgrades could include professional expertise, new management and operation systems (such as environmental management system), and human resources (Merry and Carter 1997). The costs could be extremely high, particularly for small forest owners in developing countries (Fischer et al. 2005; Innes and Hickey 2005; Leslie 2004). This is the case for China, as most forest farmers received much less than 2 ha of forest land and are still living in poverty. Sustainable economic rewards were reported by the participants as their major incentive for adopting SFM and forest certification. They lack the finances necessary to purchase equipment and other materials needed for forest operations, and are not in a position to incur the additional costs associated with being certified. In addition, most forests in China are located in remote areas, and the transport system and infrastructure remain poorly developed; these add additional challenges to SFM and certification. Yet, due to the new forest tenure reforms, farmers' incomes have been dramatically increased, and great improvements to the infrastructure have occurred. Moreover, forestry property mortgages provide an opportunity for individual farmers to raise capital, making certification more accessible to smallholders. Other approaches underway include the abolition of forest-related taxes and payments and distribution of free fertilizer.

### ***Local voluntary entities***

The tenure reform process allocated a small area of forest land (usually less than 2 ha) to individual farmers. SFM and certification are much more difficult for small forest owners due to their limited capacity to respond to market opportunities quickly and the inadequate economic incentives (FSC 2009a; PEFC 2009b). Such limitations include low product volumes and a low quality timber supply, inadequate market information, poor management systems, and inadequate human resources (FSC 2009a). Moreover, managing small-scale forest management units is labour-intensive and more costly when applying professional forest management practices. A means of countering these problems is group certification, which is tailored to meet the needs of smallholders and has been introduced by two major certification standards, including the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC). Certification is more accessible to smallholders when the costs and benefits are shared among all the participants. This phenomenon is apparent in China, with farmers voluntarily forming groups (called voluntary cooperation) to achieve the economies of scale. In addition to the cost-benefit sharing, such cooperation also strengthens access to the market by providing stable and large-volume timber supplies and shared risks.

### ***Awareness and knowledge***

An extremely low level of awareness and knowledge of SFM and forest certification was identified among the participants, including small-scale forest farmers and market officials. This has also been identified amongst other groups of stakeholders around the world, including forest industry, retailers, government officials (Ebeling and Yasué 2009), and consumers (Archer et al. 2005). There is a need for more comprehensive education and publicity activities to raise the general awareness (Archer et al. 2005; Kozak et al. 2004). Not surprisingly, farmers in China were even less aware of SFM and certification than most, despite a series of public workshops and seminars associated with the release

of China's forest certification standard in 2007. A stepwise approach to publicity is needed, moving from the state down through the various levels of government. Forest farmers considered that university professors and forest technicians have an important role to play in this education because of the trust associated with these positions. The forestry property markets should also contribute to the education of forest farmers through their training centres.

### ***The ultimate goal — Sustainable Forest Management***

Managing commercial and ecological forests responsibly and sustainably is the ultimate goal for forest owners, as it will not only generate incomes but it will also alleviate the detrimental environmental consequences resulting from past deforestation. Achieving the goal will involve many interrelated challenges, which means that overcoming one challenge may help with another one. For instance, consistent and supportive forest policies may result in greater security of tenure and in improved legality of forest management. Greater availability of finance would not only make certification more accessible to smallholders but would also improve the transport and infrastructure. Forest tenure reforms and forestry property markets, despite not being aimed at SFM and certification, provide promise for the further expansion of SFM and certification into new niches in China.

### ***Some remaining challenges***

In addition to the promising consequences of the forest tenure reforms, special action is needed to avoid some common pitfalls. The first is to avoid elite capture. The early-adopters of forest tenure reforms have been set up as models, and they have better access to land and resources and have strong connections with the forest authorities. Thus, they are better positioned to acquire further land. It could be very damaging if more and more land was concentrated in the hands of a few elites (e.g., village chiefs and the existing model areas). During this study, it was evident that some participants

were aware of this danger and that it was influencing the degree to which they trusted the reforms and forest authorities.

Elite capture triggers a second inevitable problem – the widening gap between the rich and poor. Although this gap already is widespread, it is becoming more evident in rural areas. A third challenge is the informal trade of forest tenures and land, largely caused by private agreements between buyers and sellers without the knowledge of the forest authorities. Such agreements can easily lead to disputes, especially when equivalent information is not available to both parties. Such disputes often revolve around land evaluations. Forestry property markets are intended to facilitate fair trade and reduce the potential for disputes by providing guidance and formal procedures.

The documentation requirements associated with detailed management plans are currently quite onerous, and are accompanied by bureaucratic approval processes. This may limit the capacity of farmers to liquidate their resources into cash, as the majority cannot prepare the management plans by themselves.

### **3.5 Conclusions**

Overall, the ongoing new forest tenure reforms have achieved their initial goals, such as stopping illegal logging by privatizing forests and authorizing the rights of use over forest land, providing greater security of resources through forest tenure certificates, dramatically increasing farmers' incomes through cancelling timber-related taxes and payments and by adopting other market mechanisms, and better and legitimate forest management. Individual farmers have also been empowered through better access to the resources and by the ability to transfer their tenure and land. The forestry property markets are perceived to have fulfilled their original missions, with some of the services being particularly important, such as forestry property registration and the provision of mortgages. In addition to the six key services, other context-specific services have been identified and formulated during the process of forest tenure reforms. For instance,

Tonggu heavily subsidizes forest fire insurance, ensuring that it is equally accessible to all farmers.

Given the promising outcomes revealed in this study, the decentralization of forest management to individual farmers has had immense impacts on poverty reduction. The increase in incomes together with the observed improved life quality (e.g., new houses, new vehicles, and higher education) in Yong'an and Tonggu have lifted many farmers out of poverty. Although farmers and local governments are still in favour of the immediate short-term economic rewards that could stem from unsustainable forest use, there are opportunities to inform farmers and other interested groups about the benefits of SFM and certification as well as the disadvantages of unsustainable use. This is particularly true for those individuals who have started to notice a deterioration in the quality of the environment.

The study revealed that poverty reduction is the first step on the way to sustainability in China, given that economic rewards are still the pivotal concern of forest farmers undertaking forest management. Farmers in Yong'an and Tonggu are living in poverty despite having abundant forest resources. Reducing this poverty is often associated with increased timber harvesting. In view of this, other sources of income-generating forest-related activities with lower environmental impacts should be encouraged as an alternative to timber harvesting, such as the collection of non-timber forest products (e.g., bamboo shoots). Economic compensation is the key to better promotion of SFM and certification among Chinese forest farmers with small forest holdings. More concerns would be directed towards ecological wellbeing once adequate economic incomes were in place. In addition to economic rewards, some key elements have been identified from the study relevant to SFM and forest certification, including the need for longer forest tenure ownership, long-term forest management plans, consistent forest-related policies, and the support of various levels of government and forest industry associations. The new forest tenure reforms have been able to improve

these issues. Moreover, the reforms and their associated supporting mechanism, the forestry property markets, have also assisted with the elimination or mitigation of some of the other challenges facing the adoption of SFM and forest certification amongst Chinese small-scale forest farmers. For example, the emergence of local voluntary entities is providing a vehicle for group certification. The provision of forest property mortgages is enabling small-scale forest farmers to better access finance to initiate their forest management practices. The training centre in the forestry property markets offers forest farmers a wide range of forest-related technology and knowledge transfer. Above all, the state and local forest authorities have collaborated with university professors and forestry technicians to hold various workshops and seminars to inform and educate smallholders about better forest management. Considering that both decentralization and sustainable forest management are at an early stage in China, it is however uncertain whether this type of forest decentralization will facilitate SFM adoption, or vice versa. Although forest sustainability is the ultimate goal, it will be not achieved without the sacrifice of some economic gain from timber harvesting. Although the reforms will assist in overcoming several of the barriers to SFM and certification, many challenges still exist, such as the extremely low awareness and understanding of SFM and forest certification among the smallholders. It is therefore too early to conclude that sustainability will be achieved in the near future or what path it will take in China.

# **4. An exploratory assessment of the attitudes of Chinese wood products manufacturers towards forest certification**

## **4.1 Introduction**

China's forests and forest sector have received national and international attention over the last decade. As the second largest importer of forest products worldwide (Song et al. 2007; Sun et al. 2004a), the world's largest producer of wood and paper products, and a major exporter of a wide range of forest-based products (Campbell et al. 2008), China is emerging as an important player on the international forestry stage. Domestically, there have been significant changes in the ongoing dispute over forest tenure and the transfer of collectively-owned forests to individual farmers. Internationally, the global economic crisis has swept China and has had substantial impacts on its forest sector, particularly for those forest products companies targeting foreign markets. The increasing awareness of forest degradation, climate change, biodiversity conservation, and carbon sequestration, together with the general trend towards sustainably managed forests, have brought China and China's forest sector to the centre of global environmental efforts. As a result, increasing attention has been devoted to the implications of sustainable forest management (SFM) and forest certification for China's forest industry and the possibilities for the successful implementation of both.

Forest certification was initially advanced by environmental groups as a response to the consequences of tropical deforestation and forest degradation (Leslie 2004; Rametsteiner and Simula 2003). It was quickly accepted as a means to pursue sustainable forest management by demonstrating that a forest management operation is



sustainable and responsible (Durst et al. 2006). As of October 2010, 229 million ha of forests had been certified by standards endorsed by the Program for the Endorsement of Forest Certification (PEFC), and 7,804 PEFC Chain-of-Custody (CoC) certificate holders had been approved (PEFC 2010a). Another 134 million ha of forests in 81 countries had been certified to Forest Stewardship Council (FSC) standards, with 19,313 CoC certificate holders (FSC 2010a). Despite these worldwide levels, SFM and forest certification are relatively novel in China. By October 2010, only 29 forest management units in China, covering less than 2 million ha of forest area, had been certified to FSC standards, accounting for more than one-third of the total certified forest areas in Asia (FSC 2010a). A total of 1424 wood processing enterprises had obtained FSC CoC certificates (FSC 2010a).

Although the absolute numbers of certificates remain small, progress on forest certification in China has been substantial. Since 1995, China has taken a number of steps towards the promotion of SFM and forest certification. In addition to the two dominant forest certification systems present in China (Hui et al. 2008), a national forest certification scheme initiated by the State Forestry Administration and drafted by the Chinese Academy of Forestry was released in 2007 (China Forest Certification Council 2009a). In addition, 13 pilot sites were selected in 2006 and 2007 for testing the feasibility of implementing forest certification in China. The pilot sites – in Jilin, Heilongjiang, Zhejiang, Fujian, Guangdong, Sichuan, Neimenggu, Guangxi, Yunnan, Hainan, Anhui, Hebei, and Muleng Heilongjiang – are viewed as being representative of current forest management practices (China Forest Certification Council 2009b; Hui et al. 2008). The national forest certification standard will be implemented nation-wide once these pilots are completed, and it is also currently undergoing review for PEFC endorsement.

Despite the numerous efforts being made to promote forest certification in China, many impediments still exist, and these are hindering its uptake. A major issue is the

uncertainty around costs and benefits associated with certification, a problem that extends to both developed and developing economies (Rametsteiner and Simula 2003). The willingness of consumers to pay for the premiums associated with certified products is unclear and, if any such willingness exists, it is difficult to gauge what the actual demand in the marketplace will be (Aguilar and Vlosky 2007; Anderson et al. 2005; Forsyth et al. 1999; Kozak et al. 2004; Owari and Sawanobori 2007; Sedjo and Swallow 2002). As long as this uncertainty continues, forest companies are unlikely to implement certification quickly as they are unable to see whether economic returns outweigh the additional costs (Stone 2006). Moreover, a fairly limited awareness among the public and lack of participation are common challenges which further impede the adoption of forest certification in China (Stone 2006; Wang et al. 2005a; Zheng and Jiang 2002). Comprehensive education campaigns and publicity activities in the forms of advertisement and eco-labelling, covering a wide range of interested groups, are needed in order to enhance general awareness (Zhu et al. 2007).

Concurrently, economic growth has been the pivotal focus of various levels of government in China for decades, oftentimes being achieved at the expense of ecological sustainability, and resulting in massive forest losses (Xu et al. 2006; Zhang et al. 2000). Taking advantage of the ready supply of low-cost labour (Zuo et al. 2004), China's wood processing industry has experienced exponential growth that has, in turn, resulted in a rapidly increasing demand for timber (Sun et al. 2004a). The limited supply of domestic timber cannot meet this demand and the discrepancy between fibre supply and demand has led to the procurement of fibre from other countries (Sun et al. 2004b). Over 70% of the timber is imported from countries in the Asia Pacific region, many of which have had to grapple with issues such as unsustainable forest management, dubious operational practices, high levels of illegal logging, and negative impacts on community livelihoods (Katsigris et al. 2004). As a result, Chinese forest companies are increasingly required to source wood from legally and sustainably managed forests that have met certification

standards. However, many lack the human resources and expertise (Liu et al. 2005) to fully comprehend the complexities of forest certification. This is further exacerbated by confusion over the differences between certification schemes used in different parts of the world, a general lack of mutual recognition between some of the major certification schemes, and the subsequent differences in rules and procedures for obtaining a certificate (Anderson and Hansen 2004a; Atyi and Simula 2002).

Given these complexities and uncertainties, it is extremely difficult to predict the direction that certification will take in China and to what extent it will affect its forest industry. As such, a range of questions have arisen, including whether there are adequate incentives for forest companies to increase investments or to bear the extra costs to voluntarily obtain forest certification. It is unclear whether certification will become a requirement for forest companies to enter into specific foreign markets or more environmentally-sensitive markets, such as the European and North American markets. It is unknown whether domestic consumers will start demanding certified wood products or whether the demand will be sufficient to sustain forest companies that concentrate on the supply of certified products to the domestic market. The extent to which customers will be willing to pay for the additional costs incurred with certified wood products is also unknown. As a result of these uncertainties, certification has yet to be widely adopted in China, despite steady progress.

In the global context, numerous studies have examined the motivations for and benefits of forest certification from the manufacturers' perspectives (Jayasinghe et al. 2007; Ratnasingam et al. 2008b; Stevens et al. 1998; Vlosky and Ozanne 1998), as well as consumers' behaviour towards and preferences for certified products (Aguilar and Vlosky 2007; Anderson and Hansen 2004b; Bigsby and Ozanne 2002; Forsyth et al. 1999; Kozak et al. 2004; Mohamed and Ibrahim 2007; Ozanne and Vlosky 1997, 2003). Many other aspects of forest certification have also been examined, including the efficacy of forest certification (Ebeling and Yasué 2009; Federation of Nordic Forest

Owners' Organisations 2005; Tikina and Innes 2008) and the costs and benefits of forest certification (Chen et al. 2010; Cabbage et al. 2003, 2008; Simula et al. 2004). However, the majority of these studies were situated within North America and Europe. Very little research has been done on the attitudes of Chinese wood product manufactures towards forest certification, other than a mail survey of wood products manufacturers on their motivations to implement certification in Fujian province of China (Huang et al. 2009). In this study, Huang et al. (2009) examined four factors considered to potentially influence forest products manufacturers in Fujian province of China to adopt forest certification, including the companies' general profiles, their recognition of forest certification, their understanding of forest certification, as well as the reliance of their business operations on certification; the results revealed that only their recognition of forest certification had significant impacts on their adoption. They further proposed that such recognition should be coupled with strong government support in order to increase uptake of certification. That said, little else is known with respect to manufacturers' attitudes towards forest certification in China. It is against this backdrop of uncertainty and a lack of research that this study, an interview-based exploratory assessment of the Chinese wood products industry's views on forest certification, was conducted.

## **4.2 The study**

This study explored the knowledge and views of managers at selected Chinese wood products firms regarding forest certification in China. Other objectives included: 1) examining the trends and viability of forest certification in China from the perspective of the manufacturing sectors; 2) investigating the conditions under which manufacturers would be willing to adopt forest certification, and their motivation for so doing; 3) identifying any reasons for a lack of interest in forest certification; and 4) exploring any differences in business operations that come about as a result of forest certification.

## 4.3 Methods

During the summer of 2008, twenty expert interviews were conducted to gain insights into the views and attitudes of Chinese wood products manufacturers towards forest certification. Open-ended questions were designed to guide the interviews. Participants were asked to give a general description of their companies, whether they had heard forest certification before, what the main differences between certified and non-certified firms were from their points of view, under what conditions they would be willing to get certified, what the motivation for becoming certified was, and what market and non-market benefits associated with forest certification they anticipated with its adoption. The assessment was restricted to the CEOs or managers of companies manufacturing furniture, wood flooring, wood doors, and engineered wood products (EWPs); these products consume large amounts of wood and their exports collectively account for more than 70% of total wood products exports from China (Liu et al. 2005). A directory of companies manufacturing wood products was obtained through wood365 (<http://corp.wood365.cn/>), which is the most comprehensive website for the wood products industry in China. The first selection criterion was that the companies demonstrated an interest and willingness to discuss SFM and certification during the first contact. The second selection criterion was that the subjects were interested in this research and willing to share their experiences and perspectives. Purposive sampling was employed to develop the list of potential participants based on a diversity of professional backgrounds and a willingness to participate in the study.

An initial letter was sent to each potential subject (by mail or FAX), inviting them to participate in the study. If the subject responded positively, further information, along with a consent letter, was sent (by mail or email). If consent was given, the participant was approached by telephone to set a date for the interview. All communication was in Chinese. Subjects were given one week to decide whether or not to participate in the research. Those who decided to participate were asked to reserve one

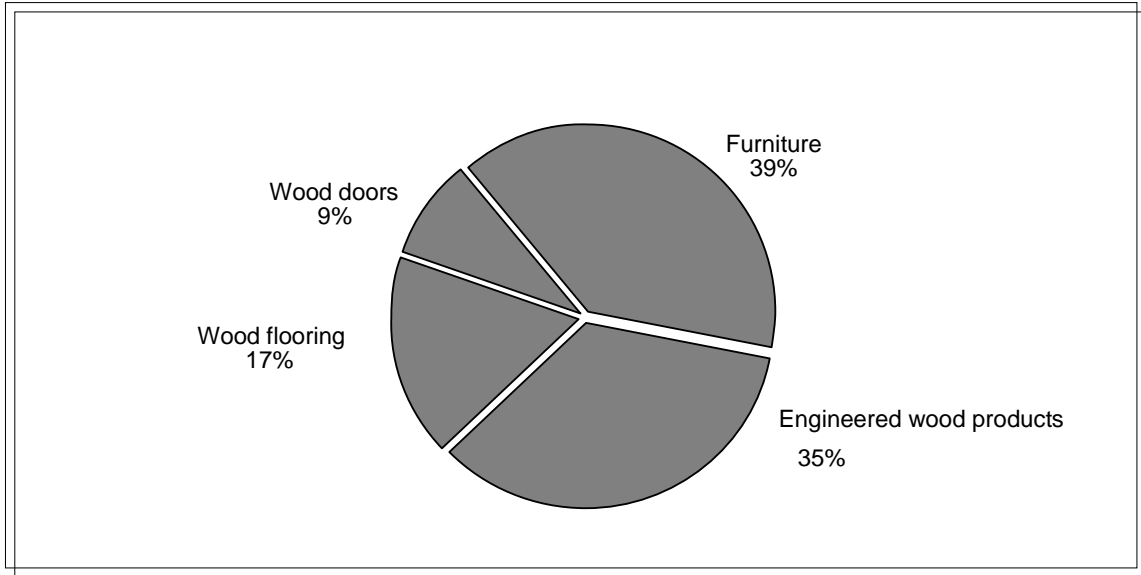
hour for the interview together with any time needed to prepare for the interview. By signing the consent form, the participants agreed to devote the amount of time requested for the study. No honorarium was offered. The questions used to guide the interviews were open-ended in order to solicit key themes regarding forest certification, but all participants were provided with the same questions during the interviews.

As a result of the relatively small sample size and the nature of the data collected, manual techniques combined with a computer-assisted qualitative data analysis tool were used to analyse the results (Welsh 2002). Manual techniques were used to obtain general impressions of the data. The software program, Nvivo 8 (Nvivo 2010), was used to uncover key themes that emerged from the participants' accounts and to map out these themes in aggregate across the entire data set. Finally, the emergent themes identified from the manual and computer-assisted techniques were triangulated and knitted together to ensure that data were valid and used in their entirety.

## **4.4 Results**

### **4.4.1 General company profiles**

Questions related to company profiles explored the different products manufactured, the numbers of employees, markets, the kinds of wood used, and their origins. A variety of products were manufactured by the participants, including furniture, wood flooring, wood doors, and EWPs (e.g., medium density fibreboard, particleboard). Most participants manufactured a diverse range of products, rather than specializing on a single product. The main products were furniture and EWPs, accounting for 39% and 35% of the respondents, respectively (Figure 4.1).



**Figure 4.1** Wood products manufactured by participants (n=20, proportion of responses)

The number of employees was used as an indicator of company size. Three groups were apparent: larger companies with more than 5,000 employees (4 participants); medium-sized companies with between 1,000 and 5,000 employees (5 participants); and smaller companies with less than 1,000 employees (the remaining 11 participants). This parallels the current distribution pattern of forest products companies in China, with 80% being considered small- and medium-sized forest companies (Zuo et al. 2004). 70% of the participants (14 interviewees) primarily targeted the domestic market, while 30% (6 interviewees) were more export-oriented.

The types of wood used in the production depended largely on the products manufactured. For instance, participants producing EWPs used small diameter timber as well as branches and limbs, which were either sourced from local farmers or from other adjacent forestry regions. The underlying rationale here is that, when sourcing timber locally or in nearby regions, the costs of raw materials will be significantly reduced due to shorter transportation distances. Furniture manufacturers primarily purchased EWPs from other producers (only a small number of manufacturers were capable of producing

their own EWPs), with some importing wood from the United States and Russia.

## **4.4.2 Forest certification in China**

### **4.4.2.1 Current uptake, awareness, and perceptions of forest certification**

#### *Uptake and awareness of forest certification*

Of all the participants interviewed, only one had obtained certification at the time of the study (an FSC CoC certificate). Participants generally had very little knowledge of certification, even though more than half had heard of certification prior to their participation in the study. The majority were unable to explain the meaning of forest certification, let alone the procedures and requirements needed to obtain forest certification. Five participants were able to describe certain aspects of forest certification, such as identifying well managed forests, protecting forest resources, and promoting sustainable harvesting practices. Only one participant mentioned CoC as a form of certification.

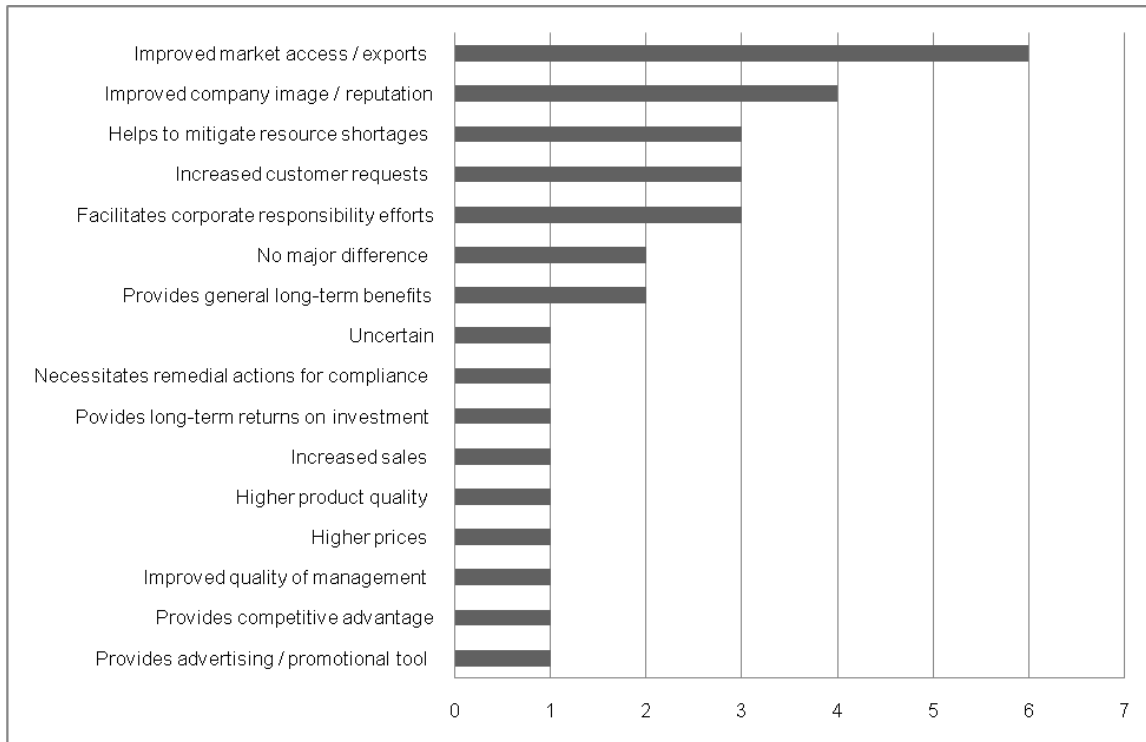
When exploring participants' views on whether they had plans to obtain forest certification in the near future, 12 gave a positive response (versus 7 negative), and one (mentioned above) had already obtained an FSC CoC certificate in 2005. Of those planning to obtain certification, half (6 out of 12 participants) indicated that they planned to adopt it within a year or in the foreseeable future, whereas the rest were likely to wait longer. Two participants indicated that they would not seek certification, an attitude that may have been linked to their lack of knowledge about the process (neither had heard of forest certification prior to the study).

#### *Perceived differences between certified and uncertified operations*

Given that many of the study participants lacked an adequate understanding of forest



certification, it was necessary to provide a brief explanation before subsequent questions dealing with various aspects of forest certification were posed. When asked about general differences between certified and uncertified operations, most participants saw the potential of certification, but two thought that there would be little in the way of differences and one was uncertain. The two most commonly cited perceived differences related to improved market access and enhanced company image or reputation (Figure 4.2). Six participants considered that obtaining forest certification would lead to better access to export markets and, to some extent, could minimize or even eliminate barriers to trade, particularly in North American and European markets. Four participants indicated that certification was beneficial to the corporation itself and could help to improve company image and reputation. Three participants stated that the uptake of certification could attract the attention of environmentally sensitive consumers which, in turn, could increase the number of customer requests. Another three expressed their concerns regarding forest resource shortages and stated that certification could at least mitigate this problem. Three more reported that certification could enhance corporate responsibility efforts. Two participants indicated that certification could bring companies long-term benefits, despite the costs incurred in the short time. Other perceived differences in certified operations cited by the participants included the potential for higher product quality, enhancements to the quality of management, competitive advantages over industry counterparts, the creation of an alternative advertisement and promotion tool, increased sales, higher prices, the need for remedial actions to be taken to comply with requirements, and long-term investment returns.



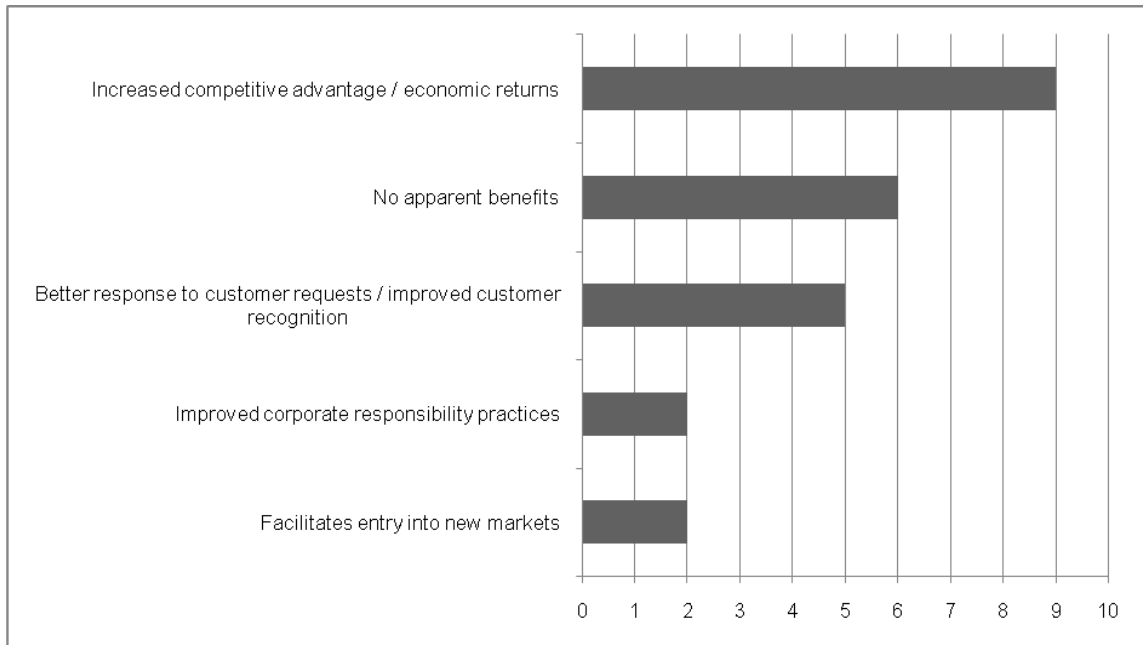
**Figure 4.2** Perceived differences between certified versus uncertified operations as indicated by participants (n=20, number of mentions allowing for multiple responses)

#### 4.4.2.2 Benefits of and barriers to forest certification

##### *Perceived benefits of forest certification*

Figure 4.3 shows the perceived benefits associated with forest certification according to the interviewees. Six participants indicated no apparent benefits associated with certification, particularly in the marketplace, due low levels of awareness among the general public. However, competitive advantages and increased economic returns (in the forms of increased sales, profits, market shares, and prices), were perceived by almost half the participants (9 out of 20 interviewees) as potential benefits of forest certification. Interestingly, this corresponds well with the motivations for adopting certification among participants. Five participants anticipated that they would be in a better position to respond to customer requests if they were certified, and that certification provides improved customer recognition. Other anticipated benefits included gaining access to

new markets, and improving corporate responsibility practices.



**Figure 4.3** Perceived benefits associated with forest certification as indicated by participants (n=20, number of mentions allowing for multiple responses)

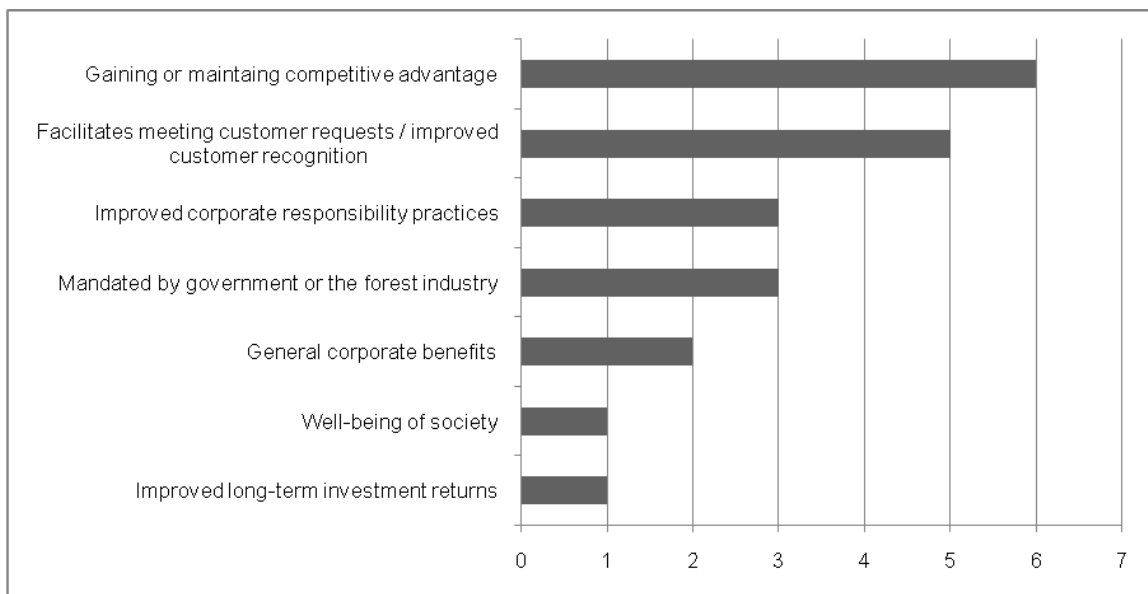
***Perceived barriers to forest certification***

Five participants stated the reasons why they were unwilling to obtain forest certification. The most significant reason (reported by three) was that it was not required by their customers. This reflects the lack of wide acceptance and recognition of forest certification among the general public. It seems that forest certification has less influence on the general public than on other related stakeholders, such as forest owners, manufacturers, and retailers. In addition to this concern, two participants reported that certification was not a prerequisite for wood products manufacturers to operate in the sector.

### 4.4.2.3 Current and future uptake of forest certification

#### *Motivations for forest certification*

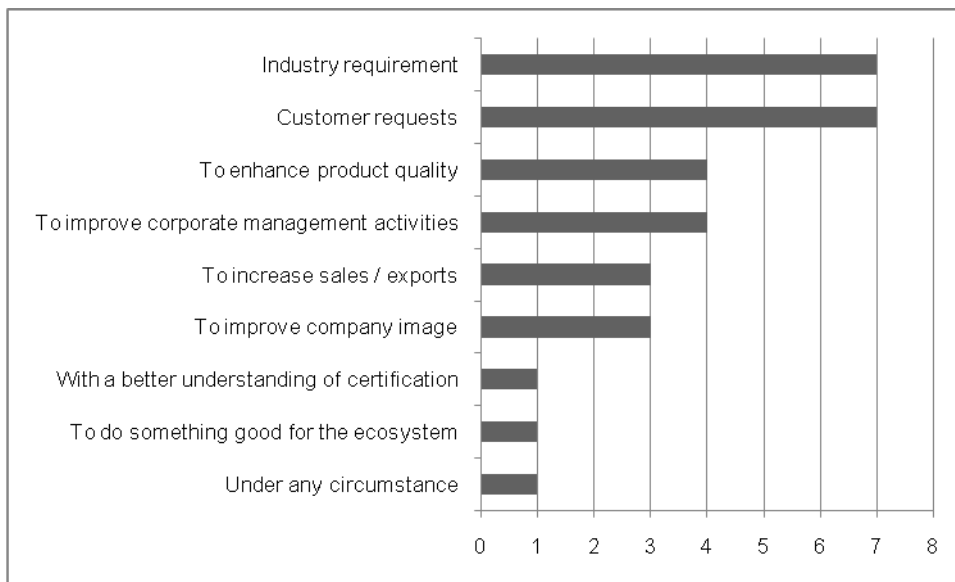
The motivations of the 12 participants expressing a willingness to obtain forest certification varied (Figure 4.4). One participant's interest was rooted in a general concern for the well-being of society. Another three participants would only adopt certification if it was mandated by the government or the forest industry. All of the remaining participants suggested that their motivations for certification should be aligned with potential company gains, such as long-term investment returns (1 interviewee), general corporate benefits (2 interviewees), improved corporate responsibility practices (3 interviewees), meeting customer requirements (5 interviewees), and gaining or maintaining competitive advantage in both foreign and domestic markets (6 interviewees).



**Figure 4.4** Motivations for adopting forest certification as indicated by participants (n=12, number of mentions allowing for multiple responses)

### *Willingness to adopt forest certification*

Seven participants would obtain forest certification if it became the industry standard, was required by law, or if customers demanded it (Figure 4.5). Four of the manufacturers would be interested in certification if it improved their corporate management activities and/or the quality of their product offerings. Three interviewees cited improvement of company image and increasing sales / exports as important considerations in adopting certification. In addition to the above, a few of the participants (3 out of 20) expressed a willingness to obtain certification for various other reasons. For instance, one manufacturer would like to get certified under any circumstance, one would do so after gaining a better understanding of certification and more detailed information, and one expressed a wish to do so if there was a demonstrable benefit for the health of forest ecosystems. On the other hand, two participants were not at all prepared to obtain certification as they saw no evidence of any tangible financial gains associated with the process. That said, most participants felt that there was currently a demand for certified products and that this demand would grow gradually, eventually becoming very strong.



**Figure 4.5** Conditions under which forest companies would consider adopting forest certification as indicated by participants (n=20, number of mentions allowing for multiple responses)

## 4.5 Discussion

This study examined Chinese wood products manufacturers' attitudes towards forest certification, with a focus on the producers of furniture, wooden doors and windows, and various engineered wood products (EWPs). As the largest EWP producer and the second largest furniture exporter (with wooden furniture accounting for a sizable proportion) in the world (Jiang, 2006), the perceptions of Chinese wood products manufacturers are of considerable importance.

The findings identified low levels of awareness and acceptance of forest certification among wood products manufacturers in China. This is not particularly surprising given that similar results have been observed in other parts of the world, such as Canada (Jayasinghe et al. 2007), the United States (Vlosky et al. 2003), and Malaysia (Ratnasingam et al. 2008b). This is indicative of the inadequacy of publicity activities aimed at enhancing the general awareness and knowledge of forest certification in China (Wang et al. 2005b) and is an important consideration in that it has been linked to low levels of acceptance in the Chinese forest sector (Huang et al. 2009). However, this study reaffirms that greater acceptance of forest certification could be achieved by increasing the awareness and knowledge of forest certification among manufacturers. This could be achieved by directing activities at managers in the forest sector, such as hosted seminars and workshops (supported by industry associations and perhaps local governments), and lectures and/or training programs by invited experts, offered in cooperation with colleges, universities, or other institutions.

This study also revealed that two of the largest impediments constraining the potential uptake of forest certification in China's wood products industry are a lack of market demand for certified wood products and the fact that certification is not a mandatory requirement of government and/or industry.

Weak market demand was reported to be the primary barrier, consistent with previous research in China (Durst et al. 2006; Huang et al. 2009; Yan et al. 2003) and

developed economies with more evolved environmental markets (Merry and Carter 1997; Owari and Sawanobori 2007; Rametsteiner et al. 1998; Vlosky and Ozanne 1999). Many questions related to the market demand for certified wood products in China remain, such as how large is the actual demand for these products, is the demand substantial enough (and profitable enough) to warrant a company switching over to supplying certified wood products, can this demand generate price premiums, and if so, are these premiums enough to offset the additional costs incurred by forest certification (Chen et al. 2010; Ozanne and Smith 1998)? For the most part, it seems that Chinese wood products manufacturers remain unclear about what, if any, tangible direct economic returns come about as a result of forest certification, and many are reluctant to take the risk of changing their current business models and bearing the potential extra costs. To that end, a thorough analysis of consumer preferences and the most appropriate levels of price premiums for certified wood products (on a product by product basis) is needed.

The participants in this study were generally optimistic about the certified wood products market and believed that it had potential to grow in the future, especially domestically. Two factors are driving this potential growth in demand, and could provide incentives for manufacturers to increase the supply of certified products. The first relates to evolving attitudes in rural communities, with increased attention being given to poverty alleviation in these areas. This has stimulated housing construction in rural communities and fostered a rapidly growing demand for furniture (Zhang 2010b). The market is expected to grow rapidly and will be extremely lucrative for well-positioned manufacturers (Sksts 2004). The other factor relates to the thriving demand from younger generations – born in urban areas in Mainland China in the 1980s – who have grown up during the transition period during which China has been transformed into a major economic player globally. This generation is highly educated, more environmentally conscious, and more inclined to accept new ideas (Hudong 2010). Moreover, they are becoming the dominant consumers within the housing and furniture

segments, and would likely become the early-adopters of certified products.

In addition to the uncertainty about the market demand, a lack of government- or industry-led mandatory requirements for forest certification also seems to be a disincentive for Chinese wood products manufacturers. In other words, the wide-scale uptake of forest certification may depend, in large part, on the strong support of government and the wood products industry, both of which seem to be of vital importance in compelling manufacturers to engage in various processes (Academy of Forest Inventory and Planning 2009; China Forest Certification Council 2009; Fang et al. 2009; Hui et al. 2008; Huo 2009). For examples, their sphere of influence can be seen in the frequent interactions that occur between wood products manufacturers and government agencies responsible for air pollution regulation in China. It is possible that forest certification could supplant some of these interactions, resulting in considerable cost savings, and potentially meaning that many manufacturers would take up certification more rapidly.

This study also found that there were some potential benefits that could induce Chinese wood products manufacturers to adopt forest certification. For example, several potential company gains associated with forest certification were identified, including improved access in both foreign and domestic markets, higher degrees of customer retention and satisfaction, and improved company image. As a market-based mechanism, forest certification is viewed as being able to provide greater market security for certification adopters (Bass et al. 2001). Market access has been and will continue to be considered one of the most important incentives for wood products manufacturers to obtain certification (Cashore et al. 2005; Stevens et al. 1998).

By obtaining certification, manufacturers are more likely to maintain their current markets (the alternative being losing them) or enter into new, more environmentally-conscious markets (Espach 2006; Nelson and Vertinsky 2005; Vidal et al. 2005). This is particularly true for Chinese wood products manufacturers, who export



large volumes of products to more environmentally concerned markets (Han et al. 2004; Sun and Yin 2006; Sun and Zhang 2004; Zheng 2004). In fact, it seems that the early adopters of forest certification in China are manufacturers that concentrate on export markets such as Europe and North America (Zheng and Jiang 2002). Two of the major drivers for this trend are the newly revised Lacey Act in the United States and the European Union FLEGT Voluntary Partnership Agreements (VPAs), both of which are creating major challenges for Chinese businesses that have not changed their current practices to reflect the more stringent requirements of these acts (Han and Cao 2009; Li et al. 2008). Forest certification could be an effective means of eliminating such trade barriers (Yu and Xiao 2004) given its widespread acceptance in these markets and because it provides the necessary due diligence for verifying that timber and wood products are legally sourced from sustainably managed forests (Durst et al. 2006). However, there has been some reluctance in Europe and North America to accept certification alone as a demonstration of timber legality. In addition, the emergence of governmental green purchasing policies which specify wood or wood products from legal and sustainable sources also requires Chinese wood products manufacturers to demonstrate the legality of their products, and forest certification is one of the ways that help do so (Jiang et al. 2005; Zhang et al. 2007).

For manufacturers concentrating on domestic sales, the general increase in the awareness of certified products (although still extremely low) provides an alternative means of communications that can inform the general public or target customers about corporate environmental commitment and social responsibility. As such, forest certification can benefit companies by enhancing their reputations and improving their competitive positions over their industry counterparts producing substitute materials (Leslie 2004; Stevens et al. 1998). An important consideration in this regard is that, given the wide range of marketing tools available to communicate with customers, such as media advertising, eco-labeling, brochures, and others (Archer et al. 2005; Kozak et al.

2004; O'Brien and Teisl 2004; Owari and Sawanobori 2007), which method would be most effective within the Chinese context? To that end, further research is needed to reveal the best approach to communicating the benefits of forest certification in domestic Chinese markets.

A few final observations from this exploratory assessment of forest certification in China are worth noting. For instance, in discussing forest certification, one of the study participants expressed more global concerns regarding forest resource shortages and declining ecosystems, a result that was also noted in a study of Canadian value-added wood producers (Jayasinghe et al. 2007). This participant would adopt forest certification on moral and ethical grounds, so long as the social and ecological improvements could be clearly demonstrated. Another interesting finding in this study relates to the large thematic overlaps that emerged when respondents discussed the benefits, barriers, and motivations associated with forest certification. Benefits, barriers, and motivations are interrelated. For instance, a barrier, if tackled appropriately and effectively, can quickly become a motivation, as is the case of market demand, which is currently low, but growing. Similarly, benefits that are not within reach, such as improved economic returns, could easily become barriers to adopting forest certification if competition for certified wood products within China intensifies.

## **4.6 Conclusions**

20 interviews were conducted to assess the potential for further development of forest certification in the Chinese wood products industry. Findings from this exploratory assessment should be treated with caution as the results reflect the perceptions of only a limited sample of wood products managers in China regarding forest certification and related issues.

Results of this analysis indicate that there is a general lack of awareness and understanding regarding forest certification in the Chinese wood products industry.

Although more than half of the participants had heard of it, only one had obtained certification with an FSC Chain of Custody certificate. The majority of the participants were unaware of the potential benefits associated with certification. In order to gain greater acceptance, further efforts should go towards enhancing the awareness and knowledge of certification, both among manufacturers and customers in China.

Infrequent customer requests for certified wood products is perceived to be one of the major hindrances to the widespread adoption of forest certification in China, reflecting low levels of awareness and understanding of forest certification in the marketplace. This implies inadequate and ineffective publicity activities across China and towards various interest groups. Many of the wood products manufacturers in this study rationally expected gains in financial performance and market position as a result of forest certification. However, these outcomes are not necessarily guaranteed, meaning that government support or industry-led mandatory requirements of forest certification may be the best means of increasing uptake of forest certification among Chinese wood products manufacturers, at least in the near-term.

The study also revealed that the primary motivations for obtaining certification relate to the potential for enhanced competitive advantage, including access to particular markets, increased sales and/or prices, improved corporate reputation and social responsibility, and better customer recognition. Improved access to foreign markets where customers are more environmentally conscious and forest certification is more commonly known has been widely discussed in the literature, but the behaviour of the domestic market in China remains uncertain. While all but one of the participants were optimistic with respect to the growth of certified products, increased demand will take time and will require educational campaigns to inform the general public of the benefits associated with certified wood products and the potential problems that it can address, at least in part (e.g., illegal logging, climate change, and loss of biodiversity triggered by deforestation and forest degradation). The large domestic market could also be a

powerful catalyst in promoting the use of certification in China's wood products industry.

In attempting to predict the path that forest certification will take in China, several factors need to be taken into consideration, including the possibility of government support and/or industry-led requirements, actual market demand, and the degree to which certification can provide competitive advantage in the forms of financial performance, company image, market access, and customer recognition. At this point in time, however, the Chinese wood products industry remains reticent about adopting forest certification as a business strategy and it appears that there remains a long way to go in its widespread uptake.

# **5. Acceptance of certified forest products in an advanced market: the case of Canada**

## **5.1 Introduction**

The research undertaken with Chinese forestry stakeholders and described in Chapters 3 and 4 has revealed that a significant perceived impediment to the adoption of certification is a fear that the costs involved in certification may not be recouped through price premiums or other advantages. However, it is also apparent that certification is still at a very early stage in China, with many of those involved in the production of wood and the manufacture of wood products having at best a very rudimentary knowledge of forest certification. There have been no attempts made to educate the final consumers about certification, and it is therefore hardly surprising that the demand for certified products appears non-existent. However, the manufacturers interviewed in China indicated that if such a market were to emerge, they would pursue it. And they are optimistic about the potential of certified wood products in China's domestic markets, despite the length of time that it will take to evolve.

Given the early stage of forest certification in China, it is difficult to predict how markets might develop and how Chinese wood products retailers might be interested in and willing to buy and sell certified wood products. There are no studies of Chinese retailers' perception of forest certification. However, some research has been conducted in other jurisdictions, such as Canada, providing some indication on how certification has developed elsewhere. In particular, if retailers in a country where certification has become more widely accepted are obtaining a premium or any other benefit, then it is possible that a similar pattern may occur in China. Given the potential benefits gained by early adopters of innovations, the presence of any commercial advantage could

encourage the adoption of certification and SFM in China. In view of this, a more developed market, namely, Canada, was assessed to gain insights into how the market for certified wood products might develop and to predict the future of such a market in China.

## **5.2 Background**

Forest certification was developed as a tool to minimize the negative environmental, social, and economic effects of forestry (Leslie 2004; Rametsteiner and Simula 2003) and to focus on efforts to achieve sustainable and responsible forest management, particularly in the tropics (Durst et al. 2006). Forest certification is also recognized as a market-driven financial incentive (Cashore 2002), whereby various stakeholders may be motivated to participate in the process by the possibility of direct and indirect benefits (Humphries et al. 2001). These stakeholders include forest owners, wood products manufacturers, and forest products retailers. Past research suggests these stakeholders have usually absorbed the additional costs incurred by certification rather than passing on the costs to the consumer in the form of higher prices (van Kooten et al. 2005).

Since the development of the FSC in 1993, certification has gained widespread acceptance. By the end of February 2010, the Program for the Endorsement of Forest Certification (PEFC) and Forest Stewardship Council (FSC) schemes accounted for 229 million ha and 134 million ha of certified forest area, respectively (FSC 2010a; PEFC 2010a). Canada has made great efforts to achieve sustainable forest management and has the largest area of independently certified forests in the world (Natural Resources Canada 2009). As of February 2010, more than 150 million ha of forests had been certified under one or more of the three globally recognized certification standards currently in use in Canada. Out of that area, 69.6 million ha were certified to the CAN/CSA-Z809 SFM Standard of the Canadian Standards Association (CSA) (PEFC 2010b) and 51.4 million ha were certified to the Sustainable Forestry Initiative standard

(SFI) (PEFC 2010b). The remaining 31.3 million ha were certified to the various regional FSC standards (FSC 2010b). Canada's certified forest area accounts for over half of the certified forest areas under the PEFC-endorsed certification schemes and almost one-quarter of all FSC certification worldwide, and therefore represents a jurisdiction where any benefits associated with certification should by now be apparent. The move towards certification in Canada is strongly supported by industry groups and the Forest Products Association of Canada (FPAC) committed to have all of its members' forestry operations certified to one of the three dominant third-party certification schemes, a goal that was achieved by the end of 2006 (Forest Products Association of Canada 2007).

The development of certification in China falls far behind Canada. Taking FSC as an example, as of October 2010, only 1.7 million ha of forests had been certified under FSC standards (FSC 2010b). As a result, there is less public awareness of certification and, as shown in earlier chapters, a general lack of awareness of certification in the Chinese forestry sector. The widespread development of forest certification in Canada is therefore the primary reason for choosing it as a means of understanding how certification could potentially evolve among Chinese retailers and to assess the market acceptance of certified wood products and the market benefits that might be obtained through forest certification.

Since its inception, many facets of forest certification have been examined. Some studies have focused on economic aspects, such as consumer preferences for certified forest products (Anderson and Hansen 2004), consumer behaviour and purchasing decisions (Anderson and Hansen 2004; Bigsby and Ozanne 2002), or the existence and size of price premiums in the market place (Aguilar and Vlosky 2007; Forsyth et al. 1999; Grönroos and Bowyer 1999; Kozak et al. 2004; Mohamed and Ibrahim 2007; Owari and Sawanobori 2007; Ozanne and Vlosky 1997; Rao and Bergen 1992; Vidal et al. 2005; Vlosky and Ozanne 1999). Other studies have investigated manufacturers'

attitudes to forest certification (Jayasinghe et al. 2007; Ratnasingam et al. 2008; Stevens et al. 1998; Vlosky and Ozanne 1998). Very few (Perera et al. 2008; Vlosky and Ozanne 1997) have assessed retailers' perceptions on forest certification, despite the importance of this group to manufacturers. This is due, in part, to the fact that retailers participate only indirectly in forest certification and in the process of getting certified. However, it is the retailers who have direct contact with the final consumers, and they should therefore be aware of any consumer demand for a particular type of product.

Vlosky and Ozanne (1997) examined U.S. business customer perspectives regarding forest products certification, including architects, building contractors, and home centre retailers. The results indicated that business customers at that time were generally not incorporating forest certification into their company philosophies even though they were expressing concerns about environmental issues. The willingness to pay for certification was mixed among customers, and price premiums still appeared elusive. A more recent study (Perera et al. 2008) used a mail survey to assess attitudes and behaviours regarding forest certification among the top 500 home centre retailers in the USA. The two most cited reasons for home centre retailers to purchase/sell certified wood products were product availability and improved company image. The findings identified the FSC as the most acceptable and preferable certification system, followed by SFI. That said, a significant number of influential retailers seemed to favour the use of their own brand names to convey environmental messages rather than utilizing certification labelling (UNECE/FAO 2008).

On the demand side, the role that retailers play in the adoption and promotion of forest certification is significant. In the forest sector, retailers play a dual role in the supply chain. On the one hand, they purchase lumber and value-added forest products from forest products manufacturers and timber suppliers. On the other hand, they sell forest products to the end consumer and can impose premiums on certified forest products. Consequently, determining the perceptions of forest products retailers on the



efficacy of forest certification as a means to achieve sustainable forest management has significant implications.

Retailers are in the best position to judge the demand for certified forest products among consumers, and are also best able to judge whether those consumers would pay a premium for such products. Their behaviour can be used as an indicator to identify whether or not the benefits of forest certification are extended up or down the supply chain. However, consumer and retailer behaviour is unlikely to be the same in different parts of the world; for example, a stronger growing demand has been found in northwestern Europe (Leek 2008). Some studies have been conducted to assess retailers' efforts to integrate forest certification into their market planning (e.g., Kärnä et al. 2003). To date, studies of retailer perceptions have largely been conducted in the United States, but not in Canada or China. As indicated above, it is premature to examine the attitudes of Chinese retailers towards certification. Furthermore, there have been few attempts to determine whether the efforts made by forest products manufacturers in Canada to manage forests sustainably are echoed along the supply chain (for instance, among retailers in Canada).

This study aimed to determine whether certification had been embraced by retailers in Canada as an indication of the possible future direction of certification amongst retailers in China. Chinese producers and manufacturers were found to be concerned that the costs of certification would outweigh any purported benefits, and were interested in knowing whether there was evidence of such benefits from a country with a more advanced state of certification. A further aim of the study was to reveal the underlying reasons explaining why retailers carry certified products, which might thereby suggest effective ways to encourage and stimulate Chinese retailers to accept forest certification. Four internationally recognized forest certification standards were taken into account in this study, including the International Organization for Standardization (ISO) (the ISO 14001 standard), FSC, SFI, and CSA.

## 5.3 Methods

Case studies are viewed as a suitable and effective method for use in the preliminary stages of an investigation (Flyvbjerg 2006). Given that forest certification is relatively novel in China and earlier chapters have revealed a low awareness of forest certification amongst forest farmers and manufacturers, it is appropriate to investigate a case, such as Canada, with richer information regarding wood products retailers as a means of elucidating some of the nuances of the issue under examination. The findings of Canadian retailers could provide evidence of the evolution of a more advanced market for certified wood products and help to predict such a market in China.

Data collection was completed by a nation-wide self-administered mail survey directed at retailers selling forest products across Anglophone Canada, which was implemented between the summer and fall of 2008. The sample frame was derived from an on-line telephone directory through a keyword search of the terms, “forest product retailers” and “wood product retailers”. The search results were then compiled into a mailing list. The questionnaire, accompanied by a cover letter, was sent to 650 randomly selected forest product retailers (representing 50% of the sample frame). The questionnaire was designed and administered based on the Tailored Design Method (Dillman 2000) in order to maximize the response rate and reduce non-response bias. The survey was pre-tested using an expert review in order to ensure that the questions would not lead to biased answers. The expert review also assessed the questionnaire content for its applicability to the target audience. The survey was administered in English and gathered general company information (e.g., the number of retail stores, the location of targeted customers and product categories), as well as a broad spectrum of questions related to forest certification.

To address different levels of understanding about forest certification, the cover letter included in the first mailing and the questionnaire itself contained a brief definition of forest certification. The definition used in the survey was as follows: “Forest

certification is a process of assuring company compliance to a standard that requires adherence to sustainable forest management (SFM), i.e. balancing environmental, social and economic aspects of long-term forest management. Companies that comply with the requirements of such standards can become certified, along with the products they sell.” While introducing the potential to create a bias (Vlosky et al. 2003), including the definition may also have helped raise awareness of forest certification among the retailers.

Implementation of the survey instrument followed a three-contact sequence: the questionnaire mailout, a reminder/thank you letter, and a replacement questionnaire. The mailings were sent at two-week intervals. The first mailing consisted of a detailed cover letter to introduce the purpose of the study and ask the recipients to participate voluntarily in it. The package also contained the questionnaire and a return envelope. Additionally, the survey was available on the internet and the participants were invited to choose to fill out the survey on-line if they preferred. However, no responses were collected on-line, with all returned surveys being mailed in.

Survey implementation was hired out and it was impossible to differentiate between early and late responses. As such, there was no means of testing for the presences of non-response bias using late respondents as proxies for non-respondents (Armstrong and Overton 1977; Jayasinghe et al. 2007). In view of this, a comparison of the distribution between the respondents and the sample frame was conducted as a potential indication of non-response bias (Table 5.1). The results indicated that the pattern of responses at large matched up well with the sample frame. However, these results should be interpreted with some degree of caution.

**Table 5.1** Comparison between sample frame and responses

	Sample size	Number of respondents	Proportion in sample	Proportion of responses
Western Canada <sup>1</sup>	271	44	40.15%	46.81%
Prairies <sup>2</sup>	93	8	13.78%	8.51%
Eastern Canada <sup>3</sup>	256	36	37.93%	38.30%
Maritimes <sup>4</sup>	60	6	8.89%	6.38%

<sup>1</sup> Western Canada includes AB and BC.

<sup>2</sup> Prairies include MB and SK.

<sup>3</sup> Eastern Canada includes QU and ON.

<sup>4</sup> Maritimes include NB, NL, and NS.

## 5.4 Results

Of the 650 surveys that were mailed out, 94 returned were usable, resulting in an adjusted response rate of 14.5%. The response rate was low, but acceptable for mailed questionnaires of this type (Bailey 1994; Baruch 1999). Two reasons account for the low response rate. First, the survey was directed towards managers, but these individuals are difficult to access. Second, some retailers indicated that they were not particularly knowledgeable about forest certification and this may have resulted in a lack of interest in the survey since they may have not seen the relevance of forest certification. This in itself is an important finding, particularly from the Chinese perspective, indicating how ineffective attempts to advertise certification may have been among certain supply chain actors.

### 5.4.1 General profile of respondents

Questions about the company profile covered the number of retail stores, product categories, and types of customers. The majority of the respondents (77.3%) had a single retail store. Approximately, two-thirds (66.4%) served customers from an urban area (urban areas were defined in this study as communities or contiguous communities with

a combined population of 50,000 or more). Just over one-third of the respondents (35%) served customers from small towns (locations with a population of less than 50,000), while 31.8% and 19.9%, respectively, dealt with rural and suburban areas. The survey reached retailers that sell lumber (64.9% of respondents), plywood (55.3%), particle board (52.1%), value-added wood products (52.1%), treated wood (50.0%), oriented strandboard (OSB) (47.9%), and miscellaneous other wood products (33.0%), with most respondents selling multiple products.

## **5.4.2 Forest certification**

Questions on forest certification related to purchasing policies for certified products and the relative importance of reasons for promoting certified wood products. Almost equal numbers of respondents indicated that they carried (38.0%) or did not carry (37.0%) certified wood products in their stores, indicating that market acceptance is still evolving. Those who indicated that they sold certified products were asked to give an approximation of the proportion (by volume) that was certified. A sizable number of these respondents (18.8%) carried 100% certified wood volume in their stores, with the average proportion of certified wood volume being 47.2%.

More than half of the respondents (54.0%) preferred to purchase large volumes of certified wood from a few suppliers. Conversely, a small number (less than 5%) of respondents chose multiple suppliers with smaller volumes. Nearly half of the respondents (44.4%) expressed a willingness to pay a premium for certified products and additional price premiums of up to 20% were charged to end-users (Table 5.2). 34.8% of the respondents indicated that they had received customer requests on certified products, yet the average requests accounted for only 8% of the total market demand for both certified and uncertified products.

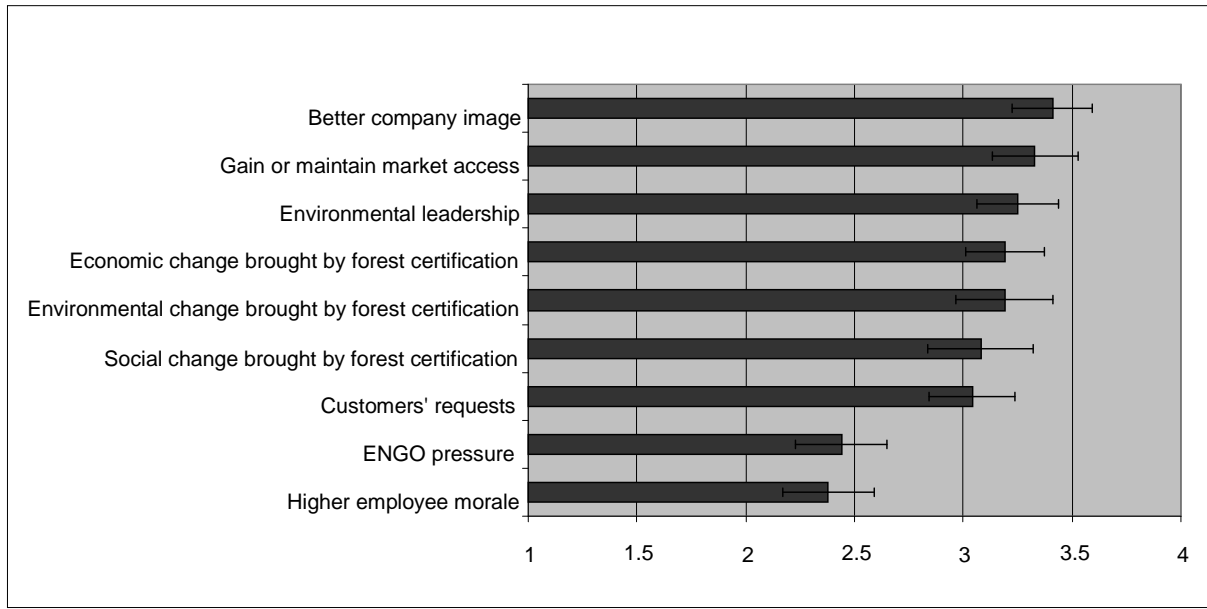
**Table 5.2** The relationship between paying premiums and charging premiums (n=27)

		Charge a premium		
		No	Yes	Total
Pay a premium	No	55.6%	0	55.6%
	Yes	3.7%	40.7%	44.4%
	Total	59.3%	40.7%	100%

The majority of retailers surveyed (84.2%) stated that they had no particular policy in place – formal or otherwise – for purchasing certified wood products. Of those carrying certified wood products, less than half had specific policies with respect to purchasing certified products. This may simply be a reflection of retailers and their suppliers, and specifically the fact that purchasing certified wood products does not require that a policy be in place. For those respondents who did have a policy for purchasing certified wood products, 50% communicated their purchasing policy to suppliers by specifying the requirements in the suppliers’ contract, while 50% only indicated a preference for certified wood.

Respondents were also asked to rate the relative importance of reasons for promoting certified wood products (Figure 5.1) using a 4-point interval scale (1=very unimportant; 2=somewhat unimportant; 3=somewhat important; 4=very important). Improving the company’s image (3.41) was the most important reason, a result that is consistent with the findings of Perera et al. (2008). Gaining or maintaining market access or market share (3.33), being an environmental leader in the field (3.25), environmental and economic change brought by forest certification (both 3.19), social change brought by forest certification (3.08), and customers’ requests (3.04), were all cited as influential reasons for respondents to promote certified wood products. While many studies have indicated that effective approaches need to be adopted to enhance public awareness and educate end consumers (e.g., Archer et al. 2005; Kozak et al. 2004), only one respondent indicated that educating the consumers was the most important reason to promote

certified products. Improving employee morale (2.38) and pressure from environmental groups (2.44) were seen as less important reasons for promoting certified products among the respondents.



**Figure 5.1** Mean importance of reasons for promoting certified wood products (n=28, 95% confidence intervals shown, scale: 1=very unimportant; 2=somewhat unimportant; 3=somewhat important; 4=very important)

## 5.5 Discussion

Suppliers stocking large volumes of certified wood were favoured by the Canadian retailers in this study, as more than half of the respondents were inclined to purchase certified wood from a few large suppliers. It should be noted that the study did not differentiate among the certification standards. It has been suggested that FSC-certified wood products are typically supplied by smaller producers and in small volumes, while CSA-certified products are usually provided by larger companies in large volumes (Canadian Sustainable Forestry Certification Coalition 2009). However, looking at the Canadian situation, this may be changing, with Tembec's FSC-certified forest area

accounting for more than one quarter of the total area of Canada's FSC-certified forest land. Another possible reason accounting for the preference towards large-volume supplies is product availability, as larger suppliers tend to be more reliable suppliers of high-quality certified products, and have stable stock levels and quick delivery times. This explains why almost 20% of respondents carried 100% certified wood products. The implication of this result for Chinese manufacturers who are considering supplying certified wood products for retailers is that having a stable supply of certified products is of utmost importance for retailers.

The survey revealed that the cost of certification could be transferred down the supply-chain; almost all those who paid a higher price for certified products also charged a premium (Table 5.2), indicating that the benefits of forest certification, in the form of price premiums, are also extended up and down the retail chain. This contradicts past studies that have indicated that manufacturers were absorbing the additional costs incurred by certification. This change almost certainly represents the growing acceptance of certified wood products among consumers, and a recognition that these products come at a premium, important findings for Chinese producers and manufacturers. Additional confirmation of this comes from the third of the respondents carrying certified products who were willing to pay up to 20% premiums, while at the same time passing on increased prices to end-users. This finding could further encourage the rapid acceptance of forest certification among Chinese manufacturers. Similarly, for Chinese retailers, the finding is encouraging given the greater market acceptance of certified wood products and the availability of price premiums.

On the demand side of the market, the majority of Canadian respondents had received requests for certified products from less than 10% of end-users, indicating a general lack of demand for certified wood products among consumers. This is not inconsistent with the willingness to pay a premium. What seems to be emerging is a growing group of consumers knowledgeable about certified products and willing to pay



a premium, but this group is still a relatively small proportion of the overall market. A similar pattern is possible in China, given the increasing disparity in incomes in the country. As a market-driven mechanism, consumers should be driving the entire certification process through the supply chain. However, it seems that retailers are leading their customers in the use of certified products, with the evidence being that almost one quarter of the respondents selling certified products were doing so without having had any requests from customers for those products. This is further confirmed by the trend revealed in the study that the amount of customer requests was disproportionate relative to the certified wood volumes carried by the respondents. For example, out of 33 respondents carrying certified wood, approximately 20% had 100% proportion of certified wood volume, but only 60% of their customers had requested certified forest products. As long as consumers are given the choice of certified or (cheaper) uncertified products, they are likely to choose the uncertified one, as price, quality, and convenience are still the three most important factors considered in making purchases. If retailers made the choice to purchase certified products and sold them as the only option (within a category) to consumers, it might force consumers to buy the certified products. This finding suggests that Chinese wood products retailers could play a role in promoting forest certification in China. Weak market demand could potentially be advanced with continuous efforts towards enhancing the awareness and understanding of forest certification amongst various Chinese stakeholders.

In Canada, given the general lack of purchasing policies specifying certified wood products, many retailers may be unwilling to exclude non-certified products, at least in the short-term. However, as an increasing proportion of Canada's forest becomes certified, approaching 37% of the total forest area as of 2010, it will become increasingly difficult to acquire uncertified wood within Canada. Sourcing outside of Canada will always be possible, but will only make sense if the products can be imported at lower cost than domestic products.

Finally, improving the company's image, gaining and maintaining market access, and being an environmental leader are the three most cited reasons for Canadian retailers to adopt forest certification. This finding points to possible benefits that Chinese retailers might gain from forest certification.

## **5.6 Conclusions**

An assessment of retailers' perspectives on forest certification and its effects was conducted across Anglophone Canada, with the intention of informing Chinese wood products retailers and manufacturers on how the market for certified forest products has developed in Canada and the market benefits that might be expected as certification develops in China. This group of supply chain actors represents both potential buyers and sellers of certified wood products, ranging from lumber, plywood, value-added wood products, particle board, treated wood, and OSB. While approximately half of the respondents reported carrying certified wood products in their stores, the majority did not have a policy in place for purchasing certified wood products. A few respondents charged a price premium of up to 20% for certified wood products; however, this was rare. Given the infrequent customer requests for certified products, the lack of pressure from environmental groups to adopt certification, and the lack of sufficient tangible financial benefits associated with forest certification, Canadian retailers' interest regarding certification seems to relate more to improved company image and developing a reputation as an environmental leader as a means of gaining and maintaining market access or market share. These are also the potential benefits that Chinese retailers could expect with the development of forest certification in China. Forest certification is increasingly being integrated into standard business practice and is being seen as a cost of doing business sustainably. This is reflected in the preference given by many retailers for using their own logo or brand name – as opposed to third-party certificates – to convey environmental messages.

The survey revealed a general lack of awareness about actual certification standards among retailers. Retailers were less involved in the certification process than forest managers and they admitted to having very little or almost no information on forest certification. Such low awareness has also been revealed amongst Chinese forest farmers and wood products manufacturers, and it is expected that even lower levels of awareness would be found amongst Chinese retailers as they are the last supply-chain actor to become involved.

The survey does indicate increasing recognition of certification and that about half the time there is a price premium associated with certified forest products at the retail level. This is different from previous findings, especially those conducted at the forest management unit level. It indicates greater market acceptance and promise for forest certification throughout the supply chain. This is also encouraging for Chinese forest products manufacturers who may be considering obtaining forest certification but are currently reticent because of the uncertainties around the actual market demand for certified wood products. Although the study only revealed the situation in Canada's market, it provides evidence that the market for certified wood and wood products will develop over time. The development of a domestic market for certified wood products is possible in China considering that the Chinese government has attempted various forms of educational activities and publicity campaigns, such as seminars and workshops. The findings of this study also suggest that Chinese wood products retailers could push for the adoption of certified wood products in the marketplace despite current weak market demand in China.

# 6. Conclusion

## 6.1 Key conclusions

The primary aim of this research was to examine the challenges facing sustainable forest management (SFM) and forest certification and to predict their potential adoption in China. To achieve this goal, four forestry actors were examined, including three Chinese and one Canadian. The perceptions of three Chinese actors were explored to reveal their awareness, understanding, interest, willingness, motivation, and barriers to adopting SFM and certification. The three groups included small-scale forest farmers who had already received small areas of collective forest land through the forest tenure reforms in two forest-dependent areas, market officials working for two forestry property markets in the same areas, and wood products manufacturers. In addition, Canadian forest products retailers were assessed to gain insights into how and to what extent forest certification and certified wood and wood products might be accepted by a more mature market in the future. The acceptance of certification by Canadian wood products retailers provides evidence for interested groups in China that they should be considering forest certification. The ongoing forest tenure reforms and one of their supporting mechanisms, forestry property markets, are having profound impacts on SFM and certification in China, as these reforms have transferred more than 50% of collective forest land (amounting to 85 million ha) to individual farmers who are now emerging as one of the critical players in the promotion of SFM and certification in China.

Past work has revealed a general lack of awareness and understanding about SFM and forest certification amongst various actors (e.g., Jayasinghe et al. 2007; Ratnasingam et al. 2008; Stone 2006; Vlosky et al. 2003; Wang et al. 2005; Zheng and Jiang 2002). This is also a significant challenge facing the three Chinese stakeholders examined in this study, making SFM and certification almost impossible at present. This

is particularly true for small-scale forest farmers who have usually received limited education and are living in poverty; almost no forest farmers interviewed understood the concepts of SFM and forest certification. A similar limited but better understanding was found amongst market officers and Chinese wood products manufacturers, some of whom were able to recount at least some elements related to SFM and certification. Earlier studies in developed economies have suggested that such low awareness could be improved through a number of educational activities and publicity campaigns, particularly amongst the general public (Archer et al. 2005; O'Brien and Teisl 2004). Such an improvement is also expected to occur in China through comprehensive and effective public education to inform stakeholders of the potential benefits associated with SFM and certification and the problems stemming from the unsustainable use of forests and resources. The most effective form of educational activities for small-scale forest farmers would be expert demonstrations in the field (e.g., forestry working stations at the village level and the provision of forest technicians) so that practical information could be disseminated to individual farmers. Another possible method is the establishment of demonstration sites for SFM and certification. That said, the most effective approach for market officials and manufacturers is various kinds of workshops, seminars and training programs held by forestry authorities as well as by forestry professionals from institutions and academia.

In addition to this common challenge of a lack of awareness of SFM and certification, there are other impediments specific to particular groups of stakeholders in China. For instance, for small-scale forest farmers, who are becoming the decision-makers for the forest land that they have obtained through the forest tenure reforms, are emerging as key players in the development of SFM and certification in China. As the potential adopters of SFM and certification, their acceptance would have immense impacts on the widespread adoption of SFM and certification in China. However, until now there have been no studies of their awareness, understanding and

acceptance of SFM and certification, despite research attempting to explore the feasibility and potential for SFM and certification (e.g., Feng et al. 2009; Huang et al. 2009; Zhang 2009). There is a belief that considerable resistance will be encountered from these forest farmers due to a number of barriers to adoption (Stone 2006). These barriers were tested in this study with the hope that genuine challenges would be identified and that potential solutions would be developed. The most important challenge identified in this study is the coexistence of poverty and environmental issues in many heavily forested rural areas. Both Yong'an in Fujian and Tonggu in Jiangxi are examples of this. Poverty reduction will remain central to the various reforms and efforts. The first step towards sustainability lies in reducing poverty, but this often means increased levels of timber harvesting. Concerns will arise over ecological and social well-being only once adequate economic incomes are in place.

Other impediments can be linked to inadequate finance, poor infrastructure and transport systems, insecure and unclear forest tenure, inconsistent forest policies, weak knowledge and technical transfer, and a lack of local organizations. Forest tenure reforms and forestry property markets could overcome some of these barriers. For instance, a lack of finance is a major challenge that can lead to a number of other problems, such as an under-developed local infrastructure and transport system and a lack of incentives to manage the forest sustainably. As the adoption of SFM and certification could be prohibitively expensive, requiring substantial changes to current management practices, resources, equipment, and personnel, and direct economic compensation is not immediately apparent, it is foreseeable that forest farmers will have no interest in SFM and certification in the short term.

The theory of decentralization suggests that private ownership may be conducive to the adoption of sustainable forest management. My study has confirmed that the ongoing tenure reforms and their associated forestry property markets are capable of eliminating or at least mitigating most of the impediments facing small-scale forest

farmers in China. Forest tenure reforms have dramatically increased farmers' incomes by enabling tenure transactions and by providing property mortgages through the forestry property markets. Moreover, forest tenure reforms have brought about consistent forest-related policies, laws and regulations and provided formal proof of full usufructs by issuing official forest tenure certificates. These last for over 50 years and are renewable. A lack of local organization is viewed as a key constraint to the further development of SFM and certification. This is particularly true for smallholders as it is almost impossible for them to access tax incentives and other preferential policies individually. Perhaps as a result, an increasing amount of cooperation was identified at the two study sites, with smallholders coming together voluntarily to achieve economies of scale by sharing costs and benefits. If this led to the development of some form of group certification scheme, certification would become more affordable and accessible to smallholders in China.

My study has revealed that the primary concern about forest certification amongst forest farmers is the impact on economic returns. The theory of forest certification suggests that other direct and indirect economic benefits might be expected from adopting forest certification, such as improved market access. However, forest farmers participating in this study did not indicate that these other benefits were of concern, probably because of their low awareness of forest certification. Consequently, assuring sustained economic gains would be the first step in encouraging the uptake of forest certification amongst Chinese forest farmers. For Chinese wood products manufacturers, the most significant barrier to adopting forest certification is the uncertainties around the financial benefits associated with certification, such as improved market access and the possibility of price premiums for products made from certified wood. The recognition of forest certification in forest companies has significant impacts on their adoption of certification (Huang et al. 2009), but little else is known about their interest and motivation in certification. This study was developed to fill in the

gap by investigating 20 managers of Chinese wood products companies to assess their awareness and understanding of forest certification, to identify their motivation and willingness to obtain certification, and to predict the path that certification will take in the Chinese forest industry.

The study revealed that China's forest industry remains largely unaware of the details of forest certification, despite a series of steps undertaken by the State Forestry Administration (SFA) to raise the general awareness of SFM and certification. Amongst those with some knowledge of certification, potential economic benefits that could be directly related to company gains were the most frequently cited reason to obtain certification. Potential advantages included gaining or maintaining a competitive advantage over their industry counterparts, improved access to both domestic and export markets, better customer recognition, and enhanced corporate responsibility practices. This result is consistent with the theory of forest certification, which was developed as a market-driven approach to promote forest certification while providing potential direct and indirect economic benefits to forest companies (Cashore et al. 2004; 2005). The Chinese forest industry's reluctance to adopt forest certification quickly is largely hinged on the uncertainty about the realization of potential benefits associated with forest certification. That said, related to the results described in Chapter 5, which indicated that better market access and improved public image were attainable, the future of certification in China's forest industry is promising once the industry is presented with the evidence that it can benefit from certification. Nearly half of the responding Canadian wood products retailers carried certified wood products in their stores and a few had paid and/or charged price premiums for them. Such a finding should be of considerable interest to Chinese wood products manufacturers, particularly those currently focusing on and intending to gain access to foreign markets.

The theory that certification is a market-driven approach suggests that market players could make use of their power to pressure forest companies to adopt forest



certification. As a result, market acceptance and adequate customer requests for certified wood products would greatly impact the future adoption of forest certification. The study revealed that the absence of market demand was the major impediment currently constraining the uptake of certification amongst the Chinese wood products industry. Considering that both SFM and certification are at an early stage in China, the domestic market for certified wood products is much less developed than foreign markets in developed economies, such as Canada. Knowledge of how the market has developed in Canada is therefore of direct relevance to Chinese wood products manufacturers, as it provides a model for the way the market may develop in China. In Canada, a nation-wide survey of wood products retailers revealed that nearly half of the respondents carried certified wood products in their Canadian retail stores. This suggests that market interest and acceptance in Canada has grown over time and that certification has gradually being integrated into standard business practice and is seen as a part of the cost of doing business sustainably. The respondents reported that they were obtaining price premiums of up to 20% on certified wood, despite infrequent and limited customer requests (less than 10%). This is an important finding, as a lack of requests for certified wood products in the domestic market has been interpreted by Chinese manufacturers as meaning that price premiums are unlikely. In addition, almost all the Canadian retailers who paid a higher price for certified wood products reported charging a premium as well, indicating the costs and benefits are extended up and down the supply chain. This is inspiring for the Chinese wood products manufacturers, who now realize that the additional costs incurred by adopting forest certification can be transferred down the supply chain. The most important reasons for buying and selling certified wood products were related to desires to be the environmental leader in the field, maintaining or increasing market share, and improving company image. These results from Canadian wood products retailers are intriguing for Chinese wood products manufacturers as they differ significantly from some of the older reports in the certification literature,

providing clear evidence of the emergence of market benefits. Additionally, the results provide an indication to Chinese wood products manufacturers as to how the market for certified wood products may evolve and what market benefits may be attained. In addition to Chinese wood products manufacturers, the findings also provide lessons for Chinese wood products retailers who are considering the potential benefits of selling certified products.

In terms of the motivations for forest certification, Chinese manufacturers were mainly concerned whether forest certification could enhance their competitive advantages, which were related to increased sales, prices and market shares. Business owners' commitment to the environment, cited as one of the most important reason for forest companies to engage in forest certification in the developed countries (Vlosky et al. 2003; 2009), was not mentioned as an important reason by Chinese manufacturers. In contrast, a major potential motivation was considered to be government and industry mandatory requirements. This suggests that a different approach might be needed to promote forest certification in China's forest industry.

The study also revealed that all levels of government could play an important role in the promotion of SFM and certification in China, at least in its early stages. From the perspectives of Chinese wood products manufacturers, government support and industry-led requirements would be the only viable ways to encourage the early adoption of SFM and certification, given the potentially limited and unclear financial benefits associated with certification. Government support and subsidies are beneficial to smallholders if they take the form of consistent forest policies and increased availability of financial resources. For both small-scale forest farmers and wood products manufacturers, collaboration between governments, industry and academia would enhance the general level of awareness of SFM and certification. However, the market officials interviewed in this study had fairly limited awareness and knowledge of SFM and forest certification. Although the results may not reflect the general level of

awareness among all government officials in the forest sector, more effort should go towards raising their understanding and knowledge so that they can inform and educate forest farmers and other interested groups.

The concept of SFM has been increasingly emphasized as one of the key elements of modern forestry in China. As applied, this concept consists of three components: healthy forest ecosystems, a sustainable but profitable forest industry with high energy efficiency, and multiple-function forests with particular attention being given to the cultural and spiritual needs of forest-dependent communities. This is consistent with the triple base-line of SFM, which recognizes the close interconnections and balance between the economy, the ecosystem and social well-being. However, despite its recognition by central government, implementation on the ground is not occurring as farmers still favour short-term immediate economic returns. As a result, in addition to education and publicity activities, other sources of income-generating activities related to forests need to be fostered and facilitated to ensure that more concerns are directed towards ecological and social well-being.

The results presented in this thesis indicate that sustainable forest management and certification are achievable in China despite the various challenges that were revealed. In attempting to predict the path that SFM and certification will take in China, numerous factors should be taken into consideration, including the level of government support and the appropriateness of forest policies (e.g., forest tenure reforms), industry-led mandatory requirements for forest certification, economic compensation and income-generating forest-related activities that do not adversely affect the forest ecosystem, market demand, market access, customer recognition, knowledge and technical transfer, and education of the general public and diverse interested groups. Different stakeholders should be treated differently as they encounter differing impediments. For instance, for small-scale forest farmers in China, the primary constraint is the lack of security of forest tenures and necessary capital to start their

forest management practices. For wood products manufacturers in China, the primary barrier is the limited and infrequent customer requests and consequent perception of a lack of market demand for certified wood products, which is attributed to a lack of awareness of SFM and certification amongst the general public. In this regard, different strategies need to be developed to facilitate the adoption of SFM and certification by different groups. There is thus a long way to go to advance SFM and certification throughout the Chinese forest sector. To date, the provision of environmental services from China's forests relies more on regulatory than market approaches as economic rewards are often listed as the top priority for forest-related activities, often leading to short-term unsustainable forest use.

Sustainable forest management is a process that involves synergies and collaboration between various stakeholders, including all levels of government, forest owners (including small-scale forest farmers), forest industry, customers (wood products retailers and end consumers), and the general public. It is therefore surprising that few studies about the diversity of opinions and knowledge of certification amongst different stakeholders in China have been completed (an exception is Huang et al. 2009). There has been no research on Chinese small-scale forest farmers in terms of their awareness and willingness to adopt SFM and forest certification. It appears that there has been no research undertaken to assess the impacts of forest tenure reforms and their associated supporting mechanisms, the forestry property markets, on the adoption of SFM and forest certification in China. Given the wide-spread recognition of the vital role of governments, it is surprising that there has been no research examining the perceptions that Chinese forest government officials hold on SFM and certification. There have also been few studies examining the attitudes of Chinese wood products manufacturers and their interests in certification. Thus far, this investigation of the awareness and perceptions of the key stakeholder groups appears to be the first comprehensive study conducted to examine the challenges facing the adoption of SFM and forest certification

in China. A summary table is provided to distinguish challenges identified from the literature from those from the interviews of Chinese small-scale forest farmers and wood products manufacturers (Table 6.1).

**Table 6.1** Summary table of challenges identified from the literature and the interviews.

Challenges	From literature	Forest farmers (before/after)	Manufacturers (before/after)
Insecure forest tenure	√ <sup>1</sup>	√ / improved	N/I <sup>2</sup>
Inconsistent forest-related policies	√	√ / improved	N/I
Lack of legalities	√	√ / improved	
Underdeveloped infrastructure and transport system	√	Observed / improved but still inadequate	N/I
Inadequate finances	√	√ / improved but still inadequate	N/I
Lack of local organizations	√	√ / improved	N/I
Lack of knowledge and technology transfer	√	√ / improved but still inadequate	N/I
Low awareness	√	√ / still present	√ / still present
Lack of incentives	√	N/I	√ / still present
Weak market demand	√	N/I	√ / still present
No requirements from government and/or industry	√	N/I	√ / still present

<sup>1</sup> “√” used in this table indicates “the challenge presents in this situation”.

<sup>2</sup> “N/I” indicates the challenge is not identified from the study.

This study tested the two theories presented in Chapter 1, namely the theory of forest certification as a market-driven approach and the theory of decentralization to improve forest management. The results confirmed that forest certification could be effective as a market-driven approach in China, although largely dependent on the realization of associated potential economic benefits. The study also revealed that forest tenure reforms could have positive impacts on the adoption of sustainable forest management and forest certification by eliminating or at least mitigating most of the

challenges facing forest farmers in China. However, the future adoption of certification still needs extensive support from all levels of government to provide adequate incentives and favourable forest policies to facilitate the development of forest certification in China.

This study has provided valuable insights into the attitudes of Chinese wood products manufacturers and small-scale forest farmers towards the adoption of SFM and certification as well as their perceived challenges. It has also contributed to a better understanding of the role of forests in a country that is a major global wood products producer and exporter. Given that China is one of the leading wood products producers and exporters, it is critical that the Chinese context is documented and that what is driving Chinese forest policies is understood. This study has helped to understand the ability of these forests to contribute towards rural economic development in China. The results from the study will assist in exploring strategies to engage the Chinese actors in forest certification and how their forests can be sustainably managed while considering rural economies.

The other primary contribution of this study is linked to the enhancement of the understanding of SFM and forest certification amongst small-scale forest farmers, market officials and managers of Chinese wood products companies. The study has also contributed to the identification of the key barriers and potential solutions to the adoption of SFM and certification in China, providing recommendations for policy makers, small-scale forest farmers, wood products manufacturers and other interested groups upon which informed decisions can be made. Moreover, the study has assessed the impacts and implications of the ongoing forest tenure reforms and the associated mechanisms on the livelihoods of rural areas and sustainable forest management. It is underpinned by the research method used to achieve its goals, namely personal interviews guided by open-ended questions with the purpose of eliciting the key elements involved in the adoption of SFM and certification in China from the

participants' perspectives. As the concept of SFM and certification is relatively new and not yet widely adopted in China, interviews were the most appropriate means to examine related stakeholders' perceptions on those issues. Using the results of the interviews, this work has been able to provide insights into the major barriers hindering the future adoption of SFM and certification and to suggest the potential solutions. However, several caveats should be stated with respect to the study. It was undertaken with limited samples. For example, only 20 wood products manufacturers were interviewed and the results were generalized based on their response. It is possible that more complex thinking may be revealed by more detailed research. Only two case study areas were used, and the results should therefore be treated with care despite their apparent representativeness in China. Given that SFM and forest certification are still at a preliminary stage and that a wide range of factors will influence their future adoption, it is too early to conclude what path SFM and certification will take in China.

## **6.2 Potential application of this work**

Within China, the results and findings presented in the study will help inform future decision-making in all areas of China's forest sector. For the small-scale forest farmers in the forest-dependent regions, the study has helped to identify their needs, genuine interests and barriers to the adoption of SFM and certification, and has thereby helped them to be aware of the potential benefits associated with SFM and forest certification and enhanced their interest in both fields. Further awareness will be achieved through training programs using the results derived from their study. For market officials, the results provide insights about the real needs and interests of forest farmers and, as a result will help them to provide better services as well as facilitating more appropriate and pragmatic mechanisms reflective of the local individual circumstances and capabilities. For Chinese wood products manufacturers, the study may be of interest because the survey of Canadian wood products retailers provides an interesting

prediction on the future potential market demand on certified wood products and therefore could assist them in making informed decisions about forest certification, as early adopters are often in a better position to take advantage of certification. The study is of particular value to decision makers in China as it provides an up-to-date assessment of the current trends in and barriers to the future development of SFM and certification. The results of the study could be used as the frame of reference for training programs directed at various groups of stakeholders. In a broader context, the results and findings obtained from this study will be instructive for the rest of the world, particularly for those undergoing economic transition and/or attempting to make such a transition. Similar methodologies and techniques could be adopted in these places.

### **6.3 Future research**

Both SFM and forest certification are still at a preliminary stage in China's forest sector and, as a result, an extremely low awareness and understanding of these issues was found across various interest groups. Limited and infrequent market demand for certified wood products is the most important barrier hindering the further uptake of forest certification. There is also a lack of comprehensive and effective education and publicity campaigns in China. As a result, future research needs to focus on how to enhance the awareness and acceptance amongst various interest groups and to develop the most appropriate and effective methods to convey such information.

Both small-scale forest farmers and wood products manufacturers, as the potential direct adopters, lack the inherent motivation to engage in SFM and certification. More research is needed on how to increase the incentives for them to voluntarily adopt SFM and certification. In forest-dependent regions, poverty reduction appears to be more often the priority of various policy reforms and initiatives, greatly impeding the widespread adoption of SFM and certification as more timber harvesting is required to increase farmers' income. Other income-generating forest-related activities are needed to



reduce the impacts of timber harvesting on forest ecosystems. More efforts should go towards facilitating such activities. The study assessed the impacts of the ongoing forest tenure reforms and forestry property markets on the adoption of SFM and certification in China. As this research was based on only two case studies, more examples are needed so that more replicates can be achieved.

Forest certification was advanced as a market-based instrument to achieve sustainable forest management. As such, it is supposed to provide adequate net market benefits to motivate interested forest owners and forest companies to obtain it. While this has not always been the case, non-market incentives, such as environmental leadership, have helped drive the uptake. Although forest certification has been seen increasingly as the cost of doing business, research is still needed to identify viable ways to involve Chinese forest owners and companies in the process. The emerging legality requirements, such as the U.S. Lacey Act, FLEGT Voluntary Partnership Agreements and Due Diligence regulation, would have influential impacts to pressure Chinese wood products manufacturers to adopt forest certification quickly, particularly those export-oriented companies.

In the global context, both sustainable forest management and certification are rapidly changing, and will continue to evolve in response to newly-emerging global challenges, such as Reducing Emissions from Deforestation and Forest Degradation (REDD+), climate change mitigation and adaptation, and biodiversity conservation. Moreover, a wider range of expectations are being placed on forests in addition to timber production, including the provision of environmental, social, cultural, and spiritual benefits. SFM is intended to recognize these links. Future research will revolve around how the concept and operational implementation of SFM can adjust and adapt to realize these diverse values as well as how and to what extent the SFM can reconcile the demands placed on the forests for products and benefits and the maintenance of forest health and diversity.

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# Appendices

## Appendix A: Interview script for Chinese forest farmers and market officials

The following questions will be used as a guide during the interviews. Other questions might bring up if necessary.

In terms of the small-scale forest farmers, all the interviewees will be asked questions such as:

- How many forests did they obtain as a result of the forest tenure reform?
- What do you think are the most important results as the land privatization and the development of regional forest markets?
- Did you have some activities on the market before? If yes, what kinds of activities did you take?
- What do you think about the forestry property markets?
- How do you know your forests are managed responsibly and sustainably?
- What factors would you use to evaluate whether the forest is managed well (e.g. social, economic, and ecological)?
- Could you rank the factors in the order of importance to you?
- Under what circumstances would you change the importance of these factors?
- Under what conditions would you like to manage your forests sustainably?
- If there is one way for you to manage your forests sustainably and demonstrate it, would you like to adopt it?

In terms of the market officials, all the interviewees will be asked general questions about their occupation and time spent on this occupation; the role and responsibility of the occupation; their involvement with farmers; their participation in decision-making.

Other questions will be asked such as:

- What is your opinion in the forestry property market?
- Do they achieve their original goal?
- What goals have they achieved and have not achieved so far?
- What aspects do you think can be improved?
- Apart from forestry property market, are there any other forms of mechanisms can achieve the same goal?
- What do you think sustainable forest management?
- In your experience, are farmers managing their forests responsibly and sustainably? Why yes, or why not?
- What are the major barriers do you perceive?
- How do you think can overcome or eliminate the barriers?
- What extent do you think forest certification can gain progress?



## Appendix B: Interview questions for Chinese wood products manufacturers

The following questions are designed to guide the interview.

Q1. Give a general description of your company, including company size, location, the number of employees, sources of wood and so on.
Q2. Have you heard about forest certification before? If yes, can you explain what forest certification is? If not, I will explain forest certification to them.
Q3. From a business point of view, what are the main differences between being certified and non-certified?
Q4. Under what conditions would you be willing to get certified? Do you plan to get certified in the future? If you do, when do you think you will get certified?
Q5. What is the motivation for you to become certified? If you are not willing to become certified, what are the reasons?
Q6. If you get certified, do you anticipate obtaining any market benefits, such as price premiums? What about non-market benefits, like avoiding backlash or alleviating environmental pressures from ENGOs?
Q7. Are you frequently in contact with ENGOs?
Q8. In your opinion, does a market exist for certified wood products and green marketing in China?

# Appendix C: Questionnaire for Canadian wood products retailers

## Assessing the Effectiveness of Forest Certification in Canada

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1. Please indicate the number of your company's retail stores. \_\_\_\_\_ stores

2. What types of customers does your company attract?

- Urban (communities or contiguous community of combined population of 50,000 or more) \_\_\_\_\_ %
- suburban (similar to urban but with population of less than 50,000) \_\_\_\_\_ %
- small town (more isolated from an urban area than suburban with population less than 50,000) \_\_\_\_\_ %
- rural (population is scattered over a large area) \_\_\_\_\_ %
- 100 %

3. What types of wood and paper products does your company sell? Please check all that apply.

- Lumber                                       Commodity grade paper
- OSB     Pulp
- Treated wood                                 Value-added wood products
- Particle board                                 Value-added paper and paperboards
- Plywood                                         Other (please specify) \_\_\_\_\_

We have a number of questions related to forest certification.

**FOREST CERTIFICATION is a process of assuring company compliance to a standard that requires adherence to sustainable forest management (SFM), i.e. balancing environmental, social and economic aspects of long-term forest management. Companies that comply with the requirements of such standards can become CERTIFIED, along with the products they sell.**

4. Does your store carry certified wood or paper products?

- Yes
- No (go to Question 9)
- Don't know (go to Question 9)

5. What percent of purchased wood volume is certified?

- \_\_\_\_\_ % percent
- 0% percent (go to Question 9)

6. What kind of suppliers provide certified wood?

- a few suppliers with large volumes
- multiple suppliers with small volumes
- a few suppliers with small volumes
- multiple suppliers with large volumes

7. Does your company pay a higher price for certified wood products?

- Yes —————> Please show the price premium on purchased wood products  
 \_\_\_\_\_% percent
- No (go to Question 8)

8. Does your company charge a higher price when selling certified wood or paper products?

- Yes —————> Please show the price premium on sold certified wood or paper products  
 \_\_\_\_\_% percent
- No (go to Question 9)

9. Does your company have a specific policy on purchasing certified wood products?

- Yes
- No (Go to Question 12)

10. How is the policy communicated to wood suppliers?

- Requirements of supplier's contract
- Indication of preference for certified wood
- Other (please specify) \_\_\_\_\_

11. How important are the following reasons for promoting certified wood or paper products?

	Very unimportant	Somewhat unimportant	Somewhat unimportant	Very important
Being an environmental leader in the field	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gaining or maintaining market access or market share	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improving company image	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Customers' requests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improving employee morale	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental change brought by forest certification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social change brought by forest certification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Economic change brought by forest certification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pressure from environmental groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. What percent of your company's customers request products that are certified by forest certification?  
 \_\_\_\_\_ % percent

13. Have you observed changes in forest management practices that happen when a forest company pursues forest certification?

- Yes
- No (go to Question 16)
- Don't know (go to Comments section)

14. How significant are the changes in the following aspects of forest management?

	Very insignificant	Somewhat insignificant	Somewhat significant	Very significant
Social aspects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Economic aspects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental aspects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. Please list up to three most prominent changes that happen when a forest company pursues forest certification.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

16. Has forest certification failed to change something that in your opinion needs/needed to be changed?

- No (go to Comments section)
- Yes → Please aspects that you think should be modified by forest certification (and have not been at present)

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

If you have additional comments on changes associated with forest certification, please provide them in the space below.

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**Thank you very much for your time and cooperation in filling out this survey!**