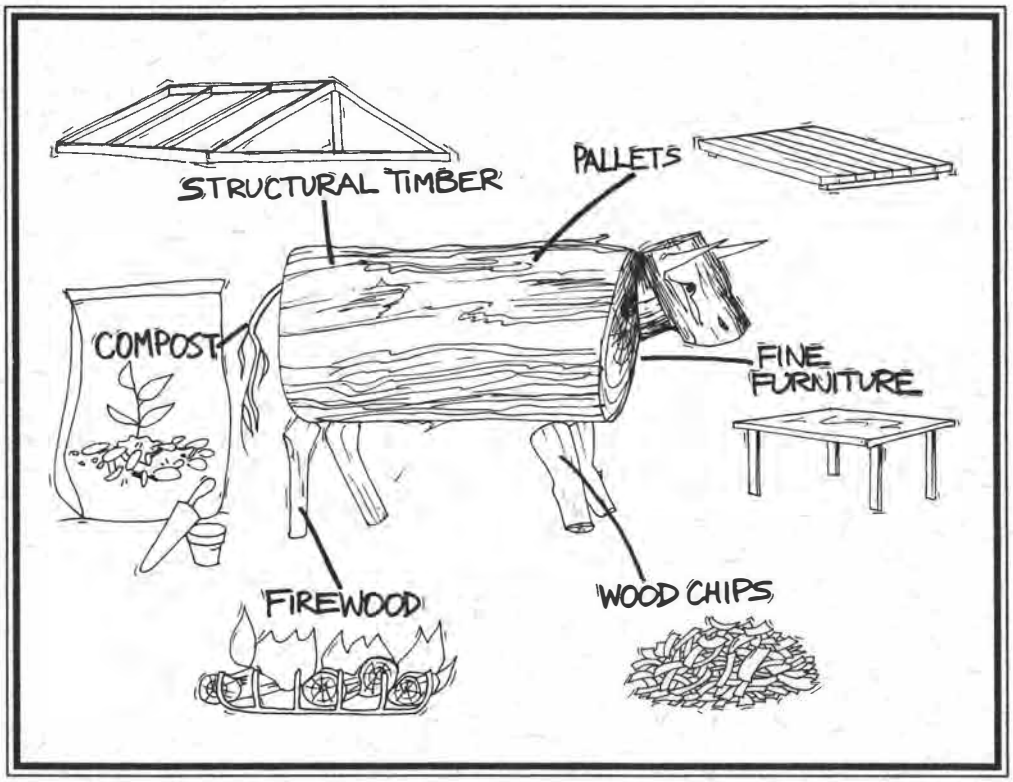

ADDING VALUE TO TIMBER PRODUCTS

A WESTERN AUSTRALIAN PERSPECTIVE

A Paper Presented to the National Conference on:
ADDING VALUE TO AUSTRALIA'S
TIMBER AND FOREST PRODUCTS
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INTRODUCTION

Value-adding has become a very popular concept in Australia, because of the realisation that our narrow commodity-based economy is extremely vulnerable to the world market fluctuations and because we are not achieving the maximum benefits from the use of some of our resources by exporting them unprocessed.

Value-adding also features in the current debate over the use of Australia's forests. Like all popular terms it means different things to different people. For purposes of this paper I define a value-added timber product as a product which is worth more than a log rotting on the forest floor.

I hasten to add that not in any way does this mean that a log rotting on the forest floor has no value. Quite the opposite. It is possible to argue quite logically and rationally that in some parts of some Australian forests, no matter how much value we may add to a forest product, the value of that product would not exceed the value of a rotting log.

If we assume that there are areas in Australia in some forests where the value of rotting logs is not at a premium, then it is reasonable to propose that an objective of the Australian forest products industry should be to increase the value of forest products. This means that any incremental increase in the value of a forest product, whether it be from a

piece of firewood to a pile of woodchips, or from a green sawn timber to high quality furniture, is value-adding.

In this short paper I have attempted to outline the benefits of value-adding to the forest products industry and forest managers, identify what has to be done to increase value-adding and outline initiatives undertaken in Western Australia.

WHY SHOULD WE PURSUE VALUE-ADDING?

In some situations we shouldn't! A value-added product that can not be sold at a price which is not competitive on the international market (and that includes Australia) has no value. Pursuit of value-added products which are not competitive will result in subsidisation and as a consequence redistribution of resources to unproductive sections of the economy.

If it is assumed that we can sell value-added products at a profit, there are four major reasons why the forest products industry should, provided we can sell the products, endeavour to maximise the value of its products:

1. *More wealth.* An increase in value-added production results in greater wealth being created within Australia.

2. *Export income.* While Australia has the capacity for significant import replacement in the forest products industry there are significant sectors of the industry in the value-added product area which potentially have a comparative advantage on the export market. Conversely, the opportunity to sell some of these products is less in the Australian market.

3. *Diversification.* One of the major problems facing the sawn timber hardwood sector is its dependence on structural timber, which in turn is dependent on the housing market. Figure 1 illustrates the fluctuations in the housing market over the last decade which translate to a roller coaster market profile for sawn structural timber. No industry which hopes to invest in new technology and improve its performance can plan or obtain finance if it is subject to massive four-year fluctuations in demand. The production of a diversified number of products in the sawn hardwood industry will smooth out these cycles, particularly if a significant proportion of these products can be exported.

4. *Political security.* One of the most important factors in determining whether the forest industries will secure a resource base in the hardwood forest is the number of constituents that are directly and indirectly dependent on it. A major increase in the proportion of native hardwood species converted to value-added product will result in more wealth for the nation and more people employed in the industry. No

BUILDING CYCLE FOR W.A. DWELLINGS

CONSTRUCTED FROM ACTUAL W.A. APPROVALS

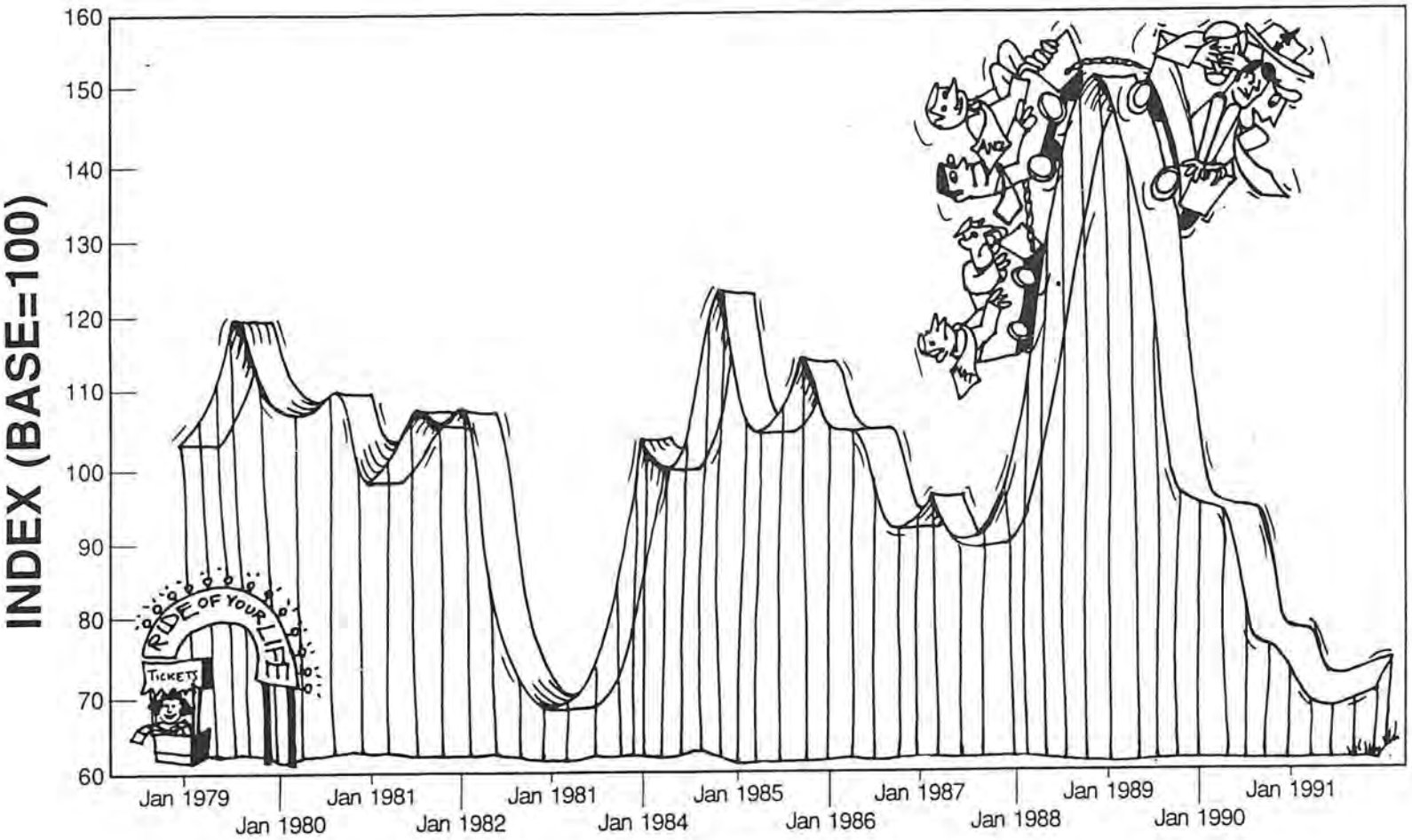


Figure 4

matter how irrational the arguments about woodchips may be perceived, the political reality is that an industry that produces furniture wood is more popular than one that produces woodchips.

VALUE-ADDED HARDWOOD SAWN TIMBER

Pre-requisites for the development of a major value-added hardwood sawn timber industry

1. Integration of forest management and utilisation

I do not believe that the community will support the extraction of hardwood logs from publicly owned native forest unless all forest values are cared for. This does not mean that we cannot employ silvicultural techniques, such as thinning, to improve productivity. But I do not believe that timber production values should be pursued to the exclusion of other forest values. Integrated (or multiple use) forest management is forestry's ace card (Shea 1990). It is possible to manage native forests so that the sum of all forest values is greater than the value of one single use pursued intensively.

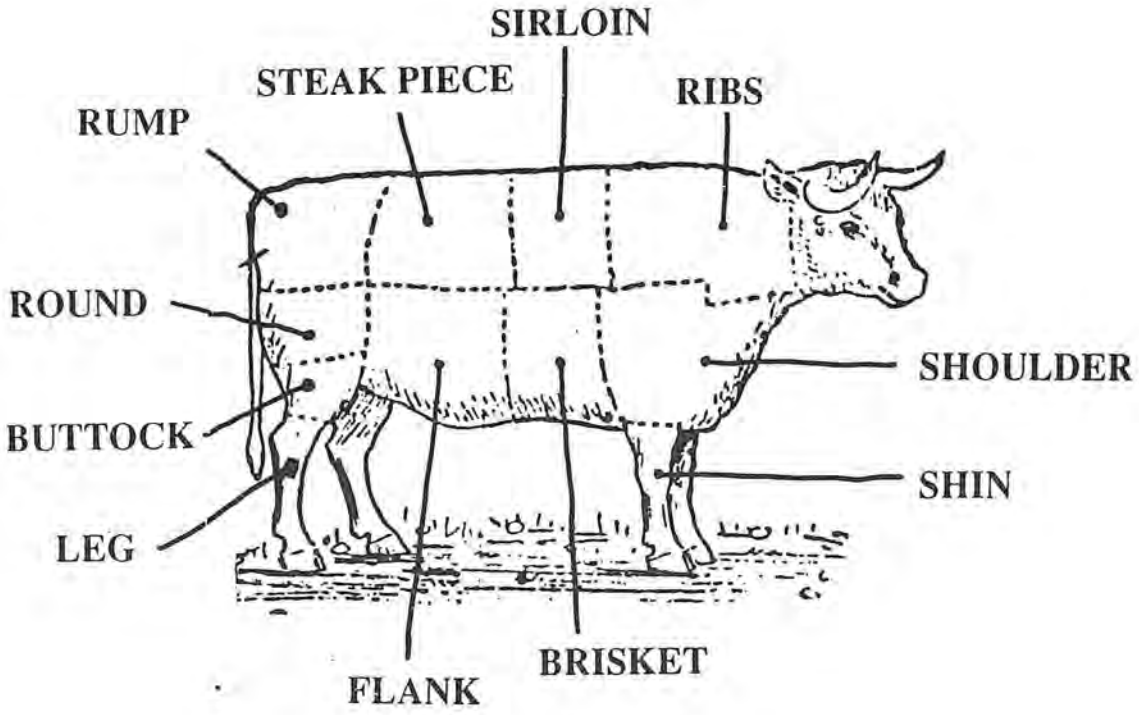
Integrated utilisation is also essential if we are to maximise the timber values of the logs taken from the forest and if they are to be sold at a profit. The concept of integrated utilisation is not new - no butcher would survive if he only used the steak from a steer (Figure 2). Similarly, in the pursuit of high grade wood products from hardwood logs, no matter how sophisticated our technology is, there will always be a proportion of the log which will not achieve the grade. If we only utilise that proportion that yields high grade products, the cost of production of that product will be too high.

2. Technology and training

The Australian hardwood sawmill sector in most parts of Australia until recently has been characterised by poor technology and low levels of training.

The most important step in the development of value-added hardwood products is the drying process. Most hardwood sawmills in the past, if they practised drying at all, achieved it by stacking sawn timber in the sun - the "Genesis" method, Figure 3. Losses of appearance grade timber due to degrade using this system typically exceed 50 per cent. In addition, periods of up to two years are required to achieve drying, resulting in large stock-holding costs. These long drying periods also mean that it is impossible to respond to the market rapidly.

Figure 2


SIRLOIN
STEAK PIECE
RIBS
RUMP
ROUND
SHOULDER
BUTTOCK
SHIN
LEG
FLANK
BRISKET

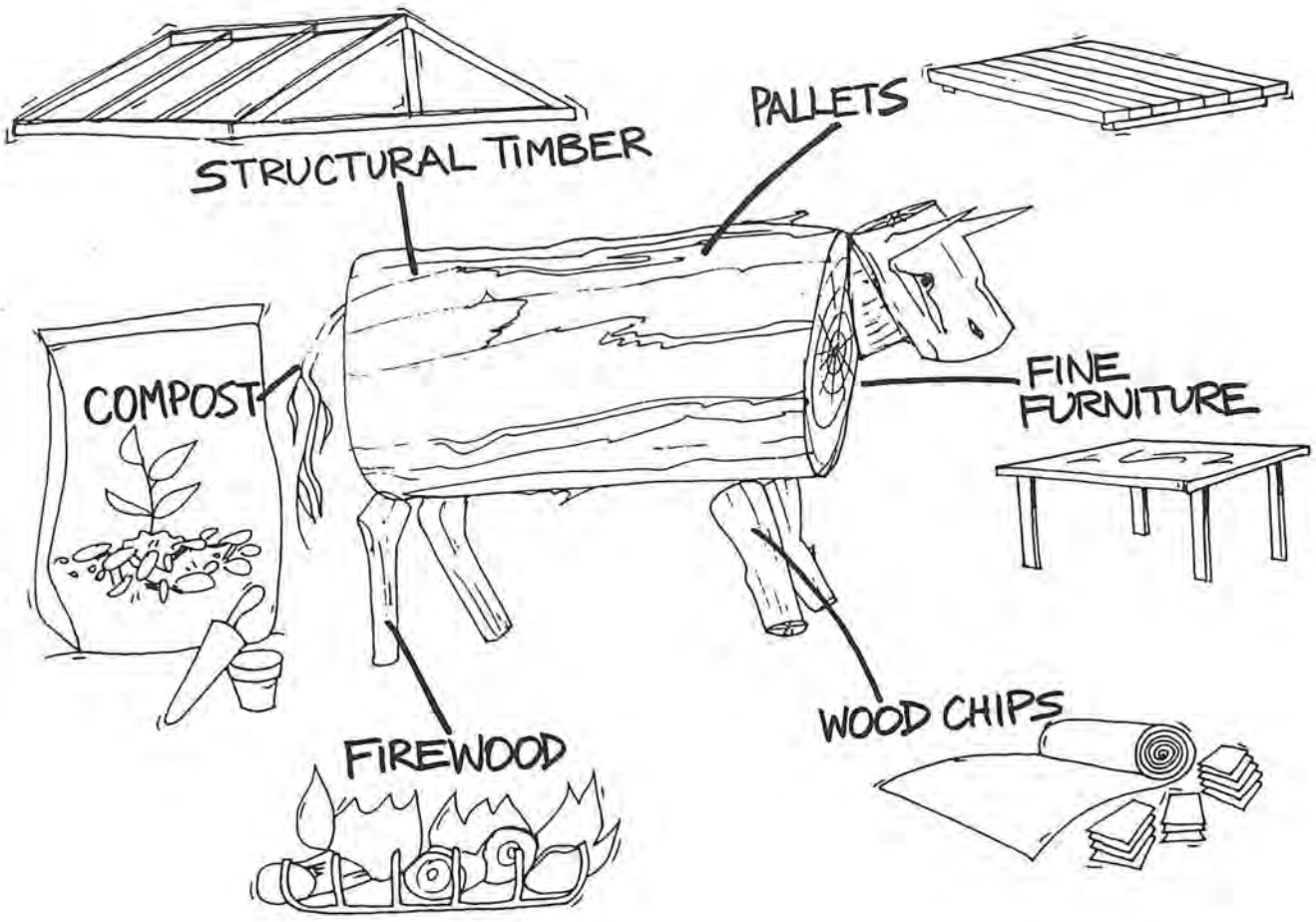
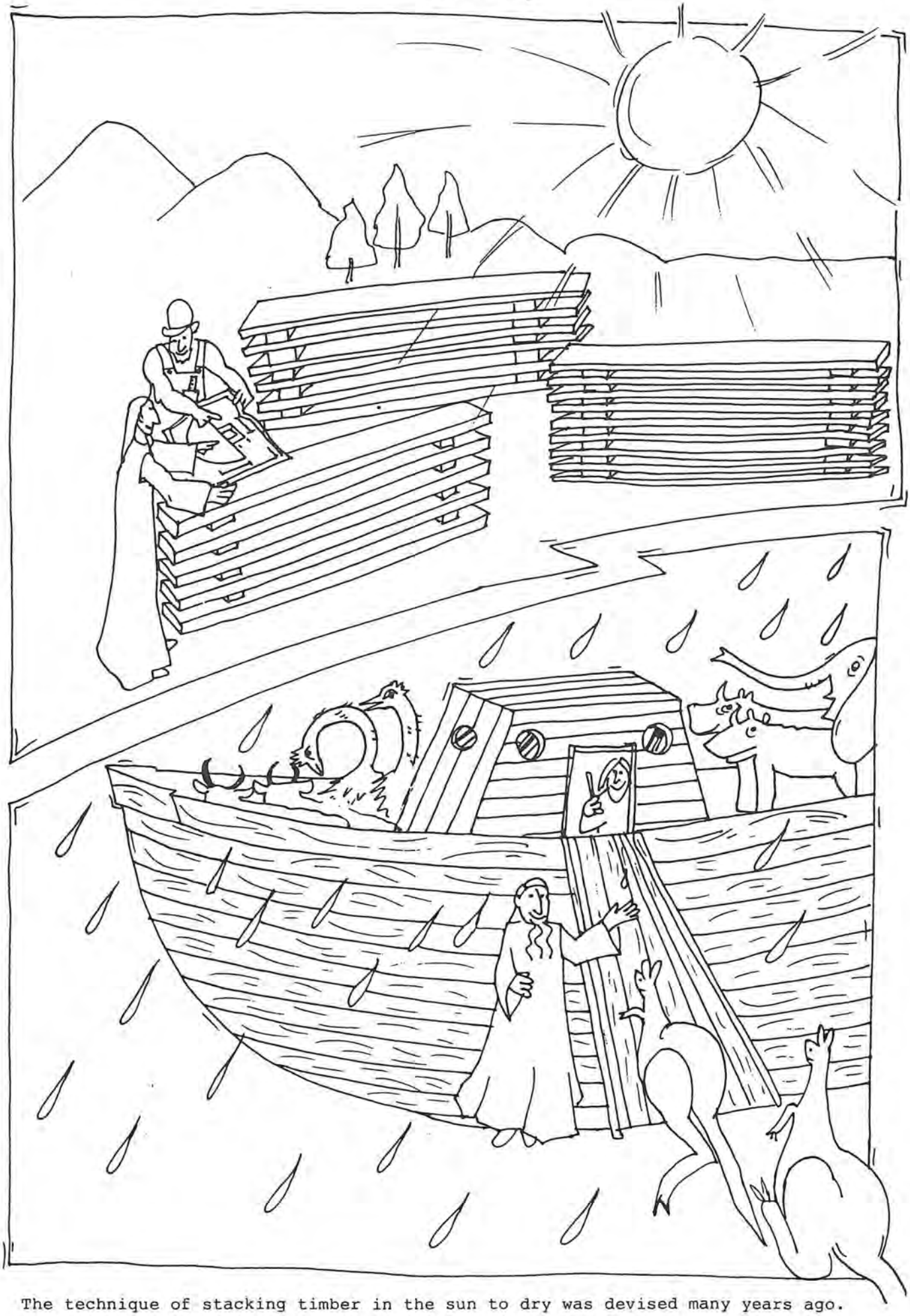

PALLETS
STRUCTURAL TIMBER
COMPOST
FINE FURNITURE
WOOD CHIPS
FIREWOOD

Figure 3



The technique of stacking timber in the sun to dry was devised many years ago.

The technology is immediately available to markedly improve recovery of high value product (appearance grade) timber from hardwood sawmills. For example, for a medium size (40,000 cubic metre) jarrah sawmill in WA, the introduction of a band saw (cost $1 million) and a progressive kiln to produce appearance grade timber (cost $1 million) would immediately increase utilisation rates by three to five per cent, reduce drying times to two months and reduce degrade by up to 50 per cent.

Major gains in the recovery of (>90%) appearance grade hardwood timber (but not drying time) can be achieved at lower capital costs by the installation of a facility (cost $40,000) to wrap green sawn timber in PVC.

Recognising that there are an estimated 800 small hardwood sawmills in Australia for which conventional drying kilns would not be commercial the Department of Conservation and Land Management has developed a low cost ($40,000) solar energy kiln (CALM 1990).

CALM has also developed a technological process which can produce value-added products from thinnings from regrowth stands which in many situations have a low commercial value. Called VALWOOD, the process has been licensed and is currently being commercially tested (CALM 1990).

In the past decade there has been a quantum leap in the availability of technology which can make major improvements in all stages of the value-adding process. Major improvements in the proportion of high quality value-added hardwood sawn timber produced are not being achieved because we do not have the technical knowledge or equipment to do it. Even where species-specific processes have not been developed, the technology could be rapidly acquired.

The introduction of new technology is pointless unless accompanied by the training of a skilled workforce.

3. Marketing

Value-added Australian timber products will not be sold unless they are marketed effectively. The forest industry's, including State agencies such as CALM, performance in marketing value-added products has been abysmal until recently.

Marketing effort has been inversely correlated with housing booms (Figure 1). That is, when it has been difficult to sell green sawn structural timber the dry sawn salesmen have been activated.

If consistent sales of value-added products are to be achieved at prices which leave a profit -

- the unique character of Australian hardwood timbers needs to be promoted and a "name created";

- supplies to markets which have been established have to be serviced consistently;

- there must be quality control of the wood;

- made up wood products must have high quality designs.

It is possible to develop a significant market in Australia for value-added timber by import replacement and by more effective marketing of the homegrown product. But the size of the market is limited by our population, the propensity of Australians to spend money on high quality products is significantly less than in other cultures, and our capacity to pay higher prices will depend on our overall prosperity which, relative to many other nations, is declining.

There are, however, large markets for high quality hardwood products in Europe, Asia and North America. European cultures are more predisposed to wood

products and, in particular, high quality items. For example, a West African timber called "Bubinga" is used by a French furniture company to make a setting of one table and six chairs which sells for $A12,000.

Increasingly there are political and resource constraints on the utilisation of tropical timbers in Europe. Australian producers would need only to capture a small percentage of the European market to sell a large proportion of the production potential of value-added products from hardwood forests.

4. Costs

It may be possible by innovative marketing to increase the price of individual valuable hardwood products so that they can bear the current costs of production. But it is unlikely that the industry will be able to depend on marketing to sell all its value-added product. Price will be a major factor which means that the costs of producing value-added hardwood products in Australia must be minimised.

It is possible to model the cost of production of a value-added product through each of its processing stages. The model can then be used to determine those parts of the process that have the most effect on the cost (or the profit) of the product produced.

Such models have been developed for all sectors of the WA forest industry. For the purpose of this paper I have used two standard jarrah and karri mills. The data presented are real but these examples are shown to illustrate principles. The effect of changes in costing of different stages of the production cycle will vary according to species and mill characteristics. But the general trends are applicable across the industry.

Figs 4 and 5 identify the areas where major gains in profit can be made. Price of product, production costs, sawmill recovery and royalty affect profit in descending order. This does not imply that a particular process should be ignored because of its relative insensitivity. In the current situation all costs need to be reduced even if the individual gains are small.

Fig 6 demonstrates the commercial benefits of value-adding with jarrah. Scenario A - the no value-added option results in a 65 per cent reduction in profit. Scenario B a 5 per cent improvement in sawn recovery - readily achievable by the introduction of band saws - results in 20 per cent improvement in profit. Scenarios C and D demonstrate the importance of integrated utilisation. Without a market for residue, profit is reduced significantly and if the price or quality of residue used can be increased, profitability can be markedly increased. Ironically, the capacity to sell residue as products such as woodchips increases the capacity of the sawmiller to produce more high value products.

Figure 4

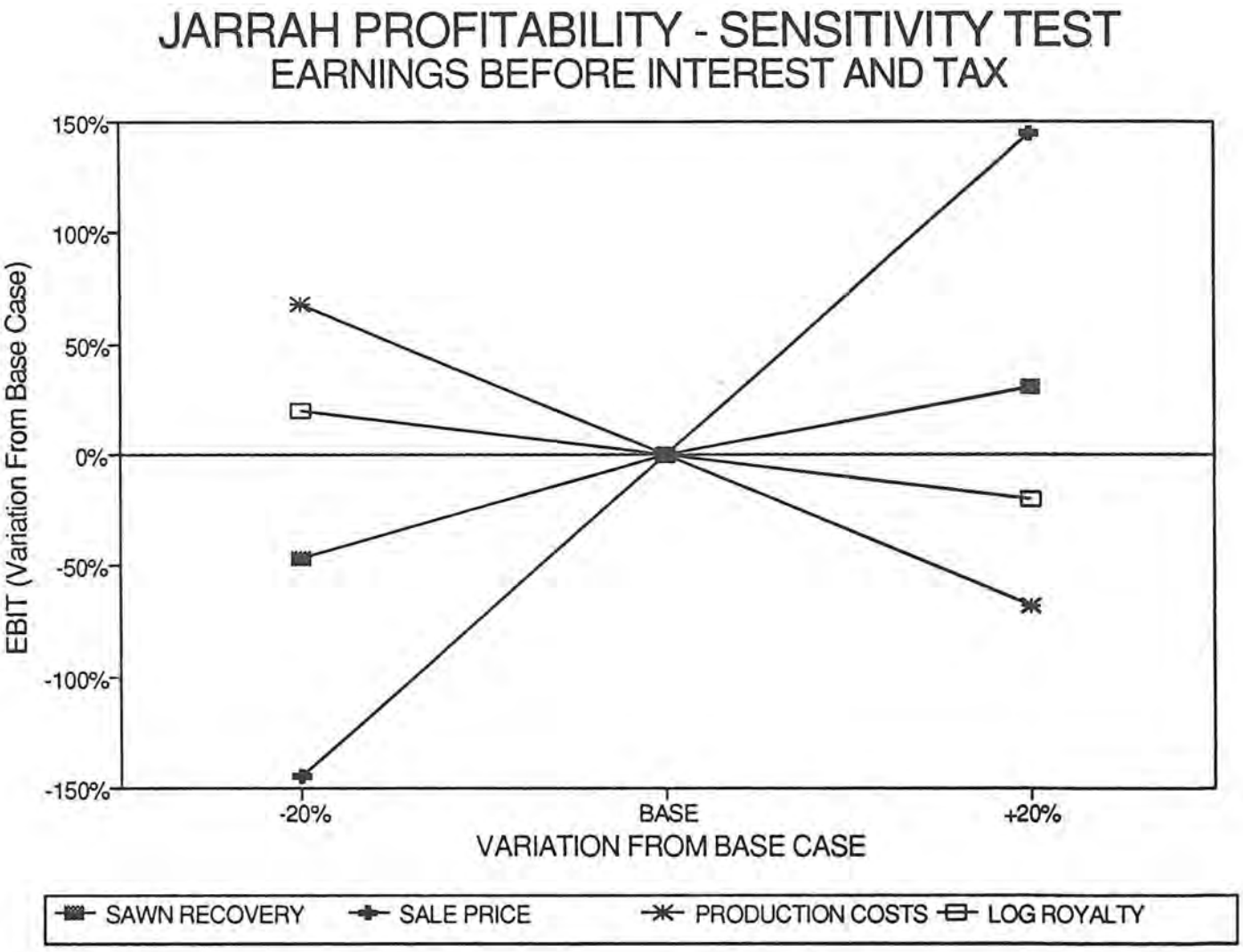

JARRAH PROFITABILITY - SENSITIVITY TEST
EARNINGS BEFORE INTEREST AND TAX
150%
100%
50%
0%
-50%
-100%
-150%
EBIT (Variation From Base Case)
-20%
BASE
+20%
VARIATION FROM BASE CASE
SAWN RECOVERY
SALE PRICE
PRODUCTION COSTS
LOG ROYALTY

Figure 5

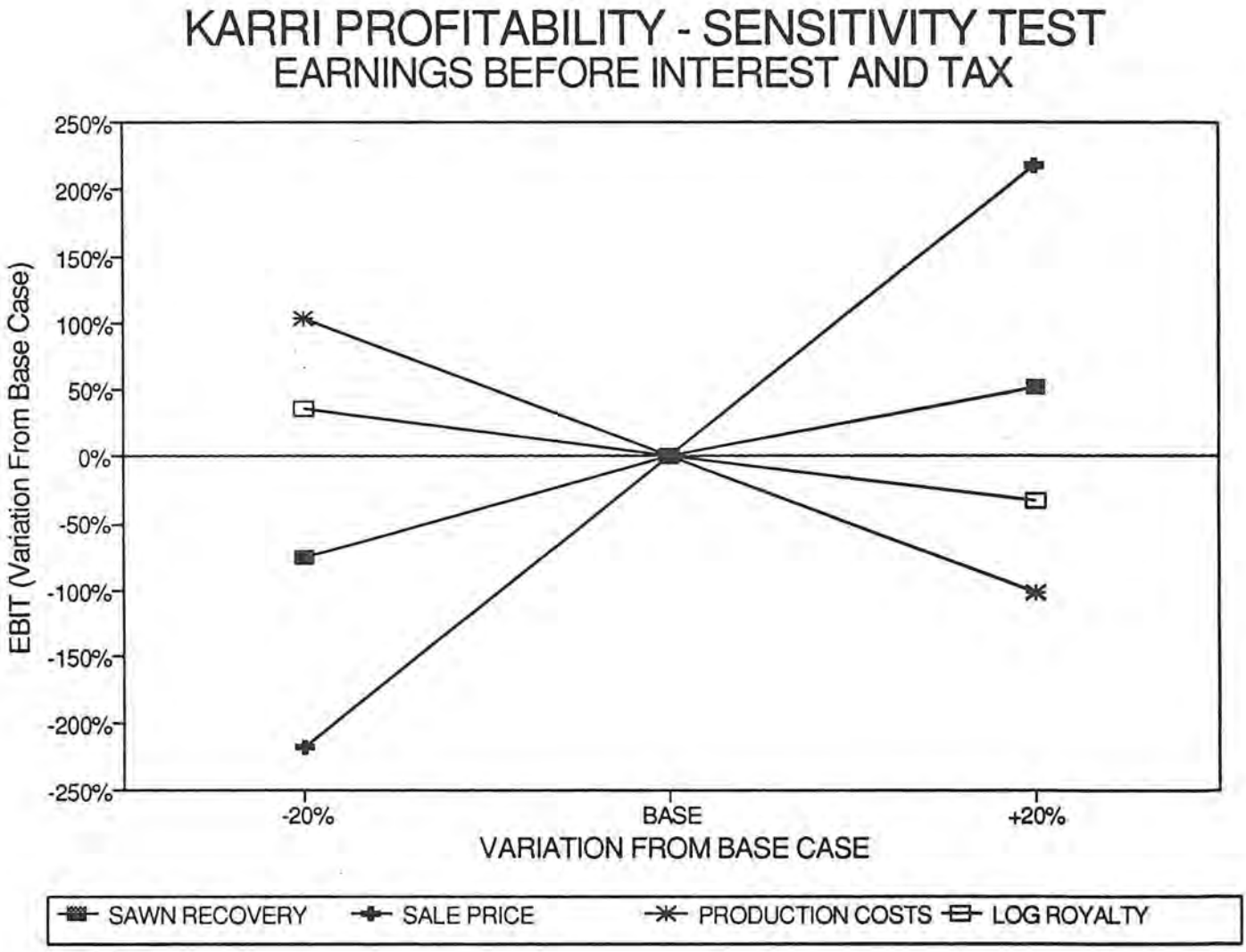
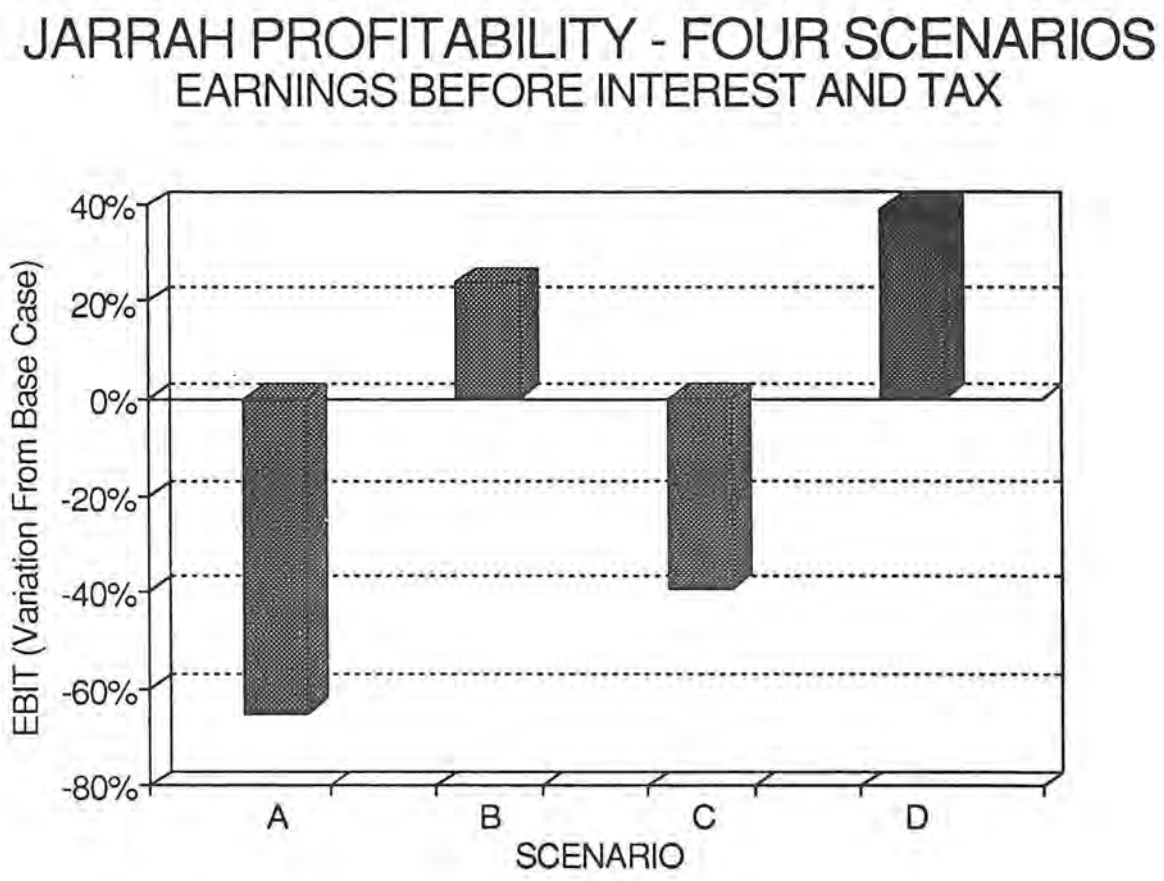

KARRI PROFITABILITY - SENSITIVITY TEST
EARNINGS BEFORE INTEREST AND TAX
EBIT (Variation From Base Case)
250%
200%
150%
100%
50%
0%
-50%
-100%
-150%
-200%
-250%
-20%
BASE
+20%
VARIATION FROM BASE CASE
SAWN RECOVERY
SALE PRICE
PRODUCTION COSTS
LOG ROYALTY

Figure 6



SCENARIO

BASE CASE	50% Value-Added Production 34% Sawn Recovery
A	No Value Added Production
B	39% Sawn Recovery
C	No Market For Residue
D	Residue Price Doubled

Figs 7 and 8 illustrate the impact of more extreme utilisation scenarios.

For example, it has been suggested that native forests should only be used for the production of high quality hardwood products. Scenario E shows the effect of a sawmiller not able to sell the residue or the green sawn structural products from the log. Profits are reduced more than 300 per cent and 500 per cent respectively.

Scenario F demonstrates the effect of incremental improvements in each stage of the value-adding process. If these improvements could be achieved profit would increase by 300 per cent and 700 per cent respectively.

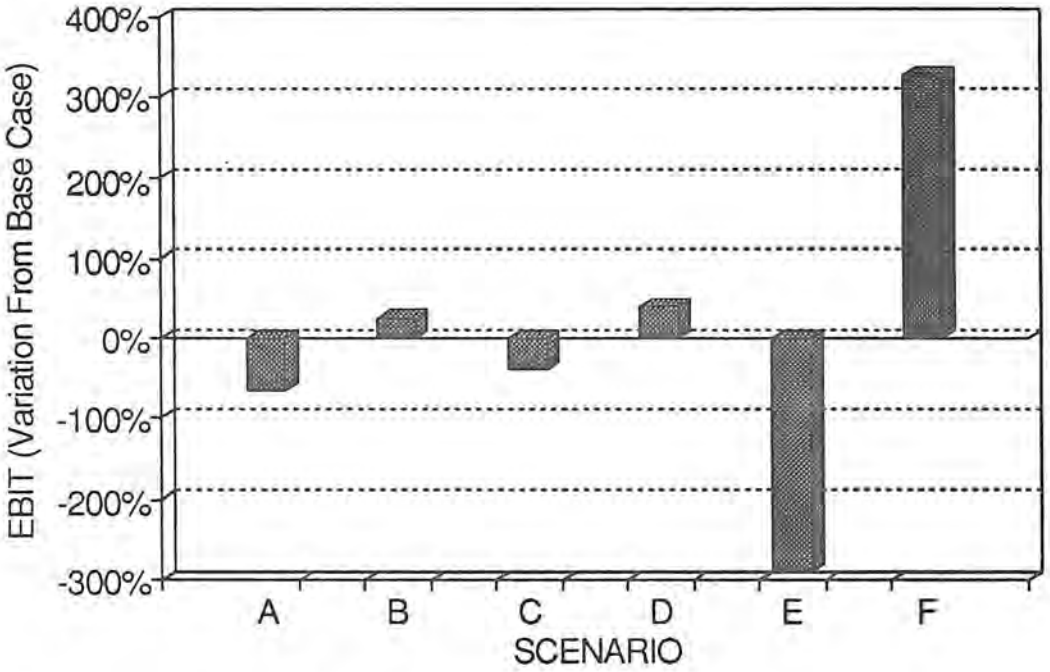
Scenario F requires improvement in efficiency and marketing that are challenging but not impossible. It illustrates that an incremental approach to improving efficiency can have a major effect on profitability.

Scenario F offers hope but it should be noted that the base case scenario is, in the current economic climate, only marginally profitable.

The above economical analyses have been used to demonstrate principles and it would be foolish to use them to plan precise mill strategies. But they do illustrate -

Figure 7

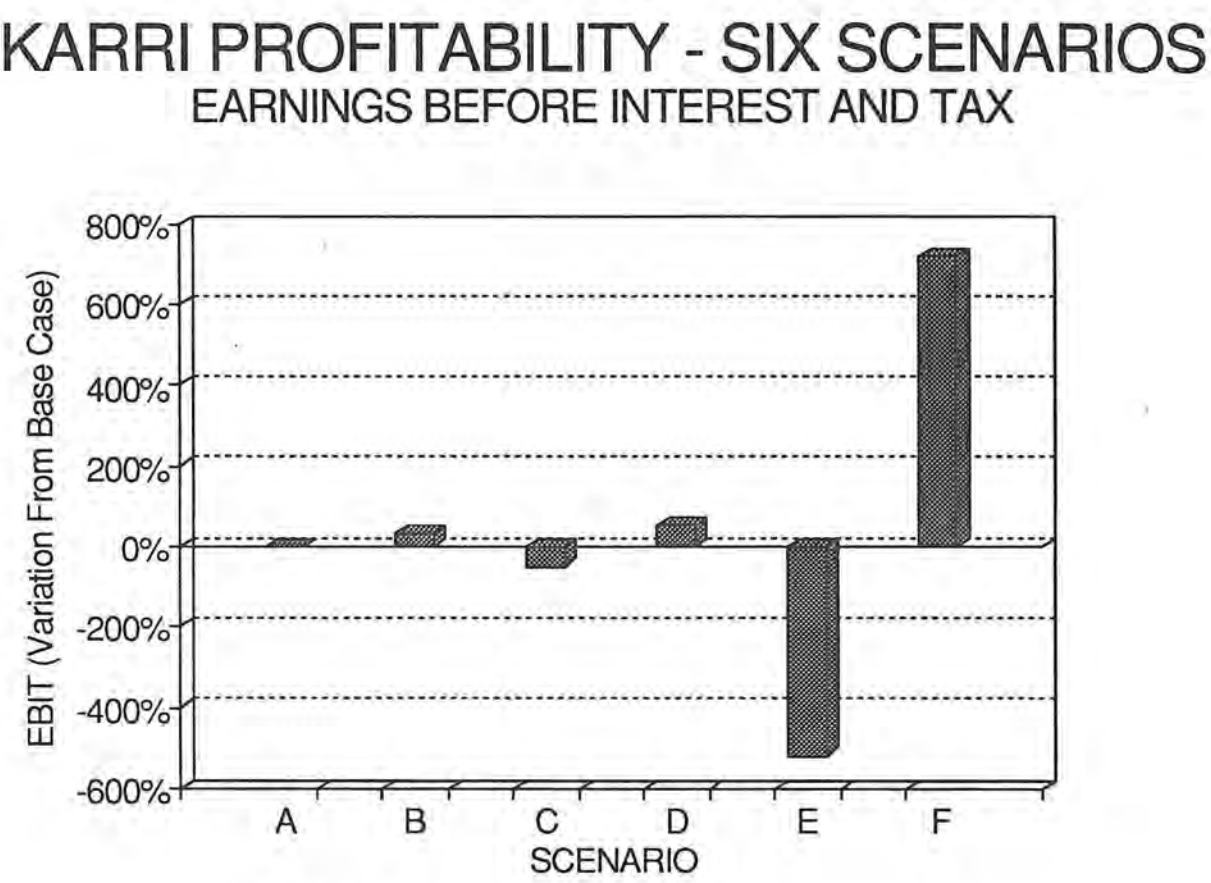
JARRAH PROFITABILITY - SIX SCENARIOS
EARNINGS BEFORE INTEREST AND TAX



SCENARIO

BASE CASE	50% Value-Added Production 34% Sawn Recovery
A	No Value Added Production
B	39% Sawn Recovery
C	No Market For Residue
D	Residue Price Doubled
E	No Market For Residue No Market For Green Sawn Material
F	60% Value-Added Production 40% Sawn Recovery Price For Dry Sawn Material Up By 38% Production Costs Down 20% Log Supply Costs Down 10%

Figure 8



SCENARIO

BASE CASE	30% Value-Added Production 42% Sawn Recovery
A	No Value Added Production
B	47% Sawn Recovery
C	No Market For Residue
D	Residue Price Doubled
E	No Market For Residue No Market For Green Sawn Material
F	60% Value-Added Production 49% Sawn Recovery Price For Dry Sawn Material Up By 62% Production Costs Down 20% Log Supply Costs Down 10%

- We have to sell as much of the log as possible - more woodchip sales and better prices will generate more furniture wood.

- The greater the proportion of value-added product that can be produced, provided that the production costs and the prices for value-added product is reasonable, the more profitable the mills.

- Incremental improvements in efficiency and marketing can have a dramatic effect on mill profitability.

5. Security

The major factors which are prerequisites to increased value-adding in the hardwood industry all require investment. No sawmill owner or manager, small or large, will convince a board or bank to release funds even if the spreadsheets show increased profitability if there is a possibility that the resource will not be available the year after the investment, or even if there is a possibility that there will be constraints placed on the sale of residue products.

VALUE-ADDING IN WESTERN AUSTRALIA

One of the major objectives of the West Australian 1987 Timber Strategy (CALM 1987) was to increase the proportion of value-added product produced from WA hardwood logs.

The strategy aimed to achieve the conversion of 30 per cent of the log intake to value-added product within 10 years.

Considerable progress has been made.

- The strategy delivered, for the first time in WA, log resource security to the industry by legally binding log supply contracts.

- Average log prices were increased substantially, increasing unit costs of production, but contributing to resource security and providing an incentive to increase recoveries and the value of the products produced.

- Large differentials in the price of high grade and low grade logs were created which increased the resource availability by stimulating marked improvement in utilisation in the forest.

- Wood utilisation research by individual companies and CALM in cooperation with industry has produced new technology which has been a major improvement in the efficiency of value-added processing.

- There has been a massive increase in investment by the industry. Overall more than $150 million is being spent or has been committed to investment in new plant and equipment, marketing and training. A large proportion of this investment is being directed to value-added processing.

- The proportion of appearance grade hardwood timber produced from native forest hardwoods has been increased from less than 10 per cent to more than 25 per cent of the log intakes for major mills.

- Individual companies and industry groups in cooperation with Government have taken new marketing initiatives. For example a jointly sponsored exhibition of WA furniture has been made at the International Furniture Exhibition in Milan in 1989 and 1991. A detailed market survey was commissioned at the 1991 exhibition which 95 per cent of those surveyed reported that one or more of the WA products at the exhibition had sales potential in their home market.

- Fine furniture production has grown from an industry worth $2 million in 1986 to $5 million dollars in 1990. Employment has grown from 70 to 100 in the same period.

VALUE-ADDING OF FOREST RESIDUE INDUSTRIES

The issues affecting residue based value-adding are being addressed in detail by other participants to this conference.

Many of the impediments to developing value-added processing in the hardwood sawn timber sector are common to the residue based industry. Resource security and macro and micro economic factors such as exchange rate and transport costs are even more important because the investments required may exceed a billion dollars.

- WA already has significant value-added residue industries: a particle board plant and medium density fibre board plant based on utilisation of pine thinnings and sawmill residues. Within a decade their intake will exceed 550,000 cubic metres. A significant proportion of their products will continue to be exported.

  A silicon smelter currently consumes 62,000 tonnes annually of jarrah logs for charcoal.

- WA has the capacity to have a major Kraft pulp mill operational by the end of the decade.

- While the pursuit of pulp mills for Australia is admirable, it is important to appreciate that there are two markets for Australian wood fibre. The "market pulp" market is the pulp traded throughout the world. New Australian pulp mills will have to capture a part of this market if they are to become a reality. There is also a wood fibre market that feeds the existing integrated pulp and paper industry. Overseas pulp and paper mills will not move to Australia. But they generate a large demand for wood fibre. Western Australia can meet part of that demand because we have the climate, soils and land to grow trees which yield high quality wood fibre.

It is important that in the quest for Australian pulp mills that artificial and irrational Government constraints are not placed on tree growing projects which aim to capture this high quality fibre market. While the production of high quality fibre for export does not have the glow of pulp it is a value-added industry. Western Australian studies have shown that hardwood plantation programs of 30 to 40,000 hectares would generate approximately $200 million of export revenue per annum. If Australia does not produce the fibre overseas pulp mills will obtain it from other countries.

CONCLUSION

Increased value-adding in the forest industries is politically desirable, economically rational, commercially possible (and it may even be essential for commercial reasons) and technically feasible.

It can become a reality if there is political support from government and vision and innovation from the private sector. It will involve substantial restructuring of the existing forest industry.

In WA we are more than halfway through that restructuring process. Major hardwood sawmills are now aiming to convert 50-60 per cent of their intake to value-added products. Effective marketing has finally commenced.

There are major challenges to meet but the rewards to the community are very high. If the WA hardwood sectors achieve 50 per cent value-adding it will result in an increase in value of over $100 million per annum. A pulp mill will generate $500 million per annum. Increased production of particle board and medium density fibre board could generate an additional $100 million per annum. A plantation industry selling high quality wood fibre could generate $300 million per annum.

If all these goals could be achieved by the turn of the century, the forest industry's contribution to WA's economic cake could be increased by a billion dollars per annum - an amount which can't be sniffed at in the current economic climate.

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