Comparison of Timber Trade Patterns between Japan and Korea

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The difference of the wood consuming patterns between Japan and Korea has caused the
different trends in wood import. In the case of Japan, the volume of logs imported has been
markedly reduced after 1980 because of the environmental problems, and then the volume of
lumbers has been increasingly imported to replace the import reduction of the logs. Also, high
added-value processing products have been rapidly increased with increases of the imported
lumbers as affected by changes in the demand of wooden residence houses built with high
quality of earthquake resistant wooden materials. However, in Korea, lower grade lumber and
coniferous logs in low-price are needed instead of high quality wooden materials and lumbers
because temporary wooden materials that does not need to be durability and high quality are
mostly demanded. Therefore, amount of the logs imported in Korea was not greatly changed as
comparing with that in Japan. Coniferous logs in lower-grade and lower-price were imported
from USA in the 1980s, but then after the 1990s, the logs have been imported from Radiata
pine in New Zealand. Although importing the lumber is in trend to be increased, it is still
low level. The portion of lumbers is still in 50% of total lumbers including the logs and the lumb-
er, imported in Japan, while it is in only 10% of the total in Korea. Thus, the logs imported are
still in important portions of domestic wood processing fields in Korea.

INTRODUCTION

The timber for lumbering materials is 41% of total volumes in timber demanded in
Japan, and similarly it is 46% in Korea. Both countries, Japan and Korea, are wood
importing countries. They are importing four–fifth of wood in total volume of supply and
demand from other countries even though those countries are covered with the forest in
two–third of their areas. Thus, wood demands and wood import patterns of both coun-
tries are similar because the wooden materials imported are in great portion.

However, according to the lumbers in use, most parts of lumbers demanded in Japan
are used for constructional materials to build wooden houses. However, in Korea, those
are used for civil engineering and construction materials. In this case, the lumbers are
mostly used as temporary supporting materials for constructing multistoried buildings
(Kim et al., 1998; Rosemarie and Bob, 1999). The different types of wood demand pat-
terns have affected the wood importing patterns in Japan and Korea with the influences
of restriction and prohibition about natural wood production in worldwide (Araya, 1995).

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The objectives of this study were to investigate wood consuming patterns, and to analyze the characteristics of wood import patterns due to the differences of wood consuming patterns between Japan and Korea.

COMPARISON OF WOOD DEMAND PATTERNS BETWEEN JAPAN AND KOREA

1. Characteristics of wood consumption

Problems of housing shortage have been occurred in Korea, especially in large cities of Korea, because Korea has been rapidly industrialized and urbanized due to the economic development since the 1960s. To resolve the housing shortage problems, Korean government made a basic goal of housing policy to supply extensive housing units, which provides numerous residence house units in the short periods of time (Kim and Chun, 1999). In particular, after finishing the government project to build 2.0 million housing units (year 1988-1992), the units of brand-new residence houses were increased about 6.5 times (0.75 million units) in 1990 as comparing with the number of housing units in 1970. As the number of housing units is recalculated in the housing unit per a person based on the population of Korea (45 million), the numbers of residence houses in Korea were as similar as those in Japan. However, the constructional materials used in the residence houses are mostly steel rods and steel frame concretes.

Table 1 shows total floor areas of the brand-new residence houses built in 2000 based on three different constructional types, such as wooden houses, steel framed reinforced concrete structural houses, and others. The total floor areas of residence houses in Japan were 120 million $m^2$ that covered with 54% for wooden houses and 46% for steel framed reinforced concrete structural houses (CRI, 2001), while those in Korea were 81 million $m^2$ that included 93% for steel framed reinforced concrete structural houses and only 0.2% for wooden houses (NSO, 2002) (Table 1). This information indicates that most of residence houses in Korea are non-wooden structures. Also, the residence houses newly built in 2000 were 43 million units that included 77% for multistoried apartments, 15% for townhouses, and 8% for single house units, especially wooden houses newly built were only 1,000 units. However, the residence houses newly built in Japan were 123 million units in 2000, and the wooden houses were 45% of total unit numbers. Thus, the difference of structural characteristics in the residence houses between Japan and Korea has caused the difference of wood consuming pattern between two countries, especially in

<table>
<thead>
<tr>
<th>Country</th>
<th>Total</th>
<th>Wooden house</th>
<th>Steel framed reinforced concrete structural house</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>119,879</td>
<td>64,531</td>
<td>55,185</td>
<td>162</td>
</tr>
<tr>
<td></td>
<td>100.0%</td>
<td>53.8%</td>
<td>46.0%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Korea</td>
<td>81,059</td>
<td>178</td>
<td>75,292</td>
<td>5,588</td>
</tr>
<tr>
<td></td>
<td>100.0%</td>
<td>0.2%</td>
<td>92.9%</td>
<td>6.9%</td>
</tr>
</tbody>
</table>

Korea; wood has been used as interior materials rather than as structural materials for the residence houses (Choi et al., 2003).

2. Characteristics of wood demand

Total volume of wood supply and demand in Japan was 101 million \( m^3 \) in year 2000. Volume of wood consumption in same year was 99 million \( m^3 \) except the consumption for fire–materials and shiitake mushroom plantings. The usage of wood in Japan was 48% for pulp chips, 41% for lumber materials, 14% for plywood, and 2% for others, while in Korea the amount of wood consumption in same year was 27 million \( m^3 \), and the usage of wood was 46% for lumber materials, 41% for pulp chips, 12% for plywood, and 1% for others. The patterns of wood demands were very similar between Japan and Korea (Table 2).

However, based on the demands of lumbers in use, the total shipment of lumbers in Japan was 17.23 million \( m^3 \) in 2000, which was mostly used for house constructional materials in wooden houses. In details, it was used with 80% for constructional materials, 11% for wooden boxes and packing materials, and 4% for engineering constructional materials (Table 3). Unfortunately, there is no official statistical information about the demand of lumbers in Korea since 1995. Park et al. (1995) reported the investigation results about the consumption of wooden materials in 1993. Those results present that the total shipment of lumbers were 4.2 million \( m^3 \). In detail, it was used with 57% for civil engineering and constructional materials, 15% for house constructional materials, 10% for wooden boxes and packing materials, and 17% for others. Also, the Korea Forest Research Institute reported that 73% of the lumbers have been used for concrete mold or tem-

### Table 2. Demand structure of wood in Japan and Korea, 2000 (1,000 \( m^3 \)).

<table>
<thead>
<tr>
<th>Country</th>
<th>Total</th>
<th>Lumber</th>
<th>Pulp &amp; Chip</th>
<th>Plywood</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>99,260</td>
<td>40,946</td>
<td>42,186</td>
<td>13,825</td>
<td>2,303</td>
</tr>
<tr>
<td>100.0%</td>
<td>41.3%</td>
<td>42.5%</td>
<td>13.9%</td>
<td>2.3%</td>
<td></td>
</tr>
<tr>
<td>Korea</td>
<td>27,970</td>
<td>12,848</td>
<td>11,486</td>
<td>3,356</td>
<td>280</td>
</tr>
<tr>
<td>100.0%</td>
<td>45.9%</td>
<td>41.1%</td>
<td>12.0%</td>
<td>10.0%</td>
<td></td>
</tr>
</tbody>
</table>

Source: Forest Agency, Japan 2002 Table of wood demand and supply. Forest Service, Korea 2002 The current state of wood demand and supply.

### Table 3. End use markets of lumber product in Japan and Korea (1,000 \( m^3 \)).

<table>
<thead>
<tr>
<th>Country</th>
<th>Total</th>
<th>Construction</th>
<th>Civil engineering</th>
<th>Packaging</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>17,231</td>
<td>13,813</td>
<td>698</td>
<td>1,862</td>
<td>856</td>
</tr>
<tr>
<td>100.0%</td>
<td>80.2%</td>
<td>4.1%</td>
<td>10.8%</td>
<td>4.9%</td>
<td></td>
</tr>
<tr>
<td>Korea</td>
<td>4,197</td>
<td>642</td>
<td>2,405</td>
<td>420</td>
<td>730</td>
</tr>
<tr>
<td>100.0%</td>
<td>15.3%</td>
<td>57.3%</td>
<td>10.0%</td>
<td>17.4%</td>
<td></td>
</tr>
</tbody>
</table>

porary constructional materials (Kim et al., 1998). The information indicates that the demands of lumbers between Japan and Korea are clearly different. The plywood demanded in Japan was used with 53% for house constructional materials, 16% for furniture, and 8% for fittings, whereas that in Korea was used with 36% for engineering constructional materials, 37% for furniture, and 18% for fittings, in particular, the plywood produced domestically in Korea are used with more than 90% for concrete molds.

CHANGES OF WOOD TRADE PATTERN IN THE WORLD

Forest problem has been considered as a global environmental problem after confirming serious decreases of tropical forest that was informed by U.S. special committee report, "The Earth in A.D. 2000", in 1980 (Ando, 1996). After this time, the environmental function of the forest has being very important subject at the United Nations Conferences related to environmental issues that focused on the absorption of CO₂ and the preservation of biodiversity, especially in tropical forests. In 1992, the United Nations Conference on Environment and Development (UNCED) was held to discuss about those types of serious global environmental problems. At the conference, "Agenda 21" that included detail plan of action in all fields to prevent the decrease of forest and "Principle about the Forest" which was the first global agreement containing the continuous management for all forests in tropical, temperate, and frigid zones were adopted (Yorimitsu, 1999). Also, in 1990, the International Tropical Timber Organization (ITTO) made a decision that wood produced from the forest where is in continuous management should be only traded by 2000, and in 1992, the standard and index for continuous management of the tropical forests were adopted (Araya, 1996; Murasima and Araya, 2000).

On the other hand, felling natural forest has been regulated in USA since the protection of spotted owl lived in the natural forest in Northwest area of U.S. was performed in the mid end of the 1980s. It has markedly influenced the wood processing industry. These types of changes dealing with the forest have affected to step forward to continuous management of the forests. The felling regulation for the natural forest decreased the supply of high quality timber from the natural forests, and then the production of logs was

![Fig. 1. World forest product exports, 1970—2000. Source: FAO, 2002 FAOSTAT DATABASE.](image-url)
decreased with changes of timber sources that were from the natural forests to the artificial forests. Moreover, the wooden materials became to being high-added value processing product because there was in difficulty to produce the high quality products of lumbers and plywood using low-quality of raw materials (Araya, 2000; Murashima and Araya, 2000). In the developing countries, felling the logs was reduced, and the export of the logs was strictly regulated to improve the wood processing industry and to protect their environment. Therefore, the wood trade patterns in the world were changed from the log trade (sources from the natural forest to the artificial forest) to wood products trade that especially focused on the production and export of high-added value products (Fig. 1).

**COMPARISON OF WOOD IMPORT PATTERNS BETWEEN JAPAN AND KOREA**

1. **Development of wood import**

The import portions of total wood supply in Japan was 13% in 1960, 68% in 1980, and, 82% in 2000. It has been continuously increased, and then the wood supply was mostly dependent upon volume of the imported woods rather than domestic self-support for wood demand. After conducting the emergency counter plan for wood price stability in 1961, the import of wood was 10.75 million m$^3$ in same year, and then it was doubled, 25.04 million m$^3$, in 1966 (Murashima, 2001). In 1969, it was 50% of total wood demands. It was different types of wood import pattern because the previous imported wood item was mostly *lauan* lumbers for a processing trade and acquisition of foreign currencies.

From the beginning of the 1970s, the imported wood was increased because the exchange rate system was changed from the fixed system to the fluctuating system that caused the price competitiveness for the imported wood was much improved. Moreover, the open market policy in Japan was asked by the Unites States in the mid end of 1980s, and then the deployment of a strong currency rate for yen against the dollar was caused

![Fig. 2. Wood imports pattern in Japan, 1970–2000. Source: Forest Agency, Japan 2001 Table of timber demand and supply.](image-url)
by Plaza Accord in 1985 (Murasima, 1994; Sato, 2001). It had influenced that the price 
competitiveness of the imported wood products was much more improved. Therefore, 
the volume of wood imported was 59.83 million m$^3$ in 1985, and it was markedly increased 
to 83.26 million m$^3$ in 1989. In 1987, the portion of the imported wood product was more 
than 52% of total wood imported (Fig. 2).

In 1990, the wood tariff rate was largely decreased because the GATT U.R. for the 
inauguration of WTO agreement was performed (Yoneyama, 1994). Thus, the amount of 
wood imported was 89.84 million m$^3$ in 1996, which was the largest volume of wood 
imported. At this time, the portion of the imported wood product was more than 72% of 
total wood imported.

The volume of wood imported in Korea was influenced by the specialization for 
plywood industry in the itemization of export products in 1964 as a part of the economic 
development project that started in 1962. Thereafter, the imported wood materials were 
rapidly increased for the plywood processing trade, and then the imported wood was 
13 million m$^3$ in 1979. However, the regulation of logs export has been performed by the 
countries that supply the wood resources, due to protect their forest resources and 
develop of their forest-product business from the beginning of the 1980s. Therefore, the 
plywood business of Korea in the world markets was dropped down, and then volume of 
the logs imported for use of plywood processing was quickly decreased in 1982, and it was 
0.93 million m$^3$ (Joung and Nagata, 1995).

However, from the mid end of the 1980s, the demand of wood was rapidly increased 
because of the rapid increases of domestic civil engineering construction and house 
constructions (Youn, 1998). Also, the tariff rate for importing wood was sharply decreased 
because of the open-economy policy due to the liberalization of trade and a policy of low 
tariff in the WTO organization. With these reasons, the import of wood had been greatly 
increased, which was from 10.90 million m$^3$ in 1985 to 26.38 million m$^3$ in 2000. The 
portions of wood products imported were 52%, 60%, and 74% of total wood imported in 
1980, 1990, and 2000, respectively (Fig. 3).

![Fig. 3. Wood Imports pattern in Korea, 1975~2000. Source: Forest Service, Korea 2001 Statistical yearbook of forestry.](image-url)
2. Log importing pattern

In 1973, the largest volume, 52.49 million $m^3$, of the logs was imported in Japan. After that, the volume of logs imported was significantly decreased, such as 42.40 million $m^3$ in 1980, 33.86 million $m^3$ in 1990, and 18.01 million $m^3$ in 2000. The logs imported were used for lumber in 68% and plywood in 28%. The source of logs for lumber was coniferous trees imported mostly from the America and the North ocean areas, and the logs for plywood were imported from the Southeast Asia and North ocean areas.

The logs imported in Japan were mostly Southeast Asia (Tropical wood), North America (American wood), and Soviet Union (Siberian wood) until the 1960s. After that time, the importing sources of log had been changed by several impactions. Exporting the logs was regulated first by Indonesia from the mid end of the 1970s, and then other developing countries also increasingly restricted and prohibited the export of their logs after 1985. The import of tropical woods was sharply decreased from 1980. Import of the logs from North America was also decreased because felling the trees was regulated due to the protection of spotted owl in the forest from the mid end of 1980s. Furthermore, from the 1990s, the maintainable forest management had been spread out globally, and felling the trees in natural forests were regulated and prohibited in worldwide (Murasima and Araya, 2000). Thus, volume of the logs imported was continuously decreased. Especially, in 2000, the logs imported were 3.03 million $m^3$ with tropical woods (decreased 56% as comparing with those in 1980), 4.78 million $m^3$ with American woods (decreased 84% as comparing with those in 1980). Therefore, the sources of the logs imported were continuously replaced after the 1990s. The logs were increasingly imported from artificially planted forest in New Zealand and Africa and North ocean areas rather than from natural forest in Southeast Asia and North America (Fig. 4).

On the other hand, the log imported in Korea was 9.48 million $m^3$ in 1978, which was the largest volume imported. The imported logs was continuously decreased from 1980, and then it was 5.58 million $m^3$ in 1985. However, it tended to be increased again from the mid end of 1980s. From the beginning of the 1990s, it was maintained in approxi-
mately 8.0 million $m^3$, and there was a specific decrease in the amount of the logs imported until the economic crisis was happened in the late of 1997. Thus, in 1998, the log imported was remarkably decreased to 4.37 million $m^3$ which is 47% decreased as comparing with that in previous year. In 2000, it was 6.74 million $m^3$ which was 61% for lumber and 19% for plywood. The logs for lumbering were mostly imported from New Zealand, Chile, and the United States, and those for plywood was obtained from Southeast Asia and New Zealand areas.

The wood import patterns between Japan and Korea were different because the portion of the logs imported in Korea was much greater than that in Japan. The reason is that the wood industry in Korea was developed with plywood processing trade. The plywood processing business was the most important part of the wood industries in Korea after performing the economic development project began in 1962. Thus, the large volume of tropical woods was imported for plywood processing, and it was major wood materials imported until 1970, and the tropical woods for plywood processing was 71% of total logs imported (Kim, 1991). The source countries for tropical woods were Malaysia and Philippines till the 1960s. After that time, those source countries were replaced to Indonesia, and 50% of total tropical woods were imported from Indonesia after 1972, but after the second oil crisis, Malaysia became main import source country for the logs because Indonesia government prohibited the export of the logs to perform the policy of wood processing industrialization and to protect their environment.

From the 1980s, the plywood industry in Korea was rapidly declined because of internal and external problems. Internally, labor cost was increased with economic growth of Korea, and externally the export of the logs in Malaysia was regulated and prohibited, which caused the cost of the logs was markedly increased. Therefore, the logs for plywood processing imported from Southeast Asia were 6.67 million $m^3$ in 1979, 3.48 million $m^3$ in 1990, and 0.64 million $m^3$ in 2000, which are 73%, 28%, and 19% of total logs imported, respectively. This information indicates that the import of tropical woods as a major source of the logs was almost ended.

In contrast with a rapid reduction of the import for tropical woods, the demand of the logs for lumbering that used as temporary constructional materials were rapidly increased after the 1980s because of the governmental plan of extensive housing construction and the special demands due to the preparation for Seoul Olympic Games (Youn, 1998). The demands of wood in Korea was mostly for temporary structural materials to construct buildings and multistoried townhouses, and thus Korean lumbermen had favored inexpensive logs instead of expensive tropical woods that used for plywood processing. However, the logs were still major importing materials even though the sources of the log spices were changed from tropical woods to U.S. coniferous timbers. Thus, during the 1980's, the coniferous timbers from the United States were major logs imported, which was 39% of total in 1989, but large volume of the logs from the United States was continuously decreased during the 1990s with increasing the price of logs in the world market due to the felling regulation of log in Northwest forest area in the United States after 1989 (Rosemarie and Bob, 1999). The logs imported were 3.07 million $m^3$ in 1989, 0.80 million $m^3$ in 1995, and 0.31 million $m^3$ in 2000.

After reducing the import of the logs from the United States, The source countries for importing the logs had been changed to various places. Inexpensive logs, such as Radiata
Timber Trade Patterns in Japan and Korea

*pine* were imported from New Zealand and Chile. The logs imported from New Zealand were markedly increased from 1.29 million $m^3$ in 1990 to 2.3 million $m^3$ in 2000 that was 41% of total logs imported (Table. 4). Thus, Korea was one of the world leading import countries for *Radiata pine* timbers. On the other hand, Korea had imported a quite amount of the logs from various source countries, such as Russia, Austria, the Republic of South Africa, European countries, Brazil, China, and Ghana. The logs obtained from tropical hardwoods were also increasingly imported from Papua New Guinea (P.N.G.) and Solomon Island, while the tropical woods imported from Malaysia were decreased.

Increases of the logs imported from New Zealand were caused by using coniferous logs for lumbers including others, and even for plywood processing from 1992. The logs sources for plywood processing were tropical woods in 100% until 1980, but from 1992,

### Table 4. Log imports by country of origin in Korea, 1970~2000 (1,000 $m^3$).

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardwood Sub-total</td>
<td>2,852</td>
<td>4,661</td>
<td>4,486</td>
<td>3,328</td>
<td>3,483</td>
<td>1,656</td>
<td>632</td>
<td>841</td>
<td>934</td>
</tr>
<tr>
<td>Philippines</td>
<td>888</td>
<td>264</td>
<td>82</td>
<td>67</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Malaysia</td>
<td>1,487</td>
<td>1,628</td>
<td>2,474</td>
<td>2,308</td>
<td>2,912</td>
<td>656</td>
<td>227</td>
<td>354</td>
<td>320</td>
</tr>
<tr>
<td>P.N.G.</td>
<td>-</td>
<td>-</td>
<td>133</td>
<td>841</td>
<td>571</td>
<td>997</td>
<td>404</td>
<td>486</td>
<td>316</td>
</tr>
<tr>
<td>Indonesia</td>
<td>477</td>
<td>2,769</td>
<td>1,817</td>
<td>12</td>
<td>-</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Others</td>
<td>-</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>165</td>
</tr>
<tr>
<td>Softwood Sub-total</td>
<td>303</td>
<td>458</td>
<td>1,655</td>
<td>2,350</td>
<td>4,450</td>
<td>6,573</td>
<td>3,378</td>
<td>5,782</td>
<td>5,801</td>
</tr>
<tr>
<td>USA</td>
<td>236</td>
<td>448</td>
<td>1,043</td>
<td>1,494</td>
<td>2,971</td>
<td>803</td>
<td>286</td>
<td>361</td>
<td>311</td>
</tr>
<tr>
<td>New Zealand</td>
<td>56</td>
<td>-</td>
<td>185</td>
<td>99</td>
<td>1,290</td>
<td>3,003</td>
<td>2,071</td>
<td>3,397</td>
<td>3,186</td>
</tr>
<tr>
<td>Others</td>
<td>11</td>
<td>10</td>
<td>427</td>
<td>757</td>
<td>541</td>
<td>2,767</td>
<td>1,381</td>
<td>2,024</td>
<td>2,304</td>
</tr>
<tr>
<td>Total</td>
<td>3,155</td>
<td>5,119</td>
<td>6,141</td>
<td>5,578</td>
<td>8,285</td>
<td>8,229</td>
<td>4,370</td>
<td>6,623</td>
<td>6,735</td>
</tr>
</tbody>
</table>


![Fig. 5. Exports of logs by main Countries of destination in New Zealand, 1981~2000.](source: New Zealand Ministry of Agriculture and Forest 2001 New Zealand Forestry Statistics 2000.)
coniferous logs were began to use for it. The portions of coniferous logs were 5%, 30%, and 63% of total logs imported in 1993, 1995, and 2000, respectively. Also, the portions of the logs imported from New Zealand were continuously increased, which were 3%, 30%, and 55% of total log imported in 1993, 1995, and 2000, respectively. Recently, *Radiata pine* has been increasingly used for raw materials of PB and MDF even though the scrap woods were still used for them. In 2000, total volume of the logs exported by New Zealand was 6.08 million m³, 56% (3.4 million m³) of them was imported by Korea, and 27% (1.63 million m³) of them was imported by Japan, which indicates that more than 80% of total logs exported by New Zealand were imported by two countries (Fig. 5). However, the logs imported from New Zealand were used for different purposes between Japan and Korea. The logs were used mainly for packing materials in Japan, whereas they were used mostly for lumbering materials in Korea.

3. Import pattern of wood products

Wood products have been produced in Japan because the price competitiveness of the import wood products was stronger due to the open market policy affected by MOSS agreement and the occurrence of strong yen against the dollar influenced by the Plaza Accord in the 1980s. After the 1980s, import of the logs was rapidly decreased due to the restriction and prohibition for exporting the logs, whereas the lumbers imported were continuously increased, which were 5.18 million m³ in 1985, 8.89 million m³ in 1990, and 12.59 million m³ in 1997. Most of lumbers imported were from North America. Volumes of the lumbers imported were 4.11 million m³ (74%) in 1980, 6.46 million m³ (73%) in 1990, 7.84 million m³ (68%) in 1998, and 5.52 million m³ (56%) in 2000. In particular, the lumbers imported from Canada were stood in the greatest portions of them, which were 2.56, 3.68, and 5.91 million m³ in 1980, 1990, and 1995, respectively. Also, the lumbers imported from European countries were continuously increased to replace the source from the United States even though they were almost none till 1980 (Araya, 1996). The amount of the lumbers imported from those countries were 0.85 million m³ in 1995 and

![Fig. 6. Lumber imports by country of origin in Japan, 1980~2000.](image)

2.19 million \( m^3 \) in 2000. Those from New Zealand and Chile which are artificially planted sources were also increasingly imported even though they were quantitatively few (Fig. 6).

An important characteristics of wood products imported in Japan is that import of high-added value products was increased with increasing import of the lumbers after 1990. As a point of view in laminated lumbers, the common laminated timbers imported were 0.02 million \( m^3 \) in 1992, 0.04 million \( m^3 \) in 1995, and 0.11 million \( m^3 \) in 2000. Also, structural laminated timbers imported were greatly increased to 0.32 million \( m^3 \) in 1996 due to the special demand caused by Great Hanshin Earthquake in 1995 and in 0.44 million \( m^3 \) in 2000 due to the law of housing quality improvement enforced in 1999 as comparing with the volume of structural laminated timber imported in 1992, which was 0.02 million \( m^3 \) (Murasima and Araya, 2000). Other wood products were also continuously increased. Volumes of plywood imported were 2.96 million \( m^3 \) in 1992 and 5.33 million \( m^3 \) in 1997. Particle Board (PB) imported was 0.13 million \( m^3 \) in 1992 and 0.64 million \( m^3 \) in 1997. MDF was imported 0.01 million \( m^3 \) in 1992 and 0.34 million \( m^3 \) in 1997. Also, the import of fittings and furniture was tended to be increased (Table 5).


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</thead>
<tbody>
<tr>
<td>Laminated timber (1,000 m³)</td>
<td>18</td>
<td>17</td>
<td>29</td>
<td>43</td>
<td>68</td>
<td>95</td>
<td>66</td>
<td>89</td>
<td>106</td>
</tr>
<tr>
<td>Structural laminated timber (1,000 m³)</td>
<td>21</td>
<td>59</td>
<td>89</td>
<td>148</td>
<td>319</td>
<td>289</td>
<td>149</td>
<td>271</td>
<td>446</td>
</tr>
<tr>
<td>Plywood (1,000 m³)</td>
<td>2,958</td>
<td>4,089</td>
<td>4,045</td>
<td>4,349</td>
<td>5,314</td>
<td>5,326</td>
<td>3,872</td>
<td>4,802</td>
<td>4,927</td>
</tr>
<tr>
<td>Particle Board (1,000 m³)</td>
<td>125</td>
<td>179</td>
<td>347</td>
<td>361</td>
<td>555</td>
<td>643</td>
<td>411</td>
<td>380</td>
<td>386</td>
</tr>
<tr>
<td>MDF (1,000 t)</td>
<td>97</td>
<td>161</td>
<td>251</td>
<td>234</td>
<td>296</td>
<td>340</td>
<td>252</td>
<td>309</td>
<td>318</td>
</tr>
<tr>
<td>Door &amp; window frame (1,000 t)</td>
<td>6</td>
<td>7</td>
<td>10</td>
<td>15</td>
<td>25</td>
<td>28</td>
<td>21</td>
<td>24</td>
<td>26</td>
</tr>
<tr>
<td>Furniture &amp; alcove post (t)</td>
<td>44</td>
<td>635</td>
<td>1,062</td>
<td>1,620</td>
<td>1,651</td>
<td>631</td>
<td>549</td>
<td>400</td>
<td>685</td>
</tr>
<tr>
<td>Building products (1,000 t)</td>
<td>16</td>
<td>22</td>
<td>32</td>
<td>48</td>
<td>77</td>
<td>70</td>
<td>62</td>
<td>80</td>
<td>89</td>
</tr>
</tbody>
</table>

Source: Japan wood products information & research center. 2001 Wood information, 121: 16-22.

On the other hand, import of the lumbers in the wood products was increased in Korea with decreasing the import of the logs due to the demand of near raw materials instead of high-added value products, but it was not as large as those imported in Japan. From the 1980s, the import of lumbers was continuously increased from 0.14 million \( m^3 \) in 1980, 0.95 million \( m^3 \) in 1991, and 1.16 million \( m^3 \) in 1996 because of the increase of domestic labor cost and the export regulation of the logs for lumbering, whereas it was decreased to 0.73 million \( m^3 \) in 2000 due to the economic crisis. In the case of Japan, the main source countries for importing lumbers were North America, while those for Korea were Southeast countries, such as Malaysia and Indonesia, rather than North America because constructional interior materials and furniture materials were mainly imported (Table. 6).

Figure 7 presents the wood import patterns between Japan and Korea as influenced by the change of importing materials which is from the log import to the lumbers import. The information indicates that the portions of lumbers imported in Japan were continuously increased, which was 13\%, 27\%, and 27\% of total wooden materials imported in...
Table 6. Lumber imports by country of origin in Korea, 1988-2000 (1,000 m³).

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</tr>
</thead>
<tbody>
<tr>
<td>Malaysia</td>
<td>368</td>
<td>733</td>
<td>468</td>
<td>423</td>
<td>305</td>
<td>161</td>
<td>188</td>
<td>162</td>
</tr>
<tr>
<td>Indonesia</td>
<td>209</td>
<td>9</td>
<td>53</td>
<td>77</td>
<td>78</td>
<td>98</td>
<td>127</td>
<td>173</td>
</tr>
<tr>
<td>USA</td>
<td>49</td>
<td>71</td>
<td>195</td>
<td>200</td>
<td>176</td>
<td>43</td>
<td>74</td>
<td>62</td>
</tr>
<tr>
<td>Chile</td>
<td>-</td>
<td>-</td>
<td>44</td>
<td>137</td>
<td>133</td>
<td>47</td>
<td>80</td>
<td>45</td>
</tr>
<tr>
<td>China</td>
<td>-</td>
<td>-</td>
<td>46</td>
<td>58</td>
<td>49</td>
<td>39</td>
<td>46</td>
<td>115</td>
</tr>
<tr>
<td>New Zealnd</td>
<td>-</td>
<td>-</td>
<td>61</td>
<td>100</td>
<td>96</td>
<td>44</td>
<td>80</td>
<td>39</td>
</tr>
<tr>
<td>Others</td>
<td>81</td>
<td>133</td>
<td>149</td>
<td>166</td>
<td>148</td>
<td>48</td>
<td>102</td>
<td>133</td>
</tr>
<tr>
<td>Total</td>
<td>707</td>
<td>946</td>
<td>1,016</td>
<td>1,161</td>
<td>985</td>
<td>480</td>
<td>697</td>
<td>729</td>
</tr>
</tbody>
</table>


Fig. 7. Trend of lumber imports ratio in Japan and Korea, 1990-2000.


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</tr>
</thead>
<tbody>
<tr>
<td>Veneer (1,000 m³)</td>
<td>-</td>
<td>-</td>
<td>75</td>
<td>61</td>
<td>102</td>
<td>407</td>
<td>101</td>
<td>121</td>
<td>246</td>
</tr>
<tr>
<td>Plywood (1,000 m³)</td>
<td>953</td>
<td>1,153</td>
<td>1,003</td>
<td>1,307</td>
<td>1,081</td>
<td>970</td>
<td>500</td>
<td>750</td>
<td>280</td>
</tr>
<tr>
<td>Particle Board (1,000 m³)</td>
<td>462</td>
<td>516</td>
<td>401</td>
<td>485</td>
<td>408</td>
<td>293</td>
<td>173</td>
<td>436</td>
<td>485</td>
</tr>
<tr>
<td>MDF (1,000 m³)</td>
<td>84</td>
<td>144</td>
<td>152</td>
<td>76</td>
<td>53</td>
<td>58</td>
<td>28</td>
<td>172</td>
<td>380</td>
</tr>
<tr>
<td>Molding (1,000 M/T)</td>
<td>-</td>
<td>-</td>
<td>86</td>
<td>100</td>
<td>117</td>
<td>95</td>
<td>36</td>
<td>29</td>
<td>33</td>
</tr>
</tbody>
</table>


1980, 1990, and 2000, respectively. However, in Korea, it was only 3% in 1985 and 11% in 1990, thus the logs were still major importing wooden material in Korea (Fig. 7). As a point of view in the wood products in Korea, the wooden products were increasingly imported. Volume of plywood imported was almost none in 1980, but it had been continuously increased to 0.74 million m³ in 1990 and 1.31 million m³ in 1995. PB imported was
Table 8. Imports of all forest products by value in Korea, 1990~1999 (US$/Million).

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</tr>
</thead>
<tbody>
<tr>
<td>Log</td>
<td>990</td>
<td>1,041</td>
<td>919</td>
<td>1,183</td>
<td>1,012</td>
<td>1,047</td>
<td>963</td>
<td>877</td>
<td>350</td>
<td>521</td>
</tr>
<tr>
<td>Lumber</td>
<td>167</td>
<td>228</td>
<td>250</td>
<td>452</td>
<td>373</td>
<td>409</td>
<td>465</td>
<td>453</td>
<td>166</td>
<td>261</td>
</tr>
<tr>
<td>Veneer</td>
<td>25</td>
<td>31</td>
<td>30</td>
<td>37</td>
<td>55</td>
<td>49</td>
<td>64</td>
<td>112</td>
<td>43</td>
<td>52</td>
</tr>
<tr>
<td>Flooring</td>
<td>15</td>
<td>24</td>
<td>38</td>
<td>63</td>
<td>90</td>
<td>114</td>
<td>142</td>
<td>120</td>
<td>36</td>
<td>28</td>
</tr>
<tr>
<td>Particle Board</td>
<td>74</td>
<td>75</td>
<td>72</td>
<td>91</td>
<td>91</td>
<td>77</td>
<td>54</td>
<td>25</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>MDF</td>
<td>27</td>
<td>25</td>
<td>28</td>
<td>56</td>
<td>69</td>
<td>40</td>
<td>26</td>
<td>25</td>
<td>10</td>
<td>42</td>
</tr>
<tr>
<td>Plywood</td>
<td>256</td>
<td>358</td>
<td>351</td>
<td>552</td>
<td>536</td>
<td>594</td>
<td>531</td>
<td>449</td>
<td>154</td>
<td>260</td>
</tr>
<tr>
<td>Building Products</td>
<td>10</td>
<td>20</td>
<td>32</td>
<td>48</td>
<td>67</td>
<td>80</td>
<td>111</td>
<td>101</td>
<td>34</td>
<td>32</td>
</tr>
<tr>
<td>Other</td>
<td>43</td>
<td>54</td>
<td>70</td>
<td>112</td>
<td>139</td>
<td>182</td>
<td>189</td>
<td>184</td>
<td>94</td>
<td>153</td>
</tr>
<tr>
<td>Total</td>
<td>1,607</td>
<td>1,856</td>
<td>1,790</td>
<td>2,594</td>
<td>2,413</td>
<td>2,606</td>
<td>2,568</td>
<td>2,375</td>
<td>912</td>
<td>1,404</td>
</tr>
</tbody>
</table>


0.06 million m³ in 1985 and 0.49 million m³ in 2000. MDF imported was 0.03 million m³ in 1985 and 0.38 million m³ in 2000 (Table 7). However, the import pattern of wood product was recently changed. It was similar as that in Japan, which is increases in the import of constructional wood products, such as wooden windows, wooden window frames, and wooden doors, related to the secondary processing products. The expense for importing constructional products was only 1.0 to 2.0 million dollars in 1980, but it was rapidly increased to 8.0 million dollars in 1995 and 10 million dollars in 1996 (Table 8).

CONCLUSIONS

As comparing the wood import patterns between Japan and Korea, it is necessary to compare the wood consumption patterns in Japan and Korea. Differences of the wood consuming patterns between Japan and Korea are due to the difference of housing structures in those countries. In the case of Japan, the usage of lumbers including domestic and imported lumbers produced in Japan was 80% for constructional materials, 11% for packing materials, and 4% for civil engineering constructional materials. These results indicate that the demand of lumbers is a little for industrial demands, so that the wood consuming pattern is directly related to the general consumers. However, the demand of lumbers in Korea was mostly for the civil engineering constructional materials, such as temporary structural materials, to construct multistoried buildings. Thus, the logs imported were used for lumbering materials in 82%, such as civil engineering constructional materials, and also the logs were used for industrial materials after domestically processing them. Also, the wood products imported were directly supplied to the general consumers.

Therefore, the differences of the wood consuming patterns between Japan and Korea have caused the differences of the wood import patterns in two countries. The wood import pattern in Japan is that the import of lumbers was increased to replenish the import reduction of large quantity of the logs due to the protection of their environment after the 1980s. Also, the import pattern of wood products is that the import of
high-added value processing products, such as wood for engineering works and various components for secondary constructional materials, has been markedly increased with increasing the import of lumbers after 1992 because of increase in the demand of high quality of earthquake proof materials.

However, the import pattern in Korea is that the logs, such as low quality and low price wood, rather than high quality wood and high-added value processing products were needed to use as temporary structural materials and packing materials. Thus, the logs imported have not been changed in quantity. There were different sources of the logs based on different species of trees. The sources were tropical woods until the 1970s, coniferous timbers from the United States till the 1980s, and temperate forest coniferous timbers from New Zealand and other countries. Thus, the logs were still major imported materials in the lumbering and the processing business. Although the import of lumbers is recently increased, it is still in low quantity. The portion of lumbers imported in Korea was only 10% of total wood including the logs and the lumbers, but that in Japan was 47% of the total amounts imported.

According to the information presented above, the wood import patterns between Japan and Korea might be completely different. Moreover, the wood import pattern in Japan has been adapted to the changes of world wood trade pattern that focused on the export of high-added value processing products rather than the logs and primary processing products. However, the wood import pattern in Korea might not be adapted to the changes because of the difference of the wood demand pattern as comparing with that in Japan. Also, import of the finished products in the secondary processing is tended to be increased even though the logs are still major import materials with trade in different species of the source trees.

REFERENCES

Kim, J. H. and H. S. Chun 1999 Improvement of residential community, Korea Research Institute for Human Settlements, pp55–72 (in Korean)
Murasima, Y. 1994 Wood import problem seen from the forestry economy of our country. Agriculture
Timber Trade Patterns in Japan and Korea

and economy, 60(6): 65-72 (in Japanese)