

Trends of forestry and wood processing industry in Thailand: Analysis using historical forestry statistics from 1997 to 2008

Naoyuki Furuya^{1)*}

¹⁾ Hokkaido Research Center, Forestry and Forest Products Research Institute, 7 Hitsujigaoka, Toyohira, Sapporo, Hokkaido 062-8516, Japan

* Corresponding author; e-mail: nfuruya@affrc.go.jp

Abstract

Trends of forestry and the wood processing industry in Thailand were observed using historical forestry statistics from 1997 to 2008. The deforestation rate slowed down during this period, and land clearing and illegal logging also seemed to be decreasing as a result of forest conservation. Efforts for reforestation by tree planting were also observed, but these did not seem to cause a marked increase in the forested area. Production of rubber sawn wood drastically increased. Pulp production also increased. Rubber plantation areas continued to increase all over the country. Rubber wood was considered to be continuously important as a raw material for the wood processing industry. On the other hand, teak wood was provided mainly from neighboring countries such as Myanmar and Laos. Given that teak wood resources from these countries are decreasing, expansion and supply of domestic teak wood from tree plantations are highly expected. The importance of expansion of widespread data collection on forestry and the wood processing industry should be emphasized for further analysis and planning for the future.

Keywords: wood processing industry, forestry statistics, Thailand, export and import of wood products, teak (*Tectona grandis*)

Introduction

Thailand is located from 2°30' to 20°30'N in latitude and has a variety of climate zones, such as tropical moist climate in the Malay Peninsula, tropical monsoon climate with a long dry season, and relatively cool temperate climate in the north and the west, with mountainous areas. These climates also result in a variety of forest formations, such as tropical evergreen forest, tropical and subtropical montane forest, dry deciduous dipterocarp woodland, and dry deciduous forest (Blasco et al. 1996). Natural teak forests are distributed in the northern and western parts of Thailand along its boundary with Myanmar (Gyi and Tint 1998). Teak woods and teak wood products have been among the main products of Thailand and this region (Gajaseni and Jordan 1990). As the result of the exploitation and the resultant decrease of forest resources, logging ban was declared in 1989. Lakanavichian (2001) discussed the impacts and effectiveness of logging bans on forestry sector in Thailand. Mahannop (2004) also reported the development of forest plantations in Thailand. However, studies on recent trends in Thai forestry and its wood processing industry have been quite limited. Therefore, this study aims to clarify the current situation in the forest and wood industry of Thailand and also to identify its trends

over the decade from the end of the 1990s to 2008.

Materials and Method

Thai forestry statistics from 1997 to 2008 were downloaded in the digital format from the website of the Royal Forest Department (RFD). These data were arranged in time series to enable analysis of the transition over time. Some tables were rearranged and recategorized to trace the change in the time series. Some tables disappeared in recent forestry statistics as a result of simplification of the forestry statistics. In such cases, tables were arranged for as long as the data were available in the forestry statistics. Thai words and the English translations were both given in the tables in forestry statistics. However, for example, "Round wood" and "Sawn wood" were used in our study instead of "Log" and "Sawntimber" in forestry statistics. Firstly, basic figures on general forest and forest resources were observed. Then, the transitions of import and export of round wood, sawn wood and wood products were observed. Lastly, on the basis of the above observations, the trends of forestry and the wood industry in Thailand were summarized. The whole of Thailand was divided into 5 regions, namely, Bangkok, Central, North, Northeast, and South.

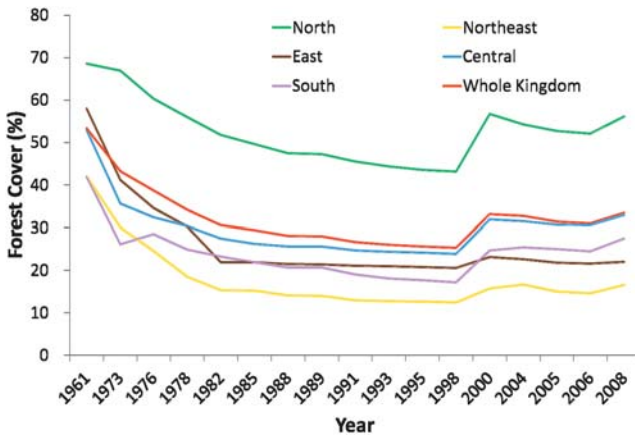


Fig. 1. Transition of forest cover of each region from 1961 to 2008

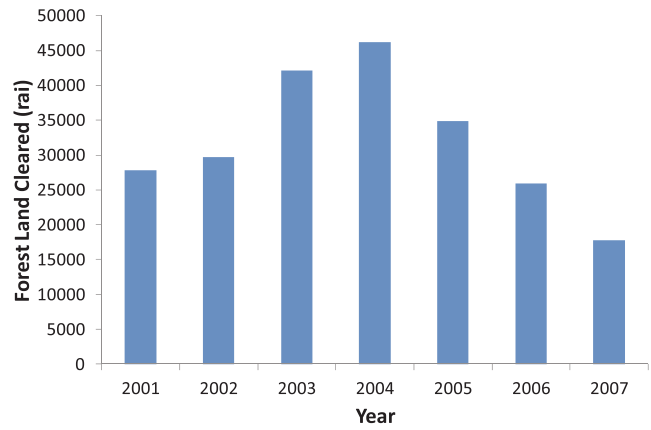


Fig. 2. Transition of areas of cleared forest land from 2001 to 2007

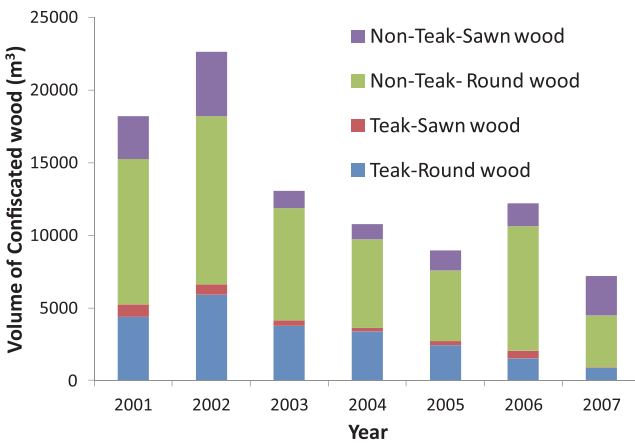


Fig. 3. Transition of volume of wood confiscated from 2001 to 2007

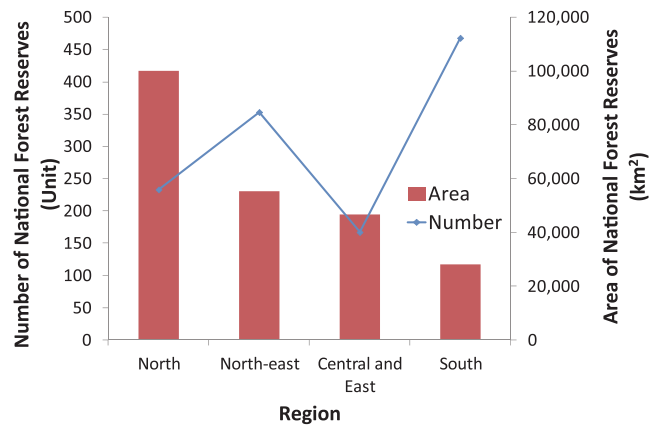


Fig. 4. Numbers and areas of national forest reserves of each region in 2007

Result

1. Transition of general forest resources

1) Transition of forest cover

The transition of forest cover from 1961 to 2008 is shown in Fig. 1. It showed a decline until 1998, but an increase from 2000. This upturn was considered to be caused by a change of the scale of the maps and the methodology as the result of application of new procedure since 2000 (Ongsomwang 2002). Therefore, forest cover change had to be evaluated with care. The rate of forest cover was high in the north, intermediate at around 30% in the south and central regions, and lowest at less than 20% in the northeast. The rate of reduction of forest cover slowed in the 1990s in most areas, but the rate of reduction was still high in the north (0.86% in 1978-88 and 0.43% in 1988-1998). Deforestation also continued in the South (0.42% in 1978-88 and 0.35% in 1988-1998). Focusing on the period after the new method of interpretation was applied, forest cover change has been almost stable and seems even to

have slightly increased after 2006.

2) Transition of number of offenses

Cleared forest land peaked in 2004 and decreased thereafter (Fig. 2). The volume of confiscated wood peaked in 2002 and then showed a decline until 2007, although it was high in 2006. The percentage of teak wood as a proportion of the total confiscated wood was high at around thirty percent in the period 2001 to 2005, but became smaller in 2006 and 2007 (Fig. 3). Although the figures are not shown here, the numbers of cases and arrested individuals have decreased since 2001 and the numbers of confiscated machines and pieces of equipment, such as cars and chainsaws, have also decreased (RFD 2005; RFD 2007). These trends may show that rapid deforestation and forest degradation have slowed to a stop in Thailand.

3) Efforts for forest conservation

In Thailand, national parks are managed by the Department of National Parks, Wildlife, and Plant Conservation (DNP), and forest reserves are assigned and

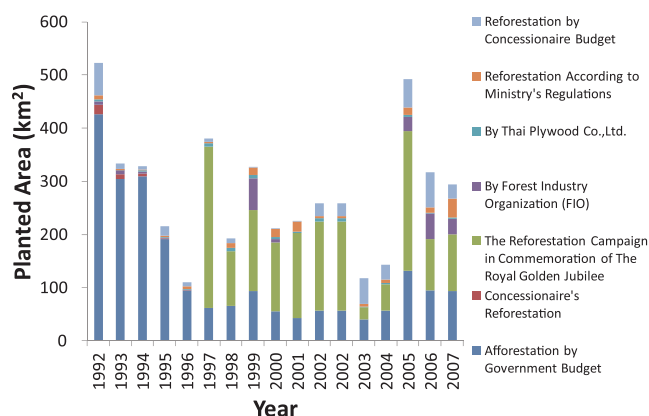


Fig. 5. Transition of planted area through different sources of funding from 1992 to 2007

managed by the RFD to protect and conserve forested areas (FAO 2010). The total area of forest reserves in each region was large in central, north, northeast, and south regions, in that order, and the number of forest reserves was large in south, central, northeast, and north regions, in that order (Fig. 4). Therefore, the average area of forest reserves was large in the north and small in the south, and intermediate in the central and northeast regions.

4) Efforts for reforestation by tree planting budget

As an active effort to increase forested area, reforestation by tree planting was observed to be effective (Fig. 5). However, the total area of reforestation fluctuated year by year and was limited. Tree planting by a reforestation campaign in commemoration of the Royal Golden Jubilee was important after 1997. Reforestation by concessionaire budget was also continuously conducted.

5) Summary of transition of forest resources

The above-mentioned trends of forest resources can be summarized as follows.

1. Forest cover was now rather stable.
2. The amounts of cleared land and confiscated wood were both decreasing.
3. There were some efforts in the assignment of forest reserves and reforestation.

These trends showed that Thailand was emerging from the phase of deforestation and was progressing toward forest conservation. However, strong initiatives for reforestation have not been shown and there was at present no tendency for the recovery of forested areas.

2. Transition of wood processing industry in Thailand

1) Transitions of numbers of wood processing factories and shops in each region and category

The transitions of the numbers of wood processing factories and shops in each category from 1997 to 2008 are shown in Fig. 6. Total numbers were stable to slightly decreasing until 2005 and increased in 2006; they then dropped again but retained the level of 1997. The numbers

of wood processing factories and shops showed similar transitions. Regional differences in these transitions were also observed, as shown in Fig. 6. In the north and northeast, the numbers of wood processing factories and shops were stable or slightly decreased until 2005, but increased after 2006. The numbers fluctuated in Bangkok and the south year by year. One of the characteristics in the north and the northeast was that the relative importance of wood processing factories run by manpower, rather than by machines, was high.

The percentages and numbers of wood processing factories and shops in each region are shown in Fig. 7. In the category of sawmills, the percentages of the south and central regions were high. The high percentage in the south was the result of increased numbers of sawmills for processing para rubber wood. In the category of sawmills run by manpower, rather than machines, the percentages in the north and central regions were high. This was caused by the many private teak plantations established in the north and west, and the harvested wood from these plantations was processed at small-scale private factories. The numbers of wood processing factories run with machinery were rather stable, and the percentages in Bangkok and the central region were high during this period. In the category of wood processing factories run by manpower, the percentage in the northeast was high. This showed that small-scale factories were operated in this region. There was no big change in the numbers and regional differences of sawn wood shops and wood product shops during the period. The transitions of numbers of sawn wood shops and wood product shops were synchronized.

2) Current situation of overall import and export of round wood, sawn wood and wood products

The amounts of imported and exported wood and main wood products in 2007 are shown in Table 1. Among the items of imported and exported wood products, the levels of import of round wood, import and export of sawn wood, import of woodchips, export of fiberboard and particle board, export of furniture, import of wood pulp, and import and export of paper were high. The trends of import/export

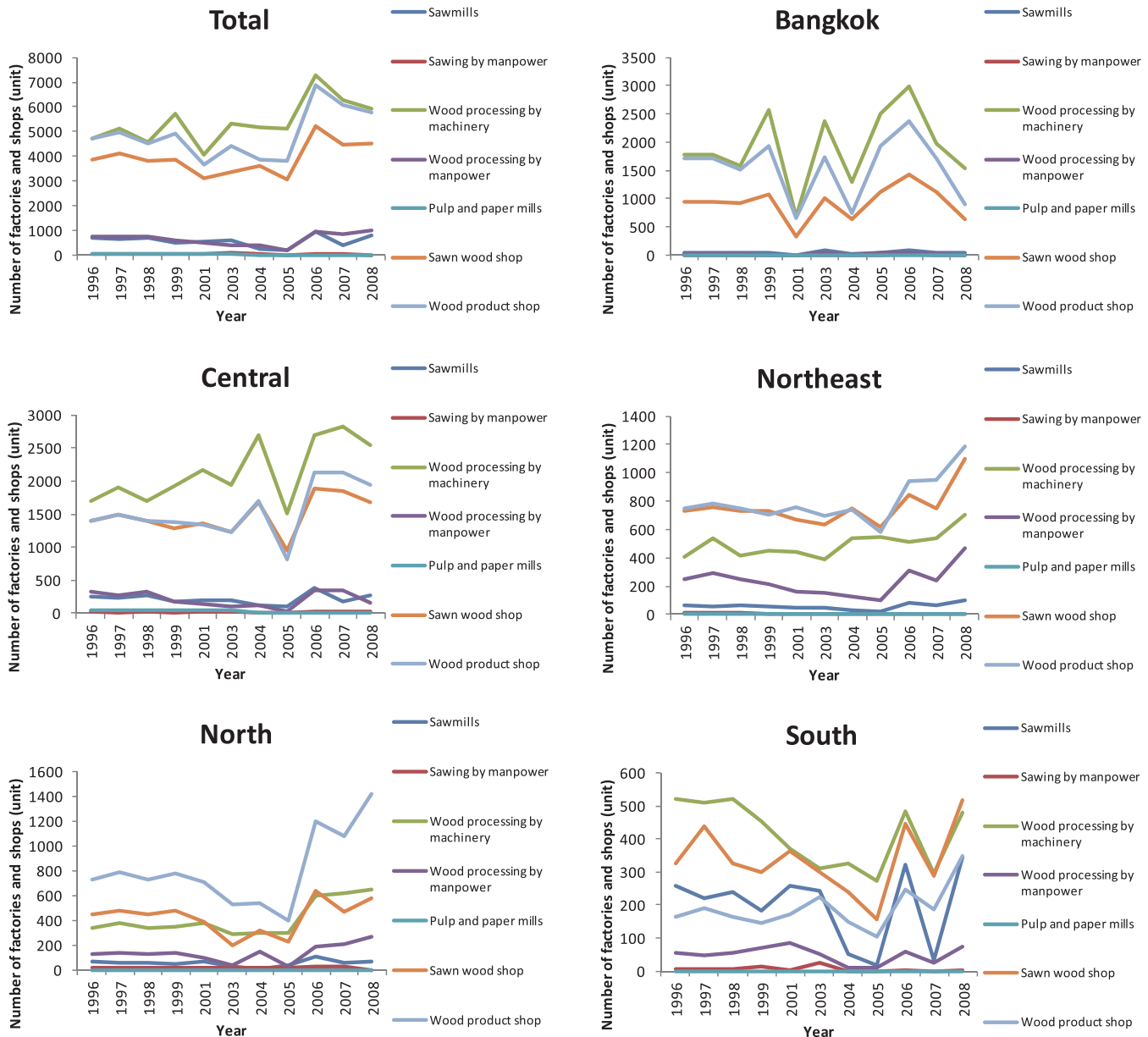


Fig. 6. Transitions of numbers of wood processing factories and shops in each region from 1996 to 2008

of these major types of wood and wood products were investigated in detail hereinafter. To enable the comparison among the different types of products, the recent trends were observed in currency baht. Only the long term trends were observed in volume or weight.

3) Transitions of import and export of round wood and sawn wood

Long term transition of import of round wood and sawn wood from 1978 to 2007 is shown in Fig. 8. Import of round wood and sawn wood increased in the 1990s after the logging ban, and peaked around 1994. It dropped until the Asian economic crisis in 1998, but showed a slight recovery in the early 2000s.

Transition of import of round wood of each tree species from 1995 to 2007 is shown in Fig. 9. Teak was one of the most important tree species in terms of imports in the whole period. The percentage of dipterocarpaceae (*Dipterocarpus alatus* etc.) was large at around 10 to 20% until 2001, but then dropped rapidly. One observed trend is that the percentage of Krabak (*Anisoptera cochinchinensis*), one of the dipterocarpaceae, became relatively high after 2002.

Amount of over half round wood have been imported from Myanmar and Malaysia (Fig. 10). In particular, the percentage of imports from Myanmar was very high at around 60 to 70% in the 2000s. A large amount of teak round wood was imported from Myanmar. On the other

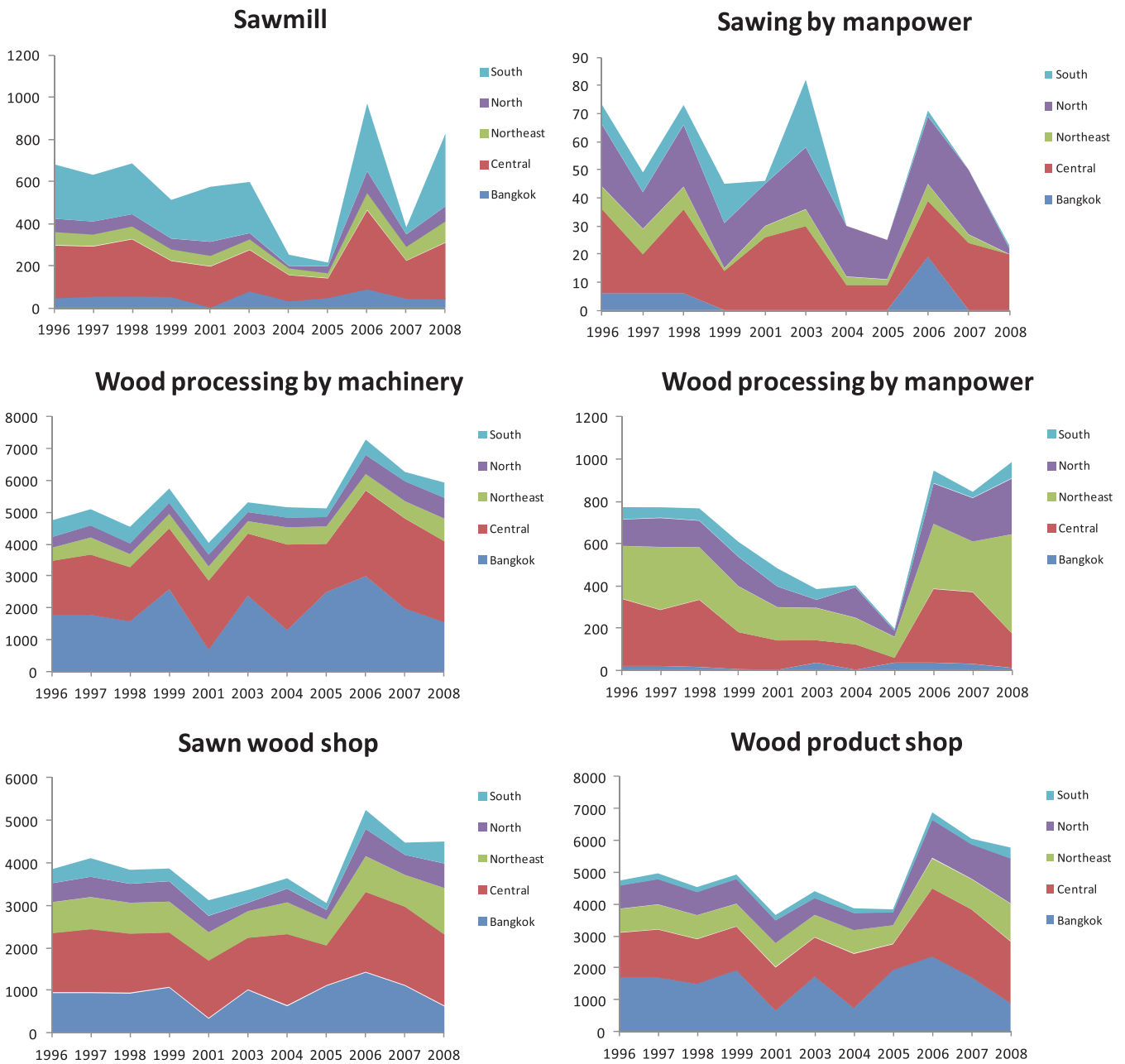


Fig. 7. Transitions of numbers and percentages of wood processing factories and shops in each region and category from 1997 to 2008

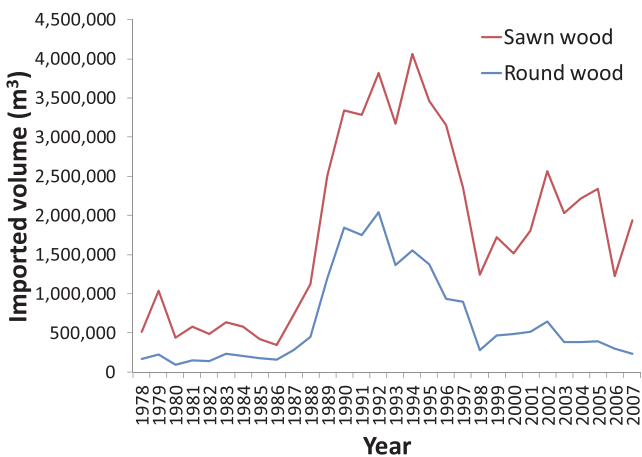


Fig. 8. Transition of imported round wood and sawn wood to Thailand in volume from 1978 to 2007

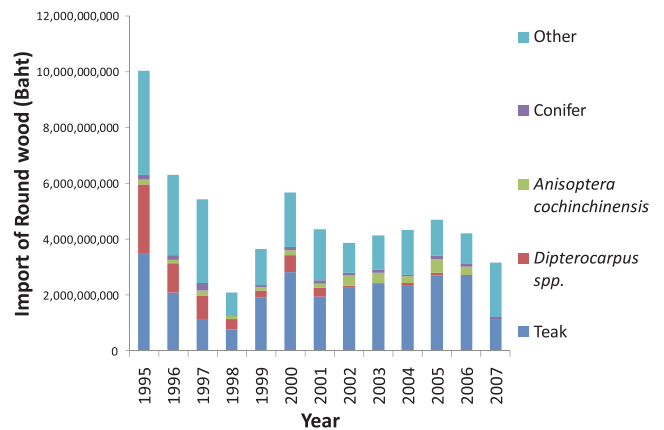


Fig. 9. Transition of imported round wood to Thailand by tree species from 1995 to 2007

Table 1. Levels of import and export of wood and main wood products in 2007

Item	Unit	Import		Export	
		(Quantity)	(Baht)	(Quantity)	(Baht)
Fuelwood	kg	721,029	8,046,769	1,008,752	7,955,072
Wood in chips or particles	kg	754,777	2,938,365	359,436,824	1,025,227,920
Wood Charcoal	kg	40,101,261	124,763,700	39,631,049	72,722,082
Round wood	m ³	231,052	3,166,902,647	5,373	23,084,968
Sawn wood	m ³	1,702,234	12,776,712,327	1,734,571	12,330,539,434
Veneer Sheets	m ³	27,784	814,736,484	1,704	284,183,450
Particle Board	kg	13,761,682	248,863,584	1,110,438,071	8,038,278,789
Fiberboard	kg	26,600,851	508,838,203	678,790,945	7,727,471,875
Plywood	m ³	317,322	2,546,306,026	62,703	784,379,472
Flooring Panels	kg	214,779	12,422,482	541,532	42,669,441
Wooden Furniture	unit	2,448,677	1,021,423,008	24,738,450	17,168,150,692
Other Wood Products	kg	62,128,766	1,380,619,999	110,703,266	10,572,626,498
Wood Pulp	kg	473,010,150	11,934,403,400	212,188,255	4,377,763,651
Other Fiber Pulp	kg	14,827,883	424,081,317	81,089,615	1,438,500,118
Recovered Paper	kg	1,015,931,347	6,458,960,759	13,637,047	147,420,212
Paper and Paperboard	kg	843,371,895	38,165,636,055	1,262,984,348	41,270,678,012

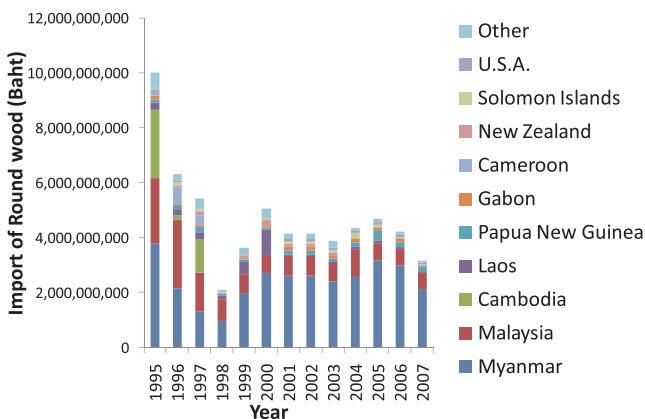


Fig. 10. Transition of imported round wood to Thailand by country of origin from 1995 to 2007

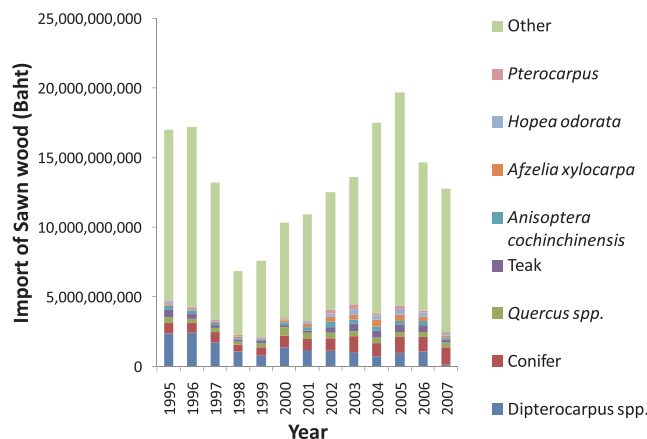


Fig. 11. Transition of imported sawn wood to Thailand by tree species from 1995 to 2007

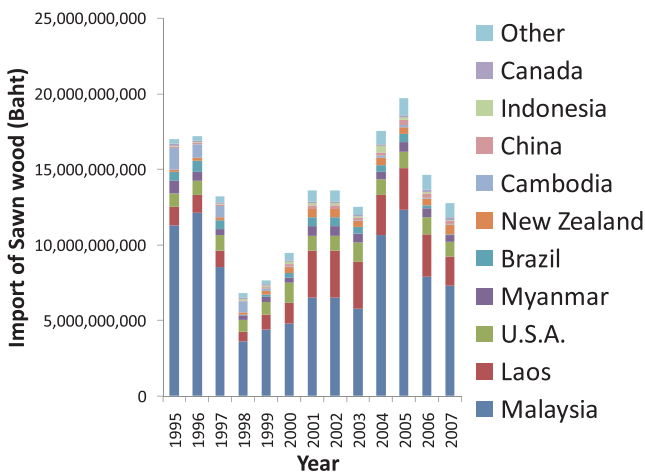


Fig. 12. Transition of imported sawn wood to Thailand by country of origin from 1995 to 2007

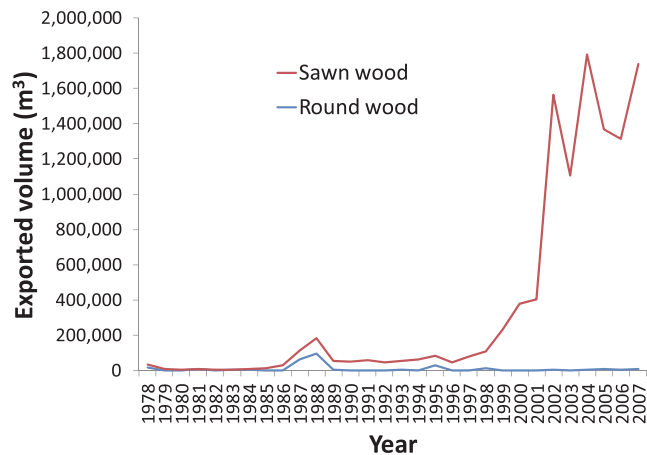


Fig. 13. Transitions of exported round wood and sawn wood from 1978 to 2007

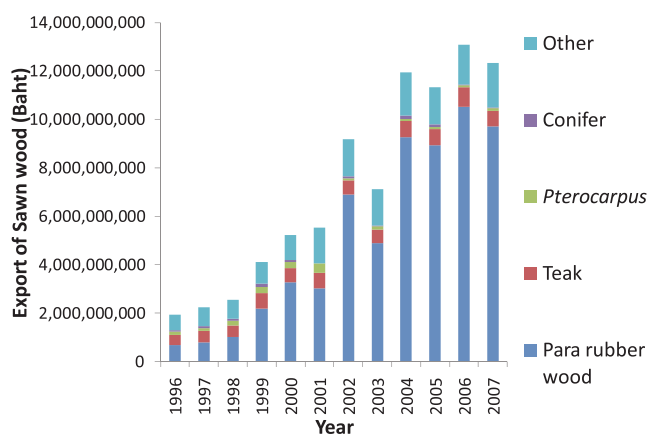


Fig. 14. Transitions of exported sawn wood by tree species from 1996 to 2007

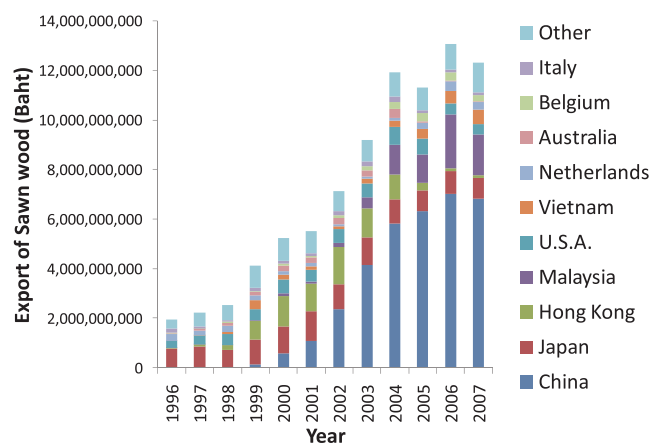


Fig. 15. Transition of exported sawn wood by country from 1996 to 2007

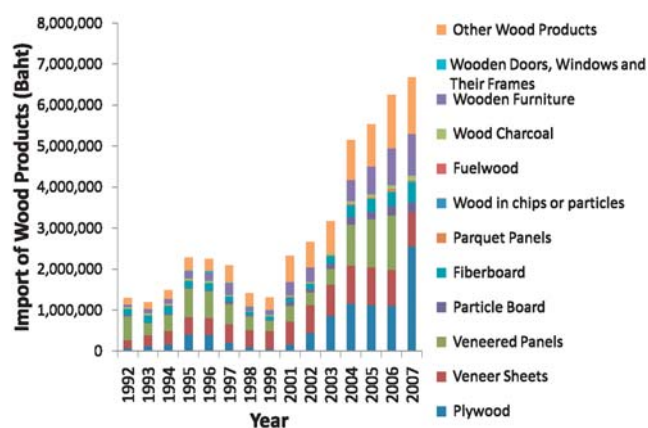


Fig. 16. Transitions of imported wood products to Thailand from 1992 to 2007

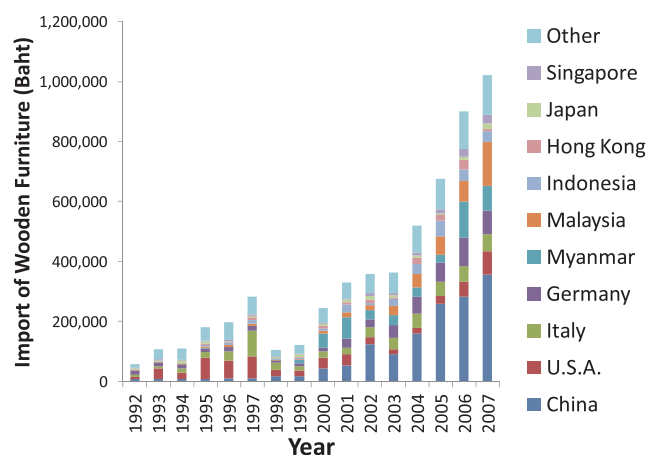


Fig. 17. Transition of imported wooden furniture to Thailand by country of origin from 1993 to 2007

hand, import of round wood from other neighboring countries such as Cambodia and Laos was not constant, although such import showed a high percentage in some years. There was also import of round wood from Papua New Guinea, USA, and the Solomon Islands.

Import of sawn wood decreased from 1997 to 1998, but it then increased until 2005 and showed a drop in 2006 and 2007 (Fig. 11). There were no specific tree species as in the case of round wood, but the percentages of conifer trees and dipterocarpaceae were large. The percentage of dipterocarpaceae was high in 1995, but diminished thereafter. The dependence on dipterocarpaceae was also decreasing in terms of both round wood and sawn wood. On the other hand, the percentage of conifer trees was increasing little by little. Teak sawn wood were exported to Thailand at the level of 500 million baht in value per year from 2002 to 2006.

Sawn wood was mainly imported from Malaysia, and the percentage of this as a proportion of the total was

around 50 to 60%. For Laos, the percentage was 10 to 15% in the 2000s (Fig. 12). The percentage for Myanmar was not high, at only 4%. The percentage for Cambodia was also low in the 2000s, although it was around 5 to 10% until 1998. Import from New Zealand could be observed continuously.

Export of round wood was quite limited, but export of sawn wood increased from 2000 (Fig. 13). With this increase in export, import and export of sawn wood were nearly balanced, although import had been much larger than export previously (Table 1). In particular, the export of para rubber sawn wood greatly increased (Fig. 14). Export of teak sawn wood was constant in currency baht.

Export of sawn wood to China grew in the observed period and reached a level around half of the total (Fig. 15). The percentage of exports to Japan was around 40% in 1996 and 1997, but decreased thereafter, although the total amount was rather stable in currency baht. Export to Malaysia was observed steadily in this period. Export to the

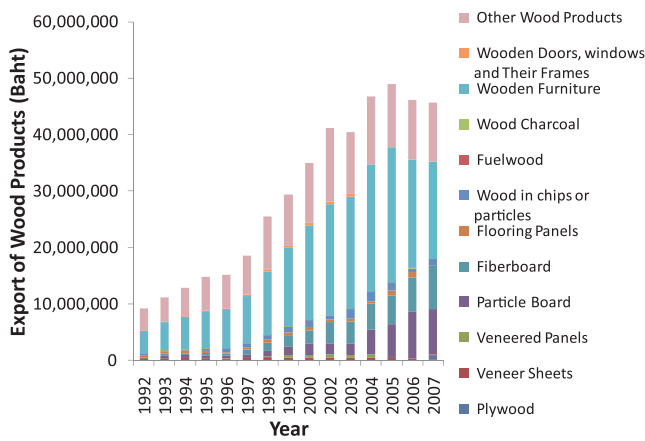


Fig. 18. Transition of exported wood products by country from 1992 to 2007

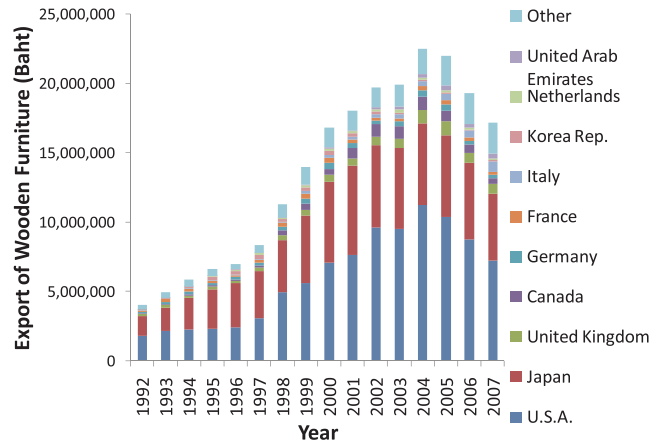


Fig. 19. Transition of exported furniture by country from 1992 to 2007

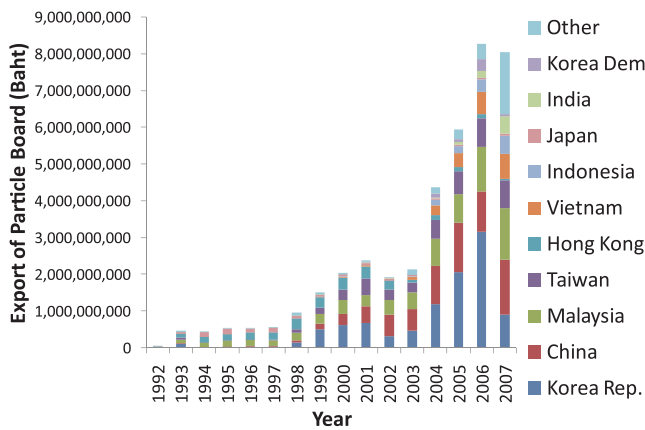


Fig. 20. Transition of exported particle board by country from 1992 to 2007

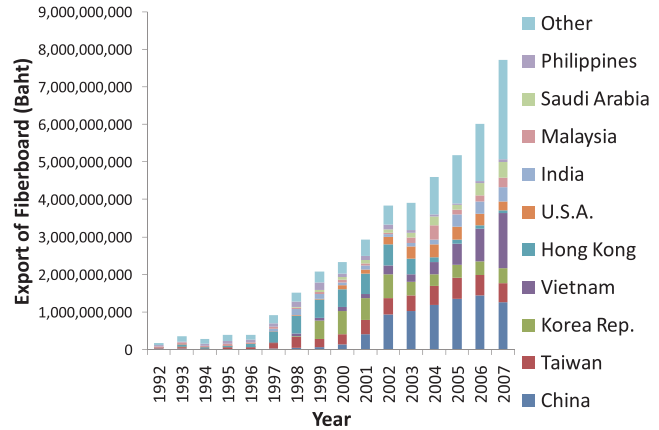


Fig. 21. Transition of exported fiberboard by country from 1992 to 2007

USA was high in the 1990s and somewhat high to Vietnam around 2000.

4) Transitions of import and export of wood products

Import of wood products such as plywood, veneer sheets, and veneered panels increased (Fig. 16). In particular, the growth of plywood was large. The percentage of wood furniture and other wood products also increased in the 2000s. The import of veneer sheets steadily increased (there are no statistics on veneered panels in the forestry statistics for 2007). The increase in the import of furniture was large, especially in recent years. The main exporter of wooden furniture was China after 1998 (Fig. 17). There were constant levels of import of wooden furniture from Germany and Italy. There was importation from Myanmar after 1999 and import from Malaysia also increased gradually during this period. Import from USA decreased, although it was high in the 1990s.

As a whole, export of wood products to Thailand increased (Fig. 18). Export of furniture was most important

among wood products, covering around 40 to 50% of the total amount. Recently, export of fiberboard and particle board has increased. Major exporters of furniture have been USA and Japan (Fig. 19). The total amount of export of wood products to Thailand increased and peaked in 2004, after which the trend has been one of decrease. Export of particle board increased, and it showed rapid growth after 2004. The main exporters of particle board were Malaysia, China, and South Korea. Export of this material to Hong Kong decreased after 2003. Continuous export to Taiwan was observed from 1998 (Fig. 20). Export of fiberboard also increased (Fig. 21). Export of this material to China and Vietnam increased recently, and continuous export to Taiwan was observed. On the other hand, export to Hong Kong, Malaysia, and the Philippines decreased.

5) Transition of paper and paper pulp industries

The transition of domestic production of paper is shown in Fig. 22. Production of craft paper and printing & writing paper has decreased drastically since the 1990s. The

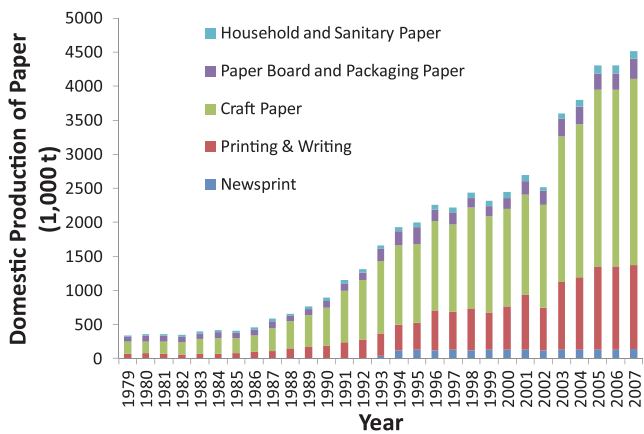


Fig. 22. Domestic production of paper from 1979 to 2007

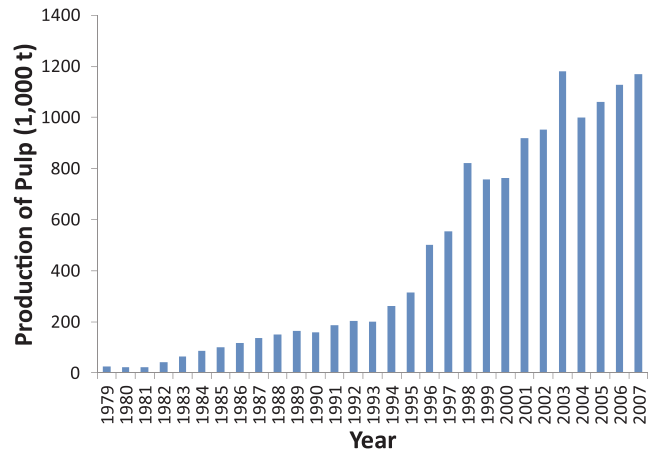


Fig. 23. Domestic production of pulp from 1979 to 2007

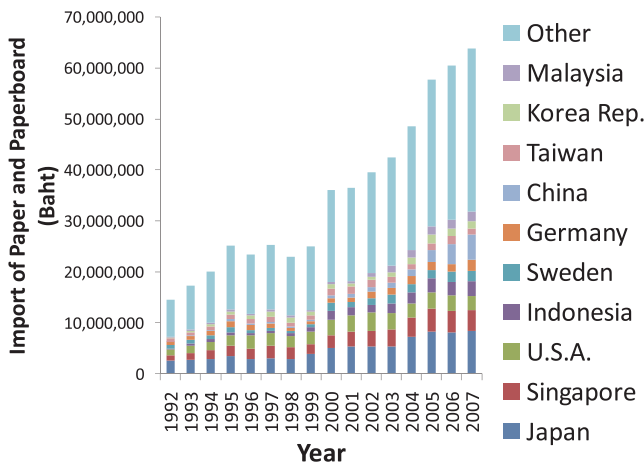


Fig. 24. Transition of imported paper and paperboard to Thailand by country of origin from 1992 to 2007

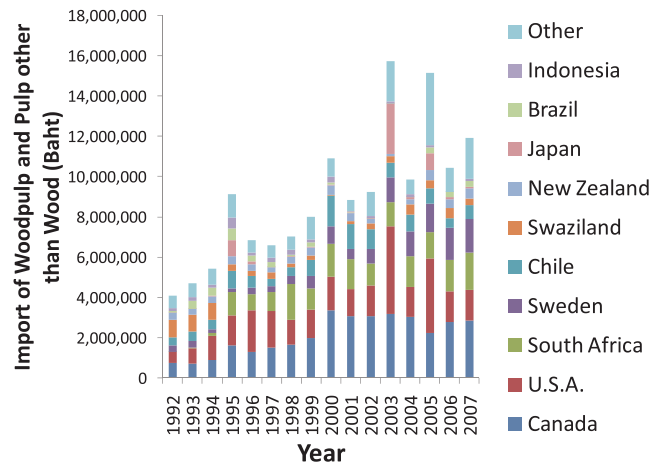


Fig. 25. Transition of imported wood pulp and pulp other than wood to Thailand by country of origin from 1992 to 2007

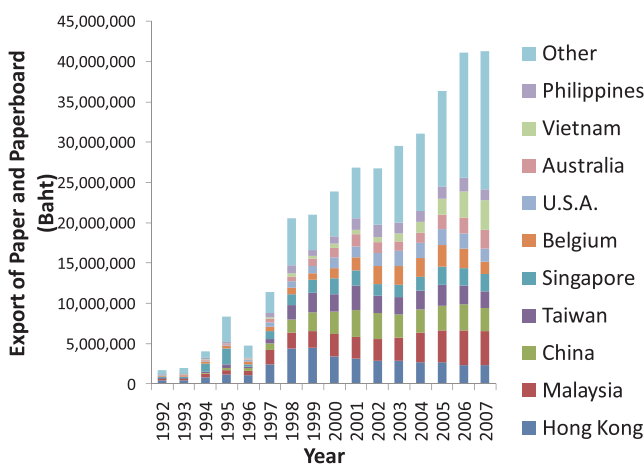


Fig. 26. Transition of exported paper and paperboard by country from 1992 to 2007

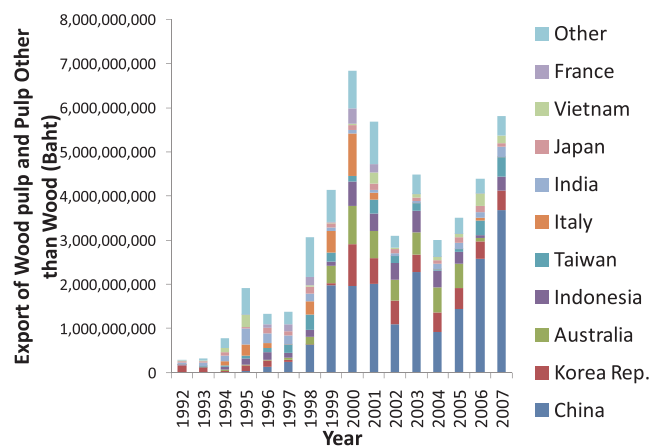


Fig. 27. Transition of exported wood pulp and pulp other than wood by country from 1992 to 2007

production of pulp has increased (Fig. 23).

Import of paper from Japan was high in the whole period (Fig. 24). Paper was also constantly imported from Singapore. The percentage of imports from China has also recently increased. The percentage for the USA was constant at around 10 percent. There was import of paper continuously from Germany, Indonesia, South Korea, Sweden, and Taiwan.

Import of wood pulp and pulp other than wood from Canada was high at around 20 to 30% of the total (Fig. 25). Import from USA, South Africa, and Sweden was also constant. There was constant import from New Zealand and Chile.

Export of paper increased (Fig. 26). Paper was exported to Malaysia at the highest level, and then to China, Australia, USA, Singapore, Taiwan, Japan, the Philippines, and others. The level of concentration on specific countries or fluctuation of export partners was rather small compared with that for other wood products.

In total, 30 to 60 percent of exported wood pulp and pulp other than wood went to China since 1999 (Fig. 27). The export destinations of wood pulp and pulp other than wood changed occasionally. Other main export destinations were India, Australia, South Korea, and Indonesia.

6) Summary of transition of wood processing industries in Thailand

As a summary of the above-mentioned trends of wood processing industries, the following factors have been clarified:

1. Decreased production of wood products after the Asian economic crisis was recovered from and strong growth was shown in some items.
2. Production of sawn wood of rubber increased and much was exported to China.
3. Import and export of sawn wood were balanced according to the growth of export of sawn wood of rubber.
4. Export of fiberboard and particle board to East Asia increased.
5. Export of furniture mainly to USA and Japan were steady.
6. Traditional wood products of teak were the key for much of the import of round wood from Myanmar and sawn wood from Laos.
7. Production of paper increased with economic development.
8. There was export of paper and wood pulp, and wood pulp in particular was exported to China.

Discussion

Thailand has achieved rapid economic growth to become one of the leading countries in Southeast Asia (Fogel, 2009). Production and export of primary industry materials such as rice, rubber, cassava, sugarcane, and maize have played important roles in the national economy,

although nowadays their relative importance for the whole national economy is shrinking (Alpha Research, 2010). Expansion of agricultural land brought drastic deforestation in 1980s and 1990s. Efforts toward forest conservation and tree planting strongly initiated in the 1990s (Mahannop 2004). As mentioned in the former studies (e.g. Fisher and Hirsh 2008; Southworth et al. (in press)), Thailand was considered to have entered a recovery stage of forest transition. However, strong initiatives for forest rehabilitation could not be observed. The trend of forest transition of Thailand should be continuously observed based on the reliable national data. Studying the transition in Thailand will also provide insight into the future of forests in countries besides Thailand.

The production, import, and export of round wood, sawn wood and wood products from or to Thailand have a big impact in this region, especially in neighboring countries. Increased export of sawn wood and wood products of rubber, achieved by the replanting of rubber, drastically changed the situation to an excess of import over export of wood products. Most rubber plantations were established in the south of Thailand and the new rubber plantations have also been developed in eastern and northeastern Thailand (Jawjit et al. 2010). However, there are some uncertainty and concerns on the application of rubber plantation to the montane area (Fox J et al. 2011). The productivity and impact on the environment and biodiversity of planting rubber in those regions should carefully be assessed. Export of wood pulp and paper has also become more and more important. Most of those materials were provided from eucalyptus plantations (Jawjit et al. 2006). Instead of conventional wood products, the importance of forest resources, such as rubber and eucalyptus, became larger and larger in the wood processing industry. China became the important trading partner in some items of wood products such as export of sawn wood. On the other hand, there were continuous demands on teak wood materials for traditional wood processing industry. However, the supply of teak wood materials depended markedly on the neighboring countries after a decrease in domestic teak resources and the subsequent logging ban. Given that teak wood resources from neighboring countries are decreasing, expansion and supply of domestic teak wood from tree plantations are highly expected. More efforts for securing of supplies of wood materials should be put on for sustainable development of wood processing industry in Thailand.

In this study, the transition of forestry and wood processing industry was observed using historical forestry statistics. The trade of wood products among countries could be observed using the statistics. However, domestic trade and transportation of wood and wood products between regions or provinces could not be studied in the current situation. Current data collection and summary of production and supply of and demand for wood and wood products were not sufficient. There were differences in the distribution of the forest resources, wood processing

industry and consumption among the regions in Thailand. Therefore, the trade between regions or provinces should be monitored. Efforts should also be put into improving the contents and accuracy of statistics instead of the current trend of simplification. Those statistics will be the basic information for further analysis and planning for the future.

Acknowledgements

This study was supported by a joint research project 2006-2010 between RFD and JIRCAS.

References

- Alpha Research Co., Ltd. (2010) Pocket Thailand in Figures 12th edition 2010, Nonthaburi, Thailand
- Blasco F, Bellan MF, Aizpuru M (1996) A Vegetation Map of Tropical Continental Asia at Scale 1:5 Million. *J of Vegetation Science* 7:623-634
- Food and Agriculture Organization of the United Nations (FAO) (2010) Global Forest Resources Assessment 2010 Country Report Thailand. FRA 2010/206, Food and Agriculture Organization of the United Nations, Rome
- Fisher R, Hirsch P (2008) Poverty and Agrarian-Forest Interactions in Thailand. *Geographical Research* 46(1): 74-84
- Fogel RW (2009) The Impact of the Asian Miracle on the Theory of Economic Growth. *In: NBER Working Paper No. 14967*, Cambridge, MA (<http://www.nber.org/papers/w14967>)
- Fox J, Castella J-C, Ziegler AD (2011) Swidden, Rubber and Carbon: Can REDD+ work for people and the environment in Montane Mainland Southeast Asia? CCAFS Working Paper no. 9. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Copenhagen, Denmark. Available online at: www.ccafs.cgiar.org
- Gajaseni J, Jordan CF (1990) Decline of Teak Yield in Northern Thailand: Effects of Selective Logging on Forest Structure. *BIOTROPICA* 22(2):114-118
- Gyi KK, Tint K (1998) Management of Natural Teak Forests. *In: Kashio M, White K (eds) Teak for the future*, RAP PUBLICATION 1998/05, Food and Agriculture Organization of the United Nations, Bangkok
- Jawjit W, Kroeze C, Soontaranun W, Hordijk L (2006) An analysis of the environmental pressure exerted by the eucalyptus-based kraft pulp industry in Thailand. *Environment, Development and Sustainability* 8(2): 289-311
- Jawjit W, Kroeze C, Rattanapan S (2010) Greenhouse gas emissions from rubber industry in Thailand. *J of Cleaner Production* 18(5): 403-411
- Lakanavichian S (2001) Impacts and effectiveness of logging bans in natural forests: Thailand. *In: Durst PB, Waggener TR, Enters T, Cheng TL (eds) Forests out of bounds: Impacts and effectiveness of logging bans in natural forests in Asia-Pacific*, RAP PUBLICATION 2001/08, Food and Agriculture Organization of the United Nations, Bangkok, pp 167-184
- Mahannop N (2004) The development of forest plantations in Thailand. *In: Enters T and Durst PB (eds) What does it take? The role of incentives in forest plantation development in Asia and the Pacific*. RAP PUBLICATION 2004/27, Food and Agriculture Organization of the United Nations, Bangkok
- Ongsomwang S (2002) Forest Assessment and Conservation in Thailand. presented paper at Workshop on Tropical Forest Assessment and Conservation Issues in Southeast Asia. 12-14 February 2002, Dehra Sun, India
- Royal Forest Department (RFD) (1997) Forestry statistics of Thailand 1997 (in Thai). RFD, Bangkok
- Royal Forest Department (RFD) (1998) Forestry statistics of Thailand 1998 (in Thai). RFD, Bangkok
- Royal Forest Department (RFD) (1999) Forestry statistics of Thailand 1999 (in Thai). RFD, Bangkok
- Royal Forest Department (RFD) (2000) Forestry statistics of Thailand 2000 (in Thai). RFD, Bangkok
- Royal Forest Department (RFD) (2001) Forestry statistics of Thailand 2001 (in Thai). RFD, Bangkok
- Royal Forest Department (RFD) (2002) Forestry statistics of Thailand 2002 (in Thai). RFD, Bangkok
- Royal Forest Department (RFD) (2003) Forestry statistics of Thailand 2003 (in Thai). RFD, Bangkok
- Royal Forest Department (RFD) (2004) Forestry statistics of Thailand 2004 (in Thai). RFD, Bangkok
- Royal Forest Department (RFD) (2005) Forestry statistics of Thailand 2005 (in Thai). RFD, Bangkok
- Royal Forest Department (RFD) (2006) Forestry statistics of Thailand 2006 (in Thai). RFD, Bangkok
- Royal Forest Department (RFD) (2007) Forestry statistics of Thailand 2007 (in Thai). RFD, Bangkok
- Royal Forest Department (RFD) (2008) Forestry statistics of Thailand 2008 (in Thai). RFD, Bangkok
- Southworth J, Nagendra H, Cassidy L (in press) Forest transition pathways in Asia- studies from Nepal, India, Thailand, and Cambodia. *J of land use science*. (DOI:10.1080/1747423X.2010.520342)