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PRODUCTION AND UTILIZATION OF RUBBER WOOD IN THAILAND : II. WOOD UTILIZATION AND ECONOMIC ASPECTS

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แนวโน้มการใช้ประโยชน์ไม้ยางพาราในประเทศไทยเพิ่มขึ้นจาก 1.48 ล้าน ลบ.ม. ในปี พ.ศ. 2519 เป็น 2.55 ล้าน ลบ.ม. ในปี 2521 และ 3.04 ล้าน ลบ.ม. ในปี 2525 ผลการศึกษาในครั้งนี้พบว่า ในปี พ.ศ. 2530 ได้มีการนำไม้ยางพาราออกมาใช้ประโยชน์ถึง 4.53 ล้าน ลบ.ม. โดย 30.43% ใช้ทำเฟอร์นิเจอร์และผลิตภัณฑ์สำเร็จรูปต่าง ๆ 30.43% ใช้ทำฟืน 16.68% ใช้ทำปาร์ติเกิลบอร์ด 11.02% ใช้เผาถ่าน และ 1.83% ใช้ทำเสาเข็ม ทว่าปริมาณที่นำออกมาใช้ประโยชน์ดังกล่าวมีเพียง 42.25% ของปริมาณไม้ทั้งหมดที่ได้จากการโค่นต้นแห้งเปลี่ยนพันธุ์ยางตามนโยบายของกองทุนสงเคราะห์การทำสวนยางเท่านั้น (10.72 ล้าน ลบ.ม./ปี) นั่นคือ 57.75% ของไม้ที่โค่นต้นออกถูกทิ้งขว้างหรือเผาทิ้งไปในสวนยางพารานั่นเอง

ราคาของไม้ยางพาราผันแปรไปตามประเภทของการใช้ประโยชน์ คุณภาพ และทำเลที่ตั้งของสวน ปกติแล้วราคาไม้ยางพาราในภาคตะวันออกสูงกว่าในภาคใต้อย่างน้อยสองเท่า นอกจากจะใช้กันในประเทศแล้วยังได้ส่งไม้ยางพาราและผลิตภัณฑ์จากไม้ยางพาราออกไปจำหน่ายยังต่างประเทศ โดยเฉพาะอย่างยิ่งคือ ญี่ปุ่น ไต้หวัน และเกาหลีอีกด้วย โดยปริมาณที่ส่งออกก็เพิ่มขึ้นเรื่อย ๆ จาก 1,696 ลบ.ม. ในปี 2527 เป็น 58,820 ลบ.ม. ในปี 2530 ไม้ยางพาราที่มีคุณภาพดีมีราคาสูงถึงลูกบาศก์เมตรละ 18,758 บาท อย่างไรก็ตาม การนำไม้ยางพาราออกมาใช้ประโยชน์นั้น มีปัญหาอุปสรรคต่าง ๆ หลายประการ ซึ่งรายละเอียดได้กล่าวไว้ในเอกสารฉบับนี้แล้ว

ABSTRACT

Utilization trends of rubber wood in Thailand were increased from 1.48 million m^3 in 1976 to 2.55 million m^3 in 1979 and 3.04 million m^3 in 1982. The current survey in 1987 showed that there were 4.53 million m^3 of stack volume equivalent to 3.05 million m^3 of solid volume being utilized, i.e., 30.43% as fuelwood, 11.02% as charcoal, 16.68% as particleboard, 1.83% as pole and pile, and 40.04% as furniture and other wood products. The amounts of wood utilized (4.53 million m^3/yr) accounted for 42.25% of total wood wood produced (10.72 million m^3/yr). while the remaining 57.75% was leftover at the plantation sites.

Prices of rubber wood varied with types of using, size, quality, and locality. Normally, average purchasing price in the East was at least two times higher than in the South. Besides domestic consumption, sawn rubber wood was exported to Japan, Taiwan, and Korea at the FOB price of 18,758 baht/m^3 for superior lumber for furniture making. The export volumes were increased from 1,696 m^3 in 1984 to 58,820 m^3 in 1987. Problems and factors limiting rubber wood utilization were discussed.

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INTRODUCTION

The first section of this paper provided details on rubber plantation areas and wood production (Urapeepatanapong, 1989). It was revealed that there were 1,717,561 ha of rubber plantation in Thailand with an annual replanting target of 50,000 ha. Rubber wood obtained from 19-24 year-old plantation was averaged at 171.67 m^3/ha. The amounts of rubber wood gained from the future replanting program were about 8,584,735 m^3/yr divided into 3,272,364 m^3 wood residues, 1,049,869 m^3 pole and pile, and 4,262,142 m^3 roundwood.

The Objectives of this study are as follows :

1. To enumerate the rubber wood used in various industries.

2. To find out the market sources, market channels, and market prices ; both in the domestic and off country areas.

3. To identify the problems affecting production and utilization of rubber wood in Thailand.

4. To recommend and produce quidelines for developing and enhancing more effective uses of this additional forest resources.

DEVELOPMENT OF RUBBER WOOD UTILIZATION

In the early promotion by the government to help the owners of old stock rubber plantations in replacing their old stocks with new high-yielded varieties. Large amounts of rubber trees were substantially cut down clearly without being used commercially. It was estimated that less than 5 percent of total cut down volume had been used only as fuelwood and the rests had been leftover and burnt into ashes at the sites. Because of the wood properties especially their natural durability, para-rubber wood is very easy to be attacked and rapidly damaged by wood-eating insects and fungi (Choomcharn and Visuthithepkul, 1978). However the goverament and non-government agencies concerned, such as Royal Forest Department, Faculty of Forestry, and interested private sectors have foreseen the importance and economic role of the wood thereafter because of the large amounts of wood being left useless. Thus, they have to made great attempts for searching new high capable procurement and technologies for developing and widening the use of this wood against its rapid decay. Coupling with the present situation the depleting natural forest resources, the demand for woods will be increase substantially and will cause the shortage of timber supplies. One of the

possible solutions, to lessen the supply shortages is to develop the utilization of small sized timbers from man-made forests. In doing so, rubber timber is one of that such resources currently to be developed and extensively used as raw materials for producing value-added products such as fuelwood, charcoal, pole and pile, particleboard, furnitures and their parts and other related commodities. From the recent survey and evaluation the utilization of rubber wood was estimated at about 1.48 million m^3 in 1976, 2.55 million m^3 in 1979, and 3.04 million m^3 in 1982. (in stack volume). These indicated that the utilization of this kind of wood is developed and utilized with progressive rate.

CURRENT PATTERNS OF WOOD UTILIZATION

By 1987 survey, the round rubber wood is widely utilized and used with the total volume (stack volume) of 4.53 million m^3 or about 3.05 million m^3 in solid volume. Its updating stack volume utilizations can be categorized as follows : fuelwood, charcoal, particleboard, pole and pile and wood products.

Fuelwood

There are more than 20 particular industries with over 2,000 mills in total such as, animal-feeding dried fish, smoked rubber sheet, brick for construction, made lime, pottery and ceramic, and others operated throughout the eastern and southern Thailand. These as mentioned, still use rubber wood as sources of fuel. It is estimated that 1.38 million m^3 of fuel wood used in these industries or about 30.43% of the total utilization.

Charcoal

There are 2 types of charcoal kilns (sawdust mound and brick beehive type) with the amount of over 500 kilns in total that use rubber wood as raw material for making chacoal. Its outputs are for domestic consumption and partially for export. The amount of rubber wood used in this industry is about 0.50 million m^3 a year or 11.02% of total usage.

Particleboard

Only 3 factories that use rubber wood residues as raw material for producing particleboard and all three are in the east. The total consumption is approximately 0.76 million m^3 annually or 16.68% of total consumption.

Pole and Pile

Most types are used for construction purposes such as for driving into the ground as building base supporting, construction part, and others temporary usage. The utilizations are generally in the central Thailand, particulary in low-land plain for example;

Bangkok and its vicinity. The consumption is about 0.08 million m^3 per annum or 1.83% of the whole utilization.

Wood Products

Most wood products are furnitures and their parts, cable reels, pallets, wooden boxes, picture frames, tooth picks, icecream sticks, household utensils, wooden toys, and some miscelleneous products. There are more than 350 small sawmills operated throughout the east and the south used round timber for processing with the volume of 1.81 million m^3 per year or about 40.04% of the total utilization (Table 1).

Considering upon the 1987 utilization (4.53 million m^3) and its expected productivity (10.72 million m^3) of para-rubber wood, the wood consumption was approximately 42.25%

Table 1. Utilization of Para-rubber Wood by Types and Provinces in 1987

No.	Region/Province	Quantity of Round Wood (m^3/year)					
		Fuelwood	Charcoal	Particle board	Pole & Pile	Wood Product	Total
	Central & East						
1.	Bangkok	–	–	–	82,960	–	82,960
2.	Pathumthani	–	–	–	–	183,750	183,750
3.	Ayudthaya	–	–	–	–	2,250	2,250
4.	Samutprakarn	–	–	–	–	65,265	65,265
5.	Samutsakhon	–	–	–	–	17,730	17,730
6.	Chachoengsao	–	–	540,000	–	–	540,000
7.	Chonburi	63,750	30,408	216,000	–	8,700	318,858
8.	Rayong	63,750	17,997	–	–	264,000	345,747
9.	Chanthaburi	76,815	–	–	–	75,000	151,815
10.	Trad	44,325	–	–	–	67,500	111,825
	Sub-total	248,640	48,405	756,000	82,960	684,195	1,820,200
	South						
11.	Chumphon	98,285	–	–	–	16,000	114,285
12.	Ranong	41,805	–	–	–	4,000	45,805
13.	Surathani	130,370	–	–	–	143,890	274,260
14.	Phang-nga	17,360	–	–	–	59,600	76,960
15.	Phuket	57,860	–	–	–	20,900	78,760
16.	Krabi	18,486	57,024	–	–	23,000	98,510
17.	Nakhon Si Thammarat	180,346	–	–	–	114,420	294,766
18.	Sathun	61,020	–	–	–	3,000	64,020
19.	Trang	93,000	108,773	–	–	159,500	361,273
20.	Phatthalung	1,500	–	–	–	68,500	70,000
21.	Songkhla	208,450	174,719	–	–	124,550	507,719
22.	Pattani	101,000	22,824	–	–	67,510	191,334
23.	Yala	52,600	20,275	–	–	274,500	347,375
24.	Narathiwat	68,500	67,473	–	–	50,700	186,673
	Sub-total	1,130,582	451,088	–	–	1,130,070	2,711,740
	Total	1,379,222	499,493	756,000	82,960	1,814,265	4,531,940
	%	30.43	11.02	16.68	1.83	40.04	100.00

Remark : Data were estimated from previous survey in 1987

of the total expected productivity or in the others said, about 57.75% (6.19 million m^3) of para-rubber wood was leftover and burnt into ashes at the plantation sites. These indicate that the country will still has more excess wood supply for more additional consumption in the foreseeable years.

PURCHASING PRICES :

Also according to the RFD's recent survey and Thai Furniture Industries Association's quoted figures in 1987, the rubber wood prices have been varied by its own type of using, sizes, qualities, originating point, source of markets, and others. The prices at purchasing places can be grouped as follows :

1. Average Purchasing Prices of Rubber Plantations

= 15,000-25,000 Baht/rai ($3,676--6,127/hectare) in the east

= 1,000-3,000 Baht/rai ($245-735/hectare) in the south

2. Average Purchasing Prices of Round Rubber Timber Wood Residues

= 180-190 Baht/m^3 (stack volume)

= $7.06-7.45/$m^3$ in the east

= 80-100 Baht/m^3 (stack volume)

= $3.14-3.92/$m^3$ in the south

Poles and Piles

0.4" × 4 m = 65-70 Baht/pole = $2.55-2.75/pole...
0.5" × 5 m = 75-85 Baht/pole = $2.94-3.33/pole... } in Bangkok and its vicinities
0.6" × 6 m = 100 Baht/pole = $3.53-4.71/pole...

Sawn Timbers

= 700-750 Baht/m^3 (stack volume)

= $27.45-29.41/$m^3$ in the central

= 600-650 Baht/m^3 (stack volume)

= $23.53-25.49/$m^3$ in the east

= 180-220 Baht/m^3 (stack volume)

= $7.05-8.63/$m^3$ in the south

3. Average Purchasing Prices of Sawn Rubber Woods Domestic Prices :

Chemical Dipped Green Wood

= 2,472-3,002 Baht/m^3

= $97-118/$m^3$ in the central

= 2,190-2,825 Baht/m^3

= $86-111/$m^3$ in the east

= 1,589-2,295 Baht/m^3

= $62-90/$m^3$ in the south

Chemical-compressed Dry Wood

= 3,532-4,944 Baht/m^3

= $139-194/$m^3$ in the central

= 3,178-4,591 Baht/m^3

= $125-180 /$m^3$ in the east

= 2,649-4,238 Baht/m^3

= $104-166/$m^3$ in the south

Exporting Prices (FOB) :

Chemical-compressed Dry Wood

- 4 size planed lumber = 6,450 Baht /m^3 = $253/$m^3$ to Japan
- Lumber for ordinary furnitures making = 12,067 Baht/m^3 = $473/$m^3$
- Lumber for highgraded-furnitures making = 18,758 Baht/m^3 = $736/$m^3$

Remark : $1 = 25.50 Baht

1 m^3 = 35.315 ft3

MARKET CONDITION OF RUBBER WOOD PRODUCTS

Sawn-Rubber Timber

Market condition of this kind is under the sellers' hand. Sawmills dominate the selection of buyers in the internal furniture making circle, or even external markets. The major exporting markets are those Far-east Asian Countries, for example : Japan, Taiwan, Singapore, and Republic of Korea. No data is available for sellings within the internal market. However, the exporting volume has been substantially increased since 1984 from 1,696 cubic meters of 4.56 million baht to 58,820 cubic meters of 186.62 million baht in 1987 (Tables 2 and 3) or about 3 times increase. The expanding demand has been fueled by the rapid increasing preference in using Para-rubber sawn-timber as a raw-material source for furniture making in almost every market--especially external markets, plus the low-competition from other exporting countries : for example, Indonesia prohibiting the exportation of para-rubber timber, and Malaysia increasing its export tax to lower its exportation. This causes the shortages of para-rubber timber as raw-materials for furniture-making in Japan, Taiwan, and South Korea. They turn to import from Thailand which causes recently the shortages of para-rubber sawn timber for the internal use.

Market Condition of rubber-wood furniture

1. **Internal market.** Para-rubber furnitures have been popularized since 1977 firstly in a disguised form of Samania type (Mai Cham Chai, because of its colour similar to Samania species and the false believes, among its users, as a low-quality species, low-durability, and/or low-grades. Later development about sawn para-rubber timber has made para-rubber wood more productive and more qualitative which causes extensively its popularity especially in furniture-production. However, the external markets are not widely opened because para-rubber furnitures still have high-prices comparing with other furnitures produced from other well-known species. Nevertheless, the diversification in producing para-rubber furnitures makes them more

Table 2. Export of Sawn Rubber Timber by Country

Quantity : m^3
Value : million baht

Country	1984		1985		1986		1987	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Japan	556	2.23	2,117	7.64	1,893	32.60	34,097	94.38
Taiwan	523	1.66	984	2.86	2,531	9.83	13,955	56.60
Korea	–	–	22	0.12	963	4.32	3,096	14.02
Belgium	–	–	–	–	27	0.17	–	–
Qatar	–	–	–	–	21	0.14	19	0.10
Sweden	–	–	–	–	23	0.11	–	–
Singapore	737	0.55	80	0.20	76	0.06	5,951	16.36
Italy	–	–	–	–	–	–	225	1.26
Others	60	0.12	29	0.05	–	–	1,487	3.50
Total	1,696	4.56	3,232	10.87	5,534	47.20	58,830	186.62

Source : Department of Business Economics and Custom Department

Table 3. Export of wood Furniture and Parts in 1985-1987

Value : million baht

Country	1985	1986	1987
United State	262.7	444.3	998.8
Japan	239.6	311.5	529.7
France	12.3	95.9	194.7
Hong Kong	73.0	136.4	192.8
Singapore	156.5	99.	115.6
United Kingdom	14.5	37.0	83.0
Australia	12.0	37.3	60.1
Canada	27.2	27.9	32.0
Saudi Arabia	12.3	16.9	21.0
Malaysia	7.2	3.6	3.0
Others	36.8	114.1	299.3
Total	864.3	1,300.0	2,590.0

Source : Department of business Economics and Custom Department
Commodity Code : exce 940101, 940102, 940502 and 943091

attractive; for example, wood table set, lobby set, bed, book shelf, audio-visual shelf, beverage counter, or even flowers pot, etc. all designed in knock down parable types which are convenient for packing and transporting. Furthermore, private and government-run agencies have shared their advertisement and/or extension programs which help induce public to extensively use and accept para-rubber furnitures.

2. External Market. Exportation is in forms of sending out furniture parts or knock-down portable types. Major markets are the United States, Japan, France, Hong-Kong, and Singapore. Exporting volumes are rapidly increased, similar to the exports of para-rubber sawn timber. Though the exporting volumes of para-rubber furnitures are not separately enumerated from other furniture types, it can be assessed that their volumes are approximately 70 percent of all other furniture types, and will be increasing to 80 percent in the year 1988. From this proportion, the exporting value for para-rubber furnitures was increased from 215 million baht in 1984, to 1,260 million Baht in 1987 about 133 percent or growing more than 2 times yearly.

As being rapidly increased, the exporting of para-rubber furnitures has attributed not only to the continuously growing marketing skills but also to the higher quality and the more attractive forms of products per se. The expansion of Thailand's external markets has been resulted from the incapability of Taiwan, as a major exporting country, to cope with her insufficient timber supply, the increasing labour wages and the extermination of G.S.P. as a part of exporting support from the United States. Furthermore, the increasing labour wages in Japan and the United States cause high prices of furniture made within the two countries and they turn to import lower-priced furnitures from outside which make Thailand as their major trade partner.

3. The competitor. Taiwan is the major competitor in this type of commodity, because Taiwan has more advanced technological skills, and has a complete manufacturing operation which help reduce much more costs of production. However, Thailand can continuously compete with Taiwan because of her superiority in terms of having low labour wages, substantial supply of raw materials and the flexible par value of local currency.

PROBLEMS & LIMITING FACTORS

From cooperating experiences with the industry sector, it can identify problems and limiting factors facing para-rubber wood commodities into 3 categories as follows :

1. The uneven supply of raw-materials. Though there have high numbers of para-rubber trees fallen down from plantations each year, no even feeding of timbers to the factory has been made. Only 42 percent of fallen-down trees have been dragged out from plantations to be used in factories.

Other 58 percent have been left rottened in the plantations because of no pull-out routes, and insufficiency of essential wood preserving treatments (having to be preserved in 48 hours after falling). These cause serious shortages of raw-materials to be evenly supplied to the factories, especially during rainy season when costs of production are automatically high.

2. Technical Skills on Production and Conversion. Para-rubber wood has to be treated before making end products, It has to be flowed through; for example, drying kiln, chemical preserving process, and colour-improvement technique, in order to meet the need of buyers, especially in foreign markets. Technical skills employed in different factories are much varied, making much losses in each production process, especially much more losses in small factories of low productive volumes. These block the more productive usages of para-rubber wood and slow down Thailand's potentiality to compete with her trade opponents.

3. Governmental Regulations. Governmental regulations, as being enforced to control trading operations on para-rubber wood, are not compatible with the advancement of para-rubber industry. Some cause the illegal maneuvers; for example,

- The Cabinet's resolution of controlling the establishment of Para-rubber conversion factories.

- RFD's regulations of limiting size and capability of timber conversion factories, or the regulations on prohibiting the transportation or movement of para-rubber sawn timbers as similar to other wood species though the government has ensured the policy of exploiting para-rubber wood as an economic species, and stimulating para-rubber plantations on private-owned lands.

The revision of the above-mentioned incomparible regulations is urgently essential to pave the way for development of Para-rubber wood industry-not only for increasing the export volumes, or more labour employment, but also for expanding para-rubber plantation to make more income for rural agriculturalists.

FACTUAL CRITERIA AND CRITERIA FOR IMPROVEMENT

Factual Criteria

1. The control on business of para-rubber wood is under Forest Act which is implemented by Royal Forest Department of Agriculture and Cooperatives Ministry.

2. The permissable rule for establishing one para-rubber saw-mill per district partially causes the raw-material shortage. It is not compatible with the Cabinet's policy of enhancing the expansion of para-rubber plantations as sources for supplies of para-rubber timber industry.

3. RFD has recently prohibited all conversion activities of producing para-rubber wood products or of selling para-rubber sawn timber within Bangkok, its vicinity, and or exporting aboard because all para-rubber sawmills have violated the RFD's permission criteria.

4. There now have free exportations of para-rubber sawn timber (3% exporting tariff) to Taiwan, and South Korea as raw materials for producing furnitures to be sold back to Thailand. This would certainly cause the shortage of high quality sawn timber in the country.

5. Though there are many advancement, in using para-rubber wood, the producing process is not standardized and still varies especially in drying activities, designing, and quality improving. These are impotent to compete with the trade opponents.

6. Informations useful for trading are not centralized to be conveniently used, making the governmental planning ineffective and difficult to follow-up, evaluate and feed-back. That would not efficiently serve private sector in producing, managing, searching for raw-materials, and even marketing for their businesses.

Criteria For Improvement

1. Separating control measures from other types of wood industry control measures in accordances with governmental policy to expand the para-rubber plantations for the development of complete uses of para-rubber wood.

Remarks :

- Considering the issuance of new Act for enhancing the development, production and marketing of para-rubber in completing exploitation rather than control measures.
- Considering the possibility to implement cabinet's resolutions or Ministerial rules in short-term operation instead of recorrecting the Forest Act which would consume times.

2. Revising the Cabinet's resolution of permissable rule in establishment of sawmills to operate freely complete use of para-rubber timber

Remarks :

- About setting new rules or regulations, opening the opportunity for privates to increase their capability in bringing para-rubber out to be used aiming at higher than 42 percent current use efficiency.

3. Allowing the said sawmills to change the permission criteria in order to sell more freely the para-rubber timber.

Remarks :

In order to enchance the complete exploitation of para-rubber wood and to be compatible with the free establishment of para-rubber sawmills previously mentioned.

4. In order to stop the free exportations of para-rubber sawn timber, one of the 2 alternatives should be either selected;

1) increasing exporting tariff changed for all para-rubber timber or
2) following the market mechanism the producers buy high-priced raw-materials when demands are high.

Remarks :

- The export prohibition is not advisable because of its adverse impacts to the tree growers in term of income reduction.
- The 2 suggested alternatives should be short-run implemented until the appropriated improvement in governmental agencies concerned will be dealt with the complete development of this wood industry.

5. Private sector should unite to share their experiences in researches, production skills, quality development expertises, and extension among themselves : for example, the extension program on effective wood drying process, the method for improving wood quality, and/or the para-rubber wood colouration method, etc.

Remarks :

The Thai Furniture Industries Association has currently initiated this kind of extension programs which should be extensively enhanced.

6. Establishing a central unit to collect essential informations, analyze, and extend to government and private sectors in order to promote the cooperative activities among them.

Remarks :

The up-dated information priorities should be well categorized as follows.

- volumes of utilized para-rubber-trees after falling down.
- numbers of para-rubber sawmills and volumes of their productivity.
- exporting volumes and value, especially of para-rubber wood furnitures industry.
- others

CONCLUSIONS

Rubber wood could be brough out and utilized only 4.53 million m^3 or about 42.25 percent of the total output. It appeared that the current demand was lower than the annual supply. This revealed that there were timbers partially leftover without utilization at the plantation sites and never been brought out. Ironically, they were burnt into ashes at leftover sites approximately 6.19 million m^3 or 57.75 percent of total cut down volume annually. Because, the timbers were originated scatteringly in remote roadless areas and rugged hilly terrains, and the market places were sparsely located far from timber sources in addition to the unmatched numbers of timber harvesters and other wood processing producers, these were the obstacles to make more leftover timbers. Furthermore, specific laws and regulations yielded no incentives for producers to harvest timbers out for utilization. The situation, therefore, should be improved and should be searched for new effective measures to eradicate the obstacles in order to utilize the timbers that leftover at any originating sites and to create the maximal uses. A feasibility study of this kind of wood, especially wood residues utilization should be undertaken to search for the best guideline and measures to utilize the leftover wood residues as much as possible.

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