ANNEX 4

to

REPORT ON PROJECT PD 107/90 (i)

Strategies for Sustainable Wood Industries in Sarawak

WOOD PROCESSING INDUSTRIES

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STRATEGIES FOR SUSTAINABLE WOOD INDUSTRIES
IN SARAWAK

ITTO PROJECT PD 107/90 (I)

WOOD PROCESSING INDUSTRIES

by
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Sarawak Timber Industries Development Corporation
International Tropical Timber Organisation

April 1994

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

The Consultant wishes to thank many members of the Forest Department and STIDC, at Headquarters and in the Regions, for their valuable assistance, and in particular Len Talif Salleh, Pengurus Kanan (Industri) of STIDC for authorising staff to assist the consultant and for making industrial records available, and Hashim Hj Bojet, Pegawai Eksekutif (Perancangan Makro) of STIDC for his valuable advice and assistance, and for making all necessary arrangements for visits to industries.

Thanks are due also to the many managers and technicians in industries who gave great assistance to the consultant.

Special thanks are due to M.S.Chiang for her patience and all the trouble she took over the presentation of this report, and in assisting the consultant with his computer work.

1 INTRODUCTION

This report summarizes the findings of a wood industry consultancy under this project. Terms of Reference are given in Appendix I. The consultant worked in close liaison with the Forest Department, the Sarawak Timber Industry Development Corporation, and in consultation with the Sarawak Timber Association.

In order to assess the current status of the industry and prospects for the future, visits were made to 17 plymills, 9 veneermills, 58 sawmills and sundry secondary wood industries, in all regions of Sarawak, and interviews were conducted with senior personnel in most of the larger companies.

The duration of the study was 4½ months in two parts between 1st September 1993 and 30th April 1994.

2 PRESENT STATUS

2.1 Primary Industries

Log input and product volume for 1993 were as follows:-

	Input (m^3)	Output (m^3)
Sawmills	2,900,000	1,400,000
Veneer & Plymills	2,840,000	1,390,000
Total	5,700,000	2,790,000

These figures are derived from monthly returns to STIDC, and from data obtained from mills visited, and may be somewhat less than actual. Details are given in Appendix 2, 3 and 4.

In most cases, veneer and plymills worked for 22 hours per day, 6 days per week in 1993, while most sawmills only worked for one shift of 8-10 hours, 6 days per week. While veneer and plymills were producing at 80-90% of maximum capacity, most sawmills could produce at least 50% more with shiftwork. However, concessionaires found it preferable to export logs up to the level allowed and, as a result, many sawmills and some veneer and plymills were constrained by shortage of logs.

2.1.1 Veneer and Plymills

There was very little veneer and plywood production before 1989, and over half of the present capacity has been installed in the last two years, 1992-93. The number of mills and lathes, and expected log requirements for 1994 (excluding very small mills) is as follows:-

Region		Mills (Nos.)	Lathes (Nos.)	Estimated Input 1994 (m^3)
I	Kuching	4	14	385,000
II	Rejang	12	40	1,701,000
III	Bintulu	7	23	933,000
IV & V	Baram, Limbang and Lawas)	4	14	555,000
Total		27	91	3,574,000

The above input volumes are estimates only, as a number of large mills were on trial run in 1993. The estimates allowed for what they ought to achieve in 1994, if sufficient logs are available.

Most mills have a high level of technology, and some of the more recent ones are able to achieve about 60% recovery from logs of reasonable quality.

Output of veneer and plymills has increased in the last ten years by about 35 times from 40,000 m^3 in 1982 to 1,400,000 m^3 in 1993.

Most veneer and plymills have strict quality control and maintain a high standard of product, meeting the quality required for particular markets.

The labour force in veneer and plymills is to a large extent foreign (about 70 %), mainly Indonesian. About 80% are female.

Although there are a few exceptions, e.g. Forescom in Kuching and Sarawak Company in Selalong, both old established companies employing local labour only, most veneer and plymills have found it necessary to recruit mainly Indonesian labour, even when sited in remote areas e.g. Jaya Tiasa 1 at Putai on the upper Baleh, and Rimex plymill at Tatau.

2.1.2 Sawmills

The sawmill industry started over 40 years ago, although in earlier years it was mainly processing swamp forest species, in particular Ramin. The sawmills often also machined mouldings and dowels of that species. The industry is still processing swamp species, but hill forest has become the main source of log supply. To a large extent sawmills process only logs which are unsuitable for export and for local plywood manufacturing.

The number of sawmills and their expected log requirement for 1994 (excluding very small mills) are as follows:-

Region		Sawmills (Nos.)	Estimated Input 1994 (m3)
I	Kuching	37	570,000
II	Rejang	70	1,330,000
III	Bintulu	30	650,000
IV & V	Baram, Limbang & Lawas	40	500,000
Total		177	3,050,000

The above input volumes are estimates only, as many mills have not been completing returns to STIDC. The volume required may be up to 20% higher, particularly if some additional hours are worked.

Output of sawmills has increased in the last ten years by about 4 times from 340,000 m^3 in 1983 to 1,400,000 m^3 in 1993.

The labour force in sawmills is mainly local, and about 20% are non-Malaysians, mainly Indonesians, and is to a very large extent male.

There are several large sawmills, mainly owned by forest concessionaires, which saw primarily logs which are not suitable for export or for plywood manufacture. They often have a low standard of output consistent with the low quality of the logs. Of these sawmills, some are geared to a high level of output and are probably profitable due to this. Other sawmills are run as an unwelcome but necessary additional operation to utilize low-grade logs and appear to be of low profitability, having poor standards of quality and supervision and often running short of logs or building up excessive unsold stock.

There are also a number of, mainly family-owned, sawmills which usually have pony-rigs, sawing a high standard of production and quality, often from good quality bought-in logs, and which appear to be profitable.

In very few cases is kiln drying carried out, and there are a number of sawmills which have kiln drying chambers, but do not use them.

2.1.3 Sliced veneer

At present there is one slicing veneer mill, Moh Sing Hiong in

Kuching, with 2 slicing machines. It was reported that the annual input is about 4,800 m^3 and output 1900 m^3, (recovery of about 40%).

The mill is personally managed by the proprietor and has a good quality of production. It is mainly slicing Nyatoh, but also processes Meranti, Agathis, Ramin, Simpoh and Keruntum.

Logs are bought on a selection basis from a large number of concessions. About 60% of the production is exported as veneer or 8' x 4' layons, while 40% is used for decorative faced plywood for the local market.

2.2 Secondary Industries

So far there has been little development of down-stream wood industries in Sarawak.

2.2.1 Mouldings and Dowels

The oldest secondary industry is the manufacture of mouldings and dowels from Ramin. With the present limited production of Ramin logs, output of this industry has been declining since the 1960s/early 1970s, but has remained fairly static through the 1980s at 40-50,000 m^3 per annum. 1993 output, reported on monthly returns to STIDC, was 34,284 m^3. The total output was probably 35000 - 40000 m^3, including estimates for mills which did not complete returns.

2.2.2 Laminated Truck Beds

Production of heavy-duty laminated truck beds started in the 1970s, using mainly Sepetir. The 4-5 mills have maintained an output of

about 24,000 m^3 per annum for many years. A new production line for this product is being installed at Rimbunan Hijau in Tg Manis.

2.2.3 Wood Chips

One producer of wood chips, Sarawak Wood-chip Co., downstream from Tanjung Manis, started in 1969 using mangrove species and has maintained production for export since. At one time swamp forest species were chipped also, but since late 1992 sawmill waste only is used. Output is now about 2500 metric tonnes (m.t.) per month, and machinery has been bought (licence to import machinery is on request) to increase output by 4700 m.t. to a total of 7200 m.t. per month.

2.2.4 Blockboard

A few of the plymills have a small production of blockboard, using sawn wood from the peeler cores for the blockboard core. A more substantial plant is now being built at Shin Yang Laminates in Kuala Baram, which will have an installed capacity of 2600 m^3 per month output (on 2 shifts - 19 hours per day) to produce mainly 4' x 8' x 18 mm blockboard. With the added advantage of utilization of waste material, and with a cost and price of about 1/3rd of plywood of the same thickness, this should be a profitable development. The mill is a joint venture with a Taiwan company experienced with this product.

In addition, Rejang Plywood, near Sibu, is now installing 7 blockboard lines, Sarawak Co. at Selalong near Sarikei, has an output of 500 m^3 of blockboard per month, and Rimex Industries in Tatau has just started one blockboard line and are planning further lines.

2.2.5 Laminated Parquet Flooring

Samling Corporation is now erecting a factory at Kuala Baram for laminated parquet flooring, which is a development from blockboard. The product will be produced in Tongued & Grooved portions of 0.19 x 2.20 metres x 14.3 mm, with a parquet mozaic of 4 mm depth of Hevea (rubberwood) or other suitable flooring species, and the expected output from one line is 600 m^3 per month. The machinery and process is Italian, but the venture is wholly-owned by the Samling Corporation

2.2.6 Prefabricated houses

Woodhouse Sdn Bhd, owned by Usama Industries, makes timber house components and installs houses on site, together with furniture. The firm has supplied customers within Sarawak and in Peninsular Malaysia, especially to tourist resorts, and claims to have exported to China, Europe and elsewhere. They have a range of exhibition houses from which choice can be made. This appears to be a substantial and profitable business.

2.2.7 Planed Timber

The export of planed timber (S4S and S2S) is not common, but one sawmill visited in Tatau, Daiya Malaysia, was found to be planing 70% of their output for the Japanese pallet market. This company is 51% Japanese owned, 49% Sarawakian, and has an input capacity of 1500 m^3 per month, although their quota from Harwood Timber Sdn Bhd [1/] is only 800 m^3 per month. They process low grade logs only, of mixed hill forest species. Management is good. Sawn timber is air-dried for 3 weeks before planing, and output is of high quality for pallets.

1/ Subsidiary company of STIDC, responsible for log distribution to industry.

2.2.8 Window and Door Frames

There are a large number of small mills supplying the local market with window and door frames, but no well-developed export trade. However, a large operation for exports is being considered by the Samling Corporation.

2.2.9 Doors

There are a number of small units manufacturing solid doors for the local market and export, and some small production units for flush doors. Eurodoor (Malaysia), at Sejingkat Industrial Park in Kuching, is making about 1000 doors per month of high quality patented design flush doors for export. This process uses the minimum of timber, and the company management informed us that they import some sawn timber and plywood as they have found that the quality offered locally was not acceptable.

2.2.10 Furniture and furniture components

Furniture manufacturing is poorly developed, with only a small number of companies producing high quality products. Of these, only one medium sized company, Yin Ming Wood Industries, near Kuching, is geared to mass production of furniture components for export. This company uses about 300 m^3 of timber per month, and exports about 12 containers monthly, with a total value of about RM 1 million, mainly components for garden furniture, although they have also started to make module furniture for indoor use. Quality control is good, and the company has plans to expand as orders exceed production by a large amount. The company might be interested in a joint venture with an overseas company to facilitate expansion. Other furniture manufacturers visited had little interest in entering the export

market as they were of the opinion that the local market was satisfactory. Ding Bros in Sibu said that they had given up their attempt to supply components for export because of too many constraints. Samling Corporation reported that it has furniture component manufacture under consideration, and Rimbunan Hijau that it is planning the manufacture of furniture components, mainly as a further processing of particle board but with some solid timber.

2.2.11 Particle Board and MDF

Although there is no production yet of any form of particle or fibreboard in Sarawak, there is considerable interest for future ventures in this field. Rimbunan Hijau reported that it now has approval for a Particle Board factory at Subur Tiasa at Sibu with an output of over 10,000 m^3 per month and an investment of over RM100 million. Site preparation has started.

An MDF plant has been approved for Bintulu with 70% Japanese investment (50% Daiken and 20% Itochu), 15% STIDC, 10% Rimbunan Hijau and 5% Limbang Trading. Investment will be more than RM100 million, and output about 10,000 m^3 per month.

In both the above cases, the raw material will be sawmill waste.

Rimex Industries (subsidiary of Shin Yang) is also studying prospects for an MDF mill in Bintulu.

2.2.12 Parquet flooring

Several mills are using sawmill waste to produce blocks for parquet flooring, mainly for the local market. This form of flooring has been replaced in most countries by quick-laying forms of flooring, but it still has a market in Sarawak and in the region. It is unlikely that there is room for much increase in this production, as it is likely to be superseded by other more convenient types of flooring.

2.2.13 Decorative Faced Plywood ("Fancy" Plywood)

Fancy plywood with a sliced veneer face is produced by Moh Sing Hiong in Kuching as further processing of their sliced veneer production, and is the principal local source of this product. The main face veneer is of Nyatoh.

Some plywood mills are making a superior plywood in small quantities, faced with a high quality rotary veneer of Nyatoh or Meranti.

A low to medium quality fancy plywood with a vinyl sheet or a liquid plastic face, is manufactured by Chee Sing Timber products in Kuching and three other companies in Sibu, catering for kitchen furniture and the lower end of the local market.

There does not appear to be much interest from most plymills in adding a unit for making fancy plywood, and some claimed that it is not a profitable process. Rimex however reported that they have a site at Tatau where it intends to establish such a production.

2.3 Costs

2.3.1 Investment Estimates

The current investment requirement for establishing sawmills and plymills (details in Appendix 7) are as follows: (In all cases, cost of land should be added at about 40,000 $US per acre. About 35 acres needed for a plymill).

2.3.1.1 Sawmills

(Information from Stenner, UK)

Machinery, buildings and installation costs (incl. Saw doctor's shop)

	Output: 50,000 m^3 p.a.	$US 1.4 million
or	100,000 m^3	$US 2.2 million

2.3.1.2 **Kiln Drying for Sawn Timber**
(Information from Cubbage, UK)

Machinery, buildings and installation costs (including boiler)

Output: 50,000 m^3 p.a.

	Aluminium prefabricated kilns	$US 1.9 million
or	with masonry/concrete buildings	$US 1.7 million

2.3.1.3 **Plymills**
(Information from Taihei Machinery, Japan)

Output: 50,000 m^3 p.a. (2 lines, 9 + 5 ft)

Machinery CIF	$US 13.7 million
Their estimate for cost of buildings, foundations and boiler	$US 13.7 million
	$US 27.4 million

Output : 80,000 m^3p.a. (3 lines, 9 + 9 + 5 ft)

Machinery CIF	$US 24.5 million
Their estimate for cost of buildings, foundations and boiler	$US 24.5 million
	$US 49.0 million

2.3.1.4 **Moulding Machines**
(Information from Wadkin Robinson, Singapore)

Medium speed Model XE 220 Feed speed 6-46 m/min with grinding equipment - CIF-	$US189,000
Fast speed Model 220 XJS Feed speed 10-120 m/min with grinding equipment - CIF-	$US304,000

Dust extraction and buildings not included.

2.3.2 Operating Costs

2.3.2.1 Sawmills

Information derived from F.D. and FRIM reports, as detailed in Appendix 6. From this the consultant has estimated that current costs excluding logs are approximately as follows:-

	$US per m³
Fixed Costs	19
Variable Costs (excl. logs)	59
Total	78

Sales prices at October 1993 were reported to be:-

		$US/m³ FOB
MLH	Merchantable	190-230
Meranti	Standard & Better	400
Meranti	Merchantable	340-350
Kapur/Keruing	Merchantable	240-350
Selangan Batu	Standard & Better	380
Selangan Batu	Merchantable	240-340
Bindang	S/Quarter Sawn	950-1300

Details on prices will be reported in Annex 2, Marketing.

2.3.2.2 Plymills

Information from Taihei Manufacturing and from Forescom is given in Appendix 6.

From this the consultant has estimated that current costs are approximately as follows:-

	$US per m³	
Fixed Costs		79
Variable Costs		
Logs	210	
Other	107	
		317
	$US/m3	396

Current sales prices are:

3 mm to China	about 525-550 $US/m³ FOB
Thicker plywood	350-450 $US/m³ FOB

See Annex 4, Marketing, for details on prices.

3 PROPOSALS FOR FUTURE

3.1 Log Supply

Following the review of forest resources, (Annex 1), several alternatives have been considered as prescriptions for reducing the present level of forest output from 16.5 million m³ in 1993, over 20-25 years to reach the sustainable level of about 8 million m³ per year. In paragraph 3.3, Proposals for Future of Primary Industries, Scenario 6, has been used.

As the annual forest cut is reduced by stages over the next 20-25 years, it will be necessary for an increasing proportion to be retained for local industries. As a result, log quality for plymills and sawmills will increasingly improve despite the completion of first-time cutting. This should make it possible for the sawmills to produce a higher average quality of sawn timber, justifying kiln drying and grading to obtain maximum prices. The availability of kiln dried better quality sawn timber will also facilitate the advancement of downstream wood industries using sawn timber. This however depends very much on market considerations as discussed in the next paragraph 3.2.

3.2 Market Considerations

3.2.1 Primary Products

Future prospects for sales of tropical wood products to Europe and USA remain uncertain, mainly because of consumer reaction to environmental publicity, but increasingly due also to competition from fast developing industries supplying alternative products e.g. MDF, OSB and LVL, which are normally cheaper as well as easier (and

more economical) to use and more environmentally accepted.

However, the market in Asia, together with the Middle East, is increasing steadily. As other sources of supply become unavailable e.g. Philippines and Thailand ceasing to be exporters; domestic demand increasing in countries previously exporting e.g. sawn timber in Indonesia; and previously stagnant national economies opening up and developing e.g. China; the market for plywood, rotary veneer and sawntimber from Sarawak to these regions can be viewed with confidence for the foreseeable future, and higher prices can be expected as demand increasingly exceeds supply.

3.2.2 Secondary Products

There is not enough information available on costs of manufacturing various secondary processed wood products, and on the markets for them, to draw any conclusions of the viability of manufacturing these products. A further study is needed by a specialist in the marketing of secondary forest products, in particular furniture and house building components, and with knowledge of recent developments in this field in West Malaysia and Indonesia, to establish if it is economically advisable to manufacture these products.

3.3 Primary Industries

From Appendix 4, it can be seen that the estimated log input for all primary industries in Sarawak for 1995, of 6,845,999 m^3 is about 1.1 million m^3 less than the estimated total log production (Scenario 6) on a sustainable basis after Year 2015 of about 7,920,000 m^3, (excluding plantation logs which may be mainly of pulpwood quality). If logs were to be available to operate sawmills at their full capacity, there would in that case be no surplus of logs for export. However, it should be borne in mind that the present machinery in many mills, (veneer, plywood and sawmills), will be obsolete by the Year 2015 unless it has been replaced meanwhile.

An uncertainty exists concerning what proportion of logs from the upper Belaga region, between the rivers Balui and Murum, will be transported down the Rajang, or alternatively to Tatau and Bintulu. Therefore the supply of logs for these two industrial areas must be considered in conjunction.

	Estimated Log Requirement for Primary Industries. 1995 (x 1000m³)	Forest Output Estimated from Scenario 6, (x 1000 m³) (Plantations not included) Year				
		1995	2000	2005	2010	2015
Kuching Region	935	760	275	260	640	500
Rajang & Bintulu	4,700	10,075	8,340	7,050	6,575	5,450
Baram	1,020	3,695	2,050	2,490	1,990	1,480
Limbang & Lawas	190	1,370	1,190	945	720	490
	6,845	15,900	12,855	10,745	9,925	7,920

By region, the Kuching area is already short of logs and will be extremely short of logs as indicated for the Years 2000/2005.

The development of industrial estates near the river mouths has in most respects been advantageous, and certainly should be so when the initial difficulties of electricity and water supplies and other infrastructure problems have been overcome. The main disadvantage at industrial estates has been the cost of transporting of logs from (in many cases) distant forest areas. Most industry managers with whom this were discussed, expressed the opinion that the disadvantages of running a mill in remote areas, e.g. poor communications, delays in obtaining urgent spare parts, difficulty in finding managers and technicians willing to live in isolated places, additional cost of social developments needed; outweighed the advantage of cheaper and fresher log supply. Concerning availability of labour, in the short-term it appears to be almost as difficult to raise a workforce of local people for large industries in remote regions as it is at the industrial estates near the coast. Most industries and logging companies expressed the opinion, from their experience, that local people in the remote areas cannot usually be relied on

as labour because they give priority to other community or family tasks, e.g. the planting and harvesting of rice. Although Ibans and other indigenous people are largely employed in logging, they are usually located far from their homes by their employers to cut them off from their home duties. Wages for logging work are considerably higher than for industrial workers so that the attraction of employed work in logging is greater. The present employment of about 12,500 Indonesians (about 10,000 female, 2,500 male) out of a total primary industry workforce of about 25,000, may not be acceptable in the long-term, and it seems probable that eventually with increasing population, shifting cultivation will not continue to be the sole economic base for people in the interior and a wage economy will be needed to replace subsistence farming.

Mills in more remote areas, (usually old-established ones), which have a trained local workforce, have no apparent reason not to continue operations where they are.

It is possible to establish some additional industrial capacity in other regions, but this depends on whether logs will be transported from there to the Kuching region, and also whether investors are willing to build additional mills for use during a short number of years only.

The alternatives available appear to be therefore as follows:-

- Allow industries to develop in each region except Kuching, up to the level of sustainable log production in that region. The result of this will be that eventually some mills in Kuching will fail due to lack of logs or high log costs. Only a few of the more efficient ones or those with own concessions may survive.

- Allow industries to develop up to the level of expected log supply during the next 10-15 years, while making it known what lower levels of log supply can be expected later.

- Disallow establishment of further primary industries or extensions to present industries on the premise that there is already enough industrial input capacity the expected sustainable forest output for the future.

Whatever policy is decided upon, the industry should be informed about the Government's long-term intentions with regard to future forest output.

The danger in allowing further industry to be established is that eventually industries will exert unreasonable pressure on the Government to increase forest production beyond the sustainable level, resulting in even lower forest production.

As a very large part of the primary wood industry was installed in 1989-93, and some plymills and many sawmills are much older, many forest industries will need to rehabilitate their mills and replace machinery over the next 20 years. This requirement may facilitate a restructuring of the industry to better harmonize with sustainable log production.

For the development of secondary industries using sawn timber, it will be important that quality is improved and that sawn timber is kiln dried in the future.

3.4 Secondary Industries

It is necessary for the future that value is added to the primary products to increase unit values of goods exported and to supply the increasingly sophisticated local market, and so compensate in value for the volume reduction as forest output decreases to a sustainable level.

It will also be a useful contribution to the economy if residues from sawmills and plymills, which amount to about 3 million m^3 per annum and are now mainly considered as waste or of little value, can be processed into marketable products, e.g. sawmill off-cuts for the production of chips, wood-based panels or pulp, and peeler cores resawn for blockboard (or laminated parquet flooring). As the technology develops for use of mixed hardwood species for

particle board, MDF and pulp, it is necessary to assess the viability of these processes and, if favourable, encourage their application in Sarawak, using sawmill waste and also forest waste if that becomes possible. The further processing of particle board and MDF into furniture or house building components, with resultant value-adding should be encouraged.

In almost all cases it is advisable that secondary wood industries be sited where the maximum of primary wood products or by-products can be obtained easily, that is mainly at Tg Manis, Sibu, Bintulu and Miri. Kuching, although the main domestic market, is not a good choice because of problems in the region, which may eventually cause many of the industries to be relocated. An exception is the production of chips and chip products, where eventually it may be advisable to site production near to the forest in order to utilize forest waste.

3.5 Costs

Some prices for moulding machines are given in Appendix 5.

4 PERSONNEL - MANAGERIAL AND TECHNICAL ABILITY

The high quality of management and technical ability, which is apparent in the more recently installed plymills, indicate that very high standards of production are possible in Sarawak.

For the establishment of industries new to Sarawak, in particular MDF and the manufacture of downstream products from MDF and sawn timber, the required special technical and management ability appears to be available. The consultant has no doubt that the required new technologies can be mastered without difficulty by local people, but it is advisable for most such operations to be joint ventures with experienced overseas companies, or that foreign specialists are employed to train technicians and operators and/or that arrangements for overseas technical and on-the-job training are made.

TERMS OF REFERENCE

SPECIALIST OF WOOD BASED INDUSTRY ACTIVITIES

Qualification:	University degree in forestry or engineering and a minimum of seven years experience of timber processing in the tropics.
Timing:	Duration, three months, starting October 1993 *(extended to 4 ½ months)*
Duty station:	Kuching, with travel to various locations in Sarawak

The Consultant will work together with other international staff of the Project and with staff of the Forest Department and Sarawak Timber Industry Development Corporation in a cooperative effort to design a forest sector development plan for Sarawak. The Consultant will specifically:-

1 Assist in collection, compiling and analysing data of the forest based industries in Sarawak.

2 Make estimates of production costs in the forest industries of the State, including logging, processing, marketing, sales and product delivery.

3 Guide and assist in the assessment of the economic and financial viability of individual forest industry units.

4 Make proposals for expansion and improvement of viable and potentially viable forest industry units, and for the establishment of new units, including estimates of investment requirements.

5 Assess the technical and managerial skill of the personnel of the forest based industries of Sarawak and propose measures for improvement.

6 Carry out any other tasks as directed by the Project Coordinator and relevant for the implementation of the Project.

7 Compile a report covering points 2 - 5 above.

PROJECT PD 107/90 (I) STRATEGIES FOR WOOD INDUSTRIES IN SARAWAK.

PLYMILLS AND VENEERMILLS.

PLYWOOD MILLS

Name of mill	Location	Input 1993 (M3)	Output Plywood 1993 (m3)	Output Veneer 1993 (m3)	Recovery 1993 (%)	Comments	Number of lines Lathes	Hot Press	Labour. Total	Non-Mal..	Hrs per day.
Region I, Kuching (4 mills)											
Forescom	Bintawa I.E.	84,242	41,844		50		4	2	630	2	22
KTS Timber Ind	Bintawa I.E.	117,719	58,760		50		3	3	800	300	16
Kuching Plywood	Pending	63,079	24,905		39		3	3	500	200	22
Lin Shan Hao	Sejingkat I.F	12,000	6,000		50	On trial run.	4	4	240	220	8
Region II, Rajang (8 mills)											
RH Plywood	Sibu	173,727	79,533		46		4	4	750	380	22
Subur Tiasa	Sibu	315,433	143,201		45		7	4	1100	980	22
Hwa Sen Ven & Ply Ind	Sibu	44,347	6,044	11,271	39	First year.	5	3	500	400	21
Sarawak Co	Selalang	179,647	56,799	31,805	49		4	3	800	0	22
Rindaya	Durin	165,871	72,614		44		4	3	700	560	22
Jaya Tiasa 2	Sibu	217,869	138,991		64		4	3	900	800	
Rajang Plywood	Sibu	160,728	15,172	57,626	45		3	3	550	400	22
Sung Chang	Rajang	61946	25849		42	First year.					
Region III, Bintulu (5 mills)											
Samling Plywood (Btu)	Kemena I.E.	228,506	116,947		51		4	3	800	560	22
Manuply Ply Ind	Kemena I.E.	215,965	33,458	63,993	45	2nd year.	4	3	1400	1200	22
Brightwood	Kemena Ind	100,763	41,158	10,246	51	2nd year.	3	2	510	200	23
Forestate	Bintulu	7,988	3,802		48		3	1	135	100	20
Rimex	Tatau	27,927	25,785		92	On Trial run.	3	3	1000	850	22
Region IV, Baram (3 mills)											
Samling Ply (Baramas)	K. Baram I.E	166,277	91,718		55		4	4	730	615	8
Samling Ply (Miri)	K.Baram I.E.	24,838	15,236		61	On trial run.	3	2	430	260	21
Shin Yang Plywood	K.Baram I.E.	23,944	10,731		45		5	3	700	200	22
Region V, Limbang & Lawas											
NIL											
SUB-TOTAL (20 mills)		2,392,816	1,008,537	174,941	49		74 +	56 +	13175	8227	

VENEER MILLS

Region 1, Kuching											
NIL											
Region 11, Rajang (3 mills)											
Jafuong Ply Corp	Sibu	114,445		51,938	45		3	0	490	460	22
Jaya Tiasa 1.	Ulu Rajang	76,156		56,132	74	On trial run	3	0	500	480	22
Tetling		3,562		1,246	35						
Region 111, Bintulu (5 mills)											
Cairnfield	Kemena I.E.	127,334		35,320	28		3	0	430	410	22
Win Miracle Corp	Sebauh	57,753		29,654	51		3	0	300	100	22
3 small mills		6,700		4,749	71	Doubtful %					
Region IV, Baram (2 mills)											
San Hak	Miri	21,639		10,265	47						
1 small mill		3,567		1,848	52						
Region V, Limbang & Lawas (1 mill)											
Limbang Trading	Limbang	38,551		19,558	51		2	0	120	0	16
TOTAL Veneer (11 mills)		449,707		210,710	47		14 +	0	1840	1450	
TOTAL, PLYWOOD AND VENEER Mills, 1993. (31 mills)		2,842,523	1,008,537	385,651	49				15015	9677	

Ref: PLYVEN

VENEER AND PLYMILLS.

Name of mill	Log prices ($M/m3) at October, 1993. MLH S.Q.	Meranti Floater	Meranti Sinker	Kapur/Ker	Sel Batu	Sales price ($US/m3 FOB) at Oct., 1993. Japan	M.East	China	HK/Sing
PLYMILLS.									
Region I, Kuching (4 mills)									
Forescom	340	670	450	480					
KTS Timber Ind	310		420		380		345		
Kuching Plywood	280								
Lin Shan Hao		560							
Region II, Rajang (6 mills)									
RH Plywood									
Subur Tiasa									
Hwa Sen Ven & Ply Ind									
Sarawak Co									
Rindaya		675	460						
Jaya Tiasa 2									
Rajang Plywood									
Sung Chang									
Region III, Bintulu (5 mills)									
Samling Plywood (Btu)								550	
Manuply Ply Ind	290		450						
Brightwood	275	440		440		410	410		390
Forestate	280	500		450					
Rimex								570	
Region IV, Baram (3 mills)									
Samling Ply (Baramas)	190		320	320					
Samling Ply (Miri)									
Shin Yang Plywood									
Region V, Limbang & Lawas									
NIL									
SUB–TOTAL (20 mills)									
VENEER MILLS									
Region 1, Kuching									
NIL									
Region 11, Rajang (3 mills)									
Jafuong Ply Corp									
Jaya Tiasa 1.									
Tatling									
Region 111, Bintulu (5 mills)									
Cairnfield								400	
Win Miracle Corp									
3 small mills									
Region IV, Baram (2 mills)									
San Hak									
1 small mill									
Region V, Limbang & Lawas (1 mill)									
Limbang Trading			275			420			
TOTAL Veneer (11 mills)									
TOTAL, PLYWOOD AND VENEERMILLS, 1993. (31 mills)									

COMPANY	Owners	Future plans
PLYMILLS.		
Region 1, Kuching.		
Forescom	30:70 STIDC:Bumi	Plan to add 1 drier, 1 HP etc
KTS Timb Ind	KTS (Sarawakian)	? decor ply, solid doors, furn comp.
Kuching Plywood	WTK (Sarawakian)	–
Lin Shan Hao	20:75:5 STIDC:Taiwan:Sarawakian	12 more lines
Region II, Rajang.		
Rib Hijau Plywood	Ribunan Hijau	Blockboard, Turbine for elec.
Subur Tiasa Plywd.	Ribunan Hijau	Particle board with profiling to furn comp. ? sliced veneer
Hua Sen Ven & Ply Ind	Hua Seng Group	–
Sarawak Co.	55:45 Sarawak:Foreign	? turbine for elec.
Rindaya	?	?
Jaya Tiasa 2	Ribunan Hijau	–
Rajang Plywood	50:25:25 Taiwan:Singapore:Malaysian	7 blockbd lines ready to instal. Plan more ply lines/dec ply
Sung Chang	45:55 Korean: Sarawakian	
Region III, Bintulu.		
Samling Ply (Btu)	60:40 Samling:? Korean	
Manuply Ply Ind	33:33:33 Sing:Ind:Taiwan	? blockboard
Brightwood	55:15:30 Jap:Hong Kong:KTS	
Forestate	Taiwanese	Applying move to Kemena IE, Blockbd, KD. Altern new lathe.
Rimex	Sarawakian	Blockboard ordered. Adjoining site intended for dec ply.
Region IV, Baram.		
Samling Ply (Baramas)	60:40 Samling:Korean	Parquet flooring (ply) site started. Looking at all possibilities
Samling Ply (Miri)	60:40 Samling:Japanese	" "
Shin Yang Ply	40:60 Taiwan:Sarawakian	Blockbd mill being constructed
VENEERMILLS.		
Region II, Rajang.		
Jafuong Ply Corp	Majority Taiwanese	? Plywood prodn in 1995, 2 lines.
Jaya Tiasa 1	Ribunan Hijau	Preparing site for a sawmill. ? blockboard.
Region III, Bintulu.		
Cairnfield	Majority Taiwanese, some Sarawakian	? blockboard, ? furn comp in future
Win Miracle	49:51 Taiwanese:Sarawakian	? plywood in future
Region V, Limbang & Lawas.		
Limbang Trading	5:95 STIDC:Sarawakian	Planning further lathe (9 ft)

VENEER AND PLYMILLS
ADDITIONAL MILLS OR LINES PLANNED.

Mill	Location	Input (M3 pa)	Plywood Output (M3 pa)	Veneer Output (M3 pa)	Number of lines Lathes	Hot presses	Comments	Probability
Already in progress (1 mill):								
Chuah Seah Joo	Tg Manis	96,000	48,000		2	2	Site preparation & construction has started.	Started construction
Under consideration (13 mills):								
Samling (Lawas)	K.Baram	240,000	120,000				Licence applied for.	Probable
Lin Shan Hao	Kuching	432,000	216,000		12	12	Plan to add 12 additional lines if sufficient logs available.	Unlikely
Forescom	Kuching	96,000	48,000		0	1	Board to be asked for approval for 1 drier + 1 H.Press etc to remove present constraints.	Probable
Rindaya	Durin	192,000	96,000		4	4	Had originally planned for 12 lines, but only installed 4. Are still considering putting in the additional lines.	Probable
CTC	Sarikei	192,000	96,000		3	3	Have considered setting up a plymill, and will again if log export is banned.	Unlikely
ETM (USAMA)	Tg. Manis						Building started, but purpose uncertain.	Uncertain use.
Ribunan Hijau	Tg Manis	240,000	120,000		4	4	Told me that site adjoining their sawmills at Tg Manis is for a proposed additional plymill.	Probable
Rajang Plywood	Sibu	144,000	72,000		2	2	May increase number of lines if log supply improves.	Uncertain
GT Plywood	Kemena						Behind Brightwood Applied for licence.	Uncertain
Rimex	Kemena						60 acre site beside Manuply. Applied for licence.	Uncertain
Shin Yang	Kemena						Licence approved.	Probable
Semarak	Bintulu	240,000	120,000		3	3	Propose to set up a 3 line plymill. Have applied for licence.	Probable
Ridan	K.Baram	240,000	120,000		4	3	Have applied for licence to construct a veneermill on adjoining site to sawmill, eventually also plywood presses.	Probable
Country For Ind	K.Baram	240,000	120,000		3	3	Intend to instal plymill on adjoining site during 1994. They understand that licence application approved.	Probable
Sembeta	Limbang	96,000	48,000		1	1	Have applied for licence to instal 1 line plymill on adjoining site with Japanese partner	Probable
Limbang Trading	Limbang	36,000		18,000	1	1	Have applied for extension to add a further line, & say that such applications are usually approved.	Probable
Total annual additional capacity planned. (16 mills)		Approximately 2,800,000 Input logs	1,400,000 Output plywood	18,000 Output veneer	39 +	39 +		

Ref. A : PLYVEN2

(A)

Project PD 107/90 (I)
STRATEGIES FOR WOOD INDUSTRIES IN SARAWAK

SAWMILLS (Based on monthly returns to STIDC for 1993).

Name of mill	Location	Input p.a. (m3)	Output p.a (m3)	Recovery (%)	Profiles output (m3)	Laminates output (m3)	Number of lines: Headrig	Ponyrig	B.Resaws	Multirip	Kilns	Machining: Profiles & planing	Labour: Total	N-Mal	Hrs pe da
Region I, Kuching															
Sarawak For Prod	Bintawa IE	41,319	23,441	57		7,554	1	2	4		yes	yes	140	20	1
KTS Timber Ind	Bintawa IE	26,617	14,034	49	794		2	1	6		yes	yes	95	14	1
Borneo Lumber Co	Bintawa IE	36,571	22,424	62			1	6		3	no	no	80	9	1
Foresin Enterprise	Bintawa IE	12,595	7,998	63			1		4		no	no	54	0	1
Sampadi Timber Co.	Bintawa IE	101,784	46,372	46	?		1		7	1	no	yes	100	0	1
Sri Bintawa	Bintawa IE	63,604	53,068	83	some S4S		4	6	7		no	yes	200	160	1
Usama Industries	Bintawa IE	24,844	18,629	75	?		1		2		yes	yes	120	0	6
Kiong Sen	Pending IE	10,224	5,894	58		?	2		3		yes	yes	?	?	
Chaseing Timb Corp	Bintawa IE	21,775	10,962	50	?		1		5		yes	yes	100	0	1
Noblewood	Selingkat	7,907	3,611	46					4				73	1	6
Hai Hing	Pending IE	7,460	4,667	62			1		6				36	0	1
Kion Ling	Bintawa IE	20,872	11,926	57		7,665	1		5		yes	yes	250	0	
Other mills		145,275	64,964	45		5,492									
Sub-total		542,807	288,222	53	794	20,911									
Region II, Rejang															
Hua Seng Sawmill	Sibu	17,185	7,066	41			2			?		yes			
Wisewood	Sibu	53,184	23,240	44			2		6		no	no	151	60	6
Sarawak Co	Selalang	17,077	9,246	54	some S4S	?	2	5			yes	yes	100	0	
CTC	Sarikei	6,670	2,782	47	2,586		1		2		yes	yes	90	0	
Rayomas	Sibu	42,625	15,662	37			1		5	2			130	0	6
R.H.Timber Proc Ind	Tg Manis	81,869	37,441	46			1		3		yes	no	169	10	1
Trimogreen	Tg Manis	42,010	18,020	43			1	2	4		yes	no	150	4	1
Woodbanks Ind.	Sibu	29,625	11,373	38	some		2	2	7	2	yes	yes	116	67	1
Mao Sen Sawmill	Sibu	33,256	14,593	44			1	1	6		no	no	80	0	1
Sarawak Moulding Ind	Sibu	74,558	29,422	39							no	yes	200	0	1
San Hup Choon	Sibu	41,756	17,972	43	broom handles						no	yes	100	0	1
Song Logging SM	Kapit	22,314	9,747	44			1		2		no	no	60	0	6
Tatsan Timber	Sibu	40,192	20,664	51	6,659		3				yes	yes	400	0	6
Replex	Sibu	9,593	4,613	50							no	no	20	0	
Foreswood	Sibu	73,337	31,775	43	4,684		2	1	?		yes	yes	?	?	
Kawood	Sg Singat	53,042	27,033	51	1,284		2		4		no	yes	100	50	
Rindaya Wood proc	Sibu	17,497	8,341	48			1		?		no	no	60	0	
Other mills		609,882	267,840	44	17,509	546									
Sub-total		1,265,284	557,070	44	32,924	546									
Region III, Bintulu															
Tabwood Sawmill	Kemena IE	39,236	21,333	54			1	2	4		no	no	100	0	6
Hock Mew	Tatau	20,666	8,579	42			1		2		no	no	90	0	6
Wui Ling Timber	Bintulu	17,545	10,118	58			1		3		no	no	37	0	5
STIDC Belian Holdngs)	Kemena IE	4,487	1,754	39			1	1	4		no	no	42	0	6
Okutai Timb Prod	Kemena IE	19,136	7,071	37			1	1	5		no	no	70	55	6
ES Ng Pembinaan P.	Kemena IE	70,030	40,652	58			1	1	6		no	yes	120	15	6
Zedtee	Tatau	63,612	38,808	61			1	2	6		no	yes	240	120	1
Tab Timber	Ulu Kemena	7,599	2,355	31			1	1	1		no	no	16	0	6
Hock Lee	Bintulu	42,669	19,010	45	?	1,721	2	3	5	1	yes	yes	150	30	6
Posen Timber (Pacific)	Kemena IE	92,054	51,558	56			1		10		no	no	160	60	1
Semarak	Kemena IE	55,266	23,475	42			1	2	7	2	yes	yes	210	90	5
Hua Lee	Balingian	17,970	7,602	42			1		3		no	no	100	0	6
Lien Ho	Balingian	7,966	3,402	43			1	1	5	1	no	no	120	0	6
Other mills.		244,640	127,662	52											
Sub-total		620,944	321,925	52		1,721									
Regions IV & V, Baram, Limbang & Lawas.															
Bintulu Lumber Devel	Susi	17,947	7,762	43			1		6		no	yes	80	0	1
Samling Wood Ind	K.Baram	74,657	34,985	47			1	1	7	1	yes	yes	150	100	6
Ridan SM	K.Baram	22,530	9,973	44			2	2	10		yes	yes	150	8	1
Country For Industry)	K.Baram	39,412	16,874	43			1		6	2	no	no	100	0	6
(Nam Hua Sawmill))															
Baya Lumber	K.Baram	12,251	4,990	41			1		10		no	no	?		
Sarawak Plywood	Temala	19,231	7,137	37			1		5		yes	yes	95	6	6
Hiap Hong SM	Marudi	1,719	1,096	64					2		no	yes	20	0	6
Samling Wood Ind	Lawas	46,641	30,301	65			1	2	6		yes	yes	200	110	6
Sembeta	Limbang	5,520	3,599	65			1	2	3	3	no	no	80	0	6
Sin Yee Shin (Lawas L)	Lawas	6,457	6,437	76			1	2	5	1	no	no	110	0	1
Jinland SM (Vamco L)	Lawas	13,936	10,217	73			1		6		no	yes	120	100	6
Other mills		210,330	94,066	45	564										
Sub-total		472,663	229,439	49	564										
Total of all sawmills for which monthly returns were received by STIDC for 1993:		2,901,698	1,396,656	48	34,264	23,178									
Additional estimate for new sawmills or lines, and for mills which did not complete returns:															
Say 5%		145,085	69,832		1,714	1,158									
EXPECTED TOTALS FOR 1994.		3,046,783	1,466,488		35,998	24,336									

PROPOSED ADDITIONAL SAWMILLS OR SAWLINES.

				Comments
Borneo Lumber, Tg Man	72,000	36,000		Now being installed. Start probably July, 1994.
Hock Mew, Tatau	24,000	12,000		New sawmill under consideration.
Wui Ling, Bintulu	24,000	12,000		New sawmill line maybe in 1995-96.
Lumber Devel., Susi	24,000	12,000		New sawmill line under consideration.
Hiap Hong, Marudi	4,800	2,400		New HR, maybe in the future (? doubtful).
Jinland SM, Lawas	48,000	24,000		New sawmill maybe in 1995.
Lieng Bang, Tg Manis.				Foundations started.
Total additional sawmills	196,800	98,400	50	

Ref: SAWMILLS

SAWMILLS

Name of sawmill	Log price (RM/m3) at October, 1993. MLH	Meranti Plaster	Meranti Sticker	Kapur/Ker	Sel batu	Agathis	Alan batu	Sales price (RM/m3 FOB) at October, 1993. MLH Merch Gr	Meranti Stand & S	Meranti Merch Gr	Kapur/Ker Merch Gr	Sel.Batu Stand & S	Sel Batu Merch Gr	Alan batu Merch Gr	Agathis Cu sawn	Railway sleepers	Belian (local)	Laminated truck flooring	Ply/Ite boards
Region I, Kuching																				
Sarawak For Prod					360															
KTS Timber Ind	310		340	360																
Borneo Lumber Co			360	360						340	340									
Foresin Enterprise	170		280	280	320															
Sampadi Timber Co.	140			370																
Sri Sinawa																				
Usama Industries																				
Kiong Sen																				
Chessing Timb Corp																				
Nakawood																				
Hai Hing																				
Kian Ling																				
Other mills																				
Sub-total																				
Region II, Rajang																				
Hua Seng Sawmill			280		340															
Wawood																				
Sarawak Co											100									
CTC			360	360																
Rayonas															1300					
R.H.Timber Proc Ind																				
Trinegreen																				
Woodbanks Ind.																				
Mee Sen Sawmill																				
Sarawak Moulding Ind																				
San Hup Choon																				
Song Logging SM				700																
Tatsan Timber																				
Replas																				
Forestwood																				
Kaiwood																				
Rindaya Wood proc																				
Other mills																				
Sub-total																				
Region III, Sibiu											280	360	340							
Talewood Sawmill			360	360	360															
Hock Mee								230												
Wd Ung Timber	220			370					400											
STIDC Belian Holdings)										360	360					426				
Ckulai Timb Prod			310	316													490			
Ell Ng Pembinaan P.	270																	720	475	
Zodiac																				
Tab Timber																				
Hock Lee																				
Pesaa Timber (Pacific)																				
Selarak	180	360	360	340	360	340														
Hua Lee																				
Lian Ho																				
Other mills.																				
Sub-total																				
Regions IV & V, Baram, Limbang & Lawas.																				
Sibulo Lumber Devel	170		280		280			200		340	300									
Samling Wood Ind	160		275	275	275			190		290	310				310					
Ridan SM			310	310			220													
Country Per Industry)																				
(Nam Hua Sawmill)																				
Seya Lumber															200					
Sarawak Plywood																				
Hap Hong SM						275										950				
Samling Wood Ind	160		275			340														
Sambelia																				
Sin Yee Shin (Lawas L)	150		170	280																
Jinland SM (Vamco L)	170		220	220	220			370		860	800									

Ref: SAWMILL2

SAWMILLS

Name of SAWMILL	Owners	Future plans
Region 1, Kuching.		
Sarawak For Prod	56% Ribunan Hijau	Lam truck floor installation at Tg Manis
KTS Timb Ind	KTS	Increase prodn of planed/profiled timber
Borneo Lumber Co	Family firm (Sarawakian)	Are building additional sawmill at Tg Manis (eventually with kilns & further processing) as insufficient room for expansion.
Foresin Enterprise	Sarawak group—Saw Chow	Might get out of sawmilling
Sampadi Timber Co	Mao Seng Group	Applied for Selingkat site: Flooring, solid doors, profiles, pallets
Sri Bintawa	49:51 Taiwan:Sarawakian	Plans for KD, profiles, furniture components
Usama Industries	Sarawakian Group	Already well—developed downstream: Prefab houses with furniture
Kiong Sen	Family owned (Sarawakian)	(See Moh Sing Hiong Slicer mill R1/3)
Chessing Timber Corp	Sarawakian family owned	Already making furniture for local market — poor quality
Noble wood	?	Not seen
Hai hing	Non—Bumi	Not seen
Kion Ling	Partly W.Malaysian, mainly Sara	Already making laminated truck flooring
Region 2, Rajang		
Hua Seng Sawmill	Hua Seng group	No plans
Wisewood	Bormill Group	Not interested in downstream investment while there sawmill is unprofitable
Sarawak Co	55:45 Sarawak:Foreign	(see plymill) Already machine planed timber for export. No plans to make furn components.
CTC	100% Delta Group	Trying sawing and moulding other spp than Ramin
Rayomas	Sarawakian	Not interested in downstream developments until SM can make profit.
RH Timber Processing	Ribunan Hijau	Turbine, more kilns & laminated board plant being installed.
Trimogreen	Ribunan Hijau	(Mill is twinned with RH Timb Proc Ind—see details above)
Woodbanks Ind	Non—Bumi	Recently installed 3 moulding machines & other joinery mach. Planning furn comp, solid doors, laminates.
Mao Sen SM	Mao Sen group	Planning kilns & probably moulding
Sarawak Moulding Ind	WTK	Trying other species for moulding
San Hup Choon	Sarawakian	No plans yet, but intend to go downstream
Song Logging SM	WTK	No plans
Tetsan Timber	?	No plans mentioned
Replax	Sarawakian	Just established plymill (Sun Chan), joint venture Koreans/other Sarawakians. Looking at downstream devel.
Foreswood	?	Doubtful about profiles, furn comp, and particle board.
Kawood	?	Now moulding Meranti & MLH only, replacing Ramin.
Rindaya Wood Proc	?	No plans mentioned
Region 3, Bintulu		
Tabwood Sawmill	95:5 Sarawakian:Japanese	Looking at prospects for: Kilning, moulding, finger—jointing & flooring.
Hook Mew	Sarawakian	Plans for new sawmill, kilns,and moulding for spp other than Ramin for Eg T & G container flooring, house panels etc.
Wui Ling Timber	?	Planning for new complete sawing line in 1994—5
STIDC Belian Holdngs)	STIDC	Kilns prob 1994. Prov plans for moulding, furn comp & truck lam flooring.
Okutai Timb Proc	60:40 Sarawakian:Japanese	Had planned Kilns & moulding but postponed because of poor market
Es Ng Pembinaan	100% West Malaysian	Machinery coming for pallet making. Planning PAS, charcoal making. Manager has many ideas.
Zedtee	Sarawakian	Not mentioned
Tab Timber	WTK	Probably none
Hook Lee	Sarawakian	Intend to develop profiling, and explore prospects for further downstream developments. Good prospects.
Posan Timber	100% W.Malaysian	No plans as mill is rented.
Semarak	Sarawakian	Installing additional PR. Plans for plymill, moulding & finger—jointing.
Hua Lee	Sarawakian family firm	Say they expect to close mill in about 3 years when swamp forest finished.
Lien Ho	Sarawakian	Expect to switch to logs from other regions in 4—5 years' time.
Region 4 & 5, Baram, Limbang & Lawas.		
Bintulu Lumber Devel	KTS	Not mentioned
Samling Wood Ind (B)	Samling	(Considerable plans — see Samling plymills)
Ridan SM	Sarawakian	Planning joint venture with Taiwanese: Veneer & eventually plymill on adjoining site.
Country For Ind	Joint vent Sarawakian/Taiwanese	Have applied to instal 3 line plymill on adjoining site in 1994.
Baya Lumber	?	Have intended for some time to instal 2nd SM line and Plymill.
Sarawak Plywood	Sarawakian. Some assocn with RH.	Considering taking site at K.Baram for Plymill & moulding.
Hiap Hong	Sarawakian	Have bought a 2nd hand HR, but waiting news on lease before installation
Samling Wood Ind (L)	Samling	Would prefer to stop production if they could lease out the mill.
Semata	51:49 Malaysian:Taiwanese	Planning plymill on adjoining site with Japanese partner.
Sin Yee Shin	51:49 Malaysian:Taiwanese	Expecting 1 planer for planing PAS for export. Also maybe 1 more HR and more MRip.
Jinland SM	Sarawakian	Planning to build another sawmill, and then lease the present one out.

Ref: SAWMILL2

Appendix 4.
April, 1994.

PROJECT PD 107/90 (I) STRATEGIES FOR WOOD INDUSTRIES IN SARAWAK.

LOG REQUIREMENT FOR PRIMARY INDUSTRIES IN 1993 AND 1995. INPUT ('000 m3).

PLANNING REGION	1993 Sawmills At coast **	Inland	Veneer mills At coast	Inland	Plymills At coast	Inland	TOTALS	Estimate of input capacity for 1995. Sawmills At coast	Inland	Veneermills At coast	Inland	Plymills At coast	Inland	TOTALS
1. Kuching	525	25	0	0	280	0	830	525	25	0	0	385	0	935
2. Sarikei/Sibu	1,130	100	120	0	1,320	0	2,670	1,300	100	120	0	1,480	0	3,000
3. Kapit	0	10	0	75	0	0	85	0	10	0	100	0	0	110
4. Dalat/Mukah	20	0	0	0	0	0	20	20	0	0	0	0	0	20
5. Bintulu	620	0	190	0	580	0	1,390	650	0	190	0	740	0	1,580
6. Belaga	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7. Baram	435	35	25	0	215	0	710	470	35	25	0	490	0	1,020
8. Limbang/Lawas	120	0	40	0	0	0	160	150	0	40	0	0	0	190
TOTALS	2,850	170	375	75	2,395	0	5,865	3,115	170	375	100	0 3,095	0	0 6,855

** "At coast" refers to locations where vessels can be loaded, Eg. Tg Manis, Sibu, Kuala Baram etc..

Ref: LOGREQUI

(1x)

LOG REQUIREMENTS FOR 1994.
Derived from STIDC summary of monthly returns for 1993, and notes on mills visited.

ROTARY VENEER & PLYMILLS. Volumes (m3) ANNUAL

Mill name	1993 Input	Output Veneer	Output Plywood	Recovery %		1994 Input	Output Veneer	Output Plywood
REGION I KUCHING								
Kuching Plywood	63,079		24,905	39		63,000		25,000
Forescom	84,242		41,844	50		84,000		42,000
KTS Ind.	117,719		58,750	50		118,000		59,000
Lin S H	12,000		6,000	50	On trial run	120,000		60,000
	277,040		*131,499*	*47*		*385,000*		*186,000*
REGION II RAJANG.								
RH Plywood	173,727		79,533	46		174,000		80,000
Subur Tiasa	315,433		143,201	45		315,000		143,000
Hwa Sen	44,347	11,271	6,044	39	1st year	76,000	16,000	15,000
Sarawak Co.	179,647	31,805	56,799	49		132,000		65,000
Rindaya	165,871		72,614	44		166,000		73,000
Sung Chang	61,946		25,849	42	1st year	130,000		63,000
Jaya Tiasa 1–Putai	76,156	56,132		74	On trial run	100,000	60,000	
Jaya Tiasa 2–Sibu	217,869		138,991	64		230,000		135,000
Rajang Ply.	160,728	57,626	15,172	45		260,000		120,000
Jafoung	114,445	51,938		45		114,000	52,000	
Tetling	3,562	1,246		35		4,000	2,000	
	1,513,731	*210,018*	*538,203*			*1,701,000*	*130,000*	*694,000*
REGION III BINTULU								
Samling (Bintulu)	228,506		116,947	51		230,000		117,000
Manuply	215,965	63,993	33,458	45	2nd year	242,000		126,000
Brightwood	100,763	10,246	41,158	51	2nd year	135,000	30,000	40,000
Forestate	7,988		3,802	48		8,000		4,000
Rimex	27,927		25,785	92	Trial run	126,000		72,000
Win Miracle	57,753	29,654		51		58,000	30,000	
Cairnfield	127,334	35,320		28		127,000	35,000	
3 small mills	6,700	4,749		71	Doubtful %	7,000	4,000	
	772,936	*143,962*	*221,150*			*933,000*	*99,000*	*359,000*
REGION IV & V BARAM, LIMBANG & LAWAS								
Samling (Baramas)	166,277		91,718	55		166,000		92,000
Samling (Miri)	24,838		15,236	61	Trial run	120,000		70,000
Shin Yang	23,944		10,731	45	Trial run	204,000		102,000
Limbang Trading	38,551	19,558		51		39,000	20,000	
San Hak	21,639	10,265		47		22,000	10,000	
1 small mill	3,567	1,848		52		4,000	2,000	
	278,816	*31,671*	*117,685*			*555,000*	*32,000*	*264,000*
TOTALS	2,842,523	385,651	1,008,537	49		3,574,000	261,000	1,503,000

ADDITIONAL MILLS OR LINES PLANNED OR UNDER CONSIDERATION. Volumes (m3) MONTHLY

Mill name.	Input	Output	Recovery (estimated) %	Location.	Additional lines. Peelers.	Hot press.	
Samling (Lawas)	18,000	10,000	55	K.Baram	4	4	Under planning
Chuah Seah Joo	10,000	5,000	50	Tg. Manis	2	2	Commission in June '94.
(STIDC)	16000	8000	50	Tg. Manis	4	4	Planning
E.T.M.				Tg.Manis			Uncertain purpose.
Lin Shan Hao	36,000	18,000	50	Kuching	12	12	Consideration
Forescom	8,000	4,000	50	Kuching		1	Planning
Rindaya	16,000	8,000	50	Rajang	4	4	Planning
CTC	16,000	8,000	50	Sarikei	3	3	Planning
Ribunan Hijau	20,000	10,000	50	Tg. Manis	4	4	Planning
Rajang Plywood	12,000	6,000	50	Sibu	2	2	Consideration
Semarak	20,000	10,000	50	Bintulu	3	3	Applied licence
GT Plywood				Kemena			Uncertain
Rimex				Kemena			Licence applied for
Shin Yang				Kemena			Uncertain
Ridan	20,000	10,000	50	K.Baram	4	3	Planning
Country Forest Ind.	20,000	10,000	50	K.Baram	3	3	Applied licence
Sembeta	8,000	4,000	50	Limbang	1	1	Applied licence
Limbang Trading	3,000	1,500	50	Limbang	1	1	Applied extend
Monthly total	223,000	112,500			47	47	
ANNUAL TOTAL	2,676,000	1,350,000					(Ref: A : PLYIPMAR)

Appendix 5.

PROJECT PD 107/90 (I) April, 1994.
STRATEGIES FOR WOOD INDUSTRIES IN SARAWAK.

INVESTMENT ESTIMATES FROM QUOTATIONS RECEIVED.

1) PLYMILLS.

Make: TAIHEI, Japan.
Machinery cost, FOB Nagoya.

a) Approx 50,000 m3 output pa. (They state 155.5 m3 per 16 hr day, but most plymills in Sarawak work a 22 hr day.)

2 lines (9'+ 5')	Yen	1,343.39 Million
@ 106 Y/$US	$US	12.7 Million.
@ 2.7RM/$US	RM	34.3 Million
+ Freight & Insurance Say 7%	RM	2.4 Million
CIF cost about	RM	37 Million.

b) Approx 80,000 m3 output pa. (They state 249 m3 per 16 hr day, but most plymills in Sarawak work a 22 hr day.)

3 lines (9'+ 9'+ 5')	Yen	2,425.24 Million
@ 106 Y/$US	$US	22.9 Million.
@ 2.7RM/$US	RM	61.8 Million
+ Freight & Insurance Say 7%	RM	4.3 Million
CIF cost about	RM	66 Million.

2) SAWMILLS

Make: Stenner, UK.

		$US
a)	50,000 m3 pa	
	Model TS 2484	
	CIF	938,000
	Foundations	75,000
	Installation	30,000
	Waste disposal	45,000
	Electrics	60,000
	Sub-total	1,148,000 $US
	@ 2.7 RM/$US	3,100,000 RM
2	+ Estimate of Maintenance equipment	100,000 RM
	2+ Estimate for Sawdoctor's shop	100,000 RM
	+ Estimate for buildings	600,000 RM
	TOTAL	3,700,000 RM.

b)	100,000 m3 pa	$US
	Model TS 2462	
	CIF	1,425,000
	Foundations	112,000
	Installation	45,000
	Waste disposal	68,000
	Electrics	90,000
	Sub-total	1,740,000 $US
	@ 2.7 RM/$US	4,698,000 RM
	+ Estimate of Maintenance equipment	150,000 RM
	+ Estimate for Sawdoctor's shop	150,000 RM
	+ Estimate for buildings	940,000 RM
	TOTAL	5,950,000 RM.

3) **KILNS FOR SAWN TIMBER.**

Make: Cubbage, UK.
50,000 m3 throughput pa.
Average thickness 38 mm
Dry from "Green".
Average species type: Keruing.
Drying cycle average 10 days
Kilns total capacity 1,400 m3 of timber.

		$US
a)	Boiler for 50,000 m3 pa kilns.	
	Type MM No.23.	
	Ex Works	304,000
	To FOB	7,000
	Freight (10%)	31,000
	Installation & commissioning	16,000
	Total	358,000
	@ 2.7 RM/$US	970,000 RM
b)	Aluminium prefabricated Kilns	$US
	12 kilns of 120 m3 @ 113,250 $US FOB	1,359,000
	Freight (5%)	67,000
	Installation & commissioning	134,000.
	Sub-total	1,560,000
	@ 2.7 RM/$US	4,212,000 RM
	+ Boiler	970,000 RM
	TOTAL	5,182,000 RM

		$US.
c)	Kilns to be masonry/concrete built.	
	12 kilns of 120 m3 @ 57,600 $US FOB	691,200
	Loading doors	106,000
	Freight (5%)	40,000
	Installation & commissioning	105,000
	Sub-total	942,000
	@ 2.7 RM/$US	2,543,000 RM
	+ Boiler	970,000 RM
	Sub-total	3,513,000 RM
	+ cost of Civil Works (20%)	702,000 RM
	TOTAL	4,500,000 RM

4) MOULDING MACHINES.

Make: Wadkin, Singapore.

a)	Model XE 220	
	Feed range 6-46 metres/minute, CIF.	125,000 $US
	@ 2.7 RM/$US	337,500 RM.
b)	Model Super 220 XJS	
	Feed range 10-120 metres/minute, CIF.	240,000 $US
	@ 2.7 RM/$US	648,000 RM.
c)	Grinding machinery needed:	
	Profile planer head grinder NXV 230S	28,000 $US
	Automatic straight knife grinder NZ300	36,000 $US
	Total	64,000 $US
	@ 2.7 RM/$US	173,000 RM.

Ref: Quotns.

PROJECT PD 107/90 (I)
STRATEGIES FOR WOOD INDUSTRIES IN SARAWAK

INVESTMENT COSTS (From STIDC Records) (Million RM)

PLYWOOD MILLS

Name of mill	Location	Total Project Cost. Million RM.	Imported Machinery Cost Million RM.	%	Input 1993 (M3)	Output Plywood 1993 (m3)	Output Veneer 1993 (m3)	Recovery 1993 (%)	Comments	Number of lines Lathes	Hot Press	Labour. Total.	Non-Mal.	Hrs per day.
Region I, Kuching														
Forescom	Bintawa I.E.	20	14	70	84,242	41,844		50		4	2	630	2	22
KTS Timber Ind	Bintawa I.E.	65	32	49	117,719	56,750		50		3	3	300	300	16
Kuching Plywood	Pending				63,079	24,905		39		3	3	500	200	22
Lin Shan Hao	Sejingkat I.F	48	20	41	12,000	6,000		50	On trial run.	4	4	240	220	8
Region II, Rajang														
RH Plywood	Sibu	54	28	52	173,727	79,533		46		4	4	750	380	22
Subur Tiasa	Sibu	100	63	63	315,433	143,201		45		7	4	1100	980	22
Hwa Sen Ven & Ply Ind	Sibu	2	1	50	44,347	6,044	11,271	39	First year.	5	3	500	400	21
Sarawak Co	Selalang	27	18	67	179,647	56,799	31,605	49		4	3	800	0	22
Rindaya	Durin	51	32	63	165,671	72,614		44		4	3	700	560	22
Jaya Tiasa 2	Sibu	200	62	31	217,869	136,991		64		4	3	900	800	22
Rajang Plywood	Sibu	9	5	56	190,728	15,172	57,626	45		3	3	550	400	22
Sung Chang	Rajang				61946	25849		42	First year.	3	3	540	370	22
Region III, Bintulu														
Samling Plywood (Btu)	Kemena I.E.	160	61	45	228,506	116,647		51		4	3	800	560	22
Manuply Pty Ind	Kemena I.E.	125	20	16	215,965	33,456	63,993	45	2nd year.	4	3	1400	1200	22
Brightwood	Kemena Ind	114	43	38	100,783	41,156	10,246	51	2nd year.	3	2	510	200	23
Forestate	Bintulu	5	2	40	7,966	3,802		48		3	1	135	100	20
Rimex	Tatau	52	36	46	27,927	25,765		92	On Trial run.	3	3	1000	850	22
Region IV, Baram														
Samling Ply (Baramas)	K. Baram I.E.				166,277	91,718		55		4	4	730	615	8
Samling Ply (Miri)	K.Baram I.E.	161	70	43	24,838	15,236		61	On trial run.	3	2	430	280	21
Shin Yang Plywood	K.Baram I.E.				23,944	10,731		45		5	3	700	200	22
Region V, Limbang & Lawas														
NIL														
SUB-TOTAL		1247	529	42	2,392,816	1,006,537	174,941	49		77	59	13715	8597	
VENEER MILLS														
Region 1, Kuching														
NIL														
Region II, Rajang														
Jaluong Ply Corp	Sibu	17	9	53	114,445		51,936	45		3	0	490	460	22
Jaya Tiasa 1.	Ulu Rajang	35	23	66	76,156		58,132	74	On trial run	3	0	500	450	22
Region III, Bintulu														
Celmfield	Kemena I.E.	18	2	11	127,334		35,320	28		3	0	430	410	22
Win Miracle Corp	Sebauh	14	5	36	57,753		29,654	51		3	0	300	100	22
Region IV, Baram														
San Hak		7	3	43	21,639		10,265	47		2	0	115	95	10
Region V, Limbang & Lawas														
Limbang Trading	Limbang	7	5	71	38,551		19,558	51		2	0	120	0	18
TOTAL Veneer		98	47	48	435,878		202,867	47		18	0	1955	1545	
ADDITIONAL PLYMILL PLANNED.														
Chuah Seah Joo	Tg Manis	70	20	29	96,000	48,000				2	2			
GRAND TOTAL		1415	596	42	2,924,694	1,056,537	377,808	96	0	95	61	15,670	10,142	

ADDITIONAL INVESTMENT COST INFORMATION FROM FORESCOM.

1 Plywood line costs about 20 M RM, including about 3 M RM for buildings.

They are now buying the following additional plant, which is costing 11.4 M RM:
1 drier, 1 cold press, 1 hot press with 40 daylights, 1 glue spreader, & various clippers & jointing machines.

Waste burning turbine for generating power, recently installed by KTS is said to have cost 10M RM. They believe that this will give a saving in costs.

They carry spares valued at 1.8 M RM.

ADDITIONAL INVESTMENT COST INFORMATION FROM STIDC (Hashim Bolet).

Cost of land in Industrial Estates: 32.29 RM per m2 = 134,000 RM/acre or 323,000 RM/hn.

For a plymill, at least 25 acres needed, but preferably 30 acres.

30 acres cost about 4 Million RM.

Imported machinery cost is about 47% of total capital needed.

Ref: Quotns.

Operating Costs for Primary Industries in 1993-1994

Plymills

The following information was received from Taihei Manufacturing (representing new plymill costs), and from Forescom (who are operating a relatively old plymill):

	Costs $US/m³			
	Taihei		Forescom	
Fixed Costs		79		42
Variable Costs				
Logs	302		176	
Glue	45		24	
Labour	20		27	
Office overheads	10		11	
Sales overheads	40		11	
Electricity & Water	10		12	
Spare parts & consumables	8		6	
		435		256
Total Costs		514		298

NB. 1 Lower Fixed Costs of Forescom can be expected as much machinery was bought at earlier lower cost and has been depreciated already.

2 Log cost difference reflects export quality logs priced by Taihei against mainly local MLH logs used by Forescom

3 Glue price difference appears to be an error

4 Sales overheads cost quoted without explanation by Taihei appears unreasonable

The probable cost for a new plymill in the opinion of the consultant is approximately:

	$US/m³
Fixed Costs	79
Logs mixed qualities and spp.	210
Glue	34
Labour	25
Office O/H	10
Sales O/H	10
Electricity & Water	10
Spare parts & consumables	8
Sundry	10
	396 $US/m³

The current price for 3 mm plywood to China is about 525-550 $US/m³ FOB, and for thicker plywood to other destinations about 350-450 $US/m³ . Thinner (more profitable) plywood is manufactured when possible, depending on outturn of face veneer from the peelers which is determined by the quality of logs.

Sawmills

Information derived from Forest Department Report "Production Cost of Sawn Timber in Sarawak, 1979-81", FRIM Report of 1990 "Excess Capacity, Cost and Earning Structure of Sawn Timber Industry of Peninsular Malaysia", with more recent information from STIDC.

	F.D. Report		FRIM Report	
	%	%	%	%
Fixed Costs				
Depreciation	11			
Interest	2			
		13		12
Variable Costs				
Labour	41			45
Office O/H	8		)	
Sales O/H	10		)	
Petrol. Oil & Lubricants	8		)	
Electricity & Water	2		)	43
Spare parts & consumables	10		)	
Sundry	6		)	
Bad debts	2		)	
		87		88
		100		100

The probable production costs for an average sawmill (excluding log cost) in the opinion of the consultant is approximately:

	%	$US/m³	$US/m³	RM/m3	RM/m3
Fixed Costs					
Depreciation	16	12		33	
Interest	8	6		17	
	24		19		50
Variable Costs					
Labour	34	26		71	
Office O/H	4	3		8	
Sales O/H	5	4		10	
Petrol, oil & lubricants	6	4		12	
Electricity & Water	6	5		13	
Spare parts & consumables		12	9		25
Sundry	8	6		17	
Bad debts	1	1		3	
	76		59		159
	100		78 $US/m³		209 M/m3

PROJECT PD 107/90 (I) STRATEGIES FOR WOOD INDUSTRIES IN SARAWAK.

SECONDARY INDUSTRIES.

Information from monthly STIDC returns.

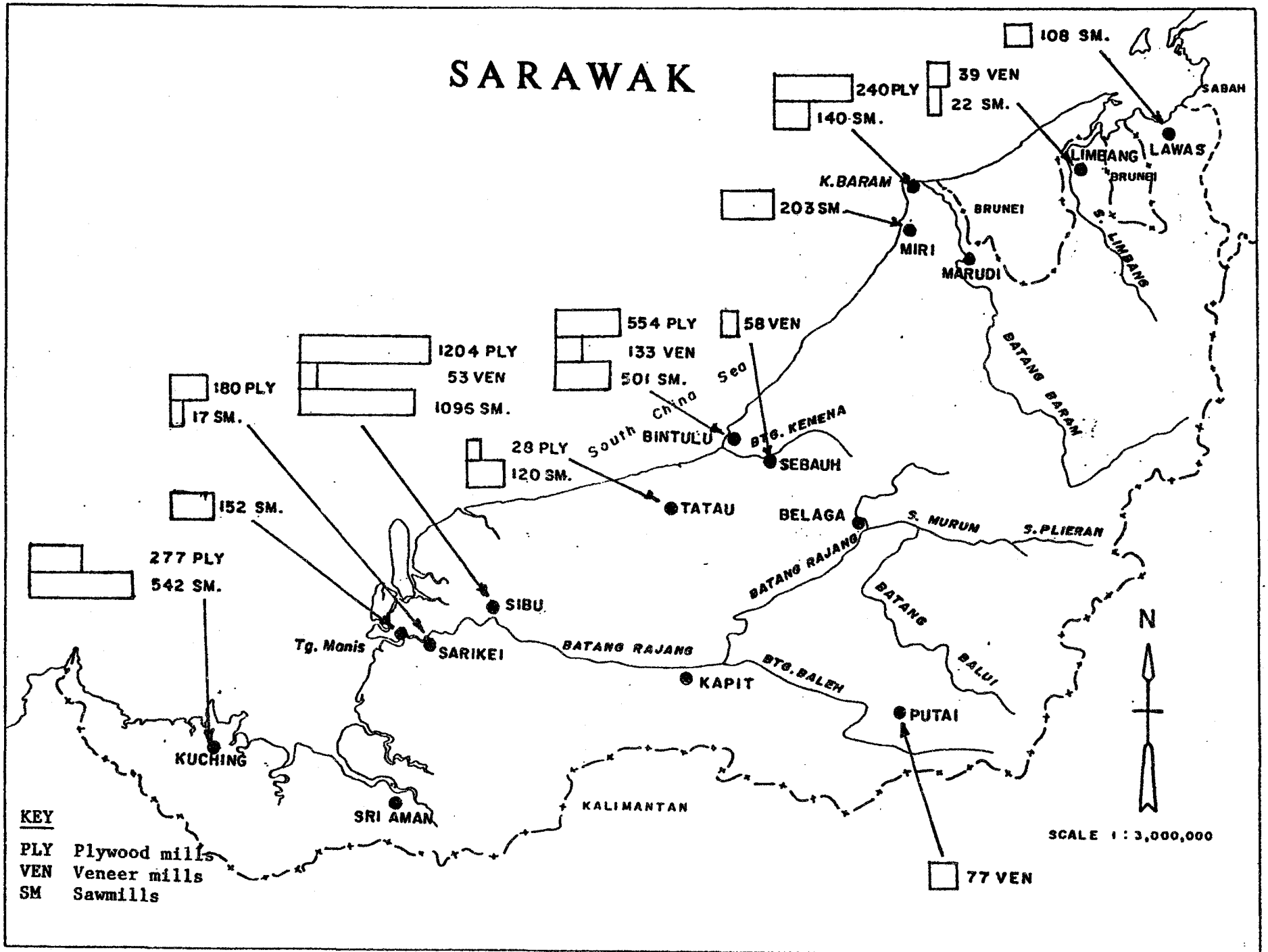
Mill name	Input (m3)	Output (m3)	Recovery (%)
MOULDINGS AND DOWELS			
Region I, Kuching			
KTS Timber Industries	1,613	794	49
Sub-total	1,613	794	49
Region II, Rajang			
Foreswood	9,559	4,884	51
Lumberkin	5,379	4,074	76
Hiep Sen	1,378	696	51
Cahayu Kayu	1,993	775	39
Ding Bros	566	276	49
TNC Timb Moulding	705	480	68
Koh Ying Ind	8,621	5,083	59
CTC	4,084	2,588	63
Tetsan	14,713	6,659	45
Huo Hap Timber	12,972	4,924	38
Kawood	1,761	1,282	73
Timber Highwood	1,927	815	42
Soon Khing	2,185	1,198	55
Sub-total	63,921	32,924	52
Region III, Bintulu			
Nil			
Region IV & V, Baram, Limbang & Lawas.			
CT Enterprise	718	564	79
Sub-total	718	564	79
TOTAL	66,252	34,282	52
LAMINATED BOARD.			
Region I, Kuching.			
Kion Ling Timber	23,515	7,865	33
Kion Kok	9,022	5,492	61
Sarawak For Products	19,521	7,554	39
Sub-total	52,058	20,911	40
Region II, Rajang.			
Ding Bros	1,111	546	49
Sub-total	1,111	546	49
Region III, Bintulu			
Hock Lee Timber	3,001	1,721	57
Sub-total	3,001	1,721	57
Region IV & V, Baram, Limbang & Lawas			
Nil			
TOTAL	56,170	23,178	41

PROJECT PD 107/90 (I) STRATEGIES FOR WOOD INDUSTRIES IN SARAWAK

SECONDARY PROCESSING

Company name	Location	Export /month	Date exports started	Type of product	Timber consumption (M3)	Employees	Market prospects	Capability	Remarks	Ownership
FURNITURE COMPONENTS										
Yun Ming Wood Ind.	Kuching, 17 mile Serian Rd.	1M $M 12 containers	1993	Mainly garden furn. Starting modular furn.	300 Sawn timber	200	Considerable enquiries, much more than output.	Good technical ability. Good management.	Only Sarawak company established in furniture comp export.	Family
Soon Onn	Kuching, Samarahan		1993	KD office furniture		75	Trial shipment to China 1 container–value 100,000$M	Good technical ability Good management	Have 2 showrooms and only produce now for them Recently agreed to instal a joint–venture furniture workshop/ factory in China.	Family
Sin Siang Hai	Miri	nil	n/a	Furniture for hotels & other local market.		60	Good local market	Good technical ability. Good management. No furn comp export experience.	Could undertake furn comp export with reorganisation, but prefer to continue in local market.	Family
Ding Bros	Sibu	nil	? 1980s	Furniture components (also Ramin & other profiles)		250 (incl SM).	Say that cannot compete with Indonesia, W Malaysia etc.	Good technical ability. Fair management, but not interested to continue.	Is possible that they might return to this product.	Family
Equatorial Timber	Kuching	?	?	Furniture for their prefab house manufacture. (Woodhouse Co.)			Say that prefab house export market is strong.	Have good reputation.	Have prefab house company–Woodhouse Sdn Bhd However, had difficulty in obtaining much information.	10% STIDC Mainly USAMA Ind.
Saming Coporation.	Miri							Have the management ability.	Are looking for consultants to advise them on this. Would consider joint venture.	Saming Coporation
Sri Bintawa	Kuching (Bintawa IE)							Have good management at their sawmill.	Are looking into prospects.	49:51 Taiwan:Sarawakian
Woodbanks Ind.	Sibu							Have good management at their sawmill.	Say that machinery for furn comp manufacture has been received, and will be installed soon. However, they will start with solid doors to Japan. Said that they expect to have to sort timber for colour.	Non–Bumi Sarawakian
STIDC Bellan Holdings	Bintulu							Their management ability is not yet clear.	Say that they have plans to make furniture comp.	100% STIDC
Soon Lin	Sebauh							Management appears only fair.	Say that they have discussed supplying Yun Ming with semi–finished furniture components from 1995.	

Ref: FURN–COM



LOCATION OF PRINCIPAL WOOD INDUSTRIES INPUT LOG VOLUMES 1993 IN' 000 M^3

Appendix 8.