

INDONESIA EMERGING as PULP and PAPER



PRODUCTION GIANT



BY DONALD G. MEADOWS

The study group flew to Sumatra to visit Indah Kiat's Perawang mill and forestry operations.

Sinar Mas Group hosts TAPPI's Asian Study Tour at mills in Sumatra and Java.



Perawang is developing acacia plantations for pulp production and using "scrap" wood from tropical forest in the interim.

Indonesia is a conglomeration of more than 13,000 islands that straddles the equator a distance of roughly 3200 miles (about 5000 km). With a population of 195 million people, it ranks as the fourth most populous country in the world. In area, it rivals Mexico. Among pulp and paper producing countries, it has become an overachiever, adding capacity at a breathtaking pace over the last few years.

In 1988, paper production capacity in Indonesia topped 1 million tons a year, more than twice what it had been in 1983. But by 1993, capacity had more than tripled, to 3.6 million tons/year. Installed pulping capacity for 1993 was between 1.7–1.9 million tons/year. Recent and announced projects could add 1.2 million tons of paper production capacity and nearly 4 million tons of pulping capacity by the end of 1997.

A question raised during the Asian visits was how so much expansion is being financed. A concern, of course, is that overcapacity and heavy debts may leave some companies financially vulnerable. One response was that investments are made openly and that there is a free flow of cash. Teguh Ganda Wijaya, president director of the Sinar Mas Group, asserted that the companies don't get any special treatment from the government. In fact, high domestic interest rates encourage companies to seek financing off-shore. Bond efforts in the United States have been quite successful in raising capital for Sinar Mas' expansion efforts, Wijaya noted. Japan has also provided financial backing.

The Sinar Mas Group, a private holding company, is the largest pulp and paper producer in Indonesia. It also operates plantations and vegetable-oil refineries, provides financial services, and deals in real estate. Related operations include chemicals, hotels, telecommunications, food and consumer products, and other investments. Last year, the pulp and paper operating group reported an annual pulp production capacity of slightly greater than 1.25 million tons. Capacity for printing and writing paper (coated and uncoated) was 738,000 tons, with lesser capacities reported for other grades and products.

P.T. Indah Kiat

Within the Sinar Mas Group, one of the largest pulp and paper producers in Indonesia and Southeast Asia has been P.T. Indah Kiat of the Sinar Mas Group. In Indonesia, "P.T." signifies a for-profit company and "Indah Kiat" means "beautiful strategy." The company was formed in 1976 as a joint venture between Chung Hwa Pulp and Yuen Foong Yu Paper of Taiwan and P.T. Berkat Indah Agung of Indonesia. The Taiwanese companies provided technological expertise and the Indonesian company provided access to mixed tropical hardwoods for pulp.

In 1979, the company's Tangerang mill began producing 100 tons/day of paper on two machines. The mill added a third paper machine in 1982 to increase production by 50 tons/day.



Ron Estridge (left) and Bob Kinstrey (right) tour Perawang's nursery; hungry fish feed in Perawang's treated effluent; acacia trees.

In 1984, the Perawang mill began producing bleached hardwood kraft pulp with one machine. Initial capacity was 250 tons/day. Various production increases have followed.

Sinar Mas Group became majority owner of Indah Kiat (67%) in January 1986. The company sold 13% of its shares in its initial public stock offering in 1990. Late the next year, Indah Kiat acquired P.T. Sinar Dunia Makmur and its 900 tons/day industrial paper mill in Serang.

During meetings in Indonesia, TAPPI's study group held discussions with Wijaya, as well as with Kahar Haryopuspito, executive director of the Indonesian Pulp & Paper Association; Yudi Setiawan Lin, president director of P.T. Pabrik Kertas Tjiwi Kimia; Rudi Wirianta, president director of P.T. Pindo Deli Pulp and Paper Mills; Ali Alimsyah, director of Pindo Deli; Su Meng Huei, vice president director of P.T. Indah Kiat Pulp & Paper Corp.; and other representatives of the Indonesian pulp and paper industry. The group also had a chance to visit two of P.T. Indah Kiat's mills: Perawang and Serang. Christian Sauzedde, president of Black Clawson's International Business Development Group, joined TAPPI's study group for its tour of Indonesia.

Perawang

Near the center of Sumatra, nearly even with Singapore, lies the city of Pekanbaru. A small international airport brings regular jet service and a supply of foreign technicians—many

from India—to the capital of Indonesia's oil-rich Riau Province. The best hotel in town provides the basic amenities: a firm bed, bottled water, a bowl of fruit, a shower, a candle in the bathroom in case the power goes out (which it does), an arrow painted on the ceiling pointing to Mecca, and a buffet breakfast. As evening approaches, loudspeakers from a nearby mosque call the faithful to prayers. The call is again loudly broadcast at 4:30 a.m.

A few hours after the wake-up call, members of TAPPI's Asian Study Tour were climbing aboard a bus on December 7 for the two-hour ride from Pekanbaru to Indah Kiat's Perawang mill. The journey quickly progressed from two-lane paved road to graded dirt roads that become increasingly treacherous. Likewise, the relative prosperity of the city gave way to clusters of shacks and then isolated dwellings.

Young children, dressed in government-provided uniforms, were gathering in schoolyards as the fire drained from the morning light. The first stop for the study tour this day was a three-story observation tower fashioned from rough timber. Looking out over the tops of acacia trees, tour members could see plantations in various stages of development.

Further down the road, company workers were preparing acacia leaves for propagation. Women—some with covered heads, some with faces daubed in white (presumably as protection against the sun)—sorted through bundles of leaves and trimmed individual stems for potting. The cuttings were dipped in fertilizer and inserted into banks of growing tubes. After the



Views inside Indah Kiat's mill at Perawang.

shoots and roots elongate, the “plantlings” are acclimatized, planted, and then replanted in a plantation in a process that can take roughly 10 months. It takes about eight years for the trees to mature.

Out of 200 varieties of acacia, the mill's research center has evaluated about 40 since 1990 to determine which are best suited to the area for pulp production. So far, the preferred cuttings are from *Acacia mangium*, *A. hybrid*, and *A. plustree*. Trees are selected for high pulp yield and density. Some experiments with hybrids are also being conducted. Except for a few species, eucalypti do not grow well in the region, mill researchers report.

Perawang has been using mixed tropical hardwoods for pulping while its plantations are being developed. About 80% of the wood used at Perawang last year was mixed tropical “waste” wood. Of about 300,000 hectares allotted to the mill for harvesting, about 70,000 ha have been planted as plantation.

Forestry practices

Several countries in Southeast Asia have been criticized for timber-cutting practices that far exceed estimates of sustainable yield. What appears to be the practice at new pulp mills in Indonesia is to salvage mixed tropical hardwoods from logging areas near the mill and replant with acacia. The benefit is that after a fixed number of years, the mill can then limit itself to

the area cleared for the plantation. The drawback is that the natural diversity is lost from that area.

Indonesia has about 144 million ha of forest, according to Haryopuspito. Business leaders are confident they can help supply part of the world's increasing demand for wood products.

“The idea is to increase production here, but we have to be environmentally friendly,” Haryopuspito said. “We are interested in managing the forests as best we can.”

The pulp industry may actually help preserve the nation's forests, Haryopuspito believes. That's because the mills will plant trees, harvest the trees, and then replant the same area. That's in contrast with subsistence farming practices of cutting the trees and burning them to clear the land, and then leaving it barren to move on to another plot when the soil is exhausted. Some of those farmers may also find new work opportunities because of the mills.

There are obvious benefits to the 8000 people employed at Perawang. In contrast with the shacks that hug the roadside on the way to the complex, company housing is neat, ordered, and comparatively modern. About 800 housing units are available to employees and their families, plus 5000 beds for single workers. A good paycheck, food and medical services, even a small zoo, are among other inducements.

The Perawang mill itself is an immense complex that covers about 1200 ha. It houses three bleached hardwood kraft pulp



Finished rolls, effluent treatment and employee housing at Perawang.

lines (PM 1, PM 2, PM 8) with a combined capacity of 790,000 tons/year. The mill's two fine paper machines have an installed capacity of 254,000 tons/year. Cut-size sheeters can convert 108,000 tons/year of paper into sheets of photocopy paper. Docking facilities on the Siak River, 1.5 km from the mill, can accommodate ocean-going container ships bringing in supplies from the Straits of Malacca or transporting finished goods back out.

Kværner Pulping (combining Kamyr and Götaverken Energy) was a major supplier for Pulp Mill 8 (PM 8), a hardwood fiber line started at Perawang in February of 1994. The line was designed to process 410,000 a.d. metric tons/year of fully bleached pulp. The line is identical to another that Sinar Mas ordered for its P.T. Wirakarya Sakti Tebin Tinggi greenfield mill in Jambi Province, Sumatra. Pulp produced using the new systems has a reported brightness in excess of 90% ISO. Kværner also supplied evaporation and recovery boiler systems to the two mills.

The continuous IsoThermal Cooking (ITC™) system plus oxygen delignification allows for elemental chlorine free (ECF) bleaching. Perawang has been using a D-C-EO-D1-D2 bleaching sequence. The ECF sequence will be D-EOP-D1-D2.

"Additional systems include an atmospheric diffuser washer in the blow line, screening followed by a filter washer, oxygen delignification with post washing in an atmospheric diffuser washer, and a wash press followed by four-stage diffuser bleach-

ing with a pressurized EOP stage," Kværner reports. Each recovery boiler system is rated at 2800 tons of dry solids per day and can produce 480 tons of high-pressure steam per hour.

Woodyard equipment was supplied by Kone, the forming section is an Andritz Sprout-Bauer design, and the dryer section is by ABB Fläkt.

Contracts for a fourth pulping line were negotiated last fall.

Serang

In contrast with the Perawang mill, Indah Kiat's Serang mill is situated 64 km west of Jakarta in a new industrial park, just off a modern highway. Construction on the greenfield mill was begun in June 1990, and PM 1 was started in July 1992. Commercial production of kraft liner and corrugating medium began there in the fall of 1992. The complex includes a corrugated carton production area.

The mill's PM 1, a Valmet machine with a wire width of nearly 7.1 m, can produce 280,000 tons of kraft liner and medium per year from recovered paper. The converting plant is said to be the largest in the world under one roof. Including warehouse areas, it spans 15 ha. The plant houses five corrugating machines, each trimming at 2.2 m. The plant also has 20 flexo printers and 20 folder gluers.

Three new paper machines are being built at the mill. PM 2, a Beloit gap former, will trim at 6.6 m, the same as PM 1. It has



On Java, west of Jakarta, TAPPI representatives toured Indah Kiat's Serang mill.

a design capacity of 250,000 tons/year and is expected to start production the end of this year. PM 3, a Voith-Sulzer multiformer, will produce coated duplex board, beginning the end of 1996. It will have four headboxes and three coating heads. This and the fourth machine, also from Voith-Sulzer, are designed to produce 200,000 tons/year each and will trim at 4.2 m. PM 4 will be equipped with four coating heads. It's expected to begin producing high-grade coated paperboard in April 1996.

The mill consumes 24,000 tons of recovered paper a month (about 45,000 tons is stored on-site). Of that, 70% comes from the United States, 20% from Europe, and 10% from local collection. Admittedly, mill managers are concerned about securing future sources of paper to recycle. The mill deals with more than 20 suppliers in the United States and is working to collect more furnish locally.

A showpiece of the Serang mill is its wastewater treatment facilities. The grounds near the clarifiers are decorated with hedges and shrubbery. Golden carp swim in the treated effluent in a demonstration pond. Water discharged by the mill is, in fact, cleaner than required by government regulations. Total suspended solids for the discharge is 80 ppm, BOD is 80, and COD is 150. The mill has also been experimenting in the use of sludge as fertilizer.

Further expansion

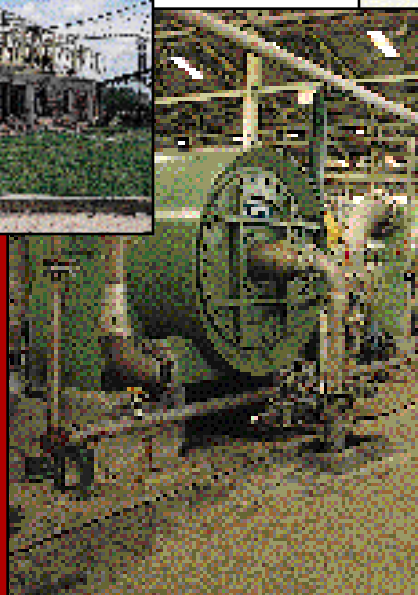
Another Sinar Mas company, P.T. Pabrik Kertas Tjiwi Kimia, is one of Indonesia's largest producers of printing and writing

paper. Its mill near Surabaya began production in 1978. It can produce 394,000 tons of paper annually on its nine paper machines and can convert 125,500 tons/year on-site. About 25,000 metric tons of pulp are also produced at the mill annually from recycled paper. In addition to high-quality printing and writing papers, the facility produces one- and two-side coated art papers and board and high gloss cast-coated papers and board. Converted products include photocopy paper, carbonless paper, writing pads, looseleaf refills, spiral notebooks, and computer stock form. The mill has announced plans to increase its annual paper production capacity by 215,000 tons.

In 1992, P.T. Pindo Deli Pulp and Paper Mills also became a Sinar Mas company. Pindo Deli itself was founded in 1976. Its mill is located 72 km from Jakarta. The seven paper machines at the mill—two of which were added in 1990—have a 180,000 tons/year capacity. Among recent additions to the mill have been one off-line and one on-line Jagenberg blade-to-blade four-blade coaters equipped with ABB computerized control systems. Pindo Deli produces high-quality coated and uncoated printing paper, industrial papers, specialty papers and board, and tissue.

Other mills

Other companies are also contributing to the rapid expansion of pulp and paper capacity in Indonesia. P.T. Kiani Kertas, for example, is beginning construction of a 472,000 metric tons/year pulp mill this summer. The fully bleached hardwood kraft



Further expansion at the Serang mill will challenge the mill to collect and process more recycled fiber.

mill will be located in the province of Kalimantan Timur in northeastern Borneo. An April 1997 startup is expected. The mill will reportedly use mixed tropical hardwoods for the first five years of operation, then rely on plantation-grown acacia. IMPCO (Ingersoll-Rand) and Beloit will be among the major suppliers involved in the project. Beloit announced that the fiber line will be based on its RDH Stage III cooking technology. The process will include two-stage knotting, four-stage fine screening, oxygen delignification, and washing preceding high-density storage. From storage, the pulp will be washed in advance of four-stage bleaching.

P.T. Riau Anadalan, in Sumatra's Riau Province, is the largest and newest of Indonesia's pulp mills. The mill is designed to produce 750,000 a.d. tons/year of fully bleached market pulp. It began production late last year. Sunds Defibrator supplied the fiber line, from woodyard to secondary screening

of bleached pulp. In the woodyard, conveyors carry logs to two drum debarkers. GentleSlice chippers and a RecAll chip reclaiming system help minimize wood loss. The fiber line includes SuperBatch™ extended cooking and oxygen delignification. The mill was confident it could reach kappa no. 15 with the system. A D-EO-D-D bleaching sequence would yield an ISO brightness of 89%. The mill was designed to accommodate a possible conversion from elemental chlorine free (ECF) to totally chlorine free (TCF) at some point in the future. Voith supplied the pulp machines and ABB Fläkt built the dryers. Ahlstrom supplied the main components for white liquor and effluent treatment and all of the mill's pumps. The recovery boiler is from Tampella. ■

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