

*The following is the text of a letter and independent technical report prepared for the purpose of incorporation in this prospectus received from CFK, an independent technical consultant, in connection with the forestry assets of our Group.*

***CFK's technical report presents all of our forest held by our Group. The projections contained in CFK's technical report are not necessarily indicative of future performance and the actual woodflows, costs and capital expenditures may vary from the projections contained in the technical report.***



**Chandler Fraser Keating Limited**  
FOREST INDUSTRY CONSULTANTS

Chandler Fraser Keating Limited  
Level 1 Quadrant House  
1277 Haupapa Street  
P O Box 2246  
Rotorua, New Zealand

19 November 2009

The Directors  
China Forestry Holdings Co., Ltd.

Dear Sirs,

**Re: Independent Technical Report**

Chandler Fraser Keating Limited (CFK) has been approached by China Forestry Holdings Co., Ltd. ("The Company", with it and its subsidiaries collectively called "The Group") to provide an Independent Technical Review of their forest operations in the Peoples Republic of China.

CFK understands that The Company intends to include this Independent Technical Report (ITR) in the prospectus to be issued by The Company in conjunction with its proposed listing on the Hong Kong Stock Exchange.

This report presents CFK's findings of our review of the forest operations of The Group.

The review was to:

- observe current forest operations;
- assess current practices and validate costs, prices and production levels; and
- provide comment on environmental performance.

CFK conducted their review on various occasions in 2008 and in March and August 2009 when CFK consultants visited some of the forest areas in Sichuan and Yunnan and spent time at The Group's offices in Beijing.

**Forward - Looking Statements**

All statements in this review that are not statements of historical fact, such as estimates of current and future growth of the forests, constitute forward looking statements. These forward looking statements and other matters discussed in this ITR that are not historical fact are only CFK's projections of future performance and this may differ from the actual performance. Nothing in this report is, or should be relied upon as a promise by CFK that the actual future performance, results, achievements, growth, yields, costs, or prices relating to the current or planned forests will be as discussed in this ITR. Factors that could impact performance that could cause actual results or performance to differ from this ITR include, but are not limited to, those factors discussed in the ITR. Actual results may differ from the opinions contained in this report as anticipated events may not occur as expected and the variation may be significant.

**Statement of Interests**

CFK was selected to undertake this review based upon our company's expertise in the forest industry. CFK has no historical relationship with and is independent of The Group and has no economic interest in any of the assets covered in this review. Our payment for this report is not contingent upon The Group's approval of our work.

**Report Qualifications and Assumptions**

In preparing this report we have relied on the accuracy and completeness of the forest inventory, operating costs and other data supplied by The Group. We have reviewed the information supplied by The Group and believe that it is consistent with the information and knowledge that The Group has on its forests. This ITR relies upon the information provided by The Group, and while we have compared the key information provided by The Group with our own research, the accuracy of the results and conclusions of the report are reliant on the accuracy of the information provided.

CFK has undertaken limited visual inspection of the forests on various occasions in 2008 and in March and August 2009.

CFK did not undertake any new inventory nor were we able to independently verify the forest area description.

This ITR is subject to certain limitations including among others the following:

- CFK undertook site inspections which can only provide an indicative subjective assessment of the quality of the forest resource and the likely wood flows. CFK assumes that the sites visited were broadly representative of the forest estate as a whole;
- CFK did not undertake a full scale review of the existence of any hazardous substances or other adverse environmental conditions that may or may not be present in The Group's forest; and
- CFK is not expert in and expresses no opinion on legal or accounting matters assumed for the purposes of this ITR.

The actual wood flows, production volumes, and conditions of The Group's forests may differ from that set forth in this ITR. The degree of uncertainty increases with each year presented. If actual wood flows, production volume and forest conditions are less favourable than those shown or if the assumptions used in formulating the projections prove to be incorrect, The Group's business and operations may differ from the projections.

The report contains input from a number of people within CFK and its production has been under the management of the undersigned to whom any questions should be referred in the first instance. This report has been prepared according to forestry consulting generally accepted practices and the reader is referred to information on what investigations have been undertaken and what was either not undertaken or not able to be undertaken due to government regulations.

Chandler Fraser Keating Limited has no responsibility to update the report for events and circumstances occurring after the date of issue.

Yours faithfully

**Geoff Manners**  
**Forestry Consultant**

## **1 INTRODUCTION**

### **1.1 THE PARTIES**

#### **China Forestry Holdings Co., Ltd**

China Forestry Holdings Co., Ltd (“The Group”, with it and its subsidiaries collectively called “The Group”) is currently one of the largest privately owned forestry companies in China. It currently has 12,447 hectares of forest in Sichuan province, and 159,333 hectares of forest in Yunnan province.

#### **Chandler Fraser Keating Limited**

Chandler Fraser Keating Limited (CFK) is a privately owned specialist forest consulting firm headquartered in Rotorua New Zealand. It has a 50% joint venture, MBAC Consulting Group Pty Ltd, with its headquarters in Melbourne Australia.

Formed in 1980, CFK has developed in to a specialist forest and solid wood processing consultancy with a focus on operations in the Asia Pacific region.

### **1.2 SCOPE OF WORK**

CFK was commissioned to review The Group’s forestry operations and present the results in an Independent Technical Report (ITR).

Specifically the review was to:

- observe current forest operations;
- assess current practices and costs, prices and production levels; and
- provide comment on environmental performance.

The ITR would be used in conjunction with the prospectus for The Group’s proposed listing on the Hong Kong Stock Exchange.

### **1.3 WHAT IS COVERED**

This report is set out in the following sections:

- key assumptions
- a review of The Group and its development;
- a market review;
- a review of The Group’s current forest operations;
- a review of The Group’s future operations.

## **2 KEY ASSUMPTIONS**

### **2.1 FORESTS**

Summarised inventory information provided to CFK forms the basis for preparing the wood flow projections used in this report.

Each harvest operation requires a harvest permit from the local authority. The annual allowable cut has been set at 10% of the initial inventory volume. This assessment has been made following discussion with The Group executives responsible for applying for cutting permits, and this is the basis upon which applications to date have been approved.

The non-declining yield has been based upon management's stated intention to provide for a stable wood flow.

Trees are replanted after harvest and management is still evaluating at what age these trees should be harvested. CFK has used a minimum felling age of 15 years to prepare the wood flows. This view is certainly liable to change, particularly when The Group gains more comprehensive growth and yield data.

### **2.2 OPERATING COSTS**

Operating costs are based on the operating costs as at the end of 2007 and early 2008.

### **2.3 EXCHANGE RATE**

Unless otherwise noted CFK has used the following exchange rate for current prices and costs.

USD 1.00 = 6.8630 RMB

For log price time series, the average USD:RMB for the time period concerned is used.

## 3. GROUP OPERATIONS

## 3.1 BACKGROUND

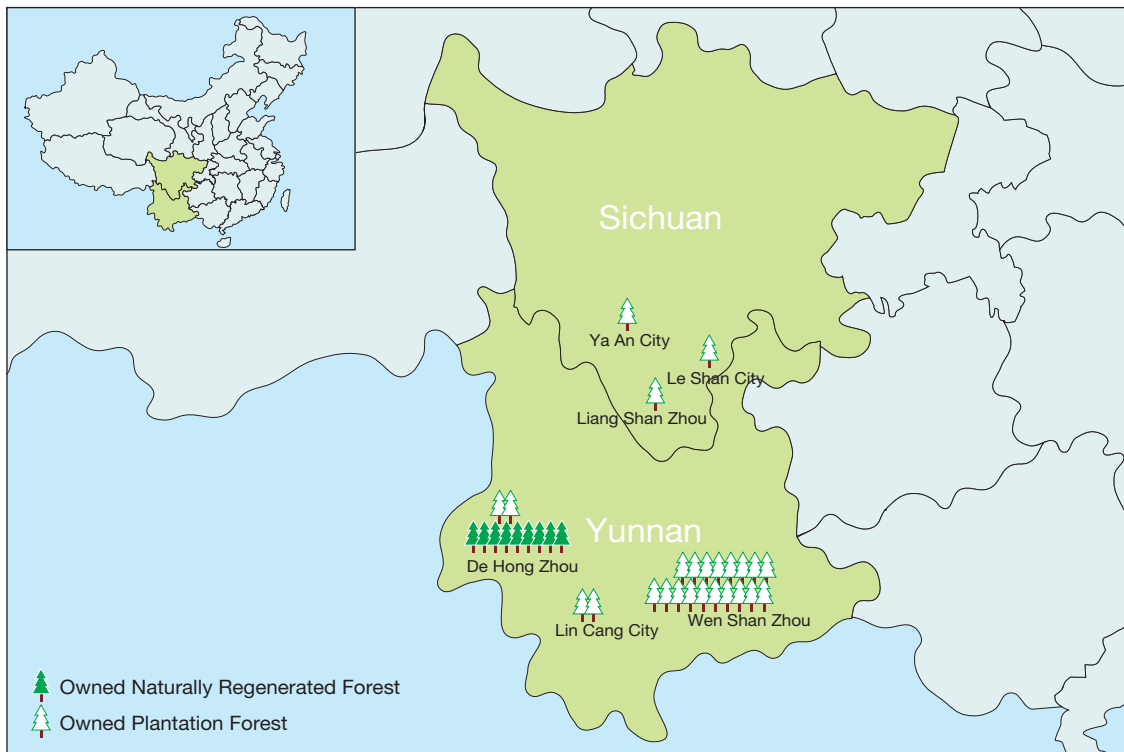
As at 30 June 2008 The Group owns forest assets primarily located in Sichuan and Yunnan provinces in the Peoples Republic of China, and sells logs into the domestic market to a range of predominantly sawmilling customers. The Group currently owns approximately 171,786 stocked hectares of productive forest. This forest estate has been acquired over a number of years with the first purchases made in June 2003 (Table 3.1).

Table 3.1 NET FOREST AREA AS AT 30 JUNE 2009 (hectares)

Year of Establishment	Birch	Fir	Beech	Yunnan Pine	Fir Cedar Birch Mix	Yunnan Pine Alder Mix	Total
<b>Sichuan Province</b>							
1983 .....					80	187	<b>267</b>
1984 .....		760			62	88	<b>910</b>
1985 .....		737			0	0	<b>737</b>
1986 .....		2,683			0	0	<b>2,683</b>
1987 .....		7,765			85	0	<b>7,850</b>
<b>Total Sichuan Province .....</b>		<b>11,945</b>			<b>227</b>	<b>275</b>	<b>12,447</b>
<b>Yunnan Province</b>							
Luxi							
1947-1966 .....				5,781			5,781
1967-1976 .....				1,586			1,586
1977-1988 .....				1,014			1,014
1989- .....				286			286
Up to 1982 .....	21,280	7,093	7,093				35,466
After 1982 .....	9,120	3,040	3,040				15,200
Wenshan							
1983-1990 .....		100,000					100,000
<b>Total Yunnan Province .....</b>	<b>30,400</b>	<b>10,133</b>	<b>10,133</b>	<b>8,667</b>			<b>159,333</b>
<b>Total Estate .....</b>	<b>30,400</b>	<b>22,078</b>	<b>10,113</b>		<b>227</b>	<b>275</b>	<b>171,780</b>

The general location of the forest estate is shown in Figure 3.1.

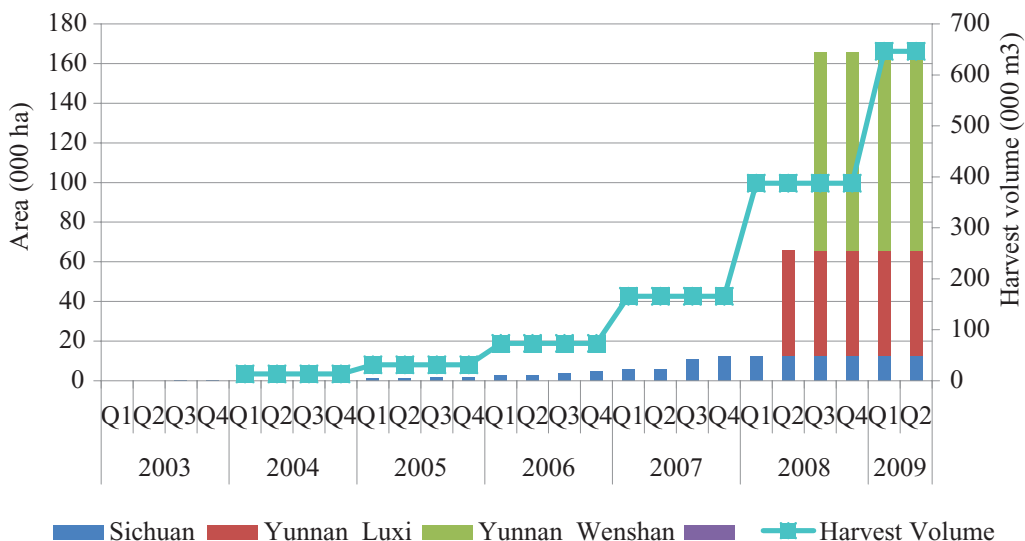
Figure 3.1 GENERAL FOREST LOCATION



Source: The Group

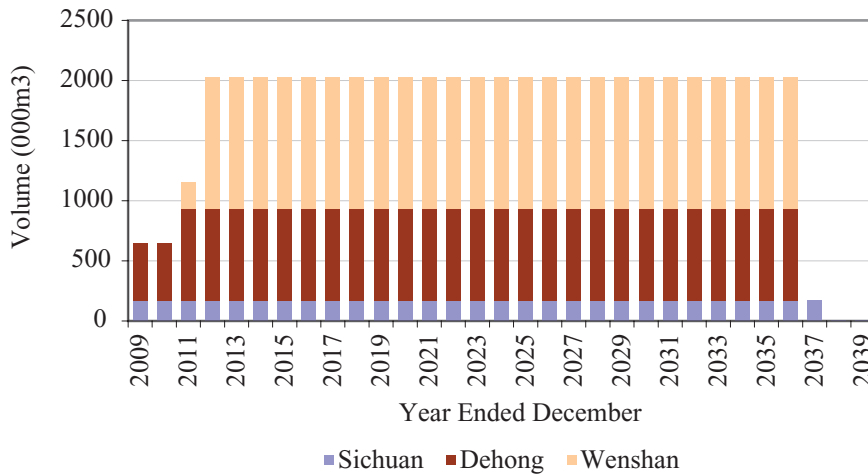
The Group harvested a total of 387,000 m<sup>3</sup> in 2008 and plans to harvest a total of 646,000 m<sup>3</sup> in 2009. In 2008 a total of 236,000 m<sup>3</sup> was harvested from the Yunnan Luxi forests The Group acquired during the first quarter of 2008. Figure 3.2 shows the expansion of the forest estate since 2003, which illustrates the impact of the recently acquired forests on the size of The Group’s forest estate, and the harvest history (blue line).

Figure 3.2 FOREST ACQUISITIONS AND HARVEST HISTORY



CFK estimates that the current forest holdings can produce a non-declining yield of approximately 1.1 million m<sup>3</sup> per annum for the next twenty years from the existing and future crops. The eventual harvest levels will be dependent upon growth of the future crops and on The Group's management plans.

**Figure 3.3 ESTIMATED NON-DECLINING WOOD FLOWS**



The Group's initial focus has been on establishing a sound acquisition team and on securing forest assets of the desired age and species mix to meet The Group's longer term objectives. To this end they have developed an acquisition team that has a good understanding of China's national forest policy, and appears to have good relationships with provincial and local Forestry Bureau in the target provinces.

The estate makes The Group well placed to take advantage of China's shortage of raw materials for its wood processing industries. This is particularly true for the hardwood resource in Yunnan which can provide a local alternative to imported temperate hardwoods.

### 3.2 FOREST OPERATIONS

The Group manages its estate using a low intensity selective harvest regime, maintaining the original stocking by replanting following harvest. The Group practices a low intensity silviculture regime. Little in the way of ongoing silviculture is practiced apart from any thinning of natural regeneration.

Planting and regeneration thinning is carried out by The Group's forest based employees. In Sichuan, harvesting is carried out using traditional methods and the Group contracts with local villagers for felling the trees, cutting to log lengths and delivery to roadside. In Yunnan specialised harvesting contractors are used. These contractors employ a combination of manual extraction methods and mechanised winches to extract the logs to roadside. Harvesting contractors are given instructions on tree sizes to cut. These tree sizes are set primarily in response to market demand, with forest dynamics playing a secondary role.

### 3.3 SALES AND MARKETING

Logs are sold to customers delivered to the forest edge alongside the road. This method of selling provides The Group with more control over the trees that are to be harvested than if sales of standing trees were made. The logistics of delivering the logs to each customer is also best managed by each purchaser.



The sales activity is controlled by a national sales manager with a sales staff of thirteen—including support functions—and a further 3 customer service staff. All are located in Beijing but travel regularly to Sichuan province.

As a forest owner at least The Group is reliant on sales of logs for its revenue. CFK is of the view that a successful sales and marketing strategy requires both a sound understanding of the resource and an understanding of the customers' requirements, so that an appropriate customer base can be developed whose requirements match the natural outturn of the forest.

### **3.4 MANAGEMENT ORGANISATION**

During the course of preparing this ITR, CFK had the opportunity to meet with various employees of The Group, both at their head office and in the field. CFK found the staff to be interested, enthusiastic and understood their roles. Management were well aware of their responsibility to the community, and local forest staff appeared to have a good knowledge of the forest area they were responsible for managing.

Any review of The Group's organisation has to be undertaken with regard to the stage of its business development. To date the focus has been on acquiring a forest estate that would give The Group economies of scale, spread over a number of geographies with a mix of species. A secondary focus has been in building relationships with key stake holders, be it local villagers, local and regional forestry bureau staff and customers. Understandably there has not been the same emphasis placed on developing technical forestry expertise, particularly in growth and yield as well as data capture and forest record systems. The Group had approximately 12,000 hectares under management as at 31 December 2007 (Most of this area was acquired during the second half of 2007 as shown in Figure 3.2) and over 170,000 hectares as at 31 December 2008. This rapid expansion of the estate has understandably meant that the forest information systems of The Group have not been able to keep up with this rapid rate of expansion. Up until now The Group has been able to rely on the knowledge of its forest workers in the field for this information. With the current size of the estate spread over two provinces and three geographical areas, The Group will need to expedite the development of their forest information systems if the value of the resources is to be maximised. Although CFK has not seen the specifications, CFK understands that the Group is in the process of implementing an information management system which, among other things, include a GIS based forestry resources management system that uses satellite imagery together with GPS, and ground truthing of the satellite images, for collection and transmission of data gathered from forests for managing the activities of logging and replanting.

In Sichuan The Group employs a minimum of one forest worker for every 66.67 hectares (1,000 Mu) of forest. As at December 2007 there were 198 such employees in Sichuan. Often these employees are the previous owners of the forest. These employees are managed by regional supervisors (as at December 2008 there were 33 in total for the Sichuan forests), and they establish The Group's links with the community and provide a good understanding of the forest resource.

In Yunnan there is one provincial manager responsible for the day to day operations. Due to the scale of operations The Group employs one forest worker for every 1,333 hectares.

Their role is more supervisory than in Sichuan as the physical harvesting and replanting operations are carried out by an independent contractor.

It is CFK's recommendation that The Group develop some technical forestry expertise, particularly in the growth and yield of uneven aged plantations, as well as develop a robust data capture and recording system to record log removals by location, changes in growing stock, forestry operations, and forest health. CFK understands that The Group recognises this deficiency and is taking steps to introduce a comprehensive information system as a matter of priority.

CFK is of the view that:

- The Group has developed the necessary expertise and understanding at the local, regional and national levels to acquire relatively large areas of forest land. This is a significant competitive advantage as this is one of the key barriers to entry into significant forest ownership in China.
- The Group has developed links with the local community, through the employment of local forestry workers. This has the advantage of securing the knowledge base about the forest resource as well as providing security for the estate. These links also place The Group in a good position to purchase more forest.
- The Group needs to develop technical forestry expertise in growth and yield and the behaviour of the different species in the Group's forests to a low intensity, selective logging system.
- The existing information that the Group holds on its forest estate contain a description of the estate as at the date of purchase, setting out the species, area age and volume for each forest in the Group's estate. The Group has records for each forest showing the area harvested, and the volume removed for each year. The fact that most of the Group's forests have been purchased in the last 18 months limits the number of harvesting operations that have been carried out (a maximum of 1/year/forest) in the forest since the acquisition date, means that the state of the Group's forests as at the valuation date can be accurately derived from the information that the Group holds. During 2007 and 2008, the Group's forest holdings expanded rapidly. As a result there is a need to develop a more comprehensive and soundly based forest record and reporting system to monitor the condition of the forest and provide an auditable record of future operations. This should, at the very least, include mapping the forest and development of a geographic information system. The existing system is rapidly being overtaken by the expansion of the Group's estate. Without a soundly based information system including yield management and projection systems, the Group's ability to maximise the value of the estate will be compromised.
- The implementation of a soundly based forestry resources management system record the current state of The Group's forests including the operational activities of

logging and replanting should enable the Group to be in a better position to manage its forest resources.

- The Group has demonstrated the ability to develop good relationships with local, regional and national government officials, so that these officials are aware of The Group's objectives and operating policy; and
- Through its relationships, particularly with local stakeholders, The Group is able to secure a sufficient allocation of harvest quota in order to meet its market commitments and wood flow projections both in the short and medium term.

The Group provided CFK with a copy of their annual administration costs. Based upon this information CFK was able to allocate these costs to either forest operations (e.g. planting, weed control, protection), general administration or sales and marketing for the year ended December 2008. Table 3.2 sets out CFK's allocation of administration costs based upon the information provided for the 2008 financial year.

**Table 3.2 ALLOCATION OF INDIRECT COSTS (2008)**

<u>Cost Grouping</u>	<u>Forest Operations</u>	<u>General Administration</u>	<u>Harvesting and Marketing</u>
Staff Costs (000RMB) .....	1,084	5,238	2,709
Travel (000RMB) .....	252	1,031	405
Office Administration (000RMB) .....	959	11,538	913
Forest Insurance (000RMB) .....	—	9,929	—
Other (000RMB) .....	—	3,081	—
<b>Total (000RMB) .....</b>	<b><u>2,295</u></b>	<b><u>30,816</u></b>	<b><u>4,046</u></b>
Units .....		171,780 ha	510,033 m <sup>3</sup>
Unit Cost .....		179 RMB/ha	7.93 RMB/m <sup>3</sup>
Harvesting Permit .....			56.00 RMB/m <sup>3</sup>
<b>Total Unit Cost .....</b>		<b><u>179 RMB/ha</u></b>	<b><u>63.93 RMB/m<sup>3</sup></u></b>

### 3.5 IMPACT OF COMPETITORS

There are three areas where The Group's activities could be impacted by their competitors. They are in the acquisition of forests, sale of logs, and competition for labour.

#### 3.5.1 LAND ACQUISITION

To date The Group has been successful in building up a forest holding in both Sichuan and Yunnan province, and is in the process of completing negotiations for an additional significant forest acquisition in Yunnan province.

There do not appear to be many other forest owning companies in China with a similar business model to that of The Group. Most other companies are focussed on acquiring land to establish fast growing plantations of Eucalypts for the pulp and paper industry, of Chinese Fir and Pine. These companies have largely focused on the Southern provinces of Guangdong, Guangxi, Hainan Island, Shandong and Henan. However, land at prices suitable for forest plantations is becoming scarce, particularly in Guangxi and Guangdong provinces. It is highly

likely that some of these locally and foreign owned pulp and paper companies will look to other provinces to extend their plantation base. Already one foreign operator (APRIL) has established plantations in Yunnan as have some locally owned pulp and paper companies. It was reported that Grand China Forestry Green Resources Group Limited (formerly known as China Grand Forestry Resources Group Limited) purchased 147,000 hectares of land (including 47,000 hectares of forest) in Yunnan during 2008. CFK understands there are also a number of private organisations that are looking to acquire forests in Yunnan. The impact of these competitors will be to increase the cost of acquiring forest. It is important that The Group capitalises on its 'first mover' advantage in Yunnan and secures its remaining target forest areas before other forest owners look to become established in the region.

### **3.5.2 LOG SALES**

The Group is currently one of the larger log sellers in both Yunnan and Sichuan provinces. Its main competitors are a number of smaller forest owners. These owners often do not have the same commercial objectives as a larger corporate organisation and as a result may impact on the ability of The Group to increase prices.

The other corporate owners are either focused on meeting their own internal needs, or supplying a different customer base to The Group. However, they are likely to be more disciplined in their behaviour than the smaller sellers. As China will continue to import logs, The Group and the other corporate forest owners should be more competitive than the cost of imported logs and should be able to sell their harvest volumes without oversupplying the market. With an increasing forest area and an associated increase in potential harvest volumes, the impact of these competitors could limit the Group's ability to sell the increasing volume of logs.

### **3.5.3 LABOUR**

The Group's forest operations are very labour intensive (as are most forestry operations in China). Increasing urbanisation will increase pressure on rural labour availability and cost.

The Group could well see itself competing for labour with manufacturing companies based in urban centres. The degree to which it is able to compete will be largely dependent upon its community links and utilising those individuals who wish to work in or near their home village, or in the open air rather than in a factory setting.

## **3.6 KEY VALUE DRIVERS**

CFK's opinion as to the key value drivers of a successful forest owner can be summarised as follows:

- Purchase forests at the right price and in the right location;
- Understand the resource, and its growth at both a stand and estate level;
- A good spread of customers that fit with the logs the forests can produce;
- Regular off-take agreements for a portion of the harvest volume;

- Good stakeholder relationships; and
- Low operating costs and a strategy for continual improvement—this is a commodity business and ultimately the lower cost producer is in the best position.

## 4 GLOBAL FOREST PRODUCTS MARKET

This section provides a broad overview of the supply and demand of industrial roundwood, a review of Pacific Rim trade, and in particular the log trade which is The Group's products.

### 4.1 GLOBAL DEMAND AND SUPPLY

#### 4.1.1 GLOBAL DEMAND

Historically there has been a close correlation between GDP, population and the consumption of industrial roundwood. In the future it is unlikely that globally the per capita consumption of roundwood will continue to strongly correlate with changes in per capita GDP. This is due to a number of factors the principle ones being:

- Improved efficiency of manufacturing ( i.e. more product per m<sup>3</sup> of log input); and
- Reduction in wood use per unit of final demand (e.g. m<sup>3</sup> of forest products per m<sup>2</sup> of house construction).

The demand for lumber and panel products is driven by:

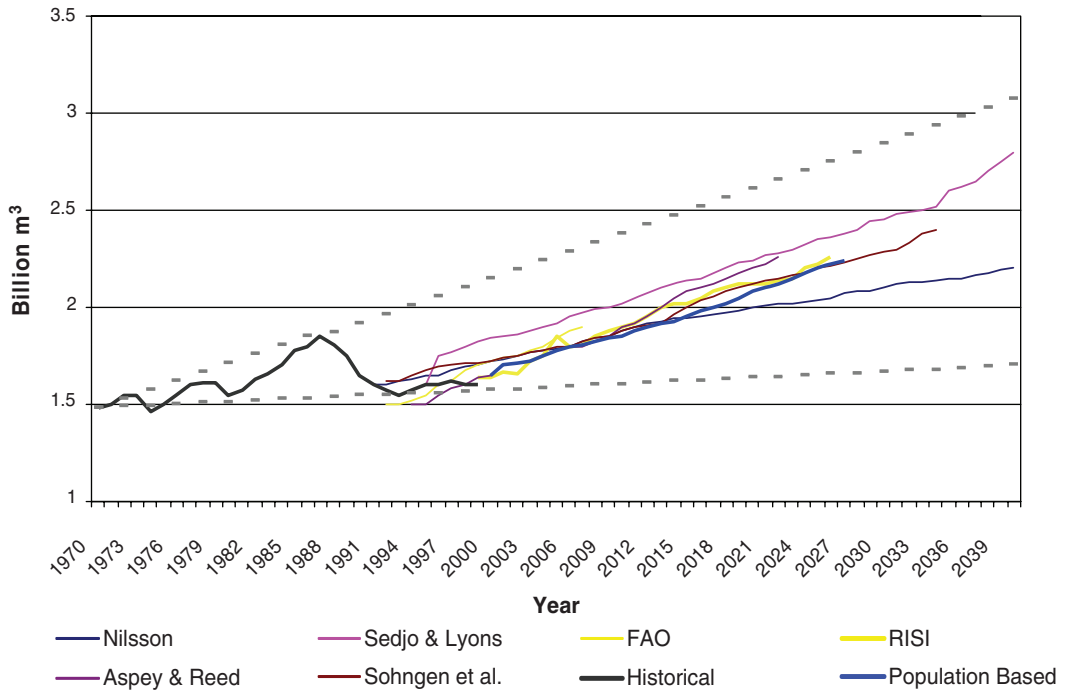
- New house construction;
- Repairs and remodelling of existing houses;
- Wooden furniture; and
- Packaging and shipping containers.

The demand for paper and paper products has generally been closely associated with increasing GDP. In recent times the impact of the internet and technology has impacted the demand for paper products, especially newsprint. This technological change has long been predicted but the results have only just started to become apparent.

However, the average global per capita consumption of wood appears to be reasonably stable. This indicates that future global demand for industrial wood is becoming aligned with increasing population growth. In developing economies increasing per capita GDP is still likely to be an important measure for increasing demand for forest products as a more affluent population is in a position to afford larger houses, and more and higher quality furniture and fittings.

There have been a number of studies looking at the future demand for industrial wood. Figure 4.1 shows a number of forecasts of industrial wood consumption.

**Figure 4.1 GLOBAL WOOD CONSUMPTION**



**Source: HNRG**

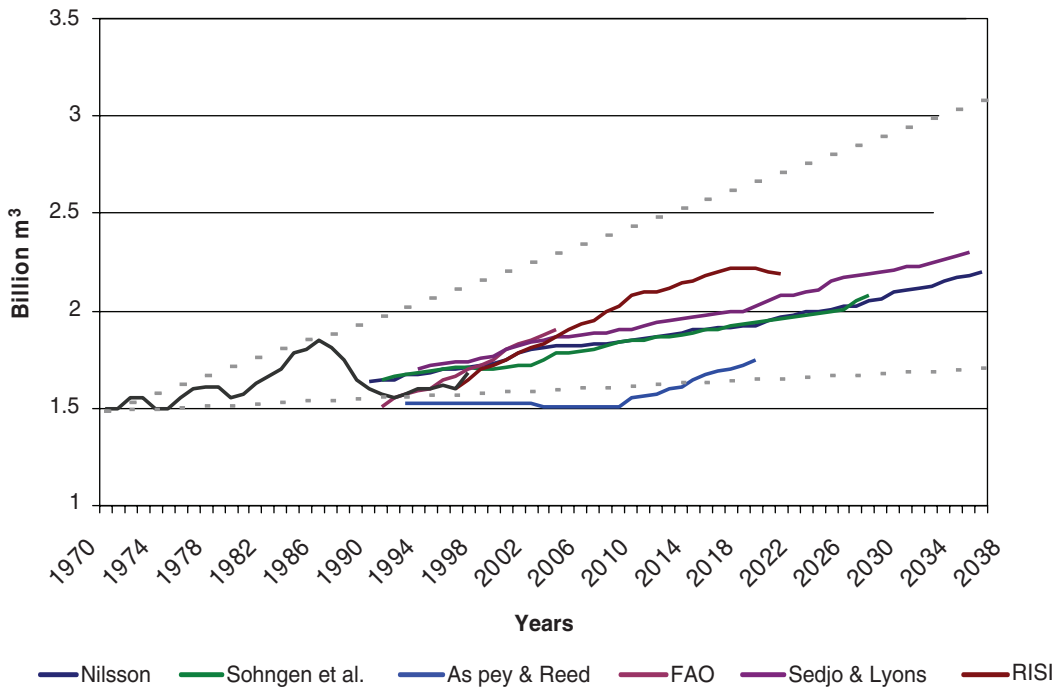
The decrease in demand observed during the latter half of the 1980s was due to the break-up of the Soviet Union, which resulted in a decrease in industrial wood demand. Harvest levels in the former Soviet Union have increased significantly since then but they are still below their previous levels.

4.1.2 GLOBAL SUPPLY

A number of studies of the potential global wood supply have also been undertaken.

Figure 4.2 shows the range of timber harvest forecasts that are currently available.

Figure 4.2 INDUSTRIAL WOOD SUPPLY FORECASTS



**Note: The dotted lines represent the extrapolation of historic high and low points. Source: HNRG, CFK Analysis**

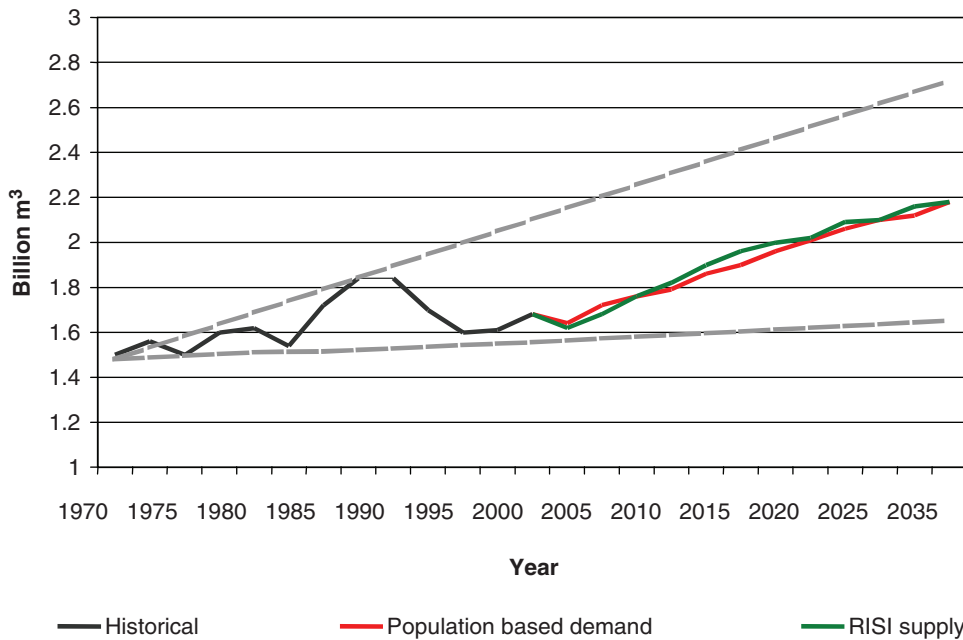
The forecasts are converging in the lower mid-section of the 1970 extrapolations. Of the most recent forecasts, RISI is the most optimistic as it incorporates an allowance for genetic gain. Most of these forecasts rely on base information collected by FAO, but apply individual assumptions on parameters such as future volume increments and availability, amongst other adjustments.

Historically, regional timber supply forecasts tend to overstate. On close examination, areas and yield tables are invariably optimistic. Apart from some well documented cases, volume increases due to genetic gain are difficult to detect on an estate-by-estate or region-by-region basis.

### 4.1.3 GLOBAL SUPPLY AND DEMAND BALANCE

As Figure 4.3 shows, the global supply, as represented by RISI forecasts, and population-based demand for industrial wood appear to be broadly in balance, with a tendency to over-supply in the medium-term. Any differences in supply and demand are well within the error of the estimates.

**Figure 4.3 GLOBAL WOOD SUPPLY AND DEMAND**



**Note:** The dotted lines represent the extrapolation of historic high and low points  
**Source:** HNRG

Regional supply and demand imbalances still exist, and the Asia Pacific region is identified as one region with a demand for forest products that exceeds the available regional supply. As the region contains two of the world's fastest growing economies (China and India) this situation is expected to continue. Any increases in regional demand are likely to be met by:

- Increased imports of logs to be processed in the region;
- Increased imports of primary processed material (e.g. lumber, veneer, wood pulp); and
- Increased imports of finished products.

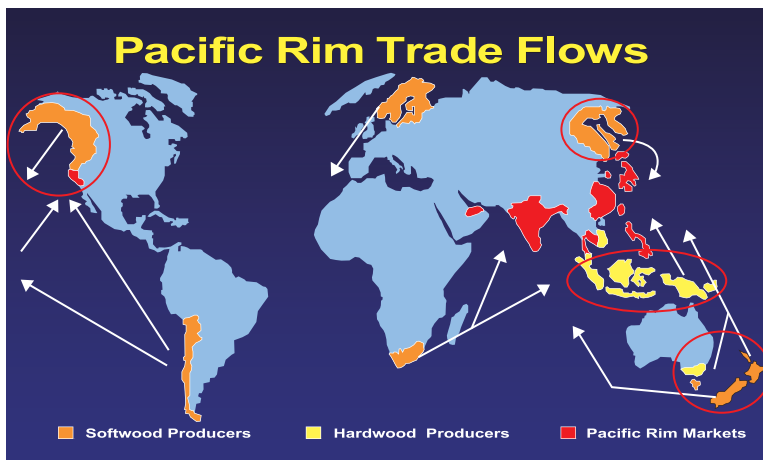
Owners and managers with well managed, cost competitive forest resources located in the region, particularly those with an emphasis on producing peelers and saw logs, are in a strong position to benefit from this regional "wood deficit".



4.2 PACIFIC RIM LOG TRADE

The Pacific Rim log market will have an important impact on future log prices.

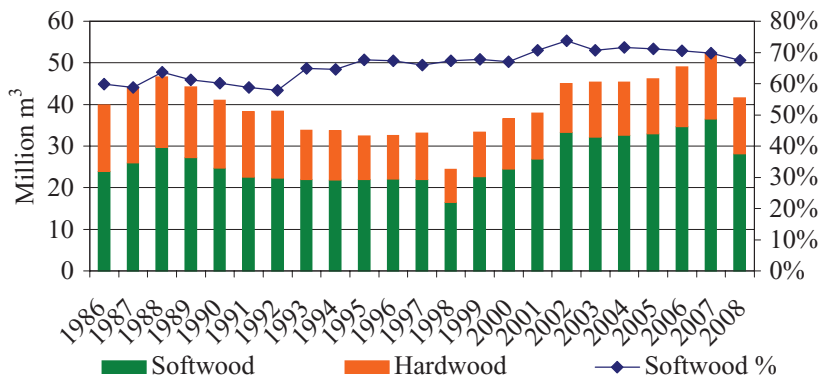
Figure 4.4 PACIFIC RIM TRADE FLOWS



The Pacific Rim log trade can be broadly broken down into the importing countries of North Asia (China, Japan and Korea) and the supplier countries lead by Russia and followed by Australasia and North America.

The Pacific Rim log trade is primarily a softwood trade. Figure 4.5 shows the volume of softwoods and hardwoods imported into North Asia.

Figure 4.5 NORTH ASIA LOG IMPORTS

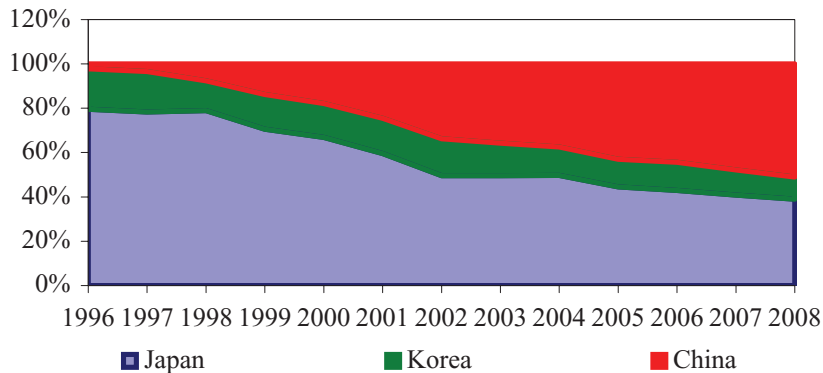


Source: RISI, WTA

4.2.1 SOFTWOODS

Figure 4.6 illustrates the increasing dominance of China in the Pacific Rim softwood trade.

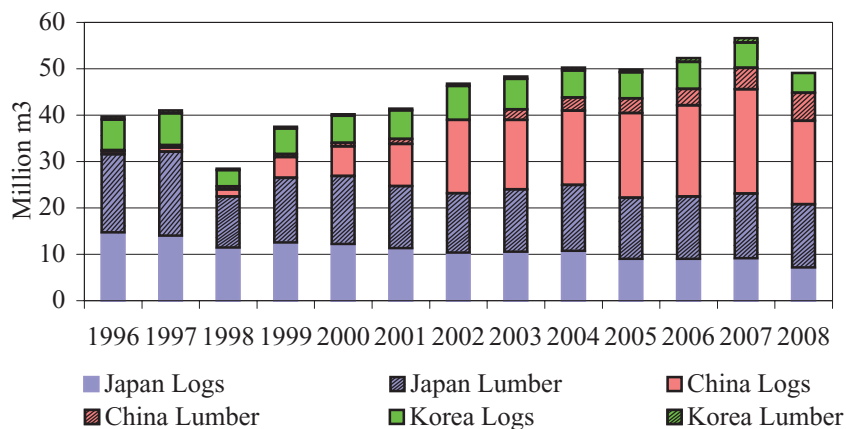
Figure 4.6 NORTH ASIA SOFTWOOD IMPORT COUNTRY MARKET SHARE



Source: RISI, WTA

Most of the softwood log imports are sawn in the North Asian markets and there is a degree of switching between log and lumber depending upon the respective economics. In order to gain a picture of the softwood trade it is important therefore that the level of softwood lumber imports/exports is also included (Figure 4.7).

Figure 4.7 NORTH ASIAN SOFTWOOD LOG AND LUMBER IMPORTS



Source: RISI, WTA

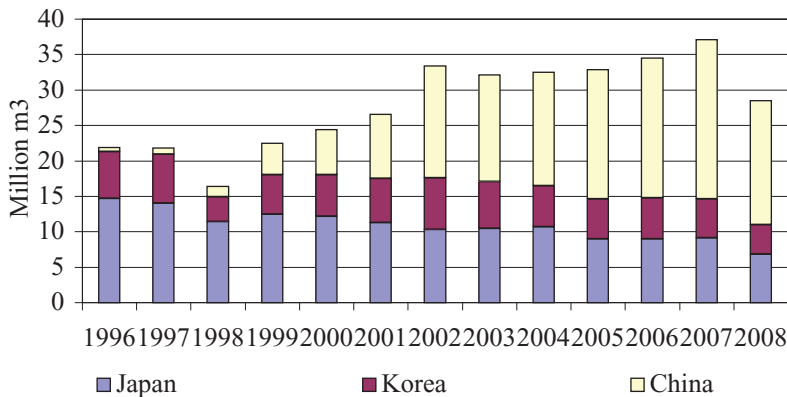
China's strong preference for logs is the main reason why the proportion of lumber imported into North Asia has declined over the last decade, from 45% in 1997 to 34% in 2007. In Japan the proportion of lumber to logs actually increased (53% to 61%).

China was a relatively small importer of logs and lumber in 1997 and had a relatively high proportion of its imports as lumber. Most of the import growth has been in logs and lumber now represents about 17% of softwood log and lumber imports, down from 33% in 1997.

**Softwood Log Trade**

Over the past decade imports by the three North Asian countries have increased by about 70%. Most of this growth has come from China where log imports have increased at an average of 38% per year. In contrast, Japan’s softwood log imports have declined by 4.0% per year (Figure 4.8).

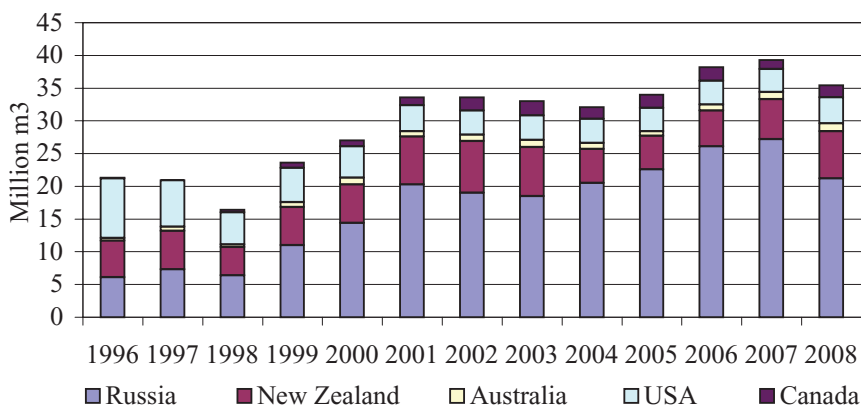
**Figure 4.8 NORTH ASIAN SOFTWOOD LOG IMPORTS**



Source: RISI, WTA

The importance of individual supplier countries has also changed over the same period (Figure 4.9).

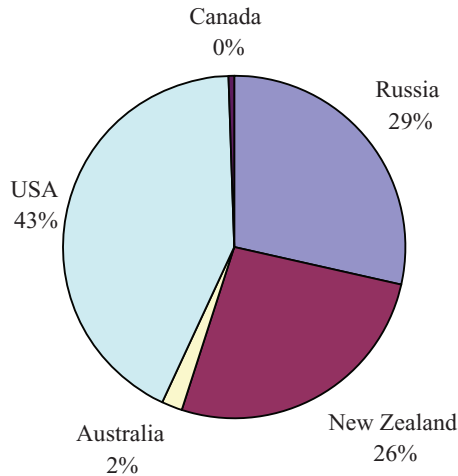
**Figure 4.9 SOFTWOOD LOG EXPORTS BY ORIGIN**



Source: RISI, WTA

Russia is now the dominant supplier with an estimated 69% market share. Two countries — Russia and New Zealand — hold an 85% market share, despite New Zealand slightly reducing market share over the period. The USA’s share of the market has declined significantly from supplying 43% of the market to 9% in 2007 (Figure 4.10, Figure 4.11).

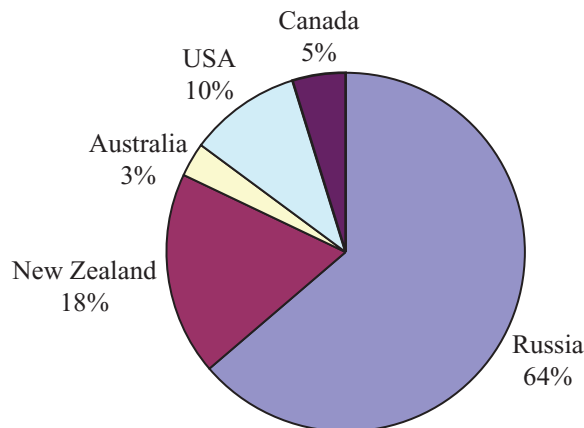
Figure 4.10 MARKET SHARE IN 1997



Source: RISI

Between 1996 and 2007 Russian log exports to China increased significantly. In 2007 Russia accounted for 68% of China’s log imports. Russian log exports fell dramatically during 2008 due to a combination of falling shipping costs making the other suppliers more competitive and the Russian log export tax making Russian logs more expensive. It is still too early to say if this represents the future picture as freight rates are likely to increase as the global economy recovers.

Figure 4.11 MARKET SHARE IN 2008

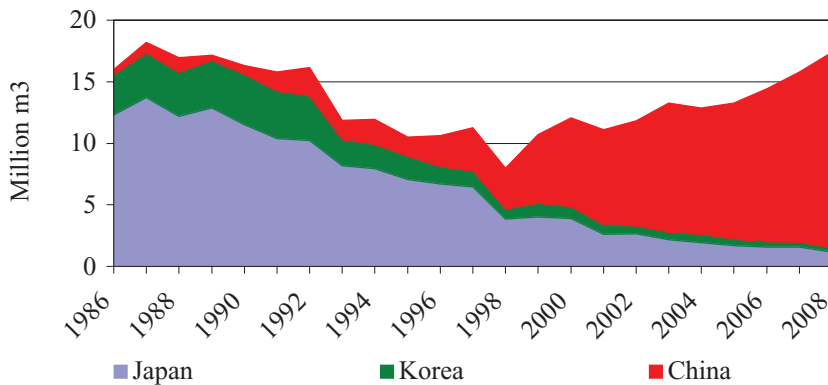


Source: WTA

4.2.2 HARDWOODS

Over the past 20 years the level of hardwood imports into North Asia has declined slightly, at the rate of -0.1% per annum. The biggest change is the shrinking importance of Japan and the increasing dominance of China since 1998, mirroring the situation with Softwoods (Figure 4.12).

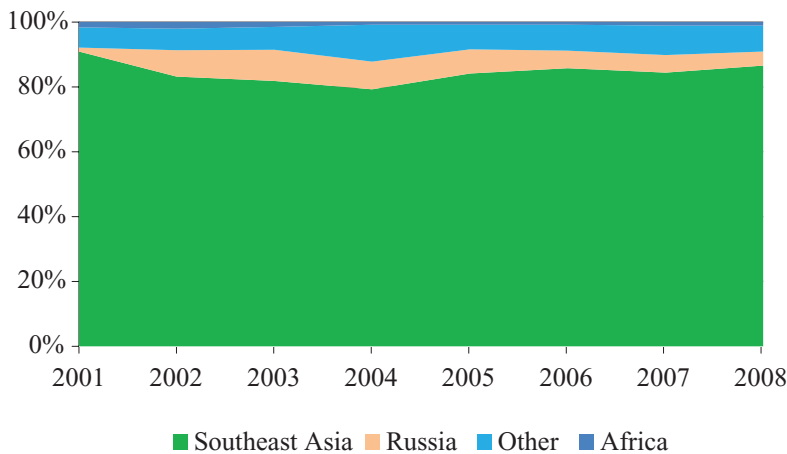
Figure 4.12 NORTH ASIA HARDWOOD IMPORTS



Source: RISI, WTA

Malaysia currently occupies the position as dominant supplier with about 60% of the trade. Papua New Guinea (PNG) and the Solomon Islands would be the next largest supplier, followed by Russia.

Figure 4.13 MAIN HARDWOOD EXPORTERS TO NORTH ASIA



Source: RISI, WTA

Note South East Asia includes PNG and Solomon Islands

### 4.2.3 SUMMARY

The key findings from this section are:

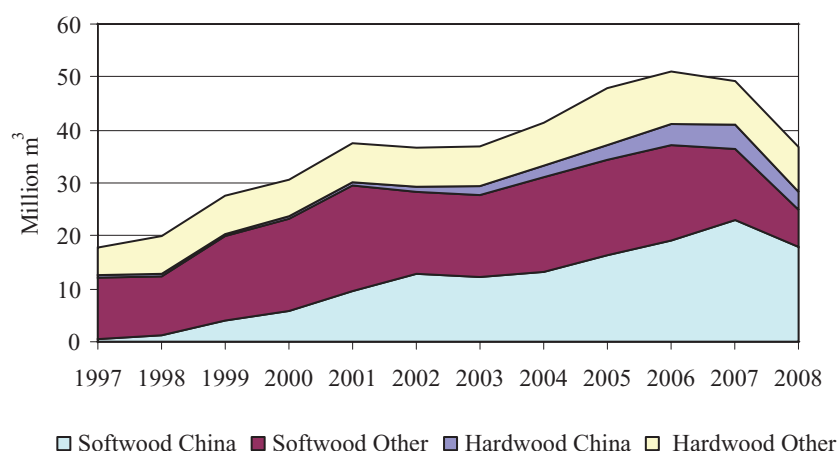
- Imports into North Asia since 2000 have increased by 11%;
- China is the dominant importing country for both hardwoods and softwoods;
- Softwoods dominate the trade;
- Russia is the dominant supplier;

- There is sufficient softwoods to meet future demand but at a higher cost;
- There are insufficient hardwoods to replace the declining South East Asian resource;
- Africa and South America will provide some short term supply; and
- Softwoods will substitute for some existing hardwood uses.

#### 4.2.4 RUSSIA

Imports from Russia have provided the raw material to supply China's growing wood products industries and is the major source of raw material to help meet China's wood deficit. China is a very significant market for Russian logs (Figure 4.14). The decline in Russian log exports during 2008 is a result of the increased log export tax.

**Figure 4.14 RUSSIAN LOG EXPORTS**



**Source: RISI, WTA**

Exports from Russia to the Pacific Rim are produced from eastern Siberia and the Russian Far East. Both these regions have vast forest resources as is summarised in Table 4.1.

**Table 4.1 FOREST AREA AND GROWING STOCK**

Species	West Siberia		East Siberia		Far East		Total	
	Forested Area Million ha	Growing stock Billion m <sup>3</sup>	Forested Area Million ha	Growing stock Billion m <sup>3</sup>	Forested Area Million ha	Growing stock Billion m <sup>3</sup>	Forested Area Million ha	Growing stock Billion m <sup>3</sup>
Coniferous . . . . .	56.3	6.8	180.2	24.9	199.7	17.6	436.2	49.3
Hard Deciduous . . . .					10.6	0.9	10.6	0.9
Soft Deciduous . . . .	21.7	2.8	31.2	2.8	12.7	0.8	65.6	6.4
<b>Total . . . . .</b>	<b>78.0</b>	<b>9.6</b>	<b>211.4</b>	<b>27.7</b>	<b>223.0</b>	<b>19.3</b>	<b>512.4</b>	<b>56.6</b>

**Source: DANA LTD**

The gross annual allowable cut (AAC) for the region is shown in Table 4.2. These figures do not necessarily represent the commercially exploitable AAC. The commercially exploitable AAC could be as low as 50% of the total AAC. This is primarily due to the lack of roads and transport infrastructure to access the timber, the distance from market and the cost of harvesting.

Table 4.2 AAC BY SPECIES GROUPING (million m<sup>3</sup>)

	1988	1992	1995	1998	2000	2002	2004	2005
<b>Softwood</b>								
Siberia	136	100	112	113	113	112	110	112
Far Eastern FO	87	58	81	79	78	78	76	75
<b>Total Softwood</b>	<b>223</b>	<b>158</b>	<b>193</b>	<b>192</b>	<b>191</b>	<b>190</b>	<b>186</b>	<b>187</b>
<b>Hardwood</b>								
Siberia	81	69	80	81	81	82	81	83
Far Eastern FO	18	11	16	15	15	13	15	15
<b>Total Hardwood</b>	<b>99</b>	<b>80</b>	<b>96</b>	<b>96</b>	<b>96</b>	<b>95</b>	<b>96</b>	<b>98</b>
<b>Hardwood and Softwood</b>								
Siberia	216	169	193	194	194	194	192	194
Far Eastern FO	105	69	97	94	93	90	90	90
<b>Total Hardwood and Softwood</b>	<b>321</b>	<b>238</b>	<b>290</b>	<b>288</b>	<b>287</b>	<b>284</b>	<b>282</b>	<b>284</b>

Source: DANA LTD

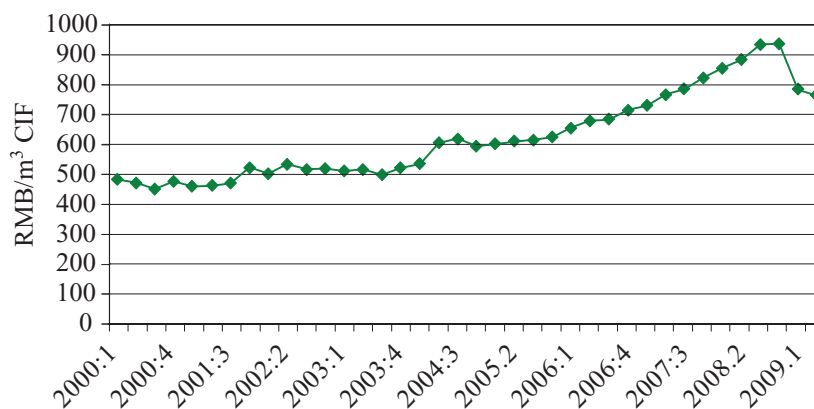
In 2007 RISI calculated that the actual harvest in 2006, of about 85 million m<sup>3</sup>, is very close to the current economic AAC once illegal logging is taken into consideration.

Access to the vast timber reserves would require expenditure on developing suitable roading networks, replacement of an ageing fleet of railway rolling stock and construction of new railway lines. At the present point in time neither the government nor the private sector appears willing to make the type of investment needed in the regions.

Shortage of potential supply will not be an issue for Russia; the limiting factor will be the cost and logistics of accessing the resource.

The price of Russian larch logs landed in China has increased by about 7% per annum from the beginning of 2000 through until the second quarter of 2008. Log prices fell by about 16% during the first half of 2009.

Figure 4.15 RUSSIAN LARCH LOG PRICES 2000 Q1 — 2009 Q3



Source: RISI

In late 2006 the Russian government announced a new, regularly changing and ever increasing log export tariff was originally to be implemented during the 2007-2008/9 period. The tariff regime commenced on 1 January 2007 at €6/m<sup>3</sup> (or 10% of log value whichever is the greater), rising through a series of intermediate steps up to a minimum of €50/m<sup>3</sup> (or 80% of log value whichever is the greater) in 2009. Despite initial scepticism that the tariff regime would not be implemented, to date the tariff increases have been put in place with only one or two small exceptions.

In late 2008 the Russian government announced that the final phase in of the tax would be delayed due to the global financial situation. As yet no date for its introduction has been announced.

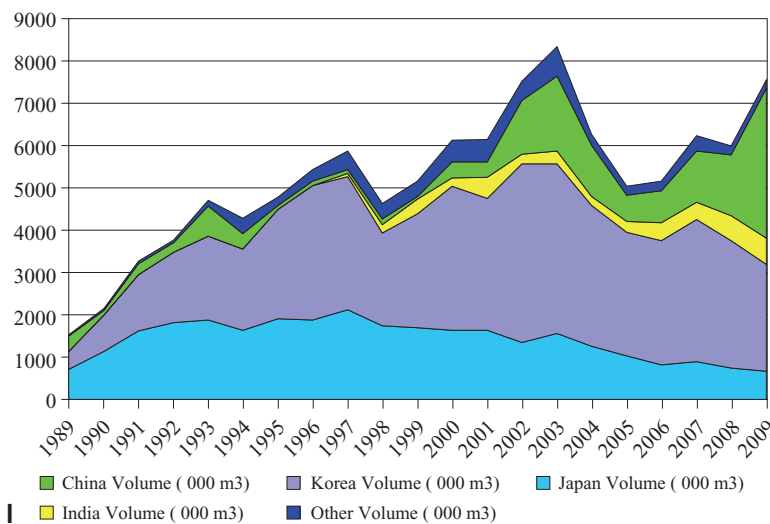
The impact of the tariffs will be to add additional cost to the log exporters, some of which can be absorbed but some of which will unavoidably flow through into higher log prices.

**4.2.5 NEW ZEALAND**

New Zealand is the second largest supplier to China, but a long way behind Russia. New Zealand’s log exports in the Pacific Rim have not increased as dramatically as those from Russia.

After the domestic market the main destination for New Zealand logs is Korea, followed by China and Japan (Figure 4.16).

**Figure 4.16 EXPORTS OF LOG PRODUCTS FROM NEW ZEALAND**



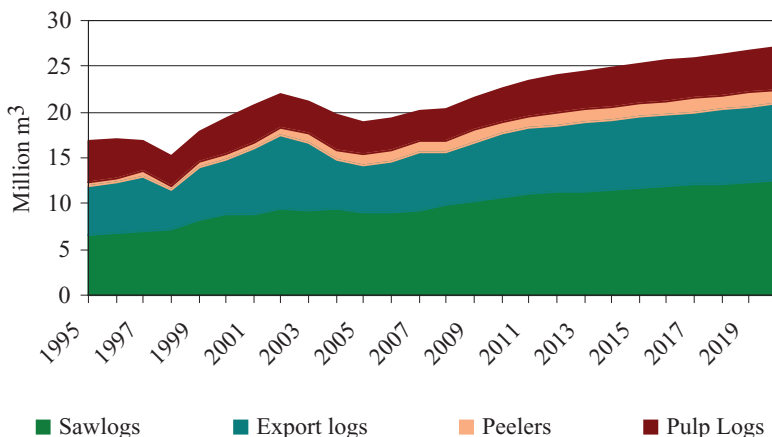
**Source: MAF**

Japan’s share when measured by value is slightly higher than China, as it imports more higher value logs than China. New Zealand has in recent times been less competitive than Russia in China, although the impact of the log export tax could well change this picture, particularly if the full Russian tax regime is implemented.



New Zealand’s expected harvest is shown in Figure 4.17. Log supply is expected to increase at the rate of about 2.5% per year through until 2020. Within that annual average however New Zealand has the capacity to increase harvest levels in the short term at a faster rate than this.

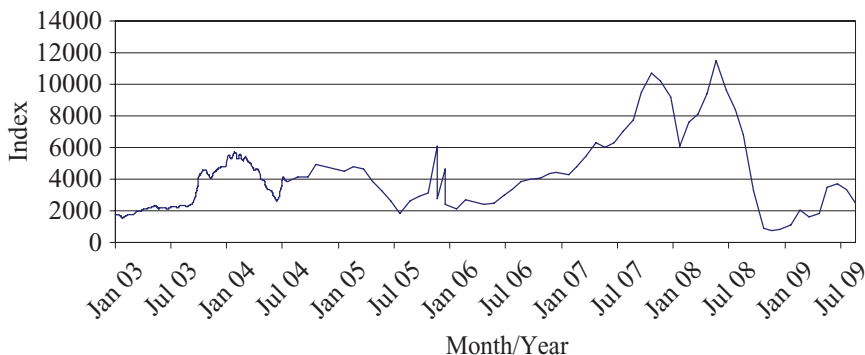
**Figure 4.17 HISTORIC HARVEST AND PROJECTED LOG AVAILABILITY**



Source: RISI Softwood Log Trade 2007

The most significant factor in the cost and volume of log supplies from New Zealand to North Asia has been the increase in freight rates. Figure 4.18 shows the movement in the Baltic Freight Index for Handysize vessels, which are used to transport logs from New Zealand.

**Figure 4.18 BALTIC FREIGHT INDEX**

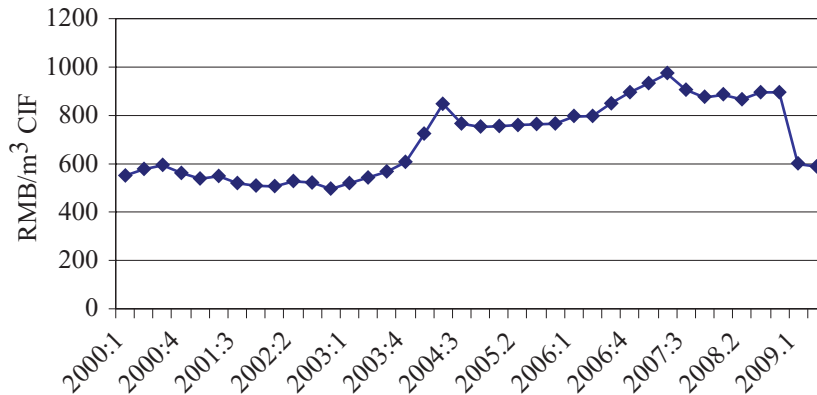


Source: Bloomberg

The index has increased at an annual rate of nearly 40% since 2002. The freight index fell dramatically in October 2008 falling from 3,217 to 851 (a fall of 74%). In the immediate term this will improve exporters margins, but as Figure 4.19 shows this has quickly resulted in lower imported log costs in the short to medium term.

The prices of New Zealand export logs have increased steadily throughout the first part of the decade. The average rate of increase has been about 6% per year.

Figure 4.19 NEW ZEALAND RADIATA PINE LOG PRICES 2001 Q1 — 2009 Q2



Source: RISI

#### 4.2.6 OTHER SUPPLIERS — SOFTWOODS

The principal other suppliers are:

##### Softwoods

- **USA**

Two main regions supply softwood logs into North Asia — Alaska and The Pacific North West (Washington, Oregon). After a period of decline log exports have now stabilised at around 3-4 million m<sup>3</sup> pa. The current weakness in the US housing market may contribute to some short term rise in log exports, but this will likely fall back in the next decade on the back of a stronger US housing market.

- **Canada**

During the first half of this decade log exports from Canada (British Columbia) to the Pacific Rim averaged about 2 million m<sup>3</sup> per year. Recent sawmill closures have reduced logging activity, and total harvest levels, and consequently the volumes available for export have reduced.

The volume available for export is restricted due to a ban on exporting logs from publicly owned land, although it is permitted from privately owned land. In the short term, slightly higher volumes may be available before dropping back to between 1.5 – 2 million m<sup>3</sup> per year.

- **Australia**

The Australian softwood harvest is predicted to be relatively flat in the short to medium term, and may even decline in the longer term due to the focus on establishing Eucalypt pulpwood forests and the replanting of some softwood forest with Eucalypt after harvest.

Log exports from Australia have generally been confined to the lower value saw/pulp logs. Log exports are unlikely to change materially from their current levels without a major collapse of the Australian sawmilling industry. Lumber exports have generally been confined to the lower value packaging grades, with the higher value structural and appearance grades being used domestically.

#### 4.2.7 OTHER SUPPLIERS — HARDWOODS

- **Malaysia**

Malaysia's tropical hardwood export logs are primarily sourced from natural forests managed under a series of forest concessions. Nearly all come from Sarawak, and to a lesser degree Sabah on the island of Borneo. There is some concern that the harvest from Sarawak and Sabah exceeds the assessed sustainable yields.

The forests on the Peninsular have been fully exploited in the past and now are either reserves or supply local manufacturers.

Barring large scale conversion of natural forest to either forest plantation or Palm Oil plantations, there appears to be little if any scope for Malaysia to increase the level of log exports. Indeed it is unlikely that the current levels can be maintained in the medium term.

- **Papua New Guinea**

Nearly all Papua New Guinea's log exports come from natural forests managed under a series of concessions. There are some hardwood plantations, most notable of *Eucalyptus deglupta*, which supply logs particularly to Japan for the plywood industry. FAO has assessed that the growing stock of PNG's natural forests has declined over the past 5 years. It is generally accepted that PNG's current logging practices are unsustainable, but implementing soundly based harvesting controls is hindered according to FAO by inadequate national forest inventory and mapping systems as well as endemic corruption. In 2006 the World Bank estimated that about 70% of PNG's timber volume was harvested illegally. More recently the PNG Prime Minister announced an intention to ban log exports in favour of more domestic processing.

It is highly unlikely that PNG's current levels of harvest are sustainable in the medium term and as proper sustainable management practices are put in place costs are going to increase and available volume reduce, without accounting for the historic overcut.

- **Gabon**

Gabon has one of the lowest deforestation rates in Africa. It is in the process of implementing sustainable management plans for both the industrial forest concession holders and the community based logging operations. The process is hindered by the lack of quality forest inventory and an understanding of the growth and regeneration of the forests following a selective harvest. Suffice to say that without sound and sustainable management practices and an understanding of the

resource it is highly likely that the resource is being harvested above its sustainable level. The introduction of sustainable management practices is likely to increase the production costs and underpin log prices.

- **Myanmar**

Obtaining a clear understanding of the forest resource, production levels and sustainability for Myanmar is almost an impossible task. The country has a long history and good understanding of Teak silviculture and has a system of annual allowable cuts for both Teak and other hardwoods. Official harvest volumes are in line with the allowable cut, however the World Bank estimates that about 50% of the timber harvest in Myanmar is illegal. It is highly unlikely that log supplies from Myanmar will increase, in fact if the regional initiatives to combat illegal logging are successful volumes may fall.

- **Congo, Republic of**

Forests in the southern part of the Congo have suffered from a history of over cutting, clearing for agriculture, and fire. Due to the recent history of civil unrest over the last decade there is little understanding of the countries forest resource. While there is a legal framework for the awarding and management of concessions, it is usually not enforced due to a lack of information on the resource and a general institutional weakness in the various forestry departments charged with implementing the policy. It is likely that as more is known about the resource volumes produced from the existing concession will decline although new areas could be opened up for management. It is highly probable that the production costs will increase as the management requirements increase.

- **Germany**

Germany accounts for less than 5% of China's log imports. Historically these exports have been beech, but more recently volumes of oak logs have increased. It is possible that logs reportedly exported from Germany include logs from forests in Eastern Europe and simply consolidated in a German port. Although traditionally Europe has not been a significant exporter of logs, with most of the production consumed internally there is potential to increase supply from the region. Most of the hardwood logs exported to China have been lower quality logs suitable for flooring. It is unlikely that the increase will be sufficient to replace the drop in volume from South East Asia. Import prices of European Beech and Oak logs could well provide a price cap for Chinese produced hardwoods.

- **USA**

Hardwood logs from North America are primarily supplied from the USA. These logs are now predominantly high grade logs suitable for producing sliced veneer. These logs are often transported to China in containers, taking advantage of the cheaper repositioning rates. It is likely that supplies from the USA will increase as supplies of high quality hardwoods from Russian decline.

#### 4.2.8 SUPPLY SUMMARY

- Cost pressure on log imports is going to increase, underpinning imported log prices.

### Softwoods

- Russia has significant forest resources but is hindered by a lack of suitable infrastructure, ageing railway rolling stock and the need to upgrade the logging equipment.
- New Zealand has additional supplies, but freight costs will determine the price and volume supplied into the market.

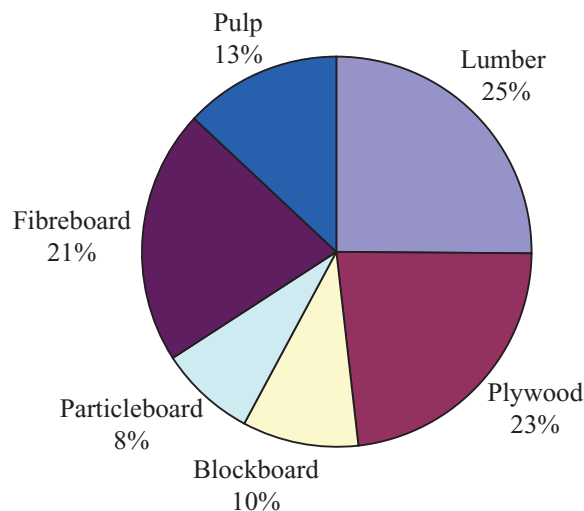
### Hardwoods

- The ability of the existing exporting countries to continue to meet the North Asian hardwood deficit is limited.
- Supplies of South East Asian hardwoods will decline.
- There is potential for supplies from Africa to increase in the short term but probably not in the medium term.
- Supplies of temperate hardwoods from Europe could assist in replacing some of the tropical hardwood supply.
- Supplies of high quality hardwoods from the USA could offset the decline in high quality hardwoods from the Russian Far East.

## 5. CHINA FOREST PRODUCTS MARKET

Firewood remains the dominant use for wood accounting for an estimated 58% of the total wood removals. The balance can be considered industrial wood. There are two basic categories of industrial wood. The first category consists of posts, poles and unprocessed wood used in construction and for rural wood use (excluding firewood). Most of this category of industrial wood does not enter the industrial supply chain as it is often acquired, processed and used by individuals and not re-sold or marketed through traditional channels. The second category of industrial wood refers to wood that is utilised in the manufacture of processed products (e.g. plywood, lumber, pulp and paper). Figure 5.1 shows the second category of industrial log demand in China in 2008.

**Figure 5.1 CHINESE INDUSTRIAL LOG DEMAND BY SECTOR (2008)**



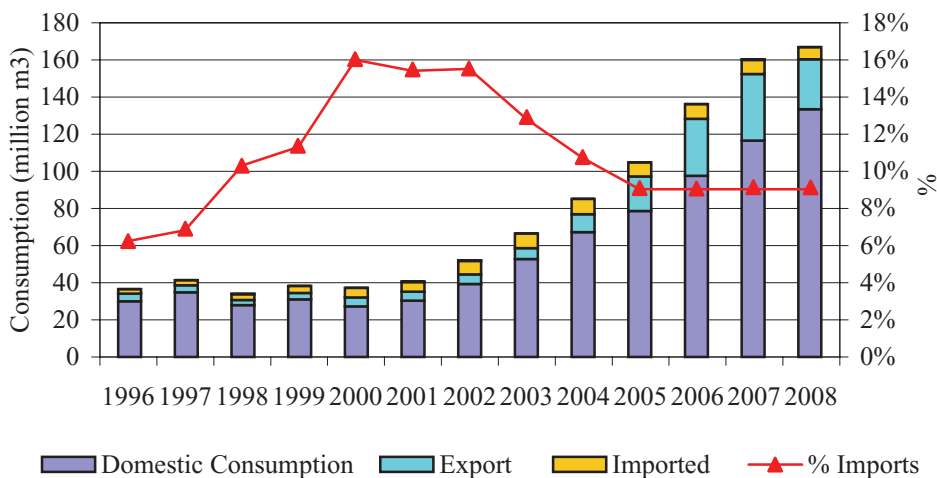
Source: SFA, CFK

Figure 5.1 shows that panel production accounts for almost 62% of the industrial wood consumption in China. This is in contrast to other wood consuming regions of the world where lumber consumption is usually dominant, and underscores the sector’s reliance on the plywood industry followed by the reconstituted panels industry.

**5.1 LOG DEMAND**

Wood consumption in China has increased steadily since 2000. Figure 5.2 shows the consumption of wood products during the period 1996 through to 2008. In Figure 5.2 domestic consumption refers to logs consumed in China; and exports and imports refer to log and primary processed products (e.g. lumber) and not total wood exports including finished products.

**Figure 5.2 CHINESE WOOD CONSUMPTION 1996 TO 2008**



Source: RISI China Wood Products Study 2006

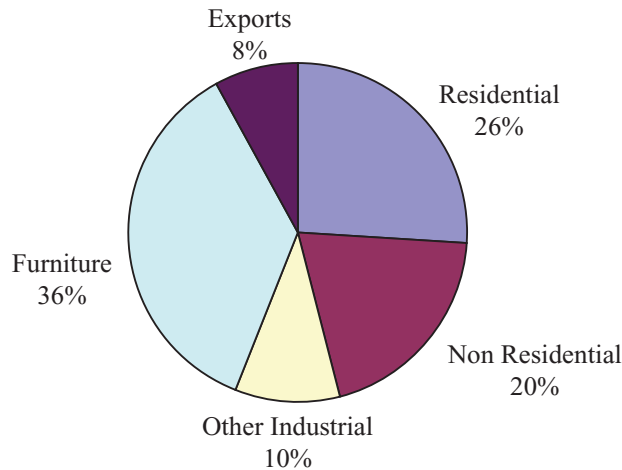
RISI China Timber Supply Outlook 2008 SFA, UNCE, CFK analysis

5.1.1 DOMESTIC CONSUMPTION

Solid Wood

Solid wood products are primarily utilised in the furniture industry followed closely by residential and commercial construction (See Figure 5.3).

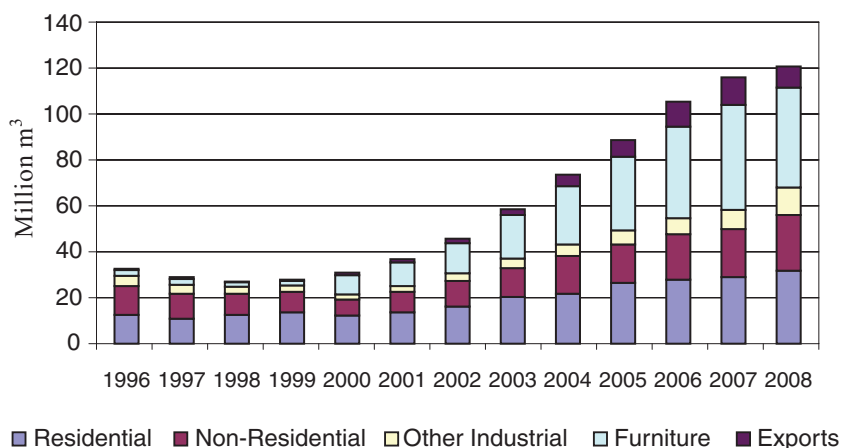
Figure 5.3 SOLID WOOD CONSUMPTION BY END USE SEGMENT 2008



Source: SFA, CFK

The level of wood consumption in China reflects strong growth in furniture production (and exports of finished products), and in residential and commercial construction. As construction and furniture manufacture increased so did the consumption of solid wood products (See Figure 5.4).

Figure 5.4 CONSUMPTION OF LUMBER PLYWOOD AND BLOCKBOARD



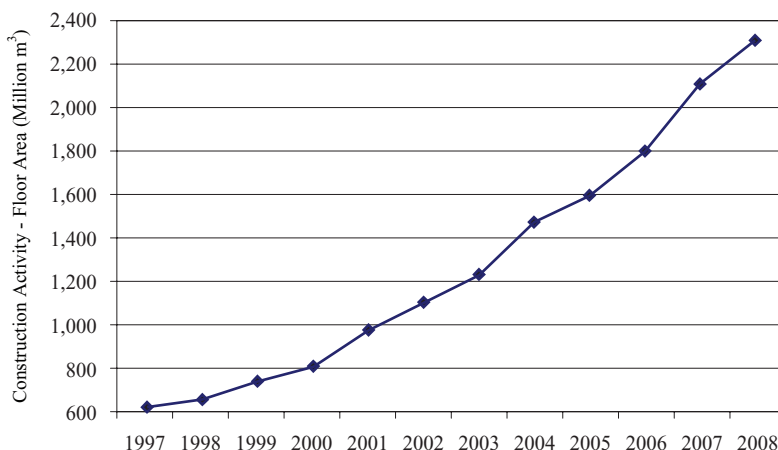
Source: RISI, SFA, CFK

The manufacture of wood products for export played only a minor role in the increasing consumption.

**Construction**

The level of construction activity has increased significantly in the past decade with the floor area under construction increasing by about 14% per annum over the period 1997 to 2007, and has been increasing at the rate of 17% per year since 2001 (See Figure 5.5).

**Figure 5.5 CONSTRUCTION ACTIVITY — COMPLETED FLOOR AREA (Million m<sup>2</sup>)**

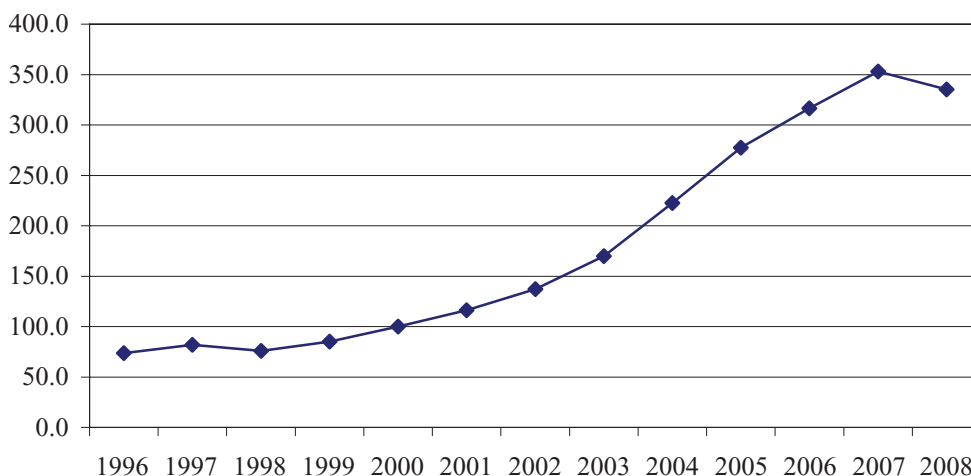


Source: CEIC Data

**Furniture**

The furniture industry has undergone dramatic growth over the last 10 years. Whilst the pace of growth has slowed the sector still expanded at the rate of over 10% in 2007. The global financial crisis had its impact during 2008 with production falling back. (See Figure 5.6).

**Figure 5.6 FURNITURE PRODUCTION INDEX (Index 100 in 2000)**



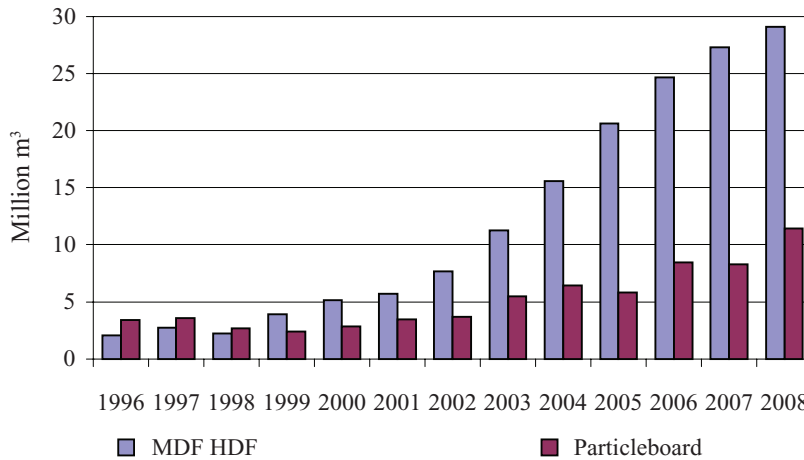
Source: SFA, CFK Analysis



**Reconstituted Panels**

The production of MDF, HDF and Particleboard, like the production of most forest products in China, has undergone rapid expansion. The production of MDF and HDF in the period between 1996 and 2007 expanded at the rate of 27% per annum, while particleboard expanded at the more modest rate of 9% per annum (See Figure 5.7).

**Figure 5.7 PRODUCTION OF MDF HDF AND PARTICLEBOARD**

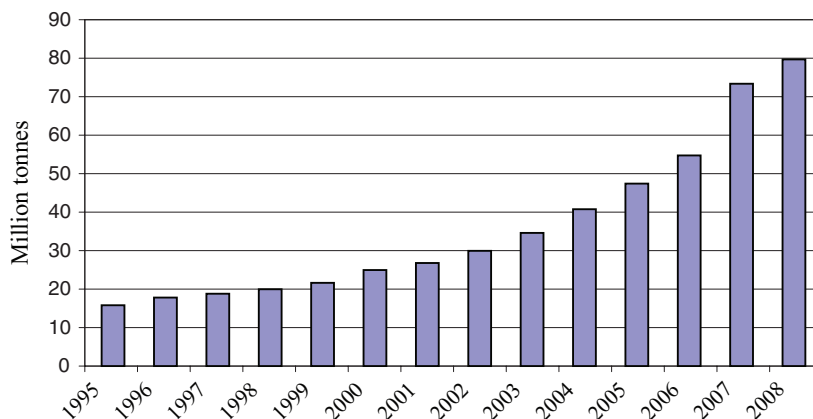


Source: RISI Softwood Log Trade 2007, SFA

**Paper and Paperboard**

The production of pulp and paper board has increased by an average of 12% per annum over the period 1995 through to 2007. This is particularly impressive when you consider the size of the industry — China is now the second largest producer of paper in the world behind only the United States; its output is more than double that of Canada and three times that of Finland. During the decade ending 2004 the increase in paper production in China was greater than that of the next 10 top producers combined. It is expected that this increase in production will continue for another decade and will drive demand for raw pulp and imports of kraft pulp.

**Figure 5.8 PRODUCTION OF PAPER AND PAPERBOARD**

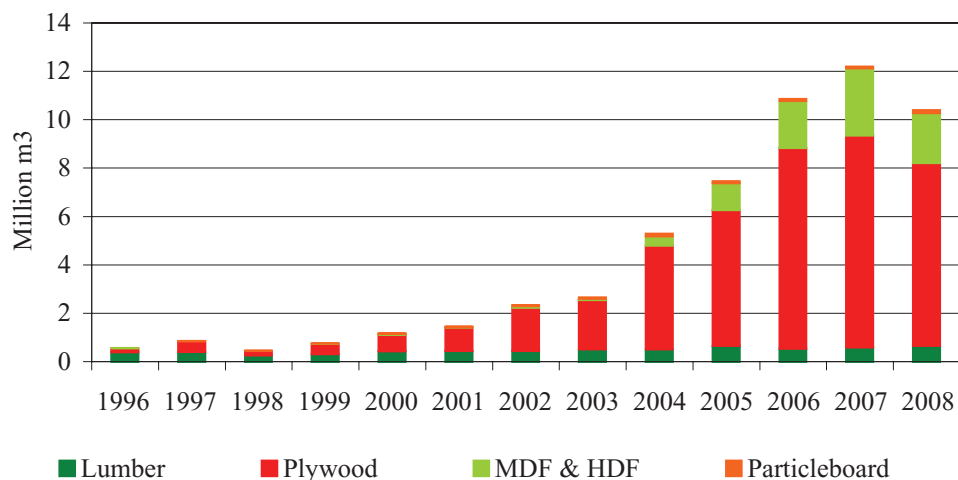


Source: RISI, China paper online

### 5.1.2 EXPORT OF FINISHED GOODS

The export of wood products has increased at an annual rate of 33% over the past decade. This is taking advantage of China's competitive advantage as a low cost producer, to import raw logs and manufacture wood products for re-export (See Figure 5.9).

**Figure 5.9 EXPORT OF FINISHED WOOD PRODUCTS**



Source: WTA

### 5.2 DOMESTIC LOG SUPPLY

In China, domestic log supply is ultimately governed by the planted area and standing volume of the resource. Any increases in the planted area and standing volume will ultimately feed into allowable cut calculations.

#### 5.2.1 FOREST RESOURCES

Every five years China's national forest inventory is published. The most recent inventory was the 6<sup>th</sup> National Forest Inventory which was completed in 2003, with the next inventory due to be completed in 2008. The results are yet to be published. Table 5.1 sets out the forest area according to the 2003 inventory.

**Table 5.1 FOREST AREA (million hectares)**

	1998	2003	% Change
<b>Plantations</b>			
Timber Producing .....	24.2	23.2	-4%
Protection .....	4.2	8.1	93%
Fuelwood/Other .....	0.8	1	25%
Economic <sup>(1)</sup> .....	20.2	21.4	6%
<b>Total Plantations</b> .....	<b>49.4</b>	<b>53.7</b>	<b>9%</b>
<b>Natural Forest</b>			
Timber Producing .....	75.2	55.4	-26%
Protection .....	17.2	46.6	171%
Fuelwood/Other .....	7.6	8.4	11%
Bamboo .....	4.2	4.8	14%
<b>Natural Forest Total</b> .....	<b>104.2</b>	<b>115.2</b>	<b>11%</b>
<b>Total Plantations and Natural Forest</b> .....	<b>153.6</b>	<b>168.9</b>	<b>10%</b>

Source: China National Forest Inventory.

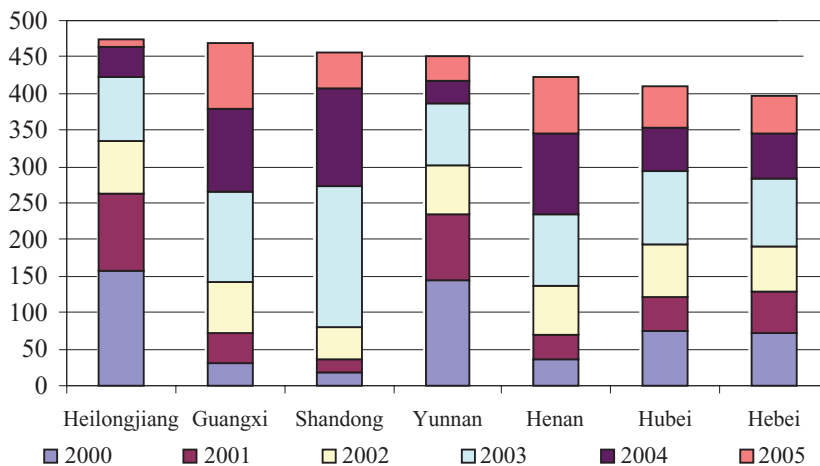
Note: (1) Primarily fruit and nut trees.

China’s timber producing area actually declined between 1998 and 2003, primarily on the back of a reduction in the area of natural forest designated for timber production.

Of the new plantations established between 1998 and 2003, only 16% were designated for timber production, 69% were for protection, another 14% economic forests (fruit and nut and other non timber products), and 1% for fuelwood.

The establishment of plantations between 2000 and 2005 has shown that Shandong, Guangxi and Henan provinces have had an increasing amount of activity. This can be put down to the increased planting of plantations by large commercial operators.

**Figure 5.10 TIMBER PLANTATION ESTABLISHMENT 2000-2005 (Million hectares)**



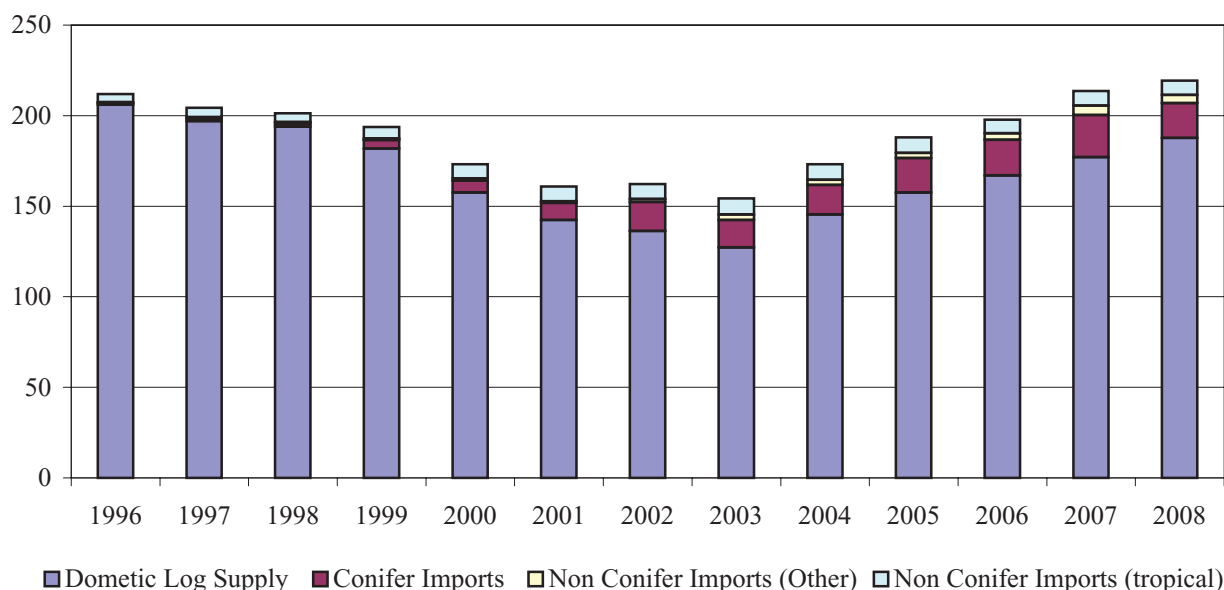
Source: RISI

**5.2.2 LOG SUPPLY**

Obtaining reliable estimates of wood removals can be difficult with a number of conflicting sources and opinions. What is known is that the annual industrial-wood harvest exceeds the national allowable cut estimate by some margin. After reviewing the information provided by a number of commentators experienced in understanding the wood supply situation in China, CFK has come to the conclusion that the allowable cut represents about 25% of the industrial-wood harvest in any one year.

Accordingly, the allowable cut information provided by the State Forestry Authority is grossed up to provide an estimate of the national industrial log production. When combined with log exports, the figures represent the total roundwood volume available for industrial use. Figure 5.11 shows the available industrial roundwood in China from 1996 until 2008.

Figure 5.11 ROUND WOOD SUPPLY



**SOURCE: SFA, FAOSTAT, CFK analysis**

The key points to note from Figure 5.11 are:

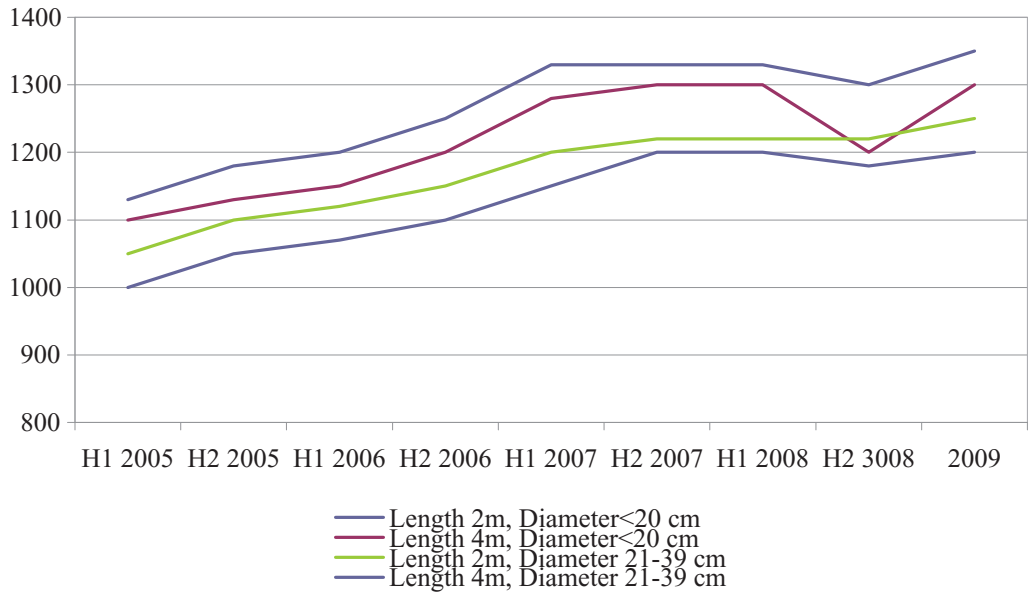
- The decline in domestic supply from 1996 to 2003 (1.4%/yr);
- The increase in conifer imports (155%/yr); and
- The increase in non-coniferous imports.

It is unlikely that China's domestic log production will be able to increase fast enough to keep pace with the increasing demand. The pattern of the last few years is likely to continue with a gradual increase in domestic supply combined with a more rapid increase in log imports.

5.2.3 LOG PRICES

In Sichuan province log prices have increased by on average 9% per annum. Figure 5.12 shows the movement in log prices by log length and diameter. There is a small price differential for log size (diameter) and also log length.

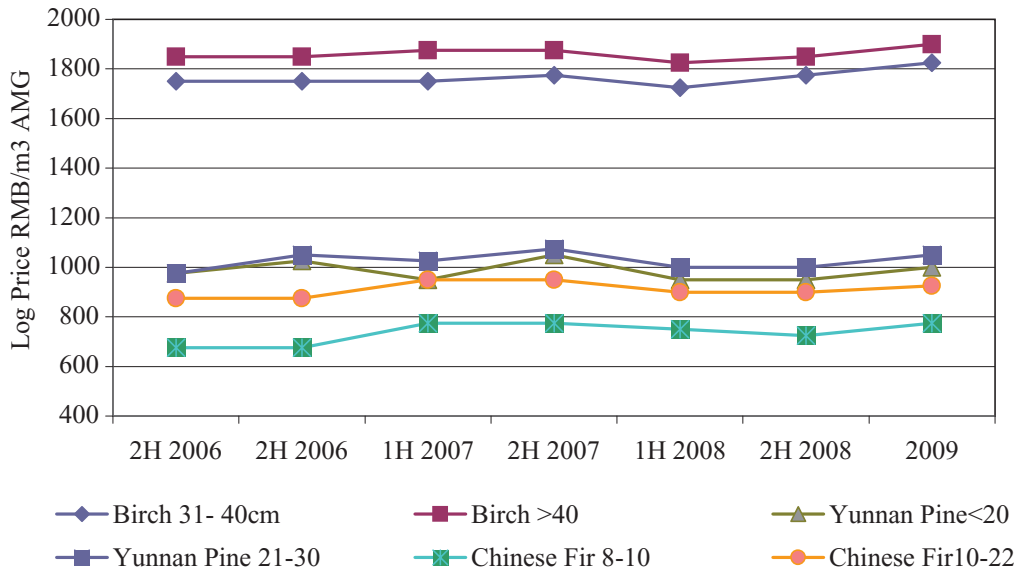
Figure 5.12 SICHUAN CHINESE FIR LOG PRICES (AMG RMB/m<sup>3</sup>)



Source: CFK Industry Sources

Yunnan province log prices have been more stable than those in Sichuan. Figure 5.13 provides a comparison of prices for Birch, Yunnan Pine and Chinese Fir prices for 4 m logs between 31 and 40 cm in diameter. In order to provide the comparison CFK has derived a Chinese Fir log price as there was no market information for larger diameter Chinese Fir. In Yunnan most of the Chinese Fir that is sold is between 8 and 20 cm diameter.

Figure 5.13 YUNNAN LOG PRICES (FOREST GATE RMB/m<sup>3</sup>)

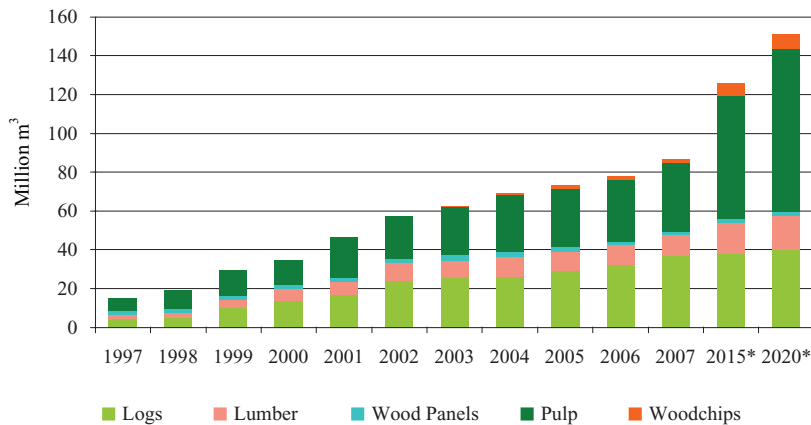


Source: CFK Industry Sources

5.3 ROLE OF IMPORTS

Imports of raw materials (logs and wood chip) and primary processed products (lumber, wood based panels and pulp) are expected to continue to increase in meeting China’s growing wood deficit.

Figure 5.14 CHINA’S WOOD DEFICIT (million m<sup>3</sup> roundwood equivalent)



\* Forecast Figure

Source: RISI

China has a relatively high demand for sawlogs but, as discussed in the supply section, the options for additional supply are relatively limited. Instead China will import an increased volume of primary processed solid wood products. The significantly increased volumes of imported market pulp are a consequence of few available sources of wood chips in significant quantities, but increased availability of market pulp on the back of the expansion in capacity in Latin America and Australia.

Since 2000 China's imports have grown at a rate of over 8% per annum, however exports have increased at a staggering 46% per annum. Domestic consumption has been increasing at an annual rate of 23%.

## **5.4 KEY MARKET DRIVERS**

### **5.4.1 DEMAND**

#### **Residential Construction**

- China has a policy of increasing the average living space from 20 m<sup>2</sup> in 2000 to 30 m<sup>2</sup> by the middle of the century;
- Increasing urbanisation — in 1987 about 25% of China's population lived in urban centres, by 2007 it had risen to 43%. Urbanisation had been increasing at the rate of 2.5% per annum, but is expected to fall to around 2% per annum over the medium term;
- Increasing household wealth and per capita GDP increases householder expectations, leading to larger dwellings, upgrading of fittings and furnishings; and
- The sector is likely to consume less wood products per m<sup>2</sup> but total consumption will increase.

#### **Non-Residential Construction**

- Closely linked with increase in GDP;
- Projected rate of increase is likely to slow in the short term as this has increased faster than the increase in GDP; and
- Will consume less wood per m<sup>2</sup> but total consumption will increase.

#### **Furniture Production**

- Level of exports in total will increase:
  - Furniture production will become increasingly higher value as commodity type furniture is manufactured in other parts of Asia (e.g. Vietnam);
  - US share of exports will decline but will move towards higher value products;
  - Volume increase will come for markets in Europe and the Middle East; and

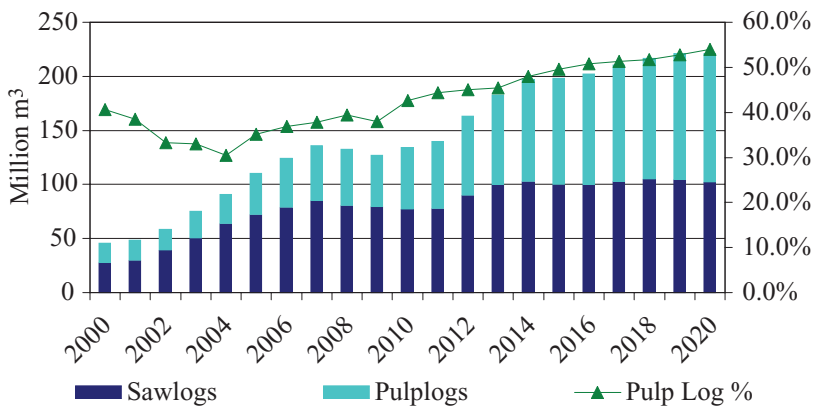
- The proportion of wood used in furniture is likely to increase as will total volume consumed.
- Increased construction of residential dwellings (size and number) will increase demand; and
- Increased household wealth will increase furniture demand both in type and quantity.

**Industrial Production**

- Industrial production is closely associated with GDP and the level of exports;
- GDP is anticipated to increase although at a slower rate than in recent years; and
- Exports will increase, increasing demand for packaging.

In its 2007 China wood market study, RISI predicted increasing demand for sawlogs (See Figure 5.16).

**Figure 5.16 CHINA DEMAND FOR SAWLOGS AND PULPLOGS 2000-2020**



**Source: RISI, CFK analysis**

The study predicted an increase in sawlog demand by an average of 2.4% per year during the period 2005 to 2020, and an increase in demand for pulpwood of 12.6% per year. The global financial situation has had a significant impact.

**5.4.2 SUPPLY**

**Domestic**

- China’s domestic log supply will increase due to:
  - The increasing establishment of fast growing plantations; and
  - The maturity of China’s already established “young” and “middle-aged” forests.



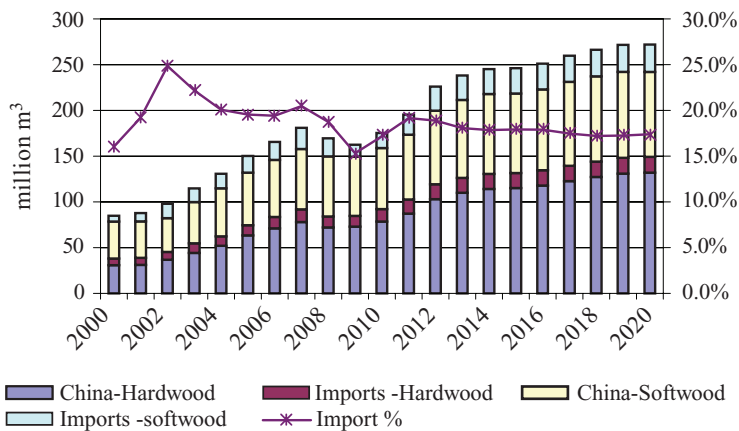
- The increase will be offset by the increasing reclassification from timber producing to protection (particularly natural forests).

**International**

- Unless the infrastructure issues are addressed in the Russian Far East and Siberia the wood supply is likely to reduce;
- The Russian export tax will reduce log supply (replaced by primary processed product) and increase the cost of logs;
- North America is unlikely to be able to supply significant additional quantities of logs;
- New Zealand will be able to supply additional log volumes, but its distance means they will be at a higher cost. Shipping costs will have a major impact on future supplies and cost;
- Availability of South East Asian hardwood logs will reduce; and
- Supply of hardwood logs from Africa could increase in the short term as new operations commence. The medium to long term supply remains doubtful and distance indicates that supply is likely to be higher cost than the closer South East Asian logs.

China is forecast to be dependent upon log exports for about 17% of its roundwood requirements. This is a similar level to 2000 but the total volume is higher.

**Figure 5.17 CHINA — DOMESTIC AND INTERNATIONAL SUPPLY**



**Source: RISI, WTA, CFK analysis**

There will be difficulty in securing adequate quantities of good hardwood logs.

Both Russia and New Zealand have sufficient softwood logs to meet any increase in demand, but it is probable that any increase in supply will come at higher prices.

### 5.4.3 POSSIBLE IMPACT OF SUPPLY/DEMAND ON LOG PRICES

China is likely to rely on imports of forest products for the foreseeable future. Imports of logs and primary processed forest products are likely to come under increasing cost pressure due to distance and increasing costs of production in the main exporting regions.

In a recent Pacific Rim outlook study RISI projected the following softwood log prices from 2007 through until 2012. CFK has Updated these projections for the impact of the financial crisis and provided an indication of possible log prices through until 2020 based on its view of the key log price drivers. These prices are presented in USD/m<sup>3</sup> as opposed to RMB/m<sup>3</sup> as this is how the exporters price their logs.

**Table 5.2 FORECAST LOG PRICES 2007-2020 (USD/M<sup>3</sup> CIF CHINA PORT)**

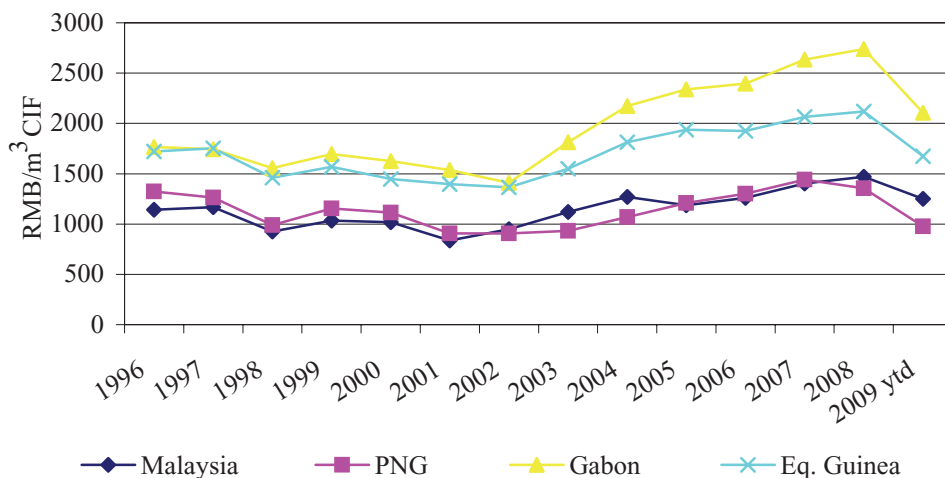
	<u>Russian Pine</u>	<u>Russian Larch</u>	<u>Radiata Pine</u>
2003 .....	67	53	66
2004 .....	73	65	94
2005 .....	76	70	101
2006 .....	89	80	105
2007 .....	101	93	121
2008 .....	115	106	125
2009 .....	110	100	98
2010 .....	130	145	113
2011 .....	139	134	122
2012 .....	144	130	129
2016-2020 .....	158	145	160

**Source: RISI, CFK**

Whilst it is relatively straightforward to identify the main softwood exporters, identifying the future hardwood exporters is more problematic. Currently the main exporters into North Asia are Malaysia followed by Papua New Guinea and the Solomon Islands. What is clear is that all three exporters will not be able to sustain exports at their current levels. The only possible source of additional supply is Africa and that remains problematic at best.

For this reason projecting hardwood log prices is a futile exercise. African log prices are currently some 67% higher than the prices of Malaysia and Papua New Guinea (See Figure 5.18).

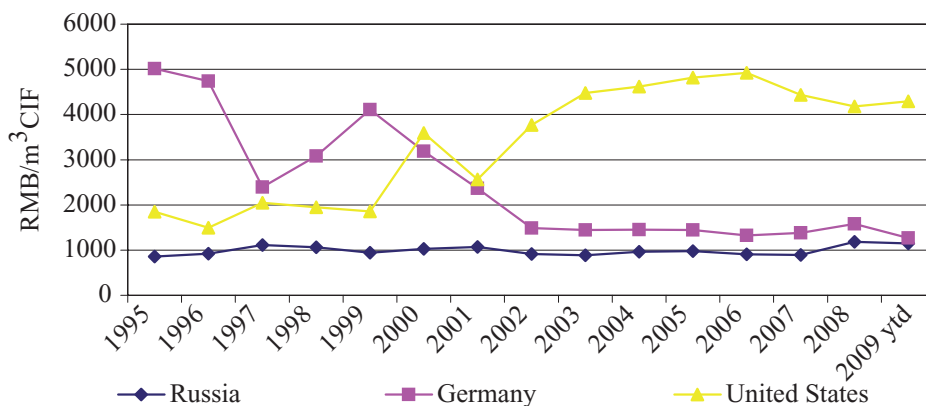
Figure 5.18 TROPICAL HARDWOOD LOGS PRICES



Source: RISI

It is clear that any increase in African supply is going to result in a large increase in the average landed cost of hardwood.

Figure 5.19 TEMPERATE HARDWOOD LOG PRICES



Source: RISI

During the latter years of this time series the USA hardwoods being imported into China were almost exclusively special purpose logs for slicing and cannot be compared to the logs from Russia and Germany.

## 6. CURRENT GROUP OPERATIONS

The Group currently has forest assets in Sichuan and Yunnan Provinces. The forests in Sichuan Province have been built up over a number of years. The Yunnan forests have only been acquired in early 2008 and as a result have no operating history.

### Regional Context

Both Sichuan and Yunnan provinces are located in China's Southwest region. The region has a population of 201 million of which Sichuan province has 87 million (Table 6.1).

**Table 6.1 Southwest Provinces Population and Growth**

<u>Province</u>	<u>Population (Million)</u>	<u>Population Growth (%)</u>	<u>GDP (Billion RMB)</u>	<u>GDP Growth (%)</u>
Sichuan .....	81	2.8	1,050	21.7
Chongqing .....	28	3.0	411	18.1
Yunnan .....	45	8.0	472	18
Guizhou .....	37	7.4	271	19.3
Tibet Provinces .....	3	11.2	34	17.8
<b>Total .....</b>	<b><u>200</u></b>		<b><u>2,238</u></b>	<b><u>19.9</u></b>

**Source National Bureau of Statistics of China**

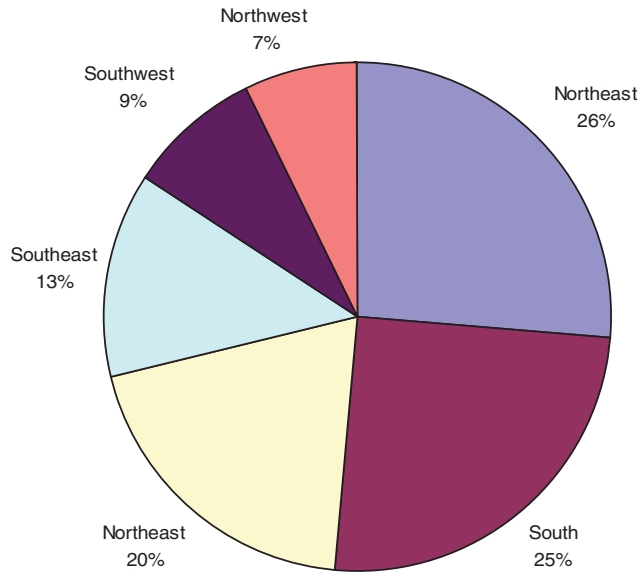
**GDP = Gross Domestic Product**

**Growth rate is year on year.**

The strong growth in both GDP and population in the regions supports the demand for additional housing and increased timber consumption. It is reasonable to assume that this growth in the regional economy will continue.

Statistics show that most of the sawn timber production capacity is located in the Northeast and Southern regions of China. The Southwest provinces account for approximately 9% of the national sawmilling capacity (Figure 6.1).

**Figure 6.1 SAWN TIMBER PRODUCTION CAPACITY**



**Source: SFA, Industry Sources**

Timber imports into the region are unlikely to be significant or competitive due to transport cost.

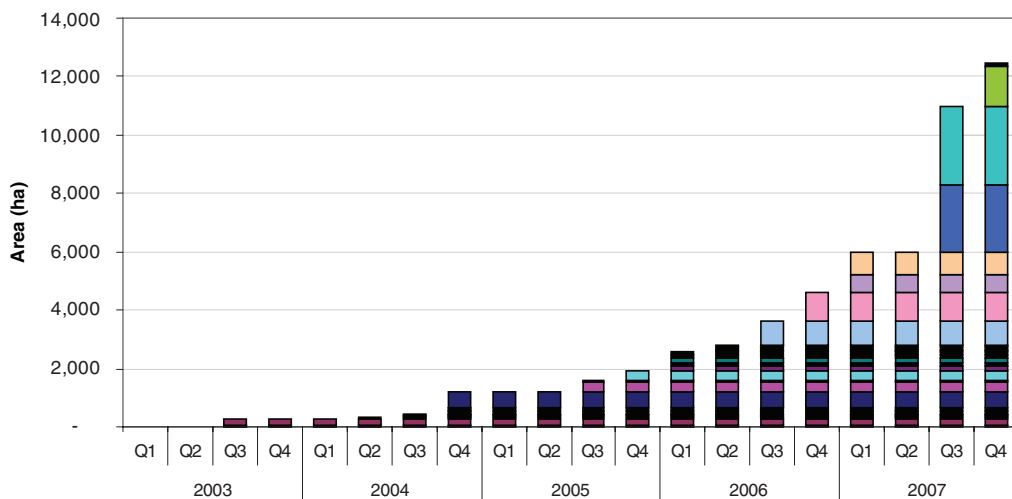
**6.1 SICHUAN PROVINCE**

**6.1.1 EXISTING FOREST ASSETS**

The estate consists of 28 separate forest areas located in the western regions of Sichuan Province. The forests are centred in three regions — Ya An city, Le Shan City and Liang Shan Zhou.

The estate has been progressively acquired since mid 2003 (Figure 6.2).

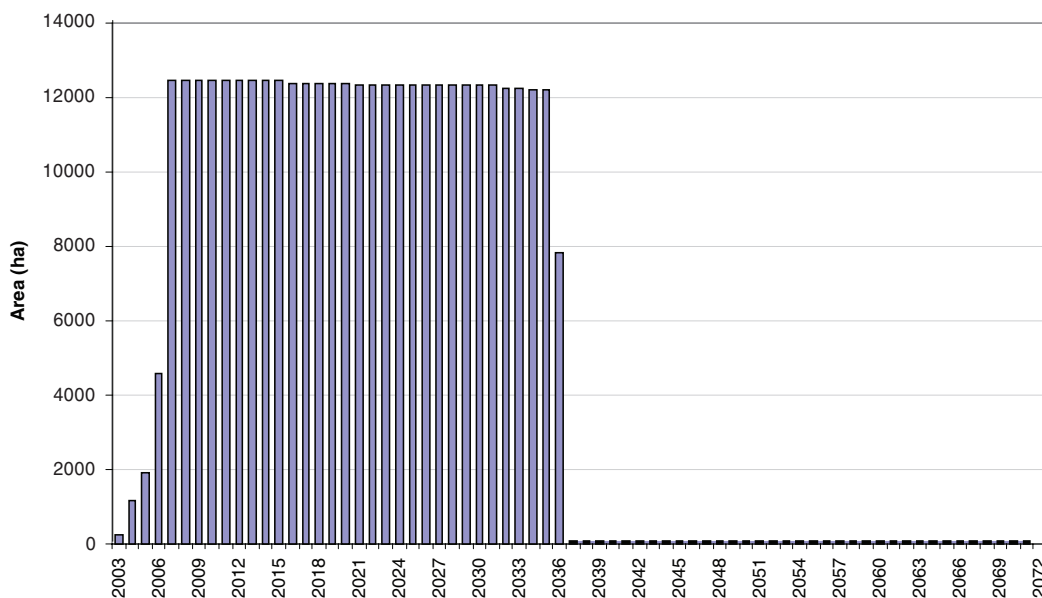
Figure 6.2 ACQUISITION HISTORY



Each forest is on land secured by way of a land use agreement with the local Village Collective, for a defined term. CFK reviewed some examples of the land tenure documents. However, it is outside the scope of this technical report and CFK is not qualified to provide a view as to the legality, validity and enforceability of these agreements. It has relied on The Group’s assurance that their right to use the land and title to the trees is protected under Chinese law.

The year on year area of the estate from 2003 to year of expiry of the agreement periods is presented in Figure 6.3.

Figure 6.3 LAND USE TENURE



As a condition of tenure, the forests must be replanted following harvest.

The forests are planted in a number of species — Chinese Fir (*Cunninghamia lanceolata*), Cedar (*Cryptomeria japonica*), Yunnan Pine (*Pinus yunnanensis*), Birch (*Betula spp.*), and Alder (*Alnus glutinosa*).

**Table 6.2 NET STOCKED AREA (hectares) AS AT 30 JUNE 2009**

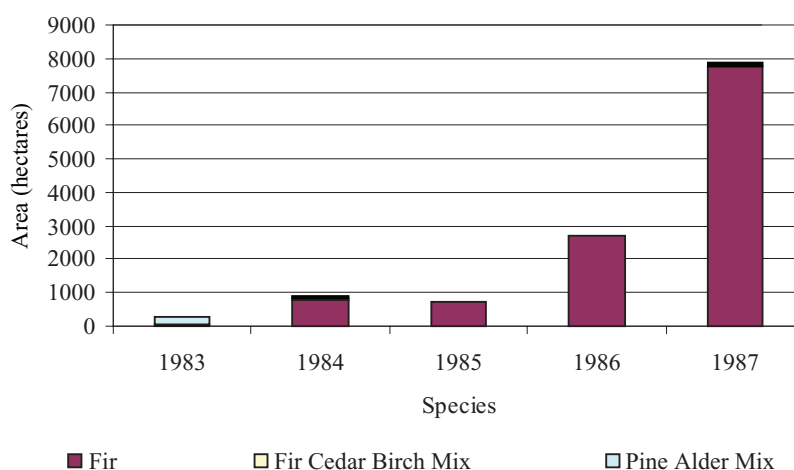
<u>Year of Establishment</u>	<u>Fir</u>	<u>Fir Cedar Birch Mix</u>	<u>Pine Alder Mix</u>	<u>Total</u>
1983 .....	0	80	187	<b>267</b>
1984 .....	760	62	88	<b>910</b>
1985 .....	737	0	0	<b>737</b>
1986 .....	2,683	0	0	<b>2,683</b>
1987 .....	7,765	85	0	<b>7,849</b>
Total .....	<u>11,951</u>	<u>227</u>	<u>275</u>	<u>12,447</u>

The stocked area at 30 June 2009 is 12,453 hectares. Approximately 96% of the area is planted in Chinese Fir, the balance in a mixture of species but predominantly Fir.

The forest area was determined by the Yingjing County Forestry Bureau from maps held in Beijing by the national office. The maps were prepared by using GPS to map the forest boundaries, excluding any unplanted areas such as roads, streams, rivers etc. Due to Government regulations, CFK was not allowed to view the maps and neither has The Group because the base maps are confidential to the Government department concerned. If the process of mapping the forest as described to CFK was followed, then CFK believes that the area description is sufficiently accurate for the purposes of the valuation.

Figure 6.4 presents the area by species and planting year.

**Figure 6.4 FOREST AREA BY SPECIES AND PLANTING YEAR**



The forests are primarily grown to provide logs for solid wood processing.

The province generally has a well-developed roading infrastructure and all forests have access to district roads and expressways, sometimes via unsealed access ways capable of accommodating logging truck traffic.

### 6.1.2 SITE VISITS AND INFORMATION

CFK visited the Sichuan forests in January and July 2008 and again in March 2009.

Information provided by The Group included a listing of forests by species, age, area, date of acquisition, land use expiry date, summarised harvest history, and a summary of inventory information.

CFK also visited The Group's offices in Beijing and reviewed a sample of the land use agreements, sales contracts, obtained information on sales history, prices received, harvesting costs, as well as access to financial information.

### 6.1.3 FOREST VOLUMES

The Group's forests were included within the Government inventory of 2003. The data from this inventory forms the basis of the Government's annual allocation of harvest volumes. If properly carried out according to the description provided to CFK, this inventory would provide the best possible estimate of volume.

The Group provided CFK with the summaries of the Government inventory the results of the Group's acquisition survey and their most recent (March 2008) survey, and some plot summaries for an inventory conducted by an independent local forest consulting firm, for those forests purchased prior to 2007.

During the field inspection undertaken in March 2009 CFK undertook a number of benchmark plots. As a result of this work CFK reduced the government survey yields to align them with the benchmark measurements.

CFK has concerns with the description of the Group's forests, based upon the Group's existing forest survey data. The Group needs to expand its forest information base to include spatial information, appropriate statistical analysis of survey results, a systematic procedure for reconciling actual harvest volumes with survey information, the integration of harvest areas into the forest record system, and develop a more comprehensive system to closely monitor and understand growth and yield.

CFK recommends that The Group address this issue as a matter of urgency because it underpins its ability to maximise the value from the estate.

Notwithstanding the above, the existing information that the Group holds on its forest estate contain a description of the estate as at the date of purchase, setting out the species, area age and volume for each forest in the Group's estate. The Group has records for each forest showing the area harvested, and the volume removed for each year. The fact that most of the Group's forests have been purchased in the last 18 months limits the number of harvesting operations that have been carried out (a maximum of 1/year/forest) in the forest since the acquisition date, means that the state of the Group's forests as at the valuation date can be accurately derived from the existing information that the Group holds.

This concern must be put in the context of The Group's forest holdings as up until 2007 they only held a little over 4,000 hectares of forest and it was not until late 2007 that holdings



increased to over 12,000 hectares. The Group now has a sufficient base in Sichuan to obtain more comprehensive yield information than is currently available.

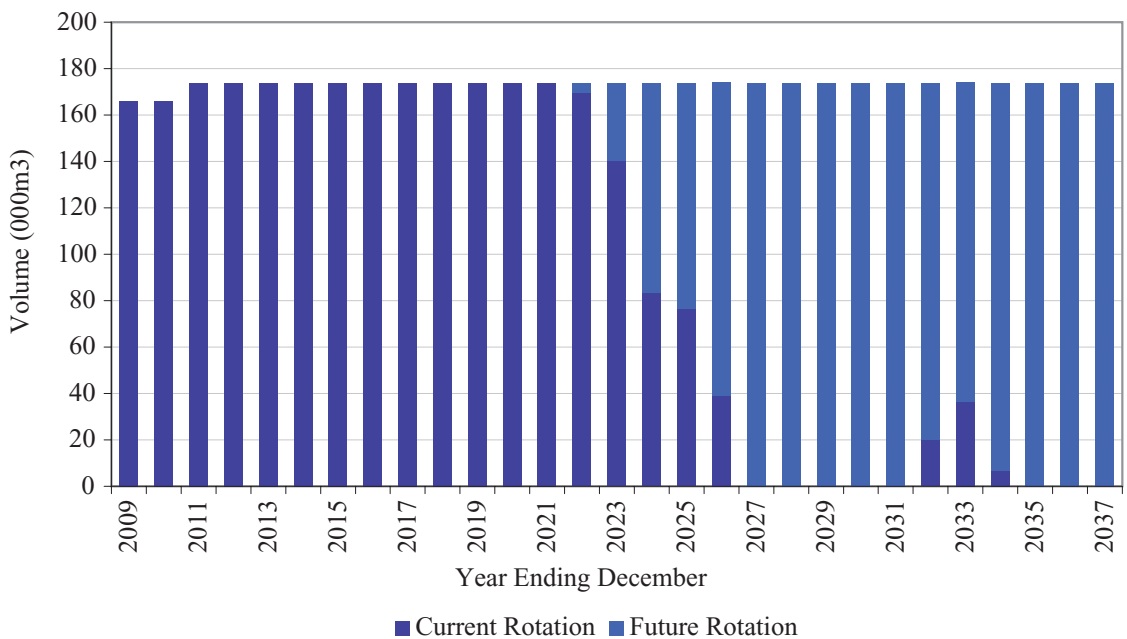
**6.1.4 WOODFLOWS**

The current crop is all over the age of 20 years and in The Group’s view is able to be harvested. The Group harvests a maximum of 150 trees per hectare.

In so far as the second rotation is concerned The Group has not yet finalised its view of a suitable rotation age, but is of the view that trees can be harvested at an age below 20 years. After discussion with CFK it was decided that the wood flows would be prepared on the basis that the second rotation could be harvested at an age of 15 years. The Group is also strongly of the view that the harvest should be planned on the basis of ensuring a non-declining yield of timber for most of the land use term. (Obviously this constraint is difficult as the end of the land use term approaches).

The harvest volume for the year ended 31 December 2008 was 170,033 m<sup>3</sup> and the planned volumes for 2009 and 2010 is 166,000 m<sup>3</sup> per year. These figures have been incorporated into the wood flow projection shown in Figure 6.5.

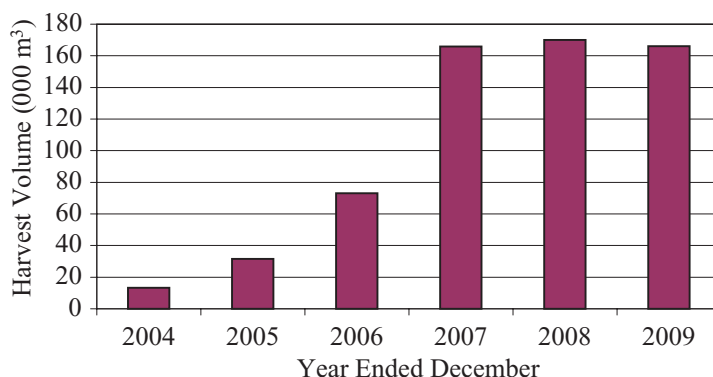
**Figure 6.5 SICHUAN WOODFLOW – NON DECLINING YIELD SCENARIO**



The non-declining yield constraint is applied up until almost the end of the land use tenure for most of the forests (in 2036), from when it is impractical to apply.

**6.1.5 SALES VOLUMES**

Sales volumes have reflected the acquisition pattern, increasing from 13,300 m<sup>3</sup> in 2004 to 169,800 m<sup>3</sup> in 2007 the harvest remained at a similar level to this in 2008 and there is a slight decrease is planned for 2009 (Figure 6.6).

**Figure 6.6 HISTORIC AND BUDGET HARVEST VOLUME**

Prior to 2008 the focus was on developing a forest estate and a customer base upon which to grow sales volumes. During the field inspection CFK visited two of The Group's existing customers both of whom would like to purchase additional volume.

While not regarded as a major centre for wood processing Sichuan represents a sizeable market in its own right and The Group's ability to provide a consistent and reliable volume of wood should ensure it is well placed to meet the market demand.

#### 6.1.6 SALES PRICES ACHIEVED

The Group sells logs to a number of customers. For major customers a base price and annual volume is agreed yearly, with delivered volumes and the actual price confirmed on a regular basis. Sales to smaller customers are made on a "spot basis" with volume and price agreed at the time a sale is negotiated. This is general practice in the region.

The Group provided CFK with log prices it received over the period it has been operating. Similar prices have been received for both Chinese Fir and Yunnan pine. The prices, up until 2008 The Group's log prices increased steadily. In 2008 the Group's VAT status changed resulting in a drop in the VAT exclusive price. The drop between 2008 and YTD 2009 is a result of the impact of the financial crisis on log prices (Table 6.3).

**Table 6.3 THE GROUP LOG PRICES (excluding VAT)**

	<u>Price (excl VAT)</u>	<u>Annual Change%</u>
2003 .....	691	
2004 .....	720	104%
2005 .....	885	123%
2006 .....	920	104%
2007 .....	944	103%
2008 .....	867	92%
2009 <sup>(1)</sup> .....	850	98%

(1) Year to date

Source: The Group records.

### 6.1.7 OPERATING COSTS

Operating costs can be broken down into three main categories:

- Forest operational costs — includes costs involved in the establishment and maintenance of the forest and vary with the volume of work undertaken;
- Production costs — includes harvesting, transport and road construction costs; these vary with the volume and type of harvest; and
- Indirect Costs — costs associated with the general management, planning and supervision of forest operations, and harvest production and sales. It includes three categories of costs:
  - Annual forest based costs — costs associated with the operational control of forest operations excluding harvest and vary with the type and quantity of forest operations being undertaken;
  - Annual administration costs — head office costs, insurance, and land rentals, and do not vary with the amount of forest based operations that are undertaken; and
  - Harvesting indirect costs — those costs associated with the sale of logs, and supervision and planning of harvest operations.

#### **Forest Costs**

The Group uses local employees for any planting and tending operations that are carried out. Based on the financial information made available to CFK, and after discussion with The Group staff, The Group does not allocate the employees time to specific operations or functions and so CFK is not able to identify individual operation costs. CFK recommends that The Group begin to record work time by operation so that unit based operation costs can be obtained for comparison with other similar forest owners and to assist future planning and regime evaluation.

#### **Production Costs**

Logs are sold “delivered to the roadside”. The customer is responsible for loading the truck and transporting the logs to the mill. From The Group’s perspective, logging covers felling the tree, processing into log lengths, primarily 2 and 4 metre lengths, and delivery to roadside.

The trees are logged by the local villagers in the traditional manner. Trees are cut into 2m and 4m log lengths in the forest and transported by hand (or rolling them down the hill) to the roadside. The productivity and hence cost of logging in such a manner is dependent upon the topography, the distance from the road and the size of the trees. The logging rates are set with the local villagers. However, The Group pays a fixed rate regardless of the impact of differing productivity factors. It may be only a matter of time before The Group will have to change its means of setting rates for cutting and delivery of logs to the roadside to reflect the differing conditions.

The harvesting rates achieved by The Group are set out in Table 6.4. For the 2007 year the rate is RMB 190 /m<sup>3</sup>. This cost appears to be higher than the costs for logging using local

villagers in other provinces but is lower than the cost of using full time professional harvesting firms.

**Table 6.4 HISTORIC HARVESTING COSTS**

<u>Year</u>	<u>Harvesting Cost (RMB/m<sup>3</sup>)</u>
2003 .....	100
2004 .....	105
2005 .....	120
2006 .....	170
2007 .....	190
2008 .....	200
2009 .....	215

### 6.1.8 ENVIRONMENTAL ISSUES

The Group does not have a formal environmental audit process. CFK prepared a short formal series of questions to the management to identify if they were aware of any:

- Chemical waste dumps in the forest;
- Significant storm damage (affecting greater than 50-100 Mu) over the past five years;
- Significant forest health issues in the last five years that have resulted in widespread mortality (affecting an area greater than 50-100 Mu);
- Significant erosion (affecting an area greater than 50-100 Mu); or
- Area of the forests situated in water catchments for large cities.

After consulting with local forest based staff The Group was able to state that there were no chemical dumps in the forest and that there have been no significant forest health or incidences of storm damage in the last five years. Some of the forests are in water supply catchments for large cities, but as The Group is using a selective harvest regime this should not present any significant impediments to harvesting or other forest management activities.

Based upon its brief overview of the forests, CFK is of the view that given the location and terrain the likelihood of any chemical waste dumps in the forest is low. Like all forests they remain susceptible to biological damage. With sound monitoring systems in place (The Group has the basis for this with their forest based employees) then early detection of any problems can usually result in the timber being recovered and sold in the market place in the case of storm damage, or insect and fungal attacks controlled.

## 6.2 YUNNAN PROVINCE LUXI

### 6.2.1 EXISTING FOREST ASSETS

The estate consists of a number of forest blocks broadly situated around Luxi City in Yunnan province. They are located in Dehong and Shaungjiang Counties.

The forests have been planted in a number of species — Birch (*Betula alanooides*), Beech (*Fagus spp.*), Chinese Fir (*Cunninghamia lanceolata*), and Yunnan Pine (*Pinus yunnanensis*). The area by region, species and age class is shown in Table 6.5.

**Table 6.5 NET PRODUCTIVE AREA (hectares) AS AT 30 JUNE 2009**

<u>Forest Number</u>	<u>Forest Type</u>	<u>Species</u>	<u>Age</u>	<u>Area (ha)</u>
Y8 .....	Plantation	Fir	26	588
Y8 .....	Plantation	Fir	19	252
Y8 .....	Natural	Beech	26	947
Y8 .....	Natural	Beech	20	405
Y8 .....	Natural	Birch	26	2,667
Y8 .....	Natural	Birch	19	1,141
Y1 .....	Plantation	Fir	26	1,287
Y1 .....	Plantation	Fir	18	553
Y12 .....	Plantation	Fir	26	703
Y12 .....	Plantation	Fir	19	301
Y12 .....	Natural	Beech	26	1,423
Y12 .....	Natural	Beech	19	610
Y12 .....	Natural	Birch	26	4,527
Y12 .....	Natural	Birch	18	1,940
Y7 .....	Plantation	Fir	26	873
Y7 .....	Plantation	Fir	20	374
Y10 .....	Plantation	Fir	26	588
Y10 .....	Natural	Beech	26	1,000
Y10 .....	Plantation	Fir	20	252
Y10 .....	Natural	Beech	20	432
Y10 .....	Natural	Birch	26	2,610
Y10 .....	Natural	Birch	19	1,118
Y4 .....	Plantation	Fir	26	1,353
Y4 .....	Plantation	Fir	10	580
Y4 .....	Natural	Beech	26	1,904
Y4 .....	Natural	Birch	26	6,076
Y4 .....	Natural	Beech	19	816
Y4 .....	Natural	Birch	19	2,604
Y9 .....	Plantation	Fir	26	607
Y9 .....	Plantation	Fir	19	260
Y9 .....	Natural	Beech	26	905
Y9 .....	Natural	Beech	20	388
Y9 .....	Natural	Birch	26	2,688
Y9 .....	Natural	Birch	19	1,152
Y2 .....	Plantation	Fir	26	40
Y2 .....	Plantation	Fir	20	17
Y3 .....	Plantation	Fir	26	409
Y3 .....	Plantation	Fir	19	175
Y6 .....	Plantation	Fir	26	71

<u>Forest Number</u>	<u>Forest Type</u>	<u>Species</u>	<u>Age</u>	<u>Area (ha)</u>
Y6 .....	Plantation	Fir	17	30
Y11 .....	Plantation	Fir	19	247
Y11 .....	Natural	Birch	26	2,713
Y11 .....	Natural	Birch	20	1,164
Y11 .....	Plantation	Fir	26	573
Y11 .....	Natural	Beech	26	916
Y11 .....	Natural	Beech	19	387
Y5 .....	Natural	Pine	12	286
Y5 .....	Natural	Pine	27	1,014
Y5 .....	Natural	Pine	37	1,586
Y5 .....	Natural	Pine	52	5,781
<b>Total</b> .....				<b><u>59,333</u></b>

### Source: The Group's records

The productive area at 31 December 2008 is 59,333 hectares. The forest consists of the following species in the forest are Birch (51%) Beech (17%), Chinese Fir (17% and Yunnan Pine (15%).

The forest area was determined by the Forestry Bureau. From the discussion that CFK held with Forestry Bureau staff, CFK was able to determine that maps were prepared using the following conventions and methodology:

- 1) the base maps used for all forestry mapping work are those provided by the Chinese military;
- 2) the Forestry Bureau used SPOT5 satellite imagery to define the forest area;
- 3) Forestry Bureaus staff went into the field to physically verify that the forest area was correct as to species and tree cover;
- 4) the forest area excluded farmland and villages;
- 5) any area without any tree cover greater than 0.14 hectares were excluded from the forest area;
- 6) each species was identified and if occupied an area greater than 0.1 hectare, was mapped separately to the surrounding forest;
- 7) excluded major rivers and roads; and
- 8) included minor streams, roads and tracks less than 0.14 hectares;
- 9) the boundaries of the Group's forests were either farmland, roads, rivers, or main ridges and spurs where the area adjoined adjacent forest; and
- 10) for the Group's forests, the forest boundary was verified in the field using GPS, the variation had to be less than 5% for the boundary to be accepted by the Group.

Government regulations meant that CFK was allowed to view only a sample of the maps.

If the process of mapping the forest as described to CFK was followed, then CFK believes that the areas used as a base for the summary information that was made available

to CFK is sufficiently accurate for use in the valuation. The sample of maps CFK did view indicates that the species and areas are likely to be mapped correctly.

### SITE VISITS AND INFORMATION

CFK visited the area in January and July 2008 and again in March 2009 and in August 2009. During the visit CFK viewed a range of different sites designed to provide an overview of the resource. CFK also met with the Luxi Forestry Bureau and discussed the basis on which the area and volume assessments were made.

The Group provided CFK with a high level summary of the species, by time of planting and average yield. CFK believes that The Group needs to obtain the detailed planting records and inventory assessment of the resource if it is to manage the estate effectively. During the visits in March and August 2009 CFK visited some areas that had been harvested and also took some high level measurements of the forest resource.

### FOREST VOLUMES

The naturally regenerated Birch, Beech and Chinese Fir plantations were originally established by villagers on land that was not suitable for agriculture. As such there are no detailed planting records apart from knowledge of when the trees were planted.

The Yunnan Pine plantations were established by a number of aerial seedings undertaken over a number of years. In CFK's experience aerial seeding does not usually result in a uniform stocking rate. The outcome of this establishment process is a variety of age classes as well as stocking rates.

Following the purchase of the forests by The Group, the results of the Government survey for the forests was available for the Birch, Beech, and Chinese Fir areas, no additional information was available for Yunnan Pine. This information supported the high level information provided earlier.

The Group was unable to obtain any additional growth and yield information on the forests so this remains a source of uncertainty.

Table 6.6 presents the recoverable volume (the volume of wood extracted and sold during harvesting) estimates CFK has constructed from the high level estate summary information made available.

**Table 6.6 TOTAL RECOVERABLE VOLUME**

<u>Species</u>	<u>Age (yrs)</u>	<u>Volume (m3/ha)</u>
<i>Birch</i> .....	25	210
<i>Beech</i> .....	25	177
<i>Yunnan Pine</i> .....	25	179
<i>Chinese Fir</i> .....	25	240

CFK recommends that as soon as is practical, the Group maps the forest estate, and implements a geographical information system. The Group should also develop and implement a methodology to assess volume growth and yield.

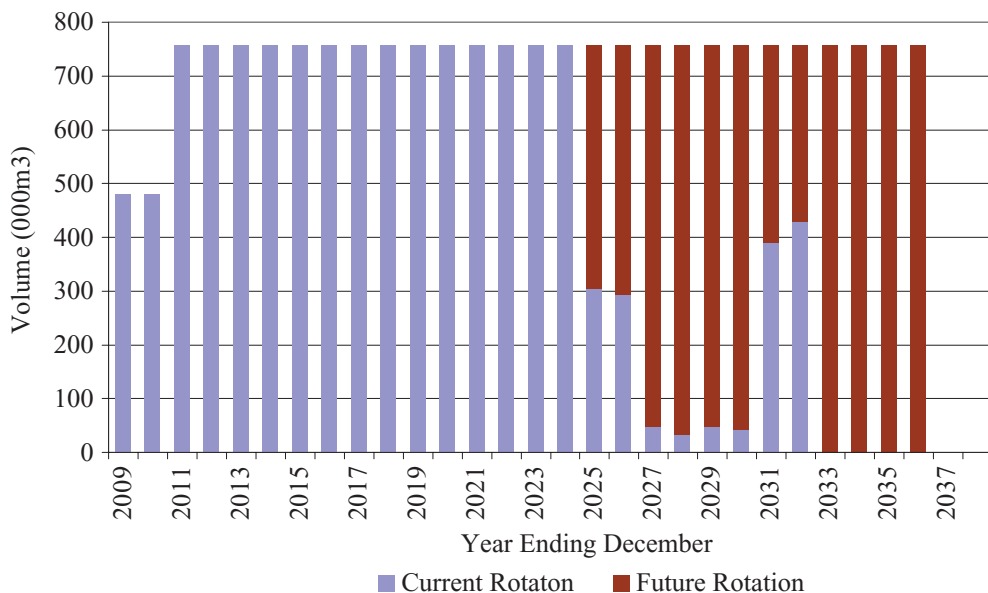
Without access to the forest records, inventory information and forest areas, CFK is not able to provide a comprehensive review of the forest description and forest yield. However, CFK believes that the forest yield projections are on the upper levels of what would be expected in the region.

**6.2.2 WOOD FLOWS**

The wood flow from the forests has been projected based upon the summarised information on the current yield status made available to CFK by The Group. The Group did not have any information that may be used to project future volume growth. As a result CFK generated some high level yield projections that are used to prepare the wood flow projection.

The projection (Figure 6.7) is based upon The Group’s current management intention which is to harvest the second rotation stands at age 15 years and to manage the forest on a non- declining yield basis.

**Figure 6.7 WOOD FLOW PROJECTION — NON DECLINING YIELD**



**6.2.3 SALES PRICES ACHIEVED**

The Group sells logs to a number of customers. For major customers a base price and annual volume is agreed yearly, with delivered volumes and the actual price confirmed on a regular basis. Sales to smaller customers are made on a “spot basis” with volume and price agreed at the time a sale is negotiated. This is general practice in the region. The Group commenced logs sales from the forests shortly after the purchase was finalised in the first quarter of 2008. This does provide a strong trading history but provides evidence of the sales prices that The Group is able to achieve (Figure 6.7).



Table 6.7 THE GROUP LOG PRICES (excluding VAT)

	2008 Price (excl VAT)	2009 Price (excl VAT)
Birch .....	1239	1173
Beech .....	1150	1106
Chinese Fir .....	867	850
Yunnan Pine .....	867	850

**(1) Year to date**

**Source: The Group records.**

**6.2.4 OPERATING COSTS**

Operating costs can be broken down into three main categories:

- Forest operational costs — includes costs involved in the establishment and maintenance of the forest and vary with the volume of work undertaken;
- Production costs — includes harvesting, transport and road construction costs; these vary with the volume and type of harvest; and
- Indirect Costs — costs associated with the general management, planning and supervision of forest operations, and harvest production and sales. It includes three categories of costs:
  - Annual forest based costs — costs associated with the operational control of forest operations excluding harvest and vary with the type and quantity of forest operations being undertaken;
  - Annual administration costs — head office costs, insurance, and land rentals, and do not vary with the amount of forest based operations that are undertaken; and
  - Harvesting indirect costs — those costs associated with the sale of logs, and supervision and planning of harvest operations.

**Forest Costs****Production Costs**

Logs are sold “delivered to the roadside”. The customer is responsible for loading the truck and transporting the logs to the mill. From The Group’s perspective, logging covers felling the tree, processing into log lengths, primarily 2 and 4 metre lengths, and delivery to roadside. The trees are logged by a local contractor using a combination of traditional methods and cable extraction. Under the traditional method trees are cut into 2m and 4m log lengths in the forest and transported by hand (or rolling them down the hill) to the roadside. The productivity and hence cost of logging in such a manner is dependent upon the topography, the distance from the road and the size of the trees. When cable extraction is used the logs instead of being extracted by hand are pulled to the roadside using a wire cable and winch system.

The Groups harvesting rate in 2008 was RMB 240/m<sup>3</sup>. The cost in the year (2009) to date have increased by about 8% and are currently RMB 260/m<sup>3</sup>.

### 6.2.5 PROJECTED SALES VOLUMES

The Group is planning to harvest the following volumes in 2009 and 2010 (Table 6.8)

**Table 6.8 EXPECTED HARVEST VOLUMES**

<u>Species</u>	<u>2009 Volume (m<sup>3</sup>)</u>	<u>2010 Volume (m<sup>3</sup>)</u>
Birch .....	228,000	228,000
Beech .....		174,000
Fir .....	36,000	
Pine .....	42,000	

### 6.2.6 ENVIRONMENTAL ISSUES

There are normally two sources of environmental issues with forests — one the impact of forest operations on the environment, and the second the impact of natural events on the forests themselves. The Group does not undertake (nor is it required to) routine formal environmental impact assessments of its operations. However, staff are well aware of the potential impact on the environment from their operations, especially that of harvesting operations. This is one of the principal reasons behind their desire to practice selective harvesting and develop a multi-aged stand, avoiding the need for clear cutting.

The Group's practice of low impact selective logging reduces the erosion risk associated with clear cut harvesting and by only removing 10% of the trees the potential for wind damage post harvesting is minimised.

The main natural environmental risks to the resource come from storms, excessive wind, rain or snow, and insect attack of fungal disease.

The main identified environmental threats come from a pine shoot beetle *Tomicus piniperda* which is present throughout Eurasia. While normally considered a secondary pest in Yunnan it is recorded as causing damage and even death of otherwise healthy *Pinus yunnanensis* trees. It is thought to have killed almost 200,000 hectares of Yunnan Pine in the region since it was first observed in 1980. There are no reports of *T piniperda* having the same impact on other Pine species or Yunnan Pine in other parts of China.

CFK was informed that during their due diligence in late 2007 and early 2008 CFK has not seen any forest health issues in the three visits it has made to the site. The Group had not identified any significant forest health concerns including *T piniperda*. They could also find no significant evidence of storm damage in the estate.

The location and nature of the forests indicate that it is highly unlikely (but cannot be completely ruled out) that the forests contain dumps of unused chemicals and other waste products.

Following the storms during the 2008 Chinese New Year in the southern parts of China, CFK asked The Group to verify what damage had occurred. These forests were in part of

Yunnan province that was not badly affected by the storms and no significant damage was reported.

## YUNNAN PROVINCE WENSHAN

In July 2008 the Group purchased a Plantation forest of approximately 100,000 hectares in Yunnan.

### 6.3.1 EXISTING FOREST ASSETS

The estate is made up of forests located in five counties—Ma Guan, Ma Li Po, Xi Chou, Fu Neng and Yan Shan. All are located in Yunnan province. The province generally has a well-developed roading infrastructure and all forests have access to district roads and expressways, sometimes via unsealed access ways capable of accommodating logging truck traffic. The Group provided CFK with a forest area description as at 31 December 2007. The forests have been planted in Chinese Fir (*Cunninghamia lanceolata*). This description predates the finalisation of the forest purchase. CFK has not been provided with the final areas and age classes, so the areas below are still subject to uncertainty as to species, age class and area. The area by region by age class is shown in Table 6.9.

**Table 6.9 NET STOCKED AREA (hectares) AS AT 30 JUNE 2009**

<u>Region</u>	<u>Age Class(Yrs)</u>	<u>Area (ha)</u>
Ma Guan .....	18	14,667
Ma Guan .....	19	20,000
Ma Li Po .....	17	23,333
Xi Chou .....	22	16,667
Fu Neng .....	23	14,667
Yan Shan .....	18	10,667
<b>Total Area</b> .....		<b><u>100,000</u></b>

#### Source: The Group's records

The stocked area at 31 December 2009 is 100,000 hectares.

The forest area was determined by The Group based upon information provided by the local Forestry Bureau.

## WENSHAN SITE VISITS

CFK visited the area in February 2008 and again in March and August 2009. During the visit in February CFK viewed a range of different sites designed to provide an overview of the resource. CFK also met with the local Forestry Bureau and discussed the general layout of the forests, and the basis on which the area and volume assessments were made.

During the second visit in March 2009 more detailed inspections of two of the forest areas one in Ma Guan the other in Yan Shan county. These inspection included reviewing the yields including taking some benchmarking measurements of the yields in these locations.

**FOREST VOLUMES**

The Group provided CFK with some average recoverable volumes by county. This information was based on more detailed information which was derived during a 7 month study by National Forestry Administration technical staff. The Group is attempting to obtain this information for CFK. During the inspection in March 2009 CFK benchmarked the survey figures with its own measurements. The result indicated that the government survey figure provided an optimistic assessment of the recoverable volumes. The resulting recoverable volume figures are presented in Table 6.10.

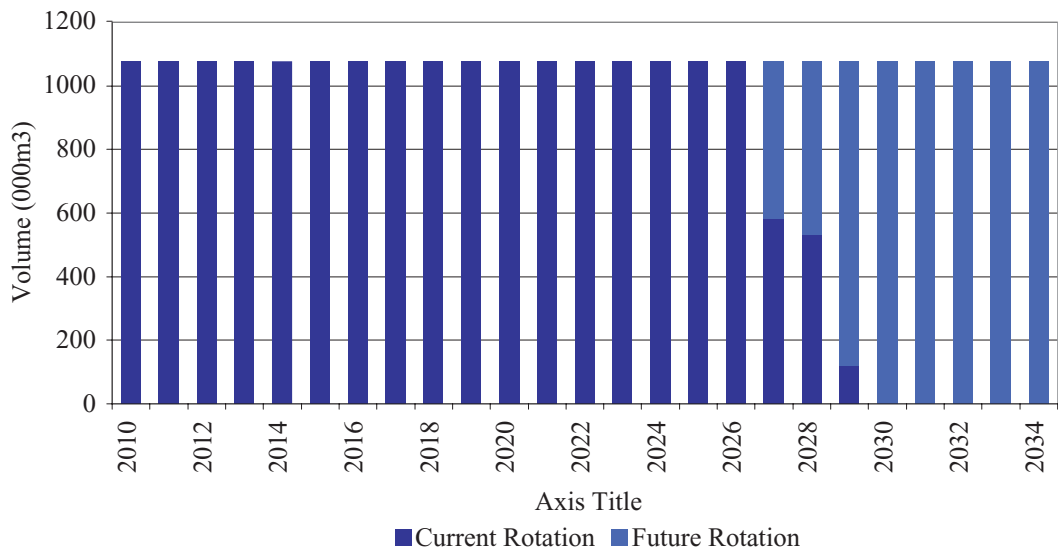
**Table 6.10 TOTAL RECOVERABLE VOLUME (m<sup>3</sup>/HA)**

Forest Number	Location	Age	Recoverable Volume M <sup>3</sup> /ha)
Y14	Gesa village renhe town maguan .....	18	197
Y15	Wumu village dalishu town maguan .....	19	203
Y16	Xiangpingshan village lianghuatang town xichou .....	22	221
Y13	Yangpizhai village babu town malipo .....	17	168
Y17	Ohebaini village pingyuan town yanshan .....	18	158
Y18	Nalai village ayong town funeng .....	23	231
<b>Total Wenshan .....</b>			<b>197</b>

**6.3.2 WOOD FLOWS**

The wood flow production from the forests has been projected based upon the summarised information that was made available to CFK by The Group. The Group did not have any information that may be used to project future volume growth. As a result CFK has generated some high level yield projections that were used to prepare the projection. The projection was developed using The Group’s current management intentions which is to harvest the second rotation stands at age 15 years and to manage the forest on a non-declining yield basis.

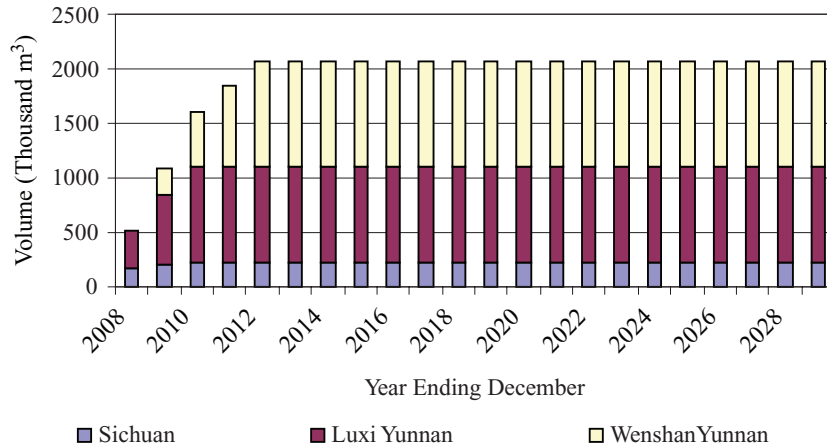
**Figure 6.8 WOODFLOW PROJECTION- NON DECLINING YIELDS**



6.4 FUTURE WOODFLOWS—ALL SOURCES

Figure 6.9 presents the future wood flows from Sichuan, Yunnan-Luxi and Yunnan-Wenshan.

Figure 6.9 COMBINED WOODFLOWS-NONDECLINING YIELD



7. FUTURE OPERATIONS

In this section confirmed investments refer to those projects that are currently being progressed and will go head. Planned investments are these investments that are at an advanced stage of planning and it is highly likely that they will go ahead.

The Group is also looking at the opportunity for purchasing forests in other provinces but these opportunities are not very far advanced and do not qualify for discussion as a confirmed or planned investment.

## 7.1 PLANNED FOREST INVESTMENTS

The Group is considering further forest acquisitions in Yunnan. The acquisition is in Ninglang county and the forest area is shown in Table 7.1.

Table 7.1 NET STOCKED AREA (hectares) AS AT 30 JUNE 2009

Species/Forest	Cuiyu	Hongqi	Hongqiao	Jinmian	Labo	Lannijing	Ningli	Xibuhe	Xichuan	Xinyingpan	Yongning	Yongningping	Zhanhe	Grand Total
Alder	0	0	0	0	0	0	0	0	0	0	0	0	0	7
Beech	0	113	0	0	0	0	111	0	0	0	0	187	0	411
Birch	100	0	21	3	113	0	0	0	0	0	139	0	0	377
Borad Leved (Soft)	0	0	88	0	0	0	0	0	0	0	0	0	0	88
Cold Spruce	1,938	543	2,092	490	1,013	0	412	0	40	292	3,066	312	0	10,197
Durable Broad-leaved Forest	0	0	0	0	0	0	0	0	0	0	20	0	0	20
Larch	496	0	1,023	8	0	0	450	0	0	0	1,060	314	0	3,350
Mixed Broad Leaved	0	0	0	0	41	0	0	0	0	0	0	0	0	41
Oak	778	4	185	0	64	33	17	332	40	71	61	289	52	1,926
Pinus densata	2,990	1,402	0	461	875	0	412	0	0	1,127	884	87	0	8,236
Pinus montana	0	0	793	0	0	287	0	0	0	0	0	0	0	1,080
Populus davidiana	14	0	39	0	0	0	0	0	26	0	0	0	0	79
Spruce	853	0	8	0	0	0	143	0	0	133	564	0	0	1,702
Pinus yunnanensis	2,880	3,311	717	1,840	370	525	2,407	4,542	2,916	2,046	884	1,505	1,876	25,820
<b>Total</b>	<b>10,050</b>	<b>5,373</b>	<b>4,967</b>	<b>2,800</b>	<b>2,476</b>	<b>845</b>	<b>3,949</b>	<b>4,874</b>	<b>3,028</b>	<b>3,670</b>	<b>6,678</b>	<b>2,694</b>	<b>1,928</b>	<b>53,333</b>

Note: Figures may not add to totals due to rounding.

**APPENDICES**

APPENDIX 1	TREE SPECIES FOUND IN THE GROUP'S FORESTS
APPENDIX 2	LOG PRICE TABLES
APPENDIX 3	WOODFLOWS AND PRODUCTION COSTS
APPENDIX 4	VALUATION METHODOLOGY
APPENDIX 5	GLOSSARY

**APPENDIX 1 TREE SPECIES**



**Chinese Fir (*Cunninghamia lanceolata*)****Range**

China, Vietnam, Laos, perhaps Cambodia; widely introduced in Japan, and widely planted throughout China, so that its original native distribution is not known.

Found from sea level to 2000 metres in most temperate areas of China but avoiding areas where the winters are very cold. It is most often found on red sandstone where it forms pure stands.

**Growth and Form**

Young trees can make quite rapid growth in height, up to 60cm a year once they have attained more than 1 metre in height. Before reaching the height of 1 metre, however, they are liable to be killed by frost. Grown in full sunlight or partial shade (will grow in shade but with poor, open form) on moist, well-drained, acid soil. Leaves may be damaged by frosts, but are quickly replaced in spring. Is extremely drought tolerant and grows well in poor, compacted clay soil.

The general shape of the tree is conical with tiered, horizontal branches that are often somewhat pendulous toward the tips. In vernacular use, it is most often known as *Cunninghamia*, but is also sometimes called “China-fir” (though it is not a fir).

As the tree grows its trunk tends to sucker around the base, particularly following damage to the stem or roots, and it then may grow in a multi-trunked form. Brown bark of mature trees peels off in strips to reveal reddish-brown inner bark. Older specimens often look ragged, as the old needles may cling to stems for up to 5 years.

It is suitable for reforestation and planting along the roads of mountainous provinces, in subtropical evergreen, coniferous and mixed broad-leaved forests (FIPI 1996). It is the most important fast-growing timber tree of the warm regions south of the Chang Jiang valley; it is propagated by seed, cuttings, or suckers. This is a prized timber tree in China, producing pale yellow to white, soft (density 0.4-0.5), highly durable, easily worked, resistant to insects and termites, scented (fragrant) wood similar to that of Coast Redwood and Sugi. It is used in constructing buildings, bridges, ships, and lamp posts, in furniture manufacture, and for wood fibre (Wu and Raven 1999); in floors, panels, packaging; and in particular for manufacture of coffins and in temple building where the scent is valued.

**Yunnan Pine (*Pinus yunnanensis*)**

It is a pioneer species following fire. It is found in Myanmar, Thailand, and Vietnam wherever there is shifting cultivation. In natural stands it is not high yielding, reaching heights of only 20-30 m and diameters to 50cm before giving way to seral hardwoods. It has excellent stem form, in contrast to *Pinus massoniana*, and has not suffered the dysgenic selection of the latter. Its good form gives it an advantage as a pole timber.

It prefers moister sites than the other species, but this characteristic is reportedly due to its intolerance of low atmospheric humidity rather than soil moisture. It is invariably planted on steep slopes, often very closely spaced on cultivated contour strips. Nowadays blanking is general. It is being used to replace failed *P.massoniana*.

The timber has a specific gravity of 0.45, and is a useful general-purpose softwood used in the round for house construction.

**Range**

Guangxi, Guizhou, SW Sichuan, SE Xizang, and Yunnan. Mountains, river basins, dry and sunny slopes from 400-3100 m altitude.

Predominantly at 600-3000 m elevation on the high plateaus of Yunnan (Li 1997), but extending north into Sichuan, where it intergrades with *P. tabuliformis*, and south into northern Burma, where it intergrades with *P. kesiya*. In recent times it has extended its range as competing broadleaf forests are logged (Farjon 1984, Li 1997, Richardson and Rundel 1998).

**Birch (*Betula alanoides*)**

A hardy deciduous tree growing to 40m at a fast rate. It grows in a range of soils, and can grow in semi-shade (light woodland). It requires moist soil. Birch has a wide range and is found from the sub tropical zones in Yunnan through the higher altitudes found in Tibet and Nepal.

The wood is moderately hard, close grained, strong, and durable. It is suitable for sawing, peeling and for pulp and paper making. The sawn lumber veneer and plywood are used in furniture manufacture, and flooring as well as interior joinery.

**Beech (*Fagus spp.*)**

A hardy deciduous tree capable of relatively fast height growth. The genus is widespread with species found in Europe and North America. The Species endemic to China are unique in that they are found in the sub tropical regions rather than the temperate climates where

European and North American *Faguss spp* are found.

The wood is moderately hard and can be sawn and peeled. It is suitable for use in flooring and furniture applications.

**APPENDIX 2 LOG PRICE TABLES**

This price data relates to Figure 5.12 Chinese National Log Prices in Section 5 of the main body of this report.

**Table App 2.1 RUSSIAN LARCH LOG PRICES 2000 Q1 to 2009 Q2**

<u>Year Quarter</u>	<u>Larch RMB/m<sup>3</sup></u>
2000:1	484
2000:2	472
2000:3	451
2000:4	478
2001:1	461
2001:2	462
2001:3	471
2001:4	525
2002:1	503
2002:2	534
2002:3	519
2002:4	520
2003:1	512
2003:2	517
2003:3	498
2003:4	522
2004:1	535
2004:2	606
2004:3	620
2004:4	594
2005:1	602
2005:2	610
2005:3	617
2005:4	625
2006:1	656
2006:2	680
2006:3	682
2006:4	717
2007:1	730
2007:2	768
2007:3	786
2007:4	825
2008:1	857
2008:2	884
2008:3	935
2008:4	937
2009:1	784
2009:2	763

**Source: RISI**

This data relates to Figure 4.15 Russian Larch Log Prices 2000 Q1 -2009 Q2 in Section 4 of the main body of this report.

**Table App 2.2 NEW ZEALAND LOG PRICES 2000 Q1 – 2009 Q2**

<u>Year Qtr</u>	<u>Radiata Pine RMB/m<sup>3</sup></u>
2000:1	545
2000:2	572
2000:3	589
2000:4	556
2001:1	533
2001:2	543
2001:3	514
2001:4	502
2002:1	501
2002:2	522
2002:3	516
2002:4	490
2003:1	514
2003:2	537
2003:3	561
2003:4	602
2004:1	718
2004:2	841
2004:3	759
2004:4	747
2005:1	750
2005:2	754
2005:3	757
2005:4	760
2006:1	790
2006:2	791
2006:3	844
2006:4	889
2007:1	926
2007:2	968
2007:3	900
2007:4	869
2008:1	880
2008:2	860
2008:3	890
2008:4	890
2009:1	594
2009:2	582

**Source: RISI**

This data relates to Figure 4.19 New Zealand Log Prices 2000 Q1 - 2009 Q2 in Section 4 of the main body of this report.

**Table App 2.3 TROPICAL HARDWOOD LOG PRICES**

<u>Year</u>	<u>Malaysia</u>	<u>PNG</u>	<u>Gabon</u>	<u>Eq. Guinea</u>
1996 .....	1142	1323	1766	1720
1997 .....	1166	1265	1745	1754
1998 .....	924	991	1556	1460
1999 .....	1035	1155	1696	1568
2000 .....	1018	1115	1626	1447
2001 .....	837	908	1537	1397
2002 .....	949	905	1408	1366
2003 .....	1119	932	1814	1549
2004 .....	1270	1068	2172	1812
2005 .....	1186	1209	2338	1936
2006 .....	1261	1301	2395	1924
2007 .....	1424	1348	2613	2034
2008 .....	208	193	388	300
2009 YTD .....	183	143	308	245

**Source: RISI, CFK analysis**

The data in Table App 2.4 relates to Figure 5.17 Tropical Hardwood Log Prices in Section 5 of the main body of this report.

**Table App 2.4 TEMPERATE LOG PRICES**

<u>Year</u>	<u>Russia</u>	<u>Germany</u>	<u>United States</u>
1995 .....	857	5018	1850
1996 .....	923	4742	1498
1997 .....	1109	2393	2050
1998 .....	1064	3081	1950
1999 .....	945	4110	1854
2000 .....	1026	3188	3591
2001 .....	1067	2366	2567
2002 .....	915	1486	3765
2003 .....	886	1448	4476
2004 .....	962	1453	4622
2005 .....	978	1446	4819
2006 .....	908	1327	4921
2007 .....	853	1308	4681
2008 .....	168	224	592
2009 YTD .....	168	185	628

**Source: RISI, CFK analysis**

The data in Table App 2.5 related to Figure 5.18 Temperate Hardwood Log Prices in Section 5 of the main body of this report.

**APPENDIX 3 PRODUCTION AND ANNUAL COSTS**

Table App 3.1 presents CFK's estimates of production and annual costs.

The following cost breakdown is based upon the direct and indirect production costs the Group is incurring in Sichuan and Yunnan-Luxi at the beginning of 2009. The Yunnan-Wenshan costs are the current estimate of the likely production cost once harvesting commences. The annual costs are based upon analysis of The Group's administration costs for the year ended December 2008. The 2008 indirect costs are significantly lower than the RMB1,000/hectare derived from the 2007 financial information. This represents the economies of scale obtained from the forest acquisitive during 2008.

**Table App 3.1 WEIGHTED AVERAGE LOGGING COSTS (RMB/M<sup>3</sup>) AND ANNUAL COSTS**

	Area (hectares)	Production Costs RMB/m <sup>3</sup>	Indirect Production Costs	Forest Based Annual Costs (RMB/ hectare)
Sichuan .....	12,447	215	63	179
Yunnan -Luxi .....	59,333	260	53	179
Yunnan -Wenshan .....	100,000	260	53	179
<b>Total .....</b>	<b>171,780</b>	<b>257</b>	<b>54</b>	<b>179</b>

	Area (hectares)	Production Costs RMB/m <sup>3</sup>	Forest Based Annual Costs RMB/ha	Annual Costs RMB/year
Sichuan .....	12,447	190	179	N/A
Yunnan -De Hong and Lin Cang .....	59,333	240	179	N/A
Yunnan -Wenshan .....	100,000	240	179	N/A
<b>Estate Wide .....</b>	<b><u>171,780</u></b>	<b><u>236</u></b>	<b><u>179</u></b>	<b><u>748,000</u></b>

**Source: CFK and The Group**



**APPENDIX 4 VALUATION METHODOLOGY**

## VALUATION METHODOLOGY

CFK has used a discounted cash flow methodology, which is by far, in CFK's view, the most common approach to forest valuation. The valuation is to conform to the International Accounting Standard 41 ("IAS 41") *Agriculture*.

The standard defines fair value as "*the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction*" ("Fair Value"). The concept of Fair Value is the basic principle of the standard.

If an active market exists for a biological asset the quoted price in that market is the appropriate basis for determining Fair Value of that asset. IAS 41 defines an active market as where the following conditions exist:

- (a) *the items traded within the market are homogeneous;*
- (b) *willing buyers and sellers can normally be found at any time; and*
- (c) *prices are available to the public.*

In the situation where market-determined prices or values may not be available for a biological asset in its present condition, the standard (paragraph 20) provides for Fair Value to be determined as the present value of expected net cash flows from the asset discounted at a current market-determined pre-tax rate in determining fair value. In applying this approach, IAS 41 requires exclusion of any cash flows for:

- financing;
- taxation; and
- re-establishing biological assets after harvest.

### *Entity valued*

The standard recognises only the existing crop. That is, cash flows up to and including the harvest of the crop which exists as at the valuation date. Any liabilities or benefits — such as those arising from replanting obligations — beyond the harvest of the existing crop must be reported separately by the entity for inclusion in their accounts. The valuation period for each stand is therefore from the valuation date through to harvest age.

### *Present Location and Condition*

IAS 41 requires assessment of Fair Value for the asset in its present location and condition, and specifically excludes increases in value from additional biological transformation and future activities. CFK adopted the following interpretation of '*additional biological transformation*' as '*biological enhancements that are unduly conjectural and have not yet been demonstrated as part of routine management*'. The International Accounting Standards Board Exposure Draft concurs with this approach and proposes to amend the perceived prohibition on recognition of '*additional biological transformation*' when estimating Fair Value.

### *Discount Rate*

The standard is prescriptive in some aspects and less prescriptive in others. In particular, it does not provide guidance on how to select the appropriate discount rate (other than that it must be “*market-determined*”). It leaves it to the valuer to make its own decision in choosing and constructing this input. The discount rate chosen has a significant impact on value.

### *Log price*

For CFK’s valuation of the Group’s Sichuan forests, the log price used by CFK are RMB869/m<sup>3</sup>, RMB912/m<sup>3</sup> and RMB943/m<sup>3</sup> for 2005, 2006 and 2007 respectively, which are consistent with the Group’s historical log prices in Sichuan in 2005, 2006 and 2007 respectively.

In respect of CFK’s valuation of the Group’s Yunnan forests, at the time such valuation was prepared by CFK, the Group did not have a trading history in Yunnan but it had entered into a number of log contracts with a number of customers for 2008. The log price used by CFK in the valuation for the Group’s Yunnan forests are RMB1,400/m<sup>3</sup> for birch, RMB1,400/m<sup>3</sup> for beech, RMB1,300/m<sup>3</sup> for beech, RMB980/m<sup>3</sup> for Yunnan pine, and RMB980/m<sup>3</sup> for Chinese fir, which are consistent with the Group’s log contracts.

## **DISCOUNT RATE**

As mentioned above, IAS 41 does not prescribe the methodology to be used to derive a discount rate to be used in determining the Fair Value, apart from stating that it must be “*market-determined*”. The discounted cash flow approach is used in the absence of an active market for forests.

Selection of the valuation discount rate is normally a two step process:

- Using a number of different methods by which the discount rate can be assessed; and
- Adjusting the derived discount rate for any specific non-quantifiable risks associated with the particular forest being valued.

While each method has its particular strengths and weaknesses, some of the more commonly approaches used to derive the discount rate are set out as follows:

- Internal Rate of Return;
- Rates used in other valuations;
- Rates implied by transaction evidence; and
- Capital Asset Pricing Model (CAPM).

CFK derives the discount rate from analysis of market sales transactions, CAPM analysis and an assessment of the non quantifiable risk associated with the forest.

## **INTERNAL RATE OF RETURN**

The Internal Rate of Return (IRR) is defined as the discount rate at which a project’s discounted revenues equal the discounted costs. While a useful technique to compare the IRR

of a number of different projects, it has a number of limitations as a valuation technique, as by definition, the net discounted revenues will be zero.

## RATES USED IN OTHER VALUATIONS

The discount rates employed by other valuers can provide a useful cross reference on the range of appropriate discount rates. However, these rates would be useful only if all the assumptions surrounding the valuation are known and understood.

There are a number of publicly listed companies that own forests in the PRC. A summary of these rates are shown in Table 4.1.

**Table 4.1 DISCOUNT RATES USED BY OTHER VALUERS FOR COMPANIES WITH FOREST INVESTMENT IN CHINA**

<u>Company</u>	<u>Exchange on which shares are listed</u>	<u>Forest location</u>	<u>Valuation Type</u>	<u>Valuation Date</u>	<u>Currency</u>	<u>Discount Rate</u>
Oji Paper Co., Ltd (Note 1)	Tokyo and Osaka	Guangdong, Guangxi	Non IAS 41 compliant	Not applicable	Not applicable	Not applicable
Sino Forest Corporation ("Sino Forest") (Note 2)	Toronto	Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Yunnan	DCF (Uncertain whether IAS 41 compliant)	31 December 2008	USD	11.5%
Cathay Forest Products Corp. (Note 3)	Toronto	Guizhou, Hunan, Jiangxi, Henan, Shangdong, Jiangsu	DCF (Uncertain whether IAS 41 compliant)	31 December 2007	USD	10.0%
China Grand Forestry Resources Group Limited ("China Grand Forestry") (Note 4)	Hong Kong	Yunnan	IAS 41 DCF	30 April 2009	HKD	11.5%
China Timber Resources Group Limited (Note 5)	Hong Kong	Guangdong	IAS 41 standing value method	31 March 2009	HKD	Not applicable

### Sources:

1. Website of Oji Paper Co., Ltd and Oji Paper Co., Ltd: Summary of consolidated Financial and Business results for the year ended 31 March 2008
2. Sino Forest 2008 Annual Report and Sino Forest Valuation as at 31 December 2007 prepared by Poyry for the existing crop only
3. Website of Cathay Forest Products Corp. and Cathay Forest Products Corp. Annual Report 2007
4. Circular of China Grand Forestry dated 24 July 2008 – Appendix IV
5. China Timber Resources Group Annual Report 2009

Since the valuations of Oji Paper Co., Ltd and China Timber Resources Group Limited are not based on discounted cash flow method, they are not able to provide any cross reference on the discount rate. Based upon the information available, CFK cannot say with certainty that the valuations for Sino Forest and Cathay Forest Products Corp are IAS 41 compliant. Their valuations are generally similar to valuations that would be produced under

IAS 41, in that they have been developed using the discounted future cash flows. Accordingly, the aforesaid valuations are considered relevant, even though they may not necessarily be IAS 41 compliant. As such, the only three comparable valuations that are useful to provide a useful cross reference on the range of appropriate discount rates for discount cash flow model (regardless whether they are IAS 41 compliant or not) are those relating to Sino Forest, Cathay Forest and China Grand Forestry.

The most significant difference between an IAS-compliant valuation and an IAS-non-compliant valuation would be that, an IAS 41 valuation is concerned only with the existing crop and excludes the costs and returns from replanting following harvest. Where discount rates are being compared between valuations, it is essential to consider the methodology employed, not whether the valuation complies with the relevant accounting standards, which vary from country to country and do not prescribe a discount rate.

The rates used by other forest valuers for comparable companies range from 10% to 11.5%. It is noted that the discount rate of 11.5% has remained unchanged since 2005 despite a decrease in transactional evidence as discussed below. This implies an increasing risk for forests located in the PRC compared with the transactional evidence. However, in CFK's view this is unlikely to be the case into the future. A number of listed companies have owned forests in the PRC for a number of years and their forest area has increased year on year. In addition there is increased international interest in PRC forest investments this will increase the understanding and transparency of forest transactions over time. This increasing track record should result in a decrease in the risk profile relative to other countries instead of an increase as implied by the unchanged discount rate, during the period 2005-2008.

The longer that a forest owner owns the forest, the probability of gathering a higher level of knowledge of the forest estate would increase, in practical terms the projections of future markets costs, growth and yield of the forest will become more reliable. This increased reliability and understanding will serve to reduce the risk profile. Nevertheless, CFK has retained the same risk profile for the Group's Sichuan forest throughout the Track Record Period, as most of the forests in Sichuan were acquired by the Group during the second half of 2007. Although the Group has owned forests in Sichuan in 2005 and 2006 (and even in the first half of 2007), this would not enable the Group to gather substantial information on the Sichuan forest as a whole and may not substantially reduce the risk profile of the Group. Therefore, the effect of such ownership of forest in 2005, 2006 and the first half of 2007 on the discount rate (and hence the valuation) was immaterial. CFK has also maintained the same discount rates in valuing the Group's forests as at December 2008 as the Group has not commenced harvesting in Wenshan and has less than one years experience in harvesting the Luxi forest estate.

#### *Transactional evidence*

To establish a PRC based transactional evidence, it would require access to and participation in direct negotiation, understanding the relationships and local knowledge specific to each transaction and company — such sale process is often not transparent to third parties. Such transactional evidence would also factor in the relationship, bargaining power and local knowledge of the buyer which may be different from one buyer to another.

There have been some "open market sales" of forests within the PRC (which were sold through advertisement and therefore everyone had an equal opportunity to purchase them),

but they have involved small areas of forest. They are not considered to be representative of the forests that the Group owns because they are much smaller than the Group's forests. Therefore, these sales can be considered to be in a different market than the market that would exist for the Group's forests should they come on the market.

CFK noticed that in November 2007, China Grand Forestry acquired forests in Yunnan with forest area of 47,467 hectares, of which the discount rate used in the valuation was 11.5%. This sale cannot be regarded as an open market sale, as it was conducted by direct negotiation and was not made through an open and competitive process. In the same way the recent transactions made by the Group cannot be considered as open market sales.

Saved for the above, most of the transactions to date have been through acquisition of smaller individual forest tracts by direct negotiation with local villagers or government agencies, and hence, there are no "open market" forest transactions in the PRC. These transactions are not conducted in a fair open market and are not regarded as open market transactions under the standard. Therefore, the use of the PRC transactional evidence is not representative in the selection of a discount rate, and there are significant barriers to entry for firms wishing to execute such transactions. Some examples of these barriers to entry are:

- Industry knowledge and expertise. Forests, as compared to other crops, have a long growth cycle. Understanding this cycle and the associated log markets and the existing forest ownership structure is the key to being able to identify forests that have hidden value;
- Connection with forestry administration bureaus. China's decentralised forest administration system increases the importance of connections within the various levels of forestry administration bureaus. Often these relationships can mean the difference between being able to purchase a forest or not; and
- Access to funding. Forestry is a relatively capital intensive business, requiring significant upfront expenditure with harvesting often to be taken place in several years in the future

Once this first phase of forest acquisition has been completed, the market is likely to become more mature and there will be secondary sales of large industrial scale forests. The absence of open market sales rules out the use of PRC based transactional evidence to select the discount rate.

In recent years, the most active markets for forest sales have been in the Northern Hemisphere and the Southern Hemisphere. These sales can be considered to be open market sales, in that they are generally advertised and have a number of competing buyers and while they cannot be directly translated, they do provide a guide to expected returns and in particular and change in the expected return over time.

The transactional evidence from both the Northern Hemisphere and Southern Hemisphere transactions is not used directly to determine the discount rate. It is important to note that a number of investment organisations are involved in both the Northern Hemisphere and Southern Hemisphere markets. In this way, both markets could be regarded as a surrogate for a global market. Between the Northern Hemisphere and Southern Hemisphere

transactions, there are a multitude of differing regulations and country risk. The key point from the transactional analysis is that discount rate in both markets behaves in a similar manner.

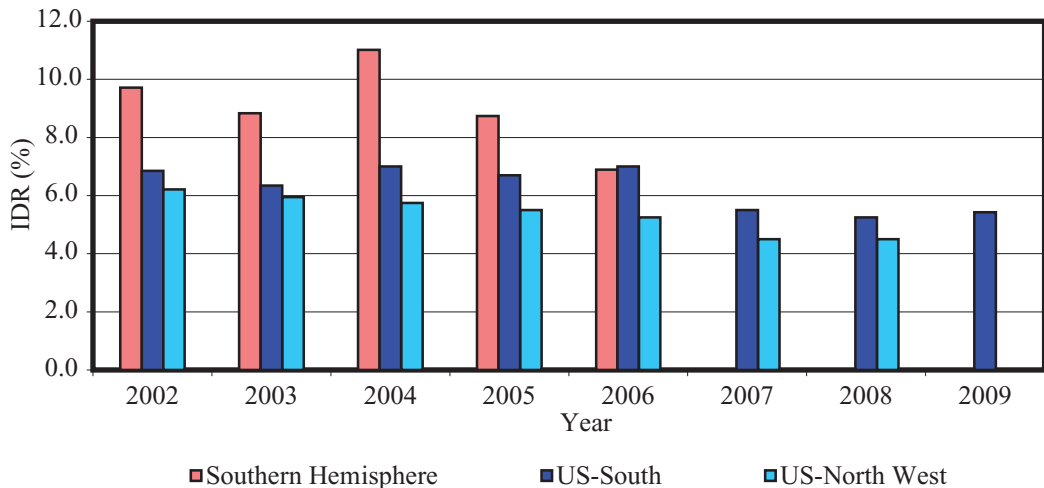
There are a number of differences between the Southern Hemisphere transactions and Northern Hemisphere ones. The followings are the major factors that could contribute to the differences:

- Different number of transactions: Southern Hemisphere had 16 sales between 2002 and 2007. The Northern Hemisphere database includes over 200 transactions conducted between 2002 to 2007.
- A large number of the Northern Hemisphere transactions represented one vendor (namely, International Paper).
- Currency Risk: CFK’s analysis has shown that if the analysis is undertaken in USD instead of the home country currency, their discount rates are at the similar levels as those of the Northern Hemisphere transactions.

CFK considers that most of the differences appears to be in currency risk. Besides these major factors, there are other factors which also contribute the differences between the implied discount rates (“IDRs”) derived from the Southern Hemisphere and Northern Hemisphere transactions.

Figure App 4.1 below shows the comparison of IDR of Southern and Northern Hemisphere transactions.

**Figure App 4.1 NORTHERN AND SOUTHERN HEMISPHERE IDR**



Notes:

1. CFK-NZD refers to Southern Hemisphere transactions dominated in home currencies.
2. CFK-USD refers to Southern Hemisphere transactions translated to US dollar.
3. S&S and M&A refer to Northern Hemisphere transactions (dominated in US dollar) valued by two forestry valuers.

**Southern Hemisphere Sales**

Since 1990, CFK has analysed all southern hemisphere plantation forest sales for which analytical data are available to CFK. The sale details and the derived implied discount rates

are maintained in a database. The IDR is the discount rate at which the net present value of the projected net cash flow equates to the transaction price. They are based on real and pre-tax cash flows.

The database contains 50 separate sales covering both state and private forests ranging in size from 48 ha to 186,000 ha. The total area of forest involved is 1,584,000 ha with an historic transaction value of NZD8.6 billion (value of the tree crop excluding freehold land).

In recent years, CFK has used the IDRs for sales since 1997 as a guide for establishing forest valuation discount rates. The Asian down-turn in that year saw a significant upwards shift in investor earnings expectations, as evidenced by the implied discount rates. Since that time there have been 31 sales.

Southern Hemisphere Implied discount rates during the 1989 to 2007 period range from 5.3% to 13.5% with a median of 10.0%.

The most recent (six) sales of large estates — occurring in 2005 and 2006 — are at or towards the lower end of the IDR range. They have the following features:

- areas ranging from 18,000 ha to 184,000 ha;
- range of IDRs 5.3% to 8.4%;
- median IDR 7.1%; and
- mean IDR 7.3%.

CFK has observed a number of consecutive sales with uniformly low IDRs in comparison with all other sales.

#### *Northern Hemisphere Sales*

From 2006 to 2009, the Northern Hemisphere sales generally have

- a lower return than the Southern Hemisphere sales.
- show a decline in IDR from early 2006
- show that sales in late 2007 early 2008 are consistent with the lower discount rates observed in 2006 and early 2007
- show that sales in the first quarter of 2009 are consistent with sales in late 2007 and 2008, indicating that the global financial crisis does not appear to have increased the IDR

Northern Hemisphere period implied discount rates during the 2006 to 2008 range from 5.3% to 6.3% with a median of 6.0%.

The more recent Southern Hemisphere transactions show a wider range than those observed in the Northern Hemisphere. There is also a small difference in the median IDR between the two data sets.



During the last three years there has been increased demand for good quality timberland in both Northern Hemisphere and for Southern Hemisphere plantations. Buyer interest has been from private pension funds, state pension funds, private equity, and forest-owning corporates. These groups are all beginning to look at forest investments outside the traditional regions. CFK is aware of forest sales in Africa to institutional buyers and at least one investment fund is actively pursuing forest acquisitions in the PRC. However, CFK does not rely on the post-1997 sales as a basis for setting the discount rate. In fact, it relies on the post-2005 sales, and the sales from 1997 to the present date are included for information and to illustrate that there has recently been a downward shift in discount rate.

CFK is aware of anecdotal evidence from some existing timberland investors in the United States that their expectation of return has increased as a result of the financial situation, and there are two reasons for this: they see a number of alternative investment opportunities with the right down in various other asset classes; and future purchases will not carry any debt or lower levels of debt than previously. On the other hand some sellers of forests appear to have the contrary view. In other situations (although the current situation is unparallel in its depth and scale) where stock market values have declined, forests have been seen as a relatively safe haven, due to relatively stable forest values. The fact is that forests have provided an inflation hedge in the past, and there is an option value in that the trees will keep growing if harvest is delayed due to the short-term falls in market demand. Conversely harvest can be increased in times where demand increases. It is this option value that differentiates forests from other investments. There is no transactional evidence to indicate that a change in discount rate is warranted.

### ***Capital Asset Pricing Model***

The CAPM is a tool commonly used by financial analysts and valuers to estimate the cost of equity capital. The discount rate is based on observed market parameters, and applied to an individual firm. The CAPM approach requires assessment of the risk-free rate, capital structure, equity beta, and risk premium for equity. For an IAS 41 compliant valuation, financing charges are excluded when preparing the asset valuation. As a result, the CAPM analysis is appropriate for an equity only valuation.

When calculating the cost of capital, (i) the currency of the cash flows and the currency of the discount rate should be the same; and (ii) the market risk premium and beta be estimated against a global market portfolio and not a local one. Given that the Group's forests are valued in RMB, a RMB based risk free rate and inflation rate should be used.

For the estimation of the equity Beta, its derivation is based on measuring the movement of listed stock prices. However, the observed Betas tend to be highly variable, even within a single industry, and therefore offer little assistance particularly where there are few listed stocks, as is the case with forestry where most of the listed stocks are either companies involved solely with manufacturing forest products or are vertically integrated forest products companies owning forests and manufacturing facilities. There are very few listed, pure forest owning companies on which to derive an accurate estimate of the sector's Beta.

CFK has utilised the standard version of the CAPM model adjusted for inflation. The CAPM model is:

$$Re = \{ [ 1 + ( Rf + e * Mrp ) ] / [ 1 + Ix ] \} - 1$$

Where:

Re = cost of equity capital

Rf = risk free interest rate

Mrp = market risk premium

e = the equity Beta

Ix = inflation

CFK has used the following inputs into the CAPM model:

*Equity Beta ( $\beta_e$ ):*

There are very few pure play publicly listed forest owning companies. Most valuers then look at the performance of the vertically integrated forest owning companies and their nominal pre-tax equity Beta lies between 0.6 and 1.1. The betas were obtained from information obtained from Bloomberg and Price Waterhouse Coopers, and interpreted and analysed by CFK.

CFK obtains summarised data and does not have access to the individual companies. It is a significant weakness in the CAPM analysis for forest owning companies. The fact is that there are very few pure forest owning companies worldwide, and nearly all have some involvement in downstream processing or other activities such as trading or alternative structures such as Real Estate Investment Trusts (REIT) in the U.S.. This situation has been exacerbated by the increasing trend to private ownership of forests dominated by the U.S. pension and endowment funds. This has reduced the number of integrated forest company worldwide. The only rationale for including those companies is that, ultimately the fortunes of the forest are linked to the fortunes of the downstream companies in the medium to long term. For this reason, CFK prefers to look at a range of asset betas rather than adopt a single beta. The calculation of the equity beta from integrated forest products companies, and in some cases, pulp and paper or other related building products companies, is normal practice amongst forest valuers who undertake CAPM analysis.

*Market Risk Premium ( $Mrp$ ):*

Market risk premium corresponds to the premium of realised total equity returns over the long term, total risk free bond returns estimated over a long period. CFK uses an estimate of the market risk premium based on the international arithmetic average international equity risk premium of 5% contained in ABN Amro's 2006 Global Investment Yearbook. This estimate is based largely on time series from European and U.S. stock markets. Accordingly it should be adjusted to reflect the sovereign and market risk of the project. CFK has adopted the same approach as others and ranked countries according to their sovereign risk ratings and applied a multiplier based on that ranking. Timber in the Chinese forest will be sold almost entirely into the domestic market and with prices set domestically. Therefore, the revenue from sales of timber as well as costs to harvest and produce the timber are exposed to Chinese country risk. For a forest company in a developing market of China, the market risk premium multiplier has

been set at 1.2 (please see below for more details of this multiplier). The market risk premium is therefore 6.0%.

CFK is of the view that although there is a need to align (where possible) the basis on which the various assumptions have been derived, the reality is that determination of both the equity beta and market risk premium will be dominated by non-Asia information. Therefore, the market risk premium applied for the Group's forests has been obtained using information from a number of sources and is not Asia/China-focused.

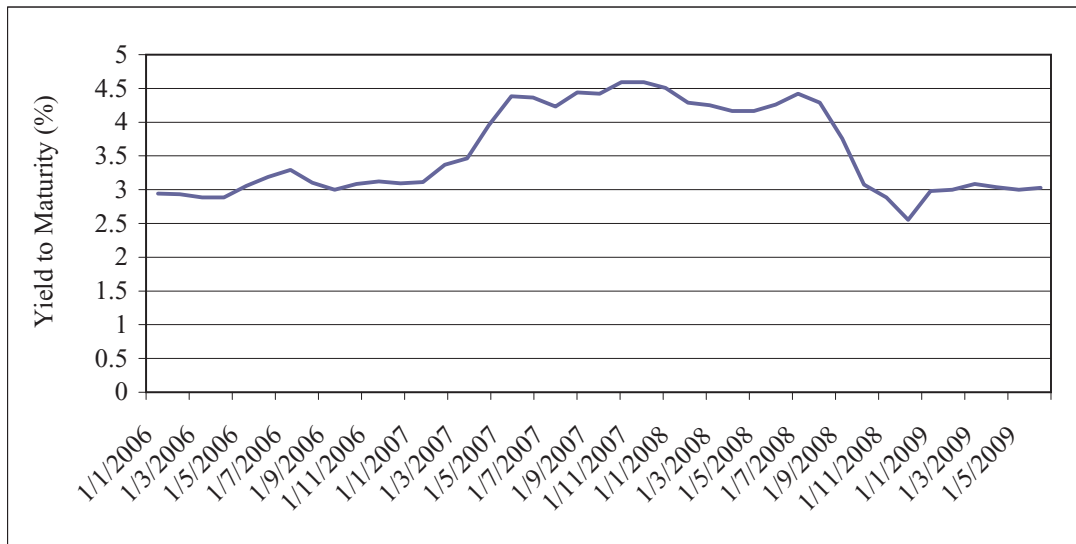
CFK following its own research and discussion with a number of forest investors, has concluded that it is more appropriate that both the market risk premium and beta are estimated using a global market portfolio, than to use a more localised approach. An additional advantage of a globalised approach is that long time series are available. CFK has made some allowance for the additional "risks" when determining the country risk multiplier. Furthermore, if one considers the market for forest products, a significant amount of forest products is traded internationally, either as raw material (e.g. logs) or partly processed products (e.g. pulp and timber) or finished products (e.g. paper and furniture), a large number of the forest products firms are global in nature. Similarly institutional investors which have significant investments in forests are increasingly global, with investments spanning a number of geographies.

CFK utilised a country attractiveness methodology originally developed by DANA/Manners in 1997, and now modified and adopted by RISI. The attractiveness index utilises assessments of (the index weightings are in brackets) policy consistency (11%), inflation (4%), economic climate (6%), deviation from purchasing power parity (4%), strength of the judicial system (11%), corruption (9%), foreign ownership provisions (7%), transport infrastructure (3%), local labour costs (3%), land tenure (13%), land availability (10%), market accessibility (10%), and biological and physical risk (9%). Each country was assigned a rating of 1 to 7 and an overall score was assigned for each country. This analysis was undertaken on 70 countries ranging from the United States to Zimbabwe. CFK based upon its experience broke the attractiveness rankings into five groups based upon their attractiveness scores. The first group had a risk multiplier of 1.0, the second 1.1, and the third 1.2. China at position 34 was in the third group, and so was assigned a multiplier of 1.2.

#### *Risk Free Rate (Rf):*

Risk free rate is calculated for the currency and inflation assumptions that underlie the cash flows of the operations. In this case it is the RMB. Accordingly, the risk free rate has been derived using the 9-year Chinese government bond. A 9-year bond was used because it was a readily available and more widely reported with lower volatility long term bond which can better reflect the long term nature of a forest investment than the shorter term bonds. Over the past two years, the yield to maturity of the 9-year Chinese government bond has been characterised by periods of relative stability followed by a rapid increase and then a further period of stability. Figure App 4.2 shows the last two years' yield to maturity of the 9-year Chinese government bond.

**Figure App 4.2 YIELD TO MATURITY OF THE RMB BASED CHINESE 9-YEAR GOVERNMENT BOND**



Source: Bloomberg

The application of the yield to maturity of the 9-year Chinese government bond over the last two years is more appropriate as an average yield to maturity over a longer historical series will incorporate a number of extraneous events such as re-rating of Chinese government bonds by rating agencies (occurred between 2005 and 2007). CFK looked at the history during 2007 when selecting the risk free rate, given the significant change that occurred in late 2006.

Based upon Figure App 4.2, there appears to have been a re-rating of the 9-year bond in June of 2007. CFK has used 4.5% as an estimate of the risk free rate.

#### *Long term inflation (I<sub>x</sub>):*

Long term inflation has been set at 4.4% representing Consensus Forecast's medium term inflation outlook for China. Consensus Forecast are a UK-based agency that provides consensus forecasts (mean) of key economic parameters provided by a number of economic forecasters. The consensus forecasts are obtained as the mean of the forecasts provided by a number of economic forecasters. The consensus forecasts for China are a consensus of the views of a number of forecasters, including some global investment banks.

CFK prefers a more forward-looking view of inflation rather than using what is in fact a mean reversion approach. If using a mean reversion approach, the debate will then become what period you use. Mean reversion in PRC would not take into account the recent economic growth that PRC has achieved which changes the economic environment, and this means that the past is not necessarily a good predictor of the future.

Consequently, CFK estimates the real, pre-tax, cost of capital for a forest owner at between 4.5% and 7.0%. This is the same as the real, post-tax, cost of capital as the Company did not need to pay any corporate tax during the Track Record Period.

## SUMMARY

The discount rate derived from the CAPM analysis is broadly consistent with the IDRs observed in both the Northern Hemisphere and Southern Hemisphere transactions. The issue then becomes what is the appropriate discount rate to use for a RMB denominated forest value for a forest situated in the PRC. Both the IDR analysis and the CAPM analysis generate discount rates that are significantly below the range used by other valuer's for forests in the PRC.

## CHOICE OF DISCOUNT RATE

Valuation theory suggests that where possible, any adjustments for risk (political, foreign investment, foreign currency risk) should be made in the underlying cash flows and not through adjustments to the discount rate. In practice adjustments to the discount rate are generally made to account for intangible factors including the risk factors in the previous sentence. In undertaking an IAS 41 valuation, it is more appropriate given the definition of fair value in the standard to place more weight on the transactional evidence than other evidence, in order to meet the standard's definition of "*fair value*".

In order to derive the discount rate, the relative risk profile of the forests must be compared to the risk profile of the forests in the transaction database. Accordingly, CFK has assessed the risk of the Group's forests *relative to the forests in the transactional evidence* as follows.

There are a number of factors to be considered when evaluating the non-quantifiable risk profile of the forests:

- Security of tenure;
- Reliability of the area description;
- Reliability of the forest yield and growth projections;
- Cost profile; and
- Relevant log markets.

## SICHUAN

In so far as the Group's Forests in Sichuan are concerned:

*Negative factors (i.e. has a lower risk than the transactional evidence)*

- As both the Group's inputs (both income and costs) and the valuation of the Group are denominated in RMB, currency translation is not required, and therefore there is no foreign exchange risk as a result of currency translation;
- Although volatility of a currency may affect the value of future cashflow in absolute term and requires a higher discount rate to compensate, RMB is a stable currency and has a less currency risk;

- Most of the Group's forests are immediate harvestable, reducing the uncertainty in the growth of the Group's tree crop;
- There is security of land use and ownership of the trees;
- The cost profile compares favourably with other forestry organisations;
- The Group has a history of harvesting operations and established customer base; and
- The Sichuan log market is currently undersupplied and could easily absorb additional volume.

*Positive factors (i.e. has a higher risk than the transactional evidence)*

- There is only limited operating history of the Group;
- The rules and regulations of PRC regarding large scale commercially owned forestry are still evolving;
- The area description appears to have been based on a sound approach, but are less comprehensive than the forests in the transactional evidence;
- The base forest inventory is less comprehensive and reliable than the forests in the transactional evidence;
- Future growth rates under the proposed harvesting regime are uncertain; and
- The Group has been rapidly expanded during the past few years and approximately 85% of its Sichuan forests were acquired after 2006.

Based on the above, the Group's risk profile is considered to be positive (i.e. has a higher risk than average) relative to the forests in the transactional database. This is primarily because the forest description while suitable for the purposes of forest valuation is not as comprehensive as that found in the Northern Hemisphere and Southern Hemisphere transactions. In addition the forest industry is not as developed as that found in the other countries. On the positive side (that leads to a decrease in the risk profile) is that the industry is growing quickly and the PRC currently has a wood deficit, and hence, demand for wood in China is predicted to increase.

#### *Selection of Discount Rate*

The IAS 41 Fair Value discount rate is based on a 'willing buyer, willing seller' with no compulsion to act and is applied in the context of the value of The Group's estate as a whole.

The discount rate for the estate is viewed in the following context:

- CAPM analysis indicates that the discount rate should lie in the range of 4.5% to 7.0%; the mid point is 5.75%.

- Southern Hemisphere transactional analysis indicates a discount rate of between 5.3% and 8.35%, with a mid point of 7.1%;
- Sales of Northern Hemisphere forests transact at around 6%; and
- The market for forest assets in the PRC is relatively undeveloped with few (if any) open market sales relative to the Northern Hemisphere and the Southern Hemisphere where the market consists of more “open market” transactions. This will result in a general risk premium over the transactional evidence.

The discount rate for a specific forest asset will vary depending on its specific, non-quantifiable risk profile. CFK is of the view that the risk profile of the Sichuan forests is greater than that represented in the transactional database and warrants a higher discount rate than the range indicated by the CAPM analysis and the transactional evidence.

The fundamental factors that affect forestry performance are favourable. Importantly, the definition of market value for the forests requires that there be not just willing buyers, but also willing sellers. If the only purchase offers to be extended involved very high discount rates, we would expect that forests would not be willingly sold. On this basis a valuation discount rate of 9.0% is indicated.

#### YUNNAN (Luxi)

In so far as The Group’s forests are concerned:

*Negative factors (i.e. has a lower risk than the transactional evidence)*

- As both the Group’s inputs (both income and costs) and the valuation of the Group are denominated in RMB, currency translation is not required, and therefore there is no foreign exchange risk as a result of currency translation;
- Although volatility of a currency may affect the value of future cashflow in absolute term and requires a higher discount rate to compensate, RMB is a stable currency and has a less currency risk;
- Most of the Group’s forests are immediate harvestable, reducing the uncertainty in the growth of the Group’s tree crop;
- The cost profile compares favourably with other forestry organisations; and
- There is security of land use and ownership of the trees; and
- The Group has secured some of the orders from its customers.

*Positive factors (i.e. has a higher risk than the transactional evidence)*

- Future growth rates under the proposed harvesting regime are uncertain;
- The area description appears to have been based on a sound approach, but are less comprehensive than the forests in the transactional evidence;

- The base forest inventory is less comprehensive and reliable in the transactional evidence;
- The forests have only a limited harvest history and suitable log markets and solid customer base to allow harvesting to occur at the maximum rate still has to be developed; and
- The Yunnan forest market is not as well developed as those in Sichuan.

Overall The Group's risk profile is considered to be significantly positive (i.e. has a higher risk than average) relative to the forests in the transactional database, principally due to the lack of harvest history.

#### *Selection of Discount Rate*

The IAS 41 Fair Value discount rate is based on a 'willing buyer, willing seller' with no compulsion to act and is applied in the context of the value of The Group's estate as a whole.

The discount rate for the estate is viewed in the following context:

- CAPM analysis indicates that the discount rate should lie in the range of 4.5 to 7.0%, the mid point is 5.75%.
- Southern Hemisphere Transactional analysis indicates a discount rate of between 5.3% and 8.4%, with a mid point of 7.1%;
- Sales of Northern Hemisphere forests transact at around 6%; and
- The market for forest assets in the PRC is relatively undeveloped with few (if any) open market sales relative to the Northern Hemisphere and the Southern Hemisphere where the market consists of more "open market" transactions. This will result in a general risk premium over the transactional evidence.

The fundamental factors that affect forestry performance are favourable. Importantly, the definition of market value for the forests requires that there be not just willing buyers, but also willing sellers. If the only purchase offers to be extended involved very high discount rates, we would expect that forests would not be willingly sold. Having said that, CFK is of the view that the current risk profile of the Yunnan estate near Luxi is higher than the Group's forests in Sichuan province, and the discount rate should be significantly higher than that from the transactional evidence. The forest of the Group in Sichuan has an established sales record with sales and operations since 2003 whilst the Group's forest in Yunnan has only commenced sales since May 2008, such lack of historical sales order in the Group's Yunnan forest warrants a higher risk profile. On this basis a valuation discount rate of 11.0% is indicated.

#### **YUNNAN (Wenshan)**

In so far as The Group's forests are concerned:

##### *Negative factors (i.e. has a lower risk than the transactional evidence)*

- As both the Group's inputs (both income and costs) and the valuation of the Group are denominated in RMB, currency translation is not required, and therefore there is no foreign exchange risk as a result of currency translation;



- Although volatility of a currency may affect the value of future cashflow in absolute term and requires a higher discount rate to compensate, RMB is a stable currency and has a less currency risk;
- Most of the Group's forests are immediate harvestable, reducing the uncertainty in the growth of the Group's tree crop;
- The cost profile compares favourably with other forestry organisations; and
- There is security of land use and ownership of the trees; and The Group has secured some of the orders from its customers

*Positive factors (i.e. has a higher risk than the transactional evidence)*

- Future growth rates under the proposed harvesting regime are uncertain;
- The area description appears to have been based on a sound approach, but are less comprehensive than the forests in the transactional evidence;
- The base forest inventory is less comprehensive and reliable in the transactional evidence;
- The forests are highly variable;
- The forests are currently being harvested and suitable log markets still has to be developed; and
- The Yunnan forest market is not as well developed as those in Sichuan.

Overall The Group's risk profile is considered to be significantly positive (i.e. has a higher risk than average) relative to the forests in the transactional database, principally due to the lack of harvest history and variability of the forest estate.

*Selection of Discount Rate*

The IAS 41 Fair Value discount rate is based on a 'willing buyer, willing seller' with no compulsion to act and is applied in the context of the value of The Group's estate as a whole.

The discount rate for the estate is viewed in the following context:

- CAPM analysis indicates that the discount rate should lie in the range of 4.5 to 7.0%, the mid point is 5.75%.
- Southern Hemisphere Transactional analysis indicates a discount rate of between 5.3% and 8.4%, with a mid point of 7.1%;
- Sales of Northern Hemisphere forests transact at around 6%; and
- The market for forest assets in the PRC is relatively undeveloped with few (if any) open market sales relative to the Northern Hemisphere and the Southern Hemisphere where the market consists of more "open market" transactions. This will result in a general risk premium over the transactional evidence.

The fundamental factors that affect forestry performance are favourable. Importantly, the definition of market value for the forests requires that there be not just willing buyers, but also willing sellers. If the only purchase offers to be extended involved very high discount rates, we would expect that forests would not be willingly sold. Having said that, CFK is of the view that the current risk profile of the Wenshan estate is higher than the Group's forests in Sichuan province or in Luxi (Yunnan), and the discount rate should be significantly higher than that from the transactional evidence. The forest of the Group in Sichuan has an established sales record with sales and operations since 2003 and the Group's forest in Yunnan (Luxi) has commenced sales since May 2008. Wenshan has no harvest history and a more variable forest resource and warrants a higher risk profile.

On this basis a valuation discount rate of 13.0% is indicated.

## CONCLUSION

The discount Rates used across The Group's estate are summarised in Table App 4.2 below.

**Table App 4.2 DISCOUNT RATES**

<u>Forest</u>	<u>Area-hectares</u>	<u>Value (RMB million)</u>	<u>Discount Rate</u>
Sichuan .....	12,447	1,067	9.00%
Yunnan-Luxi .....	59,333	4,466	11.00%
Yunnan-Wenshan .....	100,000	2,086	13.00%
<b>Estate Average</b> .....	<b>171,780</b>	<b>7,619</b>	<b>12.02%</b>

Overall the discount rate underlying the valuation of the Group's forests lies slightly higher than the range of 10% to 11.5% used by other forest valuers for forests situated in PRC. The discount rate falls outside the top end of the range of discount rates as indicated by the transactional evidence and the CAPM analysis which means that the additional return is required from forest assets at this stage of the industry's development in the PRC.

On the other hand, CFK noted from the 2008 annual report and valuation as at 31 December 2008 of Sino Forest, the circular of China Grand Forestry dated 24 July 2008, and the 31 March annual valuation of China Grand Forestry that such discount rate is marginally higher than the discount rate used by Poyry when valuing forests owned by Sino Forest (*Note 1*) and China Grand Forestry (*Note 2*) in the PRC. Such difference can be attributable to the following reasons:

- There is a significant difference in the underlying price assumptions between the approach used by Poyry and that adopted by CFK (as explained in detail below). While CFK adopts the current price for the valuation of the Group, CFK noted from the 2008 annual report and valuation as at 31 December 2008 of Sino Forest and the valuation as at 31 March 2008 of China Grand Forestry's tree crop that Poyry has applied real price increases for the first five period of the valuation;
- CFK noted from the 2007 annual report and valuation as at 31 December 2007 of Sino Forest that the valuation done by Poyry with respect to forest of Sino Forest was denominated in USD, with log prices and costs incurred in RMB. The RMB

outcome generated from the RMB inputs is required to translate into USD for the valuation report. Such translation inherently involves foreign exchange risk; and

- The Group has been operating its business in Sichuan since 2003 with an established track record on sales.

Notes:

- (1) *Sino Forest is a company listed on the Toronto Stock Exchange. According to Sino-Forest Corporation's second quarter report 2008, its principal businesses are the ownership and cultivation of forest plantation trees, the sales of standing timber and harvested logs, and the complementary manufacturing of downstream engineered-wood products. As at 30 June 2008, it had approximately 327,000 hectares of forestry plantations located in southern, south-western and eastern China (including Yunnan but not Sichuan). According the valuation report of Poyry dated 14 March 2008 for valuation of Sino-Forest's plantation assets as at 31 December 2007, as at 31 December 2007, the main tree species of Sino-Forest's plantation assets were Chinese fir, Eucalyptus and Pine, and other species included Acacia, Broadleaf, Paulonia and Poplar. According to Sino-Forest's short form prospectus dated 7 May 2004, it has been operating forestry plantations in the PRC since 2005.*
- (2) *China Grand Forestry is a company listed on the Hong Kong Stock Exchange. According to its 2007/2008 annual report, as at 31 March 2008, its forest areas under management was over 5 million Chinese Mu (approximately 333,333 hectares), spreading across ten provinces in the PRC (including Yunnan but not Sichuan), The majority of its trees are pine, mixed hard wood, fir and broad leaf trees. They sell processed standard timber, pulpwood and standing timber and their operations involves plantation of saplings, fast-growing and high-yield plantation and low-yield plantation improvement.*

CFK has used current prices for its valuation of the Group's forests. According to paragraph 17 of IAS 41, if an active market exists for a biological asset or agricultural produce, the quoted price in that market is the appropriate basis for determining the fair value of that asset. According to paragraph 20 of IAS 41, when market-determined prices or values is not available for a biological asset in its present condition, the present value of expected net cash flows from the asset discounted at a current market-determined pre-tax rate is used to determine the fair value. When estimating the future selling price for the purposes of discounting expected net cash flows, current market conditions will generally provide the best evidence on which to base estimates.

CFK has undertaken the valuation by using current prices which are then held constant in real terms for the period of the valuation (that is, prices will increase in line with inflation). CFK noted that Poyry has applied real price increases for the first 5 years of the valuation (that is, prices will increase faster than the rate of inflation) after which the prices are held constant. This is a more aggressive approach to pricing and hence has inherently more risk and would attract a higher discount rate. Based upon some analyses CFK has conducted on the Southern Hemisphere v transactional analysis, the difference in the imputed IDR between the two pricing approaches is around 1 to 2 percentage points. This is similar to the difference in the two discount rates adopted by Poyry (as noted by CFK) and CFK.

## NON END-OF-YEAR VALUATION

Besides the valuation as at 31 December 2007, CFK has also undertaken valuation for the Group's forestry assets as at 30 June 2008. Instead of running the valuation model again, the valuation as at 30 June 2008 is derived by adjusting the December 2007 base model to account for volume harvested and the passage of time. The valuation inputs (such as log prices, costs and yield) are unchanged from those used in the December 2007 valuation.

CFK has also completed a valuation of the Group's forestry assets as at 31 December 2008 and as at June 2009. Instead of running the valuation model again, the valuation as at 30 June 2009 is derived by adjusting the December 2008 base model to account for volume harvested and the passage of time. The valuation inputs (such as log prices, costs and yield) are unchanged from those used in the December 2008 valuation.

Unless there were significant and permanent changes to prices and costs, there was no need to re-run the estate optimisation model to calculate the mid year value. Instead, the end-of-year valuation model was adjusted for the volume harvested, and any costs incurred between the end-of-year valuation and the valuation date, and the first period of the valuation reduced to reflect the balance of time to the end of the year. This has the effect of reducing the period over which the future cash flows are discounted. The principle reason for this is that forest growth does not occur evenly throughout the year and the convention is to assume that growth occurs at the same time as the trees birth-date. Without volume growth and significant changes in prices/costs, the model would not generate a significantly different answer to that provided by the year-end model.

**APPENDIX 5 GLOSSARY**

## LIST OF ACRONYMS

AAC	Annual Allowable Cut
AMG	At Mill Gate
CEIC Data	CEIC Data Company Limited a provider of financial information specialising on Asia and emerging markets
CFK	Chandler Fraser Keating Limited
CIF	Cost, Insurance and Freight
cm	Centimetre
DANA LTD	A specialist in global forest resources and pup log and wood chip supply and demand
ha	Hectare
Fuelwood	Wood used as fuel, usually lower quality logs
Hardwood	Tree species distinguished from softwoods by cell structure. Examples include Birch, Beech and Alder.
HDF	High Density Fibreboard
ITR	Independent Technical Review
MDF	Medium Density Fibreboard
m	Metre
m <sup>3</sup>	Cubic metre
RISI	A leading information provider for the global forest products industry
Roundwood	Wood in log form
SFA	State Forestry Administration
Softwood	Tree species distinguished from hardwoods by cell structure. Examples include Chinese Fir, Radiata pine, Russian pine and Larch, and Cedar.
Temperate Hardwood	Temperate Hardwood Hardwoods grown in temperate climate.
The Group	China Forestry Holding Co., Ltd
Tropical Hardwood	Hardwoods grown in tropical climate (Eg Papua New Guinea)
UNCE	United Nations Economic Commission for Europe
USD	United States Dollars
WTA	World Trade Atlas
Yuan or RMB	Chinese yuan
YTD	Year to Date

## AREA CONVERSION FACTORS

Area	1.0 Mu	=	666.7 m <sup>2</sup>
	1.0 ha	=	15.0 Mu
	1.0 acre	=	5.9 Mu