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An overview of the wood product import sector in the United States with an emphasis on opportunities for Sri Lankan exporters

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AN OVERVIEW OF THE WOOD PRODUCT IMPORT SECTOR IN THE UNITED STATES WITH AN EMPHASIS ON OPPORTUNITIES FOR SRI LANKAN EXPORTERS

A Thesis
Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for degree of Master of Science

In
The School of Renewable Natural Resources

By
Rangika Thilaksri Perera
B.Sc., University of Sri Jayewardenepura, Sri Lanka, 2005
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ABSTRACT

The U.S. has dramatically altered its wood product imports and exports during the past few years, and at present, it is the leading wood product importer in the world. An understanding of market structures, factors in selecting foreign suppliers and the emphasis they place on environmental issues/certification are critical to understand from the perspective of wood products importers in the U.S.

Sri Lanka exports wood products to U.S. markets. Sri Lanka’s wood product manufacturing sector is characterized by small companies, low volumes of production, inefficient processing techniques, and outdated processing equipment. However, Sri Lankan wood products are generally of good quality. Given sufficient institutional and technological assistance, this sector has potential to grow. In order to derive maximum benefits from emerging global markets and opportunities, it is important to identify the current trade and development barriers that exist in Sri Lanka from the perspective of wood product exporters.

Two studies were conducted for this thesis. First, a study of U.S. wood products importers was conducted using a mail survey and the second study surveyed Sri Lankan wood products exporters via personal interviews. Results identify three wood product importer segments in the U.S. market. Although these three segments did not differ in terms of sources of information they use or buyer selection criteria, they differed significantly on their emphasis on environmental claims/certification, consistent supply and fair prices in foreign buyer selection. Certification and marketing, product attributes, client contact, supply of quality products, and timber species and supplier reputation are the factors valued most by U.S importers when selecting foreign suppliers. A plurality of respondents import certified products with Forest
Stewardship Council (FSC) being the most accepted certification program followed Sustainable Forestry Initiative (SFI).

Sri Lankan wood products exporters are small in scale and many of them are newcomers to the export market. Inefficient internal and external transportation procedures, lack of supportive government policies, lengthy custom procedures, lack of experienced labor, old production technology, and difficulty in meeting buyer’s delivery schedules are the prominent constraints and issues facing Sri Lanka’s wood products export sector. Although a majority of respondents export non-certified products, they are willing to know more about forest certification if it can help develop international markets. Both U.S. wood products importers and Sri Lankan exporters are not willing to pay the cost of certification.
CHAPTER 1: INTRODUCTION AND STUDY OBJECTIVES

1.1 Introduction

Growing demand for wood has exerted a greater pressure on primary old growth forests in the world. Therefore, many countries are considering secondary timber resources such as forest plantations. Other than the secondary timber resources, imports also play a key role in meeting the demand for timber and wood products in most countries (Mille, 2006). The rapid increase of domestic wood demand has driven some nations into a state where they are insufficient with wood while forcing some countries to shift from being net exporters of wood to becoming net importers (FAO, 2006). These global developments have intensified the need for cross-boundary trade of wood products.

Exports create foreign exchange and can generate employment. Although policy formulators tend to encourage exports, ideas on imports are diverse and conflicting. However, imports are also important to a country’s economy in many ways. Imports can fulfill the accessible deficit of goods and services which are essential for the well being of people while often facilitating the sustainable utilization of existing resources. In addition, imports generate employment in handling, transportation, marketing, and other segments of the value chain (US Department of Commerce, 2007).

The U.S. is the leading wood product importer in the world (fas.usda, 2006). Although the U.S. has been a relatively small consumer of tropical hardwoods (Duery, 2001), Metafore (2006) suggests that markets for tropical products such as plywood and wooden flooring will expand in the future. These market expansions provide opportunities for suppliers of tropical hardwood flooring products to increase sales in the U.S. market, particularly for fixed-width lumber and pre-finished flooring products (Metafore, 2006).
The trend towards higher usage of pre-finished products will create an excellent prospect for suppliers that can deliver quality tropical species. Tropical timber imports/trade in the U.S. seems to be highly fragmented (Metafore, 2006). This means even small to medium scale export manufacturers can thrive on these opportunities. Design and quality of timber products is increasingly being associated as a means of maintaining or increasing market share.

At present, the U.S. import wood products markets are less strict on environmental claims in comparison to European Union (EU) importers. However, with ever-increasing environmental awareness throughout the globe, it is very possible that certification will become a key factor in accessing the U.S. markets in the future. This will provide excellent opportunities for countries that can cater to high-end niche markets for certified products. Therefore, U.S. markets are potentially lucrative markets for Sri Lanka’s finished and semi-finished wood products, particularly if certification can be a profit-generating activity.

Sri Lanka’s wood product manufacturing sector is characterized by low volume and high waste, but producing good quality products. Despite a sufficient forest resource base, this sector faces many obstacles for expansion. Lack of capital and technology, overdependence on a limited number of species, unorganized industrial structure, and legal constraints have restricted the growth of the industry. In addition, forest plantations, seen by many as taking pressure of scarce primary and secondary forests, are managed unsatisfactorily, yielding low quality timber.

In order to derive maximum benefits from these emerging global markets and opportunities, it is important to identify the current trade and development barriers that exist in Sri Lanka from wood product exporters’ perspective. Identifying constraints in the export wood products industry would help policy makers to make necessary changes to facilitate development of a sustainable Sri Lankan export sector.
In addition, identifying U.S. tropical timber importer’s requirements and factors they look at in selecting their foreign suppliers will help Sri Lankan export wood products manufacturers to re-structure themselves to better serve the U.S. and other foreign markets. The study of the U.S. wood products importers was conducted using a mail survey of all currently known wood product importers (n=158) selected from the Random Lengths Buyers and Sellers Directory of the Forest Products Industry (2006). The second survey targeted Sri Lankan wood products exporters (n=100) and data were gathered from face-to-face interviews. The list of Sri Lankan exports was provided by cross-referencing Sri Lankan business directories and association member lists. The study better frames demand and supply issues including forest certification from the perspective of U.S. wood product importers, and Sri Lankan exporters seeking to expand their wood products exports. Specifically, this study attempts to accomplish the objectives listed in section 1.2.

1.2 Study Objectives

1. Identify the structure of the U.S. wood product import market.

2. Explore demand factors and opportunities in the U.S. market for international exporters selling into the U.S. market.

3. Identify the status and perceived barriers for wood product exporters in Sri Lanka.

4. Identify U.S. importer and Sri Lankan exporter perceptions towards forest certification.
CHAPTER 2: LITERATURE REVIEW

2.1 An Introduction to Wood-based Industries in Sri Lanka

Sri Lanka has been endowed with ample natural resources to enrich and sustain the lives of its people. Forest resources are one such resource. The forestry sector in Sri Lanka is comprised of natural forests and forest services, forest plantations, home gardens, other non-forest tree resources, wood and wood-based industries, non-wood forest products, and bioenergy. It is one of the sectors which has shown gradual improvement over the years and has tremendous potential to grow. Wood-based exporting industries are an emerging sector. Private sector investment and involvement is the primary reason for the expansion of the forestry sector including wood and wood-based industries.

2.1.1 Sri Lanka’s Export Economy

The export sector plays a major role in Sri Lanka’s national economy. It provides numerous direct and indirect economic opportunities and greatly contributes to the country’s development in terms of employment and foreign income generation. When comparing the export earnings of Sri Lanka during the period of January to March of 2007 with the corresponding period of 2006, a 13% incremental growth in export earnings in 2007 took place (Export Development Board, 2007). At the end of year 2006, the country’s total exports were US $ 6,829.5 million while total imports were valued at US $ 9,867.7 million (Table 1) (Sri Lanka Department of Census and Statistics, 2006). As Figure 1 and Table 1 suggest, both total exports and total imports have been increasing over the past three years (2004 to 2006). However, total imports incrementally were much higher than the total export growth compared to the previous year. A sharp increase in the import sector can be observed from year 2005 to 2006 (Figure 1). This can be partially attributed to the breakout of civil war in the country, which has created an inhospitable environment for businesses and foreign investments.
Table 1: Total value of imports and exports in 2006 (in US $ Million)

<table>
<thead>
<tr>
<th>Type of trade</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>$ Change 2005-2006</th>
<th>% Change 2005-2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total exports</td>
<td>5,612.4</td>
<td>6,165.4</td>
<td>6,829.5</td>
<td>664.1</td>
<td>10.8</td>
</tr>
<tr>
<td>Total imports</td>
<td>7,925.9</td>
<td>8,315.2</td>
<td>9,867.7</td>
<td>1,552.5</td>
<td>18.7</td>
</tr>
<tr>
<td>Total trade</td>
<td>13,538.3</td>
<td>14,480.6</td>
<td>16,697.2</td>
<td>2,216.6</td>
<td>15.3</td>
</tr>
<tr>
<td>Balance of trade</td>
<td>-2,313.6</td>
<td>-2,149.8</td>
<td>-3,038.2</td>
<td>-888.4</td>
<td>41.3</td>
</tr>
</tbody>
</table>

Source: Department of Census and Statistic, 2006

Figure 1: Total imports and exports in Sri Lanka: 2004-2006
(Source: Department of census and statistics)

Textiles and apparel accounted for more than 50% of Sri Lankan export value in 2006. Other major sectors are tea (16%), rubber based products (8%), diamonds (6%), minor agricultural products such as spices, vegetables, and beedi leaves (4%), petroleum products (3%), coconut products (2%), rubber (2%), and gems (2%) (Figure 2). Forestry is considered as sub-sector under agriculture and as such, wood and wood product exports are often categorized under agriculture.
2.1.2 The Forest Products Industry

The wood-based manufacturing sector in Sri Lanka consists of a variety of industries including saw milling, furniture, construction, parquet flooring, wood-based panel products and carvings. The sector depends almost entirely on local wood supply for raw materials. It is estimated that there are over 9,000 furniture and other woodworking industrial plants in Sri Lanka with an estimated employment over 28,000 (EDB 2006). Most of the furniture and woodworking mills are concentrated in few areas such as Moratuwa and Ambalangoda which are traditionally known for woodworking. These industries predominantly supply their products to the domestic market while a smaller number of manufacturers target export markets.

The particleboard and fiber board industries depend mainly on imports. In 2001, domestic resources contribute about 61 percent of the national requirement of about 0.031 million tons of fiber for making paper and the balance was imports (FAO, 2002). There are two government-owned paper mills in the country; one has been closed while the other is operating below its production capacity.
The main reason for fiber and paper product imports is the inadequate technology the mills have to utilize the domestic fiber resources. Many pine forest plantations were established with the expectation of utilizing them as fiber resources, however the necessary technology to process pine fibers was found to be too expensive and plantation wood quality is low.

Despite these drawbacks, both wood and paper industrial production in the country have shown a gradual increase over the past decade (Figure 3) with majority of the production was domestically consumed.

![Figure 3: Wood and Paper production (1990 – first half 2003)](image)

As indicated by Table 2, logs and sawn timber production overall shows a decrease, but the production of railway sleepers and transmission poles has increased with growing infrastructure developments. However, these figures mainly represent timber from state-managed timber sources.
Table 2: Timber production from State forests

<table>
<thead>
<tr>
<th>Item</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logs (m³)</td>
<td>86,952</td>
<td>88,284</td>
<td>99,080</td>
<td>109,024</td>
<td>112,181</td>
<td>99,488</td>
<td>88,028</td>
<td>13,368</td>
</tr>
<tr>
<td>Sawn timber (m³)</td>
<td>6,607</td>
<td>6,202</td>
<td>9,012</td>
<td>8,230</td>
<td>5,378</td>
<td>4,415</td>
<td>3,255</td>
<td>4,046</td>
</tr>
<tr>
<td>Railway sleepers (number)</td>
<td>77,092</td>
<td>95,043</td>
<td>222,180</td>
<td>145,326</td>
<td>168,321</td>
<td>100,472</td>
<td>108,648</td>
<td>106,135</td>
</tr>
<tr>
<td>Transmission poles (number)</td>
<td>39,316</td>
<td>43,657</td>
<td>92,094</td>
<td>-</td>
<td>13,115</td>
<td>36,554</td>
<td>35,532</td>
<td>52,025</td>
</tr>
<tr>
<td>Firewood (m³)</td>
<td>169,568</td>
<td>103,976</td>
<td>169,597</td>
<td>142,259</td>
<td>96,439</td>
<td>103,882</td>
<td>82,738</td>
<td>168,216</td>
</tr>
</tbody>
</table>

Source: State Timber Corporation, 2005

2.1.3 Wood and Wood Products Exports

According to the Central Bank of Sri Lanka (2006), the agricultural sector accounted for 17.8 percent of the Gross Domestic Product in 2005. Minor agricultural product sector contribution to the country’s exports was only 4 percent in 2006. There are no detailed records for the forestry sector’s contribution to the national economy. Forestry is considered as sub-sector under agriculture and as such, wood and wood product exports are often categorized under agriculture. As indicated in Table 3, of total exports in 2006, only 0.46 percent was from wood and wood products and 0.65 percent was from paper and paper products. Wood and articles of wood is the only product description category found in export records and it accounted for almost all the wood and wood product exports.

Currently, wooden products such as brooms and brush blocks, parquet, plywood, household utility items, wooden toys, carvings and ornaments, household furniture, office furniture and furniture in knockdown form are exported according to buyer specifications to markets mainly in UK, USA, India, France, Germany, Saudi Arabia and Maldives (EDB, 2005). Sri Lanka is competent in producing such items to the higher end of the market. In addition, the country also exports fibers (coir), charcoal/activated carbon, decorative/hand-made paper and wood residuals.
Table 3: Total value of wood and related wood products import and export

<table>
<thead>
<tr>
<th>Product description</th>
<th>2005</th>
<th>Percentage</th>
<th>2006</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M.US$</td>
<td></td>
<td>M.US$</td>
<td></td>
</tr>
<tr>
<td>Wood &amp; articles of wood</td>
<td>30.91</td>
<td>0.50</td>
<td>31.32</td>
<td>0.46</td>
</tr>
<tr>
<td>Wood charcoal cork &amp; articles of cork</td>
<td>0.03</td>
<td>0.00</td>
<td>0.01</td>
<td>0.00</td>
</tr>
<tr>
<td>Manufactures of straw of esparto or of other plating materials</td>
<td>0.07</td>
<td>0.00</td>
<td>0.08</td>
<td>0.00</td>
</tr>
<tr>
<td>Total for section</td>
<td>31.01</td>
<td>0.50</td>
<td>31.41</td>
<td>0.46</td>
</tr>
<tr>
<td>Paper-making materials, Paper &amp; paper board there of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paper-making materials</td>
<td>10.74</td>
<td>0.17</td>
<td>12.83</td>
<td>0.19</td>
</tr>
<tr>
<td>Paper and paper board article of</td>
<td>18.54</td>
<td>0.30</td>
<td>16.51</td>
<td>0.24</td>
</tr>
<tr>
<td>Printed books, news papers, pictures</td>
<td>8.56</td>
<td>0.14</td>
<td>14.91</td>
<td>0.22</td>
</tr>
<tr>
<td>Total for section</td>
<td>37.84</td>
<td>0.61</td>
<td>44.25</td>
<td>0.65</td>
</tr>
</tbody>
</table>

Source: Department of census and statistics, 2007

According to the Export Development Board of Sri Lanka (2006), there are nearly 100 wood and wood product exporters in the country. Almost half of these companies export furniture and furniture parts. Miscellaneous wood product such as table lamps, skipping ropes, rulers, ring mirrors, and handicrafts and articles are also among main export products. Only a limited number of companies are currently involved in exporting plywood or parquet flooring products (Figure 4).

2.1.4 Timber Resources

- Raw materials for the industry mainly come from the four major sources (FAO, 2002):
  - Forest plantations annually released by the Forest Department for harvesting
  - Forest plantations released by Regional Plantation Companies for harvesting
  - Timber from land clearance for development projects
  - Private home gardens

The State Timber Corporation (STC) currently has the monopoly for extracting timber, except private home gardens. The STC mainly sells timber through their public timber auctions.
In addition, timber from illegal logging and illicit timber confiscated by the judiciary also make a significant contribution. Timbers from illegal logging mainly go to small scale mills that produce for domestic market. These industries often buy timber directly from private landowners.

![Number of Wood Product Exporting Companies in Sri Lanka by Product Category](image)

**Figure 4**: Wood product export companies by product  
(Source: Export Development Board, 2007)

Jack (*Artocarpus heterophyllus*), Teak (*Tectona grandis*), Alstonia (*Alstonia macrophylla*), Mahogany (*Sweetenia macrophylla*), Ebony (*Diospyros ebenum*), Satin wood (*Zanthoxylum flavum*), Melia sp. and Coconut (*Cocos nucifera*) are among the main species utilized in domestic industries. Eucalypt species are mainly used for construction and railway sleepers. Exporting industries depend primarily on rubber wood for raw materials. Pine and other domestic species are used to a lesser extent. With existing natural forests becoming increasingly subjected to conservation pressure, forest plantations have been recognized as an alternative to meet the future demand for sawn timber. To realize this goal, the Forest Department of Sri Lanka has established many forest plantations with species such as eucalypts, teak and mahogany.
The Government also made the necessary provisions to increase private sector participation in forestry. As a result, in 2004, several plantation management companies have diversified their unproductive lands into forestry. According to the Ministry of Plantation Industries, the land area utilized for such diversification was 14,079 hectares in 2004. Compared to the previous year, this was a 48% increase (CBSL, 2004). There are many investors engaged in commercial forest plantations activities and therefore, the extent of newly planted area under commercial scale private forest plantations is expected to increase in the future. Most of the private companies mainly target commercial species such as rubber wood, teak, and mahogany. Over the past few years, popularity of coconut timber has increased due to its wide usage as rafters for roof construction (FAO, 2005). Table 4 shows the existing forest cover under different categories in 2005.

Table 4: Characteristics of forest and other wooded land (2005)

<table>
<thead>
<tr>
<th>Type of Forest Cover</th>
<th>Area/ 000 hectares</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>167</td>
</tr>
<tr>
<td>Modified natural</td>
<td>1,571</td>
</tr>
<tr>
<td>Productive plantation</td>
<td>171</td>
</tr>
<tr>
<td>Protective plantation</td>
<td>24</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,933</strong></td>
</tr>
</tbody>
</table>

Source: FAO, 2006

The country is divided in to three agro-ecological zones: wet zone, dry zone and intermediate zone. Annual average rainfall and mean annual temperature are the influential factors for this categorization. According to FAO (2002), wet zone home gardens have high timber densities and number of species than other regions. The total extent of home gardens in the country has been estimated to 858,490 ha (FSMP, 1995). Previous studies estimate the quantity of timber extracted from home garden to be as high as 68% of the annual national timber production of the country (FAO, 2002).
2.2. Barriers to Wood Product Export Development

The forestry sector in Sri Lanka is currently not a key component of the country’s economy. Unfortunately, many factors have hindered its development and existing resources remain unexploited. Following is a discussion of barriers to wood product export development.

2.2.1 Environmental/Conservation Pressure

a) Conservation oriented policies

Forest Policies in Sri Lanka have changed significantly over the past few decades. At present, forest policies in Sri Lanka have shifted from production-oriented to conservation-oriented due to conservation pressure. Selective logging in all forests in the country has been totally banned and many natural forests have been designated as protective forests (MAB-Sri Lanka, 2005). Logging of certain high-value timber species such as Jack (*Artocarpus heterophilus*) has been banned, even from home gardens. Other species such as Ebony has been essentially banned from international trade and can be sold only as crafts with special permits.

b) Certification

Certification is a market-based, non-regulatory forest conservation tool designed to recognize and promote environmentally-responsible forestry practices. The certification process involves an evaluation of management planning and forestry practices by a third-party according to an agreed-upon set of standards. Certification standards address social and economic aspects of forestry operations as well as environmental protection (Pinchot Institute for Conservation, 2004). During the past five years, demand for certified wood products from Sri Lanka has dramatically increased, particularly in European markets. Currently, Sri Lanka is unable to meet certified wood product demand. Certification and eco-labeling of wood products is relatively unfamiliar to Sri Lankan manufacturers.
They are often confused about benefits that certification could potentially bring. Certification carries a cost that supply chain members are not willing to pay unless there is a net profit (Perera et al. 2006). In 2005, wood products were primarily based on rubber wood (*Hevea brasiliensis*). Fifty-eight percent of the rubber plantations in the country are owned by 16 large-scale companies while the balance is owned by small holders. Of the 16 large plantations, four are certified under the FSC forest certification program. However, most wood product manufacturers see certification as a tool to encourage sustainable forest management practices. Some wood product manufacturing companies believe that they can capture a price premium for certified wood products from traditional timber species such as teak and mahogany (Perera et al. 2006).

2.2.2 Inflation Rate

High inflation rates discourage investments and lead to unhealthy business environments. According to the Central Bank of Sri Lanka (2007), Sri Lanka has the highest inflation rate in the Southeast Asia region\(^1\). Monetary pressure and rampant lending in 2006 increased the inflation rate in the country. Economists believe that recently introduced monetary policies will help to reduce the inflation rate in the future (Export Development Board, 2007).

2.2.3 Taxes

Exporters and manufacturers are subjected to several taxes in Sri Lanka. In 2004, medium sized Sri Lankan companies paid an average of 61 different taxes, spent 256 hrs filing and paying taxes, and typically paid 74.9 percent of their profits in taxes (Table 5). These numbers are significantly higher than for the Asia as a whole.

2.2.4 Infrastructure

An efficient transportation network is vital for the business development. A better transportation network facilitates timely delivery of goods and services.
Roads and railroads are the major infrastructure components in Sri Lanka.

**Table 5**: Types of taxes on a medium sized company in Sri Lanka compare to the Asian Region

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Sri Lanka</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payments (number)</td>
<td>61.0</td>
<td>30.1</td>
</tr>
<tr>
<td>Time (hours)</td>
<td>256.0</td>
<td>304.6</td>
</tr>
<tr>
<td>Profit tax (%)</td>
<td>36.8</td>
<td>20.3</td>
</tr>
<tr>
<td>Labor tax and contributions (%)</td>
<td>17.4</td>
<td>08.0</td>
</tr>
<tr>
<td>Other taxes (%)</td>
<td>20.8</td>
<td>16.8</td>
</tr>
<tr>
<td>Total tax rate (% profit)</td>
<td>74.9</td>
<td>45.1</td>
</tr>
</tbody>
</table>

Source: New Zealand and trade, Sri Lanka country brief, 2004

**a) Roads**: Roads are the major transportation system in the country with a road network of approximately 100,000 kilometers (62,140 miles) (nationsencyclopedia.com, 2007). Sri Lanka has a high road density when compared to other countries in South Asia\(^1\). However, current traffic congestion is high, attributed to poor road maintenance and roadside construction (World Bank, 2007). According to the World Bank, more than 50% of the country’s roads are classified as poor.

**b) Railroads**: Since 1928, Sri Lanka’s railroad system has been important in passenger and cargo transportation (World Bank, 2007). The railway system consists of 1,477 Km of railroad track and 306 stations. However, the rail network is not found in many non-urban parts of the country.

**2.2.5 Sectoral Policies**

The Forest Department and the Department of Wildlife Conservation in Sri Lanka are the major institutional units that are responsible for natural forest management. They are both under the Ministry of Forestry and Environment. In addition, the Ministry of Forestry and Environment

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\(^1\) Afghanistan, India, Nepal, Bhutan, Pakistan, Bangladesh, Maldives, and Sri Lanka
constitutes the Central Environment Authority which is responsible for overall environmental management. A Land-use Planning Unit established in the Ministry of Lands is charged with planning development in a sustainable manner and conserving natural resources. These institutions are responsible for various forestry related activities.

**a) Logging bans**

As a result of rapid declining natural forests, most of the Asian countries including Sri Lanka imposed logging bans on timber harvesting in certain forest types as well as for certain species. Logging bans are useful for forest conservation but may lead to negative impacts such as loss of employment, decline of production, illegal trade, and timber smuggling (FAO, 2006).

**b) Legal framework**

Currently, the STC has a monopoly in harvesting in state owned plantations. Furthermore, many timber species that are abundant have been protected by law and there are strict regulations in timber transportation. This has negatively affected raw material flows to wood-based industries.

**c) Trading across borders**

Although Sri Lanka has some of the more efficient ports in the Asian Region\(^2\), trading across borders is inefficient.

Out of 175 world economies, Sri Lanka is ranked 99\(^{th}\) in 2007 in terms of trading efficiency. For example, it takes an average of 25 days to export goods from the country while the paperwork includes eight documents to complete. Export procedures are relatively favorable in comparison to import procedure where, on average, it takes 27 days and 13 documents to clear

\(^2\) Afghanistan, Bangladesh, Cambodia, China, India, Indonesia, Japan, Laos, Malaysia, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Singapore, South Korea, Sri Lanka, Thailand, Taiwan, Tibet and Vietnam
goods from ports. In contrast, in Singapore, which ranks among one of the most efficient trading
countries in the region, it takes an average of six days to export goods and shipping costs are

2.2.6 Competitors

Sri Lanka faces intense competition from other wood producing countries. Considerable
percentage of wood products comes from other tropical producing countries in South East Asia\(^3\)
who are also supplying products for high-end markets. Leading wood product exporter of the
world for the past few years was Canada followed by EU countries and USA (Figure 5).
Recently, China has emerged as a key player in wood products exports.

2.3 Competitive Advantages for the Wood Product Export Sector

Despite many constraints, there are still opportunities for Sri Lankan wood products
manufacturers to participate in the global marketplace. Sri Lankan exporters have several
strengths where they can gain a competitive advantage over their competitors.

2.3.1 Increasing Demand for Wood Products in the World

Globally, increasing population, industrialization, and urbanization have resulted in
increased demand for wood and wood products (woodconsumption.org, 2007).

These trends have placed increased emphasis on global forest products trade. As a result
of the growing demand for wood products, many new markets have opened up that Sri Lankan
export manufacturers can target. For instance, many E.U. countries demand imported wood
product that are be environmentally certified. Introduction of forest certification to Sri Lanka’s
forestry sector can help exploiting these new market opportunities.

\(^3\) Singapore, Brunei, Thailand, Mynmar (Burma), Indonesia, Malaysia, Laos, Cambodia, Vietnam, Philippines, East
Timor
Figure 5: Top 10 wood product exporters in the world (2000-2004)
(Source: fas.usda, 2006)

2.3.2 Business Environment in Sri Lanka

According to the World Bank (2007), Sri Lanka is categorized as a lower-middle income country in terms of the economy. Gross National Income (GNI) per capita in the country was about US $1,160.00 and the population exceeded 19.5 million in 2006. Figure 6 compares business regulations in the region with 175 economies around the world.

Sri Lanka was ranked 89th. The top ranked countries in the Asian region are the Maldives (53) and Pakistan (74), followed by Bangladesh (88), Sri Lanka (89), Nepal (100), India (134), Bhutan (138), and Afghanistan (162).

Sri Lanka lies in the first 50% of world economies in terms of conditions that exist for starting a business (44), closing a business (59), protecting investors (60), dealing with licenses (71), doing business (89), and enforcing contracts (90) respectively.
Figure 7 illustrates Sri Lanka’s world rankings in terms of various business environment indicators. Sri Lanka is ranked 4\textsuperscript{th} overall in South Asia and hence, is one of the best countries in the region for foreign business investments (southasiabiz.com, 2007).


2.3.3 Trade Policies

Since 1977, trade liberalization has opened many doors in the Sri Lankan economy including the export sector (EDB, 2007).

The country has nearly 100\% foreign investment freedom except for a few exceptions such as commercial banks. Over the years, since the trade liberalization, most of imported goods have benefited from duty-free access and this, in turn, has helped to stimulate the export sector. Foreign investment and private sector involvement have dramatically increased as a result of trade liberalization and tariff/non tariff subsidies (Athukorala and Jayasuriya, 2004).
2.3.4 Flexible Export Duties

Natural resource-based products in Sri Lanka are subject to royalties, duties, and cesses (a local levy on commodity or product for special purposes). In order to encourage foreign investment and exports, Sri Lanka has been adopting flexible taxes and policies. Although export polices have some inconsistencies, export products are exempted from duties or subjected to concessionary duty rates while start-up subsidies have been made available for new exporters (Custom Sri Lanka, 2007; WTO, 2004).

In addition, export promotional schemes have been introduced to develop all export-related industries to help Sri Lanka’s economy to become more export oriented (Customs in Sri Lanka, 2007). In addition, the Export Development Board encourages Sri Lankan exporters by assisting them to find foreign markets.
2.3.5 Trade Agreements

Sri Lanka has signed several trade agreements to promote trade and development in the country (Export Development Board 2007).

Some important agreements are:

- India-Sri Lanka Free Trade Agreement
- Pakistan-Sri Lanka Free Trade Agreement
- South Asia Preferential Trade Agreement (SAPTA)
- Asia Pacific Trade Agreement (APTA)
- General Agreement on Trade in Services (GATS)

These agreements help to regulate credible and reliable international trade rules. They also ensure fair and equitable treatment for all the participants through a legal framework (Board of Investments, 2007). Tariffs under the India-Sri Lanka Free Trade Agreement are considerably lower than those found under other global pacts and agreements (Table 6).

Table 6: Average applied tariffs under existing agreements

<table>
<thead>
<tr>
<th>Agreement</th>
<th>Average Tariff</th>
</tr>
</thead>
<tbody>
<tr>
<td>India-Sri Lanka Free Trade Agreement</td>
<td>8.26%</td>
</tr>
<tr>
<td>General</td>
<td>9.73%</td>
</tr>
<tr>
<td>Least developed countries</td>
<td>9.71%</td>
</tr>
<tr>
<td>Bangkok Agreement</td>
<td>9.66%</td>
</tr>
<tr>
<td>Global System of Trade Preference</td>
<td>9.72%</td>
</tr>
<tr>
<td>Overall average applied tariff</td>
<td>9.76%</td>
</tr>
</tbody>
</table>

Source: Lanka Trade Consultation-2004

2.3.6 Labor Force

Labor rights and working conditions are protected and regulated by policies and laws in the country. Workers also have the right to form labor unions. Although there is no minimum universal wage in the country, the department of labor is responsible for solving labor issues and disputes. Usually private sector wages are higher than government wages.
The minimum age limit for employment is 15. Since the literacy rate is about 90% for both females and males and there is a high unemployment rate, cheap and skilled labor is abundant (southasiabiz.com, 2007). Figure 8 shows the percentage of employment status by gender in year 2006 (Department of Census and Statistics, 2007).

![Percentage employment by sex in Sri Lanka 2006](source: Department of census and statistics)

**Figure 8**: Percentage employment by sex in Sri Lanka 2006

**2.3.7 Forest Plantations and Lesser-known Species Potential**

As previously mentioned, the plantation forestry sector is rapidly developing. If properly managed, plantations are capable of providing export quality timber. Further, although there is high demand for species such as teak and mahogany in international and domestic markets, there is a wide variety of timber species with superior wood properties that have the potential to be used in domestic and export manufacturing. These species, including Albizzia species (*Albizzia lebbek*), Tamarind (*Tamarindus indicus*), and Domba (*Calophyllum inophyllum*), can also be used in establishing forest plantations.
2.3.8 Efficient Ports

Sri Lanka has four large ports; Colombo, Kankasanthur, Galle, and Trincomalee for incoming and outgoing cargos and containers. At present, Colombo is the most efficient and dynamic port in the country and is recognized as one of the most efficient ports in the South Asian region (Worldbank.com, 2007).

2.4 Global Wood Products Imports and Exports

In 2004, the world’s leading wood product importers were the United States (US $ billion 23.3), followed by the EU (US $ billion 13.2), Japan (US $ billion 11.8), and China (US $ billion 5.1) (FAS USDA, 2006). U.S. imports have increased dramatically over the past four years from US $ billion 16.0 to US $ billion 23.3. Canada and Japan have not shown any significant change in their imports within this time period (Figure 9).

The U.S. is also one of the world’s leading exporters of wood products (Forestry Statistics, 2006) (Figure 10). For a country like Sri Lanka that can potentially increase wood products exports, it is important to understand the structure of U.S. wood products import sector.

2.4.1 U.S. Wood Product Imports

At present, the U.S. has been recognized as the world’s largest producer and consumer of forest products.

Forest products industry contribution to the country’s GDP in the U.S. ranks eighth among domestic productions. In addition, this sector generates around 1.3 million employment opportunities in 2005 (Trade barriers to forest products, 2005). Growing demand for wood has exerted a greater pressure on primary old growth forests in the world. As a result, many countries are developing secondary timber resources such as forest plantations.
Other than the secondary timber resources, imports also play a key role in meeting demand for timber and wood products in most countries (Mille, 2006).


**Figure 9:** Top 10 wood products importers in the world (2000-2004) (Source: fas.usda, 2006)

Domestic wood demand increases have driven some nations to become insufficient with domestic wood processing and shift from being net exporters of wood to becoming net importers (FAO, 2006).

These global developments have intensified the need for cross-boundary trade of wood products. In the U.S. there are approximately 100 commercially used timber species, of which 60 are native to the country. Around 30 species are imported in various forms such as lumber, veneer, cants, logs, etc. (Mille, 2006). Among major imported tropical species, balsa accounts for 20% of the volume followed by mahogany (9.6%), keruing (8.9%), and virola (8.3%) (ITTO in mongabay.com, 2007).
Figure 10: Total forest product imports and exports of 12 economies (Source: Forestry Statistics, 2006)

Figure 11: Various wood products import in U.S. in 1000 cubic meters (Source: US forest products annual market review and prospects 2001-2006)
Figure 11 shows U.S. wood product imports from 2004 to 2006. Excluding logs and pulpwood, non-coniferous plywood is ranked first (in 2006) followed by sawn hardwood (US Forest Products Annual Review, 2004). Hardwood and insulation boards were the least imported categories from 2004 to 2006. All type of wood product imports has been increased from 2004 to 2005 and there is a slight decrease in 2006 due to unstable economic condition in the U.S.

2.4.2 U.S. Wood Consumption and Production Relative to the Imports

The U.S. produces one quarter of the world’s industrial round wood and consumes the same amount of world’s sawn timber, wood based panels, and pulp and paper (Trade Barriers to Forest Products, 2005).

Figure 12: U.S. wood product consumption, imports, and productivity by product category in 2006 (Source: U.S. forest products annual market review and prospects 2004-2008)
As shown in Figure 12, both consumption as well as production are significantly high for coniferous logs, roundwood pulpwood, hardwood logs, and sawn hardwoods relative to other products. Consumption is much higher relative to the production in sawn softwood, and oriented strandboard. Imports are significantly higher for sawn softwood than other wood products.

### 2.4.3 Wood Products and Related Merchandise Suppliers to the U.S.

Wood products and related merchandise imports to the U.S. came from 130 countries around the world in 2006. China was the leading supplier accounting for about 40 percent of imports (Figure 13).

China’s economy has boomed in past few years. Due to the availability of cheap labor, China has a competitive advantage over other countries in manufacturing goods. China is one of the dominant global exporters of wood products. Although Canada was the major supplier of coniferous logs and sawn softwood to the U.S. in 2006, its market share (27%) is less than that of China. Portugal, Indonesia, and Mexico are among the other major exporters to U.S. markets.

![Figure 13: Wood products and related merchandise suppliers to the U.S. in 2006](Source: All Other Wood Product Manufacturing Industry in the U.S. and its Foreign Trade, 1997-2009)


Table 7: Selected U.S. economic indicators, 2003–2007

<table>
<thead>
<tr>
<th>Actual Indicator</th>
<th>Actual</th>
<th>Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2003</td>
<td>2004</td>
</tr>
<tr>
<td>a) Gross Domestic Product <em>(billion 2000 dollars)</em></td>
<td>10,301</td>
<td>11,704</td>
</tr>
<tr>
<td>b) New housing starts <em>(thousand units)</em></td>
<td>1.848</td>
<td>1.956</td>
</tr>
<tr>
<td>b) Mobile home shipments <em>(thousand units)</em></td>
<td>131</td>
<td>131</td>
</tr>
<tr>
<td>a) Nonresidential investment in structures <em>(billion 2000 dollars)</em></td>
<td>243.5</td>
<td>248.7</td>
</tr>
<tr>
<td>c) Total industrial production <em>(Index: 1997 = 100)</em></td>
<td>100.6</td>
<td>104.7</td>
</tr>
<tr>
<td>c) Furniture and related products <em>(Index: 1997 = 100)</em></td>
<td>101.3</td>
<td>101.9</td>
</tr>
<tr>
<td>c) Paper products <em>(Index: 1997 = 100)</em></td>
<td>102.3</td>
<td>104.8</td>
</tr>
</tbody>
</table>

Source: U.S. Forest products annual market review and prospects, 2004-2008

Although domestic wood demand in the U.S. has increased from 2003 to 2005, with demand mainly coming from new housing starts, non industrial investment in structures, and other industrial uses (Table 7), the demand for wood has dropped for new housing constructions in latter part of the 2006 with the beginning of an economic recession. Despite this, many economists predict that timber markets will pick up in the near future (Howard and Westby, 2008).
CHAPTER 3: RESEARCH METHODOLOGY

3.1. Sample Frames

The samples for this study were Sri Lanka wood product exporters and U.S. wood product importers.

3.1.1 U.S. Importers

As compiled in the Buyers and Sellers Directory of the Forest Products Industry (2007), there were 158 wood products importers in the U.S. in 2006. All the listed companies were included as the sample frame for this component of the study. These companies import a wide variety of products such as softwood and hardwood lumber and plywood, OSB, MDF, particleboard, fence posts, moldings, hardwood veneer, flooring, doors, and furniture parts.

3.1.2 Sri Lankan Exporters

According to the Export Development Board of Sri Lanka, in 2007 there were 100 registered wood and wood product exporters in the country. All companies were included as the sample frame for this component of the study. Exports include parquet flooring, hardwood plywood, wooden toys, treated wood, fence poles, and kitchen components.

3.2 Data Collection Methods

3.2.1 U.S. Importers

A mail survey was the data collection method used, following the Tailored Design Method recommended by Dillman (1978, 2000). A mail questionnaire approach was chosen because it is the most cost-effective and relatively simple method of data collection. Other than above advantages, this method can be implemented with the least personnel available, can be distributed in a wide geographical range, and provides convenience in answering questions (Pitis, 1999).
The method affords a high degree of anonymity and is less limited by rigid time constraints that can impede the effectiveness of other survey methods. Mail survey procedures included pre-notification postcards, first mailing with the letter of introduction, follow up reminding post cards, and second mailing to non-respondents. Mail questionnaire procedures and respective time lines are shown in Table 8.

Table 8: Mail questionnaire procedure and respective time line

<table>
<thead>
<tr>
<th>Mailing procedure</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-notification postcards</td>
<td>September 1, 2007</td>
</tr>
<tr>
<td>First mailing</td>
<td>September 8, 2007</td>
</tr>
<tr>
<td>Follow up reminding post cards</td>
<td>September 17, 2007</td>
</tr>
<tr>
<td>Second mailing</td>
<td>October 1, 2007</td>
</tr>
<tr>
<td>Deadline for returned questionnaires</td>
<td>December 12, 2007</td>
</tr>
</tbody>
</table>

3.2.2 Sri Lankan Exporters

Face to face interviews were used for this part of the study. This method is considered to be one of the most efficient and effective method of obtaining information from a population due to flexibility and degree of freedom exerted by the interviewer over the respondent and his/her environment (Ary et al. 1990). De Los Santos (1988) also observed that the personal interview is the most appropriate method for obtaining data required in this setting in Sri Lanka since 85% of exporters are located in the Colombo metropolitan area. Interview procedures include pre-notification letters, follow-up phone calls, and visits to the interviewees. Thank you notes were sent to the respondents. Personal interview procedures and respective time lines are described in Table 9.

Table 9: Personal interview procedure and respective time line

<table>
<thead>
<tr>
<th>Mailing procedure</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-notification letters</td>
<td>December 1, 2007</td>
</tr>
<tr>
<td>follow-up phone calls</td>
<td>December 17, 2007</td>
</tr>
<tr>
<td>Personal interviews</td>
<td>December 8, 2007</td>
</tr>
<tr>
<td>Deadline for interviews</td>
<td>January 17, 2007</td>
</tr>
<tr>
<td>Thank you note</td>
<td>January 18, 2007</td>
</tr>
</tbody>
</table>
3.3 Survey Instrument Development

Survey items were developed to reflect research objectives. Since answers for survey items become data in the analysis, survey items were carefully designed to include all the necessary data to be collected. In order to make the questionnaire unambiguous for respondents as well as analyzers, survey items were categorized into their respective constructs or sections (Appendices I & II).

3.4 Types of Data Collected

Nominal, interval, and ordinal scale measurements were included in this instrument. Nominal scales were used to identify the qualitative difference of responses. Numerical expressions of nominal scale have arbitrary values. Those are not greater or better than the each other.

A Likert-type scale was used to measure the major independent and dependant variables of characteristics or attitudes. Respondents were asked to indicate their level of agreement or level of importance statements or criteria using five-point scaling questions, given by 1=strongly disagree to 5=strongly agree and 1=not important at all to 5=very important. When these variables are properly arranged, they can be used as interval scales, because there is an equal distance between each value (Newman, 2006).

In addition, the respondents were asked questions related to demographic characteristics and the environment which affects their business. Finally, the survey instrument was designed to gather additional information as comments, suggestions or concerns for further analysis.

3.5 Response Rate

3.5.1 U.S. Importers

Out of 158 companies of U.S. importers, 71 companies responded. Of these 71 responses, 17 were from companies that do not import wood products in 2006.
Therefore, the number of usable responses was 54. Furthermore, eight surveys were returned due to incorrect addresses. The adjusted response rate was calculated using the following formula:

\[
R_{\text{rate}} = \frac{\text{Usable responses}}{\text{Total sample} - (\text{Undeliverables} + \text{nonusable responses})}
\]

\[
= \frac{54}{158 - (8 + 17)}
\]

\[
= 40.6\%
\]

3.5.2 Sri Lankan Exporters: Out of 100 companies which were registered with Export Development of Board of Sri Lanka, 40 companies were out of business in 2006. From the remaining 60 companies, 26 agreed to share information. Therefore, the adjusted response rate was calculated as:

\[
R_{\text{rate}} = \frac{\text{Usable responses}}{\text{Total sample} - \text{nonusable responses}}
\]

\[
= \frac{26}{100 - 40}
\]

\[
= 43.4\%
\]

3.6 Data Analysis

Data were entered into an Excel® spread sheet. Data were cleaned after checking for validity and reliability. SPSS® version 15.0 (Statistical Package for Social Sciences) was for the analyses. Descriptive statistics as mean graphs, frequency graphs, percent distribution graphs for certain variables were developed to identify the respondent demographics, their perceptions and behaviors for certain information and variables.
Non-parametric two independent sample tests were conducted for the purpose of identifying group differences. This non-parametric analysis was used where data did not meet the assumption requirements of normality and homogeneity of variance (Daly and Bourke, 2000). The Mann-Whitney U test was used to identify non-normal group differences to better understand group differences. Cluster analysis was carried out to classify respondents into groups with the purpose of analyzing different behaviors of groups for a variable. The K-Means clustering method was used since it has accommodates limited restrictions on sample size and dimensionality of data. (Estvill and Yang, 2004).

Discriminant analysis is a useful tool to assign variables into known group of objects or classes. This analysis was used to see whether there is any discrimination of observations into known groups based on certain variables.

Factor analysis was first introduced by Pearson in 1901 and further developed by Thurstone and Hotelling during 1930’s with the purpose of variable reduction and to detect the structure of the relationship between variables (Goldberg and Velicer, 2006). Factor analysis was used to reduce several variables into few factors which group similar kinds of variables into a single factor. The goal of this analysis is to understand most prominent factors for a set of many variables. In order to identify profiles of two groups which were categorized based on numerical variables, multivariate profile analysis was carried out. Profile graphing helps to understand different profiles of certain groups on certain issues.

In order to see the correlation among some variables which were not normally distributed, Spearman’s correlation values were used. Spearman correlation values and particularly p-values help to understand relationships between variables.
CHAPTER 4: RESULTS AND DATA ANALYSIS OF U.S. IMPORTERS

4.1 Respondent Profile

Respondents were asked the location of their headquarters. Of 54 respondents, 52 were headquartered in the United States. One corporate office was in South Korea and the other was in Finland. Geographic distribution of remaining respondent companies by region is illustrated in Figure 14. Almost all the respondents were from south and west regions (94%).

![Figure 14: Geographic distribution of percent of respondents in the U.S. (N=52)](image)

4.1.1 Total Gross Sales in 2006

Respondents were asked to identify their company’s total 2006 gross sales including sales from imports (Figure 15). Almost 37% of respondents’ gross income was below US $5 million. In contrast, 11% of companies earned from US $100 million to greater than US $1 billion. A plurality (80%) earned less than US $50 million. Since there is a great variation of respondent companies based on their gross sales, this variable is an influential variable for company categorization.
In order to understand the degree of participation as a wood product importer, respondents were asked the percentage of company’s total gross sales that were generated from imported wood products in 2006. Of the 54 respondents, 34% indicated that 90-100% of their sales were from imports. They were the major importers basically rely on wood products from outside the U.S. rather than domestic productions (Figure 16).

4.1.3 Number of Containers Imported

Number of containers imported is a variable which can help to determine company scale. Respondents were asked about the number of wood product containers they imported in 2006 (Figure 17). Thirty-four percent imported 1-50 containers in year 2006 and more than half of respondents (56%) were large in scale and imported more than 100 containers.
Figure 16: Percent of total gross sales from imports in 2006, (Percent of respondent, n=54)

Figure 17: Number of containers imported in 2006, (Percent of respondent, n=54)
4.1.4 Number of Employees

Number of employees is another key factor which defines company scale. Almost 72% of companies have less than twenty six employees and they are small in scale (Figure 18). Few large scale companies with more than 100 employees (15%) were represented. Overall, number of employees varies from less than 10 to more than 500.

![Figure 18: Number of employees, (Percent of respondents, n=54)](image)

4.2 Types of Wood Products Imported

In order to get an overview the U.S. wood product importers; it is important to get an idea about the types of wood products they import. Figure 19 shows the percent of respondents importing various products in ascending order.

Product categories imported by most respondents were softwood lumber (19% of respondents) followed by hardwood lumber, hardwood plywood, and molding and mill work.
Product categories of kitchen components, windows, and wooden toys were not imported by any respondent companies.

![Product categories import rates](image)

**Figure 19:** Percent of respondents importing various wood products in 2006, (n=54)

### 4.3 Export Partner Countries

Respondents purchase wood products from variety of supplier countries (Figure 20). Respondents were asked to rank the top ten suppliers that they imported wood products from in 2006 by purchase value with the goal of identifying large scale foreign suppliers. Despite the fact that the US wood product imports in 2006 were from China, Canada, Brazil, Chile, and Mexico respectively, according to the respondents, Brazil was the top wood product supplier by purchase value in 2006. Chile and China ranked second followed by Canada.
**Figure 20**: Origin of wood products imported by purchase value as ranked by the respondents, (Percent of respondents, n=54)

**Figure 21**: Origin of wood products imported by product quality as ranked by the respondents, (Percent of respondents, n=54)
Respondents were also asked to rank the top five countries that they imported wood products from in 2006 based on respondents’ perception towards product quality (Figure 21). Again, Brazil wood products were ranked highest (22% of respondents) followed by Chile (18%) and Finland (10%).

4.4 Phytosanitary Tests

Phytosanitary testing is a kind of non-tariff barrier in international trade (Figure 22). Respondents were asked to indicate whether they require any of the Phytosanitary tests from their exporter partners. Almost 57% of respondent companies require their suppliers to conduct tests and remediation for insects and other pests and 47% require tests for microbes from their suppliers.

![Phytosanitary Tests Chart](image)

**Figure 22:** Respondents who require phytosanitary tests from their foreign suppliers, (Percent of respondents, n=54)
4.5 Membership in an International Wood Products Trade Organization

An organization or association is a place where people can share their knowledge and ideas locally and globally. Moreover, membership in an organization targeting wood products international trade can help companies get more relevant and current information of the global wood market and facilitate selling/buying products globally. Fifty-three percent of respondents were members of an organization or an association that has a focus on wood products international trade.

4.6 Grouping of Respondent Companies

Purpose of clustering is to categories subjects into homogeneous groups based on their similarities and differences. Researchers often use clustering to study different behaviors of groups for a same variable. Furthermore, grouping of numerous subjects into a few groups expands the ability of exploration the group characteristics rather than each individual.

K-Means clustering is widely accepted method since it has limited restrictions on sample size and dimensionality of data. In addition K-means clustering is fast and computationally simple (Estvill and Yang, 2004). In algorithm of clustering, distance between two clusters is used. Complete linkage method of K-means clustering uses the farthest-neighbor distance between clusters hence produce more compact clusters with relatively similar observations (Moser, 2004).

Cluster analysis has wide implications in marketing research. It is often used to identify market segments in the marketing environment. For instance, Ozanne and Vlosky (2000) used cluster analysis to identify consumer market segments based on their perceptions on forest certification. In the context of the current study, identifying segments in the U.S. wood product import sector helps to understand the structure of the U.S. wood product import market and in
turn, exporters can better cater the required market segment. Furthermore, exporters can restructure their marketing strategies and plans relevant to their target market.

Instead of using a single variable as total gross sales, numerous variables were used to categorize companies into groups to make them more distinct. Since total number of employees, total gross sales, number of imported containers, and percentage of sales from imports show a greater variation, those variables were used to categories U.S. wood product importers into three groups. All the variables used were significant at $\alpha = 0.05$ significance level (Table 10).

**Table 10:** Summary statistics of variables used for cluster analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>F value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of employees</td>
<td>59.647</td>
<td>.000*</td>
</tr>
<tr>
<td>Total gross sales</td>
<td>40.407</td>
<td>.000*</td>
</tr>
<tr>
<td>Number of containers imported</td>
<td>4.797</td>
<td>.013*</td>
</tr>
<tr>
<td>Percentage of sales from imports</td>
<td>105.736</td>
<td>.000*</td>
</tr>
</tbody>
</table>

*P value is significant at $\alpha = 0.05$ significance level.

Using the K-means clustering, three clusters were generated. Distances between resulted clusters are significant enough to distinguish clusters (Table 11). Summary statistics of grouping variables are included in Table 12 and cluster profiles in accordance with the group statistics are explained in Table 13. The classification in Table 12 shows that 25 respondents (48 percent) belong to the third group (Small to medium scale but major importers). The balance of respondents equally belong to the group 1 (Small to medium scale but moderate importers) and group 2 (Medium to large scale but minor importers). Further analyses were performed to identify the group differences.

**Table 11:** Distances between final cluster centers

<table>
<thead>
<tr>
<th>Cluster</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>5.005</td>
<td>5.810</td>
</tr>
<tr>
<td>2</td>
<td>5.005</td>
<td></td>
<td>7.614</td>
</tr>
<tr>
<td>3</td>
<td>5.810</td>
<td>7.614</td>
<td></td>
</tr>
</tbody>
</table>
Table 12: Number of cases in each cluster

<table>
<thead>
<tr>
<th>Group</th>
<th>Number of employees</th>
<th>Total gross sales</th>
<th>Number of containers import</th>
<th>Percentage of sales from imports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mean 1.31</td>
<td>1.46</td>
<td>2.23</td>
<td>3.69</td>
</tr>
<tr>
<td>N</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>0.630</td>
<td>0.776</td>
<td>1.235</td>
<td>1.797</td>
</tr>
<tr>
<td>2</td>
<td>Mean 4.29</td>
<td>5.21</td>
<td>3.57</td>
<td>3.14</td>
</tr>
<tr>
<td>N</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>1.383</td>
<td>1.528</td>
<td>0.938</td>
<td>1.748</td>
</tr>
<tr>
<td>3</td>
<td>Mean 1.32</td>
<td>2.08</td>
<td>3.00</td>
<td>9.40</td>
</tr>
<tr>
<td>N</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>0.557</td>
<td>1.187</td>
<td>1.201</td>
<td>1.118</td>
</tr>
</tbody>
</table>

Cut off points of mean values for grouping are as follows:

- Percent of sales from imports
  - \( \leq 3.5 \) is for minor
  - \( 3.5 \) to 7 is for moderate
  - \( 7.1 \) to 10 is for major

- Number of employees
  - \( \leq 2 \) is for small
  - \( 2.1 \) to 4 is for medium
  - \( 4.1 \) to 6 is for large

- Total gross sales
  - \( \leq 3 \) is for small
  - \( 3.1 \) to 6 is for medium
  - \( 6.1 \) to 9 is for large

- Number of containers import
  - \( \leq 2 \) is for small
  - \( 2.1 \) to 3 is for medium
  - \( 3.1 \) to 4 is for large
4.7 Sources of Information by Company Groupings

Discriminant analysis is a useful tool to assign variables into known groups of objects or classes. This method constructs a set of a linear combination from the predictor variables. This linear function is known to be linear discriminant function and it is used to assign the new observation into one of the given group.

\[ L = (a_1 X_1 + a_2 X_2 + a_3 X_3 + \ldots + c) \]

Where:
- \( L \) = Linear discriminant function
- \( a's \) = discriminant coefficients
- \( X's \) = input variables
- \( c \) = constant

Canonical discriminant analysis method uses the orthogonal depiction of the original function or variates. This orthogonal rotation maximizes the distance between groups. Usually, there should be \((n-1)\) canonical discriminant functions or canonical variates for \(n\) groups. This facilitates assigning new observations into the appropriate group using canonical discriminant functions as same as with original predictors (Moser, 2004).

Stepwise canonical discriminant analysis was carried out to see whether the utilization of sources of information is different among three groups of U.S. importers. Results of the stepwise canonical discriminant function analysis (variables to enter \(\alpha = 0.10\), variables to remove \(\alpha = .15\)) depicts word of mouth, websites, and trade magazine advertisements are significant at \(\alpha = 0.05\) significance level (Table 14).
Therefore, the degree of utilization of word of mouth, websites, and trade magazines are distinct among groups than the other sources of information.

**Table 14:** F statistics and P values for stepwise discriminant analysis

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable</th>
<th>F statistics</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Word of Mouth</td>
<td>38.0</td>
<td>0.045</td>
</tr>
<tr>
<td>2</td>
<td>Word of Mouth</td>
<td>74.0</td>
<td>0.013</td>
</tr>
<tr>
<td></td>
<td>Web Sites</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Word of Mouth</td>
<td>72.0</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>Web Sites</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Trade Magazines</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* P value is significant at $\alpha = 0.05$ significance level.

As seen in Table 15, discriminant function 1 explains 72.4% of the variance and both discriminant function one and two explains 100% of the variance. Since first two functions are statistically significant at $\alpha=0.10$ significance level, they were selected for further analysis.

Box’m test (Table 16) for the null hypothesis of equal population covariance matrix is fail to reject at 0.05 significance level since it shows a p-value of 0.090 ($>0.05$). Therefore, adequacy of the data set for discriminant analysis is significant.

**Table 15:** Number of discriminant functions and Wilk’s Lambda test results

<table>
<thead>
<tr>
<th>Function</th>
<th>Eigen value</th>
<th>% of Variance</th>
<th>Cumulative %</th>
<th>Canonical correlation</th>
<th>Wilks' Lambda</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.420(a)</td>
<td>72.4</td>
<td>72.4</td>
<td>0.544</td>
<td>0.607</td>
<td>0.005</td>
</tr>
<tr>
<td>2</td>
<td>0.160(a)</td>
<td>27.6</td>
<td>100.0</td>
<td>0.371</td>
<td>0.862</td>
<td>0.064</td>
</tr>
</tbody>
</table>

Of the variables retained in the analysis, word of mouth (0.649) and websites (0.520) are highly correlated with Function 1 and only trade magazine adds is correlated (0.994) with Function 2 (Table 16).

As observed in Figure 23, members from all the three groups are scattered and mixed. Although word of mouth, websites, and trade magazine ads were different among groups, there is no clear separation of groups based on the source of information they use. Of original grouped cases, almost 60.0% has correctly classified in this classification.
Table 16: Canonical discriminant structure matrix

<table>
<thead>
<tr>
<th>Function</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word of mouth</td>
<td>.649(*)</td>
<td>0.026</td>
</tr>
<tr>
<td>Web sites</td>
<td>.520(*)</td>
<td>0.471</td>
</tr>
<tr>
<td>Trade magazine adds</td>
<td>-0.030</td>
<td>0.994(*)</td>
</tr>
<tr>
<td>Newsletters(a)</td>
<td>0.120</td>
<td>0.796(*)</td>
</tr>
<tr>
<td>Magazines(a)</td>
<td>0.146</td>
<td>0.776(*)</td>
</tr>
<tr>
<td>Catalogues(a)</td>
<td>0.152</td>
<td>0.637(*)</td>
</tr>
<tr>
<td>Distributors(a)</td>
<td>0.073</td>
<td>0.568(*)</td>
</tr>
<tr>
<td>Workshops(a)</td>
<td>0.347</td>
<td>0.549(*)</td>
</tr>
<tr>
<td>Direct mail(a)</td>
<td>0.069</td>
<td>0.535(*)</td>
</tr>
<tr>
<td>Sales representative(a)</td>
<td>0.040</td>
<td>0.485(*)</td>
</tr>
<tr>
<td>International trade shows(a)</td>
<td>0.386</td>
<td>0.438(*)</td>
</tr>
<tr>
<td>E-mail(a)</td>
<td>0.120</td>
<td>0.134(*)</td>
</tr>
</tbody>
</table>

a) Variables are not included in the analysis

Figure 23: Canonical discriminant function plot for source of information

Despite the fact that there is no clear demarcation of groups based on the source of information, it is meaningful to identify the most important sources of information regardless of company grouping. E-mail (4.0), word of mouth (3.9), websites (3.6), international trade shows...
(3.4), and sales representative (3.1) are the top sources of information the U.S importers are interested in regardless of grouping. Ironically, direct mailing was ranked last from the list of 12 sources (Figure 24).

![Figure 24: Mean distribution of source of information, (n=54)](image)

### 4.8 Foreign Supplier Selection Criteria by Company Grouping

The importing business relies heavily on the foreign supplier. Other than the source of information, foreign buyer selection criteria are an important set of variables to analyze. A set of 21 buyer selection criteria, using a 1-5 Likert scale of importance, was posed to respondents. Summary statistics of criteria used for the foreign buyer selection is indicated in Table 17.

Stepwise discriminant analysis was carried out to determine whether there is a group difference based on the criteria used to select foreign buyers. The first six steps are statistically significant at $\alpha=0.10$ significance level. Six variables from “a” to “e” were retained in the analysis (Table 18).
According to the variance explained by the discriminant functions, the first two functions accounted for 100% of the variance. Both functions are significant at $\alpha=0.01$ significance level according to the Wilks’ Lambda statistics (Table 19). Therefore, first two functions were selected for further analysis.

**Table 17:** Summary statistics of foreign buyer selection criteria in ascending order

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Number</th>
<th>Mean</th>
<th>Std. deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product from Lesser used species</td>
<td>49</td>
<td>2.53</td>
<td>1.002</td>
</tr>
<tr>
<td>Marketing skills</td>
<td>49</td>
<td>2.65</td>
<td>1.217</td>
</tr>
<tr>
<td>Uniqueness</td>
<td>50</td>
<td>2.8</td>
<td>1.355</td>
</tr>
<tr>
<td>Product design</td>
<td>48</td>
<td>2.92</td>
<td>1.397</td>
</tr>
<tr>
<td>Distribution capabilities</td>
<td>48</td>
<td>2.96</td>
<td>1.254</td>
</tr>
<tr>
<td>Computer capabilities</td>
<td>48</td>
<td>3.21</td>
<td>1.271</td>
</tr>
<tr>
<td>Warranty</td>
<td>49</td>
<td>3.27</td>
<td>1.287</td>
</tr>
<tr>
<td>Fast delivery</td>
<td>48</td>
<td>3.42</td>
<td>1.182</td>
</tr>
<tr>
<td>Products from SMF</td>
<td>51</td>
<td>3.51</td>
<td>1.332</td>
</tr>
<tr>
<td>Product from traditional species</td>
<td>50</td>
<td>3.52</td>
<td>1.147</td>
</tr>
<tr>
<td>Provide certified products</td>
<td>52</td>
<td>3.58</td>
<td>1.319</td>
</tr>
<tr>
<td>Supplier speaks English</td>
<td>51</td>
<td>3.69</td>
<td>1.304</td>
</tr>
<tr>
<td>Knowledgeable sales people</td>
<td>50</td>
<td>3.92</td>
<td>1.158</td>
</tr>
<tr>
<td>Fast response to inquires</td>
<td>50</td>
<td>4.16</td>
<td>0.766</td>
</tr>
<tr>
<td>Customer service</td>
<td>50</td>
<td>4.28</td>
<td>0.73</td>
</tr>
<tr>
<td>Customer relationship</td>
<td>51</td>
<td>4.31</td>
<td>0.905</td>
</tr>
<tr>
<td>Supplier reputation</td>
<td>51</td>
<td>4.35</td>
<td>0.77</td>
</tr>
<tr>
<td>Fair prices</td>
<td>53</td>
<td>4.57</td>
<td>0.747</td>
</tr>
<tr>
<td>On time delivery</td>
<td>52</td>
<td>4.63</td>
<td>0.561</td>
</tr>
<tr>
<td>Long term customer relationship</td>
<td>52</td>
<td>4.71</td>
<td>0.498</td>
</tr>
<tr>
<td>Product quality</td>
<td>52</td>
<td>4.79</td>
<td>0.498</td>
</tr>
</tbody>
</table>

**Table 18:** F statistics and P value for stepwise discriminant analysis

<table>
<thead>
<tr>
<th>Step</th>
<th>Variables</th>
<th>F value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>a</td>
<td>39.000</td>
<td>0.054</td>
</tr>
<tr>
<td>2</td>
<td>a,b</td>
<td>76.000</td>
<td>0.011</td>
</tr>
<tr>
<td>3</td>
<td>a,b,c</td>
<td>74.000</td>
<td>0.005</td>
</tr>
<tr>
<td>4</td>
<td>a,b,c,d</td>
<td>72.000</td>
<td>0.002</td>
</tr>
<tr>
<td>5</td>
<td>a,b,c,d,e</td>
<td>70.000</td>
<td>0.001</td>
</tr>
<tr>
<td>6</td>
<td>a,b,c,d,e,f</td>
<td>68.000</td>
<td>0.001</td>
</tr>
</tbody>
</table>

*a= Consistent supply, b= Products from sustainable managed forests, c= Fair prices, c=Provides certified products, d= Knowledgeable sales people, e= Supplier speaks English*
Table 19: Number of discriminant functions and Wilk’s Lambda test results

<table>
<thead>
<tr>
<th>Function</th>
<th>Eigenvalue</th>
<th>% of Variance</th>
<th>Cumulative %</th>
<th>Canonical Correlation</th>
<th>Wilks' Lambda</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.864(a)</td>
<td>71.1</td>
<td>71.1</td>
<td>0.681</td>
<td>0.397</td>
<td>0.001</td>
</tr>
<tr>
<td>2</td>
<td>0.351(a)</td>
<td>28.9</td>
<td>100.0</td>
<td>0.510</td>
<td>0.740</td>
<td>0.052</td>
</tr>
</tbody>
</table>

(a) First 2 canonical discriminant functions were used in the analysis.

A structure matrix of canonical discriminate analysis is shown in Table 20. Correlation values of each variable with the discriminate function can be observed from the structure matrix.

Supplier speaks English (0.275) and knowledgeable sales people (-0.203) are the underlying variables with discriminant function 1. Discriminant function 2 is highly correlated with ability of providing certified products (0.651), products come from sustainably managed forests (0.588), consistent supply (-0.379) and fair prices (-0.360).

Table 20: Structure matrix of canonical discriminant analysis

<table>
<thead>
<tr>
<th>Supplier speaks English</th>
<th>Quality (a)</th>
<th>Products from lesser used species (a)</th>
<th>Supplier reputation (a)</th>
<th>Customer Service(a)</th>
<th>Customer relationship (a)</th>
<th>Warranty (a)</th>
<th>On time delivery (a)</th>
<th>Provides certified products</th>
<th>Products from sustainable managed forests</th>
<th>Consistent supply</th>
<th>Fair prices</th>
<th>Uniqueness (a)</th>
<th>Distribution capabilities (a)</th>
<th>Marketing skills (a)</th>
<th>Fast delivery (a)</th>
<th>Products from traditional species (a)</th>
<th>Product design(a)</th>
<th>Computer capability (a)</th>
<th>Fast response to inquiries (a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.275(*)</td>
<td>-0.322(*)</td>
<td>0.228(*)</td>
<td>-0.216(*)</td>
<td>-0.206(*)</td>
<td>0.204(*)</td>
<td>-0.201(*)</td>
<td>-0.097(*)</td>
<td>0.015</td>
<td>0.148</td>
<td>-0.358</td>
<td>0.171</td>
<td>0.058</td>
<td>-0.003</td>
<td>0.047</td>
<td>-0.288</td>
<td>0.057</td>
<td>-0.135</td>
<td>0.113</td>
<td>-0.004</td>
</tr>
<tr>
<td>-0.203(*)</td>
<td>0.075</td>
<td>-0.005</td>
<td>-0.060</td>
<td>0.079</td>
<td>-0.072</td>
<td>0.101</td>
<td>0.072</td>
<td>0.651(*)</td>
<td>0.588(*)</td>
<td>-0.379(*)</td>
<td>-0.360(*)</td>
<td>0.411(*)</td>
<td>0.409(*)</td>
<td>0.327(*)</td>
<td>0.306(*)</td>
<td>-0.198(*)</td>
<td>0.196(*)</td>
<td>0.186(*)</td>
<td>-0.041(*)</td>
</tr>
</tbody>
</table>

(a) Variables are not included in the analysis
Of these two functions, the discriminant function two clearly separates group 1 from groups 2 and 3. Accordingly, when selecting foreign buyers criteria such as certification issues, consistent supply, and fair prices are different in group 1 (small to medium scale but moderate importers) from group 2 (medium to large scale but minor importers) and 3 (small to medium scale but major importers) (Figure 26). With pre-defined probabilities for the group size, 63% of the cases were correctly classified in this analysis.

![Path diagram of canonical discriminant function two (foreign supplier selection)](image)

**Figure 25**: Path diagram of canonical discriminant function two (foreign supplier selection)

![Canonical discriminant function plot for foreign supplier selection criteria](image)

**Figure 26**: Canonical discriminant function plot for foreign supplier selection criteria
Box’s M Test (Table 21) for the null hypothesis of equal population covariance matrix was not rejected at 0.05 significance level since it shows a p-value of 0.092 (>0.05). Therefore, adequacy of the data set to be applied to discriminant analysis is significant.

<table>
<thead>
<tr>
<th>Box's M</th>
<th>Approx.</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>71.462</td>
<td>42</td>
<td>3826.506</td>
<td>.092</td>
</tr>
</tbody>
</table>

**Table 21: Number of discriminant functions and Wilk’s Lambda test results**

4.9 Important Factors of Foreign Supplier Selection Criteria (Factor Analysis)

Unlike many other statistical techniques which basically study the relationship between dependant and independent variable, factor analyses study the relationship between dependant variables. Factor analysis was first introduced by Pearson in 1901 and further developed by Th burnstone and Hotelling during 1930’s with the purpose of variable reduction and to detect the structure of the relationship between variables (Goldberg and Velicer, 2006).

It is important to understand the prominent factors of foreign buyer selection criteria rather than dealing with the list of 21 variables. Identifying factors facilitates exporter understanding of U.S. importer requirements when they select their foreign buyers.

Principal component extraction method of factor analysis combines two variables at a time into a single factor and maximizes the variance accounted by the relevant factor. Non-rotated factor analysis was conducted prior to the rotated factor analysis. Factor loadings of ±0.50 are used as the cut-off point. Since factor 2, factor 5 and factor 4 of non-rotated analysis do not have a good correlation with their underlying variables, the varimax rotation method was conducted to achieve a more interpretable solution (Field in Vlosky and Dunn, in review). Table 22 shows the summary statistics of principal component factor extraction for varimax rotation.
Table 22: Total variance accounted by factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Eigen value</th>
<th>% of Variance</th>
<th>Cumulative %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6.771</td>
<td>32.241</td>
<td>32.241</td>
</tr>
<tr>
<td>2</td>
<td>2.404</td>
<td>11.447</td>
<td>43.688</td>
</tr>
<tr>
<td>3</td>
<td>2.036</td>
<td>9.694</td>
<td>53.382</td>
</tr>
<tr>
<td>4</td>
<td>1.617</td>
<td>7.701</td>
<td>61.083</td>
</tr>
<tr>
<td>5</td>
<td>1.287</td>
<td>6.128</td>
<td>67.211</td>
</tr>
<tr>
<td>6</td>
<td>1.126</td>
<td>5.364</td>
<td>72.574</td>
</tr>
<tr>
<td>7</td>
<td>1.082</td>
<td>5.150</td>
<td>77.724</td>
</tr>
</tbody>
</table>

The number of factors to be selected is completely arbitrary and usually determined by the variance accounted by each factor, eigenvalues (≥1) and the scree plot. According to Hair et al. (1978) cited in Vlosky and Dunn (in review), a proportion of variance accounted by each factor interpreted as 0.90 or above is marvelous, 0.80 is meritorious, 0.70 is middling, 0.60 is mediocre, and below 0.50 is unacceptable. Although the first seven factors have eigenvalues greater than 1, the first five factors were selected to explain almost 68% of the variance. Accordingly, the five factors explain 68% of the total variance of the variables as follows: Factor 1 (32.2%); Factor 2 (11.4%); Factor 3 (9.7%); Factor 4 (7.7%); Factor 5 (6.1%).

Kaiser-Meyer-Olkin Measure of Sampling Adequacy falls in the acceptable region of greater than 0.5 (0.627) and the Bartlett’s Tests of Sphericity for overall significance of the correlation matrix is significant (P value = 0.000) at α = 0.05 (Table 23).

Table 23: KMO and Bartlett’s test results

<table>
<thead>
<tr>
<th>Kaiser-Meyer-Olkin Measure of Sampling Adequacy</th>
<th>0.627</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bartlett's Test of Sphericity</td>
<td></td>
</tr>
<tr>
<td>Approx. Chi-Square</td>
<td>506.197</td>
</tr>
<tr>
<td>df</td>
<td>210</td>
</tr>
<tr>
<td>Sig.</td>
<td>0.000*</td>
</tr>
</tbody>
</table>

* P value of 0.000 is significant at α = 0.05 significance level.

Summary statistics of the rotated component matrix is shown in Table 24. Since variables with loadings less than 0.5 were removed, the number of variables was reduced from 21 to 18.
Variables with factor loadings greater than ±0.5 were retained in the analysis table for the interpretation. In naming the five factors, all significant factor loadings were used in the process, but variables with higher loadings had greater influence on the factor name.

**Table 24: Rotated component matrix for varimax rotation**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Certification and marketing</th>
<th>Product attributes</th>
<th>Client Contact</th>
<th>Quality products supply</th>
<th>Timber species and supplier reputation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Products from sustainable managed forests</td>
<td>0.893</td>
<td>-0.041</td>
<td>0.089</td>
<td>0.151</td>
<td>0.058</td>
</tr>
<tr>
<td>• Ability to provide certified products</td>
<td>0.837</td>
<td>0.263</td>
<td>-0.029</td>
<td>-0.018</td>
<td>-0.002</td>
</tr>
<tr>
<td>• Uniqueness</td>
<td>0.614</td>
<td>0.365</td>
<td>0.446</td>
<td>-0.055</td>
<td>0.273</td>
</tr>
<tr>
<td>• Distribution capabilities</td>
<td>0.555</td>
<td>0.445</td>
<td>0.269</td>
<td>0.178</td>
<td>0.162</td>
</tr>
<tr>
<td>• Marketing skills</td>
<td>0.508</td>
<td>0.434</td>
<td>0.504</td>
<td>-0.029</td>
<td>0.147</td>
</tr>
<tr>
<td>• Warranty</td>
<td>0.096</td>
<td><strong>0.852</strong></td>
<td>0.034</td>
<td>0.160</td>
<td>-0.003</td>
</tr>
<tr>
<td>• Design</td>
<td>0.300</td>
<td><strong>0.712</strong></td>
<td>0.062</td>
<td>-0.058</td>
<td>0.330</td>
</tr>
<tr>
<td>• Fast delivery</td>
<td>0.330</td>
<td><strong>0.546</strong></td>
<td>0.168</td>
<td>0.362</td>
<td>0.071</td>
</tr>
<tr>
<td>• Supplier speaks English</td>
<td>0.024</td>
<td>0.089</td>
<td><strong>0.844</strong></td>
<td>-0.156</td>
<td>0.086</td>
</tr>
<tr>
<td>• Long term customer relationship</td>
<td>-0.007</td>
<td>-0.356</td>
<td><strong>0.738</strong></td>
<td>0.154</td>
<td>0.290</td>
</tr>
<tr>
<td>• Computer capabilities</td>
<td>0.262</td>
<td>0.277</td>
<td><strong>0.713</strong></td>
<td>0.178</td>
<td>0.055</td>
</tr>
<tr>
<td>• On time delivery</td>
<td>0.000</td>
<td>0.110</td>
<td>0.052</td>
<td><strong>0.897</strong></td>
<td>-0.043</td>
</tr>
<tr>
<td>• Quality</td>
<td>0.235</td>
<td>-0.031</td>
<td>-0.124</td>
<td><strong>0.730</strong></td>
<td>0.330</td>
</tr>
<tr>
<td>• Consistent supply</td>
<td>-0.033</td>
<td>0.184</td>
<td>0.214</td>
<td><strong>0.625</strong></td>
<td>0.139</td>
</tr>
<tr>
<td>• Products from traditional species</td>
<td>0.054</td>
<td>-0.085</td>
<td>0.273</td>
<td>0.012</td>
<td><strong>0.820</strong></td>
</tr>
<tr>
<td>• Supplier reputation</td>
<td>-0.026</td>
<td>0.163</td>
<td>-0.088</td>
<td>0.288</td>
<td><strong>0.644</strong></td>
</tr>
<tr>
<td>• Products from lesser used species</td>
<td>0.142</td>
<td>0.296</td>
<td>0.372</td>
<td>-0.046</td>
<td><strong>0.579</strong></td>
</tr>
<tr>
<td>• Fast response to my inquiries</td>
<td>0.187</td>
<td>0.323</td>
<td>0.007</td>
<td>0.260</td>
<td><strong>0.540</strong></td>
</tr>
</tbody>
</table>

- **Factor 1** has five significantly high loadings (0.508-0.893), which are related to forest certification and unique product marketing and distribution, thus the factor was named “certification and marketing”.

- **Factor 2** loads the high loadings (0.546-0.852) on variables associated with product intangibles and service. Accordingly, the factor was named “product attributes”.

- **Factor 3** has three items with significantly high loadings (0.713-0.844) on variables linked with clients’ ability to efficient contact. Hence, the factor was named “Client Contact”
• **Factor 4** has three significant loadings (0.625-0.897) that describe quality of the product and supply, thus the factor was named “Quality products supply”.

• **Factor 5** has four significant loadings (0.579-0.820) that describe the raw materials use and activities directly and indirectly related to supplier reputation, thus the factor was named “timber species and supplier reputation”.

### 4.10 U.S. Importers Perception towards Forest Certification

Forest certification is intended to be a market-based mechanism that promotes responsible forestry practices. Although several certification programs exist, the Sustainable Forestry Initiative (SFI), Forest stewardship Council (FSC), and Green Tag certification programs are widely accepted in the U.S. Of 44 respondents who answered the question of whether they import certified wood products, almost 64% do import certified products and 36% do not. Figure 27 shows widely accepted certification schemes among the respondent wood product importers in the U.S. More than half of the respondents (52%) have accepted FSC followed by SFI, ISO 14 000, Tree Farm, and PEFC (Program for the Endorsement of Forest Certification) certification.

![Figure 27: Percent distribution of forest certification schemes adopted by respondents](image-url)

Figure 27: Percent distribution of forest certification schemes adopted by respondents
For further analysis, all the respondents were classified into two groups based on whether the products they import are certified or not.

**Group 1:** Certified product importers

**Group 2:** Non-certified product importers

Analysis was carried out to see if there was group differences based on active promotion of certified products and eco-labeling of certified products. Cross tabulation with Spearman’s correlation value was used to determine the relationship between the group and active promotion of certified products (Table 25) and then with eco-labeling of certified products (Table 26).

**Hypothesis 1:** There is no significant relationship between certified wood product importers and promotion of certification than the non certified wood product importers

**Hypothesis 2:** There is no significant relationship between certified wood product importers and Eco-labeling of products the non certified wood product importers

**Table 25:** Cross tabulation of certified product imports by promote certification

<table>
<thead>
<tr>
<th></th>
<th>promote certification</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Certified</td>
<td>1</td>
<td>Count</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>Not certified</td>
<td>2</td>
<td>Count</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>13</td>
</tr>
</tbody>
</table>

*Spearman p value (0.003) is significant at $\alpha = 0.05$ significance level.

**Table 26:** Cross tabulation of eco labeling of certified products

<table>
<thead>
<tr>
<th></th>
<th>Carry an Eco label</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Certified</td>
<td>1</td>
<td>Count</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>Not certified</td>
<td>2</td>
<td>Count</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>11</td>
</tr>
</tbody>
</table>

*Spearman p value (0.015) is significant at $\alpha = 0.05$ significance level.
One-tailed Spearman correlation p-value of 0.003 is significant at 0.05 significance level hence reject the hypothesis 1. In conclusion, there is a statistically significant relationship between certified wood product importers and promotion of certification the non certified wood product importers. Since the value of the Spearman test is 0.451 which is greater than 0.150, this test result can be considered to be very significant.

Moreover, the p-value for the products that carry an eco-label (0.015) is less than 0.05. This test also rejects the hypothesis 2 and hence, there is a statistically significant relationship between groups and eco-labeling of certified products the non certified wood product importers. Since the value of the Spearman test is 0.377 which is greater than 0.150 this test can also be considered to produce significant results.

Multivariate profile analysis was conducted to test the profiles of the importers who import certified products and those who import non certified products on various certification issues. Statements tested regarding forest certification issues are as follows;

Q1: Certified products can help my company reach diversified markets.
Q2: Certified products can capture price premiums.
Q3: Certified products help to protect the environment.
Q4: I would like to get information about certification.
Q5: I would pay a premium for certified products.
Q6: If available, I would seek out certified wood products.

The results of multivariate test for profile analysis are summarized in Table 27. With p = 0.004, the test is significant at α = 0.05 significance level. Therefore, it is able to reject the null hypothesis and parallelism of the profiles of certified product importers and non-certified product importers will not be assumed. Figure 28 shows the forest certification profile plot of both certified and non-certified wood product importers.
Table 27: Multivariate test result for profile analysis

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Value</th>
<th>F</th>
<th>df</th>
<th>Error df</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pillai's Trace</td>
<td>0.390</td>
<td>3.940</td>
<td>6.000</td>
<td>37.000</td>
<td>0.004*</td>
</tr>
<tr>
<td>Wilks' Lambda</td>
<td>0.610</td>
<td>3.940</td>
<td>6.000</td>
<td>37.000</td>
<td>0.004*</td>
</tr>
<tr>
<td>Hotelling's Trace</td>
<td>0.639</td>
<td>3.940</td>
<td>6.000</td>
<td>37.000</td>
<td>0.004*</td>
</tr>
<tr>
<td>Roy's Largest Root</td>
<td>0.639</td>
<td>3.940</td>
<td>6.000</td>
<td>37.000</td>
<td>0.004*</td>
</tr>
</tbody>
</table>

*P value of 0.004 is significant at α = 0.05 significance level.

Figure 28: Group comparison on certification related issues

In conclusion, agreement level on certification issues of group 1 is greater than the agreement level of group 2 for all six statements regarding forest certification. Non-certified wood product importers have no positive agreement for any of the statements while certified product importers have positive agreements on certified products can help my company reach diversified markets, certified products help to protect the environment, and if available, I would seek out certified wood products. In non-parametric analysis, numerous two independent sample tests exist.
Non-parametric two independent sample tests can be used to see the difference of certain variables between two groups. This analysis is true regardless of the certain assumptions of normality and distribution of the data set (Daly and Bourke, 2000). The Mann-Whitney U test is one of the two independent sample tests which can be used to analyze the group difference. Profile analysis confirmed that there is no parallelism for forest certification related issues between two groups.

The Mann-Whitney U test shows the questions which are statistically different with the group membership (Table 28). According to the p values (<0.10) of Mann-Whitney statistics, Q1, Q2, Q3, Q5, and Q6 are significantly different between two groups. As summarized by the profile analysis, Q4 has the p-value of 0.397 hence seeking forest certification information (Q4) is not significantly different with the group membership.

**Table 28:** Mann-Whitney test statistics for certified vs. non certified product importers’ perception towards forest certification

<table>
<thead>
<tr>
<th></th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q5</th>
<th>Q6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>118.000</td>
<td>183.500</td>
<td>168.000</td>
<td>190.500</td>
<td>127.500</td>
<td>118.000</td>
</tr>
<tr>
<td>Wilcoxon W</td>
<td>271.000</td>
<td>336.500</td>
<td>321.000</td>
<td>326.500</td>
<td>280.500</td>
<td>271.000</td>
</tr>
<tr>
<td>Z</td>
<td>-3.147</td>
<td>-1.645</td>
<td>-1.999</td>
<td>-0.847</td>
<td>-2.976</td>
<td>-3.127</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>0.002*</td>
<td>0.100*</td>
<td>0.046*</td>
<td>0.397</td>
<td>0.003*</td>
<td>0.002*</td>
</tr>
</tbody>
</table>

* P-value is significant at α=0.05 significance level.

Note: Grouping Variable: Import certified products or not.

**4.11 Opportunities for Sri Lankan Exporters**

When considering the opportunities for Sri Lankan exporters to market their products in the U.S. market, it is important to analyze whether the existing importers would like to receive information from Sri Lanka. Of 54 respondents, 61% said they would like to receive information on Sri Lankan wood products. Moreover, 60% of respondent are seeking new suppliers and 53% of respondents plan to diversify their products in the next five years. Previous findings identified
market segments in U.S. for wood product imports and variables that differentiate these existing market segments. In addition, findings help to understand the overall structure of the U.S. wood product import market. In general, there is an opportunity for Sri Lanka exporters who can provide certified, good quality products into the U.S market.
CHAPTER 5: RESULTS AND DATA ANALYSIS OF SRI LANKA EXPORTERS

5.1 Respondent Profile

| Table 29: Summary statistics of demographic characteristics (2006) |
|---------------------------------|----------|--------|-----------------|-----------------|-----------------|
|                                 | Scale    | Mean   | Minimum         | Maximum         | Standard        |
| a) Total sales                 | 1-9      | 1.00   | $0-$5 million   | More than a Billion | 0.000           |
| b) Number of employees         | 1-6      | 3.23   | 1-10 employees  | More than 500 employees | 1.032           |
| c) Number of containers exported| 1-4      | 1.04   | 1-25 containers | More than 100 containers | 0.200           |
| d) Percentage of sales from exports | 1-10    | 1.20   | 1% - 9%         | 90% - 100%      | 0.500           |

5.1.1 Total Sales: As shown in Table 29, all respondent companies’ total gross sales are less than US $ 5 million.

5.1.2 Number of Employees

Respondents were asked to state the number of employees at work in the company in 2006. Half of the respondents employed 26-50 workers. Although more than 50 employees work for 35% of the respondent companies, 15% have less than 25 employees. Further, 11.5% have more than 100-500 employees in their company. Percent distribution of respondents by number of employees in 2006 is illustrated in Figure 29.

5.1.3 Number of Containers Exported

Respondents were asked to estimate the number of wood product containers they exported in 2006 in order to analyze company scale. Except for one respondent, all exported 1-25 containers in 2006.

5.1.4 Sales from Exports

Respondents were asked to estimate their total gross sales from exports in 2006. Results show that 84% of respondents earned 1-9% of their sales from exports.
None of the companies had sales in excess of 29% from foreign exports. Figure 30 illustrates the distribution of percent of respondents by sales from exports.

**Figure 29:** Number of employees, (Percent of respondents, n=26)

**Figure 30:** Percent of total gross sales from imports (Percent of respondents, n=54)
5.2 Company Experience with Exporting

Company experience is another variable which helps to determine a company profile. Respondents were asked to state the number of years that they have been exporting wood products. Sixty percent of respondents are relative newcomers exporting, being involved for five years or less. Few respondents (8%) have more than 20 years experience. In general, 90% of respondents have 0-10 year working experience in the wood product export sector. Figure 31 shows the percent distribution of respondent companies by experience.

5.3 Types of Wood Products Export

Respondents were allowed to provide multiple responses with regard to the products they export. Furniture and furniture parts were the most popular wood product category among respondents followed by cabinets, molding and millworks, and wooden toys (Figure 32). Few percent of respondents (3.8% each) were interested in exporting windows and hardwood plywood.

Figure 31: How long respondents have been involved in the export sector, (Percent of respondents, n=26)
Figure 32: Percent of respondents importing various wood products in 2006, (n=26)

5.4 Foreign Countries Exported to by Sales Value

Respondents were asked to rank the top eight countries that they exported wood products to in 2006 by sales value. The United Kingdom was cited by 36% of respondents, followed by the U.S. (20%) and India (12%) (Figure 33).

Figure 33: Countries exported to by sales value in 2006, (Percent of respondents, n=25)
5.5 Future Exports to the U.S.

Respondents that were both currently and not currently exporting wood products were asked if they intended to export wood products to the U.S. in the future (Figure 34). Although half of respondent companies will not target U.S. markets in the near future (next five years), 14.3% said they did and 35.7% were not certain.

![Diagram showing future export intentions](image)

**Figure 34:** Respondents who intend to export to the U.S. in the future, (Percent of respondents, n=14)

5.6 Raw Material Suppliers

The State Timber Corporation (STC) in Sri Lanka is the government body which is responsible for the harvesting and selling timber from state owned forests. Since 90% of natural forests are owned by the government, the STC is a significant raw material supplier for wood-based industries. Other major raw material suppliers are the private companies who own and manage their private plantations. All respondents purchase their raw materials from private companies (Figure 35). In addition, 85% purchase their raw materials from the STC and few respondents (3.8%) rely on foreign raw material suppliers.
Respondents were asked to state their level of agreement for various marketing efforts of their company using a 1-5 Likert scale anchored by 1=strongly disagree to 5=strongly agree (Figure 36). A plurality strongly agreed that targeting specific markets (S6) is an important component, indicating that they are interested in niche/specific market segments. Also, most respondents rarely do formal research on clients needs (S5). Respondent perceptions were generally neutral towards understanding competitors’ strength and weaknesses (S3), prepare a plan for marketing of products (S4), doing market research prior to introduction of their products (S1) and having a strategic plan for wood product export (S2). Although Sri Lanka manufacturers target foreign niche markets, these findings show that the Sri Lanka exporters do not have adequate efforts to market their products in foreign markets.
Figure 36: Level of agreement on marketing efforts, (Percent of respondents, n=26)

Figure 37: Respondents who conduct phytosanitary tests, (Percent of respondents, n=26)
5.8. Phytosanitary Testing

Phytosanitary tests often act as non tariff barriers in cross boundary transportation specially to control dispersion of pests and destructive organisms which can be transmitted with wood product packaging materials (corrugated boxes). Many countries including the U.S. require certain tests for insects, pests, and microbes of wood products from their foreign suppliers prior to import.

With the goal of identifying how well the Sri Lankan exporters have adopted these measures, they were asked to indicate whether they test their products for certain insects, pests, and microbes prior to export. Although 80% of respondents check their products for insects and pests, more than half of the respondents do not conduct certain tests for microbes (Figure 37).

5.9 Sources of Information

Respondents were asked to state their level of agreement using a 1-5 Likert scale on the importance of sources of information they use. In contrast to the U.S. importers, Sri Lanka exporters rely on conventional sources of information. Word of mouth (WOM, 4.65) placed in first followed by web sites (3.94) and catalogues (3.94). Newsletters (1.87) are the least important source of information followed by direct mails (2.47) and trade magazine adds (2.81). Figure 39 illustrates the mean distribution of sources of information.

5.10 Comparison of Sources of Information for Sri Lankan Exporters vs. U.S. Importers

Mann-Whitney U tests were conducted to compare the sources of information used by Sri Lanka exporters and U.S. importers (Table 30). According to the test results, degree of utilization of catalogues (0.10), workshops (0.033), magazines (0.016), word of mouth (0.000), and newsletters (0.029) are significantly different between Sri Lanka exporters and U.S. importers at
α=0.05 significance level and via distributors (0.074) is significantly different at α=0.10 significance level. The degree of utilization of e-mails, websites, through sales representative, trade magazine adds, international trade shows, and direct mails are not significantly different between exporters and importers.

**Figure 38:** Mean distribution of source of information, (n=26)

**Table 30:** Mann-Whitney test statistics for exporter vs. importer sources of information

<table>
<thead>
<tr>
<th>Source of Information</th>
<th>E mail</th>
<th>Catalogues</th>
<th>Websites</th>
<th>Workshops</th>
<th>Sales representative</th>
<th>Trade magazine ads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>319.0</td>
<td>264.0</td>
<td>348.0</td>
<td>208.5</td>
<td>382.5</td>
<td>351.0</td>
</tr>
<tr>
<td>Z</td>
<td>-1.147</td>
<td>-2.573</td>
<td>-1.042</td>
<td>-2.135</td>
<td>-1.076</td>
<td>-0.756</td>
</tr>
<tr>
<td>Asymp.sig. (2-tailed)</td>
<td>0.251</td>
<td>0.010*</td>
<td>0.297</td>
<td>0.033*</td>
<td>0.282</td>
<td>0.450</td>
</tr>
</tbody>
</table>
Only 8% of respondents export certified wood products. Respondents were asked to state their level of agreement for the following statements regarding forest certification issues in order to develop a perspective about their perceptions towards forest certification (Figure 39).

**Q1** - Certified products can help my company reach diversified markets  
**Q2** - Certified products can capture price premiums  
**Q3** - Certified products help to protect environment  
**Q4** - I would like to get information about forest certification  
**Q5** - I would incur an extra cost to certify my wood products

<table>
<thead>
<tr>
<th></th>
<th>Magazines</th>
<th>WOM</th>
<th>International trade shows</th>
<th>Direct mail</th>
<th>Distributors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>244.0</td>
<td>286.5</td>
<td>290.0</td>
<td>297.0</td>
<td>267.0</td>
</tr>
<tr>
<td>Z</td>
<td>-2.02</td>
<td>-3.600</td>
<td>-0.809</td>
<td>-1.060</td>
<td>-1.789</td>
</tr>
<tr>
<td>Asymp.sig. (2-tailed)</td>
<td>0.016*</td>
<td>0.000*</td>
<td>0.418</td>
<td>0.289</td>
<td>0.074**</td>
</tr>
</tbody>
</table>

**Figure 39**: Level of agreement on forest certification issues, (Percent of respondents)
A plurality has a neutral perception that “certified products help to reach diversified markets” (Q1) and “certified products can capture price premiums” (Q2). However, the highest percentages of respondents strongly agree with “certified products help to protect environment” (Q3) and “I would like to get information about forest certification” (Q4). Respondents are not willing to bear the cost of certification (Q5). Further analysis was carried out to identify the influential factor behind the strong agreement on seeking certification information. Spearman’s correlation was used to identify the relationship among certification statements referenced earlier. Summary statistics of Spearman correlations is illustrated in Table 31. Seeking information has a positive correlation with “certified products can help my company reach diversified markets” and “certified products help to protect environment” which are significant at \( \alpha=0.05 \) significance level. In conclusion, respondents like to get information about forest certification since they believe certified products can help the company to reach diversified markets and help to protect environment.

**Table 31:** Spearman’s correlation statistics for forest certification issues

<table>
<thead>
<tr>
<th>Spearman’s rho</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation coefficient</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation coefficient</td>
<td>0.599**</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.002</td>
<td>.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation coefficient</td>
<td>0.784**</td>
<td>0.683**</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.000</td>
<td>0.000</td>
<td>.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correlation coefficient</td>
<td>0.438*</td>
<td>0.173</td>
<td>0.417*</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.032</td>
<td>0.409</td>
<td>0.038</td>
<td>.</td>
<td></td>
</tr>
<tr>
<td>Correlation coefficient</td>
<td>0.339</td>
<td>0.105</td>
<td>0.356</td>
<td>0.235</td>
<td>1.000</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.105</td>
<td>0.618</td>
<td>0.081</td>
<td>0.258</td>
<td>.</td>
</tr>
</tbody>
</table>

**Correlation is significant at 0.01 level (2-tailed)**
*Correlation is significant at 0.05 level (2-tailed)
5.12 Comparison of Exporters vs. Importers Perceptions of Certification

To compare the level of agreements regarding above stated forest certification issues of Sri Lankan exporters with the responses given by U.S. importers, Mann-Whitney U statistics was used (Table 32).

Table 32: Mann-Whitney test statistics for exporter vs. importer perceptions of certification

<table>
<thead>
<tr>
<th></th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mann-Whitney U</td>
<td>481.0</td>
<td>551.5</td>
<td>263.0</td>
<td>335.5</td>
<td>155.0</td>
</tr>
<tr>
<td>Z</td>
<td>-1.319</td>
<td>-0.727</td>
<td>-4.307</td>
<td>-3.019</td>
<td>-5.367</td>
</tr>
<tr>
<td>Asymp.sig. (2-tailed)</td>
<td>0.187</td>
<td>0.467</td>
<td>0.000*</td>
<td>0.003*</td>
<td>0.000*</td>
</tr>
</tbody>
</table>

*P value is significant at α=0.05 significance level.

P values of Q3, Q4, and Q5 are significant at α=0.05 significance level. Therefore, at 95% of confidence we can conclude that responses for Q3, Q4, and Q5 are significantly different between exporters and importers. Both groups have similar perceptions towards Q1: certified products help to reach diversified markets and Q2: certified products can capture price premiums.

5.13 Export Limitations

An understanding of limitations encountered by Sri Lanka exporters will help them to take necessary actions to expand export participation. Respondents were asked to state their level of agreement using a 1-5 Likert scale on a given set of limitations (Table 33). The cut off point for the prominent limitations is 4.0. Bad transportation infrastructure is the key constraint encountered by the exporters followed by high shipping/handling cost, inefficient custom procedure, high export duties/tariff and lack of skilled labors.

Although Factor analysis was conducted to reduce the number of variables, the result of the analysis is ambiguous. Therefore, limitations with mean values greater than 4.00 were manually categorized in to four groups based on their physical characteristics (Table 34). In
general, transportation, labor and technology, buyer specifications and policies are the major limitations of Sri Lanka wood product export sector expansion.

**Table 33:** Mean distribution of wood products export limitations

<table>
<thead>
<tr>
<th>Export limitations</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bad transportation infrastructure</td>
<td>5.0</td>
</tr>
<tr>
<td>High shipping/handling cost</td>
<td>4.9</td>
</tr>
<tr>
<td>Inefficient custom procedures</td>
<td>4.8</td>
</tr>
<tr>
<td>High export duties/tariff</td>
<td>4.8</td>
</tr>
<tr>
<td>Lack of skilled labors</td>
<td>4.8</td>
</tr>
<tr>
<td>Lack of production technology</td>
<td>4.5</td>
</tr>
<tr>
<td>Inadequate, inefficient, and unreasonable sea cargo transportation</td>
<td>4.4</td>
</tr>
<tr>
<td>Lack of information on buyers</td>
<td>4.4</td>
</tr>
<tr>
<td>Lack of Government policies to encourage existing exports</td>
<td>4.1</td>
</tr>
<tr>
<td>Lack of government policies to encourage new investments</td>
<td>4.1</td>
</tr>
<tr>
<td>Research findings are not readily available for the investors</td>
<td>4.0</td>
</tr>
<tr>
<td>Lack of flexible forest policy regulations</td>
<td>4.0</td>
</tr>
<tr>
<td>Difficulty in meeting buyers required delivery schedules</td>
<td>4.0</td>
</tr>
<tr>
<td>Lack of interaction among stakeholders</td>
<td>3.9</td>
</tr>
<tr>
<td>Lack of exporters’ involvement in policy formulation</td>
<td>3.8</td>
</tr>
<tr>
<td>Financial constraints</td>
<td>3.8</td>
</tr>
<tr>
<td>Lack of wood exporter organization or association</td>
<td>3.7</td>
</tr>
<tr>
<td>Lack of accountability</td>
<td>3.7</td>
</tr>
<tr>
<td>Buyer payment restrictions</td>
<td>2.8</td>
</tr>
<tr>
<td>Lack of reliability of buyers</td>
<td>2.7</td>
</tr>
<tr>
<td>High demand for certified products</td>
<td>2.6</td>
</tr>
</tbody>
</table>

**Table 34:** Mean distribution of wood products export limitation factors

<table>
<thead>
<tr>
<th>Transportation</th>
<th>Labor and technology</th>
<th>Buyer specifications</th>
<th>Policies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bad transportation infrastructure</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High shipping/handling cost</td>
<td>4.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inefficient custom procedures</td>
<td>4.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inadequate, inefficient, and unreasonable sea cargo transportation</td>
<td>4.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of skilled labors</td>
<td>4.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of production technology</td>
<td>4.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of information on buyers</td>
<td>4.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difficulty in meeting buyers required delivery schedules</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High export duties/tariff</td>
<td>4.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of government policies to encourage existing exports</td>
<td>4.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of government policies to encourage new investments</td>
<td>4.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research findings are not readily available for the investors</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of flexible forest policy regulations</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER 6: CONCLUSION AND DISCUSSION

The U.S. timber demand has dramatically increased over the past few years. High demand in turn raises the price. In addition to import sector contribution to the country’s economy, open access to imports help to dilute the timber prices in the domestic market (International trade report, 2004). Despite recent drawbacks in the economy, many economists predict that timber market in the U.S. will continue to grow (Howard and Westby, 2007). As the leading wood products consumer, it is important to understand U.S. market conditions so that exporters can better serve the U.S. wood products markets.

Although Sri Lanka has a favorable environment for wood and related product exports with some avoidable constraints, wood product export sector contribution to the country’s economy is insignificant. Out of the total exports in 2006, only 0.46% was from wood and wood products export and 0.65% was from paper and paper products (Department of census and statistics, 2007). However, given the sufficient financial, institutional and technological assistance, this sector has huge potential to grow. In order to derive maximum benefits from emerging global markets and opportunities, it is important to identify the current trade and development barriers that exist in Sri Lanka from the perspective of wood product exporters.

This study aims to assess the U.S. wood products importers and Sri Lanka wood product exporters. Data were gathered using specifically designed two different survey questionnaires.

6.1 U.S. Wood Product Importers

Results better frame various import related issues from the perspective of wood product importers in the U.S. Softwood lumber was the leading wood product import category in terms of volume in 2006 followed by hardwood lumber, hardwood plywood, and millwork and molding. According to the respondents, Brazil, Chile, and China were the large scale wood
product suppliers into the U.S. market in terms of timber volume and Brazilian wood products ranked first for its product quality followed by Chile and Finland in 2006. In conclusion, Brazil and Chile were the largest and best quality product suppliers in importers’ point of view.

This study identifies the three existing segments/clusters in the wood products import market. Clustering was conducted based on some demographic characteristics such as total gross sales, number of employees, number of containers imported, and percent of sales from imports. Distinct groups were named as small to medium scale but moderate importers (Group 1), medium to large scale but minor importers (Group 2), small to medium scale but major importers (Group 3). A plurality of respondents belongs to the Group 3; small scale but major importers.

Out of numerous foreign buyer selection criteria, certification and marketing, product attributes, client contact, quality products supply, and timber species and supplier reputation were the significant factors that the U.S. importers do consider when selecting their foreign suppliers. Therefore, the exporters should highly focus on above mentioned factors if they intend to launch their products in the U.S. market. The utilization of forest certification related issues, consistent supply, and fair prices in foreign buyer selection is different in medium to large scale but minor importers (Group 2) and small to medium scale but major importers (Group 3) than in small to medium scale but moderate importers (Group 1).

Word of mouth, e-mails, and web sites are the most common sources of information for U.S. importers and main means of communication with their foreign suppliers. Hence, suppliers should take advantage of these technologies to effectively convey their product information to U.S buyers/importers.

Results indicate that a plurality of respondents (64%) are importing certified products and most popular certification programs among respondents are FSC, SFI, and ISO 14,000. If wood
products exporters are to exploit these certified wood products markets, it is advisable for them to obtain certification from FSC, SFI, or ISO 14,000 programs since they were heavily favored by the U.S. importers.

In addition, perceptions towards certification issues such as certified products help to reach diversified markets, certified products can capture price premiums, certified products help to protect environment, and if available, seek out certified wood products are significantly different between certified wood product importers and non certified wood product importers. However, none of the companies are unlikely to pay any cost of certification.

6.2 Sri Lanka Exporters

Research findings indicate that Sri Lanka exporters mainly export furniture and parts, cabinets, molding and millwork, and wooden toys. Their major target markets are United Kingdom, U.S. and India. Lead contaminated plastic toys has become a serious issue in recent times in U.S. wooden toys on the other hand are one of the major wood exports of Sri Lanka. This can be an opportunity for Sri Lanka exporters who export wooden toys.

Most of the Sri Lanka exporters are minor scale with 1-9% of their gross sales coming from exports. Most of them have recently entered to exports with less than 5 years of experience in the field. Although they target specific market segments, most of the respondents do not pay attention to strategic marketing, market research to understand latest trends, and study their competitors. However, given the sufficient institutional and technological assistance, this sector has huge potential to grow.

Considerable percentage of the Sri Lankan wood product export respondents was interested in exporting their products to the U.S. in the future. Findings from the U.S. importer study show that a plurality of respondents are seeking new suppliers and would like to obtain
information of Sri Lanka’s wood products. Moreover, half of the respondents are intending to diversify their products in the next 5 years. These findings suggest the need of a market research about Sri Lanka wood products in the US market.

Wooden toys are one of the important wood product categories that Sri Lanka exporters are interested in. Lead contaminated wood products have become a serious issue in the U.S, particularly products from China. This can be an opportunity for Sri Lanka exporters who can provide certified lead free wooden toys in to the U.S. market.

While e-mails, word of mouth, and websites are popular among U.S. importers, Sri Lankan exporters still rely on conventional methods of communication such as word of mouth, sales representative, international trade shows and product catalogues. However, there is a great tendency towards using e-mails and websites to communicate with their customers. Trade magazine advertisements and direct mails were the least utilized means of communication for both U.S. importers and Sri Lanka exporters.

Although 92% of respondents export non certified products, a plurality was interested in more information about forest certification. They have neutral perceptions on certified products can help the company to reach diversified markets and capture price premiums. In general, both importers and exporters have similar perceptions on certified products help to reach diversified markets and both do not agree on certified products can capture price premiums. These findings indicate the need of extension of awareness programs to educate Sri Lanka exporters about forest certification.

Sri Lanka exporters gave low priority for factors such as environmental certification, financial constraints, stakeholder interaction, and buyer reliability as limitations for their business expansion. Instead, they identified inefficient internal and external transportation, lack
of supportive government policies and lengthy custom procedure, lack of experienced labors and old production technology, and difficulties in meeting buyer’s required delivery schedules as major limiting factors for export business expansion. Responsible government institutions should take necessary steps to strengthen the export sector by taking necessary actions to minimize those constraints.
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APPENDIX I: U.S. WOOD PRODUCTS IMPORTERS
U.S. WOOD PRODUCTS IMPORTERS

Does your company import wood products from outside the United States???

If you answered “NO” (your business does not import wood products) please place the survey in the enclosed POSTAGE PAID envelope and mail back to us.

If you answered “YES” (your business does import wood products from outside the United States), please continue with the survey.

Section I. Company Information

1. Please estimate the total number of people that are currently employed by your company in ALL company locations. (Please circle the appropriate response).
   1. 1-10 EMPLOYEES
   2. 11-25 EMPLOYEES
   3. 26-50 EMPLOYEES
   4. 51-100 EMPLOYEES
   5. 101-500 EMPLOYEES
   6. MORE THAN 500 EMPLOYEES

2. Please estimate total gross sales for your company in 2006. (Please circle the appropriate response).
   1. $0 - $5 million
   2. $6 - $10 million
   3. $11 million - $25 million
   4. $26 million - $50 million
   5. $51 million - $100 million
   6. $101 million - $250 million
   7. $251 million - $500 million
   8. $501 million - $1 Billion
   9. More than $1 Billion

3. Is your company a member of any organization or association that has a focus on wood products international trade? (Please circle one).
   1. YES
   2. NO
   3. I DON’T KNOW

   If YES, please specify the organization(s) and/or association(s)

   ______________________________________________________
   ______________________________________________________

4. In what state is your company headquartered? ____________
Section II. Please Tell Us about Your Wood Products Imports

1. Which of the following wood products does your company import? (Please check all that apply).

___Cabinets  ___Hardwood lumber  ___Laminated Veneer Lumber (LVL)
___Doors  ___Hardwood plywood  ___Medium Density Fiberboard (MDF)
___Flooring  ___Softwood lumber  ___Oriented Strandboard (OSB)
___Furniture  ___Softwood plywood  ___Particleboard
___Windows  ___Treated wood products  ___Hardwood veneer
___Kitchen utensils  ___Wooden toys  ___Softwood veneer
___Molding & Millwork  ___Wooden ornaments  ___Shelving
___  ___Pallets

Other(s), please specify
_________________________________________________________________________________

2. Please rank the Top 10 countries that you imported wood products from in 2006 (rank by purchase value: (1=Highest Value; 2=Second Highest, etc.)

1.  6.
2.  7.
3.  8.
4.  9.
5.  10.

3. Please rank the Top 5 countries you import wood products from that have the best product quality? (1=Highest Quality; 2=Second Highest Quality, etc.)

1.  4.
2.  5.
3.  

4. How long have you been importing wood products? (Please circle one response)

1.  0-5 years
2.  6-10 years
3.  11-15 years
4.  16-20 years
5.  More than 20 years

5. Please list the TOP 5 timber species that your company imported in 2006 by VOLUME? (1=Highest Volume; 2=Second Highest Volume, etc.)

1.  4.
2.  5.
3.  

6. How many containers of imported wood products did you purchase in 2006? (Please circle the appropriate response).

1.  1-25 containers
2. 26-50 containers
3. 51-100 containers
4. More than 100 containers

7. Please estimate the percent of your company’s TOTAL 2006 gross sales that were generated from imported wood products. (Please circle the appropriate response).

<table>
<thead>
<tr>
<th>Percentage Range</th>
<th>1.1%-9%</th>
<th>2.10%-19%</th>
<th>3.20%-29%</th>
<th>4.30%-39%</th>
<th>5.40%-49%</th>
<th>6.50%-59%</th>
<th>7.60%-69%</th>
<th>8.70%-79%</th>
<th>9.80%-89%</th>
<th>10.90%-100%</th>
</tr>
</thead>
</table>

8. Does your company require quality testing from your imported wood product suppliers for any of the following prior to purchase? (Please circle one response for each)

<table>
<thead>
<tr>
<th>Component</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insects</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Pests</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Microbes</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Wood properties</td>
<td>YES</td>
<td>NO</td>
</tr>
</tbody>
</table>

9. Do you plan to diversify the wood products you import in the next 5 years? (Please circle one)

1. YES  2. NO

If YES, please list these products:

1. 6.
2. 7.
3. 8.
4. 9.
5. 10.

10. Do you plan to diversify the species you import in the next 5 years? (Please circle one)

1. YES  2. NO

If YES, please list these new species you plan to import:

1. 6.
2. 7.
3. 8.
4. 9.
5. 10.

11. Is your company currently seeking new sources of supply for imported wood products from additional countries in the next 5 years? (Circle one)

1. YES  2. NO
If **YES**, what additional countries do you plan to import from? (List all that apply)

____________________________________________________________________

____________________________________________________________________

12. Does your company import wood products from Sri Lanka?

1. **YES**  
2. **NO**

If **YES**, what products do you import from Sri Lanka? (List all that apply)

____________________________________________________________________

____________________________________________________________________

If **YES**, what species do you import from Sri Lanka? (List all that apply)

____________________________________________________________________

____________________________________________________________________

If **NO**, would you like to receive information about Sri Lankan wood products?

1. **YES**  
2. **NO**

**Section III. Your International Suppliers**

1. Please indicate the importance of the following ways your company receives information about international wood products suppliers.

<table>
<thead>
<tr>
<th></th>
<th>Not important at all</th>
<th>Somewhat important</th>
<th>Very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-mail</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Catalogues</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Websites</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Workshops</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Suppliers sales representatives</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Magazines</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Word of mouth</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>International trade shows</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Direct mailing</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Distributors</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Trade magazine adds</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Newsletters</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Other, *please specify*: __________________________________________________________

2. Please indicate the level of importance of the following criteria your company uses to select your foreign wood products suppliers.
<table>
<thead>
<tr>
<th></th>
<th>Not important at all</th>
<th>Somewhat important</th>
<th>Very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fair prices</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provides certified products</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consistent supply</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On time/flexible delivery</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product quality</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traditional species</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lesser used species</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warranty</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product design</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fast delivery</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uniqueness</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fast response to my inquiries</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supplier reputation</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If products come from sustainably</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>managed forests.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledgeable sales people</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High level of overall customer service</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distribution capabilities</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marketing skills</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer capabilities</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-term customer relationships</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supplier speaks English</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please list any other criteria you use to select your foreign suppliers.

1)

2)

3)

3. Would you prefer to buy from international suppliers other than the local suppliers?
   1. YES------- 2. NO-------

4. If yes, please mention the reason/s
   1. ...........................................
   2. ...........................................
   3. ...........................................

5. Does your company work directly with international suppliers in any of the following ways? *(Please circle all that apply)*
1. Product development research
2. Using products made of lesser known species
3. Joint ventures
4. Joint marketing
5. Offering credit
6. Advising on quality issues
7. Other (please specify) ____________________________________________

6. Please indicate the percentage of purchases of imported wood products that came from the following channels in 2006. (Total must equal 100%)

<table>
<thead>
<tr>
<th>Channel</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directly from manufacturers</td>
<td></td>
</tr>
<tr>
<td>Brokers in the U.S.</td>
<td></td>
</tr>
<tr>
<td>Brokers in foreign country</td>
<td></td>
</tr>
<tr>
<td>From distributors</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

Section IV. Certification Issues

Definition: Forest certification means that the forests from which the wood comes are managed in a sustainable manner and that the trees are harvested in an environmentally sound manner.

1. Are any of the wood products your company imports certified by a recognized certification program?
   1. YES          2. NO

   If YES, which programs? (Circle all that apply) ➔ ➔ ➔ GO TO QUESTION 3 ON PAGE 7
   1. SFI (Sustainable Forestry Initiative)
   2. FSC (Forest Stewardship Council)
   3. PEFC (Program for the Endorsement of Forest certification)
   4. Tree Farm
   5. Green Tag
   6. ISO 14000
   7. Other, Please specify ________________________________

   If NO, why not? (Circle all that apply) ➔ ➔ ➔ GO TO QUESTION 7 ON PAGE 7
   1. Have not heard about it before
   2. High cost relative to non-certified products
   3. Do not see the benefit to my company
   4. Our suppliers cannot provide certified wood products
   5. Other, Please specify ________________________________

2. Please estimate the percent of your company’s 2006 gross sales that was from certified imported wood products (Please circle the appropriate response).
3. From which countries do you purchase certified products? (List all that apply)

4. Has your company ever requested that your non-certified foreign wood suppliers to become certified? (Please circle one)

   1. YES  2. NO  3. I DO NOT KNOW

5. Does your company actively promote its products as certified to your customers?

   1. YES  2. NO  3. I DO NOT KNOW

6. Do your company’s certified products carry an “Eco-Label” indicating that they are certified?

   1. YES  2. NO  3. I DO NOT KNOW

7. Whether or not your company purchases certified imported wood products, what is your level of agreement with the following statements?

<table>
<thead>
<tr>
<th></th>
<th>Strongly disagree</th>
<th>Somewhat agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certified wood products can help my company reach diversified markets</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certified wood products can capture price premiums</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certified products help to protect the environment</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would like to get information about forest certification</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would pay a premium for certified wood products</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If available, I would seek out certified wood products</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Thank you for your cooperation and time in completing this survey!!!! Please place it in the Postage-Paid Envelope and mail it back.
APPENDIX II: SRI LANKA WOOD PRODUCT EXPORTERS
SRI LANKA WOOD PRODUCT EXPORTERS

Does your company export wood products to countries outside of Sri Lanka???

If you answered “NO” (your business does not export wood products) STOP and give the survey to the researcher.

If you answered “YES” (your business does export wood products from outside the Sri Lanka), please continue with the survey.

1. Please estimate the total number of people that are currently employed by your company in ALL company locations. (Please circle the appropriate response).
   1. 1-10 EMPLOYEES
   2. 11-25 EMPLOYEES
   3. 26-50 EMPLOYEES
   4. 51-100 EMPLOYEES
   5. 101-500 EMPLOYEES
   6. MORE THAN 500 EMPLOYEES

2. Please estimate total gross sales for your company in 2006. (Please circle the appropriate response).
   1. $0 - $5 million
   2. $6- $10 million
   3. $11 million - $25 million
   4. $26 million-$50 million
   5. $51 million-$100 million
   6. $101 million-$250 million
   7. $251 million-$500 million
   8. $501 million-$1 Billion
   9. More than $1 Billion

3. Is your company a member of any organization or association that has a focus on wood products international trade? (Please circle one).
   ___ Yes (please specify) ____________________________________________
   ___ No
   ___ I don’t know

Section I. Please Tell Us about Your Wood Products Exports

2. Which of the following wood products does your company export?

   ___ Cabinets
   ___ Doors
   ___ Flooring
   ___ Furniture
   ___ Windows
   ___ Kitchen Utensils
   ___ Molding & Millwork
   ___ Hardwood lumber
   ___ Hardwood plywood
   ___ Softwood lumber
   ___ Softwood plywood
   ___ Treated Wood Products
   ___ Laminated Veneer Lumber (LVL)
   ___ Medium Density Fiberboard (MDF)
   ___ Oriented Strandboard (OSB)
   ___ Veneer
   ___ Particleboard
   ___ Shelving
   ___ Wooden Toys
   ___ Wooden ornaments
   ___ Shelving
   ___ Pallets
   ___ Others, please specify ________________________________________
2. Please rank the Top 8 countries that you exported wood products to in 2006 (rank by sales value: (1=Highest Value; 2=Second Highest, etc.)

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8.

3. How long have you been exporting wood products? (Please circle one response)

1. 0-5 years
2. 6-10 years
3. 11-15 years
4. 16-20 years
5. More than 20 years

4. Please list the TOP 5 timber species that your company exported in 2006 by VOLUME? (1=Highest Volume; 2=Second Highest Volume, etc.)

1. 
2. 
3. 
4. 
5.

5. How many containers of imported wood products did you export in 2006? (Please circle the appropriate response).

1. 1-25 containers
2. 26-50 containers
3. 51-100 containers
4. More than 100 containers

6. Please estimate the percent of your company’s TOTAL 2006 gross sales that were generated from exported wood products. (Please circle the appropriate response).

1. 1%-9%
2. 10%-19%
3. 20%-29%
4. 30%-39%
5. 40%-49%
6. 50%-59%
7. 60%-69%
8. 70%-79%
9. 80%-89%
10. 90%-100%

8. Which country is your company’s major competitor? (Pleases indicate the country)

________________________________________

9. Does your company export to US?

1. YES------  2. NO-------
10. If your company does not export to US, would you intend to export to US?
   ________ Definitely in the next year
   ________ Definitely in the next 5 years
   ________ Definitely in the future
   ________ Definitely not
   ________ Not certain

11. Is your company currently seeking new sources of buyers for your export wood products from additional countries in the next 5 years? (Circle one)
   1. YES          2. NO

   If YES, what additional countries do you plan to export to? (List all that apply)
   ______________________________________________________
   ______________________________________________________

12. Does your company require quality testing for your exported wood products for any of the following prior to shipping? (Please circle one response for each)

<table>
<thead>
<tr>
<th>Insects</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pests</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Microbes</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Wood properties</td>
<td>YES</td>
<td>NO</td>
</tr>
</tbody>
</table>

13. Do you plan to diversify the wood products you export in the next 5 years? (Please circle one)
   1. YES          2. NO

   If YES, please list these products:
   1.               5.               
   2.               6.               
   3.               7.               
   4.               8.               

14. Do you plan to diversify the species you export in the next 5 years? (Please circle one)
   1. YES          2. NO

   If YES, please list these new species you plan to export:
   1.               4.               
   2.               5.               
   3.               6.               

92
15. Please indicate the level of agreement about your company’s wood products marketing effort.

<table>
<thead>
<tr>
<th></th>
<th>Strongly agree</th>
<th>Neither agree nor disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>We rarely do formal research about client needs in this company</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Written plans for marketing our products are prepared in this company</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>In this company we market our goods to specific market segments rather than to one overall market</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>We have a solid understanding of our competitor’s strength and weaknesses</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>We do a market research before introduce our product/s</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Our company has a strategic plan for wood product export</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

16. From where does your company get its required raw material? (Please circle relevant answers)

a. From your own plantation

   If YES, what is the total size of your plantations?............ha.

b. From State timber corporation

c. From private companies / private owners

d. From foreign suppliers

   If YES, please list the countries

   1. 4.
   2. 5.
   3. 6.

17. If your company does not purchase from STC (State Timber Corporation), please indicate the reason/s

<table>
<thead>
<tr>
<th>Reason/s</th>
<th>Check Relevant box/s in this column</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of consistent supply</td>
<td></td>
</tr>
<tr>
<td>Bureaucracies in purchasing procedures</td>
<td></td>
</tr>
<tr>
<td>Poor quality due to long term storage</td>
<td></td>
</tr>
<tr>
<td>Lack of required species</td>
<td></td>
</tr>
<tr>
<td>High prices</td>
<td></td>
</tr>
</tbody>
</table>

**Others**, please specify
Section III. International Buyers

1. Does your company work directly with international buyers in any of the following ways? (Please circle all that apply)

1. Product development research
2. Using products made of lesser known species
3. Joint ventures
4. Joint marketing
5. Other (please specify) ____________________________________________

2. Please indicate the percentage of sales of exported wood products that distributed through following channels in 2006. (Total must equal 100%)

<table>
<thead>
<tr>
<th>Channel</th>
<th>Directly by buyers</th>
<th>Brokers in S.L.</th>
<th>Brokers in foreign country</th>
<th>From distributors</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>....</td>
<td>....</td>
<td>....</td>
<td>....</td>
<td>....</td>
<td>100%</td>
</tr>
</tbody>
</table>

3. Please indicate the importance of the following ways your company receives information about international wood products buyers.

<table>
<thead>
<tr>
<th>Source</th>
<th>Not important at all</th>
<th>Somewhat important</th>
<th>Very important</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-mail</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catalogues</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Websites</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workshops</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suppliers sales representatives</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magazines</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word of mouth</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
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<tr>
<td>International trade shows</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct mailing</td>
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<td>Distributors</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Trade magazine adds</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newsletters</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Other, please specify: ____________________________________________
Section III. Certification Issues

Definition: Certified wood products means that the forests from which the wood comes are managed in a sustainable manner and that the trees are harvested and products are produced in an environmentally sound manner.

1. Are any of the wood products your company exports certified by a recognized certification program?
   
   1. YES  
   2. NO

2. If YES, which programs? (Check all that apply)
   
   ______ SFI (Sustainable Forestry Initiative)  
   ______ FSC (Forest Stewardship Council)  
   ______ SLSI  
   ______ PEFC (Program for the Endorsement of Forest certification)
   
   Others, Please specify

If NO, why not? (Circle all that apply) Then Go to Question 7 on Page 7

1. Have not heard about it before
2. High cost relative to non-certified products
3. Do not see the benefit to my company
4. High initial cost of certification
5. Other, Please specify

3. To which countries do you export certified products? (List all that apply)

4. Which importing countries have the highest demand for your certified products?
   
   1. 
   2. 
   3. 
   4. 
   5. 
   6.

5. Does your company actively promote its products as certified to buyers?
   
   1. YES  
   2. NO  
   3. I DO NOT KNOW

6. Do your company’s certified products carry an “Eco-Label” indicating that they are certified?
   
   1. YES  
   2. NO  
   3. I DO NOT KNOW
7. Whether or not your company purchases certified imported wood products, what is your level of agreement with the following statements?

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly agree</th>
<th>Neither agree nor disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certified wood products can help my company reach diversified markets</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Certified wood products can capture price premiums</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Certified products help to protect the environment</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>I would like to get information about forest certification</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>I would incur an extra cost to certify my wood products</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

8. Has your company ever being requested by your non-certified wood buyers to become certified?
(Please circle one)

1. YES                    2. NO

Section IV. Government and institutional support

1. Have you ever participated in any of the wood product sector related policy formulation processes?
   1. YES                    2. NO

2. Have you ever being supported by EDB (Export Development Board) for marketing your products in the foreign market?
   1. YES                    2. NO

3. Have you ever limited your wood product export due to Sri Lanka export quota restrictions under existing rules and regulations?
   1. YES                    2. NO

4. Have you ever received any tax /duty /tariff concession as a subsidy to encourage your wood products export?
   1. YES                    2. NO

5. Have your products ever subjected to export duty fluctuation due to changes of the product price in the global market?
   1. YES                    2. NO
Section VI. Wood Products Export Limitations

*Generally my company’s export expansion is limited by:*

<table>
<thead>
<tr>
<th>Factor</th>
<th>Strongly disagree</th>
<th>Neither agree nor disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of wood exporter organization or association</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Lack of interaction among stakeholders</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Lack of accountability</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Research findings are not readily available for the investors</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Lack of Government policies to encourage existing exports</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Lack of Government policies to encourage new investments</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Lack of exporters’ involvement in policy formulation</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Inadequate, inefficient, and unreasonable sea cargo transportation</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Inadequate and inefficient air cargo transportation</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Inefficient custom procedures</td>
<td>1</td>
<td>2</td>
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</tr>
<tr>
<td>Bad transportation infrastructure</td>
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<tr>
<td>Lack of production technology</td>
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<tr>
<td>Lack of flexible forest policy regulations</td>
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<tr>
<td>High export duties/tariffs</td>
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<tr>
<td>Financial constraints</td>
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<tr>
<td>Difficulty in meeting buyers required delivery schedules</td>
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<tr>
<td>Lack of skilled labors</td>
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<tr>
<td>High shipping/handling cost</td>
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<tr>
<td>Buyer payment restrictions</td>
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<tr>
<td>Lack of reliability of buyers</td>
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</tr>
<tr>
<td>Lack of information on buyers</td>
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<tr>
<td>High demand for certified products</td>
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Thank you for your cooperation and time in completing this survey!!!!
VITA

Rangika Thilaksri Perera was born in 1978 in Rathnapura, Sri Lanka. After successfully completing the General Certificate of Education Advanced Level examination (GCE A/L), she was selected to follow the program: Forestry and Environmental Science Degree at the University of Sri Jayewardenepura, Sri Lanka. For her undergraduate thesis, Rangika constructed a growth model to predict the individual stem volume of *Alstonia macrophylla* Wall. Ex G. She received her Bachelor of Science in Forestry and Environmental Science (special) degree on May 2005 with First Class honors. In the Fall of 2006 she enrolled at Louisiana State University (LSU) to pursue a master’s degree in forestry, focused on forest products marketing under Dr. Richard P. Vlosky. Her Master of Science (forestry) degree has a strong specialization on forest products marketing and experimental statistics.