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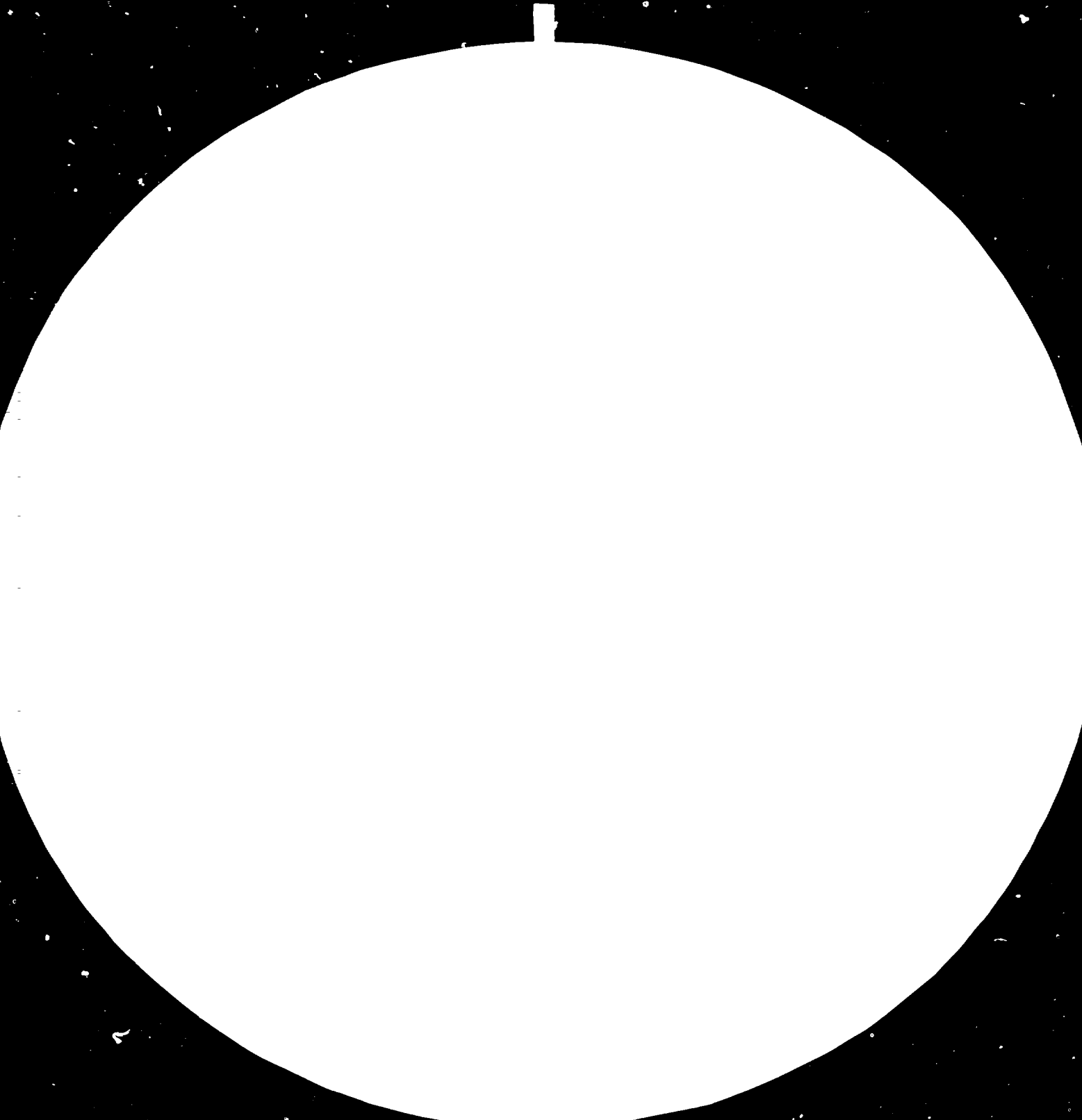
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THE PULP AND PAPER SITUATION IN THAILAND *

by

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96

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Paper is one of the basic commodities which is consumed daily. The demand for paper tends to relate directly with the size of the population as well as the rate of economic growth. The steadily rising paper consumption in Thailand, the world-wide shortage of pulping raw materials, and the resulting rapid and drastic increase in pulp and paper costs have focused ever greater attention on the search for new pulping materials within the country.

STATUS OF EXISTING PAPER INDUSTRY

Thailand has abundant raw materials for pulp and paper. However, this potential has so far only been recognized and utilized to a very limited extent. Local production of paper and paper board from 35 paper mills amounted to 322,412 tons in 1978. The projection for paper consumption in 1981 will be 450,000 tons. Among these paper mills, only four are integrated pulp and paper mills with a combined pulp production capacity of 30,000 tons. The Bang Pa-In Paper Mill produces 30 tons per day of bleached rice-straw and Burma grass pulps and makes 40 tons per day of paper by mixing the produced pulp with imported long fibre pulp. The Kanchanaburi Paper Mill makes only 10 tons of paper from 8 tons per day of bleached bamboo soda pulp mixed with some imported hardwood pulp. The Siam Kraft Paper Mill started with a daily production of kraft paper and paper board at about 300 tons mainly from imported pulp. The mill produces only about 60 tons per day of unbleached bagasse pulp using the soda process. The Siam Paper Company produces 50 tons per day of writing and printing paper from 20 tons per day of bleached bagasse alkaline sulphite pulp.

Most paper mills use imported pulp and local waste paper. The Bangkok Paper Mill consumes about 120 tons of bleached pulp per day. Panjapol Fibre Container Company and several small paper board mills use waste kraft paper and imported kraft pulp to make liner board and corrugated medium.

RAW MATERIALS FOR PULP

Rice straw production in the Central Plain is estimated about 9 million tons per year, but only 20,000 tons are used for pulp. Improvement of harvesting paddy rice to save the straw for pulp needs research and development work.

Burma grass (Pennisetum pedicellatum) in Thailand is exotic. It was introduced to Thailand about twenty years ago from Burma as a grazing grass. Apparently, the cattle in Thailand accepted the tender leaves of Burma grass but seem not to relish the tough stems of old Burma grass. The grass spread rapidly to a wide area in the central plains, encroaching on other crops except rice, as the grass is vulnerable to swampy paddy soil. In 1970, the Thailand Institute of Scientific and Technological Research (TISTR, former ASRJT) conducted the mill test at Bang Pa-In Paper Mill with the support of the United Pulp and Paper Company.

Utilization of bagasse as a raw material for pulp and paper deserves serious consideration because bagasse, as the agricultural residue, is available in a very large amount in Thailand, about 8,000,000 tons in 1977 from 42 sugar mills (Kamolratanakul A. and et. al., 1979). Utilizing bagasse for fuel by the sugar mills themselves is about 95 per cent of total production. Other industries using bagasse as a raw material are animal feed, fertilizer and particle board industries. There is still 200,000 tons per year left for the pulp and paper industry. Though bagasse pulp is a short pulp, the main component of paper is from short fibre.

Thailand is endowed with many species of bamboo in large areas of bamboo forests estimated at 1,782,000 hectares in the Western and Northern parts of Thailand bordering Burma. Only one small mill uses bamboo for pulp at about 7,000 tons of bamboo per year. There are plenty of bamboo forests available. The present forest law classifies bamboo as a minor forest product and provision to release national bamboo forest as concessions for pulp production is very necessary.

Kenaf was known as a very promising fibrous raw material for pulp and paper for many years. Several studies raise the interesting possibility of using kenaf as a domestic papermaking raw material rather than as a source of bast fibre. TISTR has been working on kenaf since early 1968 when the market of kenaf fibre was in shrinkage. Many processes had been explored to make kenaf pulp, and the conclusion was that kenaf could be a major source of pulp for use in Thailand. When kenaf is considered as raw material for pulp and paper, both the bast fibres and woody shives can be used separately or in combination. The bast fibre varies in length from 1 to 10 mm. with average about 2.5 mm. which is comparable to bamboo and most coniferous wood and is better than most hardwoods. Kenaf bast fibre is finer than most wood fibres. The woody part of kenaf stalks has shorter fibres that averaged about 0.58 mm. in fibre length. Use of kenaf stalk for pulp would be a diversification of the kenaf market. It would also salvage the waste stalks from seed harvest. About 10 tons of dry stalks can be harvested per hectare of Thai kenaf. This can produce about 5 tons of chemical pulp with a quality comparable to coniferous kraft pulp. Extension of kenaf cultivation near the existing paper mills should be of great interest to the nation.

At present about half of the rubber plantations in Thailand have reached the advanced age where yields of latex are declining steadily. The government has conducted a small holder replanting programme for new varieties of para-rubber tree since 1961. The replanting rate has been increasing every year. Replanting at about 6,000 hectares per annum would produce about 300,000 tons of discarded rubberwood. Hence, it is a cheap and abundant material in Thailand which, therefore, challenges our attention as a potential pulp wood. TISTR and RFD have carried out several studies of para-rubberwood pulping but are still facing the problem of deterioration because of mold during storage which lessen the pulp quality.

Pine, about 6,000,000 m³ in reserve is mostly located in the North. But no exploitation of pine for pulp and lumber has been started. A newsprint project for 200 tons per day of mechanical pulp based on pinewood has been awarded a promotional certificate by the Board of Investments about 5 years ago, but the mill has not been established yet. Use of very old pinewood (50-80 years old) for newsprint requires experimentation with respect to pitch problem and colour of the pulp requiring bleaching.

The plant "paw-sah" (*Proussontia papyritera* ven.) is naturally grown under the climatic conditions of Thailand and it has a very rapid growth. Annually, "paw-sah" can produce branches that mature enough for paper production. For more than 30 years, the production of "paw-sah" handmade paper in the North of Thailand is done by using the native process. "Paw-sah" paper is used widely to make umbrella, tracing paper, and gift-wrapping paper. Technically, the primitive method used until now for "paw-sah" paper can be modified. Thailand can build domestic industries that can produce a high quality of "paw-sah" handmade paper.

Giant ipil-ipil is a new plant being introduced to Thailand because of its special characteristics — fast growing, long trunk and promising for paper and dissolving pulp.

PHOENIX PULP AND PAPER COMPANY

The success of TISTR lies in making pulp from kenaf, even though it has to work without a suitable laboratory and proper equipment of its own. TISTR should recommend to the government that research in this field should be continued as a national program. TISTR has also urged the government to coordinate efforts to produce pulp domestically for the nation's growing needs and pointed out that Thailand, as an agricultural country, has abundant sources of raw materials, particularly the annual plants. As for kenaf itself, TISTR describes its two main problems: the great fluctuation of export prices reflected in the world fibre markets and the lack of control of fibre quality because of the primitive rural setting practice. With the development of pulp and paper from kenaf, Thai farmers will no longer depend solely on the export market. More kenaf can be grown for their stalks and harvested even during the dry season, since setting will not be necessary.

Thus, on September 25, 1974, the Board of Investments, with the recommendation from TISTR, approved the 70,000 MT per annum Kenaf Pulp Mill Project submitted by Phoenix Pulp and Paper Company, Ltd. The mill will be located at Rhonkaen province in the Northeast of Thailand. The mill would use kenaf whole stalks as its entire raw material. Since kenaf is rather new raw material for making paper, Phoenix, together with its technical counterpart, the Ballarpur Paper and Strawboard Company of India, conducted a series of mill tests using kenaf grown in India. Results obtained from these experiments were quite encouraging. Full mill-scale operational tests were made twice, one in May 1974 and the other in April 1975. These tests were also quite successful. Acceptable paper was produced using 100 per cent kenaf. It also blends with up to 25 percent of softwood and bamboo pulp.

From laboratory tests, there did not appear to be any variation between kenaf grown in India and those grown in Thailand from a pulping standpoint. Nevertheless, 50 MT of Thai kenaf grown in the Northeast of Thailand were shipped to India early in 1975, and in August 1975, mill scale operational tests were carried out at Ballarpur using the said 50 MT. Full mill-scale operations by Ballarpur have proven that Thai kenaf is a very satisfactory raw material for pulp paper. As it is a lightweight, bulky material, special consideration has to be given to handling and storage, but these aspects would not present any greater problems than those normally encountered with handling rice straw and bagasse for pulping processes. Several tests have been conducted to overcome such a problem and it may be concluded that Thai kenaf is a satisfactory raw material for producing paper pulp, and sufficient quantities will be available in the Northeast at acceptable cost to supply the requirements of Phoenix Pulp Mill. At present, soil testing, clearing and grading are ready for mill constructions. Building for chemical preparation, processing and power plant are on-going as well as installation of machines. The first mill test run is expected in November 1981.

CONCLUSION

The domestic supply of paper from the existing mills in Thailand will not be able to catch up with the increasing demand for all categories of paper in the future. Without the materialization of all the new mills, the import of paper will continue to play an important role as a supplement to the local supply of paper to meet the increasing domestic demand. There is, therefore, a great need to stimulate establishment of the new mills, otherwise, the consumption of paper will continue to be a source of considerable drain on the country's foreign exchange. Since the shortage appears to be in industrial paper and newsprint, most of the new projects, therefore, have been aimed to the production

of these two categories of paper. But the shortage of newsprint, tissue paper, writing and printing paper will remain implying that production of these papers should be expanded. As for domestic pulp manufacture, there is no large-scale pulp production in the country at this moment. Even if the three large pulp projects (kenaf, bamboo, and pine) are realized, the domestic supply of pulp will still be far below its requirements. Thus, great emphasis should be placed upon the pulp production in the country to make the Thai paper industry less dependent on the import.

