

New product acceptance in China's industrial wood products market

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Abstract

Chinese industrial wood consumers, mainly from Guangdong province, southern China, were surveyed to determine the factors that influence them in adopting a new product. The three most important industrial wood-using sectors - housing construction, interior decoration, and furniture - were surveyed. Overall, "Price" was rated as the most important factor by respondents in adopting a new product. This was closely followed by "Environmental Issues". Government policies which encourage the use of environmentally acceptable products and rising environmentalism in the international furniture market may be the reasons for the surveyed Chinese industrial wood consumers rating it so highly. Other important factors were "Services", "Wood Properties", "Availability" and "Product Quality". Surprisingly, "Experiences of Other Users" and "Customer Preferences" were rated as significantly less important factors. The results were generally consistent across the different sectors investigated.

Introduction

In a relatively short period, China has become a significant global market for wood products and the leading market for most exporters in the Asia-Pacific region. The value of China's imports of major wood products (excluding pulp and paper) has increased more than five-fold in the last decade, from US\$1,583 million in 1996 to US\$5,503 million in 2005 (GTIS 2005). It has also become a wood processing powerhouse, not only to fuel growing domestic demand for value-added wood products but it has also captured a significant proportion of the global trade (exports) in wood-based furniture products. The total value of the furniture trade reached US\$ 19,555 million in the year ended June 2005. A significant proportion (79 percent) of China's furniture exports were destined for the US, representing about 44 percent of all US furniture imports by value.

China's market changes have been rapid on a world scale – one example of this being changes to the import licensing system, which have radically changed the nature of the wood export trade with China. Prior to China's accession to the World Trade Organisation (WTO) in 2001, the few Chinese wood products importers with import licences made the final decision on what wood products were imported. Only 20 wood products importers, for example, accounted for 90% of all wood products imported into China in 1997 (Zhang *et al.* 1998). Today, China's import licensing system no longer functions as a trade barrier, and all industrial wood consumers are able to import without import licences, expanding the range of opportunities for exporters.

China is also important for New Zealand exporters of wood products, accounting for a growing share of log, sawn timber and fibreboard exports (GTIS 2005). Although log exports to China have declined recently, New Zealand sawn timber exports to China have been steadily increasing and there is much interest amongst the New Zealand industry in value-added opportunities for solidwood products such as structural engineered products, about which little is known in China (Turner *et al.* 2005b).

China's large historical growth in imports is expected to increase (Turner *et al.* 2005a). The prospect of further significant market growth has fuelled intense global interest in the Chinese market from the wood products industry and governments, but an acknowledgement that most have "lacked the information necessary to understand and assess the implications of the Chinese forest market" (Xu & White 2004).

In order to fill some of this information gap, this paper reports on a study undertaken in 2002/03 to provide an understanding of factors influencing Chinese industrial wood consumers to adopt new wood products. These products are defined as those that are new to the market - such as LVL, OSB, and/or standard products from different producers such as New Zealand versus Canada, and/or manufactured from different species such as radiata pine versus Douglas fir. Industrial wood consumers are manufacturers and other users (e.g. construction contractors and interior decoration manufacturers) of wood-based products (including radiata pine from New Zealand) in China.

This paper reports on the results of a survey determining the key factors regarded as important to these consumers when purchasing wood products in the most important wood consuming sectors in China: housing construction, interior decoration, and furniture, and the implications for New Zealand exporters of wood products to China.

Housing Construction

In 2001, a total of 22 million housing units were constructed, of which only 0.06% were wood-framed housing units. Most were built using steel, concrete, and other materials (USDA 2002). Most wood products were used for temporary formwork, scaffolding boards, windows, doors, and partitions on site in urban areas. In rural areas, wood products were used for beams, rafters, and joists (USDA 2001b). Plywood, sawn timber, fibreboard, and particleboard are the major wood products used in temporary construction (Li 1997).

Interior Decoration

USDA (2002) reported that Chinese consumers spent a total of US \$36 billion on interior decorating materials, with 25 percent of this spent on wood products. The volume of

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wood used by the interior decoration sector was estimated to be 10 million m³ of industrial roundwood in 2001 (Freese 2001). Wood flooring, followed by mouldings, are the main products manufactured by the interior decoration sector in China (USDA 2002).

Furniture

China's furniture sector accounted for 13 percent of the total industrial timber consumption in China in 1997 (Yang 2001). In 2001 there were more than 50,000 furniture manufacturers of various sizes with total output of US\$ 14.5 billion in 2001, and these manufacturers employed over five million people (USDA 2001a). The furniture sector is dominated by foreign joint ventures and privately owned companies and is centred primarily in the southern province of Guangdong, which accounts for more than half of domestic production (USDA 2001a). Particleboard, hardwood sawn timber (and dimension lumber), and MDF were the top three wood-based materials used by the furniture producers (Sun *et al.* 1999). As discussed previously, a significant volume of China's wooden furniture production is exported, primarily to the US and European markets (GTIS 2005).

Study Method

An industrial wood consumer survey was conducted to rate decision-making factors of Chinese industrial wood consumers. Three questionnaires were designed to examine each of the housing construction, interior decoration, and furniture sectors in southern China. In the questionnaires, respondents were asked to rate the importance of different factors in influencing them to adopt a new wood-based product in their operations. Questionnaires were translated into Chinese.

Study Areas

Questionnaires were distributed during two exhibitions, one in Hong Kong¹ (Hong Kong Convention Centre) and one in Guangzhou (Guangzhou Commodities Centre) in June and July 2002 respectively. In addition, some respondents, who were interested in participating and indicated that they did not have time during the exhibitions, were revisited on-site during June and August 2002. On-site visits were mainly concentrated in the furniture manufacturing town of Dongguan, southern China.

Targeted Respondents

Four main groups of industrial wood customers who use wood-based products as a material to produce their final goods were targeted in this study. Categories of industrial wood customers were: **wood processors**, and **construction contractors** in the housing construction sector, **interior decorating material (wood-based) manufacturers** in the interior decoration sector, and **furniture manufacturers (wood-based)** in the furniture sector.

¹ Only respondents who operate businesses in mainland China were invited to participate in this survey. Hong Kong based respondents were not examined in this study.

Respondents in the housing construction sector can be classified into two categories. The first category is the wood processors who produce wood products for construction purposes. The second category is the contractors who are involved in construction of housing units. Respondents in the interior decoration sector can be defined as the manufacturers of all wood-based materials which are used for functional and decorative purposes to complete the interior of a housing unit, for example, mouldings, flooring, doors, windows, and kitchen sets. Respondents in the furniture sector can be defined as manufacturers of (wood-based) indoor furniture, for example, dining tables, chairs, cabinets, sofas, and beds.

Rating of Factors

In order to identify the most important factors that will influence industrial wood consumers to adopt a new wood product (i.e. a new material, product or species), respondents were invited to consider the importance rating of eight determinant factors: A. *Wood Properties*; B. *Price*; C. *Availability*; D. *Product Quality*; E. *Services*; F. *Environmental Issues*; G. *Customer Preferences*; and H. *Experiences of Other Users*. The importance rating is scaled from 1 to 9, where 1 refers to not important and 9 refers to very important. The different factors are defined:

- Wood Properties refers to wood density; surface hardness; compressive strength; good nailing properties; light in weight, ease of handling; and smooth surface area (fine grain).
- Price refers to the cost of the material or product.
- Availability refers to the availability of a regular product supply, and the ability to offer different product favourites.
- Product quality refers to consistency (relative to specifications) of size and quality, and being free of sapstain.
- Services refers to reliability of delivery, the provision of technical assistance, the provision of credit and flexible payment terms.
- Environmental issues refers to the ability to provide an officially approved sustainability certificate.
- Customer preferences refers to feedback from customers.
- Experience of Other Users refers to feedback from other users.

Additional Information

Apart from asking respondents to rate the eight determinant factors, respondents were also asked to provide information on their businesses including:

- Other factors that influence them in adopting a new wood-based product or timber species in their operations.
- Total annual volume of wood products consumed, and timber species used, in 2001.
- The products produced.

Results

One hundred questionnaires were distributed in each sector during two trade shows and on-site visits for each sector in Guangdong province and Hong Kong. The number of respondents by business field is summarised in Table 1. The completed survey response rates were 19%, 36%, and 52% respectively for the housing construction, interior decoration, and furniture sectors.

Most wood processors reported that they were involved in importing primary wood products for wood processing and selling their products (e.g. plywood) to the domestic market. Most of their products were used for temporary construction. Only one respondent was involved in exporting pre-fabricated wooden frames to the Japanese residential market.

Table 1: Number of Respondents by wood sector.

Wood sector	Number of Respondents
Housing Construction Sector	
Wood processors	7
Construction contractors	12
Interior Decoration Sector	
Wood-based interior decoration manufacturers	36
Furniture Sector	
Wood-based indoor furniture manufacturers	52

In the interior decoration sector survey, 36 interior decoration material manufacturers participated, of which 21 respondents were "export" focused (and two respondents did not specify whether they were export or domestic focused). Wood flooring, mouldings, doors, wall panels, and cabinets were the major products manufactured by the respondents.

In the furniture sector survey, 52 indoor wood-based furniture manufacturers participated. They were mostly involved in domestic wholesaling and export as part of their value chains. In addition, five respondents indicated that they were also involved in furniture retailing. Dining tables, chairs, sofas, computer desks, study desks, bookshelves, and beds were the major products manufactured by the respondents.

Wood volumes consumed by respondents

The volume of wood consumed by different respondents varied considerably (Table 2). Wood processors in the housing construction sector were relatively large-scale consumers of logs.

Types of wood products used by respondents

Logs, both softwood and hardwood, and hardwood veneer were the main wood products used by wood processors in the housing construction sector (Table 3). Construction contractors used mostly softwood plywood

Table 2: Total volume/annum of wood products used by respondents in 2001, by sector (thousand m³/annum).²

SECTOR		Average	Standard deviation	Sample size (n)	Minimum	Maximum
Housing Construction	Wood Processors	170	112	7	45	360
	Construction Contractors	12	6	12	7	23
Interior Decoration		8	11	36	1	48
Furniture		5	3	52	1	18

² Total annual wood volume used in 2001 is an estimation only without conversion to roundwood equivalent (i.e. sawn timber is not converted into roundwood equivalent).

Table 3: Percentage of the total volume of wood used in 2001 within each sector by type of wood product (each column sums to 100%).

Type of Wood Products	Wood Processors	Construction Contractors	Interior Decoration	Furniture
Softwood logs	53	1	25	0
Softwood sawn timber	2	24	7	19
Softwood veneer	0	0	0	0
Softwood plywood	1	43	14	15
Particleboard	0	0	3	14
Fibreboard (MDF)	1	1	4	3
Hardwood logs	22	1	5	2
Hardwood sawn timber	2	24	27	40
Hardwood veneer	19	0	3	1
Hardwood plywood	0	6	12	6

and sawn timber (softwood and hardwood).

Respondents in the interior decoration sector primarily used sawn timber (mainly hardwood), softwood logs and plywood (both softwood and hardwood). Furniture manufacturers largely used sawn timber, plywood and particleboard.

Table 4 indicates that the majority of respondents use radiata pine although not necessarily radiata pine from New Zealand. This may reflect the region in which the questionnaires were distributed - Guangdong province - which is the major destination for radiata pine exports. It is interesting to note that the furniture industry respondents were also using wood products from Chinese, European

and Southeast Asian origin - Chinese birch and unspecified species, rubberwood, rosewood and European beech - but none from North American sources. These exporters may be targeting other provinces.

The situation is similar in the interior decoration sector, although use of radiata pine (by 53 percent of respondents) was not as predominant as in the furniture sector. Surprisingly, a large percentage of housing construction respondents used radiata pine as well as Russian coniferous species, European beech, and Chinese unspecified species. However, it is important to note that the products produced by the housing construction sector are not necessarily structural products. Another interesting

Table 4: Consumption of wood products by species and sector. (The first column under each sector gives the percentage of respondents that use a particular species. The second column gives the mean percentage of respondent's total annual volume used in 2001.)

	SECTOR					
	Housing Construction (Processors & Construction Contractors)		Interior Decoration		Furniture	
SPECIES	% of respondents	Mean (in %)	% of respondents	Mean (in %)	% of respondents	Mean (in %)
American red oak	0	0	0	0	0	0
American white oak	0	0	0	0	0	0
American walnut	0	0	0	0	0	0
Chinese unspecified species	79	9	58	23	98	17
Chinese birch	63	1	69	5	54	5
Chinese fir	0	0	0	0	0	0
Chinese red oak	0	0	3	0	2	0
Chinese white oak	0	0	0	0	0	0
Chinese walnut	0	0	3	0	0	0
Douglas-fir	0	0	0	0	0	0
Eucalyptus	0	0	0	0	0	0
European beech	58	4	89	21	87	17
Hemlock - Pacific Coast	0	0	0	0	0	0
Hemlock - western	0	0	6	0	0	0
Mahogany	0	0	36	4	19	2
Pine- maritime	0	0	0	0	0	0
Pine - New Zealand	32	16	3	1	8	3
Pine - radiata (non-specified origin)	84	51	53	43	87	34
Pine - ponderosa	0	0	0	0	0	0
Pine - southern yellow	0	0	0	0	0	0
Russian coniferous	63	19	0	0	0	0
Polar	0	0	0	0	0	0
Rosewood	0	0	6	0	54	7
Rubberwood	0	0	28	2	73	15
Spruce - Sitka	0	0	0	0	0	0
Teak	0	0	22	1	8	0

point is that Russian coniferous species are being used by a large percentage of housing construction respondents in the South of China - this province being a significant distance from the Russian border.

Importance Ratings

Results for each group of respondents are presented in Figs. 1 to 4. *Price* and *Environmental Issues* are rated as the two most important factors in all groups. In the furniture sector they have a significantly higher rating than all other factors; in the interior decoration sector they have a significantly higher rating than all other factors apart from *Services*; while in the housing construction sector there is also overlap of confidence intervals with *Services* and some overlap with *Wood Properties*, *Availability* and *Product Quality*.

It is evident that there is a large degree of consistency both in the relative rating of the different factors and in the absolute rating. *Price* and *Environmental Issues* stand

out as being most important, followed by the cluster of *Services*, *Wood Properties*, *Availability* and *Product Quality*. Much less important are *Experiences of Other Users* and *Customer Preferences*.

Discussion

Price and Environmental Issues

One of the main findings of this survey is that *Environmental Issues* are rated almost as highly as *Price*. This is likely to reflect the emphasis given to environmental issues by relatively recent changes in government policy in 1998. These changes require developers to consider environmental issues when submitting their development plans, for example, to discourage illegal harvest from natural forests, reduce the amount of construction waste, and use "harmless to human", energy efficient, and recyclable materials in their development plans (SEPA 2005). In addition, a national labelling scheme – China

Fig. 1: Housing Construction Sector: Wood Processors –Importance Rating with Respect to the Eight Determinant Factors. (95% Confidence Intervals)

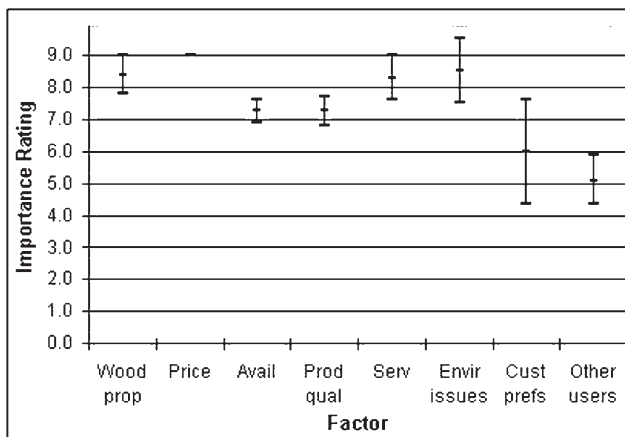


Fig. 2: Housing Construction Sector: Construction Contractors –Importance Rating with Respect to the Eight Determinant Factors. (95% Confidence Intervals)

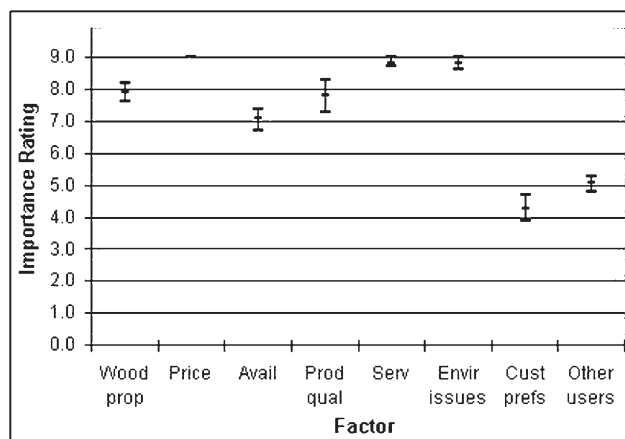


Fig. 3: Interior Decoration Sector: Interior Decoration Material Manufacturers –Importance Rating with Respect to the Eight Determinant Factors. (95% Confidence Intervals)

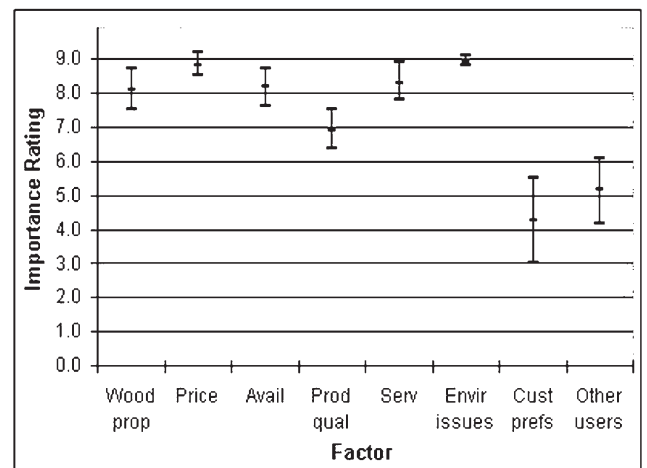
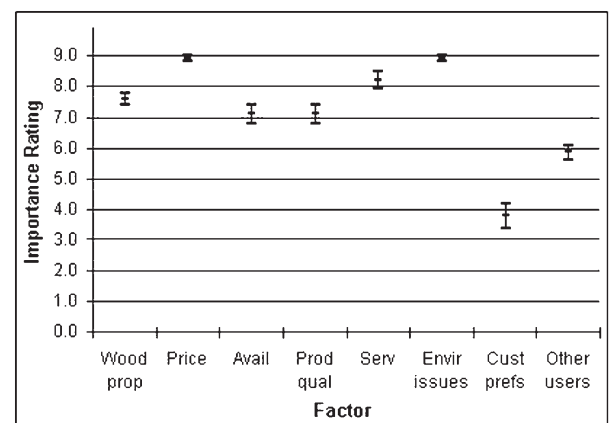


Fig. 4: Furniture Sector: Furniture Manufacturers –Importance Rating with Respect to the Eight Determinant Factors. (95% Confidence Intervals)



Environmental Labelling Scheme (Fig. 5) was established by the State Environmental Protection Administration of China (SEPA) and a NGO – the Green Council, to test and certify products which meet the SEPA environmental criteria and recommended by SEPA (Green Council 2005).

Fig. 5: Green Council Environmental Label.



Consequently, construction contractors tendering for contracts from developers are also required to consider these environmental issues, and prefer their wood products suppliers (wood processors) to supply environmentally acceptable products. Moreover, many developers are now selling turnkey housing units instead of selling unfinished housing units, and sub-contractors in the interior decoration sector tendering for interior decoration projects from developers (or contractors) are also required to consider using certified products. As a result, interior decoration manufacturers have also become more concerned about environmental issues. For furniture manufacturers, rising environmentalism in both domestic and overseas markets has driven furniture manufacturers to consider using certified wood products.

Although the results in this study indicate the importance of environmental issues in their decision-making processes, most respondents state that price is still the most important factor. Based on anecdotal information obtained during the survey, some respondents indicated that they will use certified wood products only if comparable in price to non-certified products. This is understandable as the recent policy changes only provide incentives and encouragement without enforcement to use certified products. For example, decision-making on a successful construction tender is based on many factors such as tender price, reputation and capital of the bidder, planning, and use of environmental certified products. Price is likely to be weighted more heavily than other factors.

Services

Although *Services* were highly rated by all sectors, the interior decoration sector rated *Services* higher than other sectors. Most interior decoration material manufacturers noted that they have to provide credit to wholesalers, retailers, and interior decoration sub-contractors. They usually do not receive cash until their goods are sold, or until interior decoration sub-contractors receive their partial payments from developers or property owners. Unless they have overseas orders, they are unlikely to get any financial assistance from banks. Hence, they are more concerned with financial services compared with other

services such as delivery time or technical assistance.

Wood Properties

Wood Properties is regarded as an important factor by wood processors and construction contractors, even when wood products are used for temporary housing construction. For instance, load testing is still required for wood products used for formwork in high-rise buildings (China Ministry of Construction 2002).

Many respondents from the flooring and solid wood furniture manufacturers indicated that *Wood Properties*, in terms of density and surface smoothness, are important issues that will influence them to adopt a new wood product.

Availability

The construction contractors rated *Availability* as a relatively more important factor in comparison to other sectors. One reason is that construction contractors have to sign contracts with the developers, and contractors must follow the schedules stated in their contracts.

Product Quality

The interior decoration sector gave *Product Quality* (here defined with a focus on consistency) a higher rating in comparison to other sectors. One of the reasons is that many respondents in the interior decoration sector produce flooring and mouldings. Flooring manufacturers require wood products to be more precise for continuous processing while mouldings manufacturers most often require certain clear lengths for door frames and skirting manufacture.

The furniture sector was also thought to be more concerned about *Product Quality*. However, results do not support this hypothesis. Although many furniture manufacturers state that they do not accept knotty wood products, they only require one or two clear faces and they can manually remove the knots and finger-joint the clear sections. However, many furniture manufacturers indicate that *Product Quality* with respect to moisture content is the most important factor that will influence them because they do not have their own kiln drying facilities.

Experiences of Other Users

The Experiences of Other Users was given a relatively low rating by all sectors although the furniture sector rated it as being more important in comparison to the other sectors. Most of the respondents have been using logs, sawn timber, MDF, or plywood for a long time and prefer to try a new product themselves rather than relying on the views and experiences of other users.

Customer Preferences

It is surprising that most respondents rated *Customer Preferences* as the least important factor. Wood processors in the housing sector rated *Customer Preferences* higher than other sectors. One explanation is that most of these wood processors are targeting domestic construction contractors, and they tend to develop a closer relationship with their customers than other sectors.

Construction contractors also target the domestic market, but they did not rate *Customer Preferences* as relatively more important than other sectors. One reason is that most of their wood products are used for temporary construction. As long as the construction contractors can complete their jobs in terms of time and specification according to the contracts, the developers are unlikely to influence the materials used by contractors, except where developers stated the materials in the contracts.

Most of the respondents from the interior decoration and furniture sectors consistently ranked *Customer Preferences* as the least important factor. One explanation is that most of these manufacturers are not directly communicating with their customers. They are imitating the most popular goods from the markets. If their goods can be sold quickly, they will produce more; otherwise, they will imitate other styles from the markets to generate more sales; i.e. industrial wood consumers (producers) tend to be sales focused and use sales revenue as their market indicator.

Survey Limitations

The response rate to surveys in China is usually low because respondents are reluctant to provide information. This study received only 19, 36, and 52 questionnaires respectively from the 100 distributed to each of the housing construction, interior decoration, and furniture sectors in southern China.

Respondents were chosen in two individual trade shows and personal visits. An assumption has been made that all the respondents are independent and unbiased.

Most respondents are from Guangdong province, southern China. Due to the geographic, cultural, and provincial regulatory differences, the results in this study may not represent all the industrial wood consumers in relation to the housing construction, interior decoration, and furniture sectors in China.

Summary

This survey has confirmed some widely held views (USDA 2001a, 2001b, 2002) about China's industrial wood products market. Industrial consumers have diversified species preferences but they are significantly price-conscious in adopting a new wood product. A less widely known trend is the importance of environmentally acceptable products - both for industries which are producing products for export (i.e. furniture) and for the domestic market. Wood Properties, Availability, Product Quality, and Services were still rated as very important factors and may serve as features that the New Zealand forestry sector may use to differentiate its products from other countries.

A positive feature was the high proportion of respondents already using radiata pine although not necessarily from New Zealand. Given that the respondents in the region surveyed are price-conscious, the challenge for New Zealand exporters is to remain cost-competitive with other sources in order to fulfil the vision of profitably exporting significant volumes of value-added wood

products to that market. A successful industry strategy to achieve this aim may also consider exploring opportunities to access the Chinese end consumer rather than targeting price-conscious processors and manufacturers such as those surveyed in this report.

References

- China Ministry of Construction. 2002: Code for the Construction Quality Acceptance of Timber Structures (GB 50206-2002). 86 pp.
- Freese, R. 2001: China's Construction Market: A New Star in the East. *AgExporter* 13(1): 15-18.
- Global Trade Information Services. 2005: "World Trade Atlas. Trade Information System. 4.4c." Global Trade Information Services, Inc.
- Green Council. 2005: (<http://www.greencouncil.org>) [Accessed 16 April 2005]
- Li, H. 1997. "China: Forest Resources, Products, and Market Opportunities." Miller Freeman. San Francisco. 128 pp.
- SEPA (State Environmental Protection Administration of China) 2005: (<http://www.sepa.gov.cn>). [Accessed 16 April 2005]
- Sun, X.; Hammett, A.L.; West, C.D. 1999: Chinese Furniture Industry: Its development and wood use. *Forest Products Journal* 49(10): 31-35.
- Turner, J.; Buongiorno, J.; Zhu, S.; Prestemon, J. 2005a: The United States forest sector in 2030: Markets and competitors. *Forest Products Journal* 55(5): 27-36.
- Turner J.; Maplesden F.; Walford B.; Jacobi, S. 2005b: Tariff and non-tariff barriers to New Zealand's exports of wood-based products to China. *New Zealand Journal of Forestry* 50(1): 27-33
- USDA. 2001a: China, Peoples Republic of Solid Wood Products Furniture Industry Report 2001. USDA (United States Department of Agriculture). *GAIN Report* No. CH1001. 20 pp.
- USDA. 2001b: China, Peoples Republic of, Solid Wood Products Annual 2001. United States Department of Agriculture, *GAIN Report* No. CH1032. 33 pp.
- USDA. 2002: China, Peoples Republic of Solid Wood Products Annual 2002. United States Department of Agriculture, *GAIN Report* No. CH2026. 41 pp.
- Xu, J.; White, A. 2004: Understanding the Chinese forest market and its global implications. *International Forestry Review* 6(3-4).
- Yang, Y. 2001: Impacts and Effectiveness of Logging Bans in Natural Forests: People's Republic of China. Pp. 81-102 in Food and Agriculture Organisation (Ed.) "Forests Out of Bounds: Impacts and effectiveness of logging bans in natural forest in Asia-Pacific". FAO Asia Pacific Forestry Commission.
- Zhang, D.; Liu, J.; Granskog, J.; Gan, J. 1998: China: Changing Wood Products Markets. *Forest Products Journal* 48(6): 14-20.