TIMBER IN THE WESTERN AUSTRALIAN ECONOMY

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In the early days of the Western Australian colony, timber production played a dominant role in the local economy. This dominance has gradually decreased with rural development and industrial expansion in the state, and at present timber might be considered a minor contributor to the local economy.

Foresters often use figures on annual royalties or annual values of sawn production ($30-35 million), but that seems to be where they stop. However, the timber which they had tended and despatched from the bush landing does not stop there. The employment created in growing and initial breakdown of the log similarly does not stop there either. This timber proceeds through many and varied trades and industries, generating additional value and employment until final consumption. The various stages a commodity passes through on its way to consumption, are known as forward linkages and, because of the many uses to which timber can be put, the forward linkages of forests can be numerous. Chenery and Watanabe (1958), calculated the linkage effects in 29 industries in the U.S.A., Japan and Italy, finding pulp and paper to rank third and timber twelfth - these being well above the overall average.

One method of evaluating the full role of timber in the community is to analyse the contribution to Gross National Produce (G.N.P.). This can be done by identifying the forward linkages of timber and forest products and computing the values generated by timber at each stage of production. The sum of all Values Added by all industries in the economy is the G.N.P. Since many of the basic materials are used in the production of most commodities, care must be exercised, in the case of timber, to attribute only that portion of the industry's Value Added that is generated by timber (e.g. furniture industry, construction industry).

Value Added figures are now given in the Western Australian Year Book (the derivation is outlined in Appendix I). However, these figures are not presented in such a form that can be used to identify the total role of timber in the economy and calculations that follow are thus necessary. Hair (1963) was the first to complete a comprehensive study of this kind and used the 1958 U.S.A. economy as his base. Table 1 summarises the estimated Value and Employment Added for the W.A. economy (1969/70) with a more complete breakdown and mode of derivation being given in Appendix II. Because of inadequate local data in many instances, assumptions equating productivity and industrial structure between U.S.A. (in 1958) and W.A. (in 1969/70) have been made (Appendix II).

Figures are given in Table 1 for both local wood consumption and total wood consumption (i.e. inclusive of imports primary pulp and paper). Gross multipliers indicate the level of economic benefit arising per dollar invested in forest management (or per forest employee).

TABLE 1

ESTIMATED VALUE AND EMPLOYMENT ADDED ATTRIBUTABLE TO TIMBER IN THE WESTERN AUSTRALIAN ECONOMY - (1969/70).

	Value Added ($'000,000)	Employment Added	Value Added per $ Forest Management*	Employment Added per Forest Employee*
FOREST MANAGEMENT	5.0	959	1.0	1.0
MANUFACTURING				
Attributable to W.A. Timber	28.0	5190	5.6	5.3
Imports (pulp & paper)	23.8	3970	4.8	4.2
SUB-TOTAL	51.8	9160	10.4	9.5
CONSTRUCTION	46.0	8800	9.2	9.2
TRANSPORT & MARKETING				
Attributable to W.A. Timber	16.3	1805	3.3	1.9
Imports (pulp & paper)	8.5	724	1.7	0.7
SUB-TOTAL	24.8	2529	5.0	2.6
TOTAL Attributable to W.A. Timber	96.3	16754	19.1	17.4
Total Wood Usage	128.6	21448	25.6	22.3

* Gross multipliers obtained by dividing with forest management figures.

The precision of these figures may be questioned because -

(i) of the assumptions made in computation;
(ii) of the lack of suitable data;
(iii) not all forward linkages have been identified (i.e. no account has been taken of pole and pile operations, transport of manufactured goods, port handling, education, minor forest produce etc., and this would lead to an underestimate).

The assumptions have been made pessimistically and because only major industries in the sector have been identified, the figures are considered to be conservative. However, the figures do give a broad indication of the value of timber in the economy and a vastly different picture emerges compared to that of "ground level" forestry (i.e. at least 5% of the State's contribution to G.N.P.).

Such calculations can benefit the Forests Department in a number of ways.

(i) Since the days are now gone when royalties covered Departmental expenditure, Value and Employment Added in the wood sector must enhance submissions for Treasury aid. This will be increasingly important as we now "compete" with other Departments for much of our funds.

(ii) Knowledge of a commodity's full influence in the economy is vital to Government planning and decision making. For example, it is probable that the major economic benefit of the recent Marri Chipwood Agreement with Japan will flow to the transport and port authority sectors rather than to forestry itself. Thus alternate land uses, and hence, alternate investment opportunities, are affected.

Value Added measures contribution to G.N.P. but does not account for economic efficiency. Since inefficient industries also contribute to G.N.P., Value Added cannot be considered on its own for investment evaluation. However, it can be utilised in conjunction with cost-benefit analysis whereby total economic efficiency is estimated.

An analysis of the Value Added concept will give a better appreciation of the role of timber in the economy. Forestry today is having to "stand up and be counted" amongst the rest of the business world where the alternatives of expenditure are much more broadly based than they have been in the past. Technically, forestry has generally been well to the fore but managerial and economic expertise has been sadly lacking and, thus, is an area where most of the future battles will be won or lost.

Value Added is just one aspect of a whole range of economic data being investigated by forest authorities throughout the world. The time is right for forestry in Western Australia to start analysing itself in this light. The broad calculations presented here, if they do nothing else, indicate that we play a larger role in the community than the Annual Report or the Western Australian Year Book would suggest.

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AUTHOR'S FOOTNOTE: The above article was written in 1975 and uses 1969/70 values. Conversion using general inflation rates, will give the approximate position today, i.e. value of sawn production in 1976 was $53 million dollars. The relative impact on the economy in terms of contribution to G.N.P. and employment is expected to be similar now to what is reported in the text.

APPENDIX I

DERIVATION OF VALUE ADDED

1. Sales, and transfers out, (to other establishments of the enterprise), of goods manufactured by the establishment).

PLUS 2. Sales, and transfers out, of goods not manufactured by the establishment;

PLUS 3. Bounties and subsidies on production;

PLUS 4. All other operating income;

PLUS 5. Capital, work done for own and/or for rental or lease;

EQUALS - VALUE OF TURNOVER

PLUS 6. Value of closing stocks;

PLUS 7. Value of opening stocks;

LESS 8. Purchases, and transfers in, of materials, electricity, fuels, containers etc.

LESS 9. Purchases, and transfers in, of goods for resale;

LESS 10 Charges for commission and subcontract work:

LESS 11 Repair and maintenance expenses;

LESS 12 Outward freight and cartage, motor vehicle running expenses, sales commission payments;

EQUALS - VALUE ADDED

Source: 1973 Western Australian Yearbook.

APPENDIX II

ESTIMATED VALUE ADDED AND EMPLOYMENT ATTRIBUTED TO TIMBER IN WESTERN AUSTRALIA 1969/70.

Activity	Value of Product or Service ($ x 10^6)	Value Added		Employment	
		Total ($ x 10^6)	Attrib. to Timber ($ x 10^6)	Total	Attrib. to Timber
1. Forest Management:	5.0	5.0	5.0(1)	959	959
2. Manufacturing:					
Wood, wood products and furniture	93.1	45.4	28.0(2)	8391	5190(2)
Paper, paper products and printing.	62.2	34.1	23.8(3)	5674	
Sub-total	155.3	79.5	51.8	14065	3970(3)
3. Construction:	-	277.0	46.0(4)	44000	8800(4)
4. Transportation and Marketing:					
(a) Wholesale Trade					
Building material & supplies.	122.7	26.1	5.2(5)	4513	903(5)
Household appl. & hardware	47.1	10.6	0.2(6)	1317	26(6)
Paper, paper products books and stationery	19.5	-	3.7(7)	-	512(7)
(b) Retail Trade					
Newspapers, books & stationery.	24.1	4.8(8)	4.8(8)	-	212(8)
Furniture, mattresses & floorcoverings	41.0	10.2(9)	4.1(9)	-	97(8)
(c) Transportation Timber products only.					
Rail	2.1	1.7	1.7(10)	-	226(10)
Road	-	5.1	5.1(11)	-	552(11)
Sub-total	-	-	24.8	-	2529
Total Attributed to Timber — W.A. Timber	-	-	96.3	-	16754
Timber Usage in W.A.	-	-	128.6	-	21448

Appendix II (cont'd)

1. Value of forest expenditure less estimated cost of materials used.

2. 1972 Yearbook showed 67% of sawmilling value as being Value Added (V.A.) and Hair (1963) showed 90% of this V.A. to be attributable to timber. Similarly, he also showed V.A. by furniture as being 40% attributable to timber and 90% of V.A. by veneer and plywood as being attributable to timber. These figures are therefore the basis of this V.A. and employment estimate.

3. Hair shows 90% of V.A.in primary pulp and paper manufacturing is attributable to timber, and 70% of V.A. in secondary paper manufacturing. Because W.A. imports pulp for its paper making, the lower figure is used, but note that this V.A. is not attributable to W.A. timber, but to timber in use in W.A.

4. Total V.A. derived from Hair, who showed a V.A. per 1000 employees of $9 million and V.A. attributable to timber of $1.5 million/1000 employees. This figure is multiplied by 0.7 to convert from U.S. to Australian dollars. Similarly, from Hair, employment due to timber is 20% of total employment. This calculation would presume the same employment value, construction having 20% of the value of the buildings in timber products.

5. 1973 W.A. Yearbook shows 20% of wholesale sales on own account are attributable to timber in this item, therefore 20% of V.A. is assumed attributable to timber.

6. 5% of the turnover of this item is due to furniture mattresses and blinds. It is therefore reasonable to assume 4% is due to furniture, and therefore from (2), 2% is attributable to timber.

7. 1973 W.A. Yearbook shows this item to represent 1.6% of total wholesale turnover. It is therefore assumed that it represents 1.6 of total V.A. (and also employment).

8. Hair showed that in retail trade of timber products, 25% of total value was V.A. and all this was attributable to timber. This V.A. represents 0.004% of total retail value, and therefore this percentage is applied to total employment in the retail trade.

9. Derived V.A. and total value as per (6) and (8) and employment as for (8).

10. Assumes 20% of growth revenue to cover fuel, electricity etc. Employment attributable to timber is assumed to be the same as the ratio of timber revenue to total revenue (i.e. 5%). This assumption corresponds to Hair's figures.

11. Since rail transport accounted for 25% of timber cut, road transport must have catered for 75% of the total cut. The figure here is therefore assumed to be 3 times the rail V.A. figure. Employment is only multiplied by two, however, on the basis that private road haulage will probably have less administrative personnel than the W.A. Government Railways.

Source: Derived from the 1973 Western Australian Yearbook, 1972 Australian Yearbook, Hair (1963) and the 1972 Forests Department Annual Report, the above means.