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HIGH-LEVEL ADVICE TO WOOD PRODUCTS INDUSTRY  
EXPANSION AND INVESTMENT PROMOTION

SI/GUY/90/802

GUYANA

Terminal report\*

Prepared for the Government of the Republic of Guyana  
by the United Nations Industrial Development Organization,  
acting as executing agency for the United Nations Development Programme

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\* This document has not been edited.

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**ABBREVIATIONS and TERMINOLOGY**

AFC	Assistant Commissioner of Forests
cu.m.	cubic meter
dbhob	diameter at breast height (1.3 m above ground)
CF	Commissioner of Forests
concession	used here for areas over which companies have exclusive harvesting rights
fob	free on board
GFC	Guyana Forest Commission
GoG	Government of Guyana
GNRA	Guyana Natural Resources Agency
GUYMIDA	Guyana Manufacturing Industry Development Agency
H	Hoppus measure
ha.	hectare
K	thousands
km.	kilometer
m.	meter
Melanesia	used here to refer to Papua New Guinea, Solomon Islands and Vanuatu
mln.	million
NFAP	National Forestry Action Plan
p.a.	per annum
TMU	Timber Marketing Unit (within GFC)
UNIDO	United Nations Industrial Development Organisation
\$	United States dollar
G\$	Guyana Dollar

**CONVERSION RATES**

US \$ 1 - G \$ 125

## I SUMMARY

As down stream manufacturing operations has been the subject of numerous reports and technical assistance missions over the past few years, this report concentrates on forest management and primary processing aspects of the forestry sector.

The essential elements considered necessary for a secure forest products industry, making a sufficient contribution to the national economy are:

- \* An adequately financed forest management regime that meet internationally acceptable standards for sustainable operations, and
- \* An investment climate which will allow a well equipped, well managed forest products industry, adding maximum value to the forest harvest, to make a reasonable return on investment, utilising a broad range of species.

The current forest management regime and data available is unlikely to be adequate to meet the requirements of the international community to assess that the natural forests of Guyana are being managed on sustainable basis, if the allowable cut is increased as expected.

The NFAP has been in process of implementation for over four years, but difficulties in supplying counterpart staff and funds has delayed action to the point that there is very little to show for that time. Implementation of the plan is of considerable importance for demonstration of the intent of Guyana to manage its forests in a manner that will be judged to be acceptable by the major tropical timber importing countries. Failure to do so will place exports of timber at risk, therefore the entire industry.

New investors have taken the initiative and are using external organisations to assess their operational performance from an environmental view.

The Forest Act needs review with the objective of strengthening the GFC's powers to specify numerous aspects of forest management and harvesting control which are vital to future forest management.

Development of a profitable and sustainable industry contributing substantially to the national wealth, is very much dependent on the implementation of active forest management. This must obviously be paid for, and the traditional method is through royalty or stumpage charges. Royalty rates in Guyana are currently at an incredibly low level. This report proposes that these be substantially increased, but in a way that not only raises revenue but also promotes greater species usage, hence more efficient use of the forest.

As part of the general move for more efficient forest usage it is probably desirable that minimum cutting limits be raised considerably

for premium species. This will prevent or at least reduce the impact of smaller diameter trees in the second and subsequent cutting cycles.

The investment climate in Guyana has been particularly adverse, but this is changing. However much of the effort to secure liquidity for the government has reduced the potential for investment by domestically owned companies and individuals. Many of the revenue raising measures are in fact a tax on production rather than consumption.

Unless the government accepts that its appropriate role in business is to create conditions that will induce investment in wealth and employment creating assets and activities, little sustainable investment is likely to occur.

The forest sector has become severely debilitated as a result of past economic policies and this is not likely to improve significantly, except through "new" foreign investment, unless the existing domestically owned industry is provided the opportunity to rehabilitate itself. Unless the tax regime is altered, to enhance investment in production assets and activities, the majority of the domestically owned industry is likely to continue to decline.

Industry needs now to seriously review its objectives if it is to make sound investment decisions. There is a great danger that the inefficient capital usage that has occurred in the past will continue, and even accelerate, unless industry leaders look beyond their own borders for information and investment planning skills.

Because of the nature of the species in the forests of Guyana, they would do well to look to the West Pacific, rather than North America and Europe for mill design and operational methods. There are sufficient examples of inappropriate equipment and mill designs based on softwood milling techniques without adding to the problem.

Government and at least some elements of the industry will have to come to realise that industrial development is the result of market development, not the cause. Government will need to assist in the market development by ensuring that industry can be run competitively and has the flexibility to respond to market opportunities without delay.

Industry will need to cooperate to a much greater degree than appears to have been the case in the past if reliable markets are to be developed, both export and domestic. Much of that cooperation will have to be in the marketing area, but human resource development is another area in urgent need of attention.

Regulation of the standards of use of products is a far more effective way to influence the products being manufactured than to regulate the manufacturing process itself. The latter tends to stifle innovation which is necessary for maintenance of competitiveness.



Enhancement of markets will depend in part on manufacture of value added products. This should however be approached with caution because merely applying further manufacture may not add value. The costs of additional manufacture can exceed the increased value with consequent loss in returns.

Shipping difficulties and costs undoubtedly inhibited exports in the past but these problems are well on the way to being overcome. However larger shipments in larger ships would greatly assist the industry in accessing export markets, particularly in the rapidly developing West Pacific.

**I. THE PRESENT STATUS AND DEVELOPMENT POTENTIAL OF THE  
FOREST PRODUCTS INDUSTRY IN GUYANA**

**A. THE POTENTIAL**

- 1 If a conservative 50 % of the forest now reserved for production is considered suitable for sustained yield calculations, the potential annual log yield from the natural forests of Guyana could well be as much as 3 mln. cu.m. At the rates proposed in this report, this volume would produce, for the State, an annual stumpage revenue of about G\$ 1 bln. (\$ 8 mln.), and could result in direct employment in harvesting and primary processing of about 20,000. Employment generation in downstream and associated activities could run to a further 40,000.
- 2 Contribution to GDP would probably exceed G\$ 45 bln.(\$ 360 mln.). Given the low domestic consumption of timber products, the bulk of the production would be available for export and could be a significant source of "hard" foreign exchange. Imported input costs would not exceed about 50 % of output values, leaving a net direct financial contribution to the national economy of G\$ 22 bln. (\$175 mln) in the medium term. In the short term the contribution would probably be reduced by offshore interest payments, as it is doubtful whether there would be sufficient funds available locally for the level of investment required.
- 3 The major constraints to attainment of this potential are related to the forest itself, particularly the management regime applied, and to government attitude to its role in industry development. Investors will only participate where commercial advantage can be reasonably expected.
- 4 The investment required to process the volume cited above is very considerable, about \$ 500 mln., and it is probable that the major portion would have to come from off-shore. Some of it is in the process of being invested now by new "players", but the additional investment will still have to be very large.
- 5 There would inevitably be a decline in product prices on the domestic market because of the over supply tendency of products not meeting export specifications, thereby alleviating the current housing problems, and this would be accompanied by an improvement in the grade of material available for the domestic market.
- 6 Recovery from log and general efficiency could be improved dramatically as a result of investment in more appropriate sawing machinery and log and lumber handling equipment.

**B. REALISATION OF THE POTENTIAL**

- 7 Achievement of this potential requires:

- \* security of forest resource.
- \* efficient concession allocation and forest usage.

- \* active forest management which is environmentally sensitive.
  - \* a realistic royalty or stumpage rate that provides for forest management to ensure the future crop
  - \* substantial investment in roading and harvesting equipment.
  - \* improved log and lumber handling equipment in sawmills.
  - \* a change in the type of major sawmill machinery.
  - \* increased species usage.
  - \* expanded product lines with emphasis on timber treatment and kiln drying.
  - \* strictly enforced quality assurance programs.
  - \* expanded outlets in secure market areas through promotion.
  - \* A royalty (or stumpage) structure that provides for full forest ownership and management costs
  - \* a taxation regime that encourages investment and employment
- 8 The forest resource underpins all forest industry activities. The long term contribution of the forest industry to the economy of Guyana is dependent as much on the forest management regimes applied in the natural forest, as on development and management of the industry itself, hence it is not possible to realistically consider the industry in isolation.
- 9 The government will need to perceive its role in business as the creation, to the extent possible, of conditions that induce investment in assets and activities that will generate corporate, and indirectly, national wealth.
- 10 Instruction of industry to undertake specific courses of action, or produce certain products, works only in times of national emergency, so inducement, through financial regulation remains the only viable and efficient approach.

### C. THE FOREST RESOURCE

#### a. Extent and Commercial Suitability

- 11 The area of forest currently considered suitable and available for harvest is 7.7 mln. ha. Of this, 5.4 mln. ha. has been allocated, though 1.7 mln. ha. is under short term allocation (see Attachment 3). There is no data on the net area harvested to date nor the period in which it was harvested.
- 12 The forests of Guyana have a limited commercial value at present, because of the diversity and nature of the species, and the very limited occurrence of high value species. Even Greenheart compares unfavourably with South East Asian and Melanesian species. For comparison Meranti logs are regularly selling at well over \$ 280 a cu.m. fob, Sarawak (march 1993 \$ 500), while Mixed Light Hardwood logs from Melanesia obtain average prices above \$110 and the better sawlog species above \$ 140 a cu.m. (march 1993 \$ 320). Sawn special purpose timbers exported from Guyana are currently selling at about \$ 350 a cu.m., which is equivalent to a log value of little over \$ 100 a cu.m. when reasonable recovery from log and sawing costs are allowed for.

- 13 It is very difficult to confirm that any one species, other than the 4 to 5 known in the international trade, can be regularly supplied in even a small quantity. Even the known species are available in only limited amount, largely because there is no great quantity of them in the forest. Virtually all species have to be treated as "specialist", for marketing purposes (see Attachment 1)
- 14 Because there are no forest plantations in Guyana, except for minor trials, and there are not yet firm plans for any significant plantation establishment program, the future of the industry is dependent on continued access to the natural forests. It is imperative that these forests be actively managed if export of forest products is to continue indefinitely.

b. Forest Policy and Legislation

- 15 Guyana has no formally approved Forest Policy and the existing legislation is inadequate for current and future needs (see Chapter V).
- 16 In order that necessary new forestry legislation can be soundly based, it is essential that the National Forest Policy be formally adopted as soon as possible. A draft Policy was formulated in 1988, but no further action has been taken.
- 17 The existing draft should be reviewed to ensure it is sufficiently comprehensive and that priorities are as required. It should then be published as a parliamentary "white paper" and made available for public comment. After incorporation of any desirable suggestions from the public response, a final draft should be prepared and submitted to Parliament for formal approval.
- 18 A new Forestry Act should be composed as soon as the Policy has been accepted. This legislation should address those aspects of current legislation that reduce the effectiveness of the Guyana Forests Commission, environmental protection and forest management. Aspects of current legislation that in reality will always be beyond the technical competence of the GFC should be deleted, as they are more properly the function of other Government instrumentalities.
- 19 It is considered that external assistance should be sought for final drafting of the National Forest Policy and the Forestry Act. For preparation of the Policy and of the drafting instructions for the Act, it would be better that this assistance not be in the form of a legal expert. A legal expert is required only to translate the instructions into a sound law.
- 20 If the Government of Guyana determines that it requires legal advice, this should be provided at the time the Act is to be drafted, and it may be necessary to recall the technical assistance expert used for formulation of the Policy and the drafting instructions for the Act, to ensure that the proposed Act does in fact facilitate the operations of the GFC and that it is understandable by GFC staff who will be charged with its implementation.

c. Forest Management

- 21 Sustainable management is concerned with the harvest of net growth of commercial species. The initial cut must remove some of the accumulated capital to produce a thrifty stand, giving as large a net growth as possible under the stand treatment applied. It is unlikely that the second cut will yield more than about 60 % of the initial cut unless the cutting cycle is very long, or Timber Stand Improvement (TSI) is applied to reduce competition from non-commercial species.
- 22 There is insufficient data on the forest resource, particularly net productive area as determined for the second and subsequent cutting cycles, and individual tree diameter growth rates under the stand conditions created by the initial harvest (see Attachment 3) to make confident predictions of net growth, hence cutting cycle length.
- 23 The present minimum cutting diameter limit of 34 cm. for most species, if actually applied by industry, could dramatically reduce average diameter of trees in the second cutting cycle, if a 20 year cycle is used. This will impact the type of product that can be manufactured as production of high value wide boards require large diameter logs. It will not be possible to produce the large section ( up to 40 \* 40 cm) heavy construction timbers from trees with a maximum diameter of about 42 cm.
- 24 This consultant has reservations about the growth rate anticipated ( 1 cu.m p.ha. p.a.), because no provision is made for Timber Stand Improvement (TSI) operations. It is suggested that a minimum cutting cycle of 40 years be considered for stands where TSI is not carried out, and that concession allocation policy should assume a cycle of 50 years, to provide a safety margin and some opportunity for future expansion of the enterprise.
- 25 The GFC should prepare forest harvesting guidelines ( as a "Code of Practice") which are designed to minimise adverse environmental impacts and protect the future crop. These should be so worded that they can be adequately monitored and interpretation should, where possible, be capable of measurable definition. The guidelines should have legal authority under the Forestry Act and be applicable to all operations in forests, including mining activities carried out in State Forests.
- 26 It would be desirable that external assistance be obtained for formulation of these guidelines, as there is no appropriate experience available in the GFC.
- 27 Forest Management Plans have been legally required under the Act for areas covered by Timber Sales Agreements, for a number of years. Only two plans so far submitted could be classed as an acceptable blueprint for operations. Both are from new investors. Four others are being upgraded to an acceptable standard, but this indicates that the great majority of operators have no acceptable forest working plan.

- 28 The printed "guidelines" for preparation of these plans is not sufficiently specific to assist concession holders in ensuring that all aspects are covered in adequate detail. Smaller operators, who have never before prepared detailed logging plans have had difficulty as a result.
- 29 The Forest Management Plan will be used as a guide to monitoring actual operations when field staff have been properly trained in roading and logging standards.
- 30 Current forest management practices are inadequate to maximise yield and information available is unlikely to be sufficient to demonstrate that the GFC is in fact in control of forest utilisation. This could make operations in natural forest for export purposes difficult within a few years.
- 31 It is urgent that the development of the NFAP be upgraded through increased government support by provision of both adequate counterpart staff and financial resources, and more importantly, that government demonstrate the political will to develop the economic role of the sector through active forest management and well planned and efficient forest utilisation.
- 32 No action is being taken to improve the productivity of areas which are now unproductive. This will require TSI to at least cut vines, bamboo and "weed" species. This is not possible now because funds are not available. The increased royalty rates proposed in this report would at least partially solve this problem, but it may be necessary to involve the concession holders in this activity.
- 33 In general the philosophy of the GFC and new investors does indicate a desire to operate in an environmentally sensitive manner, and many of the practises of the larger established operations are better than practised in other major tropical forest areas. It is essential that the same philosophies be adopted by all forest sector operators.

d. Concession Allocation Policy

- 34 Resource security can only be provided by government. Steps have been taken to achieve this, but the majority of businesses (though minor in output) have negligible security. There are valid reasons not to extend a high level of security to many of those businesses as they now exist. Provision of resource security to inefficient operations will defeat the government objective of improving the economic contribution from the sector (see Attachment 4).
- 35 The terms under which resource security could be offered may include responsibility for forest management. The Canadian system of "evergreen" leases, if adequately monitored and enforced, could be a suitable model. In the case of natural forests in Guyana this would require a renewable lease which always provides a minimum lease life of one cutting cycle, reputedly 20 but more likely over 35 years. This security would of course be dependent on achievement of forest management activities defined and monitored by the GFC. Forest management achievement would have to be judged on physical output rather than financial input.

- 36 A thorough review of virtually all concessions is warranted to improve forest usage. Under present circumstances much of the commercial forest area is being held in an unproductive condition. Concession holders should be required to demonstrate their ability to fully utilise the resource held or the surplus area should be surrendered for re-allocation.
- 37 The objective of concession allocation policy should be to more accurately equate the resource with the financial/technical ability or demonstrable intent of the concession holder to utilise the resource efficiently.
- 38 If the presently anticipated, but completely unproven, sustainable yield of 1 cu.m. per ha. p.a. is correct, most concessions are much larger than is required to meet log requirements as indicated by the installed processing capacity of holders. Even at a growth rate of half this, many concessions appear to be too large.
- 39 Forest harvest is largely restricted to prime species. This has the immediate effect of increasing harvesting costs because of low yield per ha. because road construction costs are amortised over a low volume.
- 40 The longer term effect is that the trees retained, mainly of low or no commercial value, will inhibit growth of the desirable residuals, hence either increasing the length of the cutting cycle, or reducing the available volume at the second cut. There is also a probability that there will be a significant shift (reduction) in the proportion of prime species available in the second cut.

e. Log Royalty Rates

- 41 Log royalty rates are extremely low when compared with other countries producing tropical timbers, and in "real" terms are far lower than they were as recently as 1989. The rates are the lowest of any for natural tropical species sawlogs known to this consultant. They do not provide any opportunity whatsoever for the government to influence species usage and would be insufficient to fund even minimal forest management by the GFC. In finished product form, the maximum difference in cost of sales generated by royalty differences alone would be about G\$ 0.54 a bd. ft. (\$ 1.82 a cu.m.)
- 42 As is illustrated in table 1-1, royalty values in US \$ terms have fallen markedly in the past 5 years in both current and real terms.
- 43 Typical differences in species prices for green off saw rough sawn timber (before consumption tax) are in the order of \$ 70 a cu.m. The added profit margin generated by using premium species for any application is about \$ 68 a cu.m. This serves as a very compelling disincentive for industry to promote the lesser known species.
- 44 The consumer price index ceased to be calculated in Guyana in 1989, hence calculation of a "real" royalty value in G \$ is not practicable. On conversion to US \$, and application of the Foreign Price Indicator (measure of international price movements in major

trading countries) using 1992 as the base year, it can be seen that royalty values have declined dramatically. Present real values are some 16 % of values in 1988. To bring royalties back to previous real levels, an increase of over 600 % would be necessary. However the rates applicable in 1989 were very low and an even greater rise in rates should be considered.

- 45 It is difficult to compare royalty rates in other countries harvesting tropical hardwoods because in many cases the charge for the logs harvested includes a royalty charge and charges for log export ( Malaysia, Melanesia<sup>1</sup>) often with an additional payment to the landowners ( Melanesia). Typical aggregate charges run from a low of about \$ 25 to a high of over \$ 100 a cu.m. For logs processed in the country, royalties and charges range from about \$ 6 to \$ 25 a cu.m.

Table 1-1: Comparison of royalty values per cu.m. 1988 - 1992

Species Group	Measure	Year				
		1988	1989	1990	1991	1992
Premium	current G \$	55.37	55.37	55.37	110.75	110.75
	current US \$	5.54	1.68	1.23	0.90	0.89
	real US \$	6.22	1.87	1.32	0.92	0.89
Class I	current G \$	37.10	37.10	37.10	74.20	74.20
	current US \$	3.71	1.12	0.82	0.60	0.59
	real US \$	4.17	1.26	0.88	0.62	0.59
Class II	current G \$	27.69	27.69	27.69	55.37	55.37
	current US \$	2.77	0.84	0.62	0.45	0.44
	real US \$	3.11	0.94	0.66	0.46	0.44
Class III	current G \$	17.44	17.44	17.44	34.88	34.88
	current US \$	3.71	1.12	0.82	0.28	0.28
	real US \$	1.96	0.59	0.42	0.29	0.28

- 46 As part of a package that would reduce industry costs for other inputs, it would be advisable to increase royalty rates. It is proposed that ~~minimum~~ rates be set as shown in table 1-2.
- 47 At a moderate sawn recovery of 40%, these changes would increase the cost of production of Premium species by about G\$ 3.92 a board foot (\$ 13.29 a cu.m.), or less than 5 % of the domestic sale price, and Class I species by G\$ 1.69. There would be no change in Class II species and the change would be negligible for Class III.
- 48 For export timbers a price increase of about 4 % would cover the cost

<sup>1</sup> Papua New Guinea, Solomon Islands



increase. As dealt with in chapter 6, this increase is overdue.

Table 1-2: Proposed minimum royalty rates

species group	current rate	proposed rate
Premium species	G\$ 4.00/cu.ft.H \$ 0.89/cu.m.	G\$ 28.00/cu.ft.H \$ 6.20/cu.m.
Class I	G\$ 2.68/cu.ft.H \$ 0.59/cu.m.	G\$ 13.00/cu.ft.H \$ 2.88/cu.m.
Class II	G\$ 2.00/cu.ft.H \$ 0.44/cu.m.	G\$ 2.00/cu.ft.H \$ 0.44/cu.m.
Class III	G\$ 0.63/cu.ft.H \$ 0.28/cu.m.	G\$ 2.00/cu.ft.H \$ 0.44/cu.m.

- 49 These changes would create a significant difference in production costs between Premium and Class II and III species. This difference would be sufficient to enable substitution of treated timber of Class II for Premium species in light construction. At 40% recovery the production cost difference, resulting from royalty charges is about G\$ 4.25 a board foot. This would cover the cost of dip diffusion treatment of the lower Class timbers.
- 50 A stumpage appraisal system would be preferred but may be too difficult to implement at this stage, because of the low efficiency of harvesting and processing operations and lack of reliable data on costs and sales values. This could however be a longer term objective and industry should be put on notice of this intention. This would of itself serve as a spur to increased efficiency, if "reasonable" costs rather than actual were used to determine average industry costs as required in a stumpage appraisal system.
- 51 As part of a package of financial inducements, and only as part of a package, royalty rates on Premium and Class I species should be greatly increased. It is emphasised that this action will be destructive rather than constructive, unless it is applied as one element of a comprehensive package that in fact improves the investment potential of the industry.

#### D. FOREST INDUSTRY

##### a. Current Status and Immediate Investment Needs

- 52 The domestically owned forest products industry in Guyana has been in decline for a considerable time. In part this follows from investment and operational decisions taken by industry itself, but past government policy has had a major impact on the ability of the industry to perform the role in national development now deemed appropriate. This combination has seriously reduced the financial capacity of the industry to take any advantage of improved economic conditions.
- 53 New investors have been able to enter the industry on relatively favourable terms, hence their ability to lead improvements in

- efficiency and product development is relatively high. It would be wrong to judge "established" industry against the new investor standards until the investment climate provides them with the opportunities to re-equip and adjust to the commercial realities of the international forest products industry.
- 54 Production levels are still substantially below that of only a few years ago, but are rising. Sawmilling production is running at about 25 to 30 % of capacity, with a number of mills producing virtually nothing.
- 55 The only plymill is running at less than 50 % of single shift capacity and only 2 to 3 furniture manufacturers are operating at anything even approaching capacity.
- 56 It is claimed that all sawn timber produced can be readily sold, though at least one major producer was discounting to clear accumulated stocks. Most production for domestic consumption is sold green-off-saw, with a small proportion dressed and moulded green.
- 57 No seasoning of timber is carried out except by two furniture manufacturers. Output is for their own use and they do not have the capacity to do custom drying.
- 58 In general the industry has been unable to provide reserves from after tax profits to meet equipment replacement costs, and maintenance has been severely curtailed. The rapid and massive devaluation of the Guyana dollar, has prevented capital equipment cost recovery, through depreciation allowances, in real terms.
- 59 Immediate investment needs are in roading and harvesting equipment, but substantial new investment in processing, and log and lumber handling equipment, is also required if product development is to be effective and downstream manufacturing is to be encouraged.
- 60 The following comments apply mainly to "established" industry participants, but there is room for improvement by new players as well.

(i) **Forest Harvesting**

- 61 Forest harvesting operations are inefficient because of lack of information on the forest, lack of detailed planning and lack of reliable and appropriate equipment. Many harvesting machines are over 20 years old. While in some operations new and appropriate equipment and methods may marginally increase log extraction and delivery costs in the short term, because of increased depreciation charges, immediate benefits would be felt in the processing plants which have been operating at a low level, largely because of an inability to maintain log supplies.
- 62 To a very substantial extent the industry has relied on water transport for delivery of logs to mill. However as harvest areas are located further from rivers this will have to change.

- 63 Road construction and maintenance standards are not adequate to efficiently sustain supplies to the processing operations. While this can be partly solved by investment, it appears that road construction and maintenance has been neglected for reasons other than lack of funds for equipment. The addition of further extraction machines would not greatly assist, unless road standards are markedly improved.
- 64 Unfortunately past neglect of roading will have to be rectified, at considerable immediate cost, before any benefits are derived. This will place an even greater strain on the cash flow of enterprises at a time when cash flow is already marginal, if at all positive. Established businesses are unlikely to be able to fund this "catch-up" construction unless some relief is obtained from taxes and other charges.
- 65 Small enterprises will not be able to undertake this activity unless some amalgamation of harvesting capacity is devised. It is suggested elsewhere that there are sound reasons for encouraging amalgamation of processing capacity. This would be logically tied to similar action in forest harvesting.
- 66 An alternative to amalgamation may be specialisation, whereby roading and haulage are carried out by contractors for a number of extraction operations. Existing operators may find this more acceptable.
- 67 Until the roading and haulage problems are rectified most enterprises will continue to operate at a fraction of sawmill design capacity, hence the sector will not make its expected and possible contribution to the national economy.

(ii) Sawmills

- 68 Sawmills are operating at only a fraction of their design capacity. This is blamed on log supply problems, but solution of this problem would reveal an even greater problem in mill equipment.
- 69 Historically, timber export activity in Guyana has been focused on large section heavy construction members, generally as squares, rough sawn and green. Sawmills were designed to meet this activity, and this inhibits a change of focus towards furniture and other display timber usage, as most mills do not have the design or equipment required for the flexibility necessary for efficient processing of tropical hardwoods. There has been only a very limited attempt to alter this focus by the sawmilling industry.
- 70 The investment emphasis in the past has been on sawmilling equipment, specifically sawing equipment. The majority of mills have inadequate log and lumber handling machinery to allow the saws to achieve anything like their design capacity. While log delivery problems have dominated productivity levels in recent years, solution of that problem will quickly reveal the sawmill design and equipment deficiencies.
- 71 Improvement in mill design and provision of ancillary equipment could increase mill capacity by a factor of 2 to 3 in many cases. This

would exacerbate the existing low saw utilisation unless investment in roading and haulage plant is greatly increased.

- 72 Equipment in most mills is not the most appropriate for general sawing of tropical hardwoods, particularly if accurate sawing on the back or quarter is required, as is the case in most high value furniture, and many precision construction applications. This will inhibit export development in value added products, particularly high quality furniture.
- 73 The majority of major sawmills in Guyana lack three essential characteristics essential for efficient processing of tropical hardwoods:
- \* the ability to taper saw logs.
  - \* the ability to turn the log after the opening cut is made, and
  - \* the capacity to kiln dry.
- 74 While there has been some move away from gang frame saws for breaking down logs and most final product cutting, the industry is still highly dependent on machines designed for use on species which are substantially free of internal defect and for logs sorted on diameter. Unfortunately tropical hardwoods are notorious for internal defect.
- 75 Most of the larger mills have their own power production units for prime supply, and the rest have stand-by units because of the unreliability of the national distribution system. In almost all cases the power production capacity is very high for the designed sawn output. If sawmills are re-equipped they would have power capacity from existing sources to run driers and dressing and moulding machinery.
- 76 The industry has been able to partly contain costs only because of the present very low wage structure in the country. The current mood for greatly increased wages could rapidly wipe out the limited profitability now being obtained.

(iii) Timber seasoning

- 77 No mills now provide air dried timber let alone kiln dried.
- 78 Major investment is required in timber seasoning facilities and general sawn timber handling. Some mills are starting to consider this and to test systems. Kiln construction is imaginative but for large scale production, reliance on proven kiln designs is suggested. This will require a very substantial investment, but the ability to guarantee the moisture content, particularly on export sales warrants this outlay.
- 79 It would be preferable that the technology not involve the use of steam if there is not now a steam boiler with spare capacity on site. Hot water or oil units are easier to maintain, particularly where there is a high content of salts, and do not require certificated boiler attendants.

(iv) **Timber Treatment**

- 80 If the lesser valued species are to find a place in the market it will be essential that preservative treatment facilities be installed. These need not be very expensive if diffusion treatments are used but there will need to be a special effort made to ensure that ground water is not contaminated.
- 81 Pressure treatment is much more expensive to set up, but the ability to use treated product in high hazard applications is an attraction. However only a limited number of species are likely to be susceptible to treatment at normal pressures used in the industry. All species can be treated by the dip diffusion process.
- 82 In addition, the environmental controls required for a high volume treated timber facility can themselves far exceed the cost of the treatment machinery itself.

(iv) **Other**

- 83 There are plans to expand plywood manufacturing facilities in addition to that planned by Barama Company. It may be more rational if intending investors were to sell logs to Barama or at least veneer, as there will be severe competition to dispose of "fall down" grades of plywood on the domestic market, and the smaller investors are unlikely to be able to survive any price war.
- 84 There is interest being shown in developing a sliced veneer industry and this should be actively encouraged by government with special "pioneer" industry investment conditions.

b. Investment Climate

(i) **Investment Policy**

- 85 The investment climate has shown signs of improvement and the Government of Guyana has indicated that a positive effort will be made to accelerate this trend. However, with current financial problems, the government is not in a strong position to rapidly improve the investment climate through financial reforms, such as reduction of tariffs and excise duties on industry inputs, or through reduction in marketing costs such the consumption tax.
- 86 The government declared a dramatic change in policy in 1988, spelled out in "The Guyana Investment Policy" (State Paper, July 1988). The Policy includes quite extensive waiver provisions for taxes and government charges, with emphasis on those which promote exports.
- 87 Protection against expropriation and nationalisation of businesses is now provided by Guyana becoming a signatory to the International Convention on the Settlement of Investment Disputes between States and Nationals of other States and of the Multilateral Investment Guarantee Agreement. This has made it possible for foreign investors to seriously consider engaging in industrial activities in Guyana.

88 To qualify for these investment incentives the investor must meet certain criteria:

- \* contributions to foreign exchange earning or saving;
- \* creation of significant employment opportunities consistent with the production process;
- \* promotion of natural resource development;
- \* use of locally produced raw materials and other local inputs;
- \* ability of the investor to finance his operations, including his capital needs from off-shore sources.

89 The last of these is difficult if not impossible for the domestically owned businesses to meet. This may mean that existing businesses wishing to re-equip or expand cannot qualify.

90 It does not clearly spell out how the policy will be implemented, but in application it appears that the policy as it is applied, is designed to attract new investors rather than new investment, even where the investor has simply taken over an existing business. This is particularly evident in the forest sector where two run down government owned businesses were sold to foreign investors under very favourable terms.

91 Because of the quite radical change in government in late 1992 it is difficult yet, to assess the probable impact of any changed emphasis in policy, on the forest products industry. Indeed these policies have yet to be identified, though there is an air of optimism in industry.

(ii) **Impact on Industry**

92 Application of the Policy has created two quite distinct forest industry groups. On one hand there are the established enterprises which have survived the debilitating conditions of the past 15 or so years. These are all domestically owned, generally as family enterprises. On the other are foreign owned, recent investments. In only one of the latter cases has there been a totally new investment, the other two have taken over existing, run down, operations.

93 In view of the rapidly changing and well known tropical hardwood supply conditions, the government has negotiated a very poor contract with recent industry investors. A very substantial potential for revenue, essential for management of the future forest crop, has been foregone. In addition these contracts will make it very difficult for existing (and domestically owned) industry to compete without massive and immediate restructuring, if at all.

(a) New Investors

94 In general, new investors have been able to negotiate very favourable conditions which have not been available to existing enterprises. In no case is the new investment a "pioneer" industry, as there are no firm plans to produce new products. In fact it is established businesses that are most active in new product development.

- 95 It is probably difficult now to renegotiate conditions of these new investments so it may be necessary to accept that the country was poorly served and accept that these new investments will directly contribute little to government revenue in the short or even medium term, and they will make inroads into the existing markets of that part of the industry that has survived the past decade of national economic decline.
- 96 Whether these investments will provide increased net economic benefit to the country in the long term will emerge in time, but short term benefits will be limited.
- 97 It is paradoxical that two pre-existing enterprises have been able to obtain favoured treatment under the Investment Policy, simply by changing ownership. This seems to suggest that a change of ownership of the majority of forest industry enterprises could result in a considerable improvement in their competitive position.
- 98 To suggest that domestic enterprises should undertake an apparent change in ownership to improve their chances of receiving equitable treatment would be an impractical subterfuge. This is hardly the objective of the policy, but it may be the best solution for established industry.
- 99 It would make far more sense to extend investment conditions on an industry basis, rather than an enterprise basis.

(b) Existing Domestic Businesses

- 100 The recent changes in the confidence of industry in future development, has created a situation where companies are starting the compilation of investment plans. However sufficient information is not yet available for preparation of competent feasibility studies. It is probable that such studies will not be undertaken, but rather ad hoc decisions will predominate, resulting in inefficient capital use.
- 101 As practised, the investment policy is penalising the existing industry. Regardless of stated intent, new investors, engaged in the same type of processing, will compete on existing markets, both domestic and export, if they produce the same products. This is particularly so for the domestic market, because all producers will have a proportion of their product unsuited to export markets. Typically this amounts to 25 % to 40 % of total sales for sawn timber, but would be a deal less than this for panel products.
- 102 This is likely to reduce prices on the domestic market and it is claimed that new investors have engaged in discounting to move stock which does not meet export specification.
- 103 If domestic prices fall as a result of the ability of "favoured" investors to discount prices, the viability of other producers will fall, reducing even further their possibility of qualifying as a "favoured" investor because they have less chance of being able to fund industrial expansion. The taxes and charges from which new investors are exempt, contribute about 30% or more to production

costs by other producers.

- 104 The net result of such a situation is of course a reduction in the ability of established business to compete on either the domestic or export markets and thus worsen an already poor investment climate for them.
- 105 It is possible that the established industry will continue to decline unless conditions are adjusted to enable them to compete on reasonable terms with new investors.
- 106 There have been some changes in industry ownership and organisation and this trend may have to continue if the sector is to achieve its potential.

(iii) Industry Options

- 107 The capacity of the industry itself to finance its rehabilitation is poor. Some companies are owned by groups in which there are associated companies that have the capacity to generate profits and these may be used as a source of development capital. Where this situation does not exist, other options may have to be considered.
- 108 All domestic wood processing enterprises in Guyana are privately owned, most as family companies. Whether many of the owners would be prepared to sell equity is doubtful, however it is an option that they should, and may have to consider. Those owners who seek to rapidly expand the size of their businesses may have few other options available.
- 109 Public float of companies would be possible when a stock exchange commences operation in Guyana. This is proposed but progress appears to be slow. However as suggested above the potential for loss of control of the business by existing owners would be an even greater deterrent than if shares were sold by private treaty.
- 110 The multitude of small participants in the harvesting and primary processing sector present special problems. Their survival has almost certainly been the result of very low personal income earning rates and low overheads, rather than operational efficiency.
- 111 The small logging concerns should be encouraged to amalgamate into a lesser number of operational units, so that some economies of scale in road construction and other forest operations requiring changed technique, can be achieved. Improved tenure of forest resource could be used as an inducement for amalgamation. This tenure may be for periods similar to that allowed under Timber Sales Agreements.
- 112 Encouragement should be given to small sawmilling enterprises to amalgamate or at least specialise. The majority of these enterprises are not financially able to re-equip outdated, inappropriate and worn out mills.
- 113 Provision of low interest, long term finance for housing would expand domestic timber demand, assisting the timber industry.



b. Investment Constraints

- 114 The national economy has been plagued by a very high inflation rate and a massive devaluation of the currency, accompanied by very high interest rates and difficulty in obtaining foreign "hard" currency for imports. Investment conditions were highly uncertain. Even since promulgation of the new "Guyana Investment Policy" the exchange rate has dropped from G\$ 33 to G\$ 125 to the US \$.
- 115 However the currency value has been fairly stable now for 2 years and there is greater confidence regarding political stability and government intent.
- 116 While foreign currency is now more readily available, interest rates are still high and there is uncertainty about inflation, because of pent up pressure for a wage "catch up". World trade conditions have been poor, the conditions for investment are still a long way from ideal.
- 117 The major current constraint on new investors is the lack of available forest for concession allocation. The major constraint claimed by existing businesses on new investment, is lack of funds for even repairs and maintenance, let alone expansion of capacity.
- 118 CIDA had planned on providing financial facilities under relatively good interest and repayment terms for equipment rehabilitation and replacement, but this offer was negated by government refusal to accept an integral element of the offer that import duties be waived. It is significant that industry could not then purchase new harvesting equipment and this has lead directly to a decline in productivity.
- 119 Bank interest rates are currently about 26 %, down from 36 % a year ago. Few if any forest industry investments could afford rates at this level if the new investment is to be geared at a not unusual debt:equity ratio of about 2:1.
- 120 Where a new product is to be produced, and that product would be exported or would be a major import substitute, approval of additional inducement to investment would be appropriate. This is common in many countries where "pioneer" status is accorded to such investment, and inducements along the lines being offered to new investors in Guyana, are available. The key is the product, not the investor. While the investor rather than product is the target, domestic industry is likely to suffer.
- 121 Depreciation of the currency has had a serious impact on the ability of companies to amortise investment expenditure. Table 1-3 illustrates that recovery of the "real" value of plant through depreciation has been effected to the extent that plant replacement from after tax savings is virtually impossible.
- 122 If a straight line depreciation schedule is assumed on plant costing G\$ 3,000 (\$ 1,000) in 1983, and the period is ten years the depreciation allowance in G\$ for taxation purposes can be seen to recover only 39 % of the real cost as expressed in U.S. dollars.

This has resulted in taxation obligations that have seriously decreased the opportunity for saving of funds for plant replacement. The depreciation deficit is the US\$ amount not allowed for taxation purposes and the tax on deficit is the additional tax paid at the rate ruling at the time. The "profit loss" is the after tax profit foregone in Guyana dollars because the "real" value in US dollars could not be written off. When the written down value is zero in Guyana dollars it is \$ 606.50 in US dollars. So in effect only a third of the "real" capital cost has been recouped through depreciation.

Table 1-3: Comparison of depreciation allowance and "real" replacement cost

year	Forex	Depreciation allowance		Depn deficit US\$	Tax on deficit US\$	Profit loss G\$
		G\$	US\$			
1983	3.00	300	100.00	0.0	0.00	0.00
1984	4.15	300	72.30	27.7	12.47	51.75
1985	4.15	300	72.30	27.7	12.47	51.75
1986	4.40	300	68.20	31.8	14.31	62.96
1987	10.00	300	30.00	70.0	31.50	315.00
1988	10.00	300	30.00	70.0	31.50	315.00
1989	33.00	300	9.10	90.9	40.91	1350.03
1990	45.00	300	6.70	93.3	41.99	1889.55
1991	120.00	300	2.50	97.5	43.88	5265.60
1992	125.00	300	2.40	97.6	34.16	4270.00
Total		3000	393.50	606.0	263.19	13571.64
WDV			0	606.50		

\* Corporate taxation rate reduced

- 123 A positive step that the government could take to upgrade industry capacity would be to allow companies to adjust past depreciation allowances to "real" terms, and write back to the books that part of depreciation that has been lost in real terms. If companies were then allowed to amortise this written back value over 2 to 3 years, funding of investment would be less dependent on high interest, bank money. The loss of short term government taxation revenue would be slight, but the increased production and employment resulting from investment induced would provide considerable longer term taxation revenue.

c. Taxes and Duties

- 124 The tax structure in Guyana is not conducive to investment in the industry because production is being heavily taxed through tariffs and consumption taxes, regardless of enterprise profitability. This does not apply to new foreign investment where most taxes and duties have been waived for up to ten years.

- 125 A review of tariffs, but more particularly consumption taxes, is required if the industry is to fulfil its role in the national economy through utilisation of a replaceable natural resource, in a manner that provides export earnings and supplies reasonably priced products for the residential construction and other domestic wood using sectors.
- 126 The use of taxation rebates for incremental exports, is a common practice that promotes export efforts. Expenditure on certain export promotion expenses is often claimable at eg. 150 % for taxation purposes.
- 127 The taxes and duties levied on importation of plant and equipment, combined with high interest rates, have caused industry to defer essential investment in logging equipment in particular and processing equipment in general.
- 128 The continued imposition of a consumption tax on machinery (tractors etc. 10 %, trucks etc. 30 %), fuel 50 %), will keep production costs high. This is particularly so for fuel as most mills generate their own power, using diesel generators.
- 129 Import duties and consumption taxes should be waived for any electricity generation equipment that uses wood as the heat source.
- 130 To encourage use of lesser known species, consumption taxes could be waived on designated species. At this stage the species list could include all but Premium species and a few of the Class 1 species.

#### F. Forest Products Marketing

- 131 The Timber Marketing Unit in the GFC has, through lack of funds and possibly motivation, virtually ceased to promote in export markets and has no role in domestic marketing.
- 132 The unit has been effectively reduced to a monitoring role, though it handles sales of about 5 % of total primary processed timber exports. It's role is mainly as an "order taker" for the industry.
- 133 For full marketing services it charges a fee of 6 % of the fob value. This is at the top of the range of marketing commissions. For a service that consists solely of approving the export price, the fee charged is 2 % of fob value. This presumably should be a contribution to promotion costs, but in fact this revenue is not directed to that purpose, so it has the effect of a tax on exports.
- 134 The most recent "guideline" price list used by the TMU was published in 1988. "Guideline" prices set by governments have a strong tendency to become not the floor prices they are intended to be, but a ceiling price. The industry has been handicapped by a ceiling price set over 4 years ago. There is no evidence that the TMU is sufficiently in touch with the market to be able to set prices.
- 135 Successful marketing requires a knowledge of production and of product development. The TMU is not close enough to industry to be

able to carry out these functions and does not appear to have attempted to do so. This lack of co-ordination has probably inhibited market development in the past, and must be doing so now.

- 136 The Timber Marketing Unit should cease its selling role, and should cease publication of "guideline" prices. A reorganised unit could continue to conduct grading for export timbers, and should strengthen its monitoring role in both the domestic and export markets. In this latter function Guyanese Overseas Missions could assist by supplying market intelligence, and Guyana should become a member of ITTO, from which much information is available.
- 137 The TMU staff should become involved in collection of information on the domestic market, and in co-operation with GFC research staff, an upgraded Guyana Technical Training Institute (GTTI), the University of Guyana (UG) and the Forest Producers Association (FPA), should promote product development and introduction of lesser known species to the domestic market.
- 138 During the past decade or so the industry in Guyana developed a poor reputation in international timber markets, because of delivery and quality problems. Overcoming this reputation will not be easy and it will be necessary that the "industry" rather than just individual enterprises move to restore confidence.

#### G. Product Development

- 139 The variety of sawn and panel products now being produced in Guyana is limited.
- 140 The bulk of exported timber is in large section heavy construction beams, with a lesser quantity of rough sawn and very little dressed and moulded timber. A small quantity of shingles, posts and poles are also exported. A low grade interior plywood is exported to the Caribbean.
- 141 No sawmill undertakes timber seasoning and in fact it is not possible to even buy air dried timber. This is inhibiting development of quality furniture manufacture.
- 142 Extension of the list of commercial species in Guyana is dependent on product development. However no rapid improvement is likely to occur because the lesser known species individually constitute a minute fraction of the stands.
- 143 The major potential product lines are considered below.

##### a. Pulp

- 144 The era of mixed tropical hardwoods as a pulpwood source for new investments is over. The rapid expansion of hardwood plantations designed specifically for pulp, particularly in southern and South East Asia, parts of South America, southern Africa, southern Europe and southern Australia will be the future hardwood pulp forest resource.

- 145 No pulp industry is likely to develop unless there is a deliberate government decision to promote this through a plantation program. Such a move does not seem feasible in the foreseeable future.

b. Reconstituted Board

- 146 There was a particle board plant in Guyana in the early 1960's but closed within 3 years. It is considered the difficulties of maintaining a consistent species mixture from tropical mixed forest make manufacture of any reconstituted panel a problem. It is unlikely that investment in this type of industry will be viable unless the timber is drawn from sawmill or plymill waste. As most major mills have to produce their own power this waste is likely to be limited.
- 147 It has been suggested that manufacture for domestic use and export to CARICOM countries may be possible, but no detailed feasibility studies have been carried out. This would only be warranted where large primary processing facilities are established within close proximity.

c. Other Panel Products

- 148 There is one operating plywood plant and a further plant should become operational by mid 1993. One sliced veneer plant is virtually complete and is expected to commence production by April 1993, but the product quality must be suspect at this stage.

(i) **Plywood**

- 149 Plywood manufacture, particularly if thick panel is produced appears to be the most promising method of increasing LKS usage, as many of these will be suitable for core and backs, if not cover. Manufacturing costs will probably be high but log cost should off-set this to some extent. Except as "face" the higher value species should not be used in plywood manufacture as they will have a higher value as sawn kiln dried boards for panelling and furniture.
- 150 It may be desirable to treat low durability veneer with a borax spray at the time of peeling to confer resistance to Lyctus.
- 151 Any production beyond that now planned seems unlikely but it would be to the nation's advantage if logs of LKS were sold to plywood producers from other concessions. This could be influenced by government through regulation of harvest.

(ii) **Veneer**

- 152 One of the most promising potential "new" wood products is sliced veneer and using the finer grained decorative species appears to be the most promising avenue for new product development. However it would be necessary to test market the product for some time before the considerable capital cost of a high quality veneer factory was committed by a local company.

- 153 This test marketing would be best achieved by allowing export of logs of selected species, to a sliced veneer producer in the target market area. This should be done only on the basis that a commitment be made, that the opportunity for the log buyer to participate in a joint venture production facility on a "pioneer" investment status, be made at the outset. The significance of the offering participation to the present log buyer is continuation of marketing capability from the commencement of domestic production and security for the buyer to justify product promotion costs.
- 154 It would be advantageous if joint ventures could be arranged with foreign organizations with established marketing expertise. Government could promote this development through tax exemptions and also by regulation of log harvest and processing.

d. Timber preservation

- 155 Preservation treatment, using the dip diffusion process could be readily introduced at very low capital cost to industry. This process is widely used and guidelines on treatment requirements and area where treatment has been mandatory for many applications for 30 years. The process is not suited to high hazard applications, ie marine, ground contact and wet areas.
- 156 Pressure impregnation processes will be much more costly to introduce, but would allow use of a wide range of species in high hazard applications provided they can be penetrated by the salts at reasonable pressures.
- 157 For either process, very strict controls to prevent water contamination at factory sites will be required.
- 158 Introduction of preservative treated timber would enable a greater proportion of lower value timbers to be used domestically in light construction releasing higher value timbers to be exported to earn foreign exchange.

e. Sawn timber seasoning

- 159 Growth of export markets will depend on expansion of seasoning and moulding capacity in sawmills. Importers and processors are finding it increasingly expensive to carry out kiln drying in the importing country, hence are buying a higher proportion of requirements in seasoned form.
- 160 A number of sawmills are investigating kiln drying and several have unused kilns on site. It is desirable that the government consider offering some inducement to companies prepared to undertake large scale seasoning.
- 161 At present the only working kilns are operated by furniture manufacturers. This is potentially inefficient as these kilns are small and tend to be designed to meet the requirements of the

furniture company alone. Whether additional capacity will ultimately be installed by furniture manufacturers, to meet other market needs is doubtful, at least in the short term.

- 162 This will lead to a situation where furniture timbers may be kiln dried but other timber will continue to be moulded in a green condition. This will inhibit the development of an export market in flooring and other dried products.
- 163 The production of seasoned products for the domestic market will not develop unless the market demands them. This can be encouraged through Building Codes and the influence of construction specifiers, such as architects and engineers.

#### H. Human Resource Development

- 164 There is an acute need for trade training in Guyana and in general, industry has little confidence in the skill levels of newly trained tradesmen, because of the extent to which the GTTI has been run down.
- 165 There is also a need to conduct training for logging crews. This would be best done under a "team training" concept, in which the necessary skills required by individual team members are taught, but the linkages between operations is emphasised. This is particularly important for the tree felling- log skidding relationship.
- 166 The Forest Industries Development Unit (FIDU) was established for the purposes of training, product development and timber research. It has been largely a failure.
- 167 In other developing countries, where educational institutions designed to assist the forestry sector have been located within a government department, which does not have education as its prime function, failure has been a common result. Such institutions are generally starved for funds, staff have no career path and almost inevitably, efforts are made to make them self financing, to the detriment of the training role.
- 168 It is recommended that the training functions be transferred to the GTTI, but that industry be called on to financially support this training. This could be achieved through allocation of a portion of royalty to training, with constraints on how these funds are spent.
- 169 It would be necessary that industry have a substantial supervisory role in course content and quality of training staff. This would be best achieved by appointing a Board consisting of government and industry representatives, which has "hire and fire" powers. A similar proposal has been made for the metal working industry, so that this would not be a special arrangement for one sector of training.
- 170 The course content should be determined in consultation with the industry, preferably through the Forest Products Association. Courses would be required in saw maintenance and timber machining,

with a considerable wood technology content. It would also be possible to arrange for short courses in sawmilling and timber drying, to be conducted in commercial sawmills and furniture factories. In these latter cases it is expected that expertise would be provided by international agencies.

- 171 The research function would be best conducted by the GFC in collaboration with the UG and the industry, as part of a product development program.
- 172 Training of field crews is more complex and must be carried out in the field. It would be preferable that a trainer be recruited to spend up to 12 months visiting different operating sites training harvesting crews in felling technique and skidding, with emphasis on the inter-dependency of these operations. An initial period, say 6 weeks, should be spent preparing a Manual



## II THE FOREST ESTATE

### A. Extent

- 173 Guyana is described as having a largely intact "rain" forest of some 16.3 mln.ha., representing 77 % of the total land surface of the country. However no data on the likely net productive area is available. Inspection of one company's operations planning maps suggests that a substantial proportion of the area will not be productive. Another company has indicated that due to swamps, some 25 % to 30 % of their concession is likely to be unproductive.
- 174 No definitive statement of the net area suitable for sustainable commercial timber production exists. It is essential for estimation of a national allowable cut under a sustained yield management regime, that this figure be determined, if creditability of claims that the forests are capable of sustained yield management, is to be established.
- 175 Because topography is relatively gentle in most of the potentially productive areas, it is possible that after deduction for roads and other permanent infrastructure, up to 65 % of the gross area may be considered as the net area on which the allowable cut under sustainable yield management may be calculated. This proportion would be high compared to South East Asia and Melanesia, hence should be treated with caution.
- 176 The rate of deforestation is unknown, but it is certainly occurring, particularly in the sand zone where charcoal and pole harvest is occurring and fire is common (Hellum, pers. comm. and own observation). The low population, resulting partly from emigration, has reduced this danger in the short term, but unless the GFC is adequately equipped and staffed to properly perform its custodial role, this will be a long term danger.
- 177 There is no reliable record of areas harvested in the past, even the relatively recent past, because no operational planning and record keeping was carried out in a systematic way.

### B. Forest Classification

- 178 There is no national forest classification system based on intended forest use, except for the broad declaration of State Forest, a National Park, and an area of some 360,000 ha. reserved for tropical forest research. For long term management control purposes it is necessary that a suitable classification exists. This determines the management regimes to be applied. It is important that the classifications are recognised in the Forestry Act.
- 179 This would be best done as an element in preparation of a national land use plan but in the absence of such planning, and only vague proposals to carry out this task, it is essential that some meaningful classification of forested areas be carried out without

delay, even if it is only provisional for some areas.

### C. Ownership and Custody

- 180 Ownership of all land not alienated, is vested in the State. This includes most if not all forested land. Under the Forestry Act (paragraph 13), all forest produce is presumed to belong to the State, and all land from which forest produce can be obtained is presumed to be State Forest, unless proven otherwise. This appears to infer that all land not held under private title, or assigned to a government body, is in fact State Forest, whether gazetted as such or not.
- 181 However in practice, only land declared to be State Forest is considered to be held in custody of the GFC.
- 182 The permanence of State Forest declarations is in some doubt as land can be excised from State Forest by ministerial rather than cabinet, decision.

### D. Accessibility

- 183 Accessibility to forests is restricted by lack of a major road system in the inland and the presence of rapids and waterfalls in the major rivers beyond about 100 km. from the sea. This deficiency is being slowly rectified by construction of a trans-national highway which will link to Brazil in the south west of the country, but access to land west of the Essequibo river, is likely to remain a problem for some time.
- 184 Access within present forest concessions is relatively simple, because topography is relatively gentle and little earthworks are required. Much of the forest concessions are on sandy soils, but clay ridges do cause problems in some areas because of lack of suitable road surfacing material.
- 185 There is relatively little well formed, all weather, road in the forest concessions. This will present long term forest management problems if that management is to extend beyond the level of "benign neglect" now employed. The 20 year cutting cycle and low initial volume removal suggests that active management, involving some Timber Stand Improvement work, may be required to achieve the projected growth of commercial species.

### E. Stand Density and Commercial Volume

- 186 Inventory data provided by an FAO mission in the late 1960's (Forest Industries Development Survey), suggested gross standing volumes (to an undefined top end diameter) in excess of 200 cu.m. per ha. over several million hectares then classified as State Forest. This included all trees above a dbh of 12 inches (30 cm.). Fanshaw (1954) compiled data on forests by region, on the basis of stocking (trees per acre) of trees over 16 " (41 cm) dbh. No estimate of

volume was recorded in the publication.

- 187 No reports seen attempt to assess the commercial volume, and it would require access to the field sheets to do this properly. From the data available and limited inspection of some forests, it is apparent that tree diameter in Guyana is relatively small for a "virgin" moist tropical forest. On the cutting diameter standards applied in tropical moist forest in South East Asia and Melanesia (varies from 50 to 60 cm), the forests of Guyana would be classed as "poor" in terms of commercial standing stock.
- 188 Of some 90 species recorded as cut from 1983 to 1989, 11 constitute about 80 % of the harvest, see table II-1.

table II-1: Log production by species, 1983 - 1992, cu.m.

species	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
Greenheart	13350	69451	79461	80808	92338	63673	51469	50477	53398	63277
Mora	13309	10435	9073	15914	13698	11601	8963	n.a.	n.a.	n.a.
Hububalli	1778	9157	12005	5901	10054	3451	11250	n.a.	n.a.	n.a.
Purpleheart	3371	9228	11502	12155	11357	5543	6229	n.a.	n.a.	n.a.
Kereti	7209	5991	6953	5897	4601	4257	4429	n.a.	n.a.	n.a.
Baromalli	5509	4113	2557	1534	2271	2450	2155	n.a.	n.a.	n.a.
Tauroniro	3399	3660	4303	3910	4527	4644	4153	n.a.	n.a.	n.a.
Shibadan	3728	3233	3814	2926	3218	2756	2706	n.a.	n.a.	n.a.
Hububalli	2985	4041	2911	2633	2838	2598	2466	n.a.	n.a.	n.a.
Crabwood	3314	2693	2593	3417	7668	6522	4987	n.a.	n.a.	n.a.
Locust	1242	2425	2261	2861	3437	1755	2500	n.a.	n.a.	n.a.
sub total	143394	124359	137433	140956	156217	119408	101106	n.a.	n.a.	n.a.
Other (78 spp)	11332	33618	35815	28017	29571	31951	30669	n.a.	n.a.	n.a.
Total	154726	157977	173248	168973	185829	151359	131774	123129	128598	139931
% frequency										
Greenheart	49.6	44.0	45.9	47.8	49.7	42.8	39.1	41.0	41.4	45.2
top 11 spp	32.4	78.7	79.3	83.4	84.0	77.9	75.7	n.a.	n.a.	n.a.

Source: GFC data

- 189 While the GFC unofficially prescribes a maximum harvest of 20 cu.m. per ha., few if any concessions actually yield this. Most concession holders do not know their actual yields, but it appears that an average of about 15 cu.m. is probable. The cutting diameter limit used is about 40 cm. in most TSA's, but many small diameter logs are also harvested for posts and poles, and even for sawlogs. Small diameter harvest appears to be more common in FHP's than TSA's. This small diameter harvest has serious implications for subsequent cutting cycles.

- 190 The Fanshaw data shows that in the seven forest areas<sup>1</sup> recognised in the 1940's, only 7 to 11 species constitute more than 2 % of the stand in numbers of trees. These species constitute between 51 % and 78 % of the stands. Details are shown in table II-2 .

table II-2: Species frequency, number of trees ( % ) in assessed forest areas

species	forest area						
	1	2a	2b	2c	2d	3	4
Baromalli	7.8	4.5	3.7	3.8	2.8	2.8	2.5
Crabwood	3.8	*	4.0	*	*	*	*
Dakama	*	*	*	*	2.5	11.6	*
Greenheart	*	16.8	11.5	13.2	16.6	*	5.2
Hauriballi	*	*	2.0	*	*	*	*
Kukuballi	2.2	*	*	*	*	6.1	3.5
Karakalli, black	13.0	5.6	11.8	3.2	4.9	2.6	3.7
Karakalli,	*	*	*	2.8	*	*	*
Kauhaballi	6.4	2.4	*	*	*	*	2.0
Kurokai	2.6	*	*	*	*	*	*
Mora	24.1	21.8	14.0	4.1	3.8	2.4	11.0
Morabukea	*	*	3.9	12.7	12.9	*	14.9
Porakusan	*	3.0	4.1	*	*	*	*
Sarebellii	*	*	*	*	3.0	*	*
Wallaba	*	13.7	16.5	25.8	18.0	16.4	14.8
Wamara	*	*	3.8	2.1	4.2	3.6	4.5
Yaruru	2.6	2.5	*	*	2.1	5.6	7.8
No spp	8	7	11	8	10	8	10
% of stand	62.5	67.9	77.7	67.7	70.8	51.1	69.6

\* less than 2 % in the forest area

Source: from Fanshaw (1954)

- 191 Estimates of commercial yield from "virgin" forest, run from 13 cu.m. per ha. for an operation in area 2d to a projected 25 cu.m. per ha. in area 1. In area 2d harvesting is restricted to about 6 species. In area 1, four species represent about 80% of the estimated commercial volume and the major product will be veneer logs, though sawlogs and export logs are projected for the near future. The majority of the current harvest comes from areas 2a to 2d.

- 192 Comparison of tables II-1 and II-2 illustrates that the actual cut

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- 2 1 : West of the Pomeroon river  
 2a: Between the Cuyuni and Supenaam rivers  
 2b: Between the Cuyuni and Mazaruni rivers  
 2c: Between the Mazaruni and Essequibo rivers  
 2d: Between the Essequibo and Demerara rivers  
 3 : Between the Demerara and Mahaicony rivers  
 4 : Between the Berbice and Courantyne rivers

does not reflect the species composition of the stands. It is unlikely that this situation will change dramatically because species such as Karakalli are not acceptable as sawlogs or veneer logs.

- 193 In the course of the FAO inventory an attempt to assess the extent of internal defect of major species was made. The results are cause for concern. The report suggests that the stands are over mature and that the extent of internal defect, particularly in the commercially most important species (Greenheart), was very high in the larger diameters.
- 194 Thirteen species were included in the study. Trees included ranged from a dbh of 30 cm. upwards. Percentage of trees showing internal defect, as determined by stem boring, are illustrated in table II-3. The level of defect in trees felled in a parallel study indicated a higher level of defect, particularly in Greenheart.
- 195 Because the higher defect percentages are found in the larger trees, the volume effected would be greater than indicated by tree numbers. The severity of defect was not recorded.

table II-3: Incidence of internal defect, as determined by stem boring - percentage of trees with defect.

diam class cm.	percentage with defect							
	30-	40-	50-	60-	70-	80-	90-	100+
species								
all species	22.6	32.4	40.3	50.8	60.7	60.4	68.2	73.6
Greenheart	6.6	16.2	21.6	36.2	53.3	59.7	54.5	75.0

- 196 Derivation of sustainable yield will require a national forest inventory, and allowance will need to be made for commercially unproductive areas. This latter will include areas excluded from production because of road reserves, etc. If a 20 year cutting cycle is used, as proposed, major skid trails will also be unproductive. The inclusion of some forest types will depend on the ability of government and industry to market the species present.
- 197 The National Forestry Action Plan (NFAP) makes provision for such an inventory but progress is slow, and it is being done on a forest concession basis, rather than a national basis. Data analysis has been done for only a limited area and maps have not been prepared showing forest types or stand densities. The inventory is being done in isolation from national land use planning and this will detract from its usefulness.
- 198 No realistic estimate of sustainable yield is possible now. However at the present level of cut and that approved on new concessions, there is no danger that the sustainable cut will be exceeded, but there are plans to greatly increase the harvest level.

**F Utilisation Potential**

- 199 The majority of species are restricted in occurrence or are of such rarity that they cannot be considered as having significant commercial export potential now, except for a limited number which may find very restricted niche markets. This may change in time, but experience in other moist tropical forest regions suggests that this will take a considerable time. Any great increase in species use should be considered a bonus.
- 200 Some 70 species are cut regularly, but the major companies tend to be much more restricted in species usage than do the small mills. This stems partly from the greater concentration on export products by the larger mills, but is also a result of less adequate extraction equipment used by the small mills, hence they take what is close to water or roads.
- 201 The majority of species now cut, in terms of volume, are specialty species. This is quite different to the major tropical hardwood exporting area of South East Asia. This suggests that markets for species from Guyana may in fact have a more secure long term market than the commodity species of South East Asia, which can be readily substituted by plantation grown forests.

### III FOREST OPERATIONS CONTROL

#### A. General

- 202 The current public concern with conservation of forests and sustainable utilisation, has presented forest authorities and industry with responsibilities and opportunities not previously available because of previous lack of public support for one of the major objectives of forest management - conservation.
- 203 If a forest industry, based on natural forests, is to contribute to the national economy, forest operations will have to be carried out in a manner that will demonstrate sustainability of the resource. This applies not only to timber growth but also other forest values. This will require both education and regulation of forest users.
- 204 The authority of government to implement the necessary regulations to ensure that acceptable forest practices are applied, is dependent on adequate legislation to provide the basis of control. Implementation of the legislation is dependent on sufficient competent staff and adequate funding for the GFC.

#### B. Forest Policy

- 205 No formal National Forest Policy, approved by parliament, could be located and it is doubtful that any comprehensive Policy exists (Commissioner of Forests pers. comm.). The 1989 Annual Report cites a "Forest Policy" but it does not address many of the aspects normally found in a Forest Policy. The National Forestry Action Plan refers to a "draft National Forest Policy" composed during preparation of the NFAP but no evidence could be found that this had been formally adopted. The present Commissioner for Forests drafted a "Mission Statement" for the Commission, approved by the Executive Chairman of the Commission in September 1992. The Commissioner indicated that it would be desirable that external assistance be obtained for the preparation of a formal policy.
- 206 The lack of a National Forest Policy, formally proclaimed by Parliament suggests a failure to recognise the potential of the forestry sector in both the short and more particularly, long term, to make a significant contribution to the national economy through its foreign exchange earning potential. More importantly it encourages an ad hoc approach to national forestry sector planning. There is no defined focus for sector development.
- 207 There is evidence of this deficiency in recent sector investment agreements, which place the established and domestically owned enterprises at a distinct commercial disadvantage. In most developing countries within this consultant's experience, domestic investors are provided at least equal, but more often preferential, investment conditions.
- 208 It is normal for policy to be drafted in consultation with many

community groups. This has not been done. It is considered desirable that external assistance be provided for initial drafting of a forest policy. The draft would then be made available to community groups for perusal and the opportunity provided for submission of detailed written comment. A small committee would then prepare the final draft for submission to parliament for acceptance.

- 209 This acceptance by parliament rather than approval by a minister is considered necessary to grant the policy sufficient status that it is unlikely to be changed lightly or ignored.

### C. Existing Forestry Legislation

- 210 Three Acts define the major controls of forest operations.

#### a. Forestry Commission Act (1979)

- 211 Conservation and management of State Forests is vested in the Guyana Forestry Commission, which was established by the Guyana Forestry Commission Act (1979). This Act provided for the establishment and defines the powers of the Guyana Forestry Commission. It is charged with administration of the Forestry Act (1973), and implementation of the National Forestry Action Plan.
- 212 The Commission consists of up to 14 members, one of whom is the Commissioner of Forests. All non-executive members are appointed at the discretion of, and by the Minister, but no specific provision is made in the Act for community and industry representation. This may detract from the effectiveness of the Commission as the broad range of community and industry interests may not be represented in decision making.
- 213 For some time the Commission has been made responsible to the Guyana Natural Resources Agency (GNRA), with the Commission Chairman being the chief executive of the GNRA. This arrangement has not worked in the best national interest, because the Commission has been effectively sidelined in its functions of resource allocation and plays little role in negotiation of major foreign investment in the forestry sector.
- 214 The Act gives the Minister very wide discretionary powers over the staff and funds of the Commission, and the Minister may direct the Commission to pursue virtually whatever policies the Minister may determine. This has certain dangers in the absence of a formally declared Forest Policy and a detailed National Forest Management Plan which includes forest classification and defines the methods of achieving the Forest Policy.

#### b. The Forestry Act (1953)

- 215 The Forestry Act of 1953 (as amended) defined the authority and powers of the Guyana Forestry Department, replaced in 1979 by the



GFC. While amendments date from as late as 1989, it is felt by the CF and endorsed by this consultant, that the Act needs revision. The Act came into force at a time when industry was small and other demands on the forest were very limited. This situation is rapidly changing.

- 216 The authority of the GFC is more extensive than in many countries, and this is particularly so in trade in forest products and environmental matters. The latter is achieved more through the vagueness of broad statements than specific determination. While this situation places considerable responsibility on the Commission, it also provides outstanding opportunities to influence and promote the contribution of the sector to the national economy.
- 217 The Guyana Forestry Commission is aware of the need for updated legislation to enable it to adjust to a changing world and it is understood that some preliminary work has commenced on this. However it is considered that external assistance would be beneficial to this process, both in terms of legislation quality and timeliness.
- 218 It is essential for both short and long term maintenance of an export oriented industry, that effective forest management and conservation controls be incorporated in comprehensive legislation, rather than that this be left to the vagaries of administrative decision.
- 219 The existing legislation is adequate for imposition of sufficient environmental controls to meet any reasonable requirements. However as the Forestry Act now exists, the application of controls can be very much "ad hoc", with the potential for ready variation of terms and conditions applying to harvesting and processing operations.
- 220 It is almost inevitable that any legislation composed, without a forest policy to guide that legislation, will not be comprehensive and may well thereby be ineffective in some aspects. Legislation should be based on the approved forest policy, hence the urgency for this first step.
- 221 It is considered that external non-legal assistance would be beneficial for both preparation of drafting instructions for the Act, and in vetting the Act after legal drafting, before it is submitted to parliament.
- 222 The delegation of authority in many functions is difficult to understand. The Minister has powers that would be better vested in cabinet or the President, and conversely powers reserved to the President would normally be delegated to the Commissioner of Forests or at most the Minister. For example, it would be appropriate for the Commissioner to have the power to suspend operations in a State Forest, but that cancellation of any type of permit to harvest would be reserved to the Minister. It is normal that a period is allowed for rectification of some deficiencies in operations before suspension is allowed but that in others immediate suspension is permitted.
- 223 There is provision in the Act, for exercise of control over export of forest products, by regulation. No such regulations have been

promulgated, but the Commission has since 1983, through the Timber Marketing Unit, had this control. The functions of the TMU have been eroded and it appears that it is intended that their export selling role cease. This would require the Timber Marketing Act (1973), the Guyana Timber Export Board Act (1973) and the Guyana Timber Export Board (Transfer of functions ) Act (1981) to be revoked.

- 224 A revised Forest Act would need to include elements that provided for control of export marketing to the extent that the national image as a timber producer is protected, through maintenance of standards, and the avenues for transfer pricing, which deprives Guyana of revenue, is closed to the extent that this is possible.
- 225 There should also be provision, either through the Forest Act or a Timber Users Protection Act, preferably the latter, to regulate standards in the domestic market. This would apply to timber preservation as well as timber grading for structural purposes.
- 226 Several sections in the existing Act and Regulations should be modified or deleted as they have nothing to do with administration of the forest estate or regulation of forest harvest. This refers particularly to importation of sawmilling equipment (paragraph 42 (J)) and labour related matters (para 40A, 42 (n)) which would more properly be contained in labour laws.
- 227 The Forests Act has some provisions not present in legislation in many developing countries. The Forests Act has precedence over other legislation on mining matters in State Forests, unless expressly exempted. Environmental damage caused by placer mining operations is reported to be a serious problem in some forest areas, yet the GFC does not appear to have the authority to control this. The Act could be strengthened to overcome this deficiency.
- 228 Paragraph 17, dealing with damage to the residual stand (forest products) needs clarification in either schedules or in TSA, license and permission documents. This aspect is not adequately treated in either legislation or permit documents. Paragraph 17 (1) is not operable as it exists, but by improved wording would serve to protect the future crop.
- 229 Paragraph 42 determines those matters which may be governed by regulations. Some of the regulations need clarification.
- 230 The regulations governing log measurement, marking and recording require amplification and some point in the chain of harvesting operations should be fixed for measurement. Most countries abandoned measurement at the stump many years ago. However it is essential that measurement and marking be carried out before a log is delivered to a processing plant or export loading point. The first convenient point is that at which logs are aggregated for loading onto trucks or pontoons, ie the first point to which they are skidded, termed a "market" in Guyana.
- 231 The log measurement system specified is impractical for any large scale operation, particularly where readily degradable species are

being harvested, and blue stain incidence is high. The possibility for the concession holder to carry out measurement exists, but it is vaguely stated in the Act. It would benefit industry if log measurement was carried out by "registered scalers", with GFC staff conducting check measures. Registration of log scalers would have to be covered in the revised Act.

- 232 Regulation 32 needs to be supported by definition of what should be classed as defect to be excluded from royalty calculation. The severity of kinks and sweeps, the extent of splits and shakes and rot require definition and should be measurable. Long butting of logs should not be permitted if this will waste commercially acceptable wood.
- 233 The log ends should be marked with a serial number, a code identifying its origin, and a species code. This would require setting codes for each logging unit (a logging unit being an area defined on a map included in the Forest Management Plan), of about 100 to 200 ha., and use of an approved list of species abbreviations. These abbreviations would be also used for forest inventory purposes.
- 234 Use of log girth as a measure is not efficient, as it frequently requires digging under the log to insert the tape, and to be accurate the bark should be removed. "Allowances" for bark assume that bark thickness is constant and that the bark is intact, which is often not the case after skidding.
- 235 Consideration should be given to using the Brereton system which uses diameter at the ends of the log and can be measured with adequate accuracy regardless of bark presence. While it can be argued that other systems of measurement provide more accurate formulae for volume calculation, obtaining accurate data for application of the formulae is more difficult.
- 236 At present Hoppus measure, which refers to the expected yield from a log as a hewn beam, is used. This is an archaic measure and bears no relationship to recovery of major forest products now. It would be rational to adopt a "true measure" system and to use the International System of Measures.
- 237 These changes could be introduced simultaneously by introduction of the Brereton system and metric measures. Guyana was scheduled to convert to the metric system of weights and measures in 1982.
- 238 An advantage of using a true measure system is that forest volumes and removals, and recovery on processing can be more readily compared with data from other countries with tropical rain forests and comparable industries.
- 239 Industry may not like the change initially, but adjustment of royalty rates and contract rates is a simple calculation. It would be necessary to ensure that training was conducted and that appropriate measuring equipment and volume tables were available before introduction of the system.
- 240 The Forestry Act empowers the GFC to specify harvesting methods.

This power has not been used. It is desirable that this power be amplified in a revised Act and that regulations or provisions in TSA's, Leases or Forest Harvest Permissions, be promulgated that will ensure that harvesting operations protect and promote the future crop, while reducing waste due to faulty technique.

c. The Timber Marketing Act (1973)

- 241 This Act defined the conditions applied to export of timber, as controlled by the Guyana Timber Export Board. These functions were transferred to the GFC, through the TMU in 1981 and these powers have recently been considerably reduced. However the Act is still in force, as it has not been repealed.
- 242 The Timber Marketing Unit does not have the authority previously held by the Board, but it does monitor all export sales and approval for export must be obtained from the TMU. It does conduct some sales, about 5 % of total timber exports, and it charges a commission on all sales. This is set at 6 % for sales negotiated by the TMU but for the majority of sales, where companies merely submit sales data for approval, a charge of 2 % of the fob price is made.
- 243 Theoretically the TMU carries out timber promotion activities, but in fact this function appears to have virtually ceased.
- 244 Under the Forestry Act the Commission has the authority to control export of forest products through regulation, however no such regulations have been promulgated. For the controls required, the Forestry Act for export sales and as proposed above, a Timber Users Protection Act for domestic sales, would be adequate.

D. Proposed Legislation

- 245 As indicated above, it would be desirable to enact legislation which provides user protection in the domestic market. This would have to be tied to existing Building Codes as they effect use of timber. While such codes exist, it is believed that some revision is warranted to take into account improved technology and to influence the specification of timber for various applications in construction.
- 246 Specification for the application of timber in construction must be based on the physical and mechanical properties of timber if more species are to be used for structural purposes. There is no doubt that potentially valuable exports, with foreign exchange earning potential, are being used wastefully in grossly over-designed cottage and general construction in Guyana.

#### IV STATUS OF FOREST MANAGEMENT

##### A. General

- 247 Forest management is obviously a vital tool for maximisation of the economic contribution of the forestry sector to the national economy. That management will have to be environmentally sensitive, based on sound forest research and sufficiently funded to achieve defined productivity targets.
- 248 The base line data base is supposed to come from the NFAP but progress appears to be very slow. Unless this is speeded up, Guyana runs the risk of being put in a position where export of forest products could be at risk.

##### B. Forest Management

- 249 The role of the GFC is really confined to that of custodian of the State Forests and the collection of royalties for timber harvested. There is very limited intervention into forest management matters, generally through regulations under the Act and inclusion of some harvesting controls in Timber Sales Agreements. Under the National Forestry Action Plan the activities of the GFC would be greatly expanded.
- 250 There is a dearth of data on the forests, including net commercial area, detailed forest typing, commercial standing stock, information on regeneration and growth capacity of individual species under various management regimes etc. It is therefore difficult to make informed forest management decisions.
- 251 The NFAP was published in 1989, following studies completed in 1988, over four years ago. That little, if any progress has been made in many, perhaps most, of the elements, should be of considerable concern to the Government, as it is to industry. This raises the question of the priority with which the forest sector is being treated.

##### a. Forest Inventory

- 252 The NFAP provides for a national forest inventory, but it does not appear that this is being tackled as a priority project. Much of the work is being conducted by the industry itself, for Forest Management Plan preparation, with advice from the Guyana Interim Forestry Support Unit regarding technique. The area covered is small as it is limited to the planned harvest area for only a few years. If the program continues in this mode, the inventory when completed (if ever), will provide data on a forest that has changed to such an extent that the data will be of no real use in formulating national forest management plans.

- 253 No forest stratification has been carried out as part of the program, so no confident estimates of productive areas or volumes beyond the land actually assessed can be made.
- 254 It is not too late to co-ordinate data collection in a manner that would allow incorporation into a national Geographic Information System (GIS). This would require definition of Resource Mapping Units based on natural characteristics of geology, soils, climate, aspect, slope, vegetation characteristics (broad vegetation classes and more finely defined forest types), and on current land use. This would have to be done for national land use planning and each natural resource sector would then provide resource data for incorporation into the national data base.
- 255 The GFC does not now have the capability to conduct post-harvest forest assessment let alone diagnostic sampling on which Timber Stand Improvement treatments would be best determined. There is no requirement on harvesting companies to conduct post-harvest inventory that would indicate the potential future crop and reveal stand damage.
- 256 Only two companies have professionally qualified forestry staff. This is a problem for analysis and interpretation of forest type and inventory data, and will be an even greater problem for post harvest assessment and forest management.
- 257 It is unlikely that smaller operators will be in a position to hire such staff in the foreseeable future.

b. Yield Regulation

- 258 Current yield regulation is based on research and forest practices in Suriname. This provides for the harvest of a projected increment of one cu.m. a ha. p.a. and is applied as a maximum harvest of 20 cu.m. a ha. on a 20 year cutting cycle.
- 259 While this consultant is concerned at the relatively short cutting cycle, this is probably the best information available to the GFC because of the similarity of some of the forests. By comparison the scheduled cutting cycles in Australia, the Pacific and South East Asia (except the Philippines) are generally about 40 years.
- 260 The species sought after in the Pacific area tend to be capable of relatively rapid growth compared with the major species in Guyana, hence a longer not shorter cutting cycle would seem to be called for.
- 261 In fact the GFC does not have the staff to monitor harvest rates and harvesting companies are not required to demonstrate that they are adhering to the harvest target, over reasonable sized blocks of forest. Two companies control harvest rates by recording the yield from defined areas, usually of 100 ha. However there is no post-harvest inventory to determine the condition of the forest after harvest, from which future yields may be predicted and TSI requirements prescribed.

- 262 The minimum cutting diameter (dbhob below which trees are not to be cut) is a very low 34 cm. for the 26 major commercial species and a remarkable 19 cm. for all other species. This compares with typical limits in South East Asia of 50 to 60 cm. and previously in Australia where some species had a minimum cutting diameter as high as 100 cm.
- 263 The philosophy behind the high limits used in Australia was that a tree should not be cut until the increment in value had peaked or that it was unlikely that the tree would survive to the next cutting cycle. The rationale for the limits set in Guyana could not be determined but it appears that they have been set on the basis of the minimum size that has current economic value. The major focus of management is on the present not the future.
- 264 These low limits in Guyana could result in a very low average diameter of the logs in the second cutting cycle, presently projected at 20 years after the first. This would have serious implications for the major sawn timber export product - large section, long length Greenheart.
- 265 The GFC does not have sufficient data on the resource to institute anything other than tentative management practices, and it has not got the staff to collect, analyse or interpret that necessary data. The National Forestry Action Plan (NFAP) is designed to provide that data and strengthen the Commission to enable it to implement comprehensive forest management practices.
- 266 Field supervision of operations is conducted by Regional Offices of the GFC. There are no guidelines for field staff to ensure monitoring is comprehensive and consistent, but it is intended that such guidelines will be prepared and training given.

c. Environmental Protection

- 267 There is no general requirement for detailed Environmental Impact Statements or for environmental monitoring. In some cases harvesting companies have entered agreements for external authorities to conduct monitoring, but smaller companies with small harvests will find this too expensive. Some provision for monitoring of these "other" operations is required.
- 268 The GFC, when staff are trained, will provide some of this service, but forest components requiring technical inputs such as faunal and hydrological surveys and analysis are beyond the present capability of the Commission, and are likely to remain so indefinitely. It would be logical to involve the UG in some of this work, but funding may have to be obtained from International Aid Agencies.
- 269 There is a general requirement under the Forestry Act, to avoid damage to the residual stand, but this requires better definition and specification of methods of doing so, for felling and skidding in particular.

- 270 The immediate need is for preparation of forest harvesting guidelines that are designed to provide environmental protection. These would cover roading, felling, skidding, landing operations, haulage under wet weather conditions, stream protection, faunal habitat protection, practices at river loading points, etc.
- 271 Of the limited field operations seen, a reasonable level of environmental responsibility is exercised by companies in minor, skid trail construction but greater attention to roading, particularly drainage, is required.

d. Post-harvest Evaluation and Stand Treatment

- 272 No post-harvest evaluation of stands is required under the TSA, or carried out by either the concession holder or the GFC. This seriously reduces the possibility of making reliable projections of future yield, as no information on damage to residuals or the extent of release of the future crop is available.
- 273 No regeneration data is available, hence this cannot be used to regulate harvest nor to project the future stand condition.
- 274 Some Timber Stand Improvement (TSI) was carried out in the past on an experimental basis. An attempt is being made to relocate plots and conduct remeasures. Data published in the 1960's on these plots indicated that a diameter growth of approximately 0.35 cm. p.a. could be expected for Greenheart of 30 cm. diameter, in a logged stand without TSI, but that this was likely to be about 0.75 cm. if TSI involving a very heavy culling of weed species was applied. This suggests that a cutting cycle of 20 years, with a minimum cutting limit of 34 cm. in the first cut and no TSI, will produce a maximum diameter tree of about 41 cm. (16 inches) at the second cut. This is decidedly smaller than the average tree now being taken and too small to produce the large section baulks that underpin the export trade for Greenheart. No pre- or post-harvest treatments are carried out now.
- 275 In fact the major industry operators use a higher cutting limit at present. There is a danger that this could be misleading after the second cycle because the actual limit used may well be dropped to the "legal" level to obtain sufficient volume per ha. This volume could be interpreted as "recruitment" into the commercial size, when in fact much of it is not. At the third cutting cycle yield may be negligible.
- 276 Inventory work carried out by FAO in the late 1960's indicated a very high defect incidence in some major commercial species. The implications of this for future forest growth do not seem to be influencing forest practices. As most of these trees are left standing, release of the pole stage trees may not be very great, hence growth rates may be low.



e. Monitoring Growth

- 277 A limited number of Permanent Sample Plots (PSP) were established in 1939 and 1961 to 1965. Measurements were carried out until 1975. Attempts are being made to "re-establish" these plots and data is to be collated and analysed.
- 278 The species most sought after have high specific gravity and it is believed that they are relatively slow grown. They are believed to be comparatively shade tolerant, but do respond to crown release.
- 279 There is no standard for future plot establishment and measurement, in harvested areas. It is believed that this is to be carried out when time and funds permit. Because of the urgency to determine the management regime to be applied, this type of data collection should be accorded a high priority.

C. Efficient Forest Usage

- 280 There are three major elements to be considered:

- i Concession allocation policy,
- ii Maximisation of log recovery, and
- iii Maximisation of species use.

a. Concession allocation policy

- 281 There is no evidence of a clear policy on concession allocation that will ensure that:
- \* the harvesting intentions are matched to available commercial volume and an acceptable cutting cycle, and
  - \* the processing intentions are matched by the species composition of the forest.
- 282 This has resulted in very large areas of potentially productive forest being locked up, for up to 25 years, with minimal likelihood of harvest. Details of allocated major concessions are illustrated in table IV-1.
- 283 In one case some 50,000 ha is set aside for processing by a relocatable sawmill that at maximum capacity, is unlikely to require the yield from more than 6,500 ha. if a 20 year cutting cycle is used with a cut of 20 cu.m. per ha., or 13,000 ha. for a 40 year cycle.
- 284 The NFAP states that in 1988 some 2.4 mln. ha. of State forest had been allocated for harvest. The current (end 1992) area allocated is 5.4 mln. ha. Much of the increase is due to the allocation of a single concession of 1.67 mln. ha.

table IV-1: Forest resource allocation at end 1992

Timber Sales Agreements

TSA No	Company	Area ha
2/85	Nagasar Sawh Ltd	31,142
3/85	Interior Forest Industries	146,101
4/85	Toolsie Persaud	121,006
6/85	A Mazaharally & Sons Ltd	64,752
7/85	Guyana Sawmills Ltd	113,226
8/85	Mondeen Industries Ltd	145,900
9/85	A Mazaharally & Sons Ltd	72,893
10/85	Willems Timber & Trading Co Ltd	68,003
11/85	Interior Forest Industries	68,835
4/89	Caribbean Resources Ltd	368,982
1/90	Amazon Caribbean Guyana Ltd	47,915
4/90	Nagasar Sawh Ltd	28,530
1/91	Willems timber & Trading Co Ltd	54,147
2/91	Demerara Timbers Ltd	221,768
3/91	Demerara Timbers Ltd	281,257
4/91	Barama Company Ltd	1,669,978
5/91	Unamco Industries Ltd	95,911

sub total 3,600,346<sup>3</sup>

Leases

1/88	Vergenogen Sawmill Ltd	28,729
1/92	Alglas Co. Ltd	121,442

sub total 150,171<sup>4</sup>

Forest Harvest Permissions

sub total 1,618,745

Total allocated for harvest 5,369,262

Amerindian Reserves 1,389,972

Unallocated 2,336,899

TOTAL 9,096,133  
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3 There is a further substantial area currently under negotiation that will, if allocated, lift the total above 4 mln. ha.

4 Additional areas under negotiation would lift the total to over 250,000 ha.

- 285 The extent to which concession area is matched to log processing intentions or capacity is illustrated in table VI-2. Barama Co Ltd has not yet commenced processing but road construction of 35 km. has been completed and harvest is expected to commence in the immediate future. Approved harvest rate is 240,000 cu.m. p.a. for the first 3 years, but future production rate projected is 1.2 mln. cu.m. p.a.
- 286 Average national log harvest for the four year period is 131,075 cu.m. If concessions allocated after 1990 or not scheduled for operation until 1992 or later, are excluded, the total area available for harvest was 3.48 mln. ha. with a theoretically rated harvest capacity of 3.48 mln. cu.m. Actual harvest has therefore been in the vicinity of 3.8% of rated capacity. It is believed that recent operations have been running at about one third of capacity, hence even at full production, harvest would be only some 12 % of rated forest capacity.

table IV-2: Concession allocation and harvest by enterprise

Company	Area ha.	mean annual harvest <sup>5</sup> actual	cu.m. % of possible
Nagasar Sawh Ltd	59,672	4,738	7.9
Interior Forest Industries	214,936	2,984	1.4
Toolsie Persaud	121,006	10,945	9.0
A Mazaharaally & Sons Ltd	137,645	8,523	6.2
Guyana Sawmill Ltd	113,226	5,240	4.6
Mondeen Industries Ltd	145,900	3,228	2.2
Willems Timber & Trading Ltd	122,150	19,984	16.4
Caribbean Resources Ltd	368,982	n.a.	n.a.
Amazon Caribbean Guyana Ltd	47,915	n.a.	n.a.
Demerara Timbers Ltd	503,025	17,188	3.4
Barama Company Ltd	1,669,978	n.a.	n.a.
Unamco Industries Ltd	95,911	n.a.	n.a.
Vergenogen Sawmill Ltd	28,729	n.a.	n.a.
Alglas Co. Ltd	121,442	n.a.	n.a.

\* these two enterprises and concessions are under single corporate group ownership

- 287 Obviously, the bulk of the forest estate is locked up in an unproductive manner. The natural forest in climax condition produces no net growth, hence forest that is not harvested on schedule will not be putting on maximum net increment and the forest will not be contributing to the national economy.
- 288 There is no requirement for potential investors to fully explore the processing potential of any concession sought. This can result in inappropriate processing facilities for the species present and

<sup>5</sup> average for the four year period 1989 to 1992 inclusive except where indicated

when the major issue of TSA's was being carried out in the late 1980's and the GFC was largely excluded from negotiations on more recent allocations.

b. Maximisation of log recovery

- 289 The product emphasis for some species, particularly Greenheart, requires that logs be substantially defect free. This results in logs which will yield a sufficient recovery on sawing to boards or scantlings, being left in the forest, either felled or standing.
- 290 Small sawmills appear to make a greater effort to utilise defective logs than the larger operators, but this is probably the result of log supply difficulties, and the fact that they do supply almost exclusively to the domestic market.
- 291 The GFC does not have sufficient staff or facilities to adequately monitor the standards of utilisation practised in the forest. As proposed in comments on log measurement some guidelines on log utilisation standards would be beneficial for field control.

c. Maximisation of species use

- 292 The tropical moist forests of Guyana are often referred to as being rich. This is so in terms of floristic composition, but if only the currently marketable species are considered, they are relatively poor commercially when compared with the forests of South East Asia and sub-tropical and temperate forests.
- 293 In all forests with a large number of species, there are some that are not sought after. In the tropical moist forests these species often constitute a large proportion of the stand and in Guyana this is particularly so.
- 294 In all tropical forest regions much is talked about utilisation of the so called "lesser known species" (LKS). Wood properties of these species have been investigated with very little positive result in terms of increased species use in the countries in which they grow, unless some preservative treatment is applied.
- 295 In those cases where the LKS are harvested extensively, it is only through export as logs, with minimal value added in the country of origin, that has allowed this increased forest recovery. In importing countries such as Japan, Korea and Taiwan, species uncommon in any particular concession are aggregated with the same species from a number of areas, allowing sufficient volume for commercial production runs and for the more valuable ones, marketing by species.
- 296 Industry development will require improved utilisation of the forest and of the logs harvested. However the potential for greatly increasing the number of species that are marketable is very poor in the short term and may be little better in the long term.
- 297 The lack of low cost timber preservation facilities at sawmills in

Guyana has precluded the low durability species from finding light construction applications for which many appear suited by their mechanical properties. The Dip Diffusion process has been in widespread use in other tropical countries for over 30 years with excellent success in extending the range of species used.

- 298 There are no pressure preservation facilities in Guyana and this precludes the use of species of low durability, but good penetrability in high decay hazard uses, eg. wet area, external and ground contact applications.
- 299 Small sawmills tend to cut a greater range of species than the larger mills, though there are an unknown number of chainsaw slabbing units that tend to concentrate harvest on premium species. This latter represents poor forest use and recovery of quality material is very low, hence wastage of premium species is very high.

#### G. Royalty Rates

- 300 Royalty rates are set at irregular intervals after consultation with industry representatives. They are uniform throughout the country and rates for logs are shown in table IV-3. While royalties do cover present GFC operations, the rates are so low that they are ineffective for manipulation of species use. If, as will be necessary, the GFC does become involved in active forest research and management, royalty revenue at current levels will not be sufficient to fund even elementary activity.

Table IV-3: current log royalty rates

species group	G\$/cu.m.	US\$/cu.m.
Greenheart	110.75	0.886
Brown silverballi	110.75	0.886
Purpleheart	110.75	0.886
Red Cedar	110.75	0.886
Letterwood	110.75	0.886
Class I	74.20	0.594
Class II	55.37	0.443
Class III	34.88	0.279

- 301 It is not uncommon in other countries, to vary royalty rates depending on accessibility and difficulty of extraction. This may be necessary as operations move further from the rivers and the mill sites. In addition the potential to vary royalty rates for second and subsequent cutting cycles should be considered. Theoretically road construction costs should be lower in the second cycle, hence royalty rates could be set at a higher level. From limited inspection of forest operations in Guyana this may not be the case, as road construction appears to have been minimal in most operations.
- 302 Further discussion of royalty rates including proposals for use of more effective rates, is contained in the body of the main report.

- 303 It may be possible to establish realistic "market" rates by calling for tenders for new concessions. However, proposals tend to be so complex that royalty alone is often a poor measure of net economic worth to the country. Use of a tender system usually requires provision of considerable detail on the forest resource to interest potential developers. There is little evidence that those tropical countries which did open areas to public tender derived any particular benefit as far as royalty is concerned. In some cases, advertisement of concessions in the overseas trade press may produce desirable results in terms of a greater diversity of products, which in turn would influence species use.
- 304 However at present there are not large single blocks of forest available for allocation.

## V CURRENT STATUS OF FOREST PRODUCTS INDUSTRY

### A. General

- 305 The majority of the major companies now engaged in forest harvest and log processing are privately owned and have managed to survive the economically very difficult past 10 to 15 years. Equipment and infrastructure has been allowed to run down because of difficulties in obtaining spare parts.
- 306 Erosion of profit margins resulting from reduced production and government imposed charges on both production inputs and sales has depleted industry financial resources and made it difficult for them to now take advantage of the improving economic status of Guyana.
- 307 A particular concern is the inability to fund repairs and replacement of plant and equipment, from cash reserves. This could mean that any rehabilitation of run down plant will have to be financed by debt. At current interest rates this will be prohibitively expensive, and it is possible that there will be corporate casualties if great care is not exercised by management, to ensure that stringent control of financial efficiency of investments is exercised.
- 308 The present status of foreign owned enterprises is markedly better because in all but one case, they purchased run down operations at the time of the political change that has improved the opportunities for private investment. The purchase did not apparently involve any premium charge for the resource security which a TSA confers. In addition, they operate under remarkably different marketing conditions than those to which the domestically owned industry is subjected.
- 309 It is difficult to make a comprehensive comparison of investment conditions because the agreements under which the foreign investments have been made were not available to the consultant. Only leaked information that could be confirmed was taken into account.
- 310 There are a number of new enterprises being established at present, and these are all predominantly or completely foreign owned. There is some movement to expand existing businesses, mainly through expansion into manufacture of new products. It is expected that these will take some time to become operational because of limited finance and more importantly lack of both technical and managerial skills.
- 311 Companies involved in down stream manufacture, particularly of furniture, are domestically owned and are also survivors of the difficult years. Only 3 or 4 have been able to improve their performance and that with the technical assistance provided by UNIDO over the past few years.
- 312 There is a marked difference in technology employed by the long established operators and the new investors. This is likely to

further adversely impact the older operators as product development is undertaken and species usage increases. Except for a couple of cases log handling and processing equipment is not sufficiently versatile to efficiently change the product mix. Indeed in most cases it is not efficient for current species and product mix.

- 313 In general there has been an over investment in sawmilling machines compared with log supply equipment. Expenditure on log and lumber handling equipment would have made much of this expenditure unnecessary, as machines are not efficiently used. Saws spend remarkably little time actually cutting.

#### B. Forest Harvesting Enterprises

- 314 There are over 600 forest harvesting operators, feeding both the major mills and the smaller ones, plus a number of so called portable mills. Many are involved in charcoal, pole, post, and hewn beam production on their own behalf or for major companies.
- 315 All large enterprises and a number of the smaller sawmills carry out their own logging. The only existing plymill buys logs from several small logging operators. New enterprises intend to do their own roading and logging.
- 316 All but three of the enterprises are private, family owned companies. The three foreign owned enterprises now operating are also private companies, generally joint ventures between substantial foreign companies. Two new ventures which have not yet commenced operations are also foreign owned or predominantly so.

#### a. Forest Resource Access

- 317 Resource tenure for the larger operations has been greatly improved over the past 7 years, through the extension of harvesting permits from an annual basis to periods up to 25 years, through the issue of TSA's. However the majority of enterprises are still functioning on annual Forest Harvest Permissions, or in a few cases, Leases of 3 to 5 years. It is believed that the latter will be extended to TSA's, subject to performance of the concession holders.
- 318 The Forest Harvest Permissions do not give exclusive harvesting rights to an area, but Leases and TSA's do.
- 319 The majority of concessions do not appear to have been allocated on the basis of any particular cutting cycle or enterprise log volume or species requirement. This has probably had no impact on industry in the past 20 years, but will inhibit industry expansion, unless existing enterprises are able and willing to increase capacity. As suggested above this will be difficult.
- 320 Area available for future allocation is about 2 mln. ha., but much of this is in scatted blocks and there is inadequate information on the commercial potential. Some of the area has been excluded from that requested by investors because of location or topography and probably



low volumes, hence is unlikely to attract major operators.

b. Forest Harvest

321 Few currently producing operations are large enough to be able to take advantage of equipment specialisation in roading and harvesting. All but a few mills receive logs from river transport systems.

(i) Roading

322 As there has been no detailed long term forest operations planning until very recently, roads have not been surveyed and are located for immediate needs only. The industry has therefore not contributed as much to the development of the national infrastructure as is usual in many other countries, where the industry harvesting virgin forest is a major road and bridge builder.

323 This lack of expenditure on roading in the past is now causing log delivery problems for some operators, which will be very expensive to overcome. This is particularly difficult now, after many years of poor economic performance of the country and high finance costs. In some cases upgrading of up to 50 km. of road is required to service haulage needs.

324 Main and spur roads are generally little more than tracks, formed roughly by bull dozer. Drainage is poorly designed and culverts rarely used. Bridges when constructed are of minimum standard and rarely have adequate decking with the stringers used as the running surface. No gravel is available in the few areas seen, but in some locations there is rock that could be crushed for road ballast and surfacing. Because terrain is gentle in most places, grades are not a serious problem.

325 Road line clearing is minimal with the result that roads tend to remain wet and readily break down if used, particularly if used for skidding when they are too wet for truck or trailer operation.

326 If better quality roads are to be constructed there would have to be a very large capital outlay on equipment. Few operators have road graders and only a new investor is using compacters. Compacted earth and a high road crown would probably be adequate in most cases, if haulage was restricted to reasonably dry conditions.

(ii) Felling and extraction

327 With only a couple of exceptions no detailed forest inventory has been carried out for planning of harvesting operations and "spotters" locate trees to be felled. Felling direction is not particularly well controlled to minimise damage or to facilitate skidding. Skid trails are generally not located or opened up prior to felling.

328 The felling losses and damage to the residual stand are typical of so called "uncontrolled" operations, where harvesting crews have minimal training and operations are not systematically planned.

329 In general, skid distances are uneconomically excessive, because of

the lack of roads. Some of the larger operations exercise some control over this, but their poor quality roads result in log supply difficulties.

(iii) Haulage

- 330 Many operations skid rather than "haul" logs unless conditions are very dry. Skidding distances can run to many kilometres.
- 331 Log production for the period 1991 to 1992 is illustrated in table V.1. In addition to this volume there is a quantity declared only as processed product volume.

(iv) Log grading

- 332 Log grading is not carried out for any purpose in Guyana, other than assessing whether a log will be removed from the forest or not. This is not a formal grading and standards differ considerably between operators. It appears that wastage in the forest is high, because there is no definition of the minimum acceptable log quality on which royalty will be charged. This decision is left to industry or at best, to an GFC employee who may have no guidance on standards.
- 333 There is no requirement for grading of logs for export except as piles or poles. This does not allow government to competently monitor export log prices. This could facilitate transfer pricing, with resultant losses of corporate taxation.

C. Log Processing Enterprises

- 334 The log processing sub-sector is composed of one moderate sized sawmill with a single shift output design capacity of about 80 cu.m. 6 mills with a capacity range from 20 to 30 cu.m., and some 60 mills with capacities less than 10 cu.m., most in the 3 to 5 cu.m. a day range. There is an unknown number of "mobile mills" and "chainsaw slabber" operations.
- 335 There is one domestically owned plywood plant with a capacity of about 30 cu.m. a day, and intentions to install another with a about the same capacity in the next year or so. there is one sliced veneer plant being installed. Its capacity is unknown but the company projects production at about 3.6 mln sq.m. (3,600 cu.m.) a year.
- 336 There is one mill with specialist equipment producing sawn shingles. Productions has been variable but with 7 machines, capacity is stated to be about 30,000 pieces a day.
- 337 A new venture is constructing a plymill with an initial annual capacity of about 100,000 cu.m. of plywood. It is intended that this will be increased to at least twice this level and that a sawmill and other facilities will be installed in time.
- 338 No mills are operating at capacity, with most running at about 35 % capacity or less. The major problem appears to be an inability to

maintain sufficient log supplies. This is due to a complex of factors including difficulty in obtaining finance at commercially tenable rates, poor plant maintenance, lack of operational planning and too little expenditure on roading.

- 339 The number of registered sawmills has declined slightly over the past ten years and many appear to operate only spasmodically.

a. Mill Equipment

- 340 The majority of major mills consist primarily of gang frame saws, followed by board edgers. It appears that frame saws are used widely because the prime purpose of the larger mills is to cut long length, large section timber for heavy marine construction timbers. The frame saw, because it cuts off both sides of the log simultaneously, relieves spring. However a relatively high proportion of sawn timber seen in timber yards is subject to spring.
- 341 Gang frame headrigs are designed to process species which do not have significant internal defect and are not subject to serious end splits and shakes. Most tropical trees have a high proportion of internal defect, and shakes are common. The frame saw has induced the situation where logs with defect that would give acceptable recovery on a versatile sawing system are left in the forest.
- 342 Of those mills with band or circular headrigs, only two have carriages with automatic offset and only one has the ability to taper saw. Log loading and turning devices are completely inadequate for high production rates and for cutting specifically for quarter or flat sawn products.
- 343 In general the log frame saws are inferior to band saws with a good carriage for cutting appearance grade wood (furniture, cabinet and panelling timbers). The frame saw is a high production machine where logs can be fed through "end-to-end". No sawmill seen can do this.
- 344 In band and circular mills, the carriage with associated log loading and turning devices, is the most important item of equipment, if high production and accurate cutting is to be achieved. It has received least attention, with most mills
- 345 The frame saws have very low productivity in most mills because of the log delivery and lumber removal systems. One recently installed mill does have a log transfer and loading system that enables a reasonable cutting time for the frame saw.
- 346 Few, if any, sawmills have adequate data on productivity and recovery rates to be able to accurately assess suitability of various species or log grades for processing.

b. Mill Practices

- 347 With few exceptions, mill practices are poor.

- 348 Little effort is made in many mills to align splits and shakes in the line of the saw to confine defect to as few pieces as possible. This is at least partly a fault of mill equipment, in that log turning facilities are inadequate, but there did not seem to be much effort made in most mills inspected where it would have been possible, and the defect was glaringly obvious.
- 349 Most mills are congested to the extent that they are dangerous. There is generally no waste removal system that will handle slabs and off-cuts, though the major mills do have reasonable sawdust removal systems. Mills are generally cleaned out at the weekend.
- 350 Only 3 to 4 mills have adequate transfer or conveyor systems for transport of lumber in the mill. Most rely on overhead cranes and gantries, which are designed for log transfer and are available only periodically for lumber transfer. This means that lumber is moved in, generally loose, bundles.
- 351 Handling of finished lumber is generally poor. Some mills do construct quite good packs for transport, but this is generally restricted to export timber. Most mills make up loose bundles or handle individual pieces.
- 352 Lumber in stock is generally loose piled, often in the open, in mixed lengths and at times, mixed cross section. Management is generally aware that the practice is bad for a product on which they have spent a great deal of money, but the practice persists, as it presumably has for years. Paradoxically small retail yards generally stack lumber in properly constructed racks under cover, as it must be if degrade is to be minimised.
- 353 No systematic air drying of lumber is done at sawmills, so stacking is not considered necessary. As loading of lumber after sale is generally done by hand, there is no incentive to construct packs which would require mechanical handling.

c. Recovery

- 354 At least some sawmills, including major mills, do not systematically tally sawn timber production, but use a conversion factor applied to log input volume, to estimate sawn output. The basis for the factor is dubious. Most mills do not stack sawn timber and could not carry out a competent stock take, hence determination of sawn timber stocks is virtually impossible.
- 355 Most mills claim a recovery of 43 % to 55 %. In fact many would not do better than 35 % if unmarketable timber is excluded from the tally. One major mill which does tally output and counts only marketable product, admits to a recovery of about 35 %.
- 356 It is most unlikely that recovery rates will be improved unless a domestic market for shorts and narrows develops. Preservation treatment of sawn timber would improve recovery by several percent as sapwood would be acceptable for light construction purposes.
- 357 The operation of frame gang saws as primary breaking down units,

particularly with the "log carriages" used, is not conducive to high recovery for the species being sawn.

d. Productivity

- 358 Outputs of forest products for 1991 and 1992 as reported by the Statistics Office are shown in table V -1. The data has been converted to cubic metres where possible. Doubt about the accuracy of this data has been expressed by both the GFC and the Statistics Office, however it is the best available. It was reported that there is a program now active to improve the collection and analysis of such data.
- 359 Major mills report log volumes harvested, but not sawn output. Minor operators report sawn production, but not log harvest. There is some doubt as to the accuracy of either figure, but in particular the latter. So it is not possible to accurately determine total production of sawn timber in the country.
- 360 The sawn lumber figure reported in table V-1 is in fact the volume produced by mobile sawmills, chainsaw slabbers and other operations of similar type. There is some doubt as to whether this is in fact a production or a sales figure. In any event it is almost certainly understated.

Table V-1: timber production and export by product 1991, 1992

product	thousands of units			
	1991		1992	
	Production	Export	Production	Export
G/h logs cu.m.	53.50	4.51	63.37	0.50
Other logs cu.m.	75.64	-	76.78	-
total logs	129.14	4.51	140.15	0.50
sawn lumber cu.m.	6.90	7.69	14.48	9.17
poles cu.m.	4.44	2.55	14.26	3.55
spars/posts cu.m.	3.06	1.93	4.93	2.76
paling staves cu.m.	1.97	.30	1.85	0.20
shingles cu.m.	1.22	-	1.84	-
charcoal m.t	0.17	0.63	0.03	0.41
firewood m.t.	3.50	-	.86	-
	16.70	-	15.59	-

- 361 There are some obvious anomalies, eg the shingle production and export figures. There is no figure for plywood, but it is claimed (the Company chairman) that production was about 3,000 cu.m. in 1992. It is also possible only to estimate what the actual sawn production may have been. If a "probable" average recovery of about 35% to 40% is used, say 37.5%, and allowance for veneer log consumption is made,

it appears that total sawn production may have been about 51,000 cu.m. in 1991 and 65,000 cu.m. in 1992.

- 362 There is no data that allows any estimate of the breakdown between rough sawn and dressed and moulded products.
- 363 This level of production for the entire national industry, with some 45 or more sawmills is very low. The 1992 output could be achieved by three reasonably well equipped band mills with a combined capital cost, including drying facilities and their own power supply, of less than \$ 24 mn. This is a fraction of the current replacement value of the existing sawmilling facilities, and is an indication of the inefficiency of present industry, in particular the inefficiency of capital use.

e. Product Quality Control

- 364 Quality control is achieved through both manual interventions and by machine selection and maintenance. Few sawmills pay anything like sufficient attention to quality control, through either mechanism.
- 365 Machines are mostly old and in many cases not conducive to accurate sawing. This appears to be partly due to the adverse economic conditions that have prevailed for longer than the economic life of many of the machines. However there does not appear to be a general "quality" ethic in the industry.
- 366 Sawn timber handling practices in most mills are not adequate.

f. Sawn timber grading

- 367 Provision exists for grading of sawn products to be exported and this is carried out adequately by the TMU.
- 368 There is no requirement for grading of sawn timber for the domestic market, but some companies do a very approximate grading. However this is not based on mechanical properties of the species or piece, hence is of no value in providing protection to the consumer in construction applications.
- 369 Timber grading is designed to protect the consumer and it does cost the industry money to implement it. However the practice also protects the industry through more efficient timber usage and protection of the image of timber as a construction material. At present there is increasing use of timber substitutes for construction in Guyana ( eg concrete block) and failure to provide timber products with known minimum mechanical and physical properties will almost certainly allow this situation to accelerate.
- 370 From observation, it seems that many buildings are over designed for the species used. Rectification of this wasteful practice will require the preparation of comprehensive grading rules and combine this with guidelines for construction specifiers eg engineers and

architects as well as builders, that focus on the mechanical properties of appropriately graded timber rather than particular species. This action should coincide with a review of construction codes in the country along the lines of "light framing codes" implemented in many countries. The light framing code in use in Australia would be a useful model as it covers more extreme climatic and biological hazard conditions than experienced in Guyana.

- 371 It would be necessary to involve architects and engineers in the process as a lead in to promotion of the use of the rules. There is a strong tendency to draw up specifications using species names as the criteria, rather than mechanical properties. Only when this is changed will a market for the lesser known species start to open up.

#### D. Timber preservation

- 372 There are no facilities for preservation treatment of timber in Guyana, though derelict dip diffusion dip tanks were seen in one mill.
- 373 The FIDU had a small experimental pressure cylinder but this has apparently been disposed of and no commercial facilities have been installed.
- 374 Without preservation facilities many of the species that could be used in light construction will, quite properly, not be acceptable in the market, regardless of their engineering properties.
- 375 This results in species with high export revenue potential being used in domestic applications which are below their mechanical capability, hence are wasted by over-design of domestic, mainly residential, structures. An FAO report pointed out this poor practice in the late 1960's but this does not appear to have been rectified.
- 376 The introduction of preservative treated timber for light construction is dependent on its acceptance in building codes and the support of construction specifiers. The use of Greenheart with a strength rating in the F22 to F27 range, in 4\*2 house studs, in an area without cyclonic winds is absurd, when in areas subject to cyclones and rot and insect hazards at least as great as those in Guyana have been using treated material for many years.

#### E. Manufactured Wooden Products

- 377 This sub-sector has been the subject of a number of reports over the last few years and little purpose will be served by extensive comment here.
- 378 The sub-sector consists of an unknown number of furniture manufacturers, but reputedly upwards of 100, and one match manufacturer. The majority of the former are "house bottom" operations, with only about 20 significant businesses. Of these latter, only 3 to 4 have the present potential to successfully engage in export. The match manufacturing business is little more than a

"sideline" for one of the country 's major industrial enterprises.

379 Major constraints on expansion of production and enhanced value of products include:

- \* inadequate supply of furniture species,
- \* poor quality of timber available, particularly the quality of sawing and included defects,
- \* lack of sufficient kiln drying facilities,
- \* lack of understanding of the standards of finish required to attract high prices,
- \* lack of adequate finishing facilities, in particular dust free spray and storage areas.

380 Even in the better operations many examples were seen of mismatching of boards in table tops and cabinet doors and drawers, etc. The inclusion of sapwood was a prominent feature of some items, dramatically reducing their price potential.

381 The major furniture manufacturers have their own kiln drying facilities.

#### F. Product Development

382 There appears to have been no product development activity in Guyana for many years, except for relatively recent action in the furniture manufacturing sub-sector.

383 If there is to be an increase in export volumes and values, it is essential that new products be developed or adopted/adapted from overseas.

384 This product development is also essential if the domestic market is to be fully serviced. Wood preservation and timber seasoning should play major roles in the domestic market. Even air drying of timber would improve the position of timber on the domestic market. With the improved opportunity to import in recent times, forest industry may well find that it will be subjected to competition from wood substitutes, from which it has been protected for a long time.

#### G. Production Costs

385 It was not possible to obtain up to date cost information from companies in a form that would enable meaningful comparisons to be made. One of the difficulties is the effect of the recent currency devaluation on depreciation. Many companies with aged equipment can make only very small depreciation allowances, thereby understating real plant ownership costs.

386 Mill door log costs vary considerably, from below \$ 20 a cu.m. to over \$40. It appears that most sawmills have a "mill door" log cost in the vicinity of \$ 32 to \$ 35. At typical recoveries this would amount to \$ 80 to \$ 100 a cu.m. of sawn product.



- 387 It was difficult to establish sawing and related costs, however it was claimed that production costs are only just covered by domestic market prices.
- 388 One set of company books was examined briefly and the profit margin indicated that this claim is more or less correct. On this basis it appears that processing and marketing costs amount to about \$ 70 a cu.m. Given the low labour costs and the low depreciation rates (because of currency devaluation) this cost is high, reflecting very low mill productivity

## VI FOREST PRODUCTS MARKETING

## A. The Domestic Market

- 389 There is no official domestic sales statistics reporting system, hence it is very difficult to assess the magnitude or nature of the domestic market for sawn timber, panels and furniture. Estimates of consumption of posts, poles, pile and fuelwood ( including that used for charcoal production) are at best tentative.
- 390 There is doubt about the validity of that total production data which is collected, but it is the only source of any estimate for a market analysis. The 1991 and 1992 reported production data is illustrated in table V-1. In an effort to estimate the volume of domestic sales of sawn lumber, it has been necessary to apply a recovery figure to that log volume that was apparently sawn. After allowance for recorded exports, it appears that domestic "consumption" may have been about 43,000 cu.m. in 1991 and 56,000 cu.m. in 1992.
- 391 The domestic market is supplied direct from mill to builders or down stream manufacturers in most cases, with a small proportion through a multitude of small retail yards, scattered throughout the populated areas. Major mills tend to supply direct, while smaller mills supply the small retail yards as well as users.
- 392 Typical product prices on the domestic market are:

G\$ per bd. ft.

## Dealer No 1

Greenheart	70 - 95
High density other	45 - 60
Low density other	30 - 45

## Dealer No 2

	1st	2nd	dressed
Greenheart	50	40	56
High density other	35	20	40
Low density other	30	20	35

- 393 The timber market in Guyana is comparatively undemanding in terms of product type and quality. This is probably at least partly the result of past economic conditions, with buyers prepared to take almost anything. Unless there is a concerted effort made to improve the efficiency of wood use in construction and in construction standards this situation is not likely to change rapidly.
- 394 The major furniture manufacturers are already expressing considerable dissatisfaction with the degree of finish and quality of sawn timber available. However until such time as they are prepared to pay a premium price for a premium product, the situation will change only slowly.

- 395 Many furniture manufacturers are buying premium furniture species from "chainsaw slabber" operators. This is encouraging an extremely wasteful processing system and will lead to a an even greater shortage of already rare species. Prices being paid are often below those for construction species, partly because no consumption tax is paid.
- 396 It appears that timber construction standards differ widely but in general buildings are "over designed" in timber usage. This is undoubtedly a carry over from historical practices typical of an age when strength testing was not carried out and timber was not graded. The introduction of timber grading, even visual strength grading would influence timber usage, hence the nature and magnitude of the domestic market
- 397 There are no reliable national statistics on the construction industry, in particular housing starts and completions or non residential construction, that would assist industry in market analysis.

#### B. Export Markets

- 398 Given the controls exercised by government on export sales, it would be reasonable to assume that the data for timber exports is reliable, however no export of plywood is noted. The only plywood producer claims to have exported some 1,500 cu.m. in 1992.
- 399 Export data is shown in table V-1.
- 400 The export achievement from a potential commercial forest as large as that in Guyana is obviously poor, but given a reasonable investment climate and an acceptance by industry of the need to adhere to a good quality assurance program, could be considerably improved.
- 401 The reputation of Guyana as a supplier of timber is not good. Reliability of delivery has been poor for many years and this has reduced sales and undoubtedly prices. The situation is believed to be improving but continuation of this trend is dependent on processors being able to maintain adequate supplies of logs to mills.
- 402 The TMU has controlled exports of timber for many years but that control was substantially reduced in the last few years. It now provides a significant service only to the rare small producer who exports occasionally. It does however charge a fee of at least 2% of fob, on all timber exported. This fee is to be used on export promotion but in fact little if any action has been taken for some time.
- 403 The TMU uses a price list, which was compiled in 1988, for export species to all major market areas. Since then, there has been a major change in sawn timber exports from South East Asia, the main supply region, with very high export taxes levied on green rough sawn timber. This resulted in a change in product being supplied and an increase in price. For unknown reasons, Guyana did not take advantage of this market change, which should have seen a price

increase of 15 % to 20 % in 1990, and provided an unusual opportunity to change emphasis from the heavy construction timbers to light construction and general purpose panelling and furniture timbers.

- 404 The major mills now do their own export marketing, in some cases through locally owned overseas companies. The new investors are starting to have a major effect on exports and in spite of initial reservations will, if supported by local industry, continue to improve export marketing.

### C. Market Development

- 405 At present, no species is harvested in sufficient volume to be placed into any but "niche" markets in major importing countries. This suggests that the past emphasis on the heavy marine construction markets of Europe for Greenheart and the Caribbean market for other species in construction and heavy construction, was warranted.
- 406 Large furniture manufacturers in Europe and North America or East Asia are unlikely to seek the small volumes of potential furniture species in Guyana, except in substantially finished form. The volumes are insufficient to meet minimum production run requirements.
- 407 The "niche" markets are likely to be fairly demanding in specification, as they seek a top quality product on which they seek high margins rather than volume sales of manufactured products.
- 408 The sawmilling industry is not now in a position to meet these demanding specifications.
- 409 There has been a concentration on some European and North American countries as outlets for Greenheart and this will probably expand, particularly in the Netherlands as the polders require maintenance. However a much greater effort is required in marketing of other species to a wider market area if the potential of the forest sector is to be realised.
- 410 The current world wide recession has restricted the potential for market penetration with "new" species, and Guyana is not now in a position, because of the run down status of the industry, to respond rapidly to any increased consumption in Europe and North America. Unless the industry is rehabilitated urgently, it will miss another opportunity
- 411 Guyana has not seriously investigated the potential market in the West Pacific, where the worlds most rapidly growing economies are, and will be for the next 15 to 20 years or more.
- 412 There has been a significant decline in harvest of tropical hardwood species in the past few years and this trend will continue. The Philippines and Thailand have virtually ceased cutting and Sarawak and Sabah have reduced their harvest and will continue to do so. Indonesia is cutting less than 20 years ago and will rely increasingly on plantations into the next century.

- 413 The availability and cost of transport have been problems but a large industry would readily overcome these problems by charter of large ships with capacities of about 30,000 tonnes. Aggregation of cargoes, by cooperation between shippers, would be necessary to sustain adequate and regular quantities of suitable species.
- 414 African supplies to Europe will almost certainly continue to decline because the forests are being cut out, and an apparent inability to sustain an efficient industry.
- 415 Development of these potential markets will require promotion and the development of confidence in the buyers that supplies can be maintained. This in turn requires rehabilitation of industry and satisfaction of environmental concerns. Both are within the capacity and control of the government and industry in Guyana. It requires the political will and managerial competence to carry through a program, based on sound strategic planning, to expand exports. Indonesia may be a apt role model, with non replaceable resources being used to finance the development of industry based on renewable resources.

#### D. Export Taxes

- 416 There is an export tax on sawn timber of \$0.04 (G\$ 5.09) per cu.m. and on round timbers ( piles, poles and round logs) of less than one fifth of a cent (G\$ 0.29) a cu.m.. These have no more than nuisance value and should be abandoned. There would be merit in applying an export tax on saw and rotary veneer logs and on sliced veneer logs where there was no commitment to domestic processing within a stipulated period of time, say 3 to 4 years. A reasonable level of tax would be about 10 % to 20 % depending on species, with premium species attracting the higher tax levels.
- 417 Any export taxes raised on logs should be payable to the Forestry Commission for use in improving forest management, promotion of domestic processing and export promotion for manufactured wooden products. All too often governments view such taxes as just another source of revenue, rather than as a tool to encourage industrial development.

## VII SHIPPING

- 418 Availability of shipping was a serious problem in the past but services from Guyana have improved considerably in the last year or so and it appears that this trend will continue. Freight rates are high but are comparable to rates experienced by other countries with similar port facilities and general cargo uplift volumes.
- 419 It is claimed that inwards freight very much exceeds outward cargo volumes (excluding specialised bulk carrier cargoes). This would suggest that lower outward freight rates should be possible, but this "backloading" rate does not appear to have been pursued by shippers. This may be a result of the lack of any shippers organisation, such as a Shippers Council, in Guyana. Exporters should consider the creation of such a body if it appears that negotiation with lines would be strengthened. This has certainly been the case in most countries.
- 420 It would certainly pay the timber industry to negotiate as a group, presumably through the Forest Products Association.
- 421 Several lines have commenced new services to both the Caribbean and the U.S east coast and Gulf ports. Sailings are available at least weekly, which would be adequate for the wood products industry.
- 422 Some Caricom destinations, in particular Jamaica, are poorly serviced by direct sailings and trans-shipment is expensive. However a new service is scheduled to commence within a few months that will give weekly sailings to Jamaica.
- 423 Services to Puerto Rico would assist in forest products marketing as this is a major market in the Caribbean, but no such services are now running and none are apparently planned.
- 424 Services to Europe still present some problems as transshipment through Trinidad is still necessary in many cases, at extraordinary cost. A service claimed to be about to commence will sail direct, with an expected (by the agents) frequency of two to three weeks. Whether this frequency will be achieved is yet to be confirmed but it is probably dependent more on inward cargo volumes than outwards.
- 425 There are no problems with minimum inducement cargo volume as Georgetown is the only port used by major ships and there is regular inward cargo.
- 426 In common with small timber shippers elsewhere, containerisation has presented problems. Breakbulk cargoes are carried by few vessels, generally trampers. Open sided containers and flat racks are scarce, hence most shipments have to be made in standard units. As inward cargo uses only standard containers, delivery charges are made on non standard units, hence freight on a flat rack is higher than for a standard box, though better stowage factors could result in lower costs per cu.m.

- 427 Typical box rates, fob Georgetown, charged by the lines are shown in table VII-1.

Table VII-1: Container freight rates ex Georgetown

Destination	Unit	rate \$
Trinidad	20' container	1300
Trinidad	20' container	1400
Trinidad	40' container	2300
Antigua	20' container	1700
Jamaica	20' container	1600
Barbados	20' container	1500
Miami	20' container	1500
	20' flat rack	1700
Europe <sup>1</sup>	20' container	4800
Europe (direct)	20' container	1800

1 transhipped through Trinidad

- 428 Freight costs per cu.m. vary depending on stowage achieved. The low labour costs in Guyana suggest that manual stuffing is feasible but the unstuffing costs in Europe or North America would be prohibitive. The stowage achieved would vary from about 12 to 20 cu.m. in a 20' standard unit, hence freight costs per cu.m. would vary from a low of about \$ 65 to a high of \$ 100 to Trinidad, \$ 80 to \$ 130 to Jamaica, \$90 to \$ 150 to Europe and \$ 85 to \$ 140 to Miami.
- 429 Some chartering on a breakbulk basis is carried out by major shippers to Europe, in which rates as low as \$ 65 a cu.m. are achieved. LCL rates to the UK run at about \$ 103 + CAF a metric tonne. CAF is currently running at 3 % of the basic freight rate.

## VIII HUMAN RESOURCE DEVELOPMENT

A. General

- 430 For some two decades there has been an erosion of numbers and skill levels in all trades. The possibility of attracting skilled workers back to the country is not clear. Attempts to do this are being made, but it is believed that a considerable improvement in conditions will be required before this has a significant effect.
- 431 There is a shortage of artisans in all trades, particularly new entrants to the trade. Industry has "made do" with staff trained some years ago, but employers are conscious of the need to sustain a flow of new tradesmen. The Guyana Technical Institute is now of such low repute that it is most unlikely that employers will sponsor trainees to that institution.
- 432 Training facilities are grossly inadequate to rapidly improve the position within the country. Under current government budget constraints it is improbable that such training can be made without industry participation in both funding and administration of training.
- 433 In general, most forest industry enterprises are too small to conduct in-house formal training and in many cases it is doubtful whether there are in-house skills adequate to conduct on-the-job training even for sawyers, tree fallers etc.
- 434 This is a problem throughout all industrial sectors in Guyana

B. Forest Industries Development Unit

- 435 This organisation has been the subject of previous UNIDO consultancies and rehabilitation of the run-down facility has been proposed. Its proposed functions are vocational training, product development and demonstration of "good" milling technique. After initial "seed" finance, it is expected to be self financing.
- 436 There are a number of conceptual flaws in this proposal:
- \* The incorporation of training facilities within government departments which do not have "training" as a prime mission, tend to treat the institution as a dumping ground for staff that can be most easily left out of the main stream activities of the Department.
  - \* There is no career path leading to senior office within the Department for staff who are prepared to devote their life to training.
  - \* Staff are rarely if ever given training as trainers, hence are usually less effective than necessary in this highly important role.



- \* Because of budget constraints on achievement of the Department's main mission, the peripheral activities suffer.
  - \* Attempts to make the training and research facility self funding, almost invariably lead to concentration on commercial activities. The training and research functions suffer to the extent that industry is no longer prepared to sponsor trainees or contribute to research.
  - \* The commercial activities are difficult to sustain unless there is a guaranteed supply of logs or timber of acceptable quality.
- 437 Lease of the land on which the facility stands will almost certainly pass to a timber company, requiring acquisition of land, construction of buildings and relocation of equipment.
- 438 The equipment at the site is in poor condition, with much of it missing as a result of past neglect.
- 439 Training in timber grading and kiln drying would be better given at commercial mills, where real production problems and work schedules are encountered. It would however be desirable to incorporate this training with wood technology and timber drying courses at the GTI.
- 440 The FIDU should be sold, and the trade training aspects of the unit's activities should be transferred to the GTI.

#### C. Guyana Technical Institute

- 441 The GTI was established as a national training centre, but like most organisations, has declined over the past years. If technical trades training in Guyana is to be conducted successfully it will be necessary to improve the quality of the GTI and to concentrate limited funds on development of facilities at a single location, without unnecessary duplication.
- 442 Staff required for timber trades training are likely to have a better career path within such an organisation.
- 443 Management and staff quality will undoubtedly be a problem and it is considered that considerable support from industry will be required to overcome these problems. To this end it would be preferable that industry representatives be involved in some form of supervision of course content, staff selection and perhaps management.
- 444 If industry provides financial support to this training unit it will expect to get value for money, and has been proposed by a UNIDO metal working expert ( Mr. Gerhardt Shipp), a board or committee, which includes government and industry representatives should play a supervisory role with powers to appoint and dismiss staff.

#### D. University of Guyana

- 445 The UG should be encouraged to play a role in research into forest products and by cooperation with the GFC, the GTI and industry,

fields such as product development could be more adequately covered than is likely to be possible in the FIDU. It is probable that an institution such as the university could more easily attract external funding for this activity than would the FIDU. This is particularly so as such research would contribute to conservation of the forest resource through improved utilisation.

446 In effect the functions of the FIDU would be taken over by specialised training and research organisations. It is suggested that at this stage, Guyana requires better training and research facilities, not more that will only duplicate facilities and spread the limited staff even more thinly.

## IX RECOMMENDATIONS

### A. Forest Operations Controls

1. A national forest policy, using the 1988 draft as a base, should be composed, after consultation with interested community, scientific and business groups. This policy should be accepted at the parliamentary level to give it the necessary authority as a guide for forest practices.
2. The Forestry Act should be revised to include site conservation measures so that these requirements are no longer changeable by administrative decision and it should be devised to implement the national forest policy. The Act should provide the mechanisms by which the Commissioner for Forests has effective control over implementation of the Act.
3. The National Forest Inventory should be urgently commenced and co-ordinated with and be incorporated into a National Geographic Information System, which should be the basis for national land use planning and management.
4. All forest concessions should be reviewed with more efficient forest usage as the main objective. The type of products to be manufactured should be taken into account in this review, to induce value added operations.
5. A "Code of Practice" for forest operations should be developed to define acceptable practices to reduce adverse environmental impacts and to protect the future tree crop. This should cover road construction standards, with emphasis on drainage, planning of skid trail networks, use of roads/skid trails during periods of wet weather, control of pollutants, tree felling technique, marking of residual trees for the future crop, skidding technique etc designed to reduce damage to the residual stand.

### B. Financial Interventions

Government policy in a number of financial areas requires reconsideration. The proposed waiver of import and consumption duties on machines will minimally effect government revenue, if at all, because the purchase of machines is likely to be minimal if the taxes are retained. The taxes foregone on fuel and lubricants will be offset by changes in royalty rates. The write back of depreciation allowances and the accelerated depreciation would reduce taxation due, but this would be offset by an increase in sales because of increased log availability.

6. Log royalties should be used to influence the way in which the forest is used as well as being a charge for resource consumption. To this end, a substantial increase in some royalty rates is warranted to create a significant production cost differential between Premium and Lesser Known Species. This would need to be in the vicinity of 700 % for Premium species and 500 % for Class I

species, with Classes II and III remaining effectively the same as now.

7. The consumption taxes on timber harvesting and hauling plant, sawmilling/veneer production and plywood/furniture manufacturing plant and the spare parts for such machines, should be waived.
8. Import duties and consumption tax on kiln drying plant and on wood fired electricity generating plant should be waived.
9. The consumption tax on diesel fuel and heavier fuel oils and lubricants and hydraulic oils used for log harvesting and haulage and power generation in areas not serviced by the national power grid, should be waived.
10. The consumption tax on domestically marketed seasoned dressed/moulded products should be substantially reduced to influence the industry to engage in these value added activities.
11. The consumption tax on structural plywood, with a highly moisture resistant glue line (A and B bonds) should be substantially reduced to induce production of a more valuable product than that now made. This would also enhance the use of plywood in structural applications.
12. The export tax on processed wooden products should be discontinued as if has nuisance value only.
13. An export tax should be selectively applied on logs other than piles and poles. Dispensations should be given only where the logs are to be used for high value applications eg. sliced veneer, and the buyer is engaged in market development with a demonstrable intent to manufacture in Guyana within a limited number of years.
14. The defacto tax on exports of manufactured forest products - the commission paid to the TMU, should be discontinued where the TMU is not in fact handling the sale, or alternately the funds so collected should be paid into a trust fund, administered by the Guyana Forest Products Association and the Guyana Forestry Commission to be spent on product development and promotion.
15. Accelerated depreciation of roading, log extraction and haulage, and processing machines should be granted. The rate would have to be determined but should probably be 40 % in the first year.
16. Businesses should be allowed to recalculate book value of plant and equipment purchased since 1980 in US \$ terms for depreciation purposes, and be allowed to write off the revised residual value over a period of 2 to 3 years.

#### C. Product Development

Effective product development is unlikely unless there is a fairly clear commercial advantage to be gained. In the domestic market this would be most easily achieved through introduction and

enforcement of up-dated building regulations.

17. It is recommended that the building codes be revised along the lines of a "light framing code" using mechanical grades for timber.
18. All timber construction on government account should use mechanical characteristics of timber for specifications rather than species names, to encourage the use of lesser known species.

For this to be effective it will be necessary to promote the concept with architects and construction specifiers.

D. **Structural Adjustment**

19. Small forest harvesting operations should be encouraged or, if necessary, coerced to amalgamate or specialise, using long term harvesting rights as the inducement.
20. Small sawmills should be encouraged to amalgamate or be allowed to sell out, with the right to transfer their log cutting rights where appropriate.

**TERMS OF REFERENCE****A Purpose of the Consultancy**

- 447 The purpose of the consultancy was to assess the condition of forest industry in Guyana and to identify constraints on, and opportunities for, increasing the contribution of the sector to development and expansion of the national economy.
- 448 The field of investigation ranged across national policy and legislation, industry condition, including equipment and methods of operation, marketing arrangements and opportunities with emphasis on exports, potential for value added products and staff development needs.
- 449 In addition it was intended that industrial feasibility studies would be carried out with the cooperation of forest industry and the Guyana Forestry Commission. There was no call for this, but assistance was provided to a number of companies in determining equipment needs and operational methods.
- 450 Inexplicably, neither the Guyana Forestry Commission nor the industry were aware of the impending visit of the consultant or the purpose. This created some difficulties for efficient execution of the tasks set, and along with economic factors now existing in Guyana, resulted in modification of the objectives.

**B. DUTIES:**

The expert will advise the Guyana Natural Resources Agency (GRNA) but be based at the Guyana Manufacturers Association (GMA) and will work closely with the industry. In particular he will:

1. Investigate the current situation with respect to;
  - a) legislation and policy effecting supply of logs, production and export including financial aspects,
  - b) physical production facilities,
  - c) human resources, shipping and commercial considerations, and
  - d) cost structure.
2. Liaise with staff of other aid projects having a bearing on the sector.
3. Screen existing market information and, together with industry representatives prepare a portfolio of investment and expansion proposals.
4. Prepare a report summarising his activities and recommendations.

Due in part to the unexpected arrival of the consultant it was not possible to prepare feasibility studies for potential investment opportunities and indeed it was difficult to obtain necessary cost information.

Advice was provided in a number of areas:

- i. industrial site layout for an integrated complex, including equipment selection and plant layout,
- ii. log and timber lumber handling systems that would improve throughput and recovery in several existing mills,
- iii. marine transport systems for log handling in rivers and the sea,
- iv. improvements to veneer and plywood manufacturing methods, particularly glueing which was extremely poor,

PERSONS AND ORGANISATIONS CONTACTED

Mr. Nizam Ameerally, Wood Associated Industries Co. Ltd.  
 Ms. Denise Amsterdam, Senior Asst. Con. Forests Silviculture, GFC  
 Mr. Balram, Mill Manager, Guyana Sawmills Ltd  
 Mr. Harold Beharry, Managing Director, Swiss Engineering Ltd.  
 Mr. David Black, Commissioner, GFC  
 Mr. Karsten Borch, Chairman, Demerara Timbers Ltd.  
 Mr. Peter Briar, Sawmill Manager, Demerara Timbers Ltd.  
 Mr. Ruston Bulkan, Director, Precision Woodworking Ltd.  
 Mr. Ronald Bulkan, Director, Precision Woodworking Ltd.  
 Mr. D Burton, Laparkan Trading Co.  
 Mr. T H Chung, Dep Marketing Manager, Barama Co. Ltd.  
 Mr. Albert Cort, Director, Administration and Marketing, GFC  
 Mr. Maungla Dass, Production Manager, Guyana Sawmills Ltd.  
 Mr. Clement Duncan, Executive Director, GUYMIDA  
 Mr. A G Farenholtz, Guyana/Canada Interim Forestry Project  
 Mr. T Gittens, Senior Project Officer, UNDP Georgetown  
 Mr. A K Hellum, Guyana/Canada Interim Forestry Project  
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 Mr. Neil Hu, Blake Sawmills  
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 Mr. David Persaud, Toolsie Persaud Ltd.  
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 Mr. Warren Phoenix, Executive Officer, Forest Products Association  
 Mr. Lochan Prashad, Accountant, Toolsie Persaud Limited  
 Mr. Ashik A Rahaman, Managing Director, Guyana Sawmills  
 Mr. David Ramchand, Forester, GFC  
 Mr. Kelvin Rodney, Outward Freight Manager, John Fernandes Ltd.  
 Mr. Chrisnadat Sawh, Nagasra Sawh Ltd.  
 Mr. H Seecharam, Marketing Manager, GFC  
 Mr. Shiunarini, Ideal Wood Products  
 Mr. Smith, Ideal Wood Products  
 Mr. N C Spanos, Shipping Consultant, England  
 Mr. Colin Welcome, Shipping Dept. Guyana National Shipping Corp. Ltd.  
 Mr. Leroy Welcome, Demerara Timbers Ltd.  
 Mr. L J P Willems, Willems Timber and Trading  
 Mr. Albert Vanlange, Asst Sawmill Manager, A Mazaharally & Sons  
 Mr. Romano Vlahov, Makvis Ltd. Italy



DUTY AND EXCISE RATES

	Import duty	Consumption tax
Tractors	5	10
Skidders	5	10
Loaders	5	10
Fork lifts	10	10
Spare parts for above	10	10
Wire rope	30	10
Steel plate	10	10
Trucks	10	30
Trailers	10	30
Spare parts for above	30	30
Chain saws	10	10
Spare parts	10	10
Wood processing machinery	5	10
Spare parts	5	10
Glue	30	10
Wheat flour (glue extender)	45	10
Plastic sheeting	30	30
Plastic strapping	30	30
Steel strapping	10	30
Safety equipment		
helmets	10	30
safety boots	25	10
Diesel fuel	20	50
Petrol	20	50
Lubricants	20	10
Sawn timber		10
Plywood		45
Furniture		45

## ANNEX 4

**Backstopping Officer's comments**

This is a most thorough and comprehensive report, describing in considerable detail the situation in Guyana in the wood sector. The consultant has investigated a wide range of factors affecting development and has made many realistic recommendations under the various chapter headings.

It is unfortunate that, despite his mission having been cleared and confirmed as still justified after several delays, his arrival was unexpected. Had this not been the case it is likely that the industry especially would have had a chance better to prepare to provide him with information.

In any event, both Government and industry representatives would do well to pay serious attention to this report as a basis for policy decisions in the hopefully near future.