I T T O

INTERNATIONAL TROPICAL TIMBER ORGANIZATION

DRAFT PROJECT DOCUMENT

Title	Strategies for Sustainable Wood Industries in Sarawak
Serial Number	PD 107/90 (I)
Original	English

Prepared by	Forest Department, State Government of Sarawak, Malaysia
Submitted by	Government of Malaysia
Duration	13 months
Fields of Activity	Forest Industry
Co-operating Governments	Government of Malaysia; State Government of Sarawak, Malaysia
Implementing Agency	Ministry of Resource Planning, State Government of Malaysia (through the Forest Department and the Sarawak Timber Industry Development Corporation)
Estimated Starting Date	Upon Approval
Estimated Project Cost	US$ 497,371
Financing Sources and Amount	
- ITTO Contribution	US$ 440,550
- Contribution of the State Government of Sarawak	US$ 56,821

Signed

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On behalf of ITTO Date

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On behalf of the State Government of Sarawak Date

STRATEGIES FOR SUSTAINABLE WOOD INDUSTRIES IN SARAWAK

I INTRODUCTION

Project [PD 107/90 (i)] will, according to its objective, prepare a basic plan for the sustainable development of Sarawak's forest industries, based on assessments of the forest resources of the State and the long term market outlook for forest products, taking into account the economic and financial environment in which the development is to take place. It should, in other words, prepare a basic forest sector plan for Sarawak. The plan should be in harmony with the economic development aspirations of the State, support the sustained production of the natural resources and aim at utilizing the market opportunities available, nationally as well as internationally.

II PLANNING APPROACH

Before any meaningful planning can start, it is necessary to establish what the main objectives with the sector development are - what aspirations should be met. The Project Document does not specify these objectives or aspirations, which are political in nature.

A number of political objectives can be envisaged, some of them are possible to quantify some are not:

- maximum contribution to State GDP,
- maximum foreign exchange earning,
- full employment in urban and/or rural areas,
- minimum detrimental effect on the natural environment,
- maximum government revenue,
- a minimum return on investment,
- skill development,
- etc.

Some of these objectives can be achieved simultaneously, but other can not be achieved without negative effects on some of the other. In addition, one objective may be of critical importance in one part of the State, while in another part another objective should be given highest priority.

If there is one, all dominating, objective, the planning process is simple. Also if there are several, non-contradictory objectives of equal importance, the planning process is rather straight forward. It becomes a maximizing or minimizing problem, within the limits set by the resources and the market.

It is when several objectives with different importance, some of them opposing each other, the planning process becomes complicated. It can however be handled if different objective can be given weights which represent their relative importance. Both negative and positive achievements with regard to the objectives need to be rated in this way.

Revised version.
Discussed in a meeting
on 14 September 1993

It is, however, usually not realistic to give an objective a weight relative to another objective whatever the achievement is. The nearer an objective comes, in the development process, to being fulfilled, the less its weight of importance should be, relative to an objective which is far from being fulfilled. Another problem is that it is seldom possible to measure the importance of three or more objectives with the same scale. For instance, objective A may be twice as important as objectives B and C, but B and C are not necessarily of equal importance, when compared with each other.

In general, public sector planning must deal with several or many objectives and with complicated relationships between objectives. It is therefore necessary to use planning procedures which can cope with this complex situation. Some options and possibilities are discussed in the following.

Planning implies choice of action alternatives among possible options. It is a process in which alternatives are assessed with regard to their anticipated results and their feasibility is evaluated and rejected or accepted.

The process of developing a plan is, thus, made up of two parts:

a) the analyses, which quantify the degree to which objectives are fulfilled by various plan options, and
b) decisions with regard to policies and strategies and choice of plan alternative.

It is also an interaction between the two. Part a) provides analyses results which are considered in b) which, in turn, provides feed-backs, which are used in a) as input in further analyses.

The analyses can be purely mathematical, if the data base and the objectives allow. It can also be purely non-mathematical, and made up of judgments or assessments of results of action alternatives, based on experience. Often, shortcomings in the data base and complicated objectives make it necessary to use both approaches, also when a purely mathematical analyses is desired.

The choice of plan alternatives, and supporting decisions with regard to policies and strategies, is basically a political process and can take place at various levels of the political hierarchy.

The interaction between the analytical process and the political decision process can either be continuous, in which one aspect at a time, of the total plan, is analyzed and assessed, and the plan is successively built up from these parts, or the entire sector plan is considered from the start. The step by step approach is usually to prefer, if also interaction with other sectors is to be considered and is crucial for the implementation of the plan.

The mathematical analyses can be carried out with the help of modern electronic equipments of varying degree of sophistication. The work will often involve large numbers of iterations of the same calculations, using varying sets of input data. In these cases it is an advantage to use programmable electronic devises, for instance a desk top computer, which can store programmes and data files.

The ultimate level of sophistication, for the analyses aspect of plan development, would be to create a computer model of the sector, which can use inputs from computer files for simulating implementation of selected plan alternatives and report the effect these alternatives will have on the various objectives.

The adaptation of computer programmes and the creation of input files are costly and time consuming, and if it is not foreseen that the sector model is to be used intensively over a period of time, it is seldom economic to use the model approach. A model is usually valid for a short period of time only, as the idea of what constitutes the sector will change and new computer facilities and calculation techniques will be developed requiring new approaches.

A methodical and direct approach to sector analysis, and strategy and plan development, would be to proceed in steps as follows:

1. Consider what should be the objectives of sector development and the constraints to be observed.

2. Make over all assessments of options, regarding the entire State as a single planning unit.

3. Review objectives and constraints in the light of the results of the over all assessments and consider interactions with other sectors.

4. Decide on general strategies for the sector, including firm commitments to objectives and constraints and to cooperation with other sectors.

5. Assess options for development within planning units, allowing deviations from State constraints.

6. Select long term strategies for planning units.

7. Compare planning units with regard to urgency of development and to local and state effects of sector development in the planning units.

8. Fit the development strategies for planning units into the State framework of constraints and decide on sequences - time and location - of development action.

9. Consider incentives and disincentives required to achieve the desired development.

10. Develop a detailed plan for sector development, including budget estimates and plans for interaction with other sectors.

11. Secure intersectoral cooperation through state plans and budgets.

Consider the following questions:

a) what are the main objective(s) of forest sector development?
b) if more than one objective, what is their relative importance?
c) what constraints for forest sector performance are to be considered with regard to :
   - employment,
   - volume outturn,
   - log export,
   - supply to local market,
   - quality and finish of export goods?

d) what approach should be used for the analyses?
e) how should the interaction between analyses and political assessment of plan alternatives be facilitated?
f) should policy development be regarded as part of the planning process?
g) should pulp and paper production be considered?

III DATA REQUIREMENTS

In order to relate the sector plan to real life conditions, sets of basic information are required. These refer to:

a) information on capacity and geographic location of:

   - the forest resources,
   - internal and external markets for forest products,
   - the existing timber processing industries, and
   - transport infrastructure within the State and to outside markets;

b) costs of:

- harvesting the resource and bringing the harvested material to industry sites and export outlets,
- processing in existing and anticipated new industries,
- expanding and/or reducing existing industry capacity,
- expanding and improving existing transport infrastructure,
- marketing and sales of logs and processed timber products, and
- bringing the produce to the consumers;

c) data on capacity and efficiency of competing producers;

d) information on:

- the economic, social and natural environment in which the plan is to be implemented,
- the legal and traditional policy framework which will affect plan implementation, and
- national plans and aspirations of which the forest sector development is expected to be an integral part.

It should be noted that the policy framework which affects plan development and implementation is not fixed but can be change in order to assist the realization of development objectives in other sectors or to promote desired developments in the forestry sector. Such policy changes are normal features of development.

The Project has only limited allocations for data collection and analyses. It is assumed that all relevant information is available and can be extracted and compiled with small inputs of Project resources. In other words, this attempt to develop strategies and plans for forest sector development is to be based on existing information, supplemented with limited efforts to obtain additional data. It is therefor essential that the best and most up-to-date data sources are identified and used in the analysis which forms the basis for this attempt to develop strategies and plans.

An incidental result of the Project may be the identification of those areas which need to be given priority attention for data collection in subsequent efforts to improve and further develop strategies and plans for forest sector development.

In the following is presented a review of the data that need to be obtained, and suggestions regarding in which form they should be compiled. The data coverage, especially with regard to the resource, is not uniform and complete. Some desired data may not be available at all. In those cases substitute values need to be derived, based on experiences elsewhere or knowledge of comparable situations. The quality of the data base will therefore be un-even. This weakness may not, in the final analysis, be a serious obstacle to the plan development, but need to be kept in mind when decisions on plan implementation are taken.

The market aspects of the sector analysis is given little detailed attention and only limited search for recent data is suggested. The reason for this is that the depression in the world has created a market situation which, though not abnormal, is far from normal, and current and recent data may give a distorted impression of what the long term outlook may be. This should not be interpreted as indicating that information on the timber market, as it is developing during the depression, is of little interest and value to the industry. In the context of this Project it has, however, limited interest and the limited resources available to the Project can yield more useful results in other data areas.

The suggested data collection efforts are presented in four sections:

- Forest Resources,
- Forest Industries,
- Transport and
- Markets.

In addition, it is anticipated that information will be required to correctly account for environmental and social aspects in plan development. This is briefly discussed in two separate sections.

Harvesting (logging) is included under Forest Resources.

IV FOREST RESOURCES

All data that have been collected on the forest resources of Sarawak are available with the Forest Department. They have been obtained through the Department's own inventory and mapping work and through inventories carried out by concession holders.

The data should be compiled in the following way.

1. The State should be divided into natural timber basins, on topographic maps, and resource references should be given on these maps, or the timber basin boundaries should be transferred to resources maps (point 2. below).

   For the purpose of planning the State forest sector, and based on impressions gained from maps only, it appears feasible to divide the State into 8 planning units as follows.

   1. Kuching, Samarahan and Sri Aman Divisions,

   2. Sarikei Division and Sibu District W of Oya river basin (W of Dalat District),

   3. Song and Kapit Districts,

   4. Dalat, Mukah and Tatau Districts,

   5. Bintulu and Miri Districts,

   6. Belaga District,

   7. Baram River basin (Marudi District),

   8. Limbang Division.

2. The resource should be described for each of the timber basins identified above and as far as possible for identified sub-divisions of these basins. If forest types have been identified and outlined on maps, these type units would be feasible forest units for the purpose of planning. Ideally, the resource should be stratified on a volume basis or, if possible, volume/dominant-economic-species basis. The sub-divisions - timber basins, sub-basins and/or forest types - should be marked on resources maps. The area of forest in each sub-division should be determined. If possible, the data for each unit (sub-basin, forest stratum, etc.) should be presented in a species/diameter matrix as given below, where the species are grouped in accordance with their acceptance by industry and markets.

   Silviculturally treated areas and areas in which forest plantations have been established should be given separate identifications and descriptions.

The record for each described unit could be as follows:

Map reference..... Planning unit no..... Division(s).....
..... District(s).....
Area ..... ha

Volume:

	DIAMETER GROUP			
	-60	45-60	30-45	-30
SPECIES GROUPS		cu. m. per ha		
Fully accepted				
Partially accepted				
Potential				
Non commercial				

Silvicultural treatment of natural stand: year..... Nature of treatment.....
.....

It is understood that the Forest Management Units, which have been established by the Department and which constitute inventory units, often extend over (straddle) administrative boundaries and that, therefore, an inventory unit may not entirely fit into a planning unit as defined above. In the lowland, where the boundaries between the natural basins are not so pronounced, this is not a problem. There the planning unit boundaries can be altered. In the hilly areas, on the other hand, where the basin boundaries are well defined, it may be necessary to divide an inventory unit and make estimates of standing volume in the two parts, though that may result is lower reliability of these estimates than is standard for the inventory units.

The maps together with the descriptions of the resource strata constitute the resources maps.

3. Information on "normal" defect occurrence should, if available, be given. Areas which markedly deviates from this "normal" should be identified and the nature and magnitude of the deviation should be given.

4. All areas in which the utilization of the timber resources is restricted, partially or totally prohibited, should be marked on the resources maps or on an overlays for these map. Plans for extension of such areas and for reservation of new areas should also be identified on the map material. The description of the areas affected by restrictions could be as follows:

Map reference.....Planning unit no.....Division(s).....
.....District(s).....
Category of forest (reserve).....
Area.....ha
Establishment year and year and nature of change of status and extent of area.....
Details of restrictions.....

5. Current concessions and concessions where logging is completed or terminated should be given on a separate set of maps or overlays to the resources maps. For each concession should be marked which areas have been logged and which areas are to be logged in he next five years. If the concession documents specify volumes to be taken out, or maximum volumes that can be removed, this should be indicated, on the maps or in accompanying documents, with reference to the concessions as identified on the maps. If data are available, it would be useful to have, for the logged over areas, information on volumes removed.

The concession record could have the following format:

Map reference.....Concession identification.....
Total area.....ha.
Year of granting..... Duration....years
Size of area to be logged annually.....ha.
Volume to be removed annually.....cu. m.
Area logged to date.....ha. Volume removed to date.... cu.m.

It may be feasible to combine the forest resources records (point 2 above) and the concession records into a common format.

6. A separate set of maps showing forested land suitable for agricultural production and land cleared for agriculture but not suitable for that purpose. Any firm plans to clear forest land for agricultural development should also be indicated on the maps.

7. A map or set of maps showing current land use should be available as reference material. It could be combined with the land suitability information maps mentioned in point 6. above.

8. A set of maps showing terrain obstacles for logging - steep land, swamps, erosion sensitive land, broken or gully terrain, etc. should be prepared. If logging in an area can have detrimental effects on wildlife and down stream fishing, this should be indicated on the maps. These maps should also show known deposits of rocks and boulders in the low land areas (road building material).

9. Data on damage from logging in stands of varying type (species, volume) and at varying logging intensity should be obtained. (The information of interest is that on viable stands remaining after logging.) Studies on this aspect have been made, in Sarawak, by FAO and the Forest Department.

10. Data on growth and yield should be collected and compiled. The data should as far as possible be specific for stand, soil and climatic conditions and to logging intencity and silvicultural treatments applied to the stands. Ideally the data should be presented in a matrix in the same way as those for growing stock (point 2 above).

11. Costs of silivicultural treatments, and the manpower requirements for these treatments, should be compiled. The data should, as far as possible, be specific for stand conditions and intensity of treatment.

12. Costs of logging in various terrain and stand conditions should be collected and compiled. The data should as far as possible be specific for logging methods and logging intensities. Separate estimates should be given for machine inputs and manpower. The amount of manpower - man days/weeks/months/year - required should also be specified.

The few studies on logging costs, which have been conducted in Sarawak, are more than ten years old. However, the methods of logging have changed little, only the costs of the various inputs have changed. It would, therefore, be possible to up-date the studies and obtain reasonably accurate estimates of current logging costs.

The studies on logging costs, referred to above, also provides a basis for estimating manpower requirements in hill logging.

A recent study on employment in the timber industry provides up-to-date data on various categories of personnel currently employed in logging and transport activities, in hill logging as well as in swamp logging. The data has been supplied by the industries and may contain some errors due to missunderstanding of what data to be included for the various activities and how to account for personnel common for several operations, such as administrative staff, maintenance and service personnel, etc.

As pointed out, the study on logging costs is old and the study on employment in the timber industry is troubled by inconsistencies in the data supplied by the industries. It would, therefore, be useful if additional, up-to-date data could be collected in order to verify the validity of the two studies and thereby strengthen the confidence in the estimates of manpower requirements of the forest sector. The study could be conducted as a sample survey of logging contractors and be part of the data collecting efforts of the Project, provided that time and budget resources allow and that the required staff time can be made available.

V FOREST INDUSTRIES

Some data on the forest based industries are available with the Forestry Department. Other sets of data, especially those on capacity and capacity utilization, can be obtained from the Sarawak Forest Industries Development Corporation.

In order to provide the information required for sector planning, it will be necessary to combine and compile data from the Department and from the Corporation and to supplement these data with additional information collected from the individual industries.

A general question is if there are constraints, imposed or to be imposed, on the industry which need to be considered, for instance :

- availability of skills
- availability of investment capital
- export restrictions
- import restrictions
- location of processing plants
- employees benefits
- taxation.

Information on these constraints is required.

It should be kept in mind when collecting industry data that they often refer to aspects of business activities that are regarded, by the industry owners, as confidential or of sensitive nature. The industries may not be prepared to provide the information, and the data, when they are given, may be bias in one direction or another.

The following format for data collection and compilation is suggested.

Identification number.....Type of Industry.....

Owner.....

1. Location.....

Land tenure.....

2. Year of establishment .....Year of major change....

Nature of change.....

3. **Investment**

Land and buildings,	RM.....	Year.....
	RM.....	Year.....
Mill machinery,	RM.....	Year.....
	RM.....	Year.....
Logging and transport machinery	RM.....	Year.....
	RM.....	Year.....
	RM.....	Year.....

4. **Machines** and facilities (number and dimensions/capacity):

Head rigs	.....
Pony rigs	.....
Re-saws	.....
Edgers	.....
Trim saws	.....
Dry kilns	.....
Lathes	.....
Dryers	.....
Trimmers	.....
Composers	.....
Glue spreaders	.....
Cold presses	.....
Hot presses	.....
Trimmers	.....
Sanders	.....
Moulding machines	.....
Trim saws	.....
Planers	.....
Sanders	.....
Dryers	.....

Power source .....

Log handling equipment .....

Residues handling and disposal .....

.....

Other .....

.....

5. Rated **capacity** (in cu m output, spec. dimension):

Sawnwood rough, green ..... dried.....

Sawnwood planed.....

Veneer.....

Plywood.....

Mouldings.....

6. **Input** of logs:

1993 (6 months)..... 1992..... 1991..... 1990.....

7. **Output** of finished products:

Sawnwood:

1993 (6 months)

Rough sawn, green ..... cu m; main dimension(s).....

Kiln dried ..... cu m; main dimension(s).....

Planed ..... cu m; main dimension(s).....

1992

Rough sawn, green ..... cu m; main dimension(s).....

Kiln dried ..... cu m; main dimension(s).....

Planed ..... cu m; main dimension(s).....

1991

Rough sawn, green ..... cu m; main dimension(s).....

Kiln dried ..... cu m; main dimension(s).....

Planed ..... cu m; main dimension(s).....

1990

Rough sawn, green ..... cu m; main dimension(s).....

Kiln dried ..... cu m; main dimension(s).....

Planed ..... cu m; main dimension(s).....

Veneer (not going into plywood):

1993 (6 months).....; main dimension(s).....

1992..... ; main dimension(s).....

1991..... ; main dimension(s).....

1990..... ; main dimension(s).....

Plywood:

1993 (6 months).....; main dimension(s).....

1992..... ; main dimension(s).....

1991..... ; main dimension(s).....

1990..... ; main dimension(s).....

Mouldings:

1993 (6 months).....; main dimension(s).....

1992..... ; main dimension(s).....

1991..... ; main dimension(s).....

1990..... ; main dimension(s).....

8. **Personnel**:

Managerial..... Supervisory..... Clerical.....

Workers: Skilled, Malaysian male..... female.....

non-Malaysian male..... female.....

Unskilled, Malaysian male..... female.....

non-Malaysian male..... female.....

Workers' wages: Skilled, male..... female.....

Unskilled, male..... female.....

9. Capacity **utilization**:

Operating days per year .....

Operating shifts per day .....

Operating hours per shift .....

10. **Timber supply**:

	Own concession	Purchase
1993 (6 months)	.....	.....
1992	.....	.....
1991	.....	.....
1990	.....	.....

Source of purchase (concessionaire, middle men, etc.).....

.....

11. **Marketing** (describe; own marketing, state board, etc,):

.....

.....

.....

12. **Sales**:

Local, quantity 1993 (6 months).....1992.....1991.....1990.....

Method: (describe; own sales organization, buyers' organization, agencies, etc):.....

.....

.....

Export, quantity 1993 (6 months).....1992.....1991.....1990.....

Method (describe; own sales organization, buyers' organization, agencies, etc):.....

.....

.....

Grading (rules and method):.....

.....

.....

13. **Transport:**

Logs

Own facilities ....

....

....

....

Purchased services, percent of total.....

Finished products

Own facilities ....

....

....

....

Purchased services, percent of total.....

Administration and supervision

Own facilities ....

....

....

....

Purchased services, percent of total.....

14. **Concession** operations:

Total production of logs, 1993 (6 months).... 1992..... 1991..... 1990.....

Supply to own mill, 1993 (6 months)..... 1992..... 1991..... 1990.....

15. **Supplies:**

Consumption, specified on mill operations, forest Operations and transport, in quantities of major items, in 1992

Petrol .....(mill) .....(forest)

Diesel .....(mill) .....(forest)

Lubricant .....(mill) .....(forest)

Electricity .....

Wood fuel, own supply....., purchased.....

Spare parts .....(mill) .....(forest)

Saws (band, circular, gang) .....(mill)

Peeler knives .....(mill)

Glue .....(mill) Filler .....(mill)

Hardener .....(mill) Water .....(mill)

Packaging material.....(mill)

16. **Plans** (for investment, production, etc., indicate when the plans are to be realized and how strong the commitment is):

.....

.....

.....

.....

17. **Production expenditures** in 1992

	Mill	Forest
Log purchase	.....	
Equipment purchase	.....	.....
Spare parts	.....	.....
Electricity	.....	.....
Consumables	.....	.....
Personnel	.....	.....
Services	.....	.....
Finance	.....	.....
Other	_____	_____
Total		

18. **Sales (revenues)** in 1992

	Export	Local
Logs	.....	.....
Sawnwood	.....	.....
Veneer	.....	.....
Plywood	.....	.....
Residues	.....	.....
Power	.....	.....
Consumables	.....	.....
Services	.....	.....
Other	_____	_____
Total		

An effort to collect information on employment in wood based industries has recently been completed and provides a basis for assessing current manpower availability in the wood processing establishments and also provides data for estimating future manpower requirements. As mentioned under IV Forest Resources above, the study results may, however, contain some errors due to missunderstanding of what data to be included for the various production activities and how to account for personnel common for several operations. It is therefore necessary to be very cautious when using the data provided by the study.

VI TRANSPORT

The information on transport which is required for forest sector analysis and planning is generally not available with the Forest Department but can be obtained from other departments such as Public Works Department, Road Transport Department and Sarawak Port Authority, and from the logging industry, trucking companies and shipping firms.

In the following is specified the information that need to be collected and the material that should be prepared.

1. A set of maps showing existing roads, including serviceable concession roads, especially access roads. Load and traffic restrictions should be indicated.

   Planned new roads should be marked on maps and the year when they are expected to be ready for use should be indicated. Load or traffic restrictions for these planned roads should be stated.

2. Information on the navigability of the rivers should be marked on a map with reference to four methods of transportation:
   - Ships
   - Barges
   - Timber rafts
   - Speed boats

   The information on navigability should refer to favourable and unfavourable river conditions. (High and low water; if high water conditions pose danger, this should be indicated.)

3. Ports and anchorages should be identified on maps and their limitations described. Restrictions with regard to access to these ports and anchorages, from the coast, should be described.

   Plans for changing existing and establishing new port and anchorage facilities should be obtained and presented in relevant detail.

   Information on charges for using port and anchorage facilities and the capacity of loading and ship supply facilities should be obtained and recorded.

   The description of ports and anchorages could have the following format:

   Map reference..... Port/Anchorage
   Draught restriction..... Length restriction.....
   Access restrictions (describe).....
   .....
   Conditions of use (describe).....
   .....
   Facilities offered (describe).....
   .....

   Charges:

Facility	Charge
1.....	.....
2.....	.....
3.....	.....
4.....	.....

4. Road transport cost will be required, specified for logs, sawnwood, plywood and general cargo. If there are variations, for areas or road segments, this should be detailed and the reason for the variation should be indicated.

   Terminal costs - loading and unloading - should, when they are obtainable, be given separate.

5. River transport rates for barges and river crafts, for logs, sawnwood, plywood and general cargo should be obtained. Variations in the rates, for river sections, origins and destinations, should be detailed.

   For logs, also costs of rafting should be obtained.

   Terminal costs should be obtained for each cargo category and any variations, referring to terminal, should be given.

6. Coastal freight rates (for destinations on the Borneo coast) should be specified for logs, sawnwood, plywood and general cargo. Terminal costs should be specified, if available.

7. Freight rates for logs, sawnwood, plywood and general cargo to and from Singapore, Taiwan, major Japanese timber ports and major destinations in Italy and Holland will be required. The rates should refer to important Sarawak export points.

8. Freight rates from main Indonesian export points to the destinations mentioned in 7. above should be obtained.

9. Trans-shipment points, which may be used by timber and timber products exporters in Sarawak, should be identified and the costs involved in using these trans-shipment points should be obtained.

   Cost of shipping from these trans-shipment points to major destinations, as mentioned in 7. above, should be obtained. Similarly, shipping costs from Sarawak outlets to these trans-shipment points should be specified.

It should be noted that shipping costs are seldom fixed rates, but determined by negotiations for each shipment. What is referred to as rates in the above points are average or most common costs quoted by shipping lines, shipping companies and exporters.

Ideally, the shipping costs mentioned in points 6 through 9 above should be presented in a matrix in which the ports and anchorages constitute the two axes.

VII MARKETS

It has been mentioned earlier that no extensive efforts should be made to collect and analyze recent market data. The information, which is listed below as needed for the Project, constitute the minimum information required for guiding a first sector planning effort. If, during the time the Project is being executed, further information is regarded as essential for fulfilling the objectives of the Project, or the market situation reverts to more normal conditions, it may be necessary to up-date the data base.

A portion of the information identified below as required by the Project is available with the Forest Department. Sarawak Timber Industries Development Corporation, Department of Statistics, ITTO, FAO, Ministry of Forestry of Indonesia and various export firms are other possible sources of information.

The initial requirement of information gathering is as follows.

A. INTERNAL (SARAWAK) MARKET

1. Derive apparent consumption of sawnwood, plywood mouldings and poles for the State for a period of at least ten years. It would be possible to derive these data from the statistics contained in the Annual Report of the Forest Department, Sarawak and the estimates which are the basis for those statistics.

2. Obtain consumption data for sawnwood, plywood, mouldings and poles for a period of time, preferably longer than 10 years, for various parts of Sarawak. If such data are not available for the entire state, effort should be made to arrive at estimates for population centers, such as Kuching, Sibu, Bintulu and Miri along the coast and Kapit and Marudi in the inland.

3. Price information for key timber products in the main consumption points should be obtained.

4. Population data for the state and for the areas or centers, for which consumption data are obtained, should be collected and the trend in these data determined.

5. Data on State GDP need to be obtained and the trend in these data derived. If it is possible, income data for key population centers should be determined and possible future trend in these data should be explored.

6. Investigate the following points:

   a) Is it possible to determine the quality (grade) of the timber consumed in the local, State, market? Is it only export rejects that goes to that market or is the industry catering for a more sophisticated local consumption?

   b) Is there a shift from manually shaped timber products to products manufactured in sawmills, plywood mills and moulding plants?

   c) Is there a shift to or from wood, from or to other building material, such as concrete and metal?

   d) If these shifts are apparent, can they be quantified?

B. EXPORT MARKET

The market study should initially concentrate on obtaining an impression of in which markets and for which products Sarawak has or can develop competitive advantages over other suppliers. The advantages are in first hand CIF price (or production and transport costs) and in second hand reliability with respect to delivery commitments and quality.

1. Obtain historic data on export from Sarawak, Sabah, (Peninsular Malaysia), Indonesia and other countries in the region which has or may have an influence on the timber trade. For all practical purposes, only countries which have had or have the potential to export 2 million cu m annually should be considered individually. Those with lower potential can be grouped together.

   The data should refer to logs. sawnwood, plywood and mouldings and be specified by destination - Regional S.E Asia, Japan, Middle East, USA and Europe.

   Trends in export - quantity, product category and direction - should be determined.

2. The trend in apparent consumption of logs, sawnwood, plywood and mouldings in the above consumption areas should be derived. Special emphasis should be given to the S.E. Asia region.

3. Historic production data, for logs, sawnwood, plywood and mouldings, should be obtained for countries in the S.E. Asia region. Information should also be obtained with regard to future outlook for production in key areas, such as Burma, Thailand, Laos, Peninsular Malaysia, Sarawak, Sabah, Indonesia and PNG. The basis for the estimates should be potential log production, but also potential industry production should be considered.

4. The derived trends in apparent consumption (point 2 above) and potential future production (point 3 above) should be combined into wood balance and product balance outlooks for S.E. Asia and likely supply potential of the region to the rest of the world.

5. Production cost data for logging and industrial processing of timber in Sarawak should be obtained from the resource and industry investigation teams. Transport and shipping cost data should be collected. (See also VI Transport)

6. Price data for timber and timber products exported from different parts of Sabah and Indonesia should be obtained. If possible, also production cost data for these competing production areas should be collected.

7. The wood balance outlooks and the export supply potential options derived as indicated in 4. above and the production cost and price data derived as indicated in 5. and 6, should be combined to obtain indication of in what markets and for which products Sarawak may have competitive advantages and in what parts of the State these advantages are apparent.

When comparing average prices, obtained from Trade Statistics or Forest Department Annual Reports, it is important to verify that they refer to the same mix of products (dimensions, quality and finish) and points of delivery.

It may be necessary to give attention to the change in export market demand which may have been caused by the liberalization of trade in East Europe and the former Soviet Union.

VIII ENVIRONMENT

Some research into the effects on environment of forest operations has been done by the Forest Department (for instance on the effects of logging roads on stream flow and water supply), and other institutions in Sarawak may have carried out research on one aspect or another of environmental effects of forest utilization. Only limited results appear to be available.

Research into the environmental effects of various forest operations have been carried out or are in progress in other parts of the Tropics. Some of the results from these research efforts may be applicable to Sarawak.

The over all situation is that it is not possible to measure, in economic or physical terms, the effects of forest operations on the natural environment. Also detailed knowledge of the gradual changes, which takes place in undisturbed nature, the changes against which the effects of forest operations should be measured, is to a great extent lacking.

The fact that the impact on the environment of forest operations can not be measured and quantified in a manner which is useful to an economic analysis does not mean that the effects can be ignored. These effects represent costs and, in few cases, benefits, to the economy and must therefore be considered. They can not be included in the mathematical evaluations, but have to be part of the "political" assessments, or interpretations, of the analyses results.

It may be possible to estimate, in some situations, the maximum environmental costs an operation is allowed to cause, in order to be viable, or the minimum environmental value an operation has to yield, in order to be justified. Such estimates should be done to assist or support the "political" assessments but they can not replace them.

IX SOCIAL ASPECTS

The implementation of a forest development plan in Sarawak, where the forest sector provides such a substantial share of he total economy, is bound to affect, directly and indirectly, the economic and social environment of people throughout the State.

The expansion or reduction of activities in forestry, forest industries and forest products trade will in many ways affect the lives of people. It will have repercussion on services provided by the state and by the private sector, direct employment will change, generated employment and earning - multiplier effects - will increase or decrease, the demand for specific skills will be affected, etc.

The effects, which the implementation of a specific forest sector plan will have outside the forest sector, is very important and need to be considered when deciding what strategies and plans are to be adopted. It may be desirable to take these generated social/economic effects into consideration when evaluating achievements, by plan options, toward stated objectives. This would require specific data sets and evaluation techniques, outside the area of competence of a Forest Department, and would, therefore, call for assistance from specialists in economic and social sciences.

X PROJECT PLAN

The Project Document allocates thirteen months for Project execution. Of this period, one month is reserved for start-up of the Project, including appointment of Project Manager, establishment of an advisory committee and installation of planning consultant.

The work with the Project can be divided into four phases:

a) **Planning** of Project activities, including start-up, assignment of staff and selection of supporting consultants,

b) **Data collection**, data analysis, and exploratory planning,

c) **Interaction** with decision makers in the Government to obtain their advise on the choice of policies, strategies and plan options; it may be advisable to consult also organizations and institutions outside the Government, and

d) **Plan formulation** and reporting.

The planning phase aims at determining in detail what activities should be undertaken, who should do the job, where the activities should take place, what the output of the activities should be, when the activities should be completed and in what form the results should be presented. This phase can be expected to be completed in two months.

The data collecting phase, which covers information on the forest resources, the forest industries, the markets for forest products and of transport facilities and costs, need to be completed at the end of the ninth month, which means that 7 to 8 months can be allocated for this phase. The data collection need not wait for the completion of the planning phase, but should start as soon as possible. The required work input can be estimated as follows:

i) Resources, 14 man months,
ii) Industries, 12 man months,
iii) Markets, 3 man months, and
iv) Transport, 3 man months.

The main sector analysis work should take place in the interaction phase and involves outlining various plan options, assessing the likely results, with regard to political objectives, of implementing the options, discussing these results with decision makers in the State administration and with individuals, organizations and institutions outside the Government. The result of the phase should be a choice, by the Government, of strategies and a plan for forest sector development. The phase should be completed in a period of two months and will require a manpower input amounting to three man months plus six man months of analyses work, which can be started already in the data collocting phase and continue in the reporting phase and spread over a longer period of time.

The final phase of plan compilation and reporting will require two months in which the manpower requirement will be 2 to 3 man months.

The various activities which are to be performed during the Project are not necessarily confined to one single phase as outlined above, but may take place in two or more phases. For instance, the analysis work should, as mentioned earlier, commence as soon as data start to come in during the data collecting phase, continue through the interaction phase and be finalized in the reporting phase. This is illustrated in Graph 1.

The required personnel input can be estimated as follows:

Activity	Expatriate input in man months	Local
Project planning	1-2	1
Resource data collection	2	12
Industry data collection	1-2	10
Market data collection	1	2
Transport data collection	1	2
Sector analysis	3	3
Sector planning	2-3	3
Interaction	1	2
Report preparation	1	1
Total	13-16	35

The expatriate inputs for project planning, sector analysis, sector planning, interaction and report preparation can be made by one and the same officer (8-10 months). Similarly, one expatriate officer should be able to cover industry and transport data collection (2-3 months).

A condenced work plan is given in Diagram 2.

The time estimates given above require that activities can be executed without delay. Two activities are specifically critical for the completion of the Project on time:

(i) resource data collection which involves collection and compilation of large amounts of information over a very limited period of time, and

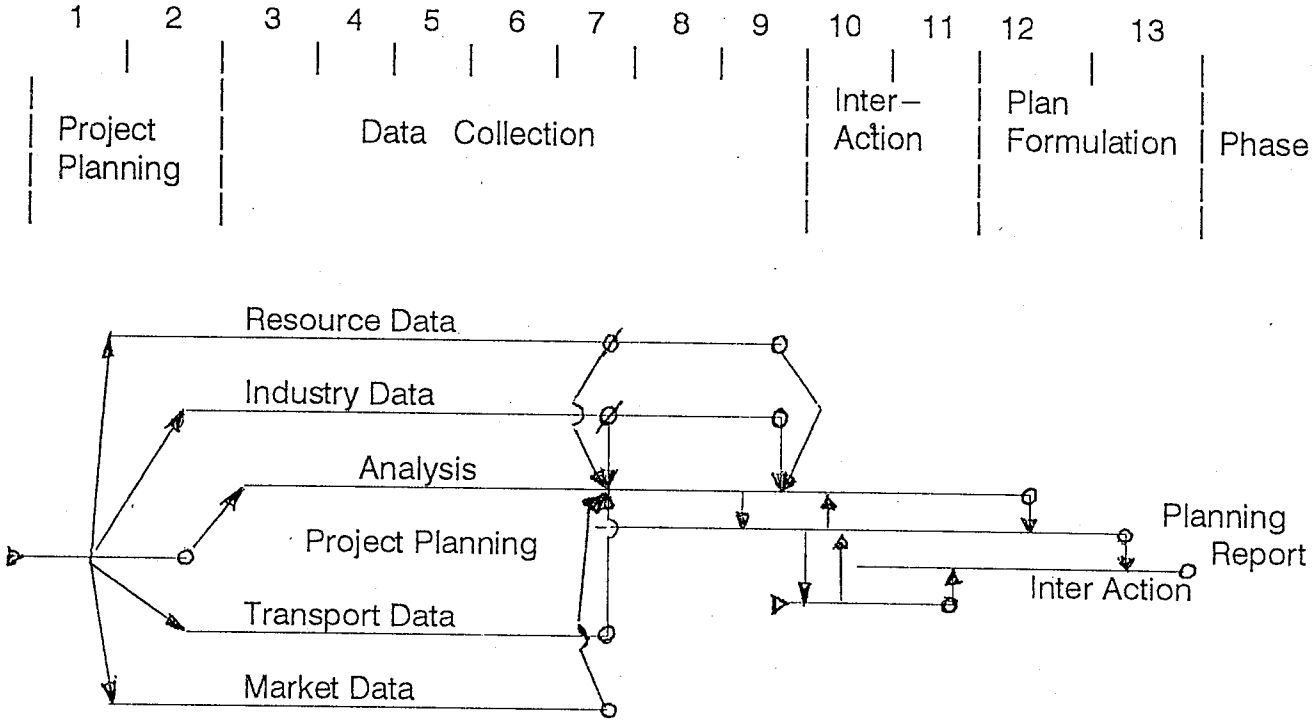
(ii) interaction with decision makers in the Government, and relevant individuals outside the Government, which is expected to take place during a defined two months period. This activity requires that key officials in the Government are available during that time and are able to allocate a substantial portion of their time for active participation in the plan development process.

In the case of resource data collection it is possible to make up for time lost by providing additional manpower, but in the interaction case, no such corrective measures are available.

It can be anticipated that the following Government departments and institutions and non-government organizations need to be consulted.

1 Ministry of Resource Planning
2 Ministry of Industrial Development
3 Ministry of Infrastructure
4 State Planning Unit
5 Department of Statistics
6 Labour Department
7 STIDC
8 STA
9 Timber industries associations
10 SAM

DIAGRAM 1



▷ Earliest Starting Date

⌀ Intermediate Results

o Work Completed

____ Activity

↓ Information, Instruction, Decision Flows

DIAGRAM 2

WORK PLAN