



PROJECT REPORT

NEW ZEALAND

- THE BUSINESS OF LOGGING AND LOG - TRANSPORTATION

The Proceedings of a series of seminars
conducted by the N.Z. Logging Industry
Research Association, in April, 1977.

P.R.3

1977

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N.Z. LOGGING INDUSTRY RESEARCH ASSOCIATION (INC.)

P.O. Box 147

Rotorua

New Zealand

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PREPARED BY:-

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Association Inc.



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These proceedings condense and amalgamate material presented by many speakers to avoid repetition. The indicative tables and figures are as stated or tabled, and subsequently checked by the speakers. Some of the calculations and some principles established are debatable, thus LIRA does not necessarily support all procedures shown, but considers examination of them will lead to a better understanding of the "business" of logging.

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1.0 INTRODUCTION

THE BUSINESS OF LOGGING AND LOG TRANSPORTATION

A priority project area for LIRA is to examine logging costing. The objective being to compile a guideline Handbook, particularly for small operators and contractors and to establish a costing formula which would provide a reasonable basis for negotiation of contracts in The Logging Industry.

Progress to date towards these objectives have been:

1976 - The Forest Research Institute, working in this field produced a branch report on Logging Costing by K. Walker* as part of an overall project on production and costs in logging and their economic implications. This report served to lay the foundations for a scientific approach to the subject.

1976 - LIRA promoted an Inter-firm comparison (I.F.C.) in the logging industry which indicated to 38 logging participants their performance comparative to others in a number of key ratios. The I.F.C. also pinpointed typical distribution of costs in the industry and laid the basis for an examination of trends.

Following the distribution of the 1976 I.F.C. results, a number of meetings were held. The conclusions from these meetings were that many small operators had limited understanding of financial factors, and that many didn't keep sufficient data to monitor the financial health of their own business. Also some Accountants had insufficient knowledge of the logging business, and thus were not servicing their clients adequately.

The meetings thus recommended:

- (a) That a further I.F.C. be conducted in the logging sector in 1977 and that every effort be made to encourage wider participation.
- (b) That prior to this, there be a meeting on the business of logging aimed at outlining basic requirements for costing and explaining the key factors affecting costs in logging.

Thus, these seminars were arranged to meet those recommendations. Furthermore, discussions with the logging committee of the Road Transport Association confirmed the desirability of similar investigations in the Log Transport sector. Therefore the seminars were broadened to include coverage of transportation with the intention of promoting an I.F.C. in that sector.

* *"The Principles and Practices of Costing as applied to Log Harvesting Systems Management"* by K.Walker N.Z.Forest Service, F.R.I.Economics of Silviculture Report No.87, 1976 (unpublished).

2.0

SEMINAR PROGRAMME

THE BUSINESS OF LOGGING AND LOG TRANSPORTATION

The N.Z. Logging Industry Research Association (LIRA) organised three two-session seminars aimed at a better understanding of business and financial aspects of the logging industry. At the same time it aimed to promote inter-firm comparisons in the logging and transportation sectors separately. A further objective was to seek suggestions on the content for a logging costing Handbook and to discuss a draft outline to ensure that the handbook presentation is most suitable for small operators.

The seminars were held at Rotorua on 15 April - 16 April - 60 attended. Richmond, (Nelson), 27 April - 28 April - 43 attended and Christchurch 29 April - 30 April - 27 attended.

The same programme was presented at each meeting. Speakers at the three separate meetings are indicated as follows:

ROTORUA (R), NELSON i.e. RICHMOND (N), and CHRISTCHURCH (C)

THE CHARACTERISTICS OF THE LOGGING INDUSTRY

T. Fraser	- Scientist, Forest Research Institute	(R)
J.J.K. Spiers	- Director, Logging Industry Research Association	(N & C)

CONTRACTING IN THE LOGGING INDUSTRY

A.H. Harris	- Logging Division Manager, Waipa Sawmill, Rotorua	(R)
P.F. Olsen	- Forestry & Logging Consultant, Rotorua	(R & N)
B. Gillooly	- Logging Manager, E.H. Baigent & Sons, Nelson	(N)
G. Eager	- Logging Manager Canterbury Timber Products, Rangiora	(C)
L. Gilsenan	- Logging Contractor, Rangiora	(C)

BASIC FINANCIAL MANAGEMENT

G. Chapman	- Accountant, Tokoroa	(R)
E. Anderson	- Accountant, Richmond	(N)
D.M. Wilson	- Accountant and Consultant, Lower Hutt	(C)

THE BUSINESS OF LOGGING AND LOG TRANSPORTATION

L. Wilson	- Forestry and Forest Engineering Consultant, Taupo	(R)
T. Johnstone	- Work Study Officer N.Z.F.S., Rotorua	(R)
P. Ammundsen	- Accountant, Transport Nelson	(N)
A.J. McConnell	- Principal Work Study Officer, N.Z.F.S., Wellington	(N)
R.N. O'Reilly	- Lecturer, Canterbury School of Forestry	(C)
D.M. Wilson	- Accountant	(C)

INTERFIRM COMPARISONS

B. Korte	- Officers	(R)
M. Huxford	- of the	(N)
J. Casey	- Productivity Centre	(C)

SESSION TWO

Discussion leaders of these working sessions held on the following day were:

LOGGING INTERFIRM COMPARISON

B. Dixon	- IFC Unit, Department of Management Studies, Waikato University	(R)
J. Spiers	- LIRA	(N & C)

LOG TRANSPORT INTERFIRM COMPARISON

- Respective Officers of the Productivity
Centre

COSTING HANDBOOK

J. Spiers - LIRA

PERSONAL INTERVIEWS

- Time was arranged for participants in the 1976 Logging I.F.C. to have confidential discussions of their own results with B. Dixon (R), M. Huxford (N), J. Casey (C) and at a later date with B. Korte at Taupo, Tokoroa and Rotorua.

3.0 THE CHARACTERISTICS OF THE LOGGING INDUSTRY AS A BUSINESS

Mr Tom Fraser of the Forest Research Institute, outlined key features of the logging industry particularly with regard to contractors and small businesses pinpointed in the 1974 F.R.I. survey*. He established the important characteristics that distinguished logging and logging-contracting from other industries.

Working conditions are as far removed from factory conditions for work as could be possible.

In the factory, working environment is constant. Productivity and product can be closely regulated. In logging there is infinitely variable terrain, widely varied raw material dimension (trees), to say nothing of unpredictable weather. All these greatly vary production and hence profitability. Thus estimation of a job price or contractor's price based on units produced is of critical importance.

Contracting in logging and log transport is different from other industries.

Earthmoving typically moves 50 to 100 miles between jobs to a variety of employers. Agricultural contracting has numerous different employers and a high number of shifts between jobs. Logging is normally an on-going operation in one forest, (salvage logging may be an exception). Fraser concluded that thus it is surprising to see the short term of contracts. Few contractors who responded to the FRI survey had contracts for even the three year period of loan repayment on machinery.

As a Captive Service Industry it is tied to a fixed market.

A contractor can't expand, sell part of his business, cut out an unrewarding line of product or find new markets like most businesses. He has very little room for manoeuvre, particularly if a contract goes sour.

Capital intensiveness is striking in logging.

* "A Survey of the Logging Industry for the year ended 31 March 1974" by T.Fraser, G.Murphy, and C.J.Terlesk. N.Z.Forest Service, Forest Research Institute Economics of Silviculture Report No.84, 1976, (unpublished).

Capital intensiveness is striking in logging.

The following figures (compiled in 1973/74) compare with new investment per worker in that year in a number of industries:

NEW INVESTMENT PER WORKER 1973/74

Logging	\$3219	Food	\$1379
Textiles	\$ 660	Wood and Cork	\$1205
Pulp & Paper	\$6583	Metal Products	\$ 674
Total Manufacturing	\$1278	Farming	\$1901

(NOTE: The above figures taken from the N.Z. Industrial Production Statistics, 1976, with the farming figure taken from the N.Z. Official Yearbook, 1976. These figures do not include land purchase (or, in the case of farming - livestock).

It should be noted that only pulp and paper is higher and that even then the figures are not strictly comparable as the log transport and part of the loading sector was not included in the logging figures and would be expected to push them significantly higher.

Working owners run a sizeable sector of the industry.

Thus logging has something in common with farmers, but new investment per worker is about twice as high. Probably an average single unit contractor skidding and loading has \$170,000 approximately invested in his business. An owner/operator in trucking may have \$80,000 to \$100,000. The community is constantly made aware of the investment problems of others, but little or nothing is heard about loggers problems.

High concentration of expenditure in the early years of machinery life is a feature of the business.

A Forest Research Institute calculation on typical skidder operation indicated that annual expenditure in the first three years was much more than half the expenditure in a seven year life expectancy of a skidder unit. Loan repayments and interest amounted to just under half the expenses in this first three year period.

Obviously, the fact that logging is so capital intensive means that investment plans are particularly vulnerable in times of rapid inflation. A contractor, particularly one with a lack of security in tenure of contract, has extreme difficulty in raising money for investment at the best interest rates. The costs of what he does manage must inevitably be passed on.

Fraser concluded that in an industry dominated by a few large organisations, many contractors are handicapped by the present system of contracts. If they are to continue to play the important part they do, there is a need to review the present contracting system.

4.0 THE PLACE OF THE CONTRACTOR IN THE LOGGING INDUSTRY

Mr. Tony Harris, Logging Division Manager of Waipa Sawmill, pinpointed two key elements in the contractor/employer relationship.

- (a) The contractor must make money.
- (b) The Mill needs a constant supply of logs at low cost to be competitive.

Mr. Harris emphasised that it was cheaper to use their own equipment and in fact Waipa operate 60% of logging with their own gangs and 33% of trucking with their own fleet. The remainder, 40% logging and 67% trucking is contracted out. From the Mill's point of view, the major advantages of this contracting sector were:

- (a) Better availability of equipment from their contractor.
- (b) The employer doesn't pay for machinery not being used.
- (c) Owner operators are generally more careful and conscientious.
- (d) A contractor did not need the back-up services or administrative overhead of the large organisation.

Mr. Peter Olsen, Forest and Logging Consultant and Contractor, stated that there was a wide range in size of contracting enterprise from large multiple crew companies down to single machine operators and piece-rate cutters. The larger contractors often became akin to Companies, thus in the bigger operations, there was a similar tendency to lose control of detail. The difficulty was in deciding at what level an organisation can maintain efficiency.

In the transportation sector, it was important to minimise the dependence on outside (and expensive) servicing, without over-capitalising the operator's own workshop plant. In discussion it was established that one despatcher manager and one mechanic per ten units seemed a reasonable balance. Many felt that given today's inflation rate the single-unit owner-operator could not provide for replacement and that minimum fleet size to cope with this aspect was probably six.

Mr. Olsen made the point that a significant item of hidden capital for contractors was generally "esprit de corp". Contractors could be relied on for sustained production, they were often innovators, but could not survive on the basis of underpriced services. Normally they operated at a higher cost rate than companies and had little access to discounted goods.

Mr. Brian Gillooly, Logging Manager for Baigent's Nelson considered that most contractors were individualists who wanted the responsibility to organise their own operations. They thus needed to be efficient, prepared to meet targets, and flexible in their approach. He foresaw problems in equipment procurement, particularly where highly specialised

highly capitalised equipment, such as mobile haulers were required. He foresaw a future in the labour only type contractor with the Company owning major capital items. Mr. Morris Honey, Logging Manager for Fletchers in Westland, confirmed that this type of operation with Companies or Sawmills owning equipment, was widely used on the West Coast.

Mr. Graeme Eager, Logging Manager for Canterbury Timber Products, said that 75% of N.Z. Logging production was by contract. He pointed out that most new Companies had high capital demands. They considered it was important to use contractors, thus relieving the company of raising capital funds. He felt that most Company Managements were more interested in the manufacturing and sales processes rather than the provision of raw materials and thus gave priority to capital expenditure in that area. The main requirements a Company expected from contractor operations were:

1. Minimum supervision.
2. Close adherence to specifications.
3. Efficiency in all operations.
4. Adherence to contract conditions in fire control, cutovers, environmental requirements etc.
5. A high standard of utilisation of wood.

Eager said the contractor must have a good understanding of costings, and that the onus was on him to present a clear case for price adjustments.

Mr. Les Gilsenan, Contractor of Rangiora, considered that the owner/employer had a significant commitment towards his contractors and needed to recognise this responsibility. He emphasised that planning of operations and scheduling of trucking was normally under management's control. Thus, provision of adequate roading and skid sites, where this was not in the contract, and the regular and prompt removal of wood from the bush was a management responsibility. Poor performance of this requirements could restrict the efficiency of the contractor. Gilsenan pointed out that most contractors had to put in a high percentage of time on their own maintenance and administration outside normal hours, and that given their highly capital intensive operations, the services of a good accountant were essential. Such an accountant can play an important role in ensuring adequate provision is made for asset replacement. A contractor had high equipment expenses and high man power costs and thus must work closely to budget. He must review his actual expenditure compared to budget and he must constantly be aware of his financial position so that negotiations for revision of contract prices were undertaken in time to avoid financial disaster.

5.0 BASIC FINANCIAL MANAGEMENT

Three Accountants, well versed in the business of contracting spoke to the separate meetings. Mr. Ted Anderson, of Richmond, outlined the current situation when he said, contracting has moved rapidly from the day of the horse and axe, to the present era of skidder and felling machine. No longer do individual mill owners and contractors, estimate prices for low volumes on a rounded out cents per foot basis. Today's high capital costs and high volumes require fine tuning in costing and with the development of the large forestry Companies, price setting has moved from the bush to the Board room. Thus it is essential that the contractor of today has understanding of financial management.

Mr. Gary Chapman of Tokoroa supported this, pointing out that contractors assets commonly were in the \$100,000 to \$300,000 range. He thus was a money manager with significant investment and as such, needed to demonstrate not only efficiency in the field but an awareness of profitability, cash flow and taxation requirements. He considered that a basic understanding of a "fair price" was essential to the health of the logging industry

Mr. Don Wilson of Lower Hutt previously Executive Director of the Road Transport Association, quoted from Robert Townsend's "Up the Organisation" - "If you are not in business for fun or profit, what the hell are you doing here?" He said contracting was a business. Business means seeing an opportunity and organising to supply a need at a price which people are prepared to pay, and which covers costs sufficiently to make a profit. The contractor was a decision maker. Even the decision to continue was a significant one.

The place of the Accountant in the services they offered to contracting clients was discussed. It had been obvious from the results of the 1976 inter-firm comparison that a wide range of accountant services with varying levels of effectiveness was used in the logging industry. Anderson said there were three basic categories of accounting services.

- (a) Preparation of annual accounts and tax returns, plus a few necessary consultations.
- (b) Handling of all routine office procedures, payments of wages, accounts, claims for refunds, sales tax etc.
- (c) Processing of the time consuming and technical side by the Accountant with retention of control by the contractor, plus consultation on financial decisions.

The latter had advantages in leaving the contractor free to concentrate on production of timber and maintenance of machinery and allowed the Accountant to keep in close contact with costs in the industry, thus enabling them to be in a better position to advise.

In discussion, it was apparent that the most advantageous relationship occurred where there was regular consultation and an understanding of the logging business by the accountants concerned. This tended to occur more in the smaller centres where the forest industry activity was significant.

Anderson proffered the following points for contractors in assisting them in their business. He said that Accountants charge by time and a tidy set of records saves time and thus money. Thus the following procedures were advantageous.

- (a) To meet the income tax act, sufficient records in the English language must be kept for 7 years.
- (b) Vouchers and supporting documents are necessary to confirm entries in cash books, journals etc.
- (c) Receipts and invoices for payments or copies of invoices supplied to forestry Companies should be kept.
- (d) Waybill dockets were not necessary for tax purposes but should be kept to check against monthly statements.
- (e) A good filing system was essential.
- (f) Full details should be entered on cheque butts and deposit butts. Bank statements should be kept and supplied in order to the accountant.

5.1 FINANCIAL PLANNING

All the accountants stressed that planning of finance is essential. This is by budgeting, which includes these aspects:

1. A capital budget - to know what outlay is required.
 2. A profitability budget - to show the expected costs in relation to needed revenue, and therefore a financial profit.
 3. A cash flow analysis, which is forecasting ahead the cash that will come in and the cash that will go out.
1. Chapman said, a capital budget is simply asking the question, "Can I afford to get into this contract?" As such, it should consider both major and minor items and the requirement for working capital. He presented a typical capital budget for tractor-arch logging. (See Table I).

TABLE I

CAPITAL BUDGET

	TOTAL VALUE	AMOUNT OF CASH DEPOSIT PAYABLE	AMOUNT ON H.P.
<u>EQUIPMENT</u>			
TRACTOR	82000	18000)	69000
ARCH	7000	7000)	3 Years
STORAGE ON JOB	200	200	
GANG TRANSPORT	6000	6000	
CHAINSAWS	2200	2200	
MAINTENANCE EQUIPMENT	500	500	
SAFETY EQUIPMENT	400	400	
FIRE FIGHTING EQUIPMENT	300	300	
SUB-TOTAL	98600	29600	69000
WORKING CAPITAL	1200	1200	
<u>TOTAL CAPITAL INVOLVED</u>	99800	30800	69000
<u>METHOD OF FINANCE:</u>			
TOTAL HIRE PURCHASE	69000	\$2491 per month	
OWN CASH	25000	for 36 months.	
BANK ACCOMMODATION	5800		
OTHER FINANCE			
TOTAL	99800		

TABLE II (See Paragraph 2, Page 12)

PROFITABILITY BUDGET

1. PRODUCTION VOLUMES

(a) WORK DAYS	52 x 5 =	260	
- ANNUAL HOLIDAYS		15	
- STATUTORY HOLIDAYS		11	
- WET DAYS AND BREAKDOWNS		14	
			220

(b) PRODUCTION PER DAY

SAY 120 TONNES PER DAY
THEREFORE TOTAL ANNUAL PRODUCTION = 26,400

2. PRODUCTION COSTS

<u>LABOUR</u> - STAFF (3 x \$8000)	24,000
- PROPRIETOR (1 x \$10,000)	10,000
ACCIDENT COMPENSATION (5%)	1,700
EMPLOYERS LIABILITY 1ST WEEK	214
SAFETY AND WET WEATHER GEAR	400

<u>TRACTOR</u> - FUEL (\$30 PER DAY)	6,600
- OILS (\$100 PER MONTH)	1,200
- REPAIRS AND MAINTENANCE (80% OF CAPITAL COST OVER 5 YEARS)	13,120

<u>ARCH</u> - REPAIRS AND MAINTENANCE	
- TYRES 1 SET EACH 4 YEARS	

GANG TRANSPORT - 15000 MILES P.A. @ 25c.	3,750
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CHAINSAWS - 3 @ \$8 PER DAY	5,280
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INSURANCE - PUBLIC LIABILITY	100
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- TRACTOR ARCH	1,980
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OVERHEADS - Accountancy, subscriptions, telephone, bank charges, stationery	2,000
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INTEREST - Hire purchase interest	6,900
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Bank	600
------	-----

On own funds 15%	3,750
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DEPRECIATION - STRAIGHT LINE 5 YEARS (RESIDUAL VALUE 33% OF COST AFTER 5 YEARS)	11,900
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PROFIT	\$94,164
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RISK FACTOR

PROVISION FOR INFLATION

TOTAL COSTS AND CHARGES TO RECOVER =====

DIVIDE TOTAL COSTS AND CHARGES BY PRODUCTION TO GIVE
PRICE PER TONNE

2. A profitability budget is an attempt to determine the expenses over the year in relation to income and show a profit. Each contractor should determine this for himself under his personal circumstances. i.e. Are the rewards sufficient? The profitability budget Chapman outlined is shown in Table II. (Contractors could put in their own figures according to their own operation.)

In the discussions on budgeting, the following points were established:

- (a) Of the 234 work days, only 220 should normally be allowed for production calculations. Even this might need to be modified if experience did not confirm this figure.
- (b) Daily production should be calculated on average performance not best production or simple acceptance of study figures.
- (c) Chapman considered 80% of the new capital cost should be allowed for repairs and maintenance over a 5 year period.

i.e. $1/5\text{th} \times \frac{80}{100} \times \text{New Capital Cost (per annum)}$

Example

In Year 1 H.D. 16 cost \$85,000 R. & M. = \$13,600
In Year 2 New Price now \$99,000 Thus R. & M. = \$15,840

This calculation was debated - more traditional R. & M. calculation allowed 100% of capital cost over 5 years. Type and extent of useage effected R. & M. but 1400 hours per year was considered an average for logging machinery. D. Wilson considered that the calculation should be based on planned projections for routine servicing, major overhauls and other predictable items, plus an allowance, based on experience, for breakdowns and emergencies. He favoured budgeting for R. & M., particularly in trucking, rather than generalised rules of thumb.

- (d) Depreciation formulas depend on what is meant by depreciation. The formula used can be different for costing, for accounting or for taxation purposes. Wilson defined depreciation as the current cost of using assets, i.e. the proportion of what they are currently worth that is being used up in the current year. In the 1976 Logging Interfirm Comparison a straight line depreciation formula was used for cases of comparison. Such formulas are being more commonly used in costing because of the distortions of high rates of depreciation allowed for taxation purposes, taxation and the effect of inflation. Allow 20% each year over five years.
- (e) Consideration should be given to the risk factor. There is a significant difference between the contract that can be terminated at one months notice, and the five year contract. If there is no tenure of contract, compensation needs to be calculated for the capital tied up in machinery which may not be earning.

(The Profitability Budget in Table II was criticised on the basis that it provides for both "interest on owners funds" and "profit" and then additionally makes allowance for "risk". Although it was agreed that higher risk required higher returns, some considered risk, profit and interest to be overlapping and distinction between them difficult. If such a budget was drawn up on "current" equipment costs it was considered that additional provision for inflation need not be made.)

- (f) Chapman considered that given current inflation rates, the trade value of the equipment plus depreciation should equal the price of a new machine as indicated in Table III. However, acceptance of such procedure is debateable. Most employing firms consider that at the stage of re-equipment in any enterprise, re-financing is required. Thus provision in advance could not be made anticipating inflation five years hence. It was agreed that, in the example, the contractor had a 33% deposit on the new machine through his trade in value, that if he then borrows the rest, no cash surplus is required, and that the depreciation provision provides sufficient cash for loan principle repayments.

TABLE III

EXAMPLE OF EFFECT OF INFLATION

TRACTOR COST, 1977	\$82,000
Replacement cost 1982, say	164,000
Trade in value of 1977 model say 33% of new tractor	54,000
EXTRA CASH REQUIRED	<u>\$110,000</u>
Depreciation claimed on old tractor over 5 years (presumed set aside)	59,500
EXTRA CASH REQUIRED OVER 5 YEAR PERIOD	<u><u>\$50,500</u></u>

To achieve \$50,500 after tax over five years would need:

To have a net profit of	91,818 ÷ 5 = 18,365 per annum.
Pay tax of	41,318
To achieve:	<u><u>\$50,500</u></u>

OR:

\$18,365 should be included in contract costs, so that I can replace the piece of equipment at end of five years.

5.2 CASH FLOW ANALYSIS

Wilson stated that to simply remain in business, a contractor must have a good cash flow and must be able to prove it to raise finance. Anderson said that by adding the calculated depreciation and return on capital elements, these two must exceed hire purchase payments to give a positive cash flow. Wilson considered flow of cash over the period of ownership of the main assets was basic and presented Table IV based on the earlier calculations of Chapman.

TABLE IV

Taxes are at 45% on all revenue in excess of the allowable expenses. Interest, other than hire-purchase will vary from year to year, but we will assume it is \$600.00 per year, and we arrive at this position:

Year	Cash Costs	H.P. Interest	Other Interest	Allowable Depreciation	Tax is on Revenue In Excess of
1	71014	10000	600	26700	108314
2	71014	7900	600	12460	91374
3	71014	4000	600	9968	84982
4	71014	-	600	7974	79588
5	71014	-	600	2528	74142

YEAR	If revenue = \$10000		If revenue = \$11000	
	taxable	tax 45%	taxable	tax 45%
1	(8314)	-	1686	759
2	8626	140	18626	8382
3	15018	6758	25018	11258
4	20412	9185	30412	13685
5	25858	11636	35858	16136

TABLE IVb

COMPARISONS OF CASH FLOWS GIVEN DIFFERING INCOME

If revenue is \$100000 and cash costs \$71014, operating surplus is \$28986; and with the same costs revenue \$110000 gives \$38986. The extra \$10000 of revenue has a marked effect on results:

Year	Operating Surplus	H.P. Instals	Other Interest	Taxes	Surplus	Deficit	Continuing Balance
1	28986	29900	600	-		1514	(1514)
2	23986	29900	600	140		1654	(3168)
3	28986	29900	600	6758		8272	(11440)
4	28986	-	600	9185	19201		7761
5	28986	-	600	11636	16750		24511
		And the machines have residual value					29370
							<hr/> 53881 <hr/>
1	38986	29900	600	759	7727		7727
2	38986	29900	600	8382	104		7831
3	38986	29900	600	11258		2772	5059
4	38986	-	600	13685	24701		29760
5	38986	-	600	16136	22250		52010
		And the machines have residual value					29370
							<hr/> 81380 <hr/>

Although a return of \$53,881 from an original investment of \$25,000 is respectable at 23%, the cash flow deficit of the first three years, particularly the third, should be noted and in many cases this is crucial. The bottom section indicates a much improved position through increased annual receipts of 10% on the same cash costs. This return of \$81,380 in five years is 45% flat, but 27% on compound interest and 32% if a discounted cash flow calculation is used.

5.3 PERFORMANCE MEASUREMENT

Chapman emphasised that planning is not enough. Performance must be measured against planned prediction in both production and financial terms. It must be done at least three monthly, preferably monthly. Annually is quite insufficient. A financial report was required which measured:

- (a) Production.
- (b) Cost of producing.

Anderson said two practical checks were:

- (a) Having prepared a budget, a daily desirable income should be established and checked each month to see receipts showed it was achieved.
- (b) A close watch on the bank balance should indicate danger if this was decreasing. If increasing, it was probably O.K., except if hire purchase commitment were small when increase should therefore be very rapid.

The performance measurement should highlight planned against actual, and give the reason why. The analysis of these results should indicate the action required to improve the situation. Regular measurement is necessary so that corrective procedures can be taken as factors change. This is particularly important today with rapid changes in cost factors, where a two to three percent swing can eliminate profit. Changes in circumstances such as new work, new machines, labour changes or more particularly, changes in prices being paid for operating supplies can markedly effect results.

A comparison of actual against budget on a regular basis was mandatory for survival and profit.

5.4 TAXATION

Chapman stated that taxation was a liability that must be planned for and a primary obligation is to minimise tax. The operator needed to calculate with reasonable accuracy, his financial flows, otherwise profits could go into taxation rather than the business. He considered it important for all firms to claim all expenses allowable and said there were significant advantages to small operators in splitting incomes, thus reducing the taxation load where a wife does work for the business. (See Table V)

TABLE V

<u>TAXATION CALCULATIONS</u>			
<u>INCOME</u>			<u>TAX PAYABLE</u>
\$12,000			\$4,172
Compared with:			
10,000	Proprietor		3,336
2,000	Wife		245
<u>12,000</u>			<u>3,581</u>
8,000	Proprietor		2,374
4,000	Wife		754
<u>12,000</u>			<u>3,128</u>

The appropriate legal taxation allowances for depreciation calculations need to be made. Wilson tabled figures for transportation depreciation as follows:

TABLE VI

"Depreciation for tax purposes in the first year varies with locations. Bay of Plenty and Christchurch are 'low' rates: investment allowances 5% and depreciation 25%, making 30% for first year. Thereafter tractors and trailers are 20% on diminishing book values. Hence the following:

Year	Book Value	Depreciation	
		Rate	Amount
1	89,000	30%	26,700
2	62,300	20%	12,460
3	49,840	20%	9,968
4	39,872	20%	7,974
5	31,898	20%	6,380

The last year's figure may be in doubt. If the items are sold or traded in at 33% of cost, the amount is \$2,528."

6.0 THE BUSINESS OF LOGGING AND LOG TRANSPORT

6.1 FACTORS EFFECTING LOGGING PRODUCTION AND COSTS

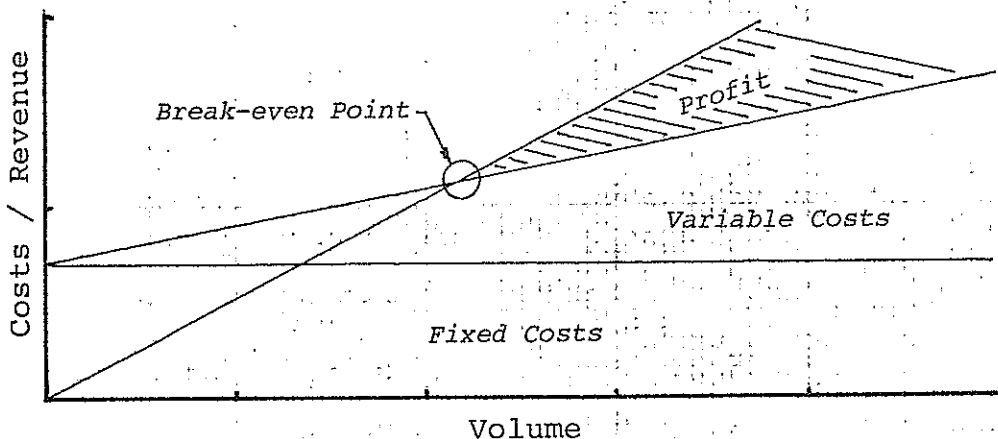
Mr. Len Wilson, Forestry and Logging Consultant of Taupo outlined the important points for the consideration of the contractor. He works in a variable environment, therefore he must know before costs are calculated, the following factors that affect the job. (Ideally confirmed in writing).

- (a) The job specification, its location and the product required.
- (b) The piece size or tree size, as this was the most important influence on productivity and machine selection.
- (c) The production required and any quota restrictions.
- (d) The topography preferably indicated in a map or plan.
- (e) The responsibility for roading and landing preparation and location.

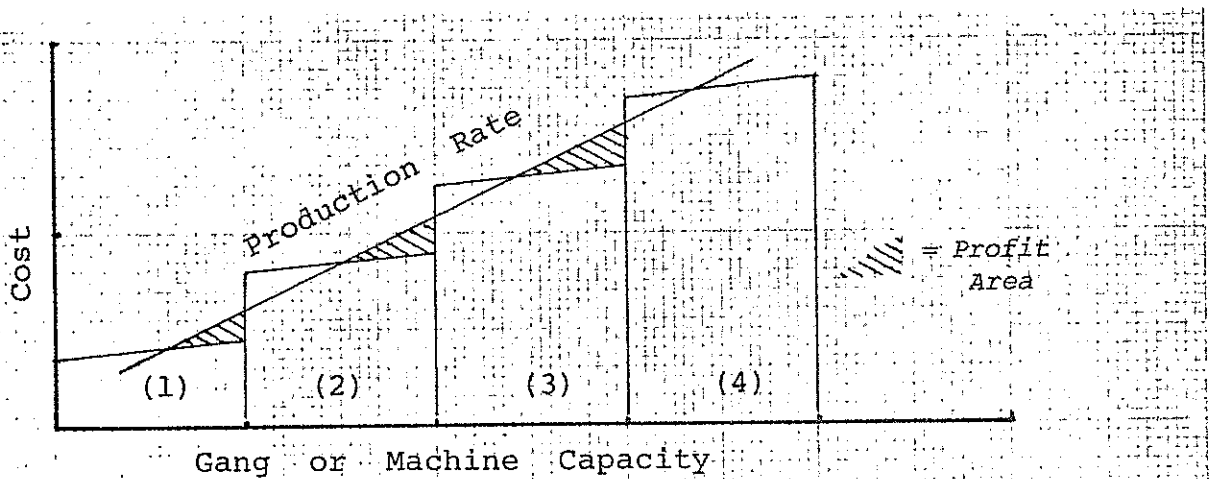
Then he must look at the inter-relationship of labour and equipment and which are fixed and variable costs amongst these.

- (a) Labour tends to be a fixed cost, and thus must be utilised to the fullest.
- (b) Machines owning costs a major proportion of total machine cost, are again fixed with p.m.'s depreciation, interest, insurance etc. Thus machine utilisation must be kept as high as possible and downtime for whatever cause minimised.
- (c) The variable cost factors were such things as fuel, tyres, R. & M. etc., which were effected by the way they were used.

Don Wilson illustrated the relationship of fixed and variable cost to profit and pointed out that once past the critical point or "break even" point, profits can be made fairly easily if work is within overall capacity.



If new assets has to be acquired to increase capacity a "stepped" effect resulted with a series of critical points to be overcome as each new unit was introduced.



He characterised costs whether fixed or variable as being:

1. Those paid out regularly in current money terms, i.e. fuel, wages, insurance, rents, telephones etc.
2. The current cost of using assets, i.e. depreciation (the proportion of their worth used up in the current year).
3. The current costs of using the investment, i.e. interest (our own or someone else's money tied up in the business).
4. Taxation on income - which is a cost as any other.

Len Wilson considered the selection and retention of good staff of prime importance. Such men kept production and machinery going in a steady and reliable way, reducing down time and enabling regular planned maintenance. This would also contribute to better residual values for machinery. Half an hour at the beginning of each day spent checking that plant was in good order, rather than "zooming off" paid good dividends.

Machine selection was also highly important otherwise capital was wasted or gave little return as indicated in the 1976 I.F.C. results. L. Wilson said selection of machine specification necessary to do the job was important. The very high fixed costs had to be recognised thus the units must be the minimum compatible with doing the job.

6.2 FACTORS EFFECTING LOGGING TRANSPORT PRODUCTION AND COST

Mr. Peter Olsen, Consultant of Rotorua, pointed out some of the key factors influencing log transport operators.

- (a) They had massive standing charges. As much as \$120 per day. Thus utilisation rate had to be high.
- (b) They had to give consideration to log segregations and piece sizes in maintaining full loading.
- (c) They had to examine the factors that effected their turn around. Skid areas and surfaces, access and quality of log handling on the skid, as well as waiting time, incurred when full loads were not assembled beforehand.
- (d) Normally they can't control the skid operation.
- (e) The loader is a major factor effecting production and turn around.

They need to isolate all the factors effecting round trip times.

- (a) Weighbridge stops and other unscheduled stops.
- (b) Road surfaces and grades and,
- (c) Problems with maintenance, flats etc., and this was effected by road surfaces. Most operated over 60% to 70% sealed but where this decreased, it reduced tyre life.

Peter Ammundsen of Transport Nelson said investment in the transport sector was even higher per man than in logging. Thus it was crucial to get the trucks to do as much work as possible. He stated that time = money and that break-downs were extremely detrimental. A good safety record was also crucial in that it increased utilisation and the no claims bonus which were important to a big fleet.

In the operational area he considered the following essential to efficiency.

- (a) Tight control over despatch of vehicles.
- (b) Minimised turnaround time on the landing by:
 - (i) Good log segregation.
 - (ii) Prior and complete log preparation.
 - (iii) Availability of loader and complete loads.
 - (iv) Good scheduling with one truck at a time to a landing.

Olsen considered there was a trade-off between capital employed in units and R. & M. costs. Capital costs could vary between \$73,000 and \$120,000 per unit for the same pay load capability. An operator needed to be able to assess a reasonable level of R. & M. according to work load requirements and type of utilisation.

Naturally the driver had a considerable effect on performance in this area. The expected mileage would be 60,000 to 90,000 per year per unit, but poor scheduling, poor log presentation. or inadequate loader capability could reduce utilisation significantly. Currently interest charges on a 36 month term were about 10.83 per cent or an 18 per cent interest over a 3 year p.m. period.

Olsen said most drivers currently want overtime or bonus and their payouts are in the region of \$11,000 to \$14,000 per year. Thus standing charges for truck plus operator would be about \$120.00 per day. Operating costs per km. would be additional to this.

During discussion it was stated that Canterbury trucks on export to Timaru probably did 100,000 km per year whereas some Bay of Plenty trucks double shifting often exceeded 175,000 km.

In discussion size of fleet, Olsen considered the owner/driver is no longer in a position to replace his unit and effective business would require a five or six unit minimum. It is desirable to have a fleet size which enables employment of R. & M. staff effectively. One fleet operator considers that 10 units were ideal and enabled the employment of both a mechanic and a truck despatcher/administrator Trouble Shooter.

Ammundsen said that with trucks about \$100,000 per unit at least \$8 per hour was involved in depreciation alone on the basis of 2000 hours per year. Given other high standing charges, i.e. insurance at approximately \$3,000 per annum etc., he considered it cost about \$18 per hour to own. i.e. 30c. per minute. On this type of unit an operator would want to make \$7000 - \$8000 per year.

Don Wilson discussed the costs of running a typical truck and trailer unit such as a Mack Tractor - semi trailer and trailer unit. He summarised costs for two different operations indicating low, high and probable estimates for each job.
(See Table VII)

TABLE VII

SUMMARIES OF COSTS FOR SELECTED OPERATIONS

(Subject to depots and administration, interest, overheads and profits.)

40 kilometre hauls, slow turnaround; 4 trips per day, 5 days per week except holidays, and allowing 10% lost time for sickness, servicing, stop-work meetings, etc.

40 x 2 x 4 x 213 = 68160 km, plus sundry = 70000 km p.a.

	LOW	HIGH	PROBABLE
	\$	\$	\$
Running costs	12684	22435	16345
Standing (moderate wages)	10664	16664	13644
Depreciation (0.1 to 0.15)	<u>7000</u>	<u>10500</u>	<u>8400</u>
For 852 trips:	<u>30348</u>	<u>49599</u>	<u>38409</u>
Per trip	35.62	58.21	45.08
Per t-km if 25 tonnes	0.036	0.058	0.045
Per t-km if 20 tonnes	0.045	0.073	0.056

100 kilometre hauls, fast turnaround; 4 trips per day of 10 hours, 6 days per week except holidays, and 10% lost time.

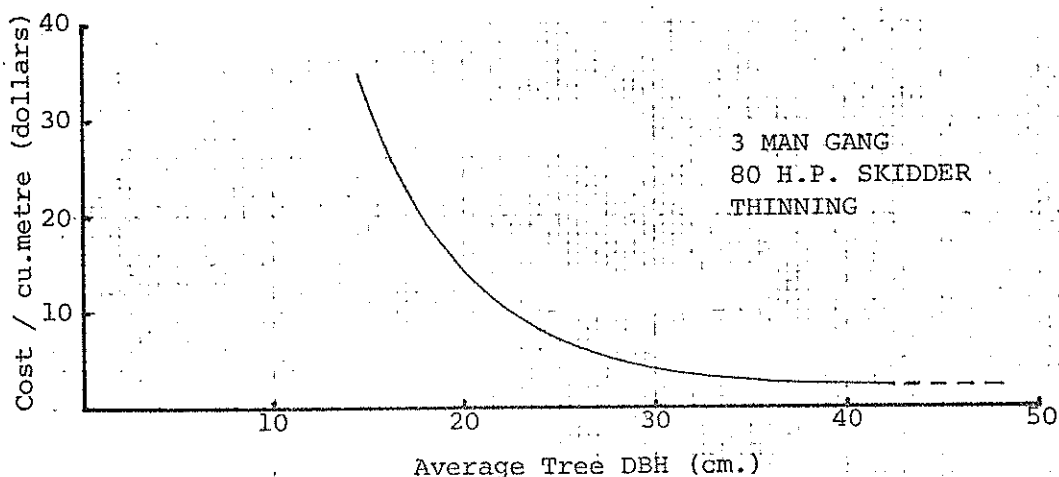
100 x 2 x 4 x 260 = 208,000 km. plus sundry = 210,000 km per annum.

	LOW	HIGH	PROBABLE
	\$	\$	\$
Running costs	38052	67305	49035
Standing, (high wages)	12664	19664	15664
Depreciation	<u>21000</u>	<u>31500</u>	<u>25200</u>
For 1040 trips	<u>71716</u>	<u>118469</u>	<u>89899</u>
Per trip	68.96	113.92	86.44
Per t-km if 25 tonnes	0.028	0.046	0.035
Per t-km if 20 tonnes	0.034	0.057	0.043

6.3 FACTORS AFFECTING LOGGING PRODUCTIVITY

Ron O'Reilly of Canterbury University Forestry School, outlined the various factors that affect productivity. He drew on extensive studies done in Canada and the U.S.A. and corroborating information from New Zealand.

The most important forest stand factor was volume per tree, and he illustrated this with a graph indicating that for a certain range in size an increased of 2 inches in Dbh was equivalent to cutting the logging costs by half, other factors being equal. Volume per hectare had an influence but it was small. The other stand factors had minor influence.



Variation in terrain factors within the capacity of the machine selected for the logging job had limited influence providing planning was adequate. Ground roughness, wetness, soil type and grade did not effect productivity much.

The climatic factors of rain, wind, snow etc., did not reduce productivity on the job. They were only limiting in the extreme, i.e. when the job stopped because of the factor.

Of the operating factors, skidding distance was very important and the number of men were important. Volume per load and number of trees per load were inter-related with tree size. The maintenance of an optimum load volume for each drag was an important factor influencing productivity.

Over riding all other factors affecting productivity were the human factors of skill, motivation and team work. The American studies identified two types of crews which they called "aggressive" and non-aggressive and considered the affect of an aggressive crew could over-rid all other factors.

O'Reilly summarised these effects as shown in Table VIII.

TABLE VIII

FACTORS AFFECTING PRODUCTIVITY

STAND - TREES PER HECTARE

VOLUME PER TREE Most Important.
VOLUME PER HECTARE Real but small.
BRANCHINESS
UNDERBRUSH

TERRAIN

GROUND ROUGHNESS
GROUND WETNESS
SOIL TYPE
GRADE

CLIMATIC

RAIN) Only limiting at
SNOW DEPTH) the extreme.

OPERATING

SKIDDING DISTANCE Very Important
VOLUME PER LOAD
NUMBER OF TREES PER LOAD
NUMBER OF MEN Important.

TYPE OF

OPERATOR

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"AGGRESSIVE"      } ..... Can Override all
"NON-AGGRESSIVE"  } ..... other factors.

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Studies of aggressive or effective crews indicated that the following characteristics were common to all these crews.

- a. The boss was on the job.
- b. The boss was the "Boss" and he knew his job.
- c. They took better care of equipment.
- d. They had newer equipment.
- e. They worked as a group, not as individuals.
- f. They could inter-change jobs.
- g. They normally earned less money per unit but total earnings was higher.

6.4 RELATIONSHIP OF INFLATION AND PRODUCTION TO COSTS

Mr. Tom Johnson of the New Zealand Forest Service, discussed the effect of inflation and fixed and variable costs on the costs of logging operations, and presented a series of tables which indicated how the various costs elements had moved over three years. He presented figures calculated separately for a large clear felling and small thinning crew. He pointed out that in the period from April, 1973, to April, 1976, costs had increased from 55% to 60% in this type of operation.

TABLE IX

<u>LARGE CREW</u>			1.4.73	1.4.76	DIFFERENCE	
1	Purchase Price	130-190 hp Skidder	\$34961	\$66684	+	91%
	"	" Tyres	\$1791	\$4246	+	137%
	"	" 120-160 hp Loader	\$38007	\$61902	+	63%
	"	" Tyres	\$2142	\$2662	+	24%
6	"	" Chainsaw	\$210.75	\$434.30	+	106%
	Accessories	Per Day	\$6.76	\$12.64	+	87%
2	Transport	Per Day	\$.0685	\$.1202	+	75%
	Fuel	Per Litre	\$.0389	\$.1420	+	265%
	Oil	Per Litre	\$.3390	\$.5233	+	54%
8	Wages	Per Hour	\$1.668	\$2.345	+	41%

<u>OPERATING COSTS</u>		1973		1976		DIFFERENCE
<u>In \$ Per Annum</u>		COST	%	COST	%	
Depreciation	10608	11.4	17727	2.3	+	67%
Insurance	5030	5.4	7119	4.9	+	42%
Interest	6722	7.2	9960	6.9	+	48%
Overheads	3569	3.8	5834	4.0	+	63%
R. & M. - C	5602	6.0	9087	6.3	+	62%
R. & M. - Wages	1639	1.8	2226	1.5	+	36%
Wages	46931	50.3	66423	46.0	+	42%
Fuel	2742	2.9	7732	5.3	+	182%
Oil	1005	1.1	2449	1.7	+	144%
Tyres	1502	1.6	2809	1.9	+	87%
Stores	2822	3.0	4483	3.1	+	59%
Transport	5083	5.5	8894	6.1	+	75%
TOTAL	93255	100.00	144743	100.0	+	55%

TABLE X

<u>SMALL CREW</u>			1.4.73	1.4.76	DIFFERENCE	
1	Purchase Price	70-100 hp Skidder	\$19703	\$33566	+	70%
	"	" Tyres	\$1023	\$2335	+	128%
1	"	40-60 hp Fleeter	\$9295	\$20300	+	118%
	"	" Tyres	\$396	\$817	+	106%
3	"	Chainsaws	\$210.75	\$434.30	+	106%
	Accessories	Per Day	\$6.76	\$12.64	+	87%
1	Transport	Per Day	\$.0685	\$.1202	+	75%
	Fuel	Per Litre	\$.0389	\$.1420	+	265%
	Oil	Per Litre	\$.3390	\$.5233	+	54%
4	Wages	Per Hour	\$1.668	\$2.345	+	41%

<u>OPERATING COSTS</u>		1973		1976			
<u>\$ Per Annum</u>	COST	%	COST	%	DIFFERENCE		
Depreciation	5563	11.5	9768	12.7	+	76%	
Insurance	2558	5.3	3638	4.7	+	42%	
Interest	2843	5.8	4424	5.8	+	56%	
Overheads	1905	3.9	3184	4.2	+	67%	
R. & M. - C	2866	5.9	4931	6.4	+	72%	
R. & M. - Wages	960	2.0	1319	1.7	+	37%	
Wages	24548	50.5	34673	45.3	+	41%	
Fuel	1393	2.9	3934	5.1	+	182%	
Oil	462	1.0	1161	1.5	+	151%	
Tyres	600	1.2	1344	1.8	+	124%	
Stores	2024	4.2	3385	4.4	+	67%	
Transport	2797	5.8	4883	6.7	+	75%	
TOTAL	48519	100.0	76644	100.0	+	58%	

Johnstone directed examination of these tables toward deducing how important each element shown was as a contributor to overall cost increase. e.g. The 265% increase in fuel costs only contributed about 5% to the total increase as shown in Table XI

TABLE XI

Contribution of individual cost elements to overall cost increase:

	LARGE CREW	SMALL CREW
Depreciation	7.6%	8.7%
Insurance	2.2%	2.2%
Interest	3.5%	3.3%
Overheads	2.4%	2.6%
R. & M. - C	3.7%	4.2%
R. & M. - Wages	.6%	.7%
Wages	20.9%	20.9%
Fuel	5.4%	5.2%
Oil	1.5%	1.4%
Tyres	1.4%	1.5%
Stores	1.8%	2.8%
Transport	4.1%	4.3%
TOTAL	55.2%	58.0%

Mr. Tony McConnell, Principal Work Study Officer for the Forest Service, explained the need to break down costs as Johnson had done, before any worthwhile analysis of the implication of the separate factors could be made. He elaborated on the influence of specific fixed and variable costs as tabulated below:

Depreciation	- Applies to skidder, loader and chainsaws. (Transport has been treated as a separate item).
Insurance	- Applies to skidder, loader, saws and wages.
Interest and Risk	- Applies to capital items - skidder, loader, saws and accessories.
Overheads	- Applies to all items except transport.
R. & M.	- Broken up into parts and wages, and applies to skidder, loader and saws.
Wages	- Must include provision for holiday pay, sick leave, allowances, bonus etc.
Fuel	- Applies to skidder, loader, saws, and even accessories. e.g. Lighting fires etc.
Oil	- As for fuel.
Tyres	- Applies to skidder and loader.
Stores	- Covers supplies such as saw chain, strops etc.
Transport	- Applied as an allowance over 133 km/day in the example.

These items can then be grouped into broader categories.

e.g. Machines
 Saws and Accessories
 Wages
 Transport

Each of which will include various items from the finer breakdown. Thus the operating costs in Table IX can be summarised as follows:

TABLE XII

Cost Item	<u>1973</u>		<u>1976</u>		% Increase per item	<u>% of</u>	
	\$/Year	% of Total Cost	\$/Year	% of Total Cost		Total	Increase
Machines	26715	28.6	47287	32.7	+ 77%	+ 22.1%	
Saws & ACC	9129	9.8	14518	10.0	+ 59%	+ 5.8%	
Wages	52328	56.1	74014	51.1	+ 41%	+ 23.3%	
Transport	5083	5.5	8894	6.2	+ 75%	+ 4.1%	
TOTAL	93255	100.0	144713	100.00	+ 55%	+ 55.2%	

McConnell emphasised that costs were only half the picture and that the effects of production are marked. If production goes up by 20% there are very much cheaper costs of production per unit and a significantly increased profit margin if original price is adhered to. On the other hand there is a disastrous effect on cash flow if production drops by 20% through any of a number of reasons. Many of which may be outside the control of the contractor.

7.0 INTERFIRM COMPARISONS

An explanation of the inter-firm comparison technique, its objectives and its value to the small business was given at each of the separate meetings by officers of the Productivity Centre of Trade and Industry Department. Messrs. Brian Korte in Rotorua, Merv Huxford in Richmond, and John Casey in Christchurch.

They explained that an inter-firm comparison, (IFC) is an organised comparison of key business data from similar firms in an industry group on an anonymous, confidential and uniform basis. The technique is applicable equally to manufacturing servicing or production industries.

They said that IFC's enabled individual participants to answer the following questions:

Just how efficient is my business?

How can I improve my profits?

Are my costs as low as they could be?

How does my cost distribution compare with my competitors?

Where can improvements be made to increase my profit?

Am I obtaining the most benefit from my investment in assets? (Machinery in logging)

Questions asked from the floor in each session queried whether one could validly compare operations as different as thinnings and clear fellings, or tractor and hauler operations. It was emphasised that the comparison was a financial one and was primarily being made in financial terms to examine the use of assets, i.e. the money tied up in the business. However participants can be sub-grouped within the industry in order to compare like with like, as well as the overall comparison of participants within the total industry.

The Productivity Centre heavily subsidise IFC's in industry, particularly the initial one. It was stated that \$1700 went towards the 1976 loggers' IFC and that this amount would be reduced in successive years. In 1976's logging IFC, the participants contributed \$45 per participant, thus could be considered a very cheap and valuable analysis of their individual businesses, (roughly equivalent to the cost of keeping one man with a saw in the field on a Saturday).

They emphasised the confidentiality aspect of the comparison in that no outsider saw either the questionnaire or the results of any specific participant except the participant himself. This, for example, was the procedure following in the 1976 logging IFC.

1. The Steering Committee* organised by LIRA selected the consultant and advised on the key ratios and questionnaire suitable to the logging industry.
2. The questionnaire was finalised by the consultant. (IFC Unit, Department of Management Studies, Waikato University).
3. LIRA listed all the firms in the industry and gave these a code number which was stamped on each questionnaire and then forwarded to individual firms seeking participation.
4. Individual firms completed the questionnaire and returned these direct to Waikato with only the code number - not the firm's name, on the questionnaire. Thus the consultants did not know who the firms were.
5. The completed results were sent in a sealed envelope to the coding centre (LIRA) where the firm's address label was attached to the envelope with the code number on it.
6. This was then posted individually to participants. The participants received two reports, their own individual report and an industry report.
7. The reports were only distributed to participants, (i.e. the firms who paid for the IFC). An extra copy (of the industry report only) went to the Productivity Centre and LIRA.
8. With the permission of the Steering Committee, LIRA reviewed the salient features of the industry report and produced a brief summary of this in their report. This was primarily aimed at getting a wider participation in the 1977 year.

Huxford gave a simple indication of how IFC results should be analysed by participants. Basically, this method involved examining the firm's results in the ratio tree and ringing all results below the middle firm, and further identifying with emphasis, any results in the lower quartile. This would enable an operator to zero in on deficiencies in his particular business.

At all the seminars the Productivity Centre officers advised that their personnel were available for personal discussion with participants on their individual reports if invited. They confirmed this by making time available to individual participants who attended the three different meetings.

* Members of the Steering Committee were:- P.Bell, B.Cochrane, P.O'Sullivan, contractors of Taupo; L.Gilsenan, contractor of Rangiora; T.Kajavala, contractor of Whakatane; P.Brown, accountant of Taupo; G.Chapman, accountant of Tokoroa; J.Davies, finance company executive of Rotorua; M.Jamieson, Productivity Centre, Wellington; L.Wilson, consultant of Taupo; and J.Spiers, of LIRA.

SESSION 2
WORKING PAPERS
- AND -
MINUTES

SESSION 2

8.0 INTERFIRM COMPARISONS - WORKING SESSIONS

8.1 1976 LOGGING INTER-FIRM COMPARISON

Bruce Dixon, Consultant, from the IFC unit of Waikato University, outlined the salient features of the 1976 IFC. These were commented on at the later meetings by Jim Spiers, LIRA.

Dixon explained that the results of the 1976 IFC could only be indicative in that there was a limited response. (Only 38 participants of a possible 250). Thus any assumptions based on this self-selected sample must be modified accordingly. Spiers considered however, that a typical spread of operations was achieved and that the comparison in clear felling and thinning operations had reasonable validity.

Dixon said that the results differed from an operator's normal accounts in that some adjustments had to be made for comparative purposes, e.g., the proprietor's salary was normalised and a standard procedure was set to establish asset values and depreciation which would be different in most cases from firms traditional accounting methods.

The industry report showed a wide range of profitability in logging firms. The most significant finding was that profitability was highly dependant on effective employment of heavy capital equipment. Highly capitalised firms were the most gravely effected by inflation and if this could not be offset by increased production they tended to be less profitable than less capitalised operations.

The middle firm result in operating profit over assets indicated that if the "risk" in logging operations is taken into account, the rate of return to assets compared poorly with the market rate of interest for long term debentures. (Roughly at present 11 - 12% for terms of 7 - 10 years).

Among the conclusions from the IFC:

1. Thinning operations gave better results in the profit ratios than the majority of firms in other categories. This could probably be related to better use of capital invested.
2. Single crew operations fared better than multiple crew. Again this was probably due to better use of lower capital, and better on the job supervision.
3. A high percentage of income was committed to finance payments and owners generally had a low level of equity. (i.e. Owner's investment in the business).

8.2 PROPOSED 1977 LOGGING SECTOR IFC

There was general acceptance of the necessity for a second IFC in the logging sector and approval to go ahead. It was considered that the same Steering Committee would be satisfactory with the preferable addition of one representative from the Nelson area, who were a major group participating. This was agreed, and a Steering Committee meeting is to be arranged by LIRA. One should be sufficient.

It was pointed out that increased participation was most important and the people who could influence this most were the participants of the 1976 IFC. It would be desirable if they would make efforts to encourage participation from their associates. LIRA should also conduct small group meetings with the assistance of the Productivity Centre if these could be arranged.

Discussing the 1976 questionnaire (See Appendix I) and definitions the general consensus was that the questionnaire basically could stand, but that some alterations should be made. (Refer to Questionnaire).

Items 1 and 2 on Location and Nature of Operations

It was considered that the Nelson areas should be segregated and this would be feasible, given the number of participants from that area. The segregation of other areas was discussed and it was pointed out that unless significant participation from any particular area could be assured, there was no point in making a segregation. The figures for a few would have little validity.

It was considered hauler operations should be segregated as they differed significantly from others. Indigenous operations should also be segregated, but this was covered in questions 22, 23 and 24.

Participation of owner/operators of units such as loaders was discussed and it was considered there was no reason why these could not be included, but it may be necessary to segregate them.

3. Direct Labour and 8. Other Direct Costs.

It was considered essential to define where power saw costs should go, as there was some confusion over this in 1976. They should be segregated separately in other direct costs. Ropes and strops were a significant part of hauler operations in particular, and in some cases, contractors particularly in indigenous operations supplied these for equipment owned by the employer, thus it was necessary to segregate these items out.

8.3 PROPOSED 1977 IFC IN THE LOG TRANSPORT SECTOR

A suggested ratio tree and additional ratios for examination in the log transportation sector (Appendix II) was tabled by Brian Korte, at Rotorua and it formed the basis for these discussions. This proved a very good guideline, particularly when it was recognised that it was drawn up during the meeting period by one who had limited experience of the industry.

In discussion, the following points were made:

Item 8 Repairs and maintenance should be separated into two ratios, parts and labour, and if feasible, major repairs, i.e. main components, should be segregated from minor repairs. In the latter, electrical systems, operator convenience items etc., often took the disproportionate amount of repair time.

10. Operating Labour Costs It was considered important to distinguish here between actual operating labour on the road and operator routine daily maintenance, and operator maintenance and repairs where he may be involved in workshop operations and not in the field. It was not considered important to distinguish overtime in the labour as this was an integral part of trucking.

Also under this item, with the owner/operator, it was important to have a clear definition of how time was segregated into administration, maintenance and operation.

7. Puncture time was important in many cases and should be recorded or distinguished.

Ratio 21 - Tonne-kilometre is the preferable measurement, but it was pointed out that mileages recorded may not be accurate. There is a complication due to recording of mileages for diesel tax purposes. This area needs to be looked at more closely.

Ratio 30 was considered a meaningless ratio although a high ratio signifies poor utilisation or over capitalised equipment.

Ratio 35 - Shifts would be easier to identify than days. One Company thought it was best to have this ratio in hours but it was unclear whether most operators would have such information available. It was important in establishing the questionnaire and ratios that it was aimed at getting answers that everybody could calculate from their own records. There may be a problem in doing this in this ratio.

Ratio 38 - It was considered that this should be the average of the cab and chassis unit and trailers could be disregarded.

Spiers advised that he had been in consultation with the Road Transport Association Logging Committee on launching an IFC, that they approved of the idea and would support it. Thus it was now necessary to form a Steering Committee and call a meeting to consider the questionnaire and the working session comments, and to appoint consultants.

Subsequently the following steering committee was appointed:

J.J.K.Spiers (Chairman)	- Director of the N.Z.Logging Industry Research Association (Inc.)
B.Corte	- Representative of the Productivity Centre, Wellington.
J.Fraser	- Chairman of the Road Transport Assn. Logging Committee. Marlborough Transport Limited.
V.Lellman	- Accountant of Tauranga.
G.Manson	- Logging and Transport Contractor, Rotorua.
P.Olsen	- Logging and Log Transport Consultant, Rotorua.
F.Oosten	- Owner/operator, Rotorua.
N.Pilcher	- R.T.A.Logging Committee, Port Chalmers.
W.Withers	- R.T.A.Logging Committee, and Costing Manager for North Canterbury Transport.

(The Steering Committee subsequently met and considered all of the aforementioned points in drawing up the questionnaire and definitions for the Log Transport Interfirm Comparison.)

8.4 LOGGING COSTING HANDBOOK

Jim Spiers of the Logging Industry Research Association said that a major target area set for LIRA was to work on the costing of logging operations, and that the requirements for a guideline handbook for small operators was a prime objective.

He outlined the major project areas in logging costing:

1. The analysis of factors influencing logging costs and productivity.

This is currently a Forest Research Institute work area and they are assembling data to produce reports on productivity. The industrial work study sections of the major companies were also producing information in this area, and much of it could be collated together by an organisation such as LIRA.

2. Monitoring industry trends. It is necessary to identify the key features affecting costs in logging and inter-firm comparisons as such help in this. A survey of the industry was carried out in 1974,¹ and future surveys will be done by FRI and LIRA in co-operation.
3. Definitions of the principles of costing operations in logging. There were two main sections here, machinery costs, as this was such an important item in overall costs, and job or contract costing. During 1976, the Forest Research Institute produced a report² on this subject. LIRA is currently examining this report and a wide range of costing handbook presentations in other industries and countries with the major objective of producing a simple costing handbook.

LIRA's Proposed Handbook

The objectives of producing a handbook were defined as follows:

1. To explain the basic conditions that should be known and agreed before entering a contract.
2. To explain the principles of logging, job or contract costing.
3. To identify the legal requirements of employers in logging, to point out their obligations to employees and taxation requirements.
4. To provide tables that might assist in the compilation of costs.
5. To outline a costing formula which might find acceptance within industry as a whole as a guideline for negotiation.

¹ "A Survey of the Logging Industry for the year ended 31 March 1974" by T.Fraser, G.Murphy, and C.J.Terlesk. N.Z.Forest Service, Forest Research Institute Economics of Silverculture Report No.84, 1976 (unpublished).

² "The Principles and Practices of Costing as Applied to Log Harvesting Systems Management" by K.Walker. N.Z.Forest Service, Forest Research Institute Economics of Silviculture Report No.87, 1976 (unpublished).

The contents proposed for the handbook were outlined as follows:

1. An introduction including the basic considerations in establishing a contract.
 - 1.1 A specification of requirements.
 - a. Volume
 - b. Limitation or quota on production.
 - c. Characteristics of forest stand.
 - d. Produce specification.
 - e. Locality.
 - f. Other constraints - fire, environment, entry etc.
 - 1.2 Method of measurement and payment.
 - a. How is production measured? What checks?
 - b. Conversion factors used.
 - c. Timing of payments.
 - d. Provision for interim payments on stockpile.
 - 1.3 Contract conditions.
 - a. Term of contract termination.
 - b. Right of renewal.
 - c. Price adjustment.
2. Legal Requirements.
 - a. Bushworkers Act.
 - b. Protection of wages.
 - c. Forest and Rule Fires Act and regulations.
 - d. Wages and wage records.
 - e. Transport regulations.
 - f. Environmental consideration.
3. A definition of costing terms.
4. An outline of the principles of costing.
 - a. Machinery costing.
 - b. Manpower costing.
 - c. Overheads.
5. Taxation.
 - a. Requirements for tax retention, (particularly the first year).
 - b. Depreciation allowances.
 - c. Saw allowances etc.
 - d. Legitimate expenses.
6. A contract cost formula.
7. Appendices and Tables including A, outlines for forms and basic records and data collection.
 - b. Owning and operating costs tables.
 - c. Fuel and oil consumption tables.
 - d. Expected life of various categories of machines.
 - e. Repairs and maintenance tables.

In discussing the proposals and the outline, the following points were offered.

It was essential that the Handbook be presented primarily as a guide and should not be taken as a Bible.

It was considered that experienced contractors were able to assess when equipment should be turned over or replaced and thus guidelines for this should be given. It would be applicable for smaller equipment, such as power saws and rope as well.

It was most important to get the definitions clear, particularly in the costing sector and it was felt that an exposure draft of the handbook should be sent out to a wide range of people for comment before final publication. Industry generally should be asked for opinions on it.

In using a handbook as a guideline, an attempt should be made to indicate the probable variation of the costs expected with a low and a high guide as well as an optimum one. Some of the deficiencies of marginal costing should be explained. Many operators did not allow all the necessary cost factors in marginally costing equipment to keep it in employment.

The need for a standard set of cost codings with definitions was raised and it was also considered that a standard type of Profit and Loss account summary form was desirable. Ted Anderson prepared a typical example. (See Table XIII). Don Wilson considered that a basic requirement for costing was a fundamental recognition that you were handling resources that were existing now and thus the current cost of using these resources at their present value must be calculated and provision must be made for eventual replacement of them. It did not matter whether resources were owned (operators equity) or hired or under hire purchase payment. The resources themselves were being used and the interest on the capital involved in the resource had to be allowed for as a legitimate cost of the business, otherwise opportunities elsewhere should indicate to an operator to sell up and get out. The recently published report of the committee of enquiry into inflation recognised this fundamental use of resources and the principles could not be disregarded in this day and age.

TABLE XIII

LOGGING CONTRACTORS
STANDARD ACCOUNTING ANALYSIS

<u>REVENUE</u>			
Contracting Proceeds - N.Z.F.S.	XXX		
Firm A	XXX		
Firm B	XXX		
			xxx
Sundry Income			XXX
<u>TOTAL REVENUE</u>			<u>XXXXX</u>
<u>LESS EXPENSES</u>			
Contract Falling	XXX		
Wages	XXX		
Shareholders salaries	XXX		XXXX
			XXX
Contracting			
Bulk Fuel	XXX		
Fuel and Oil	XXX		XXXX
Saw Maintenance	XXX		
Ropes and Strops	XXX		
Skidder Maintenance	XXX		
Loader Maintenance	XXX		
Dozer Maintenance	XXX		
Tyres	XXX		
Sundry Maintenance	XXX		XXXX
Vehicle Expenses			XXX
Hire of Equipment			XXX
Travelling Expenses			XXX
Insurance - A.C.C. levies	XXX		
Plant	XXX		
Other	XXX		XXXX
Interest	XXX		
H.P. Finance Charges	XXX		XXXX
Accountancy Fees	XXX		
Telephone	XXX		
Other Administration Expenses	XXX		XXXX
Sundry Trade Expenses			XXX
Depreciation			XXXX
<u>TOTAL EXPENSES</u>			<u>XXXXX</u>
			=====
Net Profit			XXXX

(i)

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FIRM CODE

NEW ZEALAND LOGGING CONTRACTORS

INTERFIRM COMPARISON - 1976

QUESTIONNAIREPLEASE COMPLETE AND RETURN ONE COPY TO

New Zealand Logging Contractors IFC
 Interfirm Comparison Unit
 Dept of Management Studies
 University of Waikato
 HAMILTON

BY 31st JULY 1976

PLEASE READ DEFINITIONS CAREFULLY BEFORE COMPLETING THE QUESTIONS.

ALL INFORMATION RELATES TO THE YEAR ENDED 31st MARCH 1976, OR YOUR NEAREST BALANCE DATE.

1. LOCATION

Please indicate the location of your major operation

LOCATION		Tick one only
BAY OF PLENTY, SOUTH WAIKATO, AND TAUPO	1.	
OTHER NORTH ISLAND DISTRICTS	2.	
CANTERBURY	3.	
OTHER SOUTH ISLAND DISTRICTS	4.	

2. NATURE OF OPERATION

Please indicate the nature of the operation

NATURE OF OPERATION		Tick one only
FOREST AND/OR MILL OWNER - Single gang	1.	
FOREST AND/OR MILL OWNER - Multiple gang	2.	
CONTRACTOR - Single gang	3.	
CONTRACTOR - Multiple gang	4.	

COSTS AND REVENUE

3.	Direct Labour	\$
4.	Plant and Equipment Expenses - Fixed	\$
5.	Heavy Mobile Plant and Equipment Expenses - Operating	\$
6.	Heavy Mobile Plant and Equipment Expns - Repair & Mtce	\$
7.	Transport Vehicle Running Costs	\$
8.	Other Direct Costs	\$
9.	Total Production Costs (3 + 4 + 5 + 6 + 7 + 8)	\$
10.	Administration Costs	\$
11.	Total Costs (9 + 10)	\$
12.	Total Net Revenue	\$
13.	Operating Profit (12 - 11)	\$

ASSETS

14.	Heavy Mobile Plant	\$
15.	Transport Vehicles	\$
16.	Other Fixed Assets	\$
17.	Total Fixed Assets (14 + 15 + 16)	\$
18.	Current Assets	\$
19.	Total Assets (17 + 18)	\$

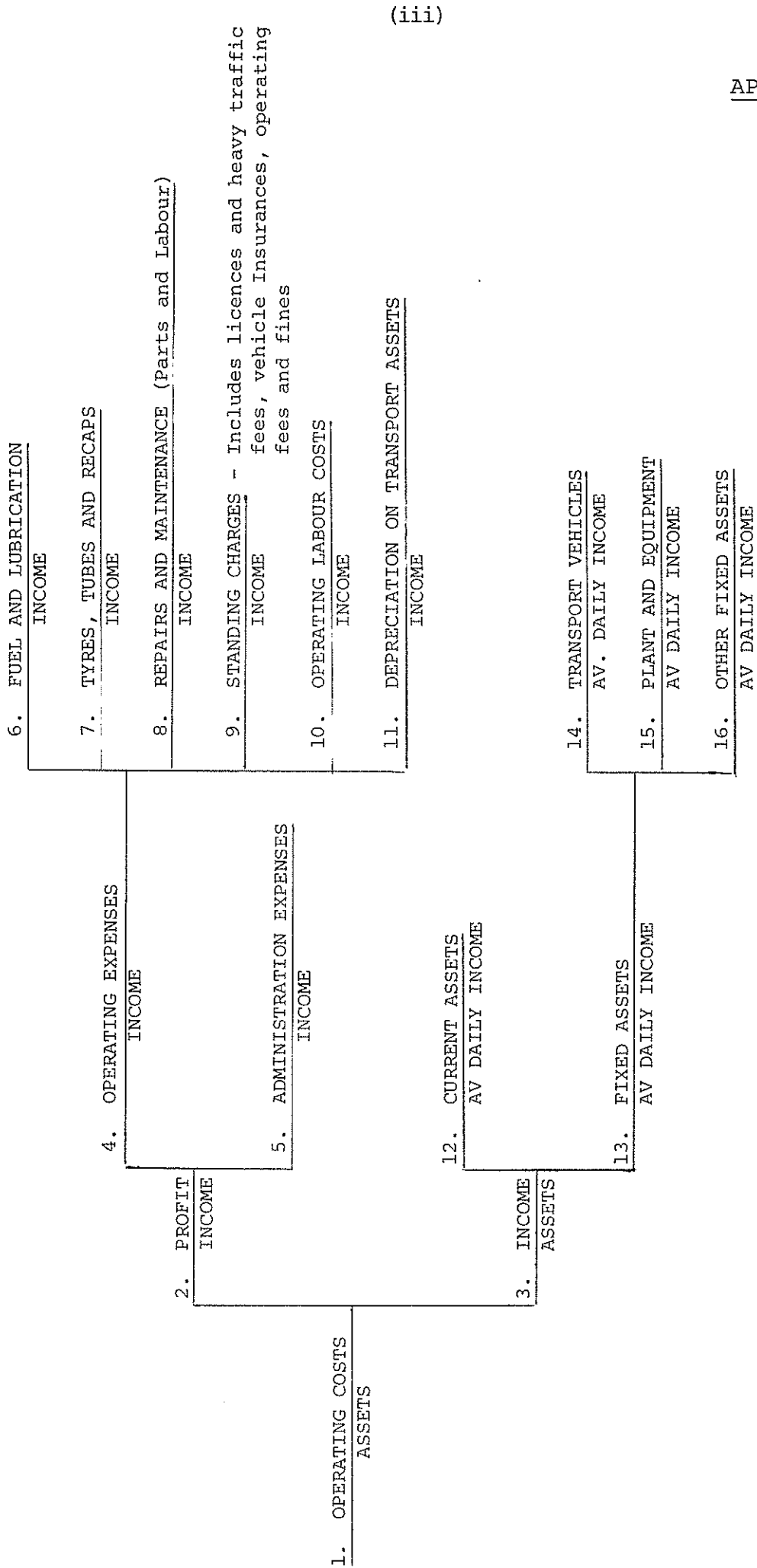
ADDITIONAL INFORMATION

20.	Normal number of employees	No
21.	Employees who left your employ	No

	Tonnes	Cubic Ft	Other (specify)
22.	Production - Exotic Clearfelling Operations		
23.	Production - Exotic Thinning Operations		
24.	Production - Indigenous		
25.	Total production during year (22+23+24)		

26.	Finance payments made during year	\$
27.	Total Liabilities	\$

LOG TRANSPORTERS IFC RATIO TREE EXAMPLE



(iii)

APPENDIX II (Contd.)

ADDITIONAL RATIOS

LOG TRANSPORTATION I.F.C.

17. INCOME PER EMPLOYEE
18. OPERATING PROFIT PER EMPLOYEE
19. INVESTMENT IN TRANSPORT ASSETS PER EMPLOYEE
20. INVESTMENT IN FIXED ASSETS PER EMPLOYEE
21. TONNE-KM PER EMPLOYEE
22. LABOUR TURNOVER
23. TONNES PER TRUCK KILOMETRE
24. TONNE-KM PER VALUE OF TRANSPORT ASSETS
25. TONNE-KM PER VALUE OF FIXED ASSETS
26. PROFIT PER TONNE-KM
27. FUEL AND OIL PER TONNE-KM
28. TYRE/TUBES/RECAPS PER TONNE-KM
29. R. & M. PER TONNE-KM
30. STANDING CHARGES PER TONNE-KM
31. OPERATING LABOUR COSTS PER TONNE-KM
32. DEPRECIATION ON TRANSPORT ASSETS PER TONNE-KM
33. OPERATING EXPENSES PER TONNE-KM
34. TONNES CARRIED TO TONNES CAPACITY
35. AVAILABLE DAYS TO OPERATING DAYS
36. OVERTIME HOURS TO NORMAL HOURS
37. OVERTIME PAYMENT TO BASIC WAGE PAYMENT
38. AVERAGE AGE OF TRANSPORT EQUIPMENT
39. FINANCE PAYMENTS PER \$100 INCOME
40. DEBT/EQUITY RATIO

LIST OF REFERENCES

1. A survey of the logging industry for the year ended 31 March, 1974, by T. Fraser, G. Murphy and C.J. Terlesk, New Zealand Forest Service, Forest Research Institute, Economics of Silviculture Report No. 84, 1975, (unpublished).
2. The principles and practices of costing as applied to log harvesting systems management by K. Walker, New Zealand Forest Service, Forest Research Institute, Economics of Silviculture Report No. 87, 1976, (unpublished).
3. Notes on financial management for the smaller company by the staff of the Productivity Centre, Trade and Industry Department, 1975.
4. The cost implications of owning and operating forest machinery in Australia by J. de Vries, Department of Primary Industry, Forestry and Timber Bureau, Leaflet No. 108, second edition, 1973.
5. Accountancy for road transport by D.M. Wilson, New Zealand Road Transport Association Inc., 1975.
6. Report of the Committee of Inquiry into inflation accounting, Report H4 N.Z. Government Printer, New Zealand, 1977.
7. Highlights of the Batelle study of Southeastern Pulpwood Harvesting, 1966, H.R. Hamilton, A.P.A. Technical Release 66-R-10.