

MARKET STRUCTURE OF PULP INDUSTRY IN THAILAND

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ABSTRACT

Objectives of the study were to determine structure and conduct of markets for pulp industry in Thailand during 1996-2005. The designed questionnaires were employed for data collection from 7 sampled pulp factories as well as the related government and private agencies which associated with the pulp industry

Results of the study indicated that eucalyptus, bamboo, jute, bagasse and rice straw were used as raw material for pulp production. The quantity of pulp production in 2005 was 1.14 million tons. The increasing rate of pulp production during 1996-2005 was 7.85 percent per annum. The structure of pulp market was oligopoly. Differences between the products could be classified into 2 types, namely, bleached short fiber and unbleached short fiber. On the other hand, the product quality of each factory normally differentiated from each other, this mainly due to differences in the using type of raw material and production technology. The most producers used eucalyptus as the raw material. Moreover, there were various types of services which were provided by pulp factories, namely, serving the production service according to the order of the domestic and rest of the world customers, and accepted the returning product or change the product which was an inconsistency or lower than the given standard. Barriers to the market entrant were the needed amount of budget for the investment in this enterprise was quite high, it was at least 300 million baht, the salary paid for the employed specialist was also high and each producer could not set the proper price for gaining the maximized profit. The domestic pulp price was mainly depended on

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production cost and pulp price in the world market. Individual producer continuously improved pulp quality and type for consistent with the customer demand and serving the production service according to orders of domestic and rest of the world customers. The entrepreneurs organized their enterprises in the form of vertical integrated industry and grouped all of the producers together. Thus, the government should support farmers to cultivate crops which were usable as the raw material for pulp production in areas adjacent to location of pulp industry; and encourage private sector entering more into this enterprise, as well as support budget and facilitating the importation of modern machine.

INTRODUCTION

In recent years, production of pulp industry in Thailand could not meet the requirement of domestic consumers; hence the pulp importation was needed. According to the government policy, the privileges of investment and tax were provided. (Yoosuk, 1999) Raw material using for pulp production were bagasse, jute, rice straw, bamboo and eucalyptus, the available quantity of these raw material were fluctuated seasonally, this caused the management problems in searching for more amount of raw material to cover the deficit and practicing the inventory. Moreover, they were also used as the raw material for producing the other products which were not related to paper industry, which caused raw material shortage. (Pradab, 1999). Pulp is important raw material for producing various kinds of commodities. Moreover, pulp industry having potential and being enlarged continuously although each producer had attempted to expand the capacity

of production. However, the available pulp was still lower than the requirement this will cause the increasing in pulp importation. Generally, determination of domestic price of short fiber pulp was mainly due to the price of imported short fiber pulp. In case the price of imported short fiber pulp decreased the domestic producers had to reduce the price of their products. On the other hand, if the price of the imported short fiber pulp increased the domestic producer could not adjust the price of their product to conform with the imported price because the government has already set the ceiling price. Although the cancellation of pulp price control was announced in 1994, the government still asked the producer to fixed the selling price at the determined level. (Niroj, 1997). Pulp competitor countries of Thailand were Canada, USA, Chile, South Africa, Sweden, etc. (Royal Forest Department 1998). The quantity of short fiber pulp exportation of the country was increased annually (The Thai Pulp and Paper Industries

Association, n.d.). It indicated that the market structure and the means of market operation in the present pulp industry is interesting issue for the study. The finding can be employed as guidelines for pulp industrial extension and development as well as planning the integrated agro-forestry system in private sector.

Objectives of the study were to determine market structure and market conduct of the pulp industry in Thailand.

INSTRUMENT

The study employed designed questionnaires as a tool for gathering data from pulp industry in Thailand, government and private agencies concerning the pulp industry.

METHODOLOGY

Data Collection

The methodology for studying the marketing system of pulp industry in Thailand was as follows.

1. Primary data. This type of data was obtained by employing the designed questionnaire interviewed the entrepreneurs of 7 pulp factories, namely, Advance Agro Co. Ltd. (Public), Phoenix Pulp and Paper Co. Ltd. (Public), Punjapol Industry Co.trd (Public), Siam Pulp Co.Ltd. (Public), Siam cellulose Co Ltd. (Public), Bang Pa In Pulp Factory Co.Ltd. Environment Pulp and Paper Co.Ltd (Public), interviewed about public enterprise, collecting data and general informations from the

entrepreneurs, market structure and market conduct during January 1996 to December 2005.

2. Secondary data. Searching in December 2005 from the relevant reports, documents, texts, and internet from government and private agencies which related to the pulp industry.

Data Analysis

There were 2 types of data analysis employing for the study, namely, descriptive analysis and quantitative analysis and their details were presented as follows.

1. Analysis of suppliers concentration. The firm ranking by quantity of production from top to bottom was carried out, then computed the ratio in percentage between the summation of the top 4 firms production and the industrial production.

$$\text{Supplier Concentration} = \frac{\text{Summation of the top 4 firms production}}{\text{Industrial production}}$$

In case the concentration ratio is 100 percent of all firms in the market, this indicated that the market structure is monopoly, and if the market share of the top 4 firms having the concentration ratio of 5-10 percent indicated that the market structure is competitive, and if the market share of the top 4 firms is more than 10 percent and less than 100 percent indicated the market structure is oligopoly (Cave, 1982)

2. Analysis of product differentiation. This is the descriptive analysis by determining of the characteristic of the product, product

quality, packaging and various kinds of services of the seller serving to the buyers.

3. Analysis of barrier to entry. To determine the barrier rely upon firm size and real cost, and this was analyzed by descriptive analysis.

4. Market conduct. The market conduct was examined from the price determination policy, product and competitor eradication policy, these were also analyzed by the descriptive analysis.

RESULTS AND RECOMMENDATIONS

All of the active pulp factories were employed as the targeted group for the study, thus the finding may cause the impact on the enterprise of such factories. So, the name of the studied factories were keep in secrete and they were called in term of A, B, C, D, E, F and G. The results of the study were presented as follows.

GENERAL INFORMATION OF PULP INDUSTRY

The study on pulp industry during 1996 to 2005 indicated that there were 7 firms in this industry, those were categorized to be 4 public company Ltd. Namely company A, B, C and D. The rest of 3 were company Ltd., they were company E, F and G

All of them except company A were the companies that source of their capitals were come from domestic partners only, while

capital of company A came from the cooperations between domestic partners and partners from abroad. Moreover, there were 3 companies namely A, B and E were supported by Board of Investment (BOI), while company C, D and F used to be supported by the government but now the support was already terminated. The support duration was ranging from 3 to 7 years. During 1996 to 1998 there were 6 pulp factories, namely, A, B, C, D, E and F and most of them used eucalyptus as the main raw material but bamboo, jute, bagasse and rice straw were also used. In 1999, the pulp company F was closed, this mainly due to material shortage and the using machine was lower than the standard. However there was no impact on the other firms because its production was rather small and was only sent to its branch factories. During 1999 to 2004 the number of pulp factory was reduced to be 5 and up to 2005 there was a new comer entering into this industry, so the number of pulp factory was become 6. Pulp production increased annually, it was 593.50 thousand tons in 1996 and increased to be 1,143.34 thousand ton in 2005 with the average annual growth rate of 7.85 percent.

MARKET STRUCTURE

Concentration ratio of supplier

The concentration ratio of supplier could be determined from quantity of the pulp production of each producer. During 1996-2005 the

total number of pulp producers in the country was 7, they were producer A, B, C, D, E, F, and G. During 1996 to 1998, there were 6 producers, the concentration ratio of suppliers was ranging from 89.00-91.07 percent. During 1999 to 2004 pulp factory F was closed because of raw material shortage and machinery problem, the concentration ratio was ranging from 91.40-92.87 percent, but the factory F had a rather low market share, this caused a very little impact on the concentration ratio. In 2005 the factory G entered into this business caused the concentration ratio reduced to be 87.40 percent. The maximized and minimized concentration ratio was found in the year 1999 and 2005 with their values of 92.87 and 87.43 percent respectively (Table 1). Hence, the market structure of pulp industry during 1996-2005 was oligopoly.

Table 1 Concentration ratio of pulp industry during 1996-2005

Year	Concentration ratio (percent)
1996	89.11
1997	89.00
1998	91.07
1999	92.87
2000	92.40
2001	91.55
2002	91.40
2003	91.62
2004	91.67
2005	87.43

Product differentiation

Product differentiation could be classified into 2 aspects, namely, the difference in produced pulp and packaging. The pulp production of any firm was normally different from each other, this mainly due to differences in using kind of raw material. Pulp factory in the country could produce only short fiber pulp. The study found that the produced pulp could be classified into 2 main types namely bleached short fiber pulp and unbleached short fiber pulp. Most of pulp production was bleached short fiber pulp and could be widely used as raw material for producing the various kind of products such as writing and printing paper, sanitary paper, coffee cup, food pack, etc, and having more market demand. The factories that produced bleached short fiber pulp were A, B, D, E, F and G, while unbleached short fiber pulp was produced by factory C, which was used as raw material for producing craft paper, hard paper, newspaper, wave paper etc.

The product differtiation due to characteristics of pulp packaging produced in Thailand could be divided into 3 types namely:

1. Dry pulp. This type of paper had moisture of 10 percent, it was produced in form of sheet, and different in size, this mainly due to the plant size. The characteristic of produced dry pulp was rectangular bundle shape, it was called *ibalei* each bundle of dry pulp was packed with pulp or paper at least 2 layers and all 4 sides of each bundle were fastened with wire. The bale

size depended on determination of each factory. There were 3 bale sizes namely 82x71x48 cm., 85x64x43 cm. and 80x60x70 cm. and the average weight per bale was ranging from 150 to 250 kg. Moreover, the characteristic of pulp was not only in bale form but also unitized bale form (fastening 8 bales together) this is for facilitating the transportation and conformity with the machine. Dry pulp was produced not only for exportation but also for selling to the domestic remote factories which mainly produced pulp. This were the packaging characteristic of factory A, B, D, E and G

2. Wet lap pulp. The moisture of this type of pulp was ranging from 50 to 60 percent. The wet lap pulp was emphasized to send to the branch of the produced factory and selling in the domestic market for producing writing and printing paper and craft paper, this was the packaging characteristic of factory A and C

3. Slurry pulp. The pulp was sent along the tube to paper factory of each company, this was the packaging characteristic of factory A, C, D and F

Pulp quality, produced from each factory, will be different from each other this due to the differentiation of using kind of raw

material and machine. The most of pulp factories used eucalyptus as their raw material because eucalyptus pulp was recognized as a good quality pulp, being the most suitable for producing writing and printing paper and having the largest market demand. The eucalyptus using factories were A, B, C, D and E, while the quality of pulp which was produced from bagasse was equivalent to the ones which were produced from the broad leaf tree species but lower than the eucalyptus pulp. Thus, the bagasse pulp was suitable for producing pond paper, but because of its market demand was lower than eucalyptus pulp. There were 2 factories that producing bagasse pulp, they were D and G. Bamboo and jute pulp having a longer short fiber and good quality which suitable for producing writing and printing paper, and paper for industry such as craft paper. Hence factory B had to employed bamboo as the raw material for pulp production.

Pulp from rice straw had short and thin fiber, it was proper for producing box, hard paper, and wrapping paper, ect., they were produced by factory F.

Differentiation of services. There was the production service according to the order of domestic and rest of the world customers. This

was the service of factory B, the unbleached bamboo pulp was sent to the customers in Germany, this being used for producing coffee filter, and produced bleached jute pulp for sending to customers in Japan, this being used for producing coffee cup, tissue paper, food pack, etc. Factory C and D produced unbleached eucalyptus pulp sending to the domestic producers to be used for producing craft paper and wave paper, while factory produced bleached eucalyptus pulp sending to the domestic producers to be used for producing writing and printing paper and craft paper. Moreover, the inconsistent or low standard product could be returned or changed.

Barrier to entering into the market

Barrier based on business size. Pulp industry was characterized by large size and capital intensive use, hence, the money used for investment was quite high, this included registration fee and machinery cost. All of the machines using for pulp production were imported from abroad, which needs a very large amount of money for investment. Each company had to pay money for the registration fee ranging from 300-6,300 million baht and also paid a very large amount of money for buying ma-

chines.

Barrier based on the real cost. The total pulp production cost was composed of raw material cost (50%), chemical substance (30%), and cost of water, labour cost, and other (20%). (Group of Exportation Services 4, 2002), this indicated that a half of production cost was the expenditure for chemical substance, labour and others. Based on the production technique aspect, due to the pulp production process is the high production technology especially the stage of pulp boiling and bleaching will need the personals, who having comprehension and being specialist in order to produce the standard pulp quality. In addition, the personnels who working related to the production process had to develop their knowledge and ability as well as to attend continuously the relevant training course, hence producers had to spend more money for such activities for developing the technology. This will cause the new comers had to pay the cost higher than the old ones especially during the beginning stage of production.

MARKET CONDUCT

Price Determination Policy

Pulp industry in Thailand started after

the World War I, the paper was produced to serve the government agencies and domestic use, after that paper production was changed from manual to machinery process. In 1938, one more factory was established in Kanchanaburi Province and since 1982 the pulp industry was developed and enlarged along the direction of integrated industry. During 1982-1992 was the beginning period of pulp industry but with a little of expansion rate, it was the beginning of investment and the expansion of the production capacity of company B as well as the beginning of the pulp production of Thai Cement Group Company which used to imported pulp for paper production. Since 1992, pulp industry was expanded at a rapidly rate this due to the expansion of production capacity of Company B and the investment of company C in 1994 as well as the investment of the largest company of Thailand which was company A in 1996. In 1998, each company having their own pulp price determination by pulp quality and production technology. Because the market structure of pulp industry was oligopoly, each producer could not set the price for gaining the maximized profit and because the domestic pulp price was related to the pulp price in the world market and was the commodity under price control, the policy

of price determination of each producer depended on production cost and pulp price in the world market. In 2003 Company B was combined with company D and E hence, the three companies could perform the silence price determination.

Product Policy

Pulp industry was the industry that the producers could not set the price at their desired level, this will cause the producer to develop the pulp quality and type of pulp to conform with the requirement of customers. The most producers produced their products from eucalyptus because it provided the good pulp quality which was accepted by the consumers. The producers who produced their products from eucalyptus were A, B, C, D and E, each of them continuously improved their production technology in order to develop the pulp quality as well as to create the product differentiation and the quality of these product were better than the ones which were produced by their competitors, these were the results from creation of product differentiation. Moreover, production service according to the order of domestic and rest of the world customs was provided by company B which accepted to produce

unbleached bamboo pulp and bleached jute pulp while C and D company accepted to produce unbleached eucalyptus pulp and E company accepted to produce bleached eucalyptus. In addition, the changing or returning of the product which was not conform with or lower than the given standard was practiced.

Competitor Eradication

Normally, each producer made pulp quality development for creating product differentiation, production process control in order to save the energy or to reduce the production cost, used the waste of raw material as the energy for production, developed services serving to the customer for creating satisfaction and more relationship. In case of producer A and B, they desired to keep constantly or to increase their market share, while producer A integrated vertically its enterprise by encourage the farmers to grow eucalyptus, and accepted to buy eucalyptus (after it was harvested) for pulp production, and then the obtained pulp will be used for paper production. This is the integrated paper production pattern which leading to avoid from the increasing in cost. The collusion among produce B, D and E will create the large base of production capacity, and having the company

certified the certainty of product, and having more potentiality. If there were the new comers entering into the business but couldnít develop the product to conform with the market demand or could not control the production cost level to be able to afford such high monetary value for the investment, these will purse them to leave from the business.

CONCLUSION AND RECOMMENDATION

Objectives of the study on market structure of pulp industry in Thailand during 1996-2005 were to determine market structure and conduct of pulp industry. The designed questionnaire was used as a tool for collecting data from 7 pulp factories in Thailand as well as government and private agencies related to pulp industry. Results of the study could be concluded that pulp industry in the country used eucalyptus, bamboo, jute, bagasse and rice straw as raw material. In 2005 the total pulp production was 1,143.34 thousand tons and with the average annual increasing rate during 1996 to 2005 of 7.85 percent. The pulp market structure was oligopoly. The product

differentiation could be classified by the type of produced pulp into bleached short fiber pulp and unbleached short fiber pulp. In addition the product differentiation could be classified by type of packaging into dry pulp, wet lap pulp and slurry pulp. The pulp quality of each producer was different from each other, this mainly due to the different in the type of using raw material and production technology. The most producers used eucalyptus as the raw material for pulp production. Moreover, the producers served the production service according to the order of the domestic and rest of the world customers as well as serving the service about changing or returning the products that didn't conform with or lower than the given standard. Barrier to the market entrant was mainly due the business size, the pulp business needed a rather high budget for the investment (at least 300 million baht); and real cost which occurred from the expenditure for employing the specialist, these will cause the new comers having a higher cost than the old ones especially during the beginning stage of the production. Policy of price determination, each producer could not set the price for gaining the maximized profit, this mainly due to the pulp price was depended on the

production cost and pulp price in the world market. Product policy, producers always develop pulp quality and type of pulp to conform with the requirement of customers and serving the production service according to the order of domestic and rest of the world customers and eradicated competitors by reforming their business to be vertical integrated business and collusion among the pulp producers.

The study indicated that the market structure of pulp industry was oligopoly and nearly to be monopoly, it played an important role in Thai socio-economic development because the annual income from pulp industry was rather high and having potentiality for the development in the future if receive the necessary support from the government such as encouraging the local farmers who residing in the areas which located within the radius of 100 km. from the factory site to cultivate crops with were useable as the raw material for pulp production. Moreover, the government should encourage the private sector to invest more in pulp industry by supporting the capital and importation of modern machines.

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