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Regional Economic Impact Assessment for the Southern NSW CRA Region

A project undertaken as part of the NSW Comprehensive Regional Assessments

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REGIONAL ECONOMIC IMPACT ASSESSMENT FOR THE SOUTHERN NSW CRA REGION

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A project undertaken as part of the
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The project has been overseen and the methodology has been developed through the Economic and Social Technical Committee which includes representatives from the New South Wales and Commonwealth Governments and stakeholder groups.

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EXECUTIVE SUMMARY

This working paper describes a project undertaken as part of the comprehensive regional assessments of forests in New South Wales. The comprehensive regional assessments (CRAs) provide the scientific basis on which the State and Commonwealth Governments will sign regional forest agreements (RFAs) for major forest areas of New South Wales. These agreements will determine the future of these forests, providing a balance between conservation and ecologically sustainable use of forest resources.

Project Objectives

This working paper provides socio-economic information towards the assessment of alternate land management regimes and practices, as considered under the comprehensive regional assessment process for the Southern NSW RFA region. This paper:

- provides an economic profile of the Southern CRA region including the South Coast and Southern Tablelands sub-regions and the forestry industry in these sub-regions.
- estimates the likely direct and in-direct effects associated with changes in land management in the Southern NSW RFA region.

Methods

The work entailed the development of a database of key economic variables and the interpretation of those data. A model of the forestry industry was also constructed to indicate how the various activities relate to each other and how changes in the amount of wood available from State Forests impact on other forestry activities.

Input-output models for the South Coast sub-region and the Southern Tablelands sub-region were constructed. These models were used to estimate multipliers and the flow-on effects associated with the direct effects of forestry activities. A base case was constructed around the actual level of activity in 1998-99.

South Coast Key Results

The South Coast sub-region has been a high growth area in terms of population and employment, especially in the areas near to the coast. However, unemployment remains high as more people are attracted to the region, and the number of dependents is well above the average for NSW. Employment in 1996 was of the order of 61,400 and Gross Regional Product was $3,331m.

The sub-region as a whole has a high degree of industry diversity and a mix of industries that is slightly biased toward low growth industries. The sub-region appears to be under the NSW average for the provision of many services, especially those that support business activity. In both the north and south of the

sub-region, many residents take advantage of employment opportunities in the Wollongong area and the ACT.

The average household income in the South Coast sub-region is about 10 per cent lower than the average for NSW. When related to living costs, that appears to be a good result. The region has a high dependence on social welfare payments as measured by the tax paid to social welfare benefits received ratio. In the South Coast, this is 1.2 compared to a NSW average of 1.6.

In the South Coast sub-region, there has been a winding down of the timber industry over time as the region has diversified through the growth of manufacturing, tourism, recreation and retirement activities. In this sub-region, all forestry-based activities account for about 2.5 per cent of the economic activity: in employment terms the total impact (direct plus flow-on) is 1676. Between 50 per cent and 60 per cent of that activity is secondary processing.

The negotiated outcome for the South Coast sub-region involves a very minor change in the level of logging from that permitted in 1998-99. This reflects a history of adjustments to the level of logging over recent years along with additions to the areas reserved for national parks.

Southern Tablelands Key Results

In the Southern Tablelands sub-region in 1996 total employment was of the order of 15,000 and Gross Regional Product was $790m. This smaller economy is specialised on forestry and tourism, especially tourism that related to the snowfields. The region has relatively low population and employment growth and unemployment has been under the NSW average for most of the recent years.

Generally, the region reflects the stability, limited growth and low incomes of rural regions. Alongside that pattern is the high incomes and growth in the Snowy River Shire based around the snowfields. Beyond those services associated with tourism, the region is poorly serviced especially in terms of the services that support business activity.

The average household income in the Southern Tablelands is 15 per cent below that for NSW (it should be noted that this figure is inflated by snowfields developments). Outside of the Snowy River Shire, the importance of welfare payments relative to tax paid is lower in the Southern Tablelands than on the South Coast (the tax to benefits ratio is 1.45).

In the base year, the Southern Tablelands timber industry activities accounted for between 15 per cent and 20 per cent of economic activity depending on the measure used (the majority of which was due to the softwood component of the industry). Base year total employment was 2231 all of which was in forestry and primary processing.

This region has moved from native forests to a high level of softwood plantations that supply a range of processing activities. The hardwood activities in 1998-99 accounted for less than one per cent of the economic activity in the region while softwood activities accounted for between 13 per cent and 18 per cent of the region's economic activity. The softwood processing is expanding with a

cardboard production plant along with additional plantations to increase the supply of wood.

The negotiated outcome for the Southern Tablelands involved an increase in the supply of hardwood logs that were mostly in the high quality range. This would almost double the level of activity in the hardwood sector of the industry relative to that in 1998-99. It is notable that in 1998-99, about one-quarter of the hardwood supply commitments were not taken up (due to the loss of one of the region's mills by fire). Thus, the negotiated outcome has the potential to add about $6m to the 1998-99 gross output and around 60 jobs.

1. INTRODUCTION

1.1. THE STUDY

The Southern region includes many of the forest ares in the south-east of NSW. The far south-east of Eden and Bombala shires were not included in this study as they were considered as part of the comprehensive regional assessment (CRA) process undertaken for the Eden CRA / RFA region.

For assessment purposes, the Southern NSW CRA / RFA region was divided into sub-regions, reflecting the different socio-economic characteristics of these areas and to take account of the differences in the forest industries that operate in those economies.

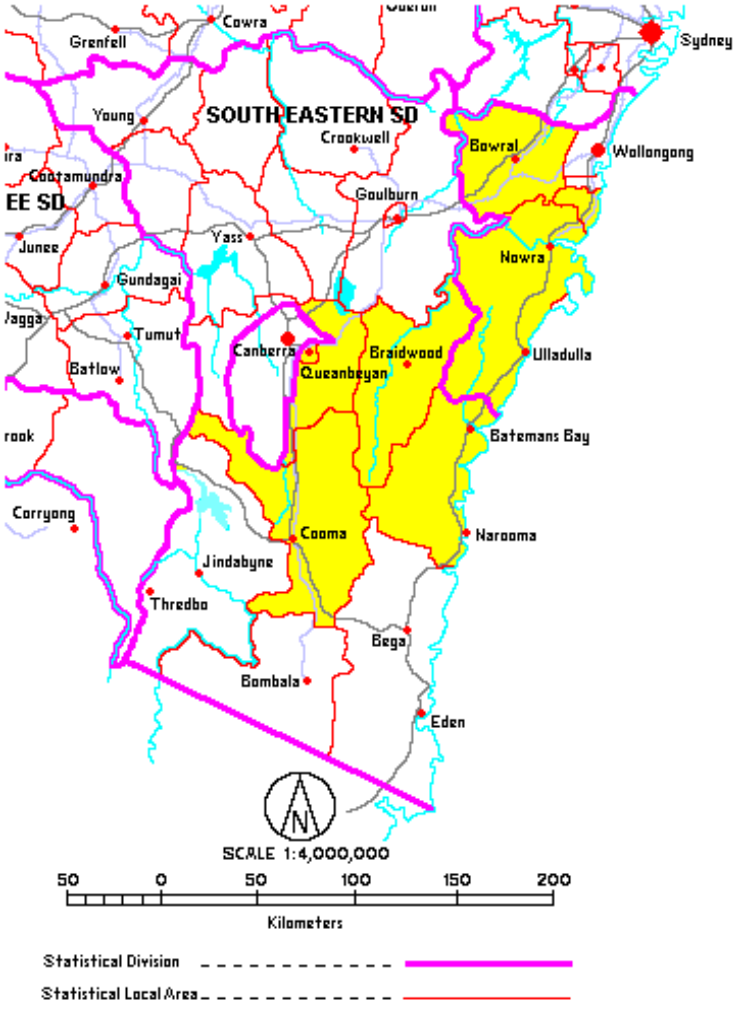
The South Coast sub-region includes shires along the coast running from the shires on the periphery of Wollongong to the shires adjacent to the ACT. This area is a relatively high rainfall area and has supported a substantial native-forest timber industry. Recently, however, there has been strong growth in manufacturing, tourism, recreation and retirement along the coast. The ACT also exerts some influence over the region. Thus, the timber industry has become relatively less important and has itself been contracting in recent times.

The South Coast sub-region is shown in Figure 1-A. It comprises the LGAs of Wingecarribee, Kiama, Shoalhaven, Eurobodalla, Tallaganda, Yarrowlumla (A), Queanbeyan and Cooma Monaro.

The Southern Tablelands sub-region lies between the ACT and the border with Victoria. This sub-region includes the main snowfields in Australia and as well as areas that have seen substantial development of softwood plantations. Some parts of this sub-region also benefit from the proximity to the ACT. In this sub-region the timber industries have been an important source of growth and they represent a significant part of the economy. Most of the growth however, is associated with softwood production. It is expected that this growth will continue with the further expansion of the Vizy processing operations in Tumut. The native hardwood timber industry has only a small presence in the Southern Tablelands sub-region.

The Southern Tablelands sub-region region is shown in Figure 1-B. The sub-region comprises the LGAs of Yass, Yarrowlumla (B), Gundagai, Tumut, Holbrook, Tumbarumba and Snowy River.

FIGURE 1-A: SOUTH COAST SUB-REGION

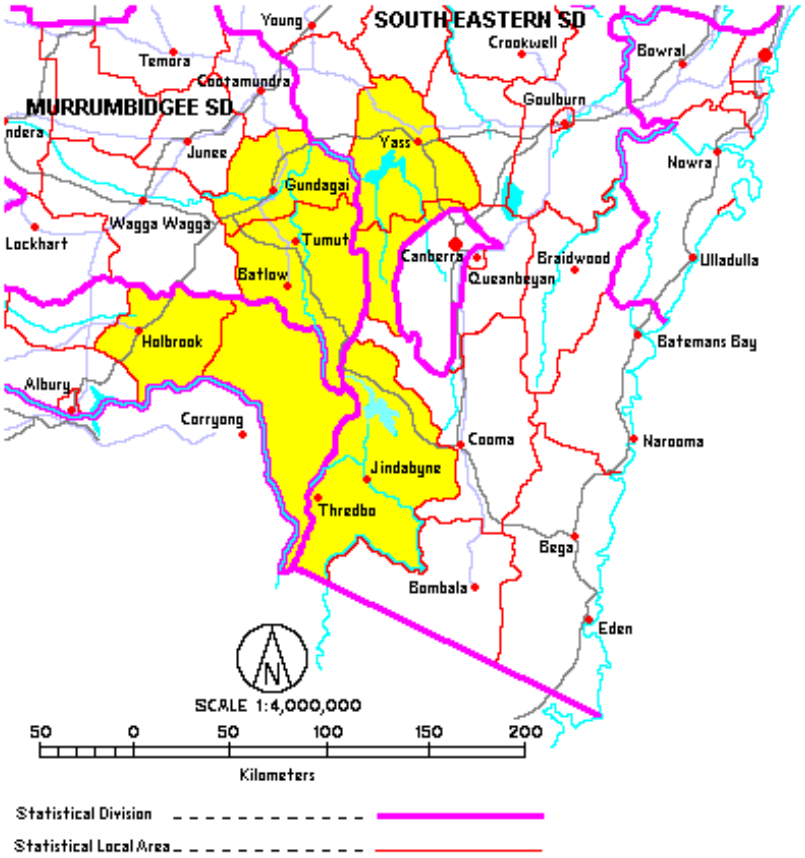


In both sub-regions, the relative economic significance of the native hardwood timber industry within the local economies varies. The purpose of the socio-economic analysis is to document these aspects of the region and to prepare estimates of how changes in forestry policy may impact on the industry, the regional economy and particular localities.

To facilitate this analysis, an Industry Response model and a Regional Economic Input-Output model were developed to estimate the economic impacts of a number of land alternate management scenarios.

This report includes information on the contribution of the forestry industry to the sub-region and the prospective impact on the economy of the negotiated future supply of hardwood wood from public lands. The impact analysis includes information on other forestry activities for completeness, however changes to those activities are not considered.

FIGURE 1-B: SOUTHERN TABLELANDS SUB-REGION



1.2. THE CONTEXT

The Southern region has been a supplier of hardwood timber since the early days of settlement. In recent times, there has been considerable adjustment within the forestry industry, due to changing technology, changing wood products, changing industry organisation and ownership structures and changes in the balance of land use among timber production, conservation and recreational uses.

There is some forest on privately owned lands, some of which has been used in commercial processing and small on-farm mills. The size and nature of that resource is not as well documented as for the State Forest lands. Recent changes in forest policy have induced more interest in the commercial potential of wood supply from private property.

The development of Regional Forest Agreements within NSW has involved a number of studies over several years. A first step was taken in the Interim Forest Assessment process (IAP) with implementation commencing in July 1996. The IAP involved an integrated set of measures that reduced log supply from public land, increased log prices, gave added security of supply to processors and provided adjustment assistance to affected people and businesses including support for value adding developments. The work undertaken as part of the Southern CRA / RFA process has been carried out as part of the evaluation and negotiating process that seeks to finalise the regional forest

agreements and provide the security and framework for the industry over the next 20 years.

A consolidation of the socio-economic analysis for the South Coast and Southern Tablelands sub-regions of the Southern CRA / RFA region is presented in this report.

The following sections provide a perspective on the sub-region economies as a whole including a discussion of the structure of the regional economy and current trends in the development of the region.

There is also a discussion of the forestry industry in the response modelling in Section 4. This includes a profile of the forestry industry for 1998-99 as a baseline against which the negotiated changes in the industry can be assessed. The negotiated outcome for each of the sub-regions was evaluated in terms of the direct effect on the forest industry and the wider effects on the region. These results are reported in Section 5. An overview and summary of the studies findings is presented in the final section.

2. ECONOMIC PROFILE OF THE SOUTH COAST SUB-REGION

2.1. INTRODUCTION

The economy of the South Coast region is described in this section. This will provide a context for consideration of the forestry industry, including information on the relative importance of the forestry industry to the region. An analysis of trends in the economy provides a perspective on its growth performance and an indication of the capacity of the region to absorb changes in the structure and operation of particular industries without major economic and social disruption.

The analysis in this section is based on an input-output table for the region and shift-share analysis of employment data for the region. The input-output table was compiled using conventional procedures and data as outlined in Attachment 1. The industry/sector classification outlined in Attachment 2 shows the 107-sector system used in compiling the table (it is identical to that used by the ABS in compiling the Australian National input-output table). A 52-sector system is also defined in Attachment 2 and is used in the presentation of a selection of the results in this report. The shift-share analysis has been carried out for 107 sectors with the detailed data shown in Attachment 3.

2.2. OVERVIEW OF THE SOUTH COAST REGION ECONOMY

The input-output table has been compiled using the most recent available data relating to 1996-97. These tables are data intensive and are difficult to compile for years other than population census years. By 1996-97, the NSW economy was well on the way to recovery from the early 1990s recession.

The base table is shown in Table 2-1 in a highly aggregated form. More detailed sectoral structure charts based on 52 sectors are used to describe the economic structure of the South Coast region. Input-output methods are especially valuable in terms of providing a standard structure for compiling data in a consistent way. That enables useful comparisons to be made over time and from region to region.

TABLE 2-1: AGGREGATED INPUT-OUTPUT TABLE - SOUTH COAST 1996-97 ($'000)

	Ag Forestry Fishing	Mining	Manufacturing	Utilities	Building	Services	TOTAL	H-hold Exp	O.F.D	Exports	Total
Ag/Forest/Fish	7333	106	51313	5	138	11233	70128	32603	11737	116500	230969
Mining	156	4633	25369	7674	1481	3873	43186	0	373	85351	128911
Manufacturing	7030	4143	166727	3472	69048	123837	374257	239294	65974	494587	1174112
Utilities	3022	2114	18763	8182	896	61503	94479	63467	1404	1158	160509
Building	610	248	181	76	177	110690	111981	0	323256	0	435237
Services	29100	9538	129653	5441	51953	474074	699759	1950013	815709	60700	3526181
TOTAL	47250	20781	392007	24849	123694	785209	1393790	2285378	1218454	758297	5655919
H-hold Income	95739	18317	190453	28167	137028	1138716	1608420	0	0		1608420
O.V.A.	21916	70465	267468	87981	60801	908920	1417551	256058	49801		1723410
Imports	66063	19347	324184	19512	113715	693336	1236157	1117651	402025		2755834
TOTAL	230969	128911	1174112	160509	435237	3526181	5655919	3659087	1670280	758297	11743583
Employment	3731	458	7012	709	4614	44909	61433				

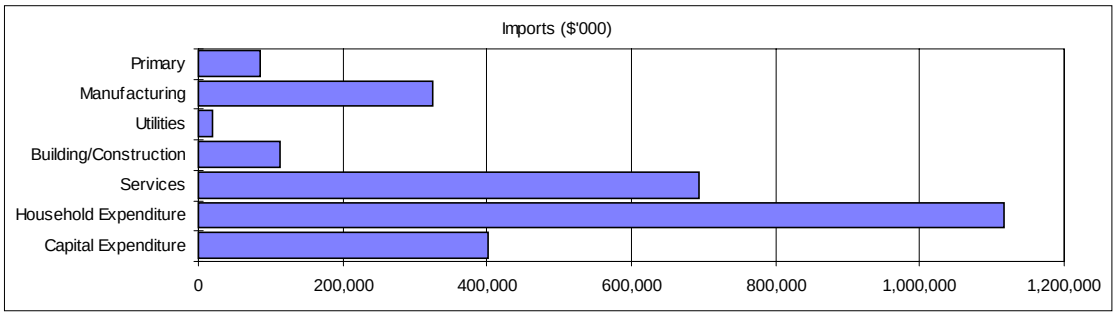
The rows of the input-output table (Table 2-1) indicate how the output of an industry is allocated as sales to other industries, to households, to exports and other final demands (OFD, which includes stock changes, capital expenditure and government expenditure). The corresponding column shows the sources of inputs to produce that output. These include purchases of intermediate inputs from other industries, the use of labour (household income), the returns to capital or Other Value Added (OVA, which includes gross operating surplus, depreciation and net indirect taxes and subsidies) and goods and services imported from outside the region. The number of people employed in each industry is also indicated in the final row. Forestry is included in the agriculture/forestry/fishing sector while wood processing is part of manufacturing.

Gross Regional Product was $3,332m that included $1,608m paid to households as wages and salaries (including imputed payments to self-employed persons and employers).

Employment totalled 61,433 people and the average wage and salary earned was $26,182 per person. This is lower than the NSW average of $30,868.

The trade in goods and services between the South Coast region and the rest of the world strongly favours imports. Imports totalled $2,756m that was 3.6 times the level of exports at $758m. The destination of imports into the local region from all sources is shown by major category in Figure 2-A and in detail by industry in Figure 2-I. In most regions the largest import items are goods for consumption by local households. This is also the case in the South Coast region where 41 per cent of total imports to the local region were household consumables. Expenditure on capital items represented 14 per cent of imports.

FIGURE 2-A: DISTRIBUTION OF IMPORTS BY DESTINATION SECTOR



A further feature of the South Coast region is the high level of household expenditure estimated to be $3,659m. This is more than GRP of $3,331m and considerably more than earnings from employment of $1608m. A number of factors contribute to this including a high proportion of non-working dependents (such as retirees) a high level of social welfare receipts, the earnings from investments and a likely significant 'informal' economy. In addition, there are residents of the region that work outside the region, principally in the ACT. It is estimated that there are 17,276 people who bring into the region earnings of $79m. These factors enable regional households to spend much more on consumption expenditure than they earn from wage and salary employment.

The Department of Social Security (DSS) has made estimates for 1996 of some of these variables (Bray and Mudd 1998). South Coast residents made income tax payments of $512m and received DSS payments of $460m. The high level of importance of DSS payments in the South Coast region is indicated by the income tax paid/DSS benefits ratio which is 1.1 and can be compared with 1.6 for NSW as a whole.

The economic structure of the South Coast region may also be compared with that for NSW through a comparison Figure 2-B and Figure 2-C. This reveals that in the South Coast region, the agriculture/forestry/fishing industry is more important than in NSW while the mining and manufacturing industries are less important than in NSW. The relative importance of the building, utilities and services industries are similar in the South Coast to that of NSW. It is also notable that the agriculture/forestry/fishing industry and manufacturing industry are more important contributors to exports in the South Coast than they are in NSW.

FIGURE 2-B: SUMMARY OF AGGREGATED SECTORS: SOUTH COAST 1996-97

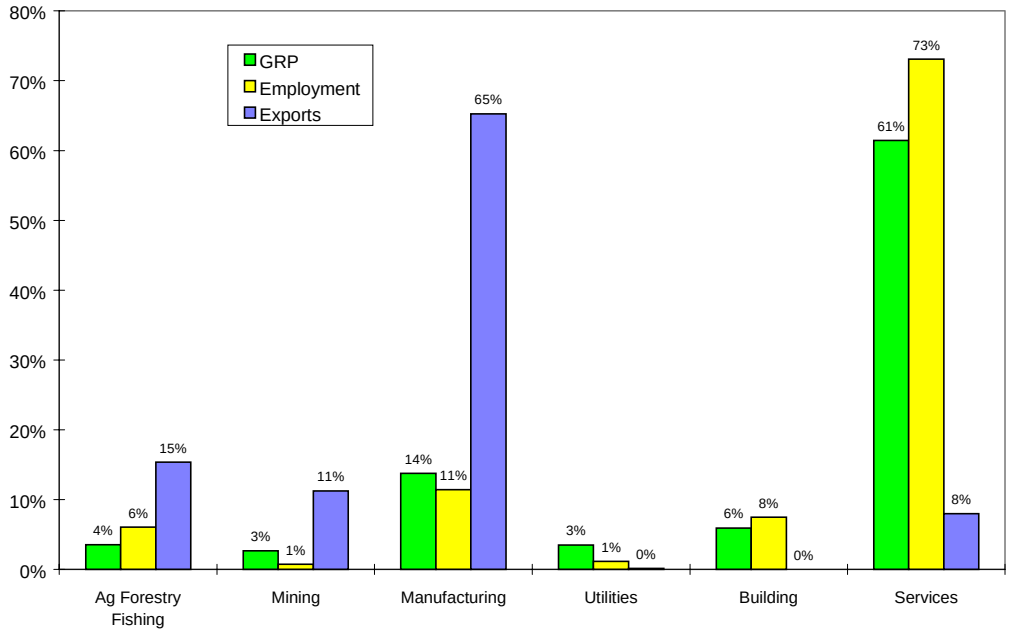
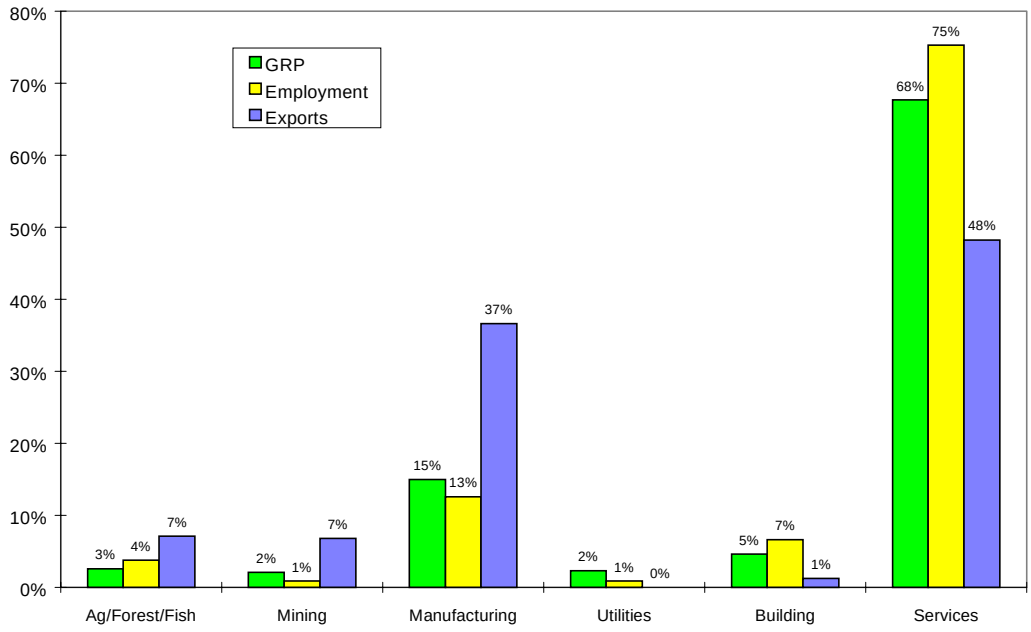


FIGURE 2-C: SUMMARY OF AGGREGATED SECTORS: NSW (1995-96)



The identification of key industries in the South Coast economy can be made with reference to Figure 2-D through Figure 2-I. Industry importance does vary in terms of the measures used but the following sectors stand out as among the most important to the economy.

- Manufacturing, especially that related to mineral processing, food processing and paper products
- Wholesale and retail trade
- Accommodation & restaurants
- Education
- Health
- Public administration
- Residential building

The charts indicate that there is some diversity in the economy, especially among the service industries meeting consumer needs.

The forest industry and wood processing contribute $48m (1.4 per cent) to the value added of the region and generate 950 jobs (1.5 per cent of regional employment). Around one-half of these contributions come from secondary processing of wood products. These contributions become more important in some of the local areas where there is a concentration of wood processing activities. These issues are discussed further in the sections below.

FIGURE 2-D: SECTORAL DISTRIBUTION OF GROSS OUTPUT: SOUTH COAST 1996-97 ($'000)

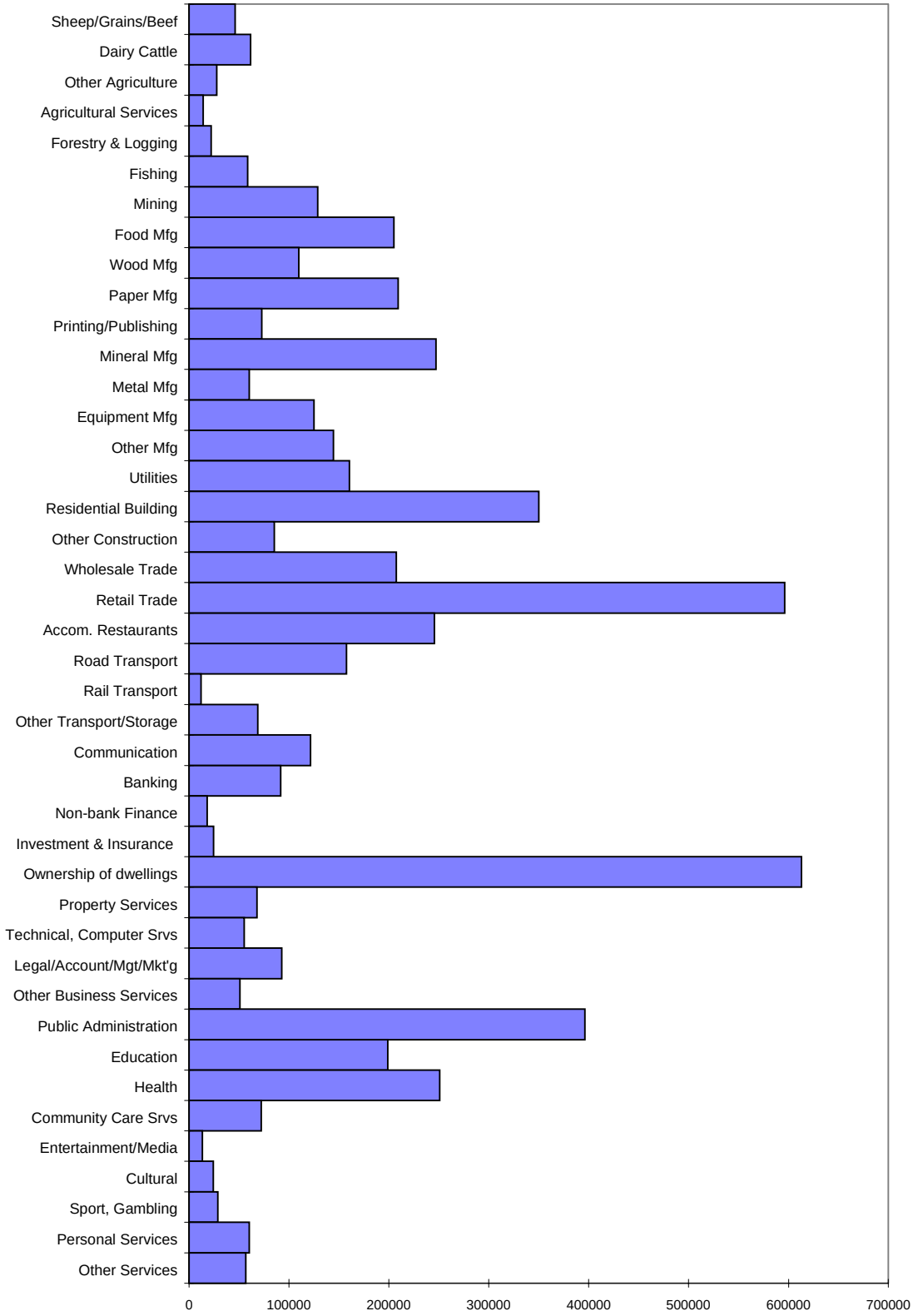


FIGURE 2-E: SECTORAL DISTRIBUTION OF GRP (VALUE-ADDED): SOUTH COAST 1996-97 ($'000)

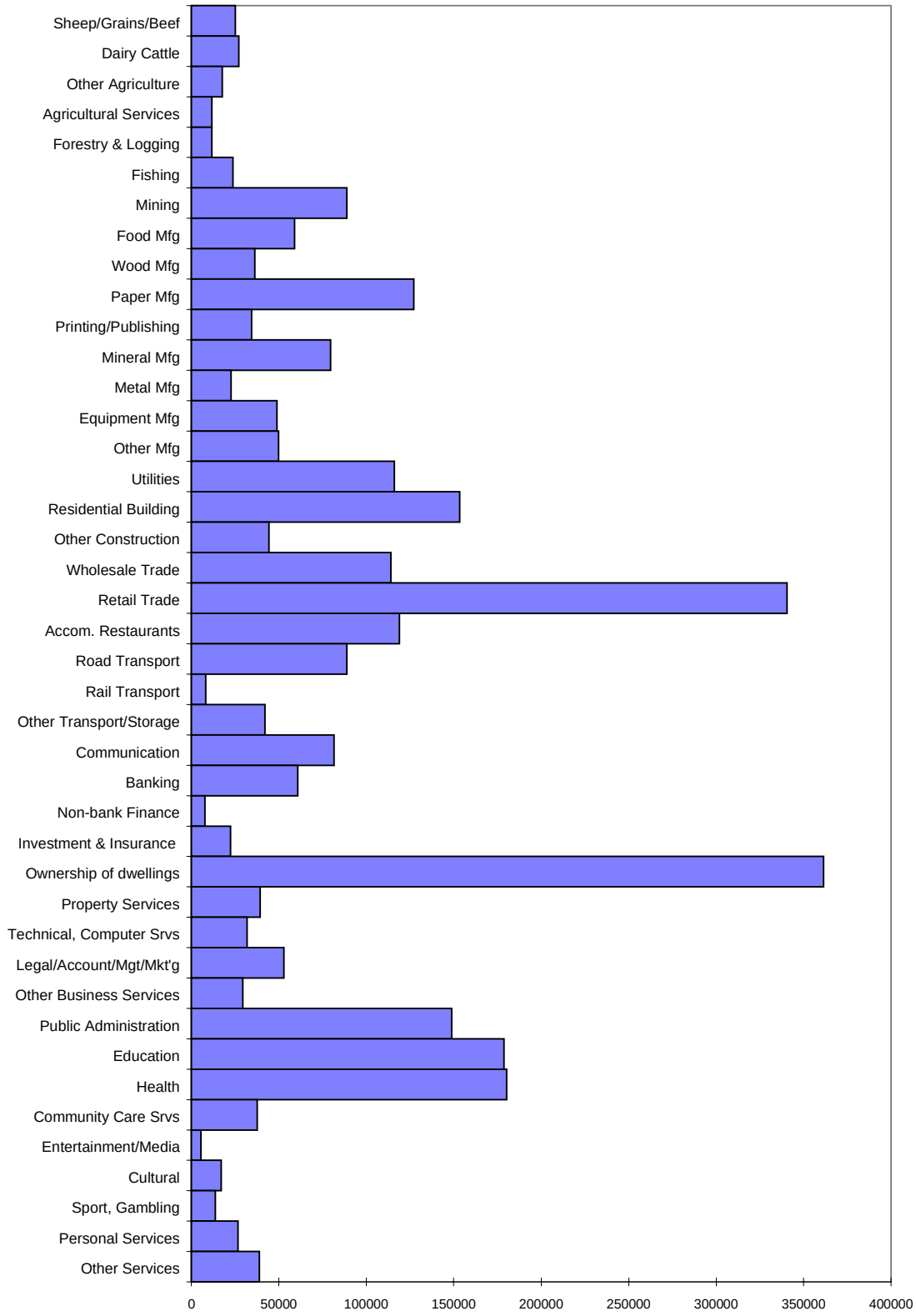


FIGURE 2-F: SECTORAL DISTRIBUTION OF HOUSEHOLD INCOME: SOUTH COAST 1996-97 ($'000)

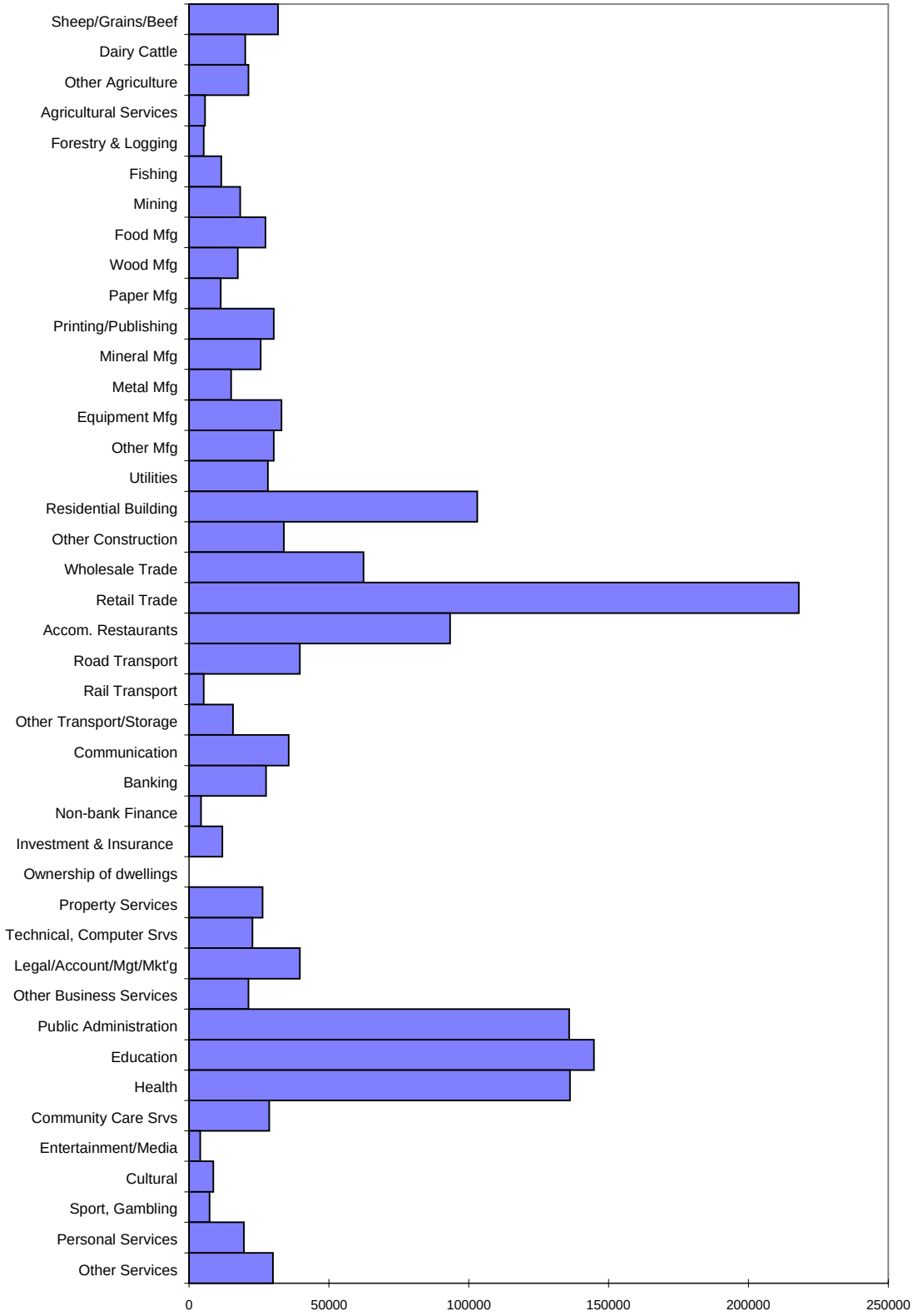


FIGURE 2-G: SECTORAL DISTRIBUTION OF EMPLOYMENT: SOUTH COAST 1996-97 (NUMBER)

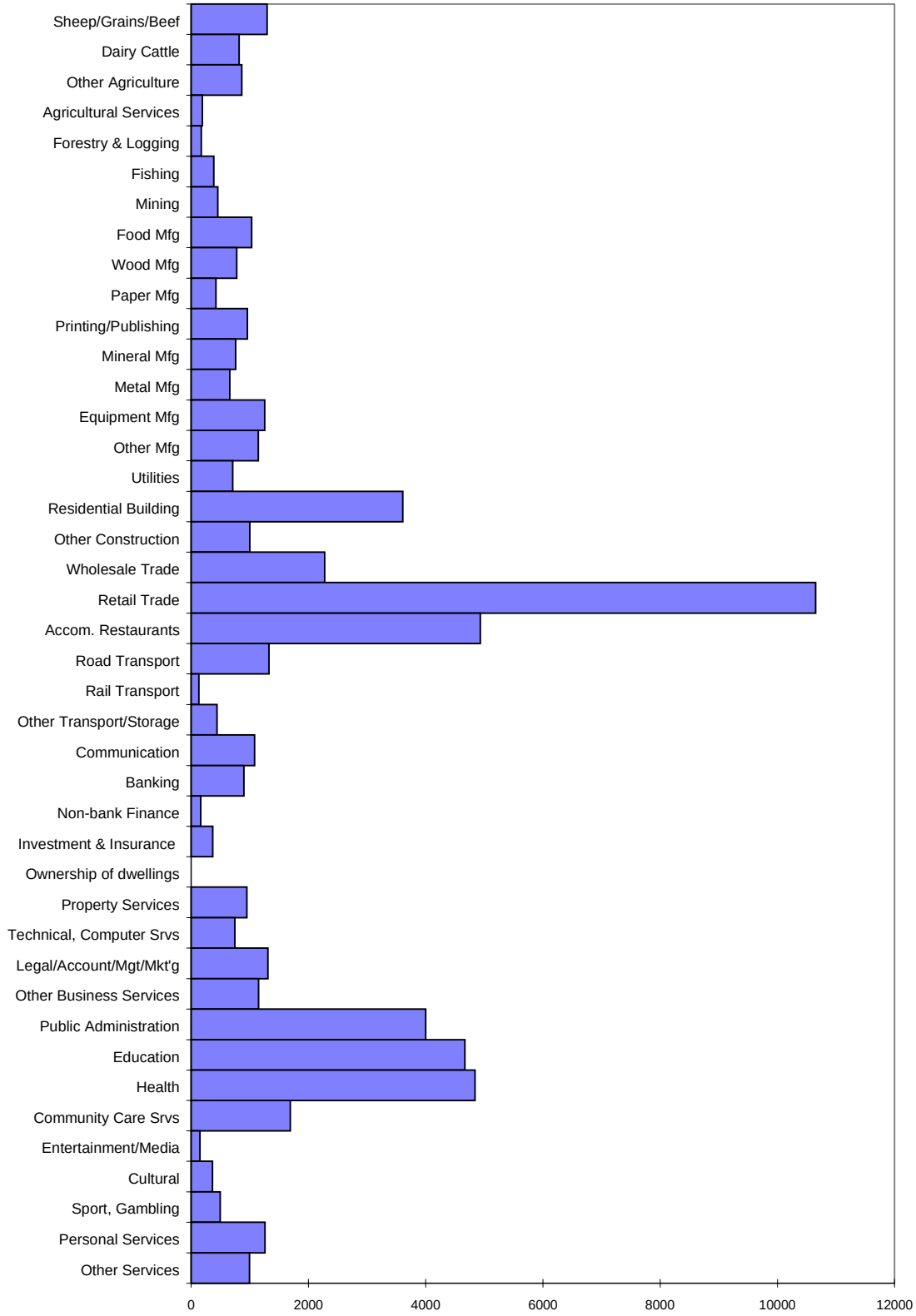


FIGURE 2-H: SECTORAL DISTRIBUTION: EXPORTS, SOUTH COAST 1996-97 ($'000)

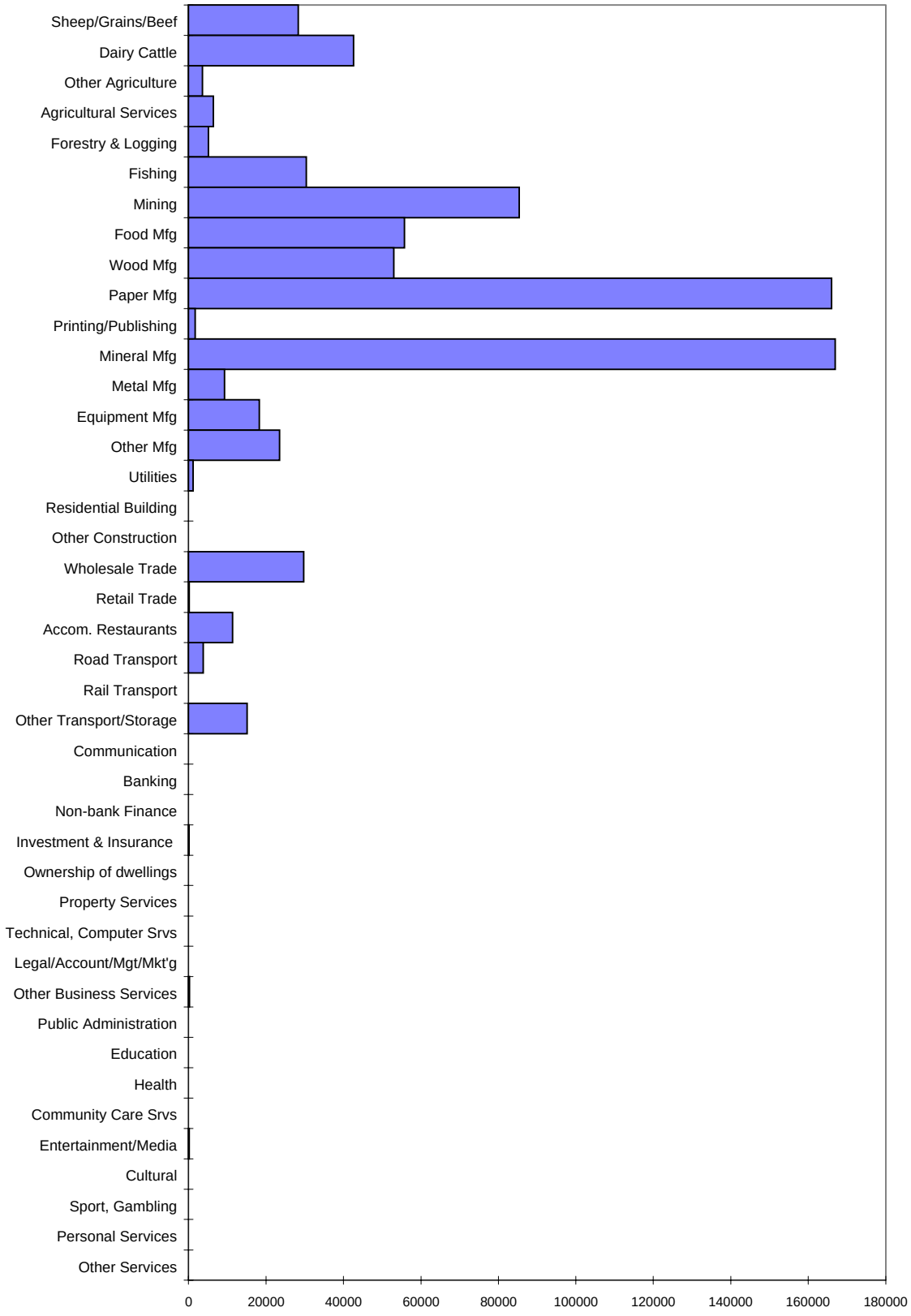
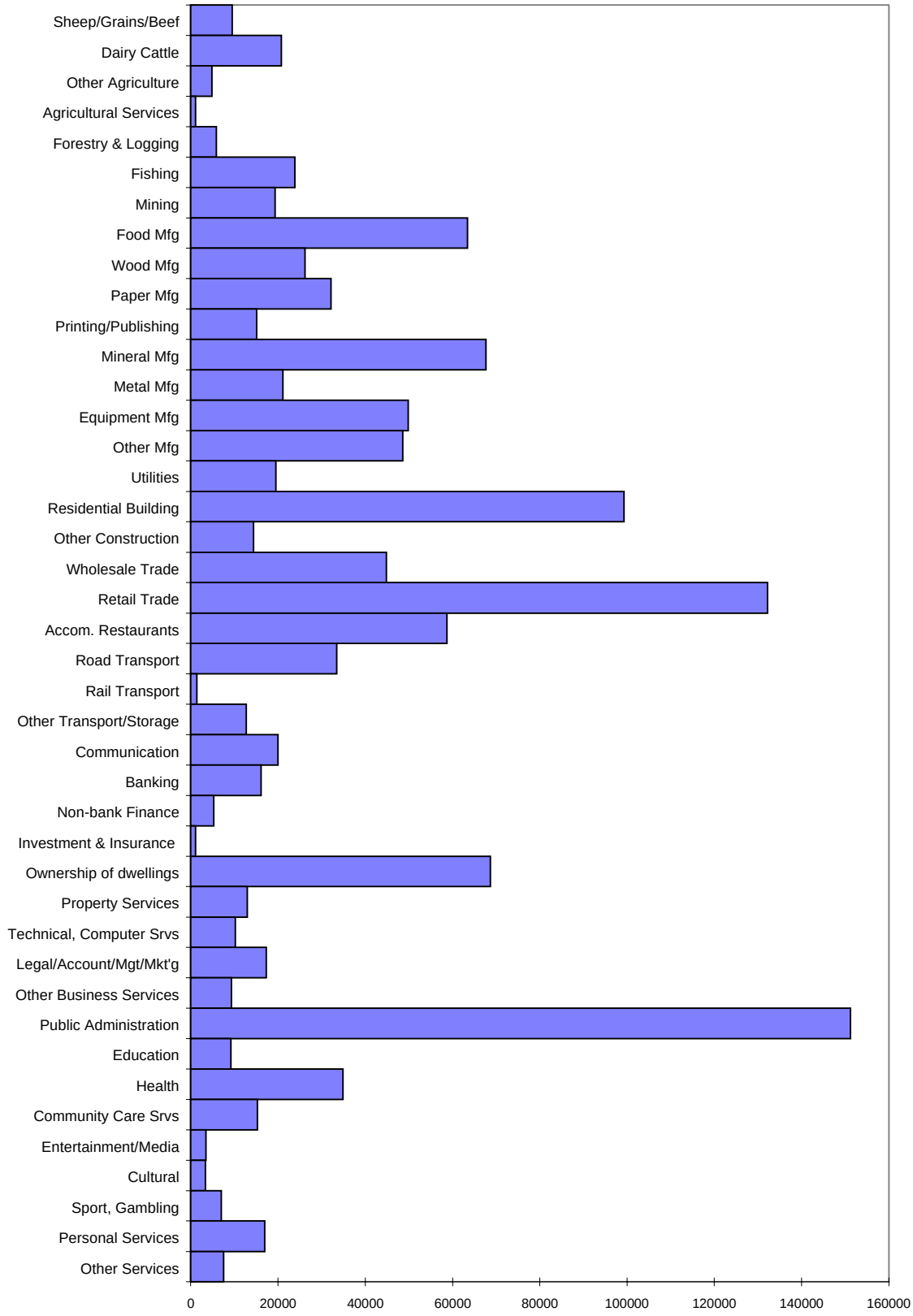


FIGURE 2-I: SECTORAL DISTRIBUTION: IMPORTS, SOUTH COAST 1996-97 ($'000)



2.3. TRENDS IN THE REGIONAL ECONOMY

The previous section provided a snapshot of the South Coast region for 1996-97. The analysis of the trends in those variables and some updating beyond 1996-97 is provided in this section. This also provides an opportunity to relate some measures of the South Coast performance to those for NSW.

The analysis is based on detailed employment by industry data obtained from the ABS Population Censuses. These data are the best available for the analysis of industry profiles and trends to provide a context for the analysis of the forest industry in the South Coast region.

2.3.1. Regional Population and Employment

Data on population employment levels from the ABS Population Census form the basis for this section. The employment data represent workplace based employment estimates (the usual LGA residence based employment numbers have been adjusted for those LGAs in which there are significant people working in neighbouring LGAs, including Queanbeyan, Yarrowlumla, Shoalhaven, Kiama and Wingecarribee. They are expressed as total employment, not full time equivalents, and are compared with population changes.

TABLE 2-2: TOTAL EMPLOYMENT AND POPULATION: SOUTH COAST

Census Year	Total Employment	Total Population	Employment Share of Population	Average Annual Change Between Census Years	
				Employment	Population
			%	%	%
1976		116,698			
1981	43,623	137,467	31.7		3.33
1986	47,258	162,243	29.1	1.61	3.37
1991	56,647	193,300	29.3	3.69	3.56
1996	61,435	215,375	28.5	1.64	2.19

Source: ABS (Population Census data)

It is apparent from Table 2-2 that the 1976 to 1991 period was a boom period for population growth in the South Coast region. Employment growth approached 3.7 per cent per year in the late 1980s, but generally was well below the growth in population. There was a slowing of the population growth in the early 1990s.

The growth has been concentrated in those LGAs on the coast, Shoalhaven and in the hinterland of Canberra as shown in Table 2-3. The predominantly rural areas of Cooma-Monaro and Tallaganda show the slowest rates of growth of population and employment.

Throughout the 1980s and 1990s, there has been a high rate of unemployment in the region. This reflects conditions in Australia as a whole where it has proved difficult to lower the national jobless rate. It also reflects local characteristics that result in the South Coast region rating highly as a place to live and work. Thus it tends to attract additional people regardless of the local employment situation and results in some

movement of people within the region toward the coast. Over the 1981 to 1996 period this is shown as a declining proportion of the population in employment (see Table 2-2). Other factors such as the in-movement of retirees and a large number who work outside the defined region reduce this percentage which, in 1996, was substantially lower than the average for NSW of 41.3.

TABLE 2-3: AVERAGE ANNUAL RATES OF CHANGE BETWEEN CENSUS YEARS

	Population				Employment		
	1976 to 1981	1981 to 1986	1986 to 1991	1991 to 1996	1981 to 1986	1986 to 1991	1991 to 1996
	%	%	%	%	%	%	%
Wingecarribee	2.66	2.42	3.77	2.17	0.64	4.10	1.39
Kiama	5.10	3.18	3.79	2.03	1.93	5.19	1.89
Shoalhaven	4.50	3.48	4.09	2.33	1.64	4.27	2.21
Eurobodalla	6.55	5.74	4.93	2.50	3.97	4.54	1.73
Tallaganda	-0.44	1.88	0.56	0.48	0.23	1.68	0.74
Yarrowlumla (A)	5.53	8.07	4.07	2.93	2.04	2.06	3.01
Queanbeyan	0.15	2.81	1.82	2.24	2.18	2.34	1.60
Cooma-Monaro	0.00	0.26	0.55	0.19	-0.40	0.17	-0.95
South Coast	**3.33**	**3.37**	**3.56**	**2.19**	**1.61**	**3.69**	**1.64**
NSW	**1.09**	**1.11**	**1.29**	**1.02**	**-0.11**	**1.63**	**1.26**

Source: ABS (Population censuses)

2.3.2. The Labour Force

The following information on the total labour force and unemployment is sourced from the Department of Education, Workplace Relations and Small Business (DEWRSB 1999). The unemployment data refer to the number of people receiving unemployment benefits as well as an estimate of those unemployed who do not receive benefits (eg. married spouses). That value is then expressed as a percentage of the local labour force derived from the ABS Labour Force Survey to provide an unemployment rate. From these values it is possible to estimate the level of employment.

These data do not have the accuracy of the ABS population census data, but the frequency permits the development of annual movements in employment. The resultant trends reflect a combination of macro-economic factors affecting Australia generally and local factors.

The information presented in Table 2-4 and Figure 2-J indicate very strong growth in employment over many years. However, that growth has slowed in the late 1990s. The rate of unemployment has generally been higher than for NSW and Australia, and the region has not shared in the declining rates in Australia and NSW in 1998-99.

FIGURE 2-J: TOTAL LABOUR FORCE AND EMPLOYMENT TRENDS - SOUTH COAST

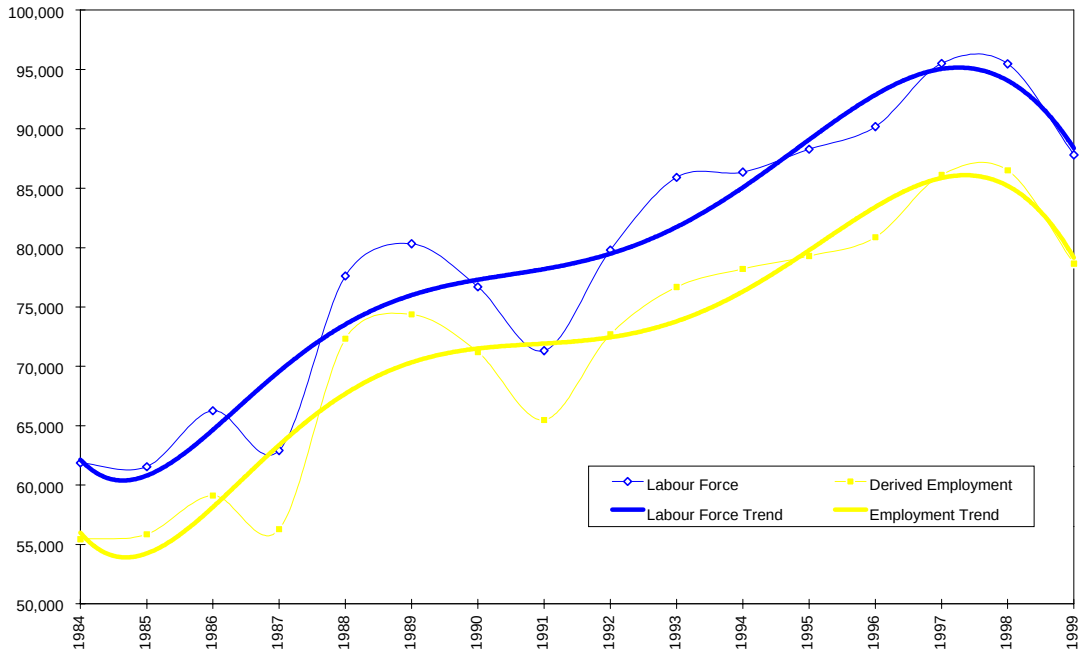


TABLE 2-4: LABOUR FORCE SOUTH COAST

	South Coast				Unemployment	
Year	Labour Force	Derived Employment	Unemployment		NSW	AUST
	no.	no.	no	%	%	%
1984	61,856	55,443	6,413	10.4	9.5	8.9
1985	61,550	55,866	5,684	9.2	9.0	8.4
1986	66,271	59,128	7,143	10.8	8.2	7.8
1987	62,916	56,285	6,631	10.5	8.8	8.1
1988	77,614	72,314	5,300	6.8	7.6	7.6
1989	80,320	74,374	5,946	7.4	6.4	6.1
1990	76,690	71,214	5,476	7.1	6.2	6.5
1991	71,313	65,490	5,823	8.2	8.2	9.6
1992	79,798	72,702	7,096	8.9	9.8	10.8
1993	85,915	76,673	9,242	10.8	10.6	10.9
1994	86,362	78,194	8,168	9.5	9.7	10.0
1995	88,272	79,298	8,974	10.2	7.5	8.3
1996	90,188	80,876	9,312	10.3	7.8	8.4
1997	95,520	86,122	9,398	9.8	7.8	8.6
1998	95,474	86,503	8,971	9.4	7.2	7.9
1999	87,804	78,654	9,150	10.4	6.5	7.2

Source: DEWRSB (1999)

2.3.3. Unemployment

The unemployment data for the South Coast region are shown in Figure 2-K and Figure 2-L. The overall rate of unemployment has been around 10 per cent apart from the boom period in the Australian economy from 1988 to 1992. There are some large variations in unemployment rates within the region. The southern part of the coast has the highest unemployment rates that are around 15 per cent in 1999. The hinterland areas and the northern part of the coast have rates that are below the region average and are presently about 6 per cent.

There would be a range of factors that are influencing these differences. The proximity of the north coast areas to the Wollongong area, which provides significant employment opportunities, would be one factor. A similar situation occurs around the ACT-Queanbeyan area. These opportunities are not available in the Eurobodalla area. The high unemployment in the Shoalhaven area is a little puzzling given the range of industries. Apparently, that factor is overshadowed by the general attractiveness of other parts of the LGA that draws people irrespective of the employment outlook.

The unemployed number and rate from the Population Census is shown in Table 2-5. These rates are comparable with those from the DEWRSB data.

Table 2-5 also indicates the trends in employment in the timber industry between the various census years. Overall, timber industry employment has about halved over the period 1981 to 1996. The reductions in employment occurred in all LGAs except Wingecarribee and were concentrated in the 1986 to 1991 period. Thus, many of the adjustments in the timber industry associated with reductions in logging levels took

FIGURE 2-K: SUMMARY OF UNEMPLOYMENT RATES

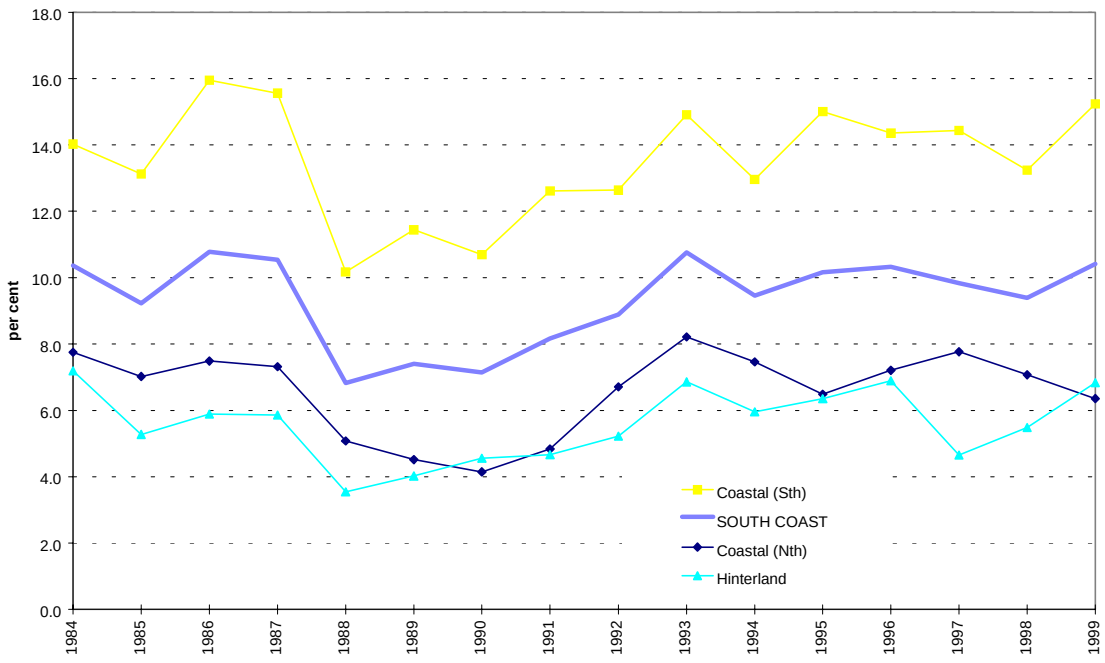


FIGURE 2-L: UNEMPLOYMENT RATES BY LGA AND SUB-REGION

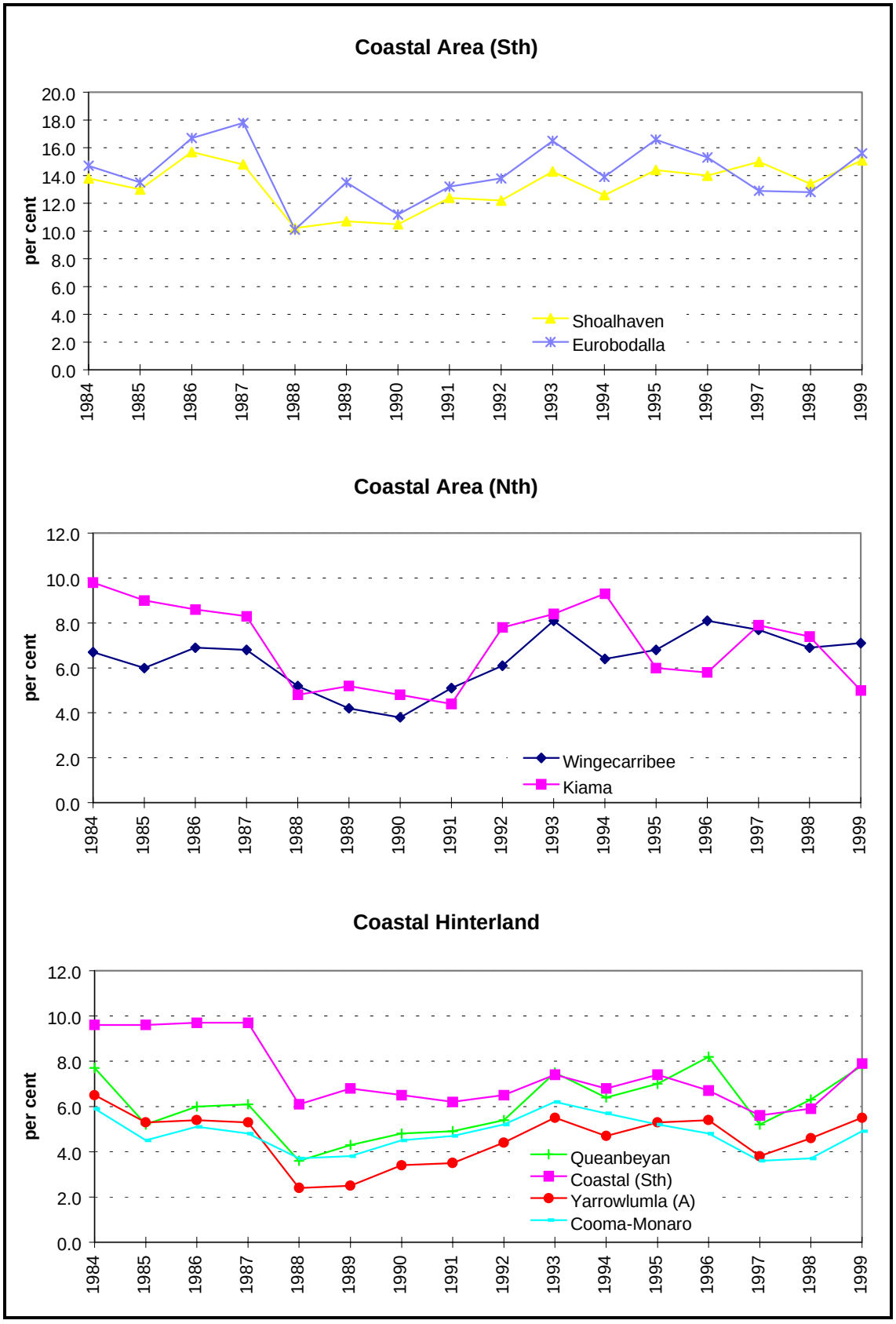


TABLE 2-5: LOCAL AREA UNEMPLOYMENT RATES AND TIMBER INDUSTRY EMPLOYMENT

LGA	Timber Industry Employment				Unemployment: 1996		1999
	1981	1986	1991	1996	Number	Rate	Rate
Wingecarribee	57	56	63	73	1215	8.1	7.1
Kiama	3	3	10	3	551	5.8	5.0
Shoalhaven	251	239	124	134	4112	14.0	15.1
Eurobodalla	256	197	152	124	1693	15.3	15.6
Tallaganda	55	33	19	26	85	6.7	7.9
Yarrowlumla (A)	37	24	16	13	256	5.4	5.5
Queanbeyan	153	116	63	51	1149	8.2	7.8
Cooma-Monaro	50	51	32	26	251	4.8	4.9
SOUTH COAST	**862**	**719**	**479**	**450**	**9312**	**10.3**	**9.4**

Source: DEWRSB (1999) and ABS (Population censuses)

place some years ago. The 1996 level of employment in the forestry and timber milling industry of 450 is equivalent to 0.7 per cent of total employment. In that respect, the timber industry is a small industry in the South Coast region economy. However, there are larger numbers employed in the secondary processing of wood products into doors, trusses etc., which support the building industry.

2.4. ANALYSIS OF INDUSTRY EMPLOYMENT

This section provides details of the industry or sectoral structure of the economy. The analysis of the detailed employment by industry data obtained from the ABS Population Census is presented in this section. This provides an industry context and trends as background to the consideration of change in the timber industries.

The sectoral or industry classification used in this analysis is based on the Australia and New Zealand Standard Industry Classification (ANZSIC). The particular aggregation and description used in this work is shown in Attachment 2.

2.4.1. Sectoral Distribution – 1996

The industry distribution of employment was presented in Figure 2-G. For a total employment of 61,433 persons, the main employing industries were (expressed in terms of the share of regional employment):

- The retail trade sector representing 14.6 per cent of total employment.
- The education and health sectors each employed 7.6 and 7.9 per cent, respectively.
- The accommodation/restaurants/cafes/pubs/clubs sector employed 8.0 per cent.
- The residential building sector employed 5.9 per cent.
- The total manufacturing sectors employed 11.5 per cent including 1.9 per cent in wood and paper manufacturing industries.
- The remaining sectors employed 45 per cent.

These characteristics indicate a regional economy where agriculture is not as important as in the inland areas of NSW, but there is a significant manufacturing component in the Shoalhaven area. Otherwise service industries are important for the residents, retirees on the coast and tourists. Employment in the service industries in August, when the Population Census was taken, would underestimate the average level which would be boosted by the peak of visitation in the summer months.

The following analyses provide a range of comparative and benchmarking information on the South Coast economy.

2.4.2. Location Quotient Analysis

A location quotient (LQ) is a ratio that shows the relative importance of sectors to the region, compared to that in Australia as a whole, ie:

$$\frac{\text{\% of } \textbf{local} \text{ employment in sector x}}{\text{\% of } \textbf{national} \text{ employment in sector x}}$$

Where the local share is larger than the national share, the LQ is greater than one and where the local share is smaller, the value is less than one. Where the value is high (greater than 2) it indicates that those industries are likely to be key strengths in the region.

LQs are presented in Table 2-6 for those industries that have a 1996 value greater than 1.0 and a selection of some of the essential service sectors. The LQs confirm that there is considerable diversity in the South Coast region and include a number of agriculture, manufacturing and service industries. A number of the key service sectors that are important to business development have values below 1.0.

Paper manufacturing is important to the region but most of that is based on recycled materials. Both sawmill products and forestry and logging are around twice as important in this region than in Australia. However, the LQ for these industries has declined over the 1981 to 1996 period.

The strongest increases in LQs over the 1981 to 1996 period have occurred in some of the manufacturing industries. This is indicative of the region becoming an important manufacturing location, especially in the Shoalhaven and Queanbeyan areas.

The LQs for the health education and community services sectors were all around 1.0 and were about constant, indicating that they were constant or keeping pace with Australia-wide trends. Retail trade has a value of 1.2 that indicates that they have a share larger than is indicated by the overall size of the population. The retail sector would be servicing consumers outside the region, or a large number of visitors to the region over the summer.

TABLE 2-6: LOCATION QUOTIENTS: SOUTH COAST

	LQs				Employment
Selected Sectors	1981	1986	1991	**1996**	**1996**
Pulp, paper and paperboard	7.7	9.7	7.4	7.9	417
Concrete, cement, lime	6.8	6.1	5.1	6.8	374
Commercial fishing	4.6	5.0	4.3	4.1	385
Beef cattle	2.7	2.2	2.3	2.6	684
Rubber products	0.4	1.4	1.7	2.5	171
Household appliances	0.3	0.1	1.0	2.4	239
Defence	3.5	2.2	2.4	2.4	1440
Sawmill products	3.6	3.0	2.6	2.3	292
Dairy cattle	3.4	3.1	2.5	2.2	820
Other mining	2.1	2.1	3.4	2.2	195
Sheep	1.3	1.5	1.5	2.2	577
Ceramic products	1.9	1.7	1.9	2.1	157
Other wood products	2.0	2.0	1.9	1.9	484
Forestry and logging	2.8	2.5	2.3	1.9	174
Flour and cereal foods	0.7	0.9	1.4	1.9	129
Electricity	1.3	1.3	1.7	1.9	541
Aircraft	0.1	0.4	0.5	1.7	141
Accom. & restaurants	1.9	1.8	1.6	1.7	4931
Residential building	1.9	1.9	1.9	1.5	3611
Agricultural, mining etc machinery	0.6	0.7	0.7	1.5	256
Plaster; other concrete products	1.9	1.9	1.8	1.4	122
Publishing; recorded media etc	1.0	1.1	1.5	1.4	529
Structural metal products	1.1	1.5	1.6	1.4	366
Dairy products	1.6	1.7	1.2	1.4	168
Mechanical repairs	1.2	1.2	1.2	1.3	1463
Services to agric.; hunting	1.5	1.7	1.3	1.2	191
Retail trade	1.2	1.2	1.2	1.2	8964
Other manufacturing	0.6	0.8	0.9	1.2	145
Community care services	0.8	1.1	1.0	1.2	1694
Prefabricated buildings	0.0	0.0	0.0	1.1	30
Bakery products	1.1	1.2	1.1	1.1	366
Non-metallic min. products nec	4.8	4.2	1.6	1.1	51
Other repairs	0.7	0.7	1.0	1.1	224
Personal services	0.9	0.9	1.1	1.1	1261
Other property services	1.1	1.0	1.1	1.1	952
Education	1.0	1.0	1.0	1.0	4668
Health services	0.8	0.9	1.0	1.1	4842
Communication services	1.1	1.0	1.0	0.9	1082
Other services	0.7	0.7	0.9	0.9	995
Other business services	0.9	0.7	0.8	0.8	1152
Banking	0.9	0.9	0.8	0.7	902
Legal, accounting srvs	0.6	0.6	0.6	0.6	1310
Scientific research etc	1.2	0.8	0.7	0.5	745

2.4.3. Industry Diversity

One indicator of the diversity of the economy is the large number of sectors which have LQs over 1.0. A specific measure of the industry diversity in the economy is the coefficient of specialisation (CS). The CS is calculated as the sum of the differences

between the proportions of local and national employment in each sector. The more the local economy emulates the structure of the national economy the lower (or closer to zero) the value of the CS as shown by the low CS for NSW. At the other extreme, the maximum CS is 100 indicating that a region has only one sector.

This measure can be used to gauge the extent of specialisation in an economy and how the value may change over time. Most economies tend to become more diversified over time. However, the rate of diversification varies among regions.

The CS for the South Coast and NSW are shown for four Population Census years in Figure 2-M. After falling rapidly to 1886, the South Coast has diversified relatively slowly over the past five years in common with many regional areas.

For comparative purposes, the values for the South Coast are shown against some selected SDs in Table 2-7. With a value of around 18, the South Coast is similar to many of the coastal regions and is a little less diversified than the Hunter region.

FIGURE 2-M: COEFFICIENTS OF SPECIALISATION: SOUTH COAST

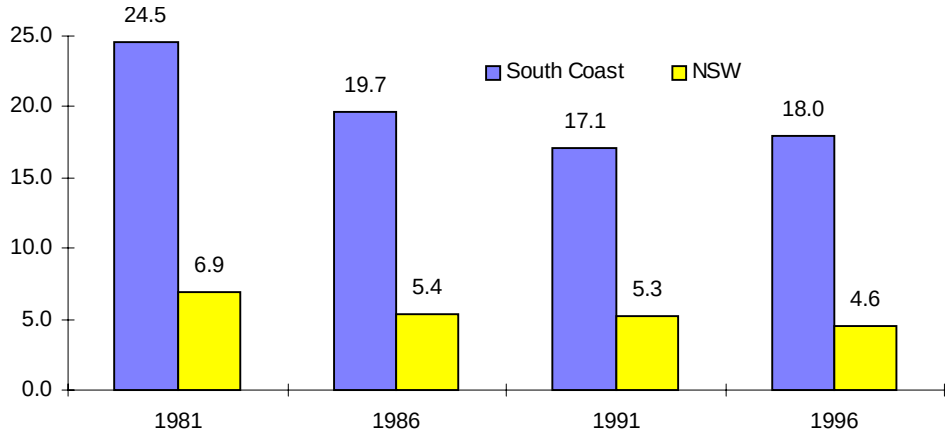


TABLE 2-7: REGIONAL COEFFICIENTS OF SPECIALISATION

	1981	1986	1991	1996
NSW	**6.9**	**5.5**	**5.3**	**4.6**
SYD SD	12.8	11.7	11.2	10.7
LNE	**19.2**	**14.8**	**12.2**	**12.2**
HUN SD	23.0	17.9	15.6	15.1
MNC SD	27.1	20.3	18.6	18.0
UNE	**24.6**	**20.0**	**18.2**	**18.3**
R-T SD	25.7	22.5	19.7	19.2
NTH SD	27.6	24.5	23.0	22.9

2.4.4. Population Employment Ratios

The servicing capacity of the South Coast regional economy is shown as Population-Employment Ratios (PER). Here, the servicing capacity is represented by the **number of residents serviced per employee** in a particular sector. This measures the share of the South Coast region relative to NSW as a whole. The trend over time in the level of service is also measured. In all cases, the lower the PER, the more intensive is the service level that may indicate a higher quality of service. These ratios are only calculated for service sectors.

The information in Table 2-8 indicates that the South Coast region has service levels better than NSW in only accommodation and restaurants and residential building (ie. a smaller PER). The important tourism, retirement and residential roles played in some parts of the region would support this result. Otherwise, the region has lower levels of service that for NSW, especially in those services that support business activity. Banking and communication services are notably lower in the South Coast than they are in NSW.

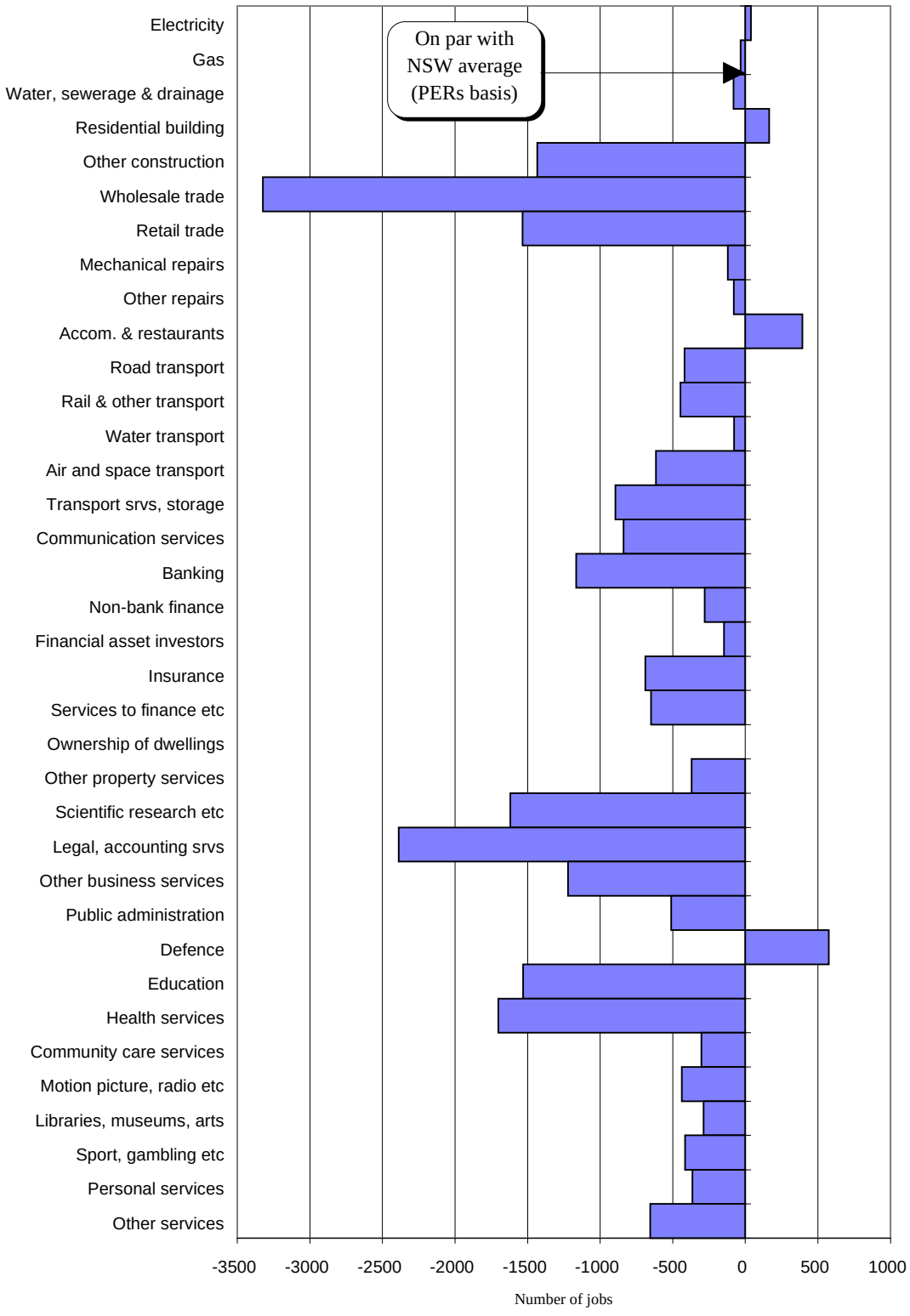
TABLE 2-8: POPULATION:EMPLOYMENT RATIOS: SOUTH COAST

	South Coast				NSW	
Selected Sectors	1996	1991	1986	1981	1996	1991
Retail trade	24	23	23	23	21	20
Health services	44	47	53	60	33	35
Education	46	50	51	50	35	36
Accom. & restaurants	44	49	57	52	47	53
Legal, accounting srvs	164	186	240	253	58	75
Residential building	60	55	60	53	62	70
Other business services	187	239	365	328	91	129
Banking	239	199	175	182	104	97
Community care services	127	210	254	522	108	156
Communication services	199	187	152	129	112	133
Road transport	162	155	164	127	123	108
Other services	216	198	290	287	131	129
Personal services	171	199	265	301	133	160
Other property services	226	220	290	237	163	159
Libraries, museums, arts	592	727	873	1033	330	437

The level of service can also be expressed in the form of jobs potential as shown in Figure 2-N. This indicates the change in employment that would occur in the South Coast region if the PER were at the same level as for NSW as a whole. Only the defence, accommodation, restaurants, residential building and electricity sectors had levels above the NSW average. All of the remaining services industries were operating at levels below that for NSW. There were notable deficits in the trade sectors, education, health, and a wide range of business services and in transport and communications.

Overall, if these sectors were operating at the NSW level, it would result in 23,463 additional jobs that is equivalent to 38 per cent of the 1996 employment. However, the number of residents who have jobs outside the region was estimated to be 17,276 giving a net potential increase of around 6,000 jobs.

FIGURE 2-N: JOBS POTENTIAL: SOUTH COAST 1996



2.4.5. Employment Change by Sector

The remainder of this section is focused on identifying industry trends in the South Coast economy, and in comparing the South Coast with what is happening in NSW as a whole. The analysis is based on detailed employment data from recent ABS Population Censuses.

Based on the Population Census data for South Coast, the following changes in total employment have occurred.

1991	56,647	1996	61,435
1981	43,623	1991	56,647
Diff.	13,024		4,788

These data (and the data in Table 2-2) indicate that employment grew in the 1990s at a slower rate than in the 1980s. The change in total employment between 1991 and 1996 was distributed across the sectors as shown in Figure 2-O.

There is a clear pattern of structural change in the data with overall employment losses in agriculture and a mix of increases and declines in manufacturing. The strong growth occurs in the service industries that support households, visitors and retirees. The largest gains have been concentrated in the retail trade and accommodation etc. sectors along with education, health and community care. There have been some gains in business services, notably the legal etc. and other business service sectors. The largest losses have occurred in public administration, utilities, other construction and broadacre agriculture. Overall there was a net employment growth over the period of 4,788.

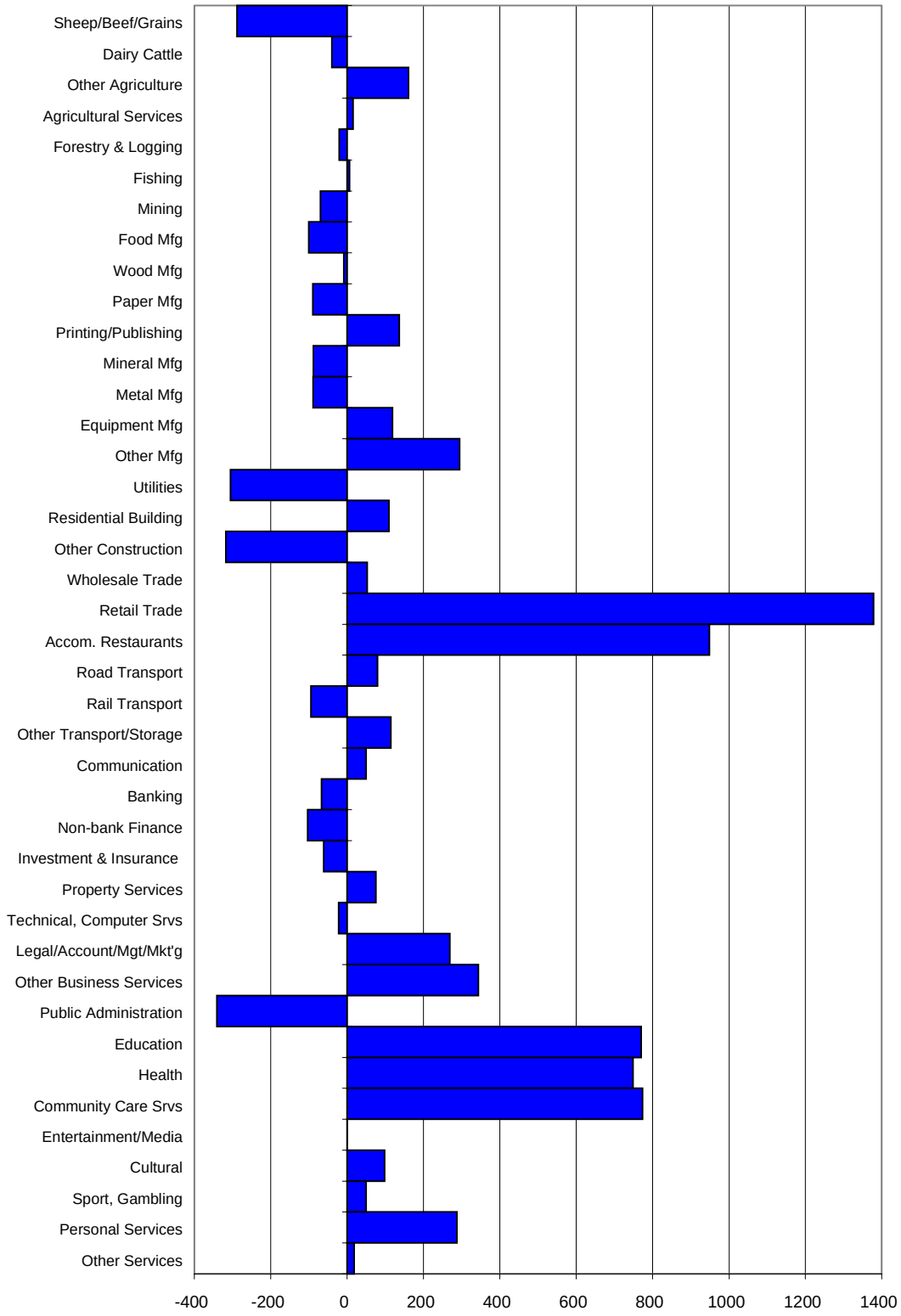
There was a small loss of 20 jobs in forestry and logging and 101 in the aggregate wood and paper manufacturing sectors.

It is possible to assess these changes in the South Coast area against the changes that are occurring in NSW as a whole. This can be done using shift share analysis that compares regional growth with growth in the State and the growth in each industry. Not all industries grow at the same rate and the particular mix of industries may favour some regions. As a result, regional growth is apportioned among total State growth, industry mix effects and local factors.

The results for the South Coast region are shown in detail in Attachment 3 and summarised in Table 2-9, for the period 1991 and 1996. If the South Coast economy performed as well as the NSW economy over that period, then employment would have grown by 3,140 jobs. The industry mix effects were significant suggesting that the region had more slow-growing industries than NSW that was equivalent to a loss of 528 jobs to the region.

The overall benchmark that is established is to measure the performance of the South Coast against the overall trend in NSW and its industries. If the South Coast were on this benchmark, then employment would have increased by 3,140 (Table 2-9). That benchmark for the South Coast would have resulted in employment changes for each industry as shown in Figure 2-P. That indicates greater declines in employment in

FIGURE 2-O: CHANGE IN EMPLOYMENT 1991 - 1996: SOUTH COAST



some agricultural sectors, some manufacturing and public administration. There would have been broad-based growth in the services sectors.

TABLE 2-9: SUMMARISED SHIFT-SHARE ANALYSIS

	Component				**Total**
	State	Industry	**Total State**	**Local**	**Change**
	No.	No.	**No.**	**No.**	**No.**
Positive Effects	3,667	3,979	**7,646**	**4,222**	**11,869**
Negative Effects	-	(4,507)	**(4,507)**	**(2,574)**	**(7,081)**
Total Effects	**3,667**	**(528)**	**3,140**	**1,649**	**4,788**

The combined state and industry effects provide a state benchmark of a 3,140 (3,667 - 528) job increase in the South Coast region over 1991 to 1996. Since jobs actually grew in the local region by 4,788, the difference between the state benchmark suggests that local factors have been positive to the extent of a growth of 1,649 jobs (4,788 - 3,140). Those local factors could include:

- seasonal and price conditions in the region;
- gain of market share due to scale factors;
- significant population growth;
- major infrastructure development; and
- the choices made by members of the community and business sector about where they locate and make purchases.

This analysis is not able to apportion the changes to these factors.

The shift-share analysis of employment between 1991 and 1996 indicates that some industries did **not** perform as well at the local level as the state benchmark (Figure 2-Q). Thus, these industries lost some of their NSW market share and included:

- Residential building
- Technical, computer services (including research)
- Communication
- Other construction
- Sport, gambling
- Food manufacturing

There were a large number of other sectors with small losses

Those industries that did well, and increased their share of that industry in NSW will normally equate with those that are competitive and can do well in other markets. Note that this can also result from the local industry declining more slowly than the industry in the state as a whole. Those industries included:

- Retail trade

- Education
- Community care services
- Sheep/beef/grains
- Other agriculture
- Other agriculture
- Health
- Public administration
- Accommodation, restaurants
- Equipment manufacturing
- Other manufacturing

In NSW, both the forestry and wood manufacturing sectors showed a small increase in employment. But within the South Coast region, local factors were negative for both sectors. That result is indicative of the adjustments that have been taking place in the timber industry in the South Coast region for several years.

A similar shift-share analysis covering the census periods from 1981 is shown in Figure 2-R. Between 1981and 1986 there was an increase in employment in the South Coast region that was similar in size to that for 1991 to 1996. However, most of that was associated with favourable factors in the region because NSW did not experience employment growth in that period.

Between 1986 and 1991 in the South Coast region, local factors continued to add to the growth of the region. By sharing in the growth in employment in NSW as well, the 1986 to 1991 was a period of high growth.

FIGURE 2-P: STATE COMPONENT OF CHANGE 1991 - 1996: SOUTH COAST

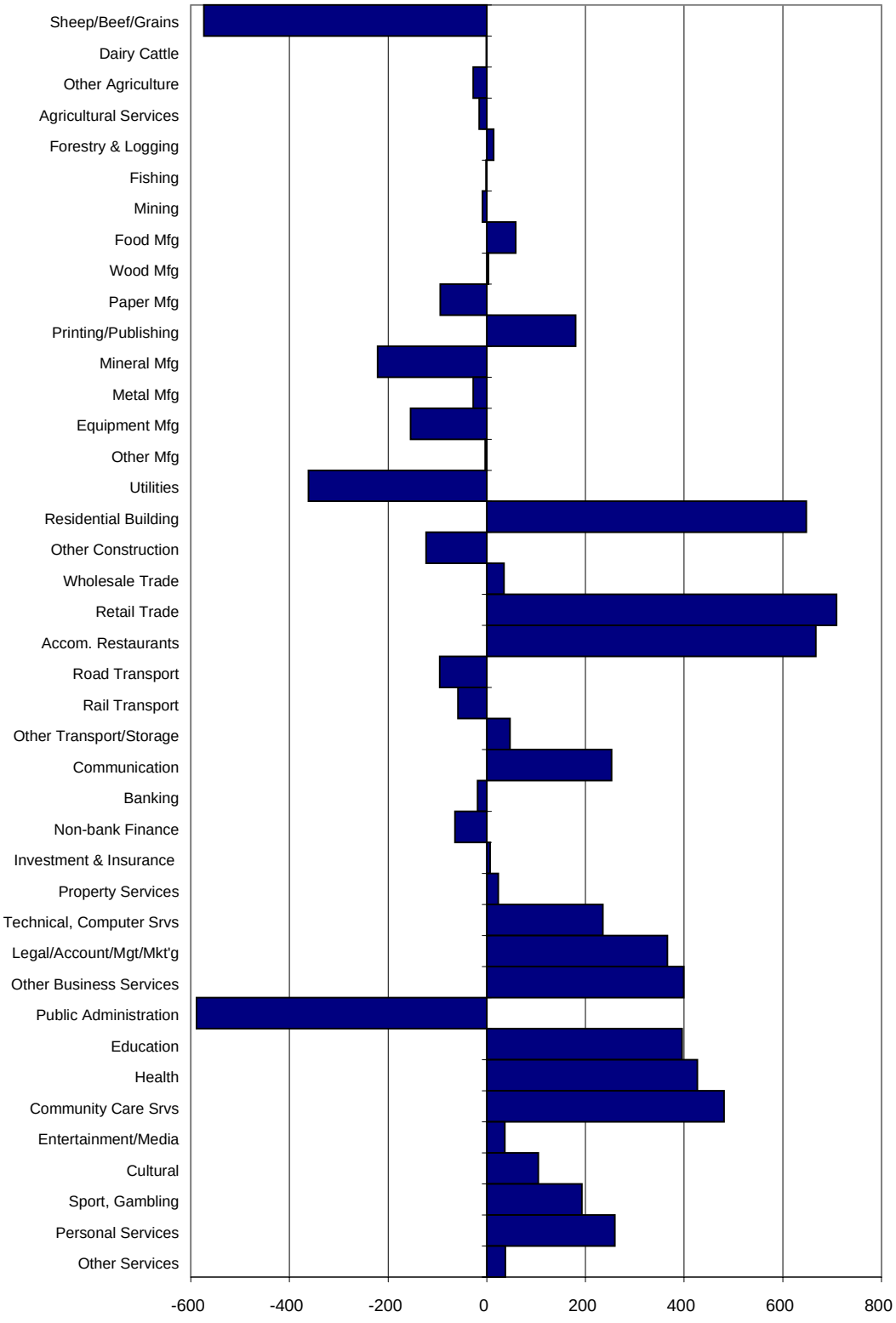


FIGURE 2-Q: LOCAL COMPONENT OF CHANGE 1991 - 1996: SOUTH COAST

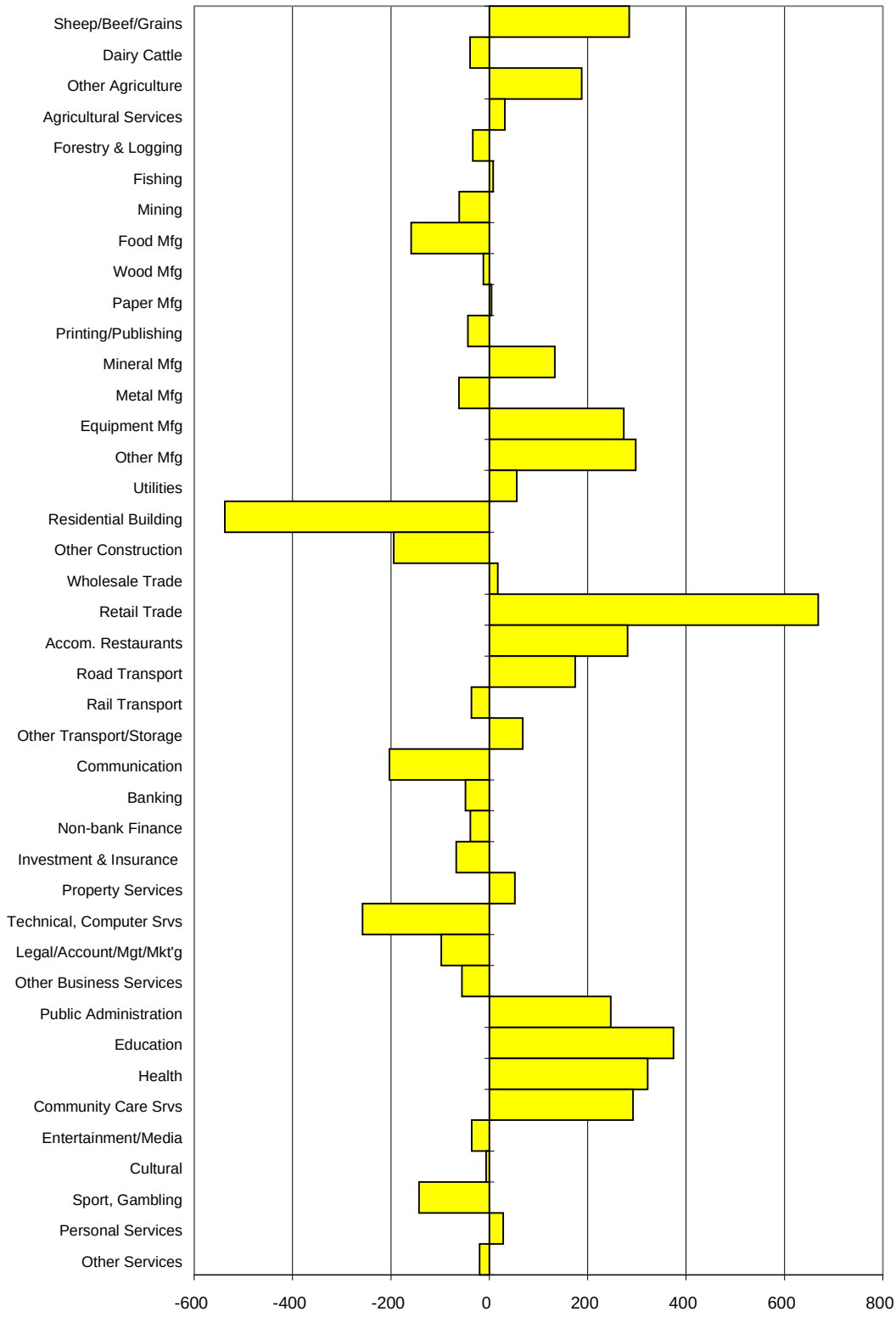
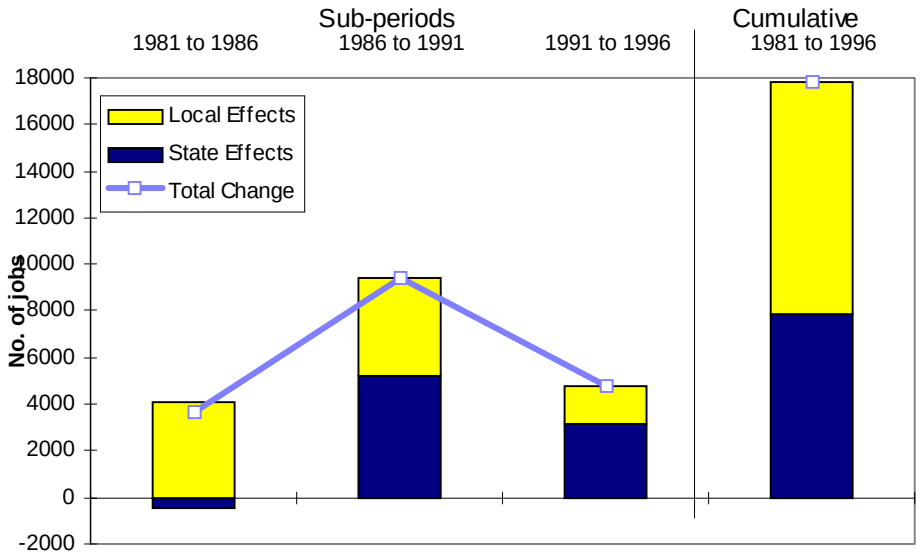


FIGURE 2-R: TOTAL STATE AND LOCAL COMPONENTS OF CHANGE: SOUTH COAST 1981 TO 1996



2.5. AVERAGE INCOMES

The ABS Population Census includes information on personal incomes. This provides the basis for comparing incomes across industries and from region to region. This information is provided in Table 2-10.

Incomes in the South Coast region average 89 per cent of the NSW level. This is a relatively high percentage for regional NSW and especially for regions where there is large numbers of seasonal workers associated with the tourist industry.

Additional information compiled by the Department of Social Security is indicative of the relative position of household income in the region. Bray and Mudd (1998) compiled estimates of household income from tax statistics and related those to the levels of income tax paid and (Federal government) social welfare benefits paid. For the South Coast region the estimates were:

Gross Income	$2817m
Income tax paid	$512m
Social welfare benefits	$460m

Welfare payments amounted to 16 per cent of gross income compared with the NSW level of 12 per cent. The ratio of tax paid to benefits received in the South Coast was 1.1 that is well below the ratio for NSW of 1.6. Thus, this region is one where the household income situation appears to be well below the average for NSW. However, it should be noted that there will be areas within the region that are better (Yarrowlumla, Queanbeyan and Cooma Monaro) and worse (Eurobodalla and Shoalhaven) than the average.

TABLE 2-10: INCOMES BY INDUSTRY: SOUTH COAST 1996

	Median Annual Individual Incomes		
1 Digit INDUSTRY	STH COAST	NSW	STH COAST :NSW
	$	$	%
A Agriculture, Forestry & Fishing	17,614	18,035	98
B Mining	41,036	55,395	74
C Manufacturing	25,545	27,288	94
D Electricity, Gas & Water Supply	33,896	35,495	95
E Construction	24,685	27,430	90
F Wholesale Trade	24,447	28,612	85
G Retail Trade	16,642	17,571	95
H Accommodation, Cafes & Restaurants	16,553	18,014	92
I Transport and Storage	27,215	30,257	90
J Communication Services	29,021	32,965	88
K Finance and Insurance	25,455	31,574	81
L Property and Business Services	25,115	30,773	82
M Government Administration & Defence	32,685	32,593	100
N Education	33,507	32,286	104
O Health and Community Services	22,811	24,636	93
P Cultural & Recreational Services	19,454	25,485	76
Q Personal and Other Services	20,887	23,990	87
R Non-classifiable economic units	19,656	23,374	84
& Not stated	13,480	16,449	82
Total	**23,265**	**26,078**	**89**

Source: 1996 Census of Population and Housing
Note: Includes income of employed persons from all sources.

2.6. CONCLUSION

The South Coast region has been a high growth area of NSW over the 1980s and 1990s. A feature has been the high growth in population that is above the NSW levels. Since 1980, the growth in employment has been lower than that of population with the best growth in employment occurring in the late 1980s.

The combination of relatively high unemployment and the attractiveness of the region to retirees leads to a relatively high proportion of dependents in the population. This also means that household income is reliant on significant social welfare payments and the use of retirement funds.

The economy of the South Coast is relatively strong and is characterised by strong growth in some manufacturing industries and the provision of services. There is a high level of visitation during the summer months while a considerable number of residents in those areas adjacent to the ACT and Wollongong work outside the region in those centres.

The forestry and related industries in the South Coast account for around 1.5 per cent of the regional economy. At least one-half of that is secondary processing that is not necessarily dependent on the supply of wood from local forests. Since 1980, employment in the forestry and related harvesting and processing activities has declined with most of that decline occurring in the late 1980s.

3. ECONOMIC PROFILE OF THE SOUTHERN TABLELANDS SUB-REGION

3.1. INTRODUCTION

The economy of the Southern Tablelands region is described in this section. The format follows that for the South Coast. The shift-share analysis and the detailed employment data are shown in Attachment 4.

3.2. OVERVIEW OF THE SOUTHERN TABLELANDS REGION ECONOMY

The input-output table has been compiled using the most recent available data relating to 1996-97. The base table is shown in Table 3-1 in a highly aggregated form. More detailed sectoral structure charts based on 52 sectors are used to describe the economic structure of the Southern Tablelands region.

TABLE 3-1: AGGREGATED INPUT-OUTPUT TABLE - SOUTHERN TABLELANDS 1996-97 ($'000)

	Ag Forestry Fishing	Mining	Manufacturing	Utilities	Building	Services	TOTAL	H-hold Exp	O.F.D	Exports	Total
Ag/Forest/Fish	17653	1	26001	4	73	3638	47370	6682	17650	178013	249715
Mining	16	71	1018	21	484	279	1888	0	-93	2430	4225
Manufacturing	606	77	28355	273	9977	13315	52603	28817	2917	112476	196814
Utilities	2607	89	1939	6480	212	14255	25581	10934	403	84534	121451
Building	860	24	66	95	42	19269	20356	0	60729	0	81085
Services	26502	287	22357	3324	8022	74152	134645	325210	128303	93540	681697
TOTAL	48244	550	79735	10197	18809	124908	282443	371644	209907	470993	1334987
H-hold Income	92137	482	31326	18772	24277	217731	384724	0	0		384724
O.V.A.	51293	2165	33544	68821	13976	178970	348769	44635	11922		405326
Imports	58041	1028	52210	23661	24022	160089	319051	221552	99517		640120
TOTAL	249715	4225	196814	121451	81085	681697	1334987	637831	321346	470993	2765157
Employment	3409	26	1292	480	773	8718	14698				

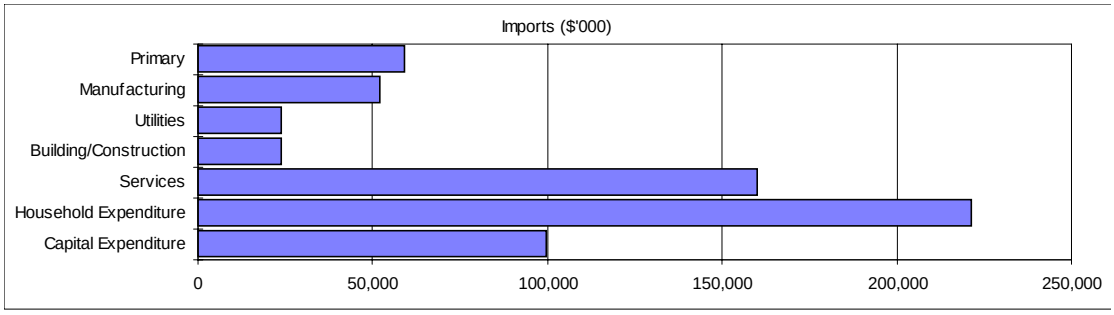
The rows of the input-output table (Table 3-1) indicate how the output of an industry is allocated as sales to other industries, to households, to exports and other final demands (OFD, which includes stock changes, capital expenditure and government expenditure). The corresponding column shows the sources of inputs to produce that output. These include purchases of intermediate inputs from other industries, the use of labour (household income), the returns to capital or Other Value Added (OVA, which includes gross operating surplus, depreciation and net indirect taxes and subsidies) and goods and services imported from outside the region. The number of people employed in each industry is also indicated in the final row. Forestry is included in the agriculture/forestry/fishing sector while wood processing is part of manufacturing.

Gross Regional Product was $790m that included $384 m paid to households as wages and salaries (including imputed payments to self-employed persons and employers). The Southern Tablelands economy is considerably smaller than that of the South coast.

Employment totalled 14,698 people and the average wage and salary earned was $26,175 per person. This is lower than the NSW average of $30,868 but similar to the average earnings in the South Coast..

The trade in goods and services between the Southern Tablelands region and the rest of the world favoured imports. Imports totalled $640 m; that was 1.4 times the level of exports at $471m. The destination of imports into the local region from all sources is shown by major category in Figure 3-A and in detail by industry in Figure 3-I. In most regions the largest import items are goods for consumption by local households. This is also the case in the Southern Tablelands region where 40.6 per cent of total imports to the local region were household consumables. Expenditure on capital items represented 14.6 per cent of imports.

FIGURE 3-A: DISTRIBUTION OF IMPORTS BY DESTINATION SECTOR



A further feature of the Southern Tablelands region is the high level of household expenditure estimated to be $638m. This is a large part of the GRP of $790m and considerably above the estimated level of household income of $385m. Households have a number of other sources of income that can support expenditure. These include social welfare receipts, earnings from investments and retirement incomes. In addition, there are residents of the region that work outside the region, principally in the ACT. It is estimated that there are 1536 who bring into the region earnings of $16m.

The Department of Social Security (DSS) has made estimates for 1996 of some of these variables (Bray and Mudd 1998). Southern Tablelands residents made income tax payments of $162m and received DSS payments of $63m. The relatively strong

household income position of the Southern Tablelands region is indicated by the income tax paid/DSS benefits ratio that is 2.6 compared with 1.6 for NSW as a whole.

The information for the Southern Tablelands includes the operations of the main ski areas of NSW. The population census carried out in August 1996 would coincide with the peak of the ski season. This makes comparisons with other areas of NSW and the South Coast difficult because they have peak visitation in summer. It also seems likely that the visitation to the ski fields is inflating the employment levels and the expenditure of households relative to what the real figure would be after allowing for those seasonal factors.

The economic structure of the Southern Tablelands region may also be compared with that for NSW through a comparison Figure 3-B and Figure 3-C. This reveals that in the Southern Tablelands region, the agriculture/forestry/fishing industry and utilities are more important than in NSW while the mining, manufacturing and service industries are less important than in NSW. It is also notable that the agriculture/forestry/fishing industry and utilities are the most important contributors to exports in the Southern Tablelands, which is in marked contrast with NSW.

FIGURE 3-B: SUMMARY OF AGGREGATED SECTORS: SOUTHERN TABLELANDS 1996-97

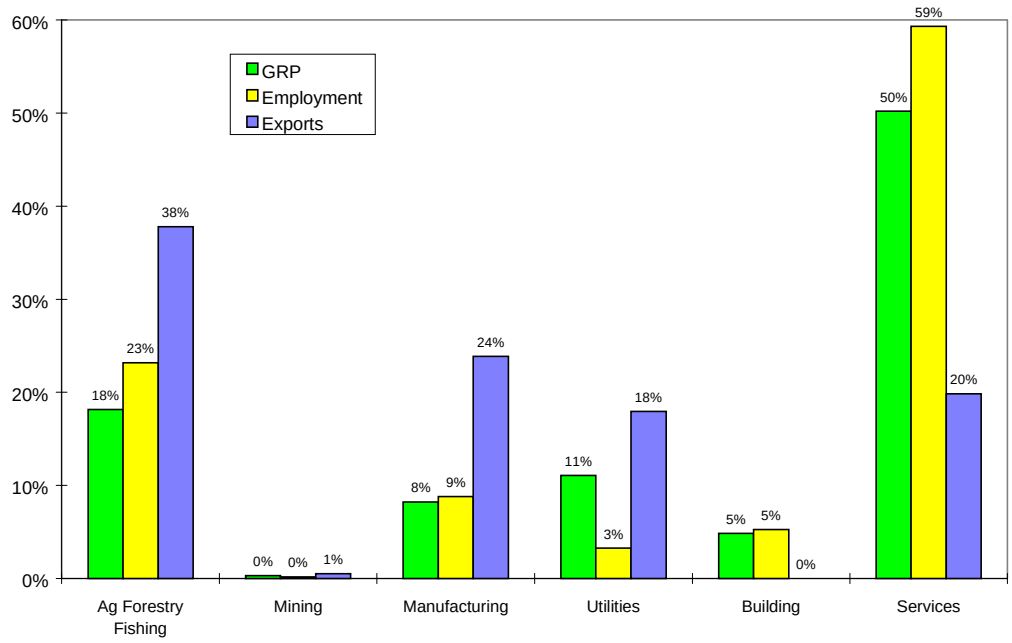
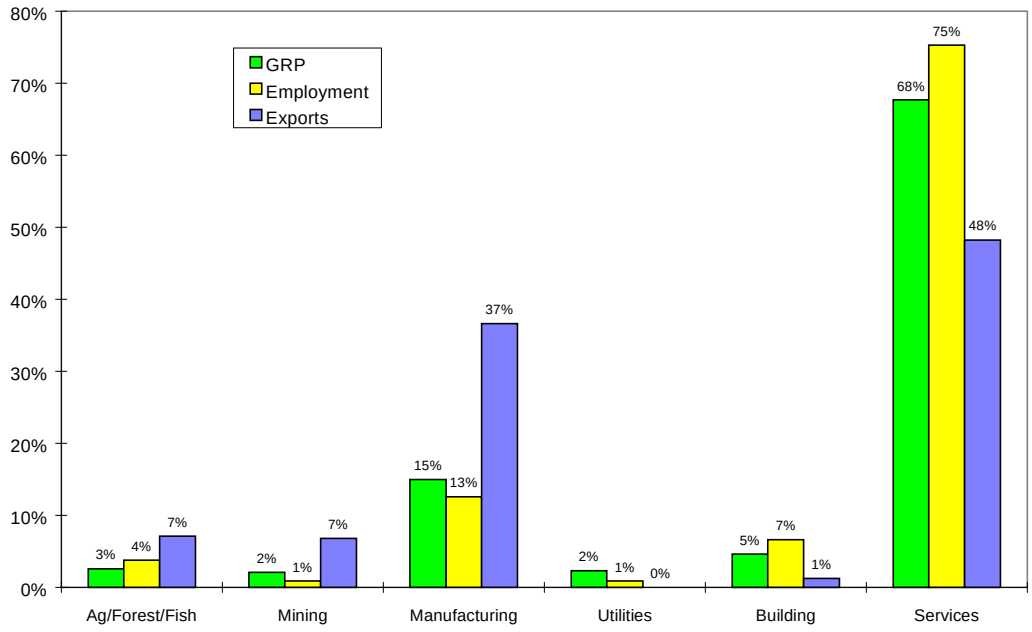


FIGURE 3-C: SUMMARY OF AGGREGATED SECTORS: NSW (1995-96)



The identification of key industries in the Southern Tablelands economy can be made with reference to Figure 3-D. The importance does vary in terms of the measures used but the following sectors stand out as among the most important to the economy.

- Sheep, grains and beef
- Other agriculture including horticulture
- Forestry and logging
- Food manufacturing
- Utilities
- Retail trade
- Accommodation & restaurants

This represents a notable diversity in the industry structure.

In 1996-97, the forest industry and wood processing contributed $66m (8.4 per cent) to the value added of the region and generated 1186 jobs (8.1 per cent of regional employment). Around 20 per cent of that contribution was provided by secondary processing of wood products. These contributions become more important in some of the local areas where there is a concentration of wood processing activities. It should be noted that the majority of the economic activity relating to forestry and logging is attributable to the softwood sector of the industry. These issues are discussed further in the sections below.

FIGURE 3-D: SECTORAL DISTRIBUTION OF GROSS OUTPUT: SOUTHERN TABLELANDS 1996-97 ($'000)

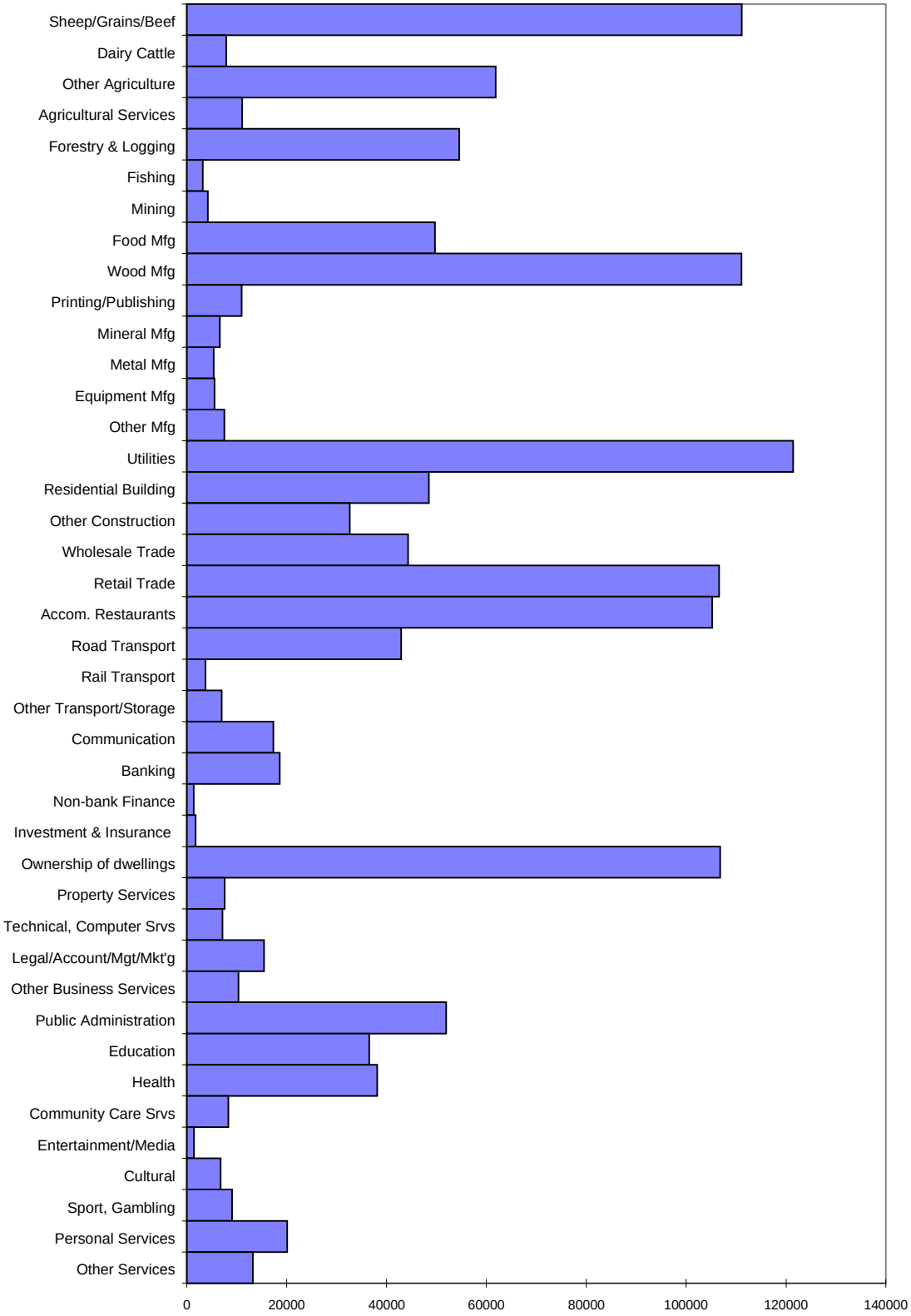


FIGURE 3-E: SECTORAL DISTRIBUTION OF GRP (VALUE-ADDED): SOUTHERN TABLELANDS 1996-97 ($'000)

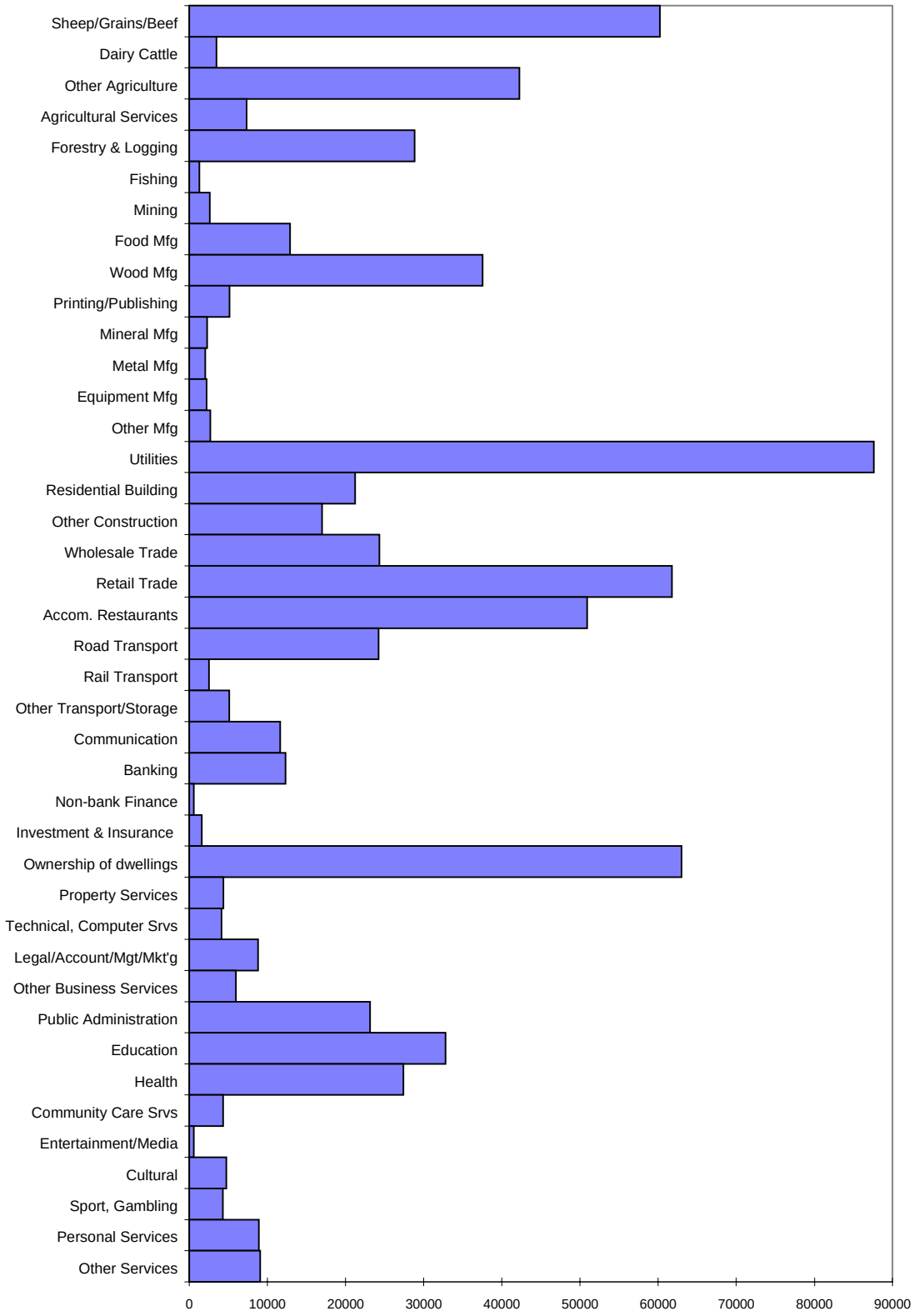


FIGURE 3-F: SECTORAL DISTRIBUTION OF HOUSEHOLD INCOME: SOUTHERN TABLELANDS 1996-97 ($'000)

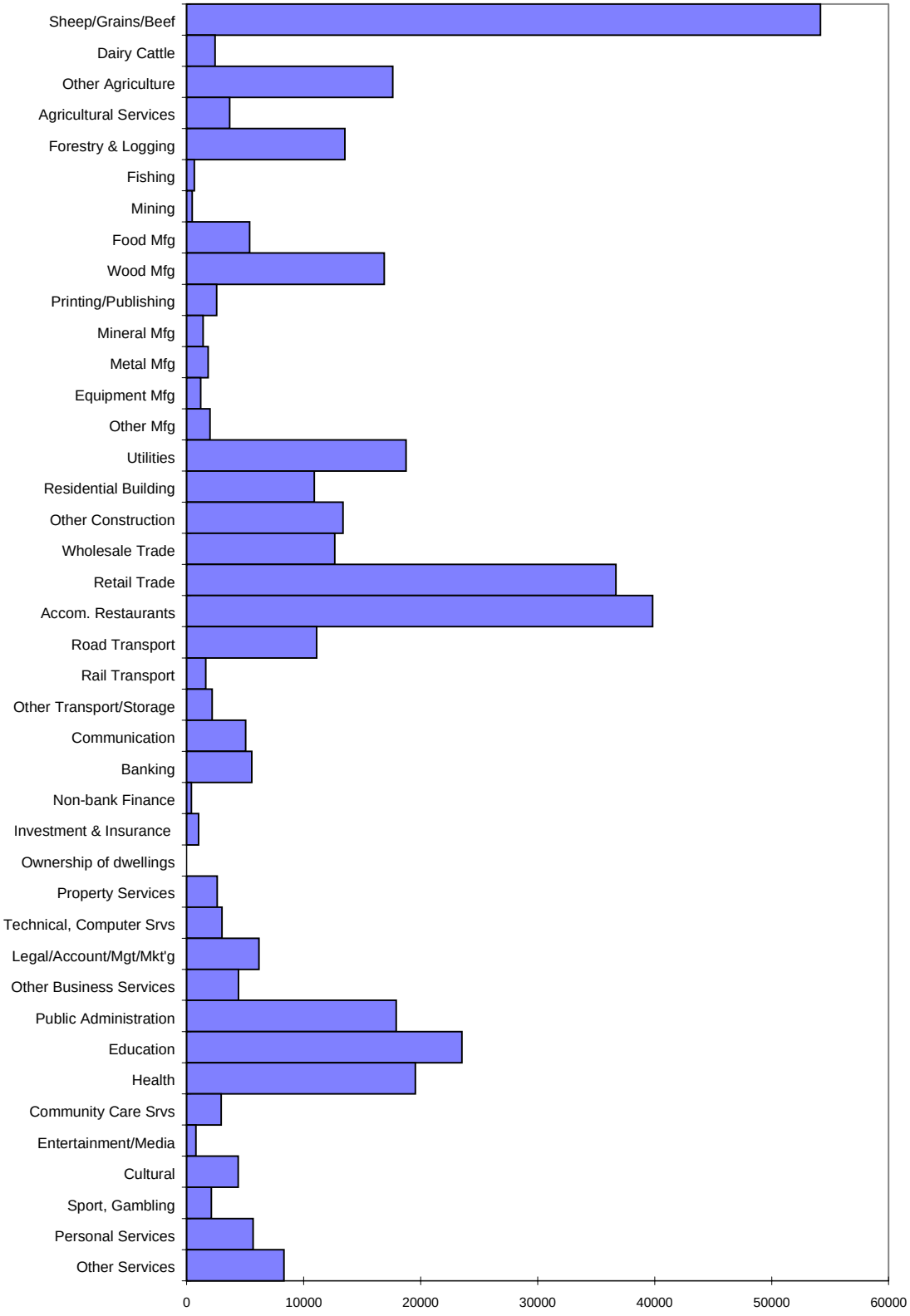


FIGURE 3-G: SECTORAL DISTRIBUTION OF EMPLOYMENT: SOUTHERN TABLELANDS 1996-97 (NUMBER)

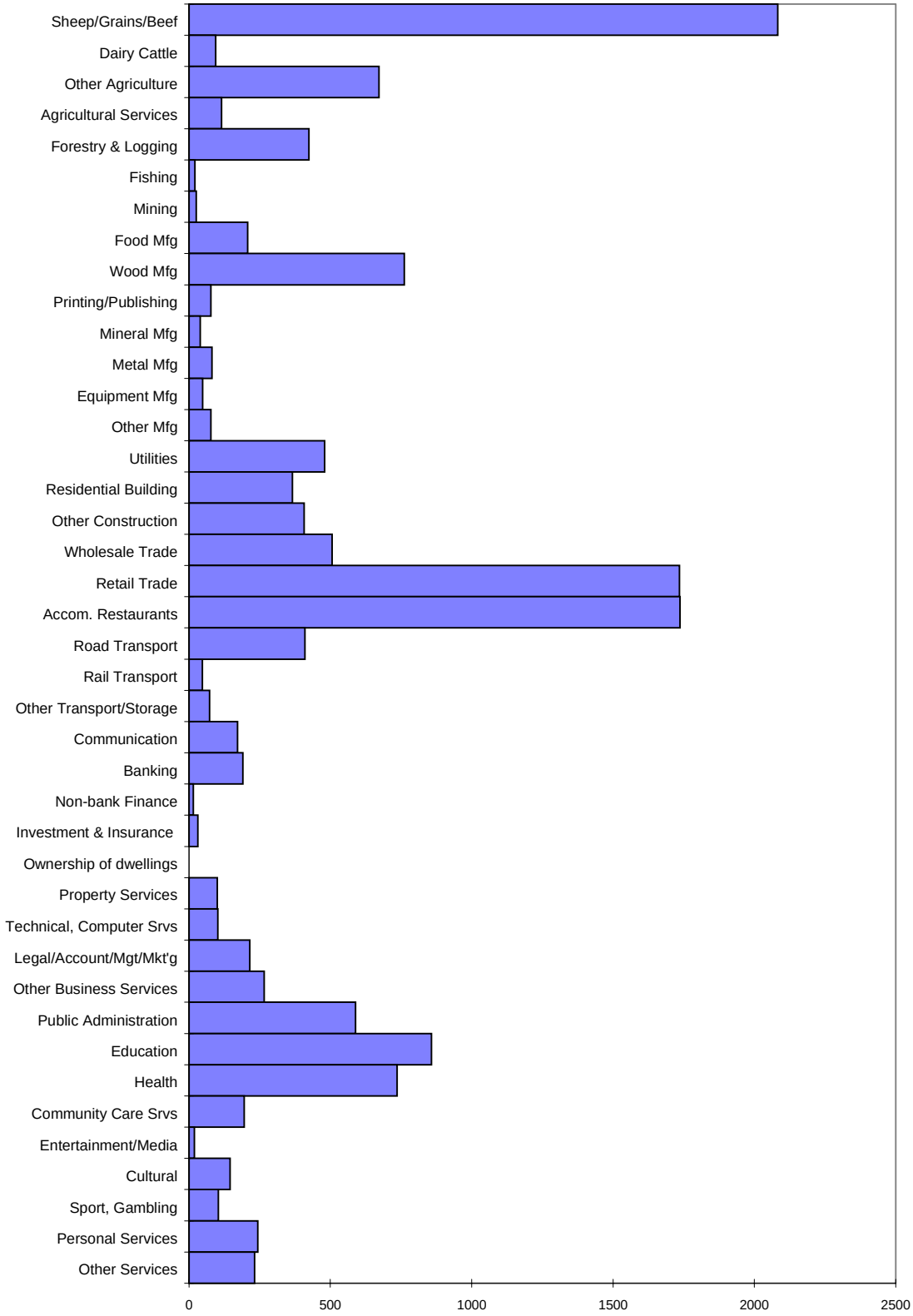


FIGURE 3-H: SECTORAL DISTRIBUTION: EXPORTS, SOUTHERN TABLELANDS 1996-97 ($'000)

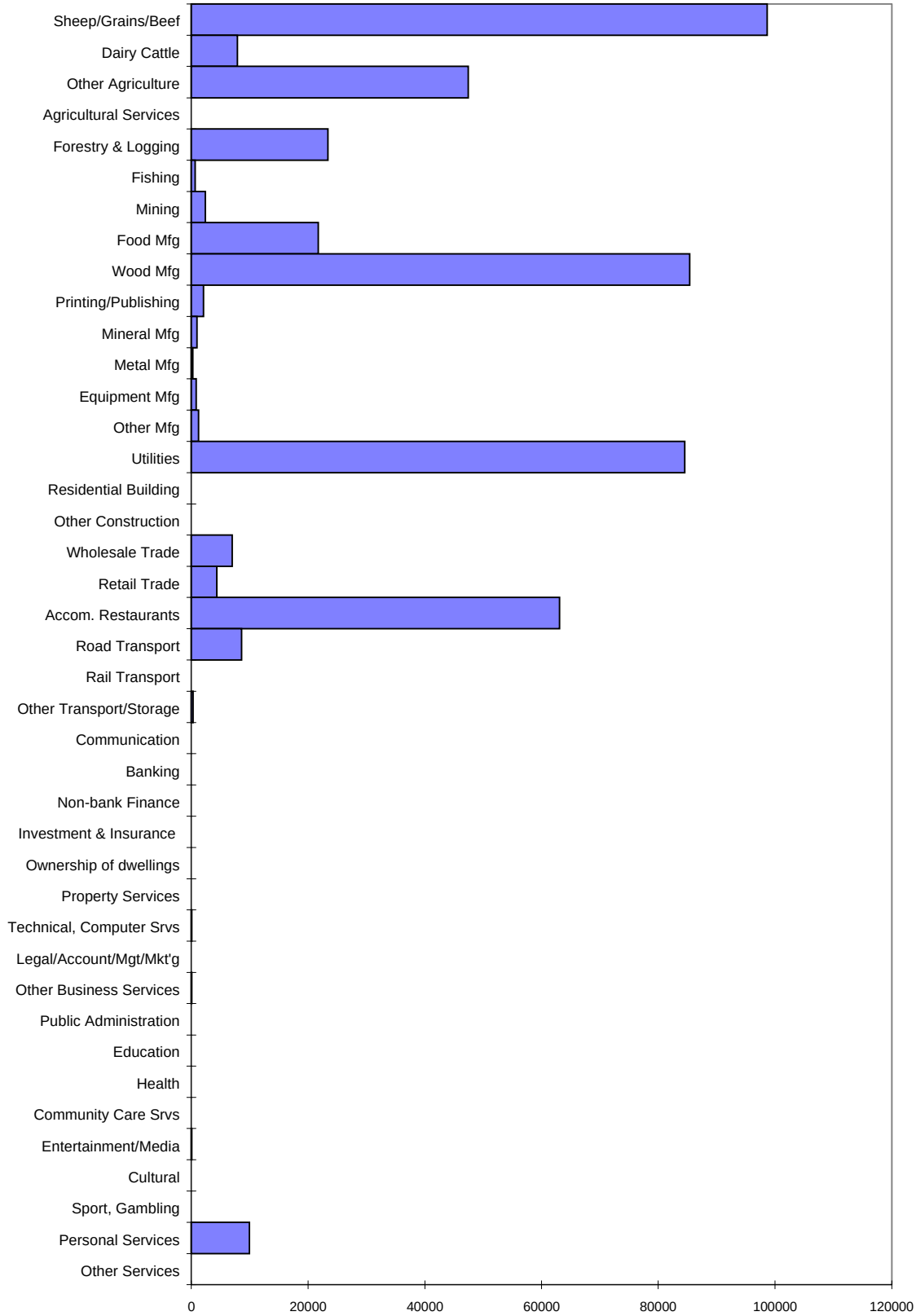
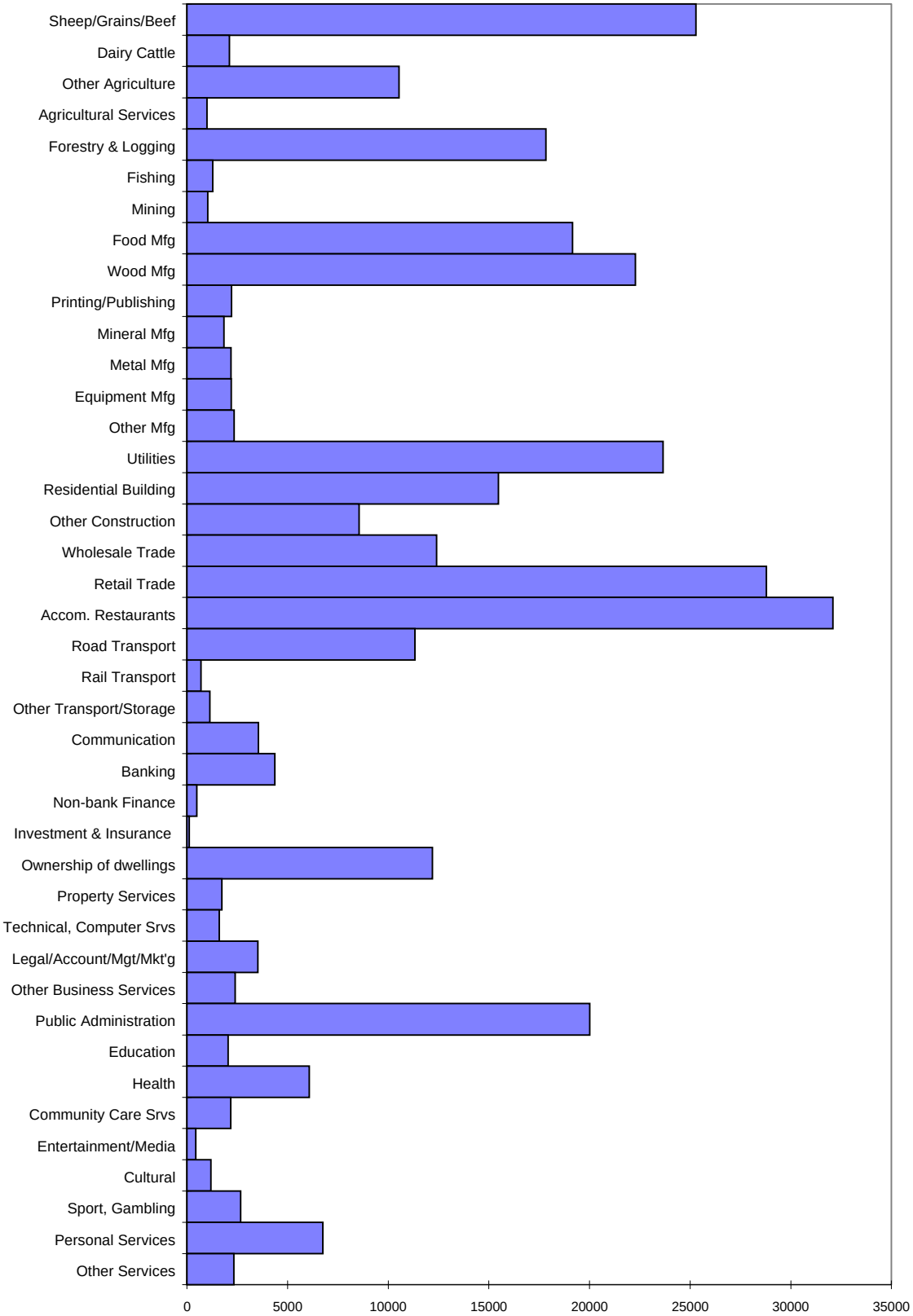


FIGURE 3-I: SECTORAL DISTRIBUTION: IMPORTS, SOUTHERN TABLELANDS 1996-97 ($'000)



3.3. TRENDS IN THE REGIONAL ECONOMY

The previous section provided a snapshot of the Southern Tablelands region for 1996-97. The analysis of the trends in those variables and some updating beyond 1996-97 is provided in this section. This also provides an opportunity to relate performance measures for the Southern Tablelands to those for NSW.

The analysis is based on detailed employment by industry data obtained from the ABS Population Censuses. These data are the best available for the analysis of industry profiles and trends. These will provide a context for the analysis of the forest industry in the Southern Tablelands region.

3.3.1. Regional Population and Employment

Data on population employment levels from the ABS Population Census form the basis for this section. The employment data represent workplace based employment estimates (the usual LGA residence based employment numbers have been adjusted for those LGAs in which there are significant people working in neighbouring LGAs, including Yarrowlumla, and Yass. They are expressed as total employment - not full time equivalents and are compared with population changes.

TABLE 3-2: TOTAL EMPLOYMENT AND POPULATION: SOUTHERN TABLELANDS

Census Year	Total Employment	Total Population	Employment Share of Population	Average Annual Change Between Census Years	
				Employment	Population
			%	%	%
1976		33,902			
1981	13,336	34,984	38.1		0.63
1986	13,208	35,827	36.9	-0.19	0.48
1991	13,981	36,730	38.1	1.14	0.50
1996	14,711	37,543	39.2	1.02	0.44

Source: ABS (Population Census data)

It is apparent from Table 3-1 that the 1976 to 1991 period was a period of modest population growth in the Southern Tablelands region. There were only small variations in the rate of growth over the four census periods. Employment growth from 1986 to 1996 was around double that for population and was just over one per cent per year.

The growth has been concentrated in the Yass and Yarrowlumla (B) LGAs that adjoin the ACT and Snowy River with its focus on the snowfields as shown in Table 3-3. The predominantly rural areas of Gundagai, Tumbarumba and Holbrook show the slowest rates of growth of population and employment and generally show a decline in employment. The exception is Tumut Shire that has increased employment in the 1990s.

Over the 1981 to 1996 the proportion of the population in employment has tended to increase (see Table 3-2). Thus, the mix of employment and those not employed is near the level for NSW which, in 1996, was 41.3. The region would appear to be losing jobs from the traditional rural areas and gaining jobs and population in the vicinity of the

ACT and the snow field areas. Developments in the timber industry appear to be having a positive impact in Tumut.

TABLE 3-3: AVERAGE ANNUAL RATES OF CHANGE BETWEEN CENSUS YEARS

	Population				Employment		
	1976 to 1981	1981 to 1986	1986 to 1991	1991 to 1996	1981 to 1986	1986 to 1991	1991 to 1996
	%	%	%	%	%	%	%
Tumbarumba	0.00	-0.30	-0.87	-0.14	-1.01	-0.52	-0.68
Holbrook	0.00	0.31	0.53	-0.20	-1.12	-0.18	-1.35
Tumut	0.43	0.25	-0.69	-0.33	-0.92	-0.03	1.01
Gundagai	0.48	-1.30	-0.15	-0.78	-1.92	-0.12	-0.95
Yass	0.55	2.10	1.67	0.99	0.71	2.24	0.98
Yarrowlumla B	5.61	8.01	4.03	2.98	0.00	0.00	0.00
Snowy River	2.25	0.46	2.69	2.48	3.27	4.92	4.04
Southern Tablelands	**0.63**	**0.48**	**0.50**	**0.44**	**-0.19**	**1.14**	**1.02**
NSW	**1.09**	**1.11**	**1.29**	**1.02**	**-0.11**	**1.63**	**1.26**

Source: ABS (Population censuses)

3.3.2. The Labour Force

The following information on the total labour force and unemployment is sourced from the Department of Education, Workplace Relations and Small Business (DEWRSB 1999). The unemployment data refer to the number of people receiving unemployment benefits as well as an estimate of those unemployed who do not receive benefits (eg. married spouses). That value is then expressed as a percentage of the local labour force derived from the ABS Labour Force Survey to provide an unemployment rate. From these values it is possible to estimate the level of employment.

These data do not have the accuracy of the ABS population census data, but the frequency permits the development of annual movements in employment. The resultant trends reflect a combination of macro-economic factors affecting Australia generally and local factors.

The information presented in Table 3-4 and Figure 3-J indicate steady growth in employment over many years. However, that growth has slowed in the late 1990s. The rate of unemployment has always been lower than for NSW and Australia. These labour force survey data relate to the June Quarter that coincides with the high winter employment in those parts of the region benefiting from the snow season. The quarterly data do indicate some small seasonal variation in Snowy River LGA, but it is not sufficient to change the general situation of this area being one with low unemployment rates.

FIGURE 3-J: TOTAL LABOUR FORCE AND EMPLOYMENT TRENDS - SOUTHERN TABLELANDS

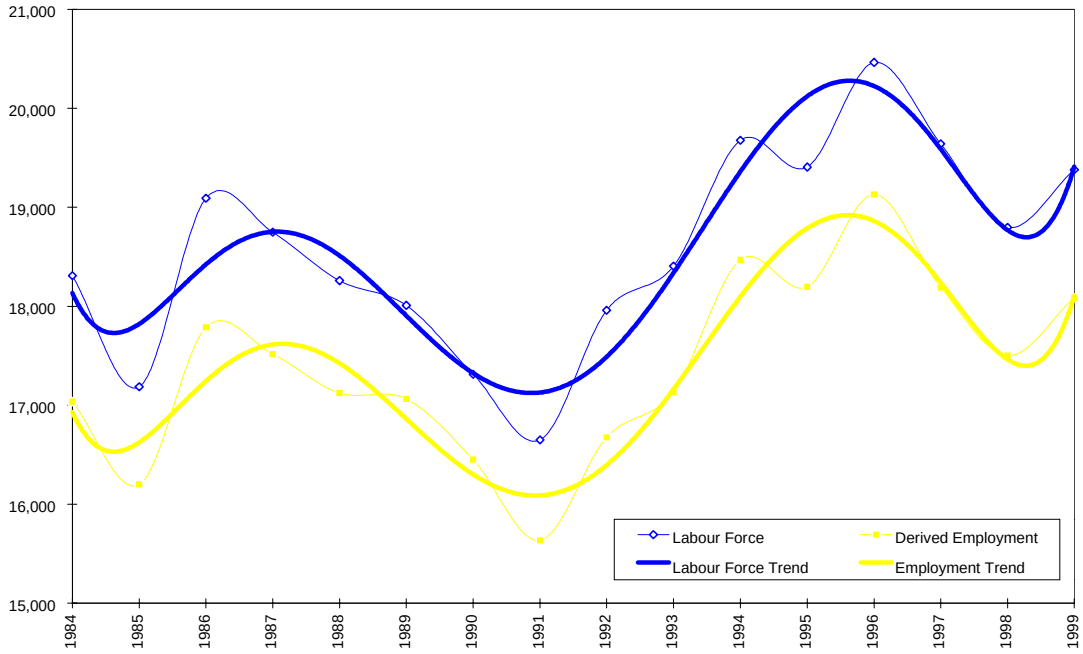


TABLE 3-4: LABOUR FORCE SOUTHERN TABLELANDS

	Southern Tablelands				Unemployment	
Year	Labour Force	Derived Employment	Unemployment		NSW	AUST
	no.	no.	no	%	%	%
1984	18,310	17,038	1,272	6.9	9.5	8.9
1985	17,187	16,200	987	5.7	9.0	8.4
1986	19,093	17,788	1,305	6.8	8.2	7.8
1987	18,750	17,518	1,232	6.6	8.8	8.1
1988	18,260	17,124	1,136	6.2	7.6	7.6
1989	18,010	17,065	945	5.2	6.4	6.1
1990	17,314	16,452	862	5.0	6.2	6.5
1991	16,651	15,635	1,016	6.1	8.2	9.6
1992	17,961	16,677	1,284	7.1	9.8	10.8
1993	18,407	17,134	1,273	6.9	10.6	10.9
1994	19,678	18,470	1,208	6.1	9.7	10.0
1995	19,408	18,198	1,210	6.2	7.5	8.3
1996	20,465	19,132	1,333	6.5	7.8	8.4
1997	19,642	18,192	1,450	7.4	7.8	8.6
1998	18,799	17,504	1,295	6.9	7.2	7.9
1999	19,382	18,088	1,294	6.7	6.5	7.2

Source: DEWRSB (1999)

3.3.3. Unemployment

The unemployment data for the Southern Tablelands region are shown in Figure 3-K and Figure 3-L. The overall rate of unemployment has been around five per cent for most of the 1990s and around six per cent in the 1980s. There is also some variation in unemployment rates within the region. The highest rates occur in Tumut and Gundagai LGAs and the lowest rates in the Snowy River and Yass LGAs. The latter LGAs seemed to have sustained their activities in the 1990s recession better than any of the other LGAs.

The unemployed number and rate from the Population Census is shown in Table 3-5. These rates are comparable with those from the DEWRSB data.

Table 3-5 also indicates the trends in employment in the timber industry between the various census years. Overall, timber industry employment has declined by about 200 over the period 1981 to 1996. The reductions in employment occurred in Tumut. However, it is noticeable that employment increased from 1991 to 1996 and that seems set to continue given the planned developments in the wood processing industries.

FIGURE 3-K: SUMMARY OF UNEMPLOYMENT RATES

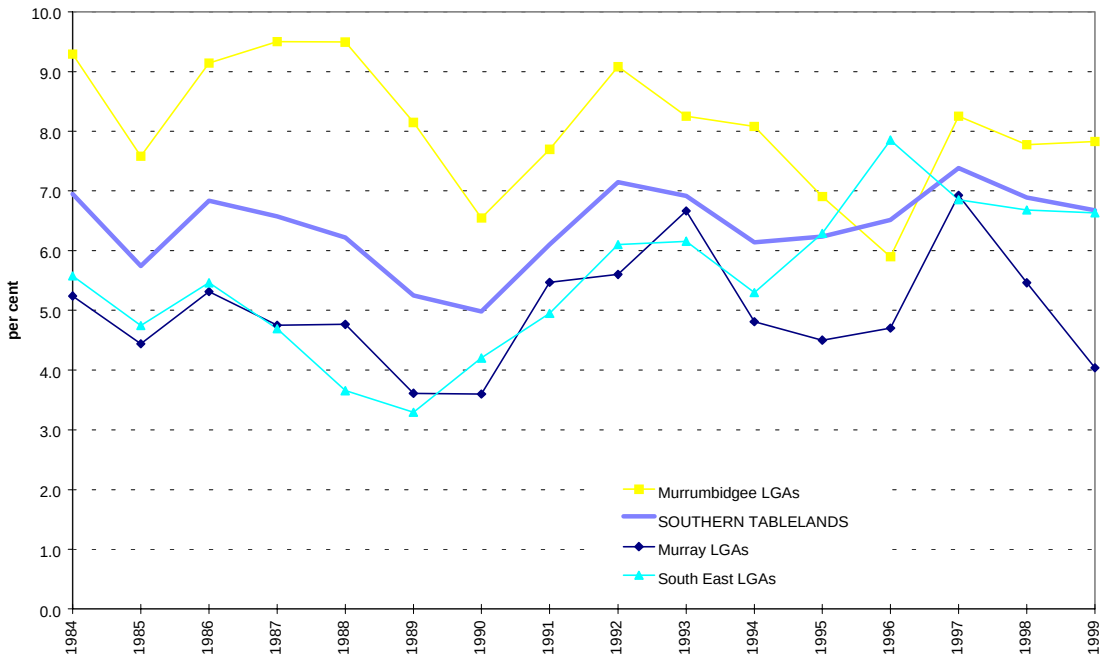


FIGURE 3-L: UNEMPLOYMENT RATES BY LGA AND SUB-REGION

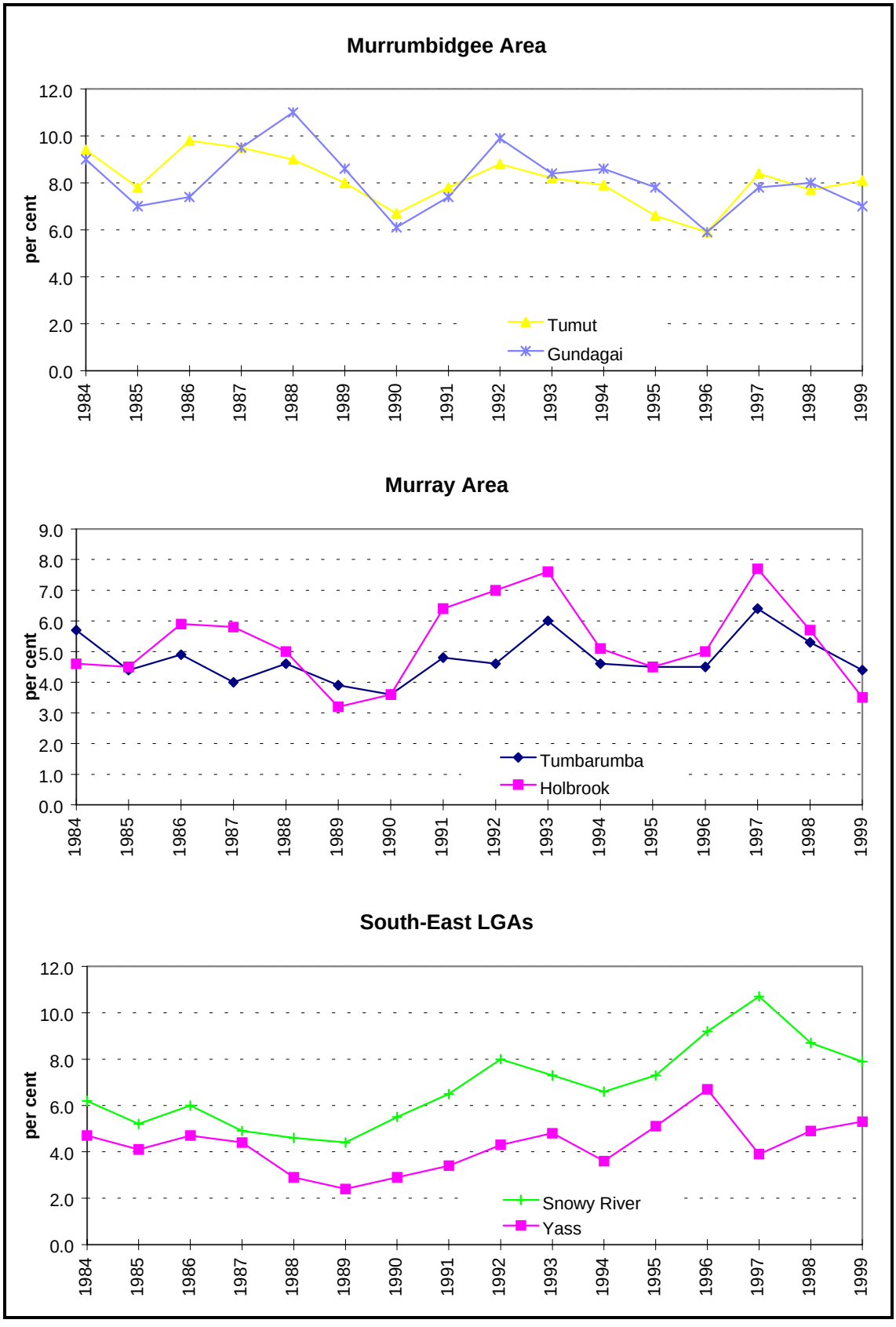


TABLE 3-5: LOCAL AREA UNEMPLOYMENT RATES AND TIMBER INDUSTRY EMPLOYMENT

LGA	Timber Industry Employment				Unemployment: 1996		1999
	1981	1986	1991	1996	Number	Rate	Rate
Tumbarumba	229	202	218	229	99	4.5	4.4
Holbrook	9	29	27	19	75	5.0	3.5
Tumut	870	734	569	635	349	5.9	8.1
Gundagai	11	6	7	12	127	5.9	7.0
Yass	12	9	9	6	314	6.7	5.3
Yarrowlumla B	0	0	0	0	0	0.0	6.9
Snowy River	2	0	3	3	369	9.2	7.9
SOUTHERN TABLELANDS	**1133**	**980**	**833**	**904**	**1333**	**6.5**	**6.9**

Source: DEWRSB (1999) and ABS (Population censuses)

The 1996 level of employment in the timber industry of 904 is equivalent to 6 per cent of total employment. In that respect, the timber industry occupies a significant position in the Southern Tablelands region economy. Further, that share of the economy appears likely to increase.

3.4. ANALYSIS OF INDUSTRY EMPLOYMENT

This section provides details of the industry or sectoral structure of the economy. The analysis of the detailed employment by industry data obtained from the ABS Population Census is presented in this section. This provides an industry context and trends as background to the consideration of change in the timber industries.

The sectoral or industry classification used in this analysis is based on the Australia and New Zealand Standard Industry Classification (ANZSIC). The particular aggregation and description used in this work is shown in Attachment 2.

3.4.1. Sectoral Distribution – 1996

The industry distribution of employment was presented Figure 3-G. Total employment was 14,698 persons and the main employing industries were (expressed in terms of the share of regional employment):

- The broadacre agriculture (sheep/beef cattle/grains) sector generated 14.2 per cent of total employment.
- The retail trade sector represented 11.8 per cent of total employment.
- The accommodation/restaurants/cafes/pubs/clubs sector employed 11.8 per cent.
- The education and health sectors each employed 5.8 and 5.0 per cent, respectively.
- The total manufacturing sectors employed 8.8 per cent including 5.2 per cent in wood manufacturing industries.
- Other agriculture employed 4.6 per cent
- The remaining sectors employed 38 per cent.

These characteristics indicate a regional economy where agriculture is important and manufacturing is limited to timber and food processing. Otherwise service industries are important for the residents and tourists, especially the visitors to the snowfields. Employment in the service industries in August, when the Population Census was taken, would reflect the high levels of visitation to the area in winter.

The following analyses provide a range of comparative and benchmarking information on the Southern Tablelands economy.

3.4.2. Location Quotient Analysis

A location quotient (LQ) is a ratio that shows the relative importance of sectors to the region, compared to that in Australia as a whole, ie:

$$\frac{\text{\% of } \textbf{local} \text{ employment in sector x}}{\text{\% of } \textbf{national} \text{ employment in sector x}}$$

Where the local share is larger than the national share, the LQ is greater than one and where the local share is smaller, the value is less than one. Where the value is high (greater than 2) it indicates that those industries are likely to be key strengths in the region.

LQs are presented in Table 3-6 for those industries that have a 1996 value greater than 1.0 and a selection of some of the essential service sectors. The LQs confirm that the Southern Tablelands region is heavily concentrated on a number of agricultural and related industries and the production and processing of timber. The generation of electricity is also significant. Among the service sectors the accommodation and restaurants stands out reflecting the importance of the snowfields.

Forestry and logging and the related processing industries have been increasing in importance in the Southern Tablelands region along with the grazing industries. The economy appears to be increasing its dependence on the natural resources of the region.

There is little manufacturing apart from wood processing in the region relative to Australia as a whole. Further, the LQs for most of the service sectors are less than 1.0 that is likely to reflect the potential for surrounding centres to provide those services to residents and businesses in the Southern Tablelands region. Those centres would include the ACT, Albury and Wagga Wagga. The LQs for education and health are less than 1.0 and this is unusual with most regions receiving funding on a per capita basis that brings them close to the national level.

TABLE 3-6: LOCATION QUOTIENTS: SOUTHERN TABLELANDS

	LQs				Employment
Selected Sectors	1981	1986	1991	**1996**	**1996**
Forestry and logging	**15.9**	**18.0**	**20.6**	**19.5**	**424**
Sheep	9.5	10.2	11.7	18.3	1166
Sawmill products	**8.9**	**7.3**	**9.0**	**16.8**	**514**
Beef cattle	9.3	6.9	8.9	11.5	719
Electricity	3.7	3.7	5.0	6.4	438
Other wood products	**5.3**	**5.2**	**5.4**	**4.1**	**248**
Fruit and vegetable products	5.7	5.5	5.2	3.3	57
Other agriculture	1.9	2.3	2.5	3.3	668
Services to agric.; hunting	4.1	3.7	3.3	3.1	115
Accom. & restaurants	2.2	2.9	2.6	2.5	1737
Grains	1.9	1.2	0.7	1.5	198
Non-metallic min. products nec	0.7	1.1	1.2	1.4	16
Libraries, museums, arts	2.0	2.2	2.0	1.4	145
Road transport	3.8	1.2	1.2	1.4	410
Water, sewerage & drainage	0.5	0.8	1.1	1.1	42
Other mining	1.0	0.7	0.7	1.1	23
Dairy cattle	0.8	1.4	0.9	1.1	94
Retail trade	0.8	0.8	0.8	0.8	1440
Education	0.8	0.9	0.8	0.8	857
Other services	0.7	0.7	0.6	0.8	232
Health services	0.6	0.6	0.7	0.7	736
Other business services	0.8	0.6	0.7	0.7	266
Banking	0.8	0.7	0.7	0.7	190
Communication services	0.8	0.7	0.7	0.6	172
Other property services	0.4	0.5	0.5	0.5	100
Legal, accounting srvs	0.5	0.5	0.5	0.4	215
Scientific research etc	0.3	0.3	0.4	0.3	102

3.4.3. Industry Diversity

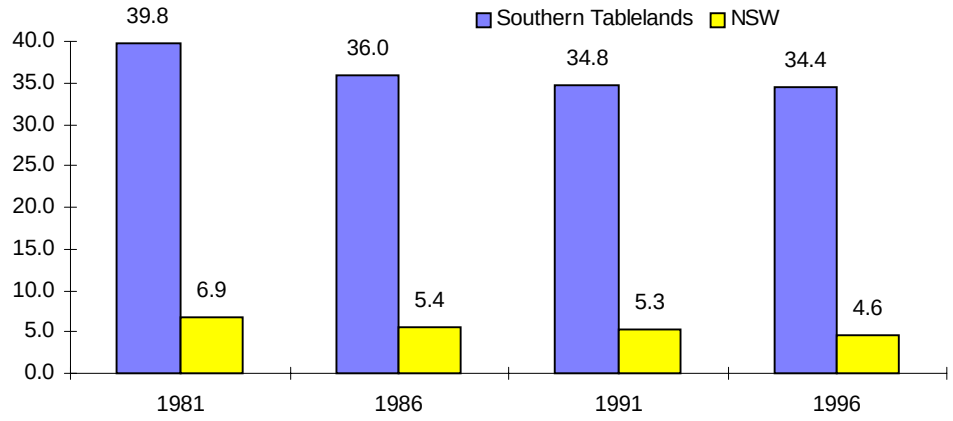
A measure of the industry diversity in the economy is the coefficient of specialisation (CS). The CS is calculated as the sum of the differences between the proportions of local and national employment in each sector. The more the local economy emulates the structure of the national economy the lower (or closer to zero) the value of the CS as shown by the low CS for NSW. At the other extreme, the maximum CS is 100 indicating that a region has only one sector.

This measure can be used to gauge the extent of specialisation in an economy and how the value may change over time. Most economies tend to become more diversified over time. However, the rate of diversification varies among regions.

The CS for the Southern Tablelands and NSW are shown for four Population Census years in Figure 3-M. These are relatively high values indicating a high level of specialisation noted earlier. There has been only a small decline in the value since 1981 and the planned growth in the timber industry is not likely to increase diversity unless the region can develop a substantial amount of related industries that support the timber industry.

For comparative purposes, the values for the Southern Tablelands are shown against some selected SDs in Table 2-7. With a value of around 35, the Southern Tablelands is similar to many of the inland regions of NSW, but is much above the coastal regions (including the South Coast) and the Hunter region with its broad industrial base.

FIGURE 3-M: COEFFICIENTS OF SPECIALISATION: SOUTHERN TABLELANDS



3.4.4. Population Employment Ratios

The servicing capacity of the Southern Tablelands regional economy is shown as Population-Employment Ratios (PER). Here, the servicing capacity is represented by the **number of residents serviced per employee** in a particular sector. This measures the share of the Southern Tablelands region relative to NSW as a whole. The trend over time in the level of service is also measured. In all cases, the lower the PER, the more intensive is the service level that may indicate a higher quality of service. These ratios are only calculated for service sectors.

The information in Table 3-7 indicates that the Southern Tablelands region has service levels better than NSW in only accommodation and restaurants and road transport (ie. a smaller PER). The important tourism industry and the dependence on road transport with limited rail access (much of it provided by local operators) would support this result. Otherwise, the region has substantially lower levels of service than for NSW as a whole, especially in those services that support business activity. However, the level of service provided within the region has been improving apart from banking and communication services where there has been a national trend toward rationalisation.

The level of services provided within the region can also be expressed in the form of jobs potential as shown in Figure 3-N. This indicates the change in employment that would occur in the Southern Tablelands region if the PER were at the same level as for NSW. Only the accommodation, restaurants etc. road transport and electricity sectors had levels notably above the NSW average. The major deficiencies occurred in the residential building, trade, education, health and community services sectors along with smaller deficiencies in a large range of services that mostly support business activity.

Table 3-7: Population: Employment Ratios: Southern Tablelands

	Southern Tablelands				NSW	
Selected Sectors	1996	1991	1986	1981	1996	1991
Retail trade	26	25	26	27	21	20
Health services	51	53	59	64	33	35
Education	44	44	45	48	35	36
Accom. & restaurants	22	24	28	37	47	53
Legal, accounting srvs	174	190	253	248	58	75
Residential building	103	91	114	93	62	70
Other business services	141	212	321	322	91	129
Banking	197	165	179	173	104	97
Community care services	193	337	333	671	108	156
Communication services	218	203	176	162	112	133
Road transport	92	100	106	84	123	108
Other services	162	206	224	254	131	129
Personal services	154	217	334	372	133	160
Other property services	375	360	491	642	163	159
Libraries, museums, arts	259	249	258	340	330	437

Overall, if these sectors were operating at the NSW level, it would result in 2,874 additional jobs that is equivalent to 20 per cent of the 1996 employment. However, the number of residents who have jobs outside the region was estimated to be 1,536 giving a net potential increase of around 1,300 jobs.

3.4.5. Employment Change by Sector

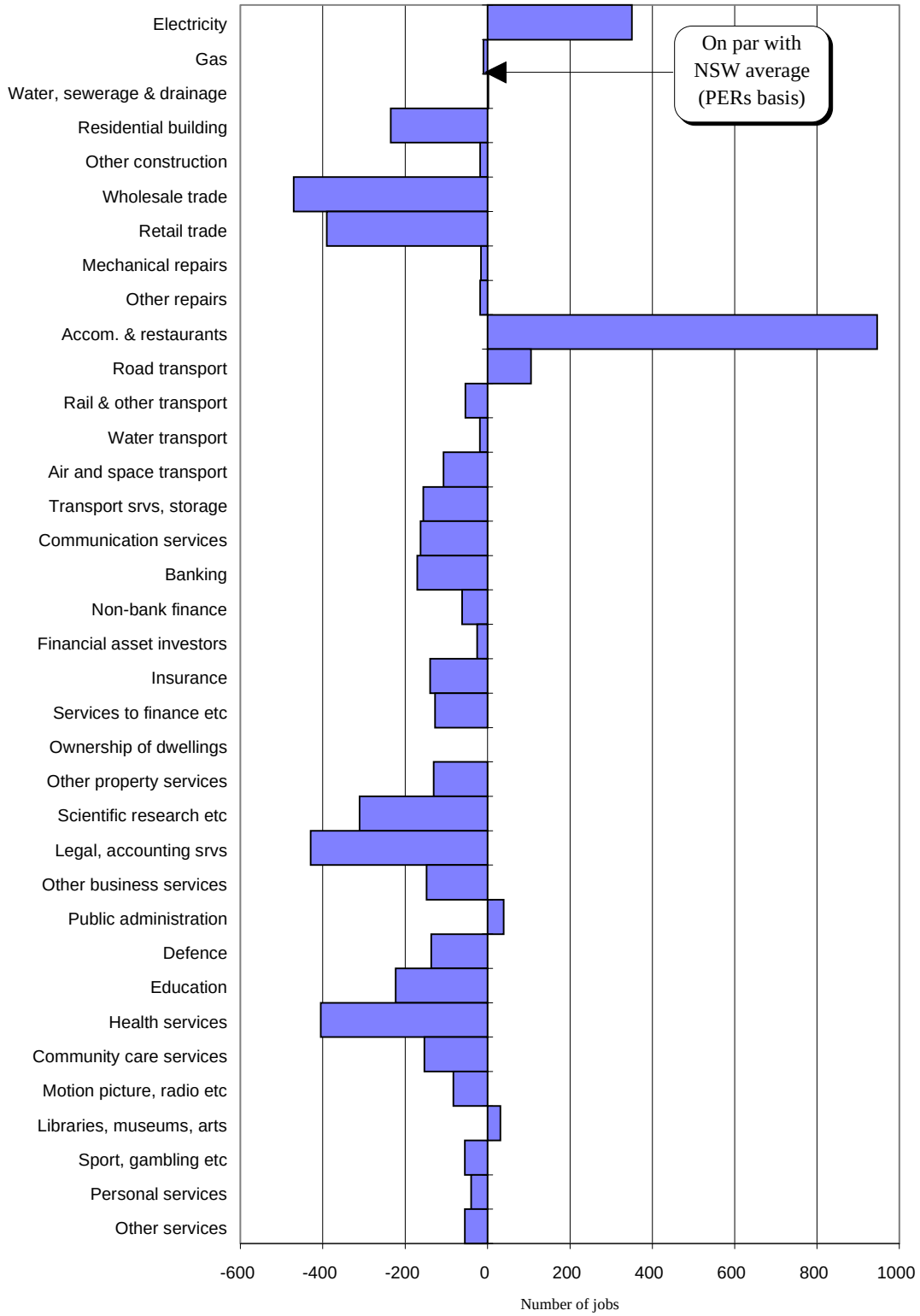
The remainder of this section is focused on identifying industry trends in the Southern Tablelands economy, and in comparing the Southern Tablelands with trends in NSW as a whole. The analysis is based on detailed employment data from recent ABS Population Censuses. While it would be preferable to use output data, these are not available for many industries.

Based on the Population Census data for Southern Tablelands, the following changes in total employment have occurred.

1991	13,978	1996	14,705
1981	13,336	1991	13,978
Diff.	642		727

These data (and the data in Table 3-2) indicate that employment grew in the 1990s at about twice the rate of the growth in the late 1980s. The change in total employment between 1991 and 1996 was distributed across the sectors as shown in Figure 3-Q.

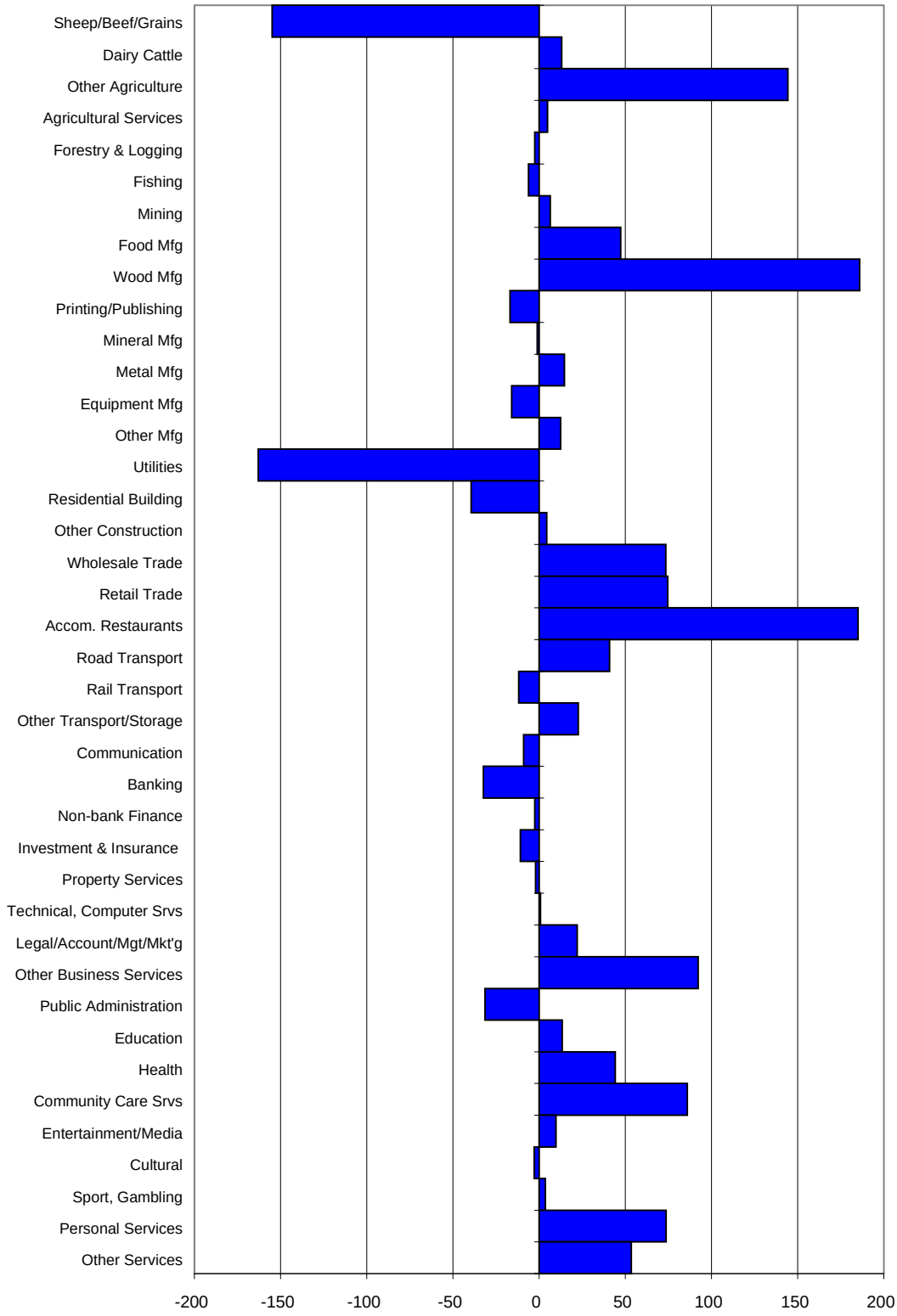
FIGURE 3-N: JOBS POTENTIAL: SOUTHERN TABLELANDS 1996



There is a clear pattern of structural change in the data with overall employment losses in agriculture and a mix of increases and declines in manufacturing. The strong growth occurs in the service industries that support visitors, wood manufacturing and other agriculture (includes horticulture). The large gains in the retail trade and accommodation etc., personal services and other services are related to the growth in the

ski industry. There have been some gains in business services, community care and health. The largest losses have occurred in utilities and broadacre agriculture., other construction and broadacre agriculture. Overall there was a net employment growth over the period of 727.

FIGURE 3-O: CHANGE IN EMPLOYMENT 1991 - 1996: SOUTHERN TABLELANDS



Employment in forestry and logging remained almost constant. However, there was a substantial growth in sawmill products and a decline in other wood products giving an overall gain in employment of nearly 200 jobs. This represented a major development for the region.

It is possible to assess these changes in the Southern Tablelands area against the changes that are occurring in NSW. This can be done using shift share analysis that compares regional growth with growth in the State and the growth in each industry. Not all industries grow at the same rate and the particular mix of industries may favour some regions. As a result, regional growth is apportioned among State growth, industry mix effects and local factors.

TABLE 3-8: SUMMARISED SHIFT-SHARE ANALYSIS

	Component				**Total**
	State	Industry	**Total State**	**Local**	**Change**
	No.	No.	**No.**	**No.**	**No.**
Positive Effects	905	878	**1,783**	**1,739**	**3,522**
Negative Effects	-	(1,854)	**(1,854)**	**(941)**	**(2,795)**
Total Effects	**905**	**(976)**	**(71)**	**798**	**727**

The results for the Southern Tablelands region are shown in detail in Attachment 4 and summarised in Table 3-8 for the period 1991 and 1996. If the Southern Tablelands economy performed as well as the NSW economy over that period, then employment would have grown by 905 jobs. The industry mix effect was significant suggesting that the region had more slow-growing industries than NSW. The industry effect was equivalent to 976 jobs in the region.

The benchmark that is established is to measure the performance of the Southern Tablelands against the overall trend in NSW and its industries. If the Southern Tablelands were on this benchmark, then employment would have decreased by 71 Table 3-8). That benchmark for the Southern Tablelands would have resulted in employment changes for each industry as shown in Figure 3-P. A major part of that state-wide change was a reduction in agricultural employment and a rationalisation with the electricity industry. Most of those reductions have been offset by widespread increases in employment over many of the service industries, especially those related to the servicing of visitors to the region.

The combined state and industry effects provide a state benchmark of a 71 (976 - 905) job decrease in the Southern Tablelands region over 1991 to 1996. Since jobs actually grew in the local region by 727, the difference between the state benchmark suggests that local factors have been positive to the extent of a growth of 798 jobs (727 -+- 71). Those local factors could include localised seasonal and price conditions; gain of market share due to scale factors; significant population growth; major infrastructure provisions; and the choices made by members of the community and business sector about where they locate and make purchases. This analysis is not able to apportion the changes to these factors.

The shift-share analysis of employment between 1991 and 1996 indicates that some industries did **not** perform as well at the local level as the state benchmark (Figure 3-Q). Thus, these industries lost some of their NSW market share and included:

- Residential building
- Retail trade
- Accommodation, restaurants, etc.
- Education

A large number of other sectors showed small losses

Those industries that did well, and increased their share of that industry in NSW will normally equate with those that are competitive and can do well in other markets. Note that this can also result from the local industry declining more slowly than the industry in the state as a whole. Those industries included:

- Sheep/beef/grains
- Other agriculture
- Wood manufacturing
- Road transport
- Wholesale trade
- Utilities

Note that some of these increases in market share may arise because the industry in the Southern Tablelands declined more slowly than the industry did in NSW as a whole. This would be the case in both broadacre agriculture and utilities. That situation may reflect competitive advantages for those industries or the lack of alternative uses for those resources in other industries.

In NSW, both the forestry and wood manufacturing sectors showed a small increase in employment. Within the Southern Tablelands region, local factors were negative for forestry and logging but were strongly positive for wood manufacturing. This result is indicative of the growing maturity of the forestry investments in plantations that are supporting additional processing operations and higher volumes being processed.

A similar shift-share analysis covering the census periods from 1981 is shown in Figure 3-R. Between 1981and 1986 there was a small decrease in employment in the Southern Tablelands region. The dominant factor at that time appeared to be the weak growth in NSW as a whole. Over that period the Southern Tablelands region did better than NSW.

The reverse occurred in the 1986 to 1991 period when growth in NSW was very strong, but was partly offset by negative local factors. Perhaps this was a period when the high growth in NSW made it possible for some people to leave the region and find employment elsewhere in the high growth industries and regions of NSW. Finally, in

the period from 1991 to 1996, most of the growth was attributable to local factors as State growth slowed under the influence of the recession and some unfavourable seasonal conditions and commodity prices.

FIGURE 3-P: STATE COMPONENT OF CHANGE 1991 - 1996: SOUTHERN TABLELANDS

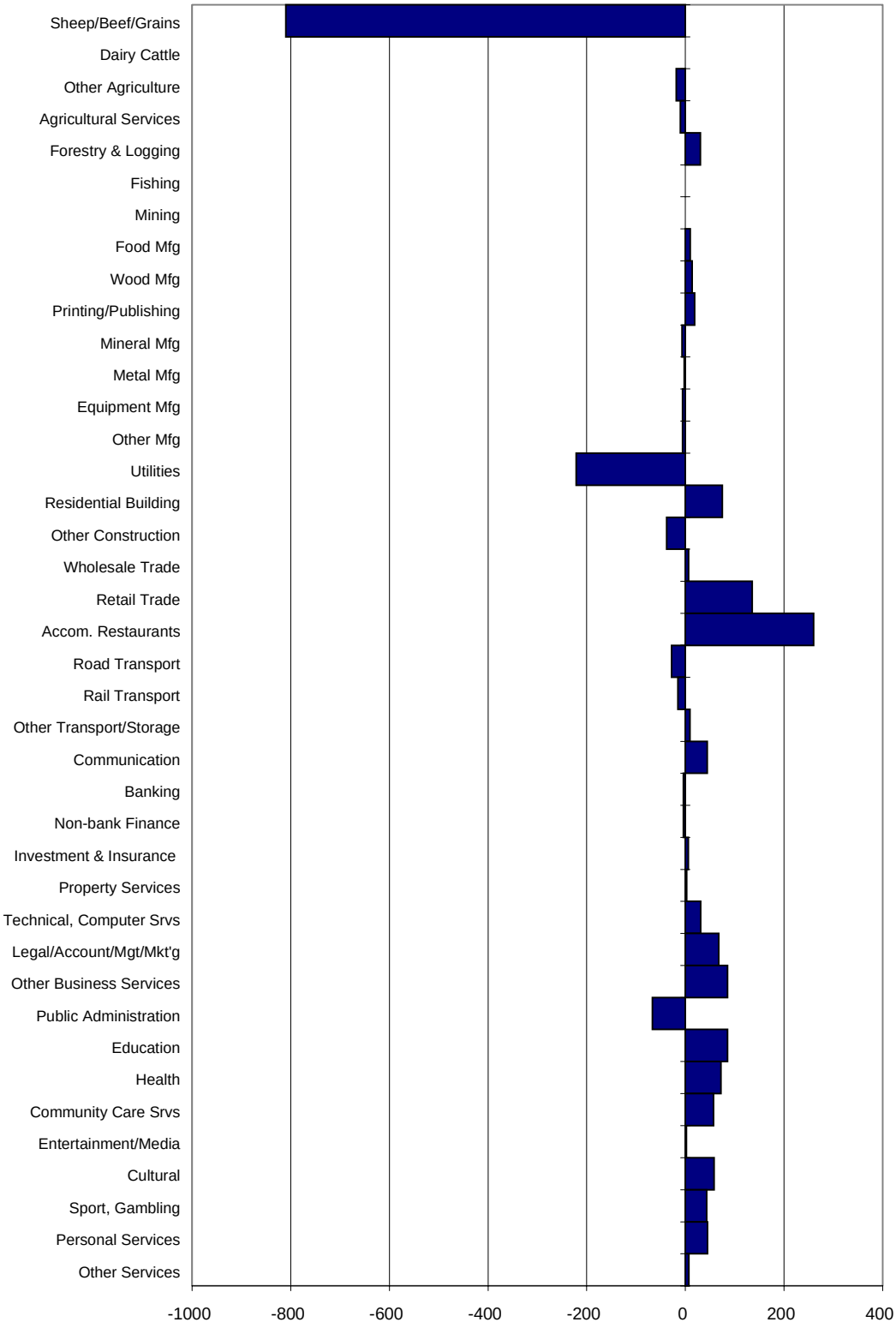


FIGURE 3-Q: LOCAL COMPONENT OF CHANGE 1991 - 1996: SOUTHERN TABLELANDS

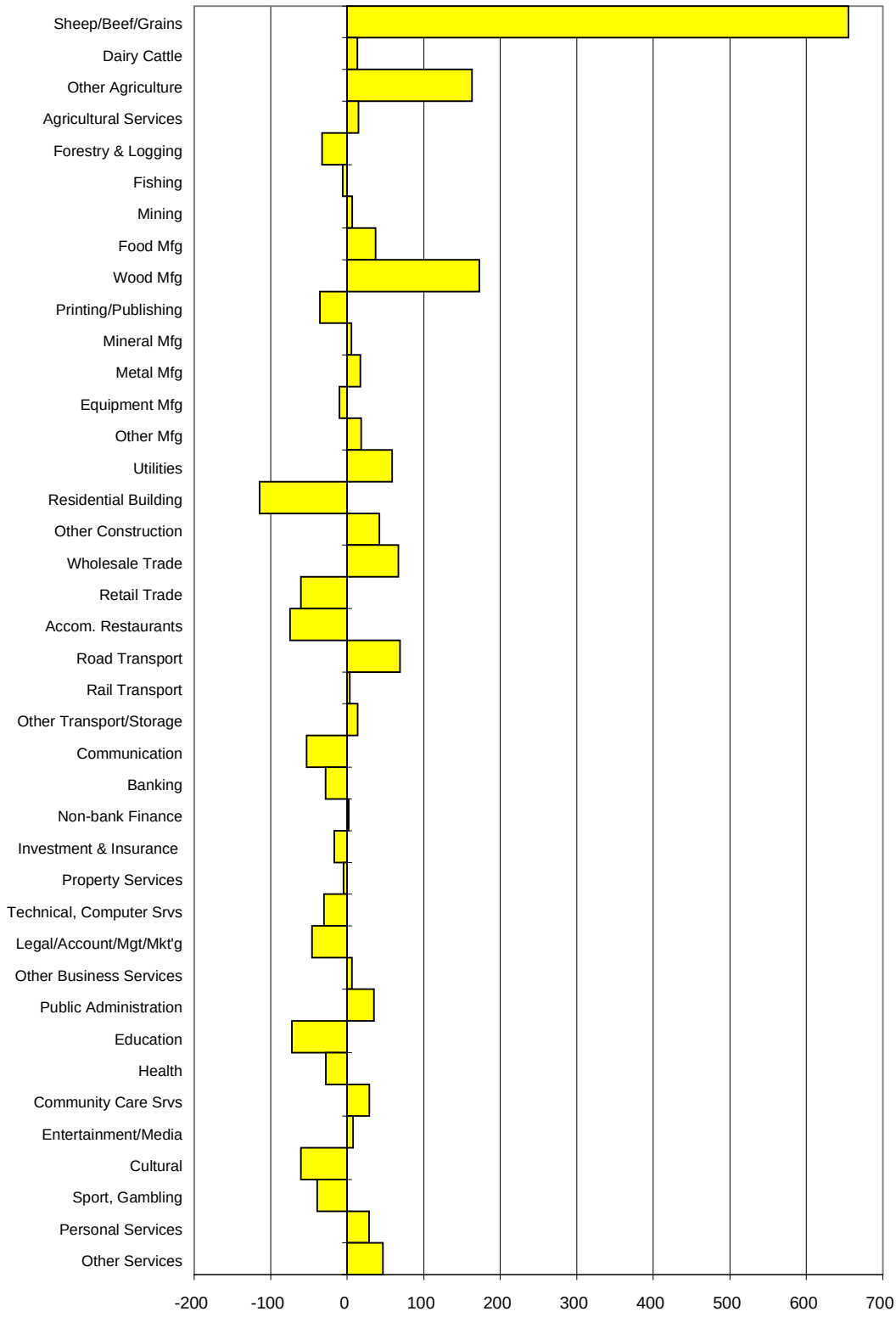
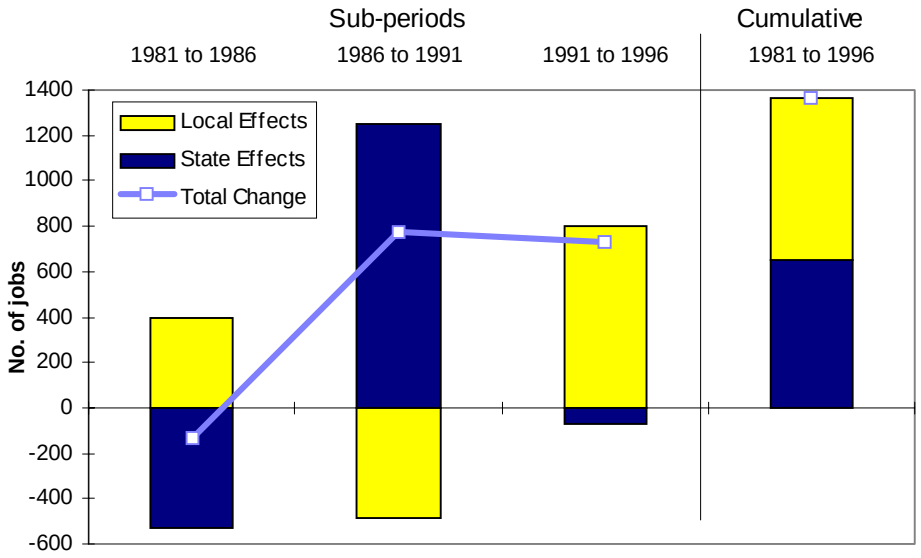


FIGURE 3-R: TOTAL STATE AND LOCAL COMPONENTS OF CHANGE: SOUTHERN TABLELANDS 1981 TO 1996



3.5. AVERAGE INCOMES

The ABS Population Census includes information on personal incomes as shown in Table 3-9.

Incomes in the Southern Tablelands region average 85 per cent of the NSW level. This percentage is about average for regional NSW. It is notable that some of those industries that are important to the skiing operations have high incomes relative to the NSW average that highlights the importance of that industry to those parts of the region. In other parts of the region, the overall income position is not likely to be so attractive.

Additional information compiled by the Department of Social Security is indicative of the relative position of household income in the region. Bray and Mudd (1998) compiled estimates of household income from tax statistics and related those to the levels of income tax paid and (Federal government) social welfare benefits paid. For the Southern Tablelands region the estimates were:

Gross Income	$803m
Income tax paid	$162m
Social welfare benefits	$63m

Welfare payments amounted to 8 per cent of gross income compared with the NSW level of 12 per cent. The ratio of tax paid to benefits received in the Southern Tablelands was 2.6 compared to 1.6 for NSW. This region is one where the household income situation appears to be well above the average for NSW. However, it should be noted that there would be areas within the region that are better (Snowy River) and worse (all other LGAs) than the average. By excluding Snowy River, the average for the rest of the region become social welfare benefits at 13 per cent of gross income and the tax to benefits ratio 1.45. Both are below the NSW average. Thus, the Snowy River LGA highlights the importance of the activities associated with the snowfields.

TABLE 3-9: INCOMES BY INDUSTRY: SOUTHERN TABLELANDS 1996

	Median Annual Individual Incomes		
1 Digit INDUSTRY	STH Tablelands	NSW	STH Tablelands :NSW
	$	$	%
A Agriculture, Forestry & Fishing	18,691	18,035	104
B Mining	24,325	55,395	44
C Manufacturing	25,710	27,288	94
D Electricity, Gas & Water Supply	33,148	35,495	93
E Construction	25,925	27,430	95
F Wholesale Trade	22,574	28,612	79
G Retail Trade	17,301	17,571	98
H Accommodation, Cafes & Restaurants	19,398	18,014	108
I Transport and Storage	24,074	30,257	80
J Communication Services	26,626	32,965	81
K Finance and Insurance	24,432	31,574	77
L Property and Business Services	23,710	30,773	77
M Government Administration & Defence	29,407	32,593	90
N Education	29,386	32,286	91
O Health and Community Services	21,135	24,636	86
P Cultural & Recreational Services	25,174	25,485	99
Q Personal and Other Services	23,975	23,990	100
R Non-classifiable economic units	17,496	23,374	75
& Not stated	15,962	16,449	97
Total	**22,157**	**26,078**	**85**

Source: 1996 Census of Population and Housing
Note: Includes income of employed persons from all sources.

3.6. CONCLUSION

The Southern Tablelands region economy is much smaller than that of the South Coast. It is a specialised economy built around primary production and tourism especially the snowfields. Some of the region is close to the ACT, which provides employment for some of the residents.

Within the region, there is variable economic conditions reflected in unemployment rates, income levels and the dependence on social welfare payments. But overall, these measures are better than they are in the South Coast. In the 1990s, there appears to be growing economic activity associated with the snowfields and the growth in the timber industry. The latter will be an on-going source of growth with the development of additional processing industry in Tumut. In 1996, the timber industry provided 6 per cent of employment.

4. INDUSTRY RESPONSE MODELLING

4.1. INTRODUCTION

The main objectives of the Industry Response Modelling project were to:

- develop a quantitative framework for analysing the commercial response of the Southern region's timber industry to changes in resource supply and land use configurations;
- assess the direct economic impacts of the outcomes for the Southern NSW CRA region; and
- provide economic data to linked projects, including the Regional Economic Impact Assessment and the Threshold Value Analysis of Non-Use Values of Forest Preservation.

To meet these requirements, the study involved the development of both a mill database and a number of financial simulation models. The data base and simulation models were used to describe the 1998-99 public hardwood timber milling sector and provide estimates of the contribution that hardwood milling made to regional employment and output. The simulation model was also used to estimate the likely direct employment and output effects of the final outcomes for the Southern NSW RFA region.

4.2. METHOD OF ANALYSIS

4.2.1. The Mill Database

A mill database was originally collated for the financial year 1997-98. This database was up-dated to reflect the nature of the industry in 1998-99, taking account of changes known to have occurred in relation to mill closures or redirection of SFNSW wood supply.

The database contained general information in relation to mills that had a licence from SFNSW, location information on these mills, private and public timber supply data and employment data for each mill.

More specifically the following information was collated:

General information such as:

- Licence name of mill;
- Licence number;
- Information on the type of plant ie. whether the mill is a sawmill, chip mill, a pole plant, a value adding plant, etc; and

Location information including:

- Easting and northing;
- CRA region within which the mill is located;
- Postal address for mill;
- Local Government Area in which the mill is located; and
- Forestry district in which the mill is located.

Public timber supply information including purchases by each mill from SFNSW in 1997-98 and 1998-99 in the following log grades:

- Quota
- Smalls
- Salvage logs
- Girders
- Piles
- Poles
- Veneer
- Pulp.

As well as total purchases by mills of each log grade, the mill database also contained this information in a spatial context ie. the source of the timber in terms of the timber catchment zones in the southern region of NSW. Timber catchment zones are spatial areas identified by SFNSW that each contain a number of management areas:

Private timber supply information was obtained from a variety of sources including:

- a survey of hardwood mills by the Australian Bureau of Agricultural and Resource Economics (ABARE);
- a survey of hardwood mills by the Forest Product Association (FPA); and
- SFNSW records.

Mill and contractor employment data were obtained from a survey of mills undertaken by the FPA and referenced against existing data sets for cross-check purposes.

4.2.2. Financial Model Simulations

A series of financial models were then developed for each mill. These models were used to:

- estimate the direct output value of the 1997-98 native hardwood milling sector, the mill regional expenditure profile and associated employment levels;

- estimate the direct output value of the 1998-99 native hardwood milling sector, the mill regional expenditure profile and associated employment levels; and
- estimate the likely direct output value of the native hardwood milling sector, the mill regional expenditure profile and associated employment under different logging scenarios (reference points).

Two sources of physical and financial information were available to assist in the development of these models:

- the findings from the 1997-98 ABARE survey of mills; and
- the results of the 1997-98 FPA survey of mills.

The ABARE survey provided detailed information on recovery rates and product mixes by log grade and species for each mill. Due to confidentiality restrictions, detailed financial information for each mill was not available, however, averages across mill groups, based on mill size classifications were provided. This survey also included information from a selection of the region's private property mills and included information on an additional crown timber mill not surveyed as part of the FPA research.

The FPA survey provided information on recovery rates and product mixes by total log input and detailed financial information for each mill.

Because of differences in survey design it was not possible to integrate the results of the two surveys to obtain a single detailed data set. The need for detailed mill by mill financial information and the fact that product mixes and recovery rates did not vary significantly between log grades, resulted in the FPA survey results forming the basis of the financial models, with the ABARE data used for cross-check purposes. The exception was the additional mill surveyed by ABARE. Product mix data from the ABARE survey together with average price and expenditure data from the survey were used as a best case proxy. The ABARE data were also used to model private property mills.

The financial models for each mill for 1997-98 contained the following information:

- the total volume of SF timber processed;
- the total volume of private property resource processed;
- the product mixes obtained per cubic metre of log processed;
- average SFNSW royalty costs per cubic metre of log processed;
- an allowance for private royalty costs;
- average fall, snig and loading costs per cubic metre of log processed;
- labour costs per cubic metre of sawn timber including wages, payroll, super, workers compensation

- non-labour costs per cubic metre of sawn timber including materials (fuel, utilities), repairs and maintenance, administration salaries, administration /other, depreciation, interest, overheads, light and power, other costs;
- haulage to market costs per cubic metre of sawn timber
- average market prices of different products achieved by each mill.

This information was built into a linear spreadsheet model, that was able to estimate the indicative final product mix[1], the volume of sawn timber output, the value of output and the regional expenditure profile, associated with the processing of logs on a mill by mill and aggregate basis.

Employment data from the FPA survey were used to determine employment ratios per total volume of timber processed or per volume of timber felled and transported. This took into account owners/partners/family, permanent full-time staff, permanent part time staff and casuals working at the mill, and persons employed in falling/snigging/loading logs and persons employed in log haulage. These ratios were entered into the spreadsheet so that adjustments in timber volume would lead to changes in employment levels (owners/partners/family working at the mill was held constant). The spreadsheet models for 1997-98, including employment information, were calibrated so that they provided the same results as those obtained from the FPA survey.

The financial models were then moved forward to represent 1998-99. This involved the following adjustments and assumptions:

- changing the log input volumes to reflect changes in SFNSW supply;
- holding private property volumes constant;
- holding product mixes and recovery rates constant;
- varying variable costs on a per cubic metre basis;
- holding fixed costs such as depreciation and interest repayments constant;
- assuming a 3% price increase for all products[2]; and
- applying the employment to output ratios for each mill.

The SFNSW timber volumes utilised in developing the final outcomes for the region were allocated between Crown mills on the basis of SFNSW advice. These volumes were then applied to the financial models for each mill again:

- holding private property volumes constant;

[1] Product mix categories were those used in the FPA survey i.e. scantling/boards green, scantling boards KD, scantling green & KD, KD flooring, crating, fencing, pallet, stakes, dunnage, sawdust/woodchip, other.

[2] The SFNSW 1998 Market Survey claimed a 5.56% price movement over the preceding year. This price movement followed a movement of approximately 3% that SFNSW claimed to have identified in 1997. The Forest Products Associate Producer Survey disputes such price movements. For the purpose of this study the more conservative 3% average price movement was adopted.

- holding product mixes and recovery rates constant;
- varying variable costs on a per cubic metre basis;
- holding fixed costs such as depreciation and interest repayments constant;
- assuming the same price levels for all products as in 1998-99; and
- applying the employment output ratios for each mill.

4.2.3. Producer Surplus

Producer surplus is the difference between the costs of the inputs used in the production process (economic cost to producers) and the price received for the finished product (total benefit to producers). It is measured as the area between a supply curve and a given price for a specified quantity supplied. In practical terms it is the net revenue that is earned by producers (James and Gillespie 1997).

However, where a community resource such as timber is an input into the production process and a royalty is paid for this resource the producer surplus is being shared between the owners of capital and the owners of the resource.

Producer surplus estimates for the base year and the reference point were calculated in the following manner:

- calculating the total value of production associated with hardwood milling operations in the region (including private property mills) and the value of production associated with timber that is sourced from the region but processed outside the region ie. HDA timber supply and 1000 m^3 to Eden (but not supplied in 1998-99);
- subtracting from this value of production the following costs:

- fall, snig and loading costs;
- labour costs including wages, payroll, super, workers compensation
- non-labour costs including materials (fuel, utilities), repairs and maintenance, administration salaries, administration /other, depreciation[3], overheads, light and power, other costs (with the exception of interest which is a financial rather than economic cost);
- haulage to market costs;
- SFNSW and private property management costs directly associated with management for timber production.

Other costs of management such as those associated with recreation areas etc are assumed to be common between management of the forests for timber or conservation (Streeting and Hamilton 1991).

[3] Depreciation is included as it is a proxy for the allocation of capital equipment costs to a particular year.

4.3. THE SOUTH COAST SUB-REGION

4.3.1. Industry Profile

Since the 1997-98 starting point for collection of information, there were a number of changes in the industry in the South Coast sub-region. The main changes in industry structure, as incorporated into simulation modelling included:

AS Blatch and Son elected to take their reduced allocation over a shorter time frame and have since left the industry (Feb 1998);

Tablelands Sawmill closed its Cooma-Monaro Mill in 1999. It is building a new mill at Eden. Tablelands Sawmill's Queanbeyan base allocation was traded to Davis and Herbert. Davis and Herbert also receive the Tablelands annual top up;

Timber Integrated Services, which only took some firewood from SFNSW, shut down in November 1997.

Koppers Timbers (Queanbeyan) which previously processed both hardwood and softwood decided to focus on softwood production and hence no SFNSW hardwood from the South Coast sub-region is being provided to Koppers.

Consequently, there were seven hardwood mills located in the South Coast sub-region that obtained and processed SFNSW hardwood resource in the base year. These included:

- Gumm Bros
- Goodsell Timber Contractors
- D & P Timbers
- Romney Park Sawmill
- Davis and Herbert (Narooma)
- Davis and Herbert (Batemans Bay); and
- Davis and Herbert (Nowra).

Five of these mills also obtained some private property resource in 1997-98. No records were available on private property supplies to these mills in 1998-99 and hence it was assumed that the 1997-98 levels also applied to 1998-99. One of the mills also processes a small quantity of softwood.

Mill size varied, with two Crown mills processing over 20,000 m^3 per annum, 1 processing between 10,000 and 20,000 m^3, with the remaining mills processing between 1,000 m^3 and 10,000 m^3 per annum.

There is also a small amount SFNSW timber that is exported from the region for processing elsewhere, namely, pulp that is supplied to Harris Daishowa in Eden. The Eden RFA, which was finalised prior to the Southern region assessment process, included a commitment of 1,000 m^3 from the South Coast sub-region.

There were also a number of hardwood mills that relied solely on private property resource. Gaining accurate data on these operations was complicated, however, SFNSW licence data suggested that there were 9 mills relying solely on private property resource in 1998-99. Six of these mills were considered to be small in size processing less than 1000 m^3 per annum. The remaining mills were estimated to process between 1,000 and 10,000 m^3 per annum. It should be noted that this may understate the magnitude of the private property mills since mobile mills operating in the sub-region are no longer required to be licensed by SFNSW.

Table 4-1 illustrates the number of mills in the sub-region by size and wood source.

TABLE 4-1: SOUTH COAST SUB-REGION - MILL SIZE 1998-99

Mill Size Groupings (m^3)	Crown Mills	Private Property Mills
More than 20,000	2	0
10,000 to 20,000	1	0
1,000 to 10,000	4	3
Less than 1,000	0	6
TOTAL	**7**	**9**

The estimated timber volume processed by these mills and broken into SFNSW product categories in 1998-99 is shown in Table 4-2.

TABLE 4-2: TIMBER VOLUMES SUPPLIED AND PROCESSED 1998-99 (M^3)

	High Quality Large (HQL)	High Quality Small (HQS)	Low Quality (LQ)	Pulp	TOTAL
Private Property Hardwood Mills					**10718**
Crown Hardwood Mills					
Hardwood Private Property Resource					14879
State Forest Softwood					1981
Actual 1998-99 SFNSW Hardwood Allocation	39560	11364	33317	51914	136155
Total Crown Mills					**153015**

Note: All pulp goes to HDA and was processed outside the region

Table 4-2 indicates that 153,000 m^3 of SFNSW hardwood resource was supplied from the State Forests of the South Coast sub-region in 1998-99. Mills in the South Coast sub-region processed all of this, apart from 51,914 m^3 of pulp. The 51,914 m^3 of pulp was processed by HDA. The net result was that in the order of 101,001 m^3 of native hardwood timber from State Forests was processed in the South Coast sub-region of the Southern NSW CRA region.

State Forests also supplied 1,981 of softwood to a Crown hardwood mill in the South Coast sub-region for processing.

In addition to State Forest timber, indications are that approximately 25,500 m^3 of private property resource was harvested and processed in the South Coast sub-region in

1997-98[4]. Crown mills processed 14,879 m^3 while 10,718 m^3 was estimated to be processed by private property mills. It was assumed that this supply of private property hardwood resource remained constant in 1998-9.

Overall in the order of 151 034 m^3 of native hardwood resource (and 1,981 m^3 of softwood processed by hardwood mills) was harvested in the South Coast sub-region with 99,120 m^3 of hardwood (and 1,981 m^3 of softwood) processed by hardwood mills in the region.

On the basis of the production and financial models developed for each Crown mill and for private property mills (in aggregate) the estimated sawn timber production for 1998-99 is outlined below.

TABLE 4-3: TIMBER VOLUMES SUPPLIED AND PROCESSED 1998-99 (M^3)

	Crown Mills		PP Mills	
Product (output) mix	**Vol.**	**%**	**Vol.**	**%**
Scantling/Boards green	2649	6	3040	28
Scantling boards KD	0	0		0
Scantling green and KD	6222	13		0
KD Flooring	0	0		0
Crating	21803	45		0
Fencing	2811	6	746	7
Pallet	5984	12	746	7
Stakes	192	0		0
Dunnage	6785	14		0
Sawdust/woodchip	1452	3	5253	49
Other	43	0	933	9
				0
TOTAL	**47943**	**100**	**10719**	**100**

The direct annual output associated with milling of native hardwood timber resource (and the small quantity of softwood milled by hardwood mills) in the South Coast sub-region is provided in Table 4-4, together with estimated direct employment associated with milling, fall/snig/loading and haulage contracting. The level of output is over $18m with just over 200 people employed in these operations.

TABLE 4-4: DIRECT ANNUAL OUTPUT VALUE AND EMPLOYMENT LEVELS FOR THE NATIVE HARDWOOD TIMBER INDUSTRY 1998-99

	Mill Output Value in Region	**Owners /Partners**	**Perm f/t**	**Perm p/t**	**Casuals**	**FSL**	**Haul**	**Total**
	$m	No.	No.	No.	No.	No.	No.	No.
Private Property Mills	$2,332,666	11	12	0	6	0	0	29
Crown Mills (including fixed levels of private property resource)								
1998-99	$15,712,100	14	119	2	0	29	14	178
Total	**$18,044,766**	**25**	**131**	**2**	**6**	**29**	**14**	**207**

[4] All wood from private land was assumed to be grown and processed in the same CRA region.

4.3.2. Outcome Development

Stakeholders were provided with indicative information on a number of possible wood supply arrangements. This information was provided in the form of "reference points" to inform stakeholder negotiations and decision-makers of the likely outcomes for the industry and the region. The outcome developed from these consultations for the South Coast sub-region is reported here.

For the negotiated outcome, SFNSW identified the timber yields through time and provided information in relation to four log grades: High Quality Large (HQL), High Quality Small (HQS), Low Quality (LQ) and pulp. In performing this impact assessment, pulp and the supply of wood from private land were held constant. The timber supply estimates for the 1998-99 allocation and the negotiated outcome are shown in Table 4-5.

TABLE 4-5: TIMBER VOLUMES ASSOCIATED WITH THE NEGOTIATED OUTCOME (M^3)

	HQL	HQS	LQ	Pulp	TOTAL
Private Property Hardwood Mills					10718
Crown Hardwood Mills					
Hardwood Private Property Resource					14879
State Forest Softwood					1981
Negotiated Outcome	41,776	12,120	29,500	51,914	135,310

Note: All pulp goes to HDA outside the region

For the negotiated outcome it was assumed that 1,000 m^3 of HQL goes to Tablelands Eden located outside the Southern RFA region.

To enable estimation of the direct regional economic impacts of the negotiated outcome it was necessary to identify likely changes in the volumes and location of timber processed by the mills in the South Coast sub-region. Adjustments were made to account for the trade in wood between sub-regions and between the regions. Reflecting the current situation it was assumed that there was no trade in timber between the South Coast sub-region and other sub-region's of the Southern NSW CRA region. It was assumed that the pulp was processed outside the southern region at Eden as was 1000 m^3 of HQL. The rest of the SFNSW timber grown in the region was assumed to be processed in the region.

4.3.3. Industry Response and Direct Regional Economic Impacts

In order to determine the direct economic impacts of the negotiated outcome it was necessary to consider how native hardwood firms would be impacted by changes in wood supply.

To some extent this depends on how such changes would be implemented eg., through Government selecting those mills who would bear changes in timber volumes (providing compensation where appropriate) or through a more market based system, such as auctioning of any additional timber volumes associated with some reference points. For the purpose of this analysis, it was assumed that the initial changes in allocations would be directly implemented by SFNSW through all term agreement

holders having their wood volumes varied on a proportional basis. Following this initial allocation, term agreement holders would decide on how they would respond to changes in timber volumes.

Modelling this subsequent mill response is very subjective as firms may adopt a range of adjustment strategies to changes in timber volumes. These include:

- Operating on reduced throughput and lower variable costs and continue to operate until the need for major capital replacement arises, then make a decision about continuing to operate at all;
- Purchase additional entitlements from other firms that have decided to close or focus on some particular timber species/product;
- Sell the reduced entitlements (and so close the business) to other processors that are seeking to maintain/expand their operations;
- Seek alternative sources of logs from plantations, private lands or imports;
- Expand into other types of timber processing;
- Seek to operate at lower throughputs but produce higher value products;
- Seek alliances/amalgamations with other similarly affected firms;
- Take over some operations that are currently outsourced; and
- Seek higher return niche markets.

(Based on CARE 1996)

Numerous factors may influence the selection of adjustment strategies including:

- SFNSW contractual arrangements,
- the objectives of the firm,
- the type of ownership,
- the location of the mill vis-à-vis timber supply (FORUM focus),
- the products produced,
- the production affiliations,
- the current technology and investments including those associated with FISAP,
- the capacity of the firm and current operating levels,
- the capital structure and financial position,
- the family and business life cycle,
- marketing systems and affiliations,
- management entrepreneurial capacity,
- the nature of Government Structural Adjustment Packages.

(Based on CARE 1996).

The response of mills to changes in timber volumes also has a time dimension. In the short run, mills are likely to continue to operate on the reduced or increased timber supplies in a similar manner to their existing operations while consideration is given to various adjustment strategies.

In the medium run, major changes may occur including rationalisation of mills through the trading of term agreement entitlements. Because of the high level of subjectivity associated with modelling medium-run effects, the focus of this industry response study was on more short-run effects. That is, the focus of modelling was on the impacts on output and employment associated with the increased or decreased timber supplies associated with the negotiated outcome, assuming all mills continue their operations.

It should be noted, however, that under both the 1998-99 levels and the negotiated outcome it is considered that some rationalisation of mills may occur.

Estimates of the value of output and employment for the negotiated outcome are shown in Table 4-6 along with the changes from the 1998-99

TABLE 4-6: DIRECT OUTPUT AND EMPLOYMENT IMPACTS OF THE CURRENT COMMITMENTS IN THE SOUTH COAST SUB-REGION

Scenario	Mill Output Value in Region	Owners Partners	Perm f/t	Perm p/t	Casual	FSL	Haul	Total
	$m	No.	No.	No.	No.	No.	No.	No.
Private Property Mills (constant between reference points)	$2,332,666	11	12	0	6	0	0	29
Crown Mills (including fixed levels of private property and softwood resource)								
1998-99	$15,712,100	14	119	2	0	29	14	178
Current Commitments	$15,431,611	14	117	2	0	29	13	175
Change from 1998-99	-$280,489	0	-2	0	0	0	-1	-3

These results indicate that the current commitments involve only a small reduction in the value of production and employment relative to 1998-99. While there is a small reduction in the volume of logs available from SFNSW, this is concentrated in the lower quality logs. A small rise in the amount of high quality logs available offsets that reduction. The processing of private property logs remains the same so that the overall impact is only a small change on the levels of output and employment reported for 1998-99.

4.4. THE SOUTHERN TABLELANDS SUB-REGION

4.4.1. Industry Profile

There were three hardwood mills located in the Southern Tablelands sub-region that obtained and processed SFNSW hardwood resource in 1998-99. These were:

Hardwood Resources;

Adjungbilly Timbers; and

Tumbarumba Alpine Hardwoods.

Two of these mills also obtained a small quantity of private property resource in 1997-98. No records were available on private property supplies to these mills in 1998-99 and hence it was assumed that the 1997-98 levels also applied to 1998-99.

One Crown mills processed over 20,000 m^3 per annum, 1 between 10,000 and 20,000, with the other processing between 1,000 m^3 and 10,000 m^3 per annum. All timber harvested in the region was processed within the region. There were no private property mills operating in the region in 1998-99.

The estimated timber volumes processed by these mills in 1998-99 are summarised in Table 4-7. This indicates that 39,016 m^3 of SFNSW hardwood resource was supplied from the State Forests of the Southern Tablelands sub-region in 1998-99.

TABLE 4-7: TIMBER VOLUMES SUPPLIED AND PROCESSED 1998-99 (M3)

	HQL	HQS	LQ	Pulp	TOTAL
Private Property Hardwood Processed by Crown Mills (held constant)					1,000
State Forest Hardwood Supply (varies between options)					
Actual 1998-99	25,027	525	13,464	0	39,016

In addition to State Forest timber, indications are that approximately 1,000 m^3 of private property resource was harvested and processed in the Southern Tablelands sub-region in 1997-98[5]. It is assumed that this supply of private property hardwood resource remained constant in 1998-99.

On the basis of the production and financial models (as explained in the previous section) developed for the three Crown mills, the estimated sawn timber production for 1998-99 is shown in Table 4-8.

[5] All wood from private land was assumed to be grown and processed in the same CRA region.

TABLE 4-8: TIMBER VOLUMES SUPPLIED AND PROCESSED 1998-99 (M3)

	Crown Mills	
Product (output) mix	**Vol. m3**	**%**
Scantling boards KD	524	3
Scantling green and KD	0	0
KD Flooring	175	1
Crating	0	0
Fencing	0	0
Pallet	12962	76
Stakes	0	0
Dunnage	0	0
Sawdust/woodchip	0	0
Other	0	0
TOTAL	**17041**	100

On the basis of the assumptions made in the financial models and the available employment data, the direct annual output associated with milling of native hardwood timber in Southern Tablelands sub-region is provided in Table 4-9, together with estimated direct employment associated with milling, fall/snig/loading and haulage contracting.

TABLE 4-9: DIRECT OUTPUT AND EMPLOYMENT IMPACTS OF THE BASE CASE REFERENCE POINTS ON THE SOUTHERN TABLELANDS SUB-REGION

Scenario	**Mill Output Value in Region**	**Owners Partners**	**Perm f/t**	**Perm p/t**	**Casuals**	**FSL**	**Haul**	**Total**
	$	No.	No.	No.	No.	No.	No.	No.
Crown Mills (including fixed levels of private property resource)								
1998-99	$5,437,341	6	36	0	6	10	5	64
1998-99 commitments	$7,266,850	6	50	1	7	13	6	83

The information in Table 4-9 shows a value of output of output for 1998-99 of $5.4m and employment of 64 people. In the Southern Tablelands area, not all of the available SFNSW timber for 1998-99 was used. If the mills took up all of the supply commitments, then the estimated value of production would be $7.3m and employment would be 83 people.

4.4.2. Outcome Development

Three reference points were examined for the Southern Tablelands sub-region. These were:

- The 1998-99 allocations reported above – a reference point approximating what was being allocated to mills at the time of the CRA;

- The 1998-99 commitment levels from State Forests if they were harvested and sawn[6]; and
- The negotiated outcome for the Southern Tablelands sub-region.

For each 1998-99 commitment level and the negotiated outcome, SFNSW identified the timber yields and provided information in relation to four log grades: HQL, HQS, LQ and pulp. Pulp was held constant during the analysis. The supply of wood from private land was also held constant. The timber supply estimates for these reference points are shown in Table 4-10. These data indicate that 9,651 m^3 of timber resource commitment was not taken up by the mills. The negotiated outcome involves an increase in the allocation of 10,141 m^3, most of which is in the HQL category.

TABLE 4-10: TIMBER VOLUMES ASSOCIATED WITH THE REFERENCE POINTS

	HQL	HQS	LQ	Pulp	TOTAL
Private Property Hardwood Processed by Crown Mills (held constant)					1,000
State Forest Hardwood Supply (varies between options)					
1998-99 Commitment levels	38,702	4,465	5,500	0	48,667
Negotiated outcome	48,000	5,318	5,500	0	58,818

4.4.3. Industry Response and Direct Regional Economic Impacts

In order to determine the direct economic impacts of the negotiated outcome it was necessary to consider how native hardwood firms would be impacted by changes in wood supply. To some extent this depends on how such changes would be implemented eg. through Government selecting those mills who would bear changes in timber volumes (providing compensation where appropriate) or through a market based system, such as auctioning of any additional timber volumes associated with some reference points. For the purpose of this analysis, it was assumed that initial changes in allocations would be directly implemented by SFNSW through all term agreement holders having their wood volumes varied on a proportional basis. Following the initial allocation, term agreements holders would decide on how they would respond to changes in timber volumes.

Modelling this subsequent mill response is very subjective as firms may adopt numerous adjustment strategies to changes in timber volumes (refer to section 4.3.3).

The response of mills to changes in timber volumes also has a time dimension. In the short run, mills are likely to continue to operate on the reduced or increased timbers supplies in a similar manner to there existing operations while consideration is given to various adjustment strategies. In the medium run, structural changes may occur including rationalisation of mills through trading of term agreement timber entitlements.

[6] Due to a fire and the subsequent reconstruction work at one of the mills, all timber committed for harvesting by State Forests in 1998-99 was not utilised by the region's mills.

Because of the high level of subjectivity associated with modelling medium-run effects, the focus of the Industry Response Modelling project was on more short-run effects. That is, the focus of modelling was on the impacts on output and employment associated with the increased or decreased timber supplies associated with different reference points, assuming all mills continue their operations.

For the negotiated outcome, SFNSW identified the timber yields through time and provided information in relation to four log grades: High Quality Large (HQL), High Quality Small (HQS), Low Quality (LQ) and pulp. The timber supply estimates for the 1998-99 allocation and the negotiated outcome are shown in Table 4-11.

TABLE 4-11: DIRECT OUTPUT AND EMPLOYMENT IMPACTS OF THE REFERENCE POINTS ON THE SOUTHERN TABLELANDS SUB-REGION

Scenario	Mill Output Value in Region	Owners Partners	Perm f/t	Perm p/t	Casuals	FSL	Haul	Total
	$	No.	No.	No.	No.	No.	No.	No.
Crown Mills (including fixed levels of private property resource)								
1998-99	$5,437,341	6	36	0	6	10	5	64
1998-99 commitments	$7,266,850	6	50	1	7	13	6	83
Negotiated Outcome	$9,624,991	6	61	2	9	15	8	102
Negotiated outcome change from								
1998-99 actual	$4,187,650	0	25	2	3	5	3	38
1998-99 commitments	$1,829,509	0	14	1	1	3	1	19

The results in Table 4-11 indicate that the value of output with the increased negotiated allocation will increase by 77 per cent over the actual output levels of 1998-99. That reflects the high proportion of HQL timber supplied to the mills. Relative to the level of output that would have occurred if all of the 1998-99 allocation had been taken up, the $9.6m of output represents a 32 per cent increase. The increases in terms of employment are less being 59 per cent and 12 per cent, respectively.

5. REGIONAL IMPACT ANALYSIS

5.1. THE GENERAL APPROACH

In analyses of this type, the task is to compare the alternatives with a specified base case. In this study, the base case is established as the activities taking place in the year 1998-99. This represents the most recent year for which data are available. It is also a year which reflects many of the adjustments consequent to the measures introduced following the Interim Assessment in 1996 and should be a situation which can readily be related to by the stakeholders.

Both direct and indirect (or flow-on) effects are estimated. The indirect effects are estimated using an input-output table for the South Coast compiled for 1996-97. Multipliers are estimated in this model and applied to the 1998-99 direct values. Hence, all impacts are valued in terms of 1998-99, but refer to the region's general economic structure in 1996-97. (It is unlikely that the structure of the regional economy will have changed significantly between 1996-97 and 1998-99.)

The level of each timber activity was estimated from information supplied to CARE by SFNSW and the Industry Response Modelling as reported in Chapter 4. Estimates have been made of all of the activities related to forestry to provide a full assessment of the industry even though the focus is on the hardwood timber production and processing.

The economic impacts are presented in terms of the:

- value of gross output (equivalent to business turnover),
- value added (equivalent to the measure of gross national product – using the income method of summing wages and salaries, gross operating surplus and taxes net of subsidies),
- payments to households of wages and salaries and imputed incomes to self employed, and
- level of employment.

There are reservations about the level of employment measures, as there is growing flexibility in labour markets associated with levels of skills, hours worked and employment conditions. It is an almost impossible task to reduce all of that variation

into a single measure of employment. The only practical way of doing that is to refer to the total wages and salaries paid to all workers in the industry, including an imputed wage or salary to the self-employed persons and employers.

This summary for each sub-region is presented in three parts.

- A definition of the sectors used in the analysis and the data sources.
- Economic impact estimates for the base case of 1998-99.
- Economic estimates for three reference points involving different levels of log supply.

The prepared tables also include the multiplier values for all of the activities. The multipliers for gross output, value added and household income are all expressed in terms of the impact per $1 of gross output. Employment is expressed as the number of jobs per $1000 of gross output.

The Type II ratios express the relationship between the total impact and the direct impact.

The multipliers are used to estimate the flow-on effects of economic activities. Those flow-on effects are of two types:

Production-induced effects that are associated with the industry purchasing inputs from other industries, and

Consumption-induced effects associated with employed households spending their earnings on consumer goods and services.

The consumption-induced effects are somewhat conjectural when dealing with changes in activities. This is because they indicate the effect of new households being established or existing households leaving as employment changes. In that sense, they represent long-run impacts when there has been population movements to adjust to job opportunities.

In the following estimates of the economic impacts, the full consumption-induced effects have been included. This is legitimate in the description of the existing industry structure, but will likely involve an overestimation of the short-run impacts of changes in the industry. There is limited information available for estimating the short-run impacts and so no attempt has been made to estimate them. However, in the full tables in Attachment 5, the consumption effects are separately shown so as to enable analysts to adjust those values in accord with their purpose and knowledge of household behaviour.

The multipliers reflect the strength of an industry's linkages with other industries through the use of intermediate inputs and the capacity of industries in the local region to supply those intermediate inputs. Thus, detailed expenditure data and information on the source of inputs are critical in estimating multipliers. The multipliers are included in Attachment 5.

5.2. THE SOUTH COAST SUB-REGION

5.2.1. Sector Definitions and Data Sources

The activities were compiled in four groups. This grouping and the identified activities are used for the presentation of the results for the base case and the reference points.

- Those related to hardwood log supply and milling (primary or first stage processing).
- Those related to softwood log supply and milling (primary or first stage processing).
- Those activities that relate to the further fabrication of timber products (secondary processing) including structural framing, door frames, pallets, etc. but excluding furniture and prefabricated buildings (or final stage processing).
- Those activities that occur in state forest areas that are not related to local milling in the South Coast.

They are discussed in turn and in reference to the associated tables.

Hardwood log supply and milling

The base data were derived from SFNSW data. These were then included in the response model to estimate the value of mill output, royalty payments and the costs of the main activities.

For the base year, the total volume of hardwood processed in the region was 101,001m^3. This resulted in hardwood products valued at $16.589m (ex mill gate), or $18.045m to customers.

The freight associated with shipping those products to their markets (either traders or processors) is shown separately as 'downstream freight', which amounted to $1.456m.

The wood supply for processing was derived from two sources:

- HWD Forestry is the log supply from the South Coast State Forests that is processed in the South Coast region. A separate item HWD Forestry (Other sales) relates to the logs from the South Coast that are processed in other regions.
- PP Forestry is the supply of logs from private property in the South Coast. Some logs are supplied to other mills and some are used in small mills on the property. The milling of the private property logs is included in the total milling values.

A specific sector including costs structures and sales patterns (ie, a separate row and column in the input-output table) has been compiled for each of these supply operations. They have been based on expenditure data provided from SFNSW for their supply. The private property supply has been estimated on the basis of the forest operations of SFNSW. This does not allow for any overhead/administration costs and is designed to reflect relatively low levels of forest management in most items apart from labour.

There is also a specific sector to indicate the log, snig and haul costs –Logging/Haulage – which relates to that timber logged in the South Coast region and milled in the South Coast region. That component of the timber that is logged in the South Coast region but milled in other regions falls in the Logging/Haulage (other sales) sector.

In summary, the hardwood operations (excluding downstream freight) include:

Log supplies to the value of:	
State Forests	$2.652m
Private property	$0.277m
Softwood	$0.047m
Log, snig and haul cost of:	$2.763m
Milling operations (net of log and logging costs) to the value of:	$10.850m

For the base case, these comprise a total ex-mill value of: **$16.589m**
This includes private property milling with a total ex-mill value of $2.203m.

The total hardwood operations described also contributed:

- $11.762m to value added,
- $6.132m of payments to households, and
- employment for 229 people.

The above estimates can be reconciled with those in Table 4-4 through the inclusion of downstream freight in the value of gross output. In terms of employment, allowance has to be made for those employed in forestry and those in operations that supply wood to processors outside the region. This gives an overall total direct employment of 278. These differences arise because of the conventions used in input-output modelling that allocate activities differently from those used in the response analysis. There may also be some rounding errors in the data.

Softwood plantation management

The South Coast also includes a small area of softwood plantations and milling operations. The softwood management activities relate to plantations and comprise only the forestry management operations. In the base case, the management expenditure on softwood forestry was $1.609m in total and $0.710m was supplied to softwood milling within the region with the balance being exported from the region.

The value of the logging and haulage was $1.910m of which $0.573 related to mills within the South Coast and the balance related to exports from the region. The total ex-mill value of production in the region was $5.350m.

The softwood forestry and milling operations in total contributed:

- $5.662m to value added,
- $2.175m of payments to households, and

- employment for 61 people.

Secondary processing of timber products

These activities are included to complete the picture of wood-related activities in the region. They are large in this region as they are related to the building industry. Building has been at a high level given the high rate of population growth in the South Coast. In some cases, these activities are closely linked to primary processing, in others they are completely separate activities. There is also variable dependence on the supply of local wood products.

These activities have not been the subject of specific studies and have been estimated on the basis of information on manufacturing and employment from a range of ABS sources. These activities were estimated to contribute:

- $58.7m to gross output net of the amount of local wood used.
- $21.9m to value added.
- $11m to household wage and salary earnings.
- Employment for 484 people.

Activities not related to South Coast log milling

The activities fall into two groups, namely:

- Those related to other SFNSW operations and management, and
- Those related to other activities.

Other SFNSW operations include:

SFNSW established softwood plantations in the region that accounted for expenditure of $0.156m.

The amount of logs exported out of HWD Forestry (other sales)) amounted to $2.15m plus associated logging activities Logging/Haulage (other sales)) of $1.124m. Softwood exports from the region amounted to $0.945m, plus the associated logging and haulage operations of $1.337m

The non-wood activities include the following.

Visitation to State Forests by either visitors to the region (tourism) or locals (recreation) is represented in the input-output model by the SF Visitors sector. Hassall & Associates estimated the number of visitors per year (420,000) along with an estimate of their daily expenditure ($23.04) associated with the visits to a State Forest. Total expenditure was therefore estimated at $9.677m. These expenditure items were then disaggregated into various cost components and allocated to the respective input-output

sectors. The estimated local expenditure (net of imported components and taxes) associated with these visitors amounted to $6.279m in 1998-99.

Apiary activities: Hassall & Associates estimated a value of $1.386m for 1997-98 apiary activities in State Forests in an associated study. This represented 85 per cent of the apiary activity in State Forests for the Southern CRA region.

Mining activities in State Forests were estimated by the Department of Mineral Resources to be worth $1.021m in 1997-98.

5.2.2. The Base Case: South Coast Sub-Region

The base case has been specified in detail in the tables on the basis of the operations in 1998-99. The details for the hardwood operations are presented in Table 5-1. Further details for each of the activities and the multipliers are included in Attachment 5 with one table for each of gross output, value added, household income and employment. An overall summary is included in Table 5-2. That table shows the values for softwood operations, secondary processing of wood products and other activities that occur on state forest land. The industry contribution to the South Coast economy is also shown in Table 5-2.

Table 5-1 shows that the gross output from hardwood operations was $21.3m that generated flow-on impacts of $16m to give a total impact of $37.3m. In terms of employment, there were 278 persons employed directly and with total employment of 460. The total value of income to households was estimated to be $12.3m.

Milling of the hardwood logs generates about one-half of the impacts under all of the measures. Forestry contributes around one-quarter of the total impacts when the local and export uses are combined. The private property contribution represents around 15 per cent of the overall hardwood use and impact.

The multiplier impacts were around 1.6, which is considered to be in the moderate range. The industry in the region is not large and so the support industries tend to be limited in scope. The operations are based on the supply of $3m of logs to local processors. Thus, the ratio of the total impact to the value of logs is over 10, which is a substantial 'value-adding' effect. A similar high 'value adding' ratio exists when considered in terms of employment.

The information in Table 5-2 shows the total forestry industry in the South Coast region. In gross output terms, the value is approaching $100m in direct value and $170m in total value. The major contributor is the secondary processing of timber that includes the building of frames, trusses, windows, etc. This sits alongside a high level of building activity in the South Coast region that is generated by the high levels of population growth along the coastal areas and in the hinterland of the ACT.

The softwood operations in the South Coast region are relatively small at about one-third the size of the hardwood operations. Further the South Coast area has not been targeted for significant growth in softwood plantations - the Bombala and Tumut areas

are the main focus. State forests do form the basis for apiary and visitation that are significant. There is little mining in the forest areas.

TABLE 5-1: SOUTH COAST HARDWOOD ECONOMIC IMPACTS 1998-99

IMPACTS	Direct Effect	Flow-on Effects: Production Induced	Flow-on Effects: Consumption Induced	Flow-on Effects: Total Flow-on	TOTAL IMPACT
GROSS OUTPUT IMPACTS ($'000)					
Local hardwood milling:					
HWD Forestry	2,652	1,012	1,438	2,450	**5,102**
SWD Forestry	47	9	13	22	**69**
PP Forestry	277	111	160	271	**548**
Logging/Haulage	2,763	810	1,313	2,123	**4,886**
Milling (net)	10,850	2,297	5,099	7,397	**18,246**
TOTAL (mill gate)	**16,589**	**4,239**	**8,023**	**12,262**	**28,850**
Downstream Freight	1,456	416	542	957	**2,413**
TOTAL HWD MILLING	**18,045**	**4,654**	**8,565**	**13,219**	**31,264**
HWD Forestry (Other sales)	2,150	820	1,166	1,986	**4,136**
Logging/Haulage (Other sales)	1,124	329	534	863	**1,987**
TOTAL GROSS OUTPUT	**21,319**	**5,804**	**10,265**	**16,069**	**37,387**
VALUE ADDED IMPACTS ($'000)					
Local hardwood milling:					
HWD Forestry	1,571	559	799	1,357	**2,928**
SWD Forestry	38	5	7	12	**51**
PP Forestry	162	62	89	150	**312**
Logging/Haulage	1,797	455	729	1,184	**2,981**
Milling (net)	8,194	1,281	2,832	4,113	**12,307**
TOTAL (mill gate)	**11,762**	**2,361**	**4,456**	**6,817**	**18,579**
Downstream Freight	821	241	301	542	**1,363**
TOTAL HWD MILLING	**12,583**	**2,602**	**4,756**	**7,359**	**19,942**
HWD Forestry (Other sales)	1,273	453	648	1,100	**2,374**
Logging/Haulage (Other sales)	731	185	297	482	**1,213**
TOTAL VALUE ADDED	**14,588**	**3,240**	**5,701**	**8,941**	**23,529**
HOUSEHOLD INCOME IMPACTS ($'000)					
Local hardwood milling:					
HWD Forestry	1,004	336	388	724	**1,728**
SWD Forestry	9	3	4	7	**16**
PP Forestry	113	36	43	79	**192**
Logging/Haulage	946	277	354	631	**1,577**
Milling (net)	4,060	691	1,376	2,067	**6,127**
TOTAL (mill gate)	**6,132**	**1,342**	**2,165**	**3,507**	**9,640**
Downstream Freight	367	138	146	284	**651**
TOTAL HWD MILLING	**6,499**	**1,480**	**2,312**	**3,791**	**10,291**
HWD Forestry (Other sales)	814	272	315	587	**1,401**
Logging/Haulage (Other sales)	385	112	144	257	**641**
TOTAL HOUSEHOLD INCOME	**7,698**	**1,864**	**2,770**	**4,635**	**12,333**
EMPLOYMENT IMPACTS ($'000)					
Local hardwood milling:					
HWD Forestry	30	12	16	28	**58**
SWD Forestry	0	0	0	0	**1**
PP Forestry	5	1	2	3	**8**
Logging/Haulage	30	10	15	25	**55**
Milling (net)	164	24	58	82	**246**
TOTAL (mill gate)	**229**	**47**	**91**	**138**	**367**
Downstream Freight	12	5	6	11	**23**
TOTAL HWD MILLING	**241**	**52**	**97**	**149**	**390**
HWD Forestry (Other sales)	25	10	13	23	**47**
Logging/Haulage (Other sales)	12	4	6	10	**22**
TOTAL EMPLOYMENT	**278**	**66**	**116**	**182**	**460**

TABLE 5-2: SUMMARY OF FORESTRY ECONOMIC IMPACTS: BASE CASE, 1998-99

	Direct Effect		Total Impact		Sth Coast
	Value	% of	Value	% of	TOTAL
Gross Output ($m)					
Hardwood Milling etc.	18.0	0.3	31.3	0.6	
Softwood Milling etc.	5.5	0.1	8.7	0.2	
Other Activities	14.4	0.3	25.5	0.5	
Secondary Processing	58.7	1.0	101.8	1.8	
Total	**96.5**	**1.7**	**167.2**	**3.0**	**5,655.9**
Value Added ($m)					
Hardwood Milling etc.	12.6	0.4	19.9	0.6	
Softwood Milling etc.	4.0	0.1	5.8	0.2	
Other Activities	8.4	0.3	14.6	0.4	
Secondary Processing	21.9	0.7	43.5	1.3	
Total	**47.0**	**1.4**	**83.9**	**2.5**	**3,331.8**
Household Income ($m)					
Hardwood Milling etc.	6.5	0.4	10.3	0.6	
Softwood Milling etc.	1.5	0.1	2.4	0.2	
Other Activities	4.6	0.3	7.9	0.5	
Secondary Processing	11.0	0.7	21.6	1.3	
Total	**23.7**	**1.5**	**42.1**	**2.6**	**1,608.4**
Employment (no.)					
Hardwood Milling etc.	241	0.4	390	0.6	
Softwood Milling etc.	46	0.1	81	0.1	
Other Activities	173	0.3	300	0.5	
Secondary Processing	484	0.8	904	1.5	
Total	**944**	**1.5**	**1,676**	**2.7**	**61,433**

Forestry-based operations in the South Coast amount to about 2.5 per cent of the regional economy. About one-half of that contribution could be based on the forestry resources in the region and the remainder would likely exist even if there were imported wood products. On the other hand, the industry could be expanded if some of the exported logs were to be processed in the region.

The forestry industry appears to have been relatively stable over the 1990s with the population census employment indicators showing only small changes between 1991 and 1996. The estimates of direct employment in the industries that are comparable to the population census data are of a similar level.

5.2.3. Negotiated Outcome: South Coast Sub-Region

The preferred outcome has been investigated in terms of the economic impacts relative to the base case. The negotiated outcome involves a change in the level of supply of logs from State Forests NSW for processing and in the extent of value-adding processing. In addition, there is the supply of 25,597 m^3 of hardwood logs from private

property and 1,981 m^3 of softwood that are held constant at the level in the base case. The detail for the negotiated outcome is summarised below:

The negotiated outcome is close to the base case (a one per cent reduction) and reflects the commitments of SFNSW to supply 135,310 m^3 of hardwood.

Data relating to this negotiated outcome were entered into the economic impact model to estimate the total impacts for all of those activities that had changed. These were then compared with the base case estimates to obtain the tables shown in Attachment 7 and summarised in Table 5-3.

TABLE 5-3: SUMMARY OF THE NEGOTIATED OUTCOME IMPACT CHANGES FROM THE BASE CASE: HARDWOOD TIMBER INDUSTRY

Current Commitments	Direct Effect	Total Flow-on	**TOTAL IMPACT**
GROSS OUTPUT IMPACTS ($m)	-0.2	-0.2	-0.4
VALUE ADDED IMPACTS ($m)	-0.2	-0.1	-0.3
HOUSEHOLD INCOME IMPACTS ($m)	-0.1	0.0	-0.2
EMPLOYMENT IMPACTS (No.)	-3	-2	-5

5.3. THE SOUTHERN TABLELANDS SUB-REGION

The approach used is that described in Section 5.1 for the South Coast sub-region.

5.3.1. Sector Definitions and Data Sources

The activities were compiled in four groups. This grouping and the identified activities are used for the presentation of the results for the base case and the reference points.

- Those related to hardwood log supply and milling (primary or first stage processing).
- Those related to softwood log supply and milling (primary or first stage processing).
- Those activities that relate to the further fabrication of timber products (secondary processing) including structural framing, door frames, pallets etc. but excluding furniture and prefabricated buildings (or final stage processing).
- Those activities that occur in state forest areas that are not related to local milling in the Southern Tablelands.

They are discussed in turn and in reference to the associated tables.

Hardwood log supply and milling

The base data were derived from SFNSW data. These were then included in the response model to estimate the value of mill output, royalty payments and the costs of the main activities.

For the base year, the total volume of hardwood processed was 39,016m^3. This resulted in hardwood products valued at $4.905m (ex mill gate), or $5,437m to customers.

The freight associated with freighting those products to their markets (either traders or processors) is shown separately as 'downstream freight', which amounted to $532m.

The wood supply for processing was derived from two sources:

- HWD Forestry is the log supply from the Southern Tablelands State Forests that is processed in the Southern Tablelands sub-region. A separate item HWD Forestry (Other sales) relates to the logs from the Southern Tablelands that are processed in other regions (in this case – zero).
- PP Forestry is the supply of logs from private property in the Southern Tablelands. The milling of the private property logs is included in the total milling values.

A specific sector including costs structures and sales patterns (ie, a separate row and column in the input-output table) has been compiled for each of these supply operations. They have been based on expenditure data provided from SFNSW for their supply. The private property supply has been estimated on the basis of the forest operations of SFNSW. This does not allow for any overhead/administration costs and is designed to reflect relatively low levels of forest management in most items apart from labour.

There is also a specific sector to indicate the log, snig and haul costs –Logging/Haulage – which relates to that timber logged in the Southern Tablelands sub-region and milled in the Southern Tablelands sub-region. That component of the timber that is logged in the Southern Tablelands region but milled in other regions falls in the Logging/Haulage (other sales) sector (in this case – zero).

In summary, the hardwood operations (excluding downstream freight) include:

Log supplies to the value of:	
State Forests	$1.167m
Private property	$0.024m
Softwood	$0.000m
Log, snig and haul cost of:	$2.043m
Milling operations (net of log and logging costs) to the value of:	$1.671m
For the base case, these comprise a total ex-mill value of:	**$4.905m**

The above estimates can be reconciled with those in Table 4-9 through the inclusion of downstream freight in the value of gross output. In terms of employment, allowance has to be made for those employed in forestry and those in downstream freight. This gives an overall total direct employment of 75. These differences arise because of the

conventions used in input-output modelling that allocate activities differently from those used in the response analysis. There may also be some rounding errors in the data.

The total hardwood operations described also contributed:

- $2.732m to value added,
- $1.614m of payments to households, and
- employment for 69 people.

Softwood plantation management

The Southern Tablelands also includes significant areas of softwood plantations and milling operations. The softwood management activities relate to plantations and comprise only the forestry management operations. In the base case, the management expenditure on softwood forestry was $37.4m in total and $34.7m was supplied to softwood milling within the region with the balance being exported from the region.

The value of the logging and haulage was $24.9m of which $18.8m related to mills within the Southern Tablelands and the balance related to exports from the region. The total ex-mill value of production in the region was $142m.

The softwood forestry and milling operations in total contributed:

- $110.5m to value added,
- $43.7m of payments to households, and
- employment for 1242 people.

Secondary processing of timber products

Any further stage or secondary processing impacts has not been estimated for this sub-region.

Activities not related to Southern Tablelands log milling

The activities fall into two groups, namely:

- Those related to other SFNSW operations and management, and
- Those related to other activities.

Other SFNSW operations include:

SFNSW established softwood plantations in the region that accounted for expenditure of $7.331m.

There were no logs exported out of HWD Forestry (other sales)) and therefore no associated logging activities Logging/Haulage (other sales). Softwood exports from the

region amounted to $2.750m, plus the associated logging and haulage operations of $6.050m

The non-wood activities in forest areas are as follows.

Visitation to State Forests by either visitors to the region (tourism) or locals (recreation) is represented in the input-output model by the SF Visitors sector. Hassall & Associates estimated the number of visitors per year (70,000) along with an estimate of their daily expenditure ($23.04) associated with the visits to a State Forest. Total expenditure was estimated at $1.613m. These expenditure items were then disaggregated into various cost components and allocated to the respective input-output sectors. The estimated local expenditure (net of imported components and taxes) associated with these visitors amounted to $0.925m in 1998-99.

Apiary activities: Hassall & Associates estimated a value of $0.245m for 1997-98 apiary activities in State Forests in an associated study. This represented 15 per cent of the apiary activity in State Forests for the Southern CRA region.

The Department of Mineral Resources indicated that there were no mining activities in State Forests.

5.4. The Base Case: Southern Tablelands Sub-Region

The base case has been specified in detail in the tables on the basis of the operations in 1998-99. The details for the hardwood operations are presented in Table 5-4. Further details for each of the activities and the multipliers are included in Attachment 6 with one table for each of gross output, value added, household income and employment. An overall summary is included in Table 5-5. That table shows the values for softwood operations, secondary processing of wood products and other activities that occur on state forest land. The industry contribution to the Southern Tablelands economy is also shown in Table 5-5.

Table 5-4 shows that the gross output from hardwood operations was $5.4m that generated flow-on impacts of $3.6m to give a total impact of $9.0m. In terms of employment, there were 75 persons employed directly with total employment of 112. The total value of income to households was estimated to be $2.7m.

Milling of the hardwood logs generates about one-third of the impacts under the output and value added measures and one-half the income and employment measures.

The multiplier impacts were around 1.6 which is considered to be in the moderate range. While the industry in the region is significant the region is not large and so the support industries tend to be limited in scope. The hardwood operations are based on the supply of $1.2m of logs to local processors. Thus, the ratio of the total impact to the value of logs is over 7, which is a substantial 'value-adding' effect. A similar high 'value adding' ratio exists when considered in terms of employment.

The information in Table 5-5 shows the total forestry industry in the Southern Tablelands region. In gross output terms, the value is approaching $170m in direct value and $250m in total value. The softwood operations in the Southern Tablelands

TABLE 5-4: SOUTHERN TABLELANDS HARDWOOD ECONOMIC IMPACTS 1998-99

IMPACTS	Direct Effect	Flow-on Effects: Production Induced	Flow-on Effects: Consumption Induced	Flow-on Effects: Total Flow-on	TOTAL IMPACT
GROSS OUTPUT IMPACTS ($'000)					
Local hardwood milling:					
HWD Forestry	1,167	406	290	696	**1,863**
SWD Forestry	0	0	0	0	**0**
PP Forestry	24	6	11	17	**41**
Logging/Haulage	2,043	424	715	1,139	**3,182**
Milling (net)	1,671	630	844	1,474	**3,145**
TOTAL (mill gate)	**4,905**	**1,466**	**1,860**	**3,326**	**8,231**
Downstream Freight	532	108	155	263	**795**
TOTAL HWD MILLING	**5,437**	**1,574**	**2,015**	**3,589**	**9,027**
HWD Forestry (Other sales)	0	0	0	0	**0**
Logging/Haulage (Other sales)	0	0	0	0	**0**
TOTAL GROSS OUTPUT	**5,437**	**1,574**	**2,015**	**3,589**	**9,027**
VALUE ADDED IMPACTS ($'000)					
Local hardwood milling:					
HWD Forestry	706	210	163	373	**1,079**
SWD Forestry	0	0	0	0	**0**
PP Forestry	14	4	6	10	**24**
Logging/Haulage	1,301	252	403	655	**1,956**
Milling (net)	712	371	475	847	**1,559**
TOTAL (mill gate)	**2,732**	**837**	**1,047**	**1,884**	**4,617**
Downstream Freight	300	66	87	153	**454**
TOTAL HWD MILLING	**3,033**	**903**	**1,135**	**2,038**	**5,070**
HWD Forestry (Other sales)	0	0	0	0	**0**
Logging/Haulage (Other sales)	0	0	0	0	**0**
TOTAL VALUE ADDED	**3,033**	**903**	**1,135**	**2,038**	**5,070**
HOUSEHOLD INCOME IMPACTS ($'000)					
Local hardwood milling:					
HWD Forestry	190	131	73	205	**394**
SWD Forestry	0	0	0	0	**0**
PP Forestry	10	2	3	5	**15**
Logging/Haulage	663	129	181	310	**973**
Milling (net)	751	185	213	398	**1,149**
TOTAL (mill gate)	**1,614**	**447**	**469**	**917**	**2,531**
Downstream Freight	138	34	39	73	**211**
TOTAL HWD MILLING	**1,752**	**481**	**509**	**990**	**2,742**
HWD Forestry (Other sales)	0	0	0	0	**0**
Logging/Haulage (Other sales)	0	0	0	0	**0**
TOTAL HOUSEHOLD INCOME	**1,752**	**481**	**509**	**990**	**2,742**
EMPLOYMENT IMPACTS ($'000)					
Local hardwood milling:					
HWD Forestry	6	4	3	7	**13**
SWD Forestry	0	0	0	0	**0**
PP Forestry	0	0	0	0	**1**
Logging/Haulage	15	5	7	12	**27**
Milling (net)	48	7	9	15	**63**
TOTAL (mill gate)	**69**	**16**	**19**	**35**	**105**
Downstream Freight	5	1	2	3	**8**
TOTAL HWD MILLING	**75**	**17**	**21**	**38**	**112**
HWD Forestry (Other sales)	0	0	0	0	**0**
Logging/Haulage (Other sales)	0	0	0	0	**0**
TOTAL EMPLOYMENT	**75**	**17**	**21**	**38**	**112**

region are the most significant. State forests in this area do not support substantial apiary and visitation activities. Forestry-based operations in the Southern Tablelands amount to between 15 and 21 per cent of the regional economy depending on the measure used.

TABLE 5-5: SUMMARY OF ECONOMIC IMPACTS: BASE CASE, 1998-99

	Direct Effect		Total Impact		
	Value	% of	Value	% of	TOTAL
Gross Output ($m)					
Hardwood Milling etc.	5.4	0.4	9.0	0.7	
Softwood Milling etc.	144.8	10.8	211.2	15.8	
Other Activities	17.3	1.3	27.8	2.1	
Secondary Processing	0.0	0.0	0.0	0.0	
Total	**167.6**	**12.6**	**248.0**	**18.6**	**1,335.0**
Value Added ($m)					
Hardwood Milling etc.	3.0	0.4	5.1	0.6	
Softwood Milling etc.	104.1	13.2	142.6	18.1	
Other Activities	9.8	1.2	15.9	2.0	
Secondary Processing	0.0	0.0	0.0	0.0	
Total	**117.0**	**14.8**	**163.6**	**20.7**	**790.1**
Household Income ($m)					
Hardwood Milling etc.	1.8	0.5	2.7	0.7	
Softwood Milling etc.	41.3	10.7	58.9	15.3	
Other Activities	5.1	1.3	8.0	2.1	
Secondary Processing	0.0	0.0	0.0	0.0	
Total	**48.2**	**12.5**	**69.7**	**18.1**	**384.7**
Employment (no.)					
Hardwood Milling etc.	75	0.5	112	0.8	
Softwood Milling etc.	1,177	8.0	1,862	12.7	
Other Activities	148	1.0	257	1.7	
Secondary Processing	0	0.0	0	0.0	
Total	**1,400**	**9.5**	**2,231**	**15.2**	**14,698**

5.4.1. Negotiated Outcome: Southern Tablelands

The negotiated outcome for the Southern Tablelands sub-region involves an increase in the allocation of hardwood timber to the processors to 58,818 m^3. This represents an increase of just over 10,000 m^3 relative to the 1998-99 commitments and almost 20,000 m^3 more than that taken in 1998-99. Much of the increase in available wood is in the high quality types.

The economic impact of this increase in wood supply is shown in Table 5-6. The impacts are shown in two ways. The first relates to the levels of wood actually taken in 1998-99 and is shown by the items '48000 Negotiated Outcome'. This shows a total

increase in gross output of $6.2m and 62 more jobs. That is equivalent to an increase of about one-half of one per cent in the economy. Within all of the forestry activities, the effect amounts to about a 3 per cent increase in forestry activities.

TABLE 5-6: SUMMARY OF THE NEGOTIATED OUTCOME IMPACT CHANGES FROM THE BASE CASE: HARDWOOD TIMBER INDUSTRY

Information Point	Direct Effect	Total Flow-on	**TOTAL IMPACT**
GROSS OUTPUT IMPACTS ($m)			
Current Commitments	1.8	1.0	2.8
48000 Negotiated Outcome	4.2	2.0	6.2
VALUE ADDED IMPACTS ($m)			
Current Commitments	1.3	0.6	1.9
48000 Negotiated Outcome	3.1	1.1	4.3
HOUSEHOLD INCOME IMPACTS ($m)			
Current Commitments	0.6	0.3	0.9
48000 Negotiated Outcome	1.4	0.5	1.9
EMPLOYMENT IMPACTS (No.)			
Current Commitments	21	10	31
48000 Negotiated Outcome	41	21	62

The second option is to compare the increase with what would have been the level of activity in 1998-99 if all of the wood allocations had been taken up. These estimates are also shown in Table 5-6 under the 'Current Commitments' heading. In these cases, the total economic impact is generally less than one-half of those relative to actual 1998-99 operations.

Overall, the changes are relatively small both in terms of the forestry industry and the regional economy. In this region, those increases in activity would take place in an environment where the timber industry is already expanding rapidly under the impetus of softwood plantations and associated processing operations. The developments in relation to hardwood would assist in maintaining a greater range of timber industry activities in the region.

6. SUMMARY AND CONCLUSIONS

This study has been undertaken as part of the process for establishing a RFA in Southern NSW. Two sub-regions were identified. The first spans the coast south from Wollongong but not inducing the Eden area that has been studied previously, and second, an inland area including the Tablelands between the ACT and the Victorian border. These provide a mix of inland and coastal ares and a mix of factors that influence the socio-economic performance of regional economies.

The South Coast sub-region has been a high population and economic growth region of NSW. The attractiveness of the coastal region underpins the population growth along with a high level of visitation during the summer. While there has been some employment growth, the unemployment rate has been consistently above the rate for NSW, particularly in the coastal shires. In 1996, employment in the region was 61,435.

The sub-region as a whole has a high degree of industry diversity and a mix of industries that is slightly biased toward low growth industries. The sub-region appears to be under the NSW average for the provision of many services, especially those that support business activity. In both the north and south of the sub-region, many residents take advantage of employment opportunities in the Wollongong area and the ACT.

The average household income in the South Coast sub-region is about 10 per cent lower than the average for NSW. When related to living costs, that appears to be a good result. The region has a high dependence on social welfare payments as measured by the tax paid to social welfare benefits received ratio. In the South Coast, this is 1.2 compared to a NSW average of 1.6.

The Southern Tablelands sub-region is a smaller economy and specialised on forestry and tourism, especially that related to the snowfields. The region has relatively low population and employment growth and the unemployment rate has been under the NSW average for most of the recent years. In 1996, employment in the region was 14,705.

Generally, the region reflects the stability, limited growth and low incomes of rural regions. Alongside that pattern is the high incomes and growth in the Snowy River Shire based around the snowfields. Beyond those services associated with tourism, the region is poorly serviced especially in terms of the services that support business activity.

The average household income in the Southern Tablelands is 15 per cent below that for NSW which is a figure inflated by the snowfields developments. Outside of the Snowy River Shire, the importance of welfare payments relative to tax paid is lower in the Southern Tablelands than on the South Coast (the tax to benefits ratio is 1.45).

The timber industry has been part of these sub-region economies for many years. However, the paths taken in respect of the timber industry provide a marked contrast in terms of their development. These differences are discussed briefly below.

In the South Coast sub-region, there has been a winding down of the timber industry as the region has diversified through the growth of manufacturing, tourism, recreation and retirement activities. In this sub-region, all forestry-based activities account for about 2.5 per cent of the economic activity: in employment terms the total impact (direct plus flow-on) is 1676. Between 50 per cent and 60 per cent of that activity is secondary processing. Thus, not much more than one per cent of this sub-region economy is attributable to forestry activities in the region. There will be a few localities where the timber industry is significant to their future, but these are few in number and some of those on the coast are benefiting from other sources of growth.

The negotiated outcome for the South Coast sub-region involves a very minor change in the level of logging from that permitted in 1998-99. There has been a history of adjustments to the level of logging over recent years along with additions to the areas reserved for national parks. Thus most of the adjustments to a reduced level of logging has already occurred. On the other hand, this is not a priority area for establishing plantations. Thus, there has not been a significant amount of plantation-based timber industry development.

The Southern Tablelands has achieved slower growth than the South Coast apart from the snowfields area. Here, many of the development opportunities reside in the natural resource base and primary production, including timber. In the base year, the timber industry activities accounted for between 15 per cent and 20 per cent of economic activity depending on the measure used. Base year total employment was 2231 all of which was in forestry and primary processing.

There has been change in the composition of the forestry industries. This region has moved from native forests to a high level of softwood plantations that supply a range of processing activities. The hardwood activities in 1998-99 accounted for less than one per cent of the economic activity in the region while softwood activities accounted for between 13 per cent and 18 per cent of the region's economic activity. The softwood processing is expanding with a cardboard production plant along with additional plantations to increase the supply of wood.

The negotiated outcome for the Southern Tablelands involved an increase in the supply of hardwood logs that were mostly in the high quality range. This would almost double the level of activity in the hardwood sector of the industry relative to that in 1998-99. It is notable that in 1998-99, about one-quarter of the hardwood supply commitments were not taken up. Thus, the negotiated outcome has the potential to add about $6m to the 1998-99 gross output and around 60 jobs.

ATTACHMENT 1: INPUT-OUTPUT METHODS

6.1.1. Introduction

An input-output or transactions table is the basic component of input-output analysis. A descriptive 'snapshot' of any selected region for a particular year (financial or calendar) is provided in an input-output table. Within the table the economy is represented in terms of aggregated commodity groups, industries or sectors. Any input-output table can be as aggregated or disaggregated as required. The availability of data and the purposes of the study generally determine the level of sector disaggregation.

The intersectoral transactions for a given period are summarised in the table which is conventionally presented in a (n*n square) matrix form which shows the general accounting framework of the economy. The sales from sector, *i*, to all other sectors are shown in the *ith* row of the matrix and the purchases by sector, *j*, from all other sectors are included in the *jth* column. Hewings (1985, p23) states that these:

> are sales and purchases made on the current account and represent stages in the processing of intermediate goods. Current account purchases are those that a firm needs for the production of its commodities in any given year. Intermediate goods are those that are sold to other firms for further processing (or value-adding) prior to sale to final consumers.

An input-output table is divided into four main quadrants. In the table transactions between sectors are shown in the intermediate quadrant. Import requirements and purchases from local households (labour income or wages and salaries) are included in the primary inputs quadrant. Exports out of the region, and sales to households are part of the final demand quadrant. Other value added cells in the primary inputs quadrant incorporate gross operating surplus, depreciation, taxes, subsidies, import duties; and other final demand cells include government expenditure, capital expenditure and changes in stocks. The final quadrant includes the primary inputs into the final demand categories. Sectoral employment numbers are also provided in an input-output table.

TABLE 1: INPUT-OUTPUT TABLE QUADRANTS

1 Intermediate Quadrant	3 Final Demand Quadrant
2 Primary Inputs Quadrant	4

Once a transaction table has been developed for a particular region, simple mathematical procedures can be applied to derive multipliers for each sector of the economy. The main function of input-output tables is to analyse problems involving the

intersectoral linkages using the derived multipliers. In an input-output transactions table a consistent and disaggregated accounting system is provided for a regional economy. Therefore, 'in the regional policy and planning context the transactions table gives both a general understanding of the economy of a particular region and important information on particular aspects of the regional economy' (Leslie and Powell 1990, p16).

6.1.2. Compilation of Input Output Tables

The compilation of some 200 input-output tables by CARE has followed the same procedure as those compiled in many other impact studies in Australia.

Input-output tables can be constructed by:

(i) collecting detailed data from all firms in the economy using direct survey methods;

(ii) using various types of statistical and estimation methods involving essentially no survey work; or

(iii) any level of combination of both (i) and (ii).

Some form of method (iii) is usually chosen since:

detailed surveys are costly in terms of data collection, processing and the lengthy period of time to produce such a table, and

entire non-survey methods are not generally statistically accurate although the tables are less expensive and quicker to produce.

The challenge to find cheaper methods of constructing tables, particularly at the regional level, existed in Australia. This was taken up by a research group at the University of Queensland and led to the so-called GRIT (Generation of Regional Input-output Tables) method. This is appropriately termed a "hybrid" method and utilises both survey, or superior data, and computer methods to generate tables. It allows the analyst to exercise judgement as to how much primary data are needed to construct a table suitable for the task at hand and to focus resources on the important elements/sectors. This method has come to dominate the construction of regional input-output tables in Australia.

The following provides a brief overview of the GRIT method and is drawn mainly from Jensen and West (1986). The initial comprehensive report was that of Jensen, Mandeville and Karunaratne (1979).

The GRIT system was designed to:

combine the benefits of survey based tables (accuracy and understanding of the economic structure) with those of non-survey tables (speed and low cost);

enable the tables to be compiled from other recently compiled tables;

allow tables to be constructed for any region for which certain minimum amounts of data were available;

develop regional tables from national tables using available region-specific data;

produce tables consistent with the national tables in terms of sector classification and accounting conventions;

proceed in a number of clearly defined stages; and

provide for the possibility of ready updates of the tables.

The resultant GRIT procedure has a number of well-defined steps. Of particular significance are those that involve the analyst incorporating region-specific data and information specific to the objectives of the study. The analyst has to be satisfied about the accuracy of the information used for the 'important' sectors. The method allows the analyst to allocate available research resources to improving the data for those sectors of the economy that are most important for the particular study. It also means that the method should be used by an analyst who is familiar with the economy being modelled, or at least someone with that familiarity should be consulted.

An important characteristic of GRIT-produced tables relates to their accuracy. In the past, survey-based tables involved gathering data for every cell in the table, thereby building up a table with considerable accuracy. A fundamental principle of the GRIT method is that not all cells in the table are equally important. Some are not important because they are of very small value and, therefore, have no possibility of having a significant effect on the estimates of multipliers and economic impacts. Others are not important because of the lack of linkages that relate to the particular sectors that are being studied. Therefore, the GRIT procedure involves determining those sectors and, in some cases, cells that are of particular significance for the analysis. These represent the main targets for the allocation of research resources in data gathering. For the remainder of the table, the aim is for it to be 'holistically' accurate (Jensen 1980). That means a generally accurate representation of the economy is provided by the table, but does not guarantee the accuracy of any particular cell.

A summary of the steps involved in the GRIT process is shown in Table 2. The parent table used to generate the 1995-96 input-output tables for NSW and the 12 SDs was the national input-output table for 1993-94 (ABS 1997).

TABLE 2: THE GRIT METHOD

Step	Action
PHASE I	ADJUSTMENTS TO NATIONAL TABLE
1	Selection of national input-output table. (107-sector table with indirect allocation of all imports, in basic values).
2	Adjustment of national table for updating.
3	Adjustment for international trade.
PHASE II	ADJUSTMENTS FOR REGIONAL IMPORTS
	(Steps 4-14 apply to each region for which input-output tables are required)
4	Calculation of "non-existent" sectors.
5	Calculation of remaining imports.
PHASE III	DEFINITION OF REGIONAL SECTORS
6	Insertion of disaggregated superior data.
7	Aggregation of sectors.
8	Insertion of aggregated superior data.
PHASE IV	DERIVATION OF PROTOTYPE TRANSACTIONS TABLES
9	Derivation of transactions values.
10	Adjustments to complete the prototype tables.
11	Derivation of inverses and multipliers for prototype tables.
PHASE V	DERIVATION OF FINAL TRANSACTIONS TABLES
12	Final superior data insertions and other adjustments.
13	Derivation of final transactions tables.
14	Derivation of inverses and multipliers for final tables.

Source: Table 2 in Bayne and West (1988)

6.1.3. Methods Used

The input-output tables developed at CARE are constructed using the GRIT method supplemented by data gathered from a variety of other sources as detailed in the reference list. These tables should be considered in the context of 'holistic' accuracy whereby they are considered to be generally representative of the sectors in the economies even though no particular cell may be necessarily accurate.

Once the input-output tables were developed using the GRIT procedure (phases I to IV in Table A1.1) other adjustments and refinements that were made to the tables (phase V in Table A1.1) were undertaken in the IO7 (Input-Output Analysis Version 7.1) program. West (1992) developed this program from earlier versions of the GRIMP (Generation of Regional Impacts) program, also developed by West. This software is also used to generate multipliers from the input-output tables.

Data were gathered from a variety of mostly secondary sources. The following description applies to the construction of the set of 1995-96 input-output tables for NSW.

Employment

For the 1995-96 input-output tables employment data were obtained from the Australian Bureau of Statistics (ABS 1998). These data were allocated to the respective 107 national input-output sectors on the basis of Appendix B in ABS (1997). Undefined, not stated and non-classifiable units were proportionately allocated to these 107 sectors.

Gross Output

Gross output for the agricultural, mining and manufacturing sectors was sourced from the ABS (1997a, g, d and e). For the other sectors where this was not available, total output or production was estimated using the ratio of wage and salaries paid in each sector to the total output of each sector, Or the ratio of employment in each sector to total output in each sector - depending upon the stability of the estimates. The ratios were obtained from the Australian national input-output tables (ABS 1997b) and applied to the total estimated wage and salaries earned in each sector or total employment in each sector. For example:

$$A_{NSW_i} = A_{AUS_i} / W_{AUS_i} * W_{NSW_i}$$

where: $i = 1...109$

A_{NSW_i} = *sector i output in NSW*

A_{AUS_i} = *sector i output in Australia*

W_{NSW_i} = *estimated wages and salaries paid in sector i in NSW*

W_{AUS_i} = *total wages and salaries paid in sector i in Australia.*

The agricultural output values were collected from the ABS (1997a) and converted into local values of production (excluding marketing and transport of the commodities after they leave the farm gate) using State data from the ABS (1997g).

Manufacturing sector outputs were estimated using sector aggregates from the Manufacturing Industry Survey for 1995-96 (ABS 1997d) and applying them to the sector details from the Manufacturing Industry Census for 1993-94 (ABS 1996c). The employment census data were used to adjust these data to estimate total sectoral output.

Mining sector outputs were obtained from the ABS (1997e) for NSW. For the regions the relationships between employment and output in NSW were applied to regional employment to estimate regional outputs.

Household Income

Wages and salaries paid in each sector were calculated by multiplying the number of wage and salary earners employed in each sector by the average earnings paid in NSW in May 1996 (ABS 1996d). The average wage and salary calculated for 1995-96 equalled annual gross earnings by total employed wage and salary earners divided by the average number of wage and salary earners. For the regional tables the NSW

earnings were adjusted using information from the ABS (1998b) which provided information on incomes by industry division for each region.

In general, total household income generated by each sector was calculated by multiplying the average earnings for NSW above, by the total number of people 'employed' in each sector.

Therefore the household income row in the regional tables is different from that compiled in the national input-output table. A wage has been imputed for non-wage and salary earners in the regional tables. This imputed wage is part of gross operating surplus in the national table. The rest of the primary inputs sectors (excluding imports) is included in the other value added row (O.V.A) of the regional input-output tables.

Household Expenditure

The procedure for collecting and manipulating household expenditure data was that outlined in Morison and West (1988) which is detailed below. In following this procedure ABS publications (1993-1997 various quarters, 1996a, b and 1997b,c,f) were used.

For the rural areas in NSW detailed household expenditure data for NSW (ABS 1996b) were converted to NSW 'country' values (total outside capital city) using the relationship between the two areas at the broad expenditure group level (Table 20, ABS 1996b). That is:

$$a_{C_{bread}} = a_{NSW_{bread}} * A_{C_{Food}} / A_{NSW_{Food}}$$

where:	a	=	*average weekly expenditure on a particular item*
	A	=	*average weekly expenditure on broad expenditure group*
	C	=	*country households*
	NSW	=	*all households in NSW.*

The detailed household expenditure data for each region were then aggregated into the appropriate 107 input-output sectors. These values were in purchasers' prices and needed to be converted into basic values for use in input-output tables. To do this, commodity taxes and marketing margins needed to be separated and allocated to the appropriate sectors. The allocation of margins and taxes was undertaken by applying the national reconciliation of flows at basic values and purchasers' prices for final private consumption expenditure (ABS 1997b). From each item purchased taxes/subsidies were allocated to O.V.A. (other value added row) and margins were proportionately allocated to the margin sectors (trade, transport, personal services). The remaining basic values of the commodities/services and the allocated margins were then adjusted for imports. Imports were calculated using location quotients (LQs). Where:

$$LQ_i = R_i / R * N / N_i$$

where:	i	=	*sector 1....109*
	R	=	*regional employment*
	N	=	*national employment.*

If the sectoral location quotient is greater than one then all the commodity/service can potentially be supplied from within the local region, given that the ratio of national employment can meet the demands of the country. If the location quotient is less than one then local supplies will not meet all the demands of the local region. In this case some proportion of the commodity/service will need to be purchased from outside the region (that is, imported). For example, if LQ = 0.60 then potentially 60 per cent may be purchased locally but at least 40 per cent of the requirements will need to be imported from outside the local region.

These location quotients provide minimum import requirement levels - that is, more of certain commodities/services may need to be imported than indicated by the LQs. This may arise when exports of locally produced products are not considered or cheaper imports make the locally produced product less attractive. Adjustments to imports are made when the total regional household expenditure per sector is compared with the total output of each sector. Further adjustments are made in GRIMP after the initial input-output table has been generated when combined household expenditure and intermediate purchases from each sector are compared with the total output and exports of that sector.

The State Accounts (ABS 1997c) provided the basis for updating the household expenditure from the 1993-94 Household Expenditure Survey to 1995-96 values. Data were also adjusted to be consistent with the national accounting framework in the national input-output table by adjusting the state estimates by a ratio of the national estimates derived following this procedure and those that appear in the national input-output table.

Once the local weekly household expenditure patterns were developed for 107 sectors these were multiplied up to annual values and further multiplied by the number of households in the region. From these manipulations a total annual regional household expenditure pattern was derived. The number of households in the region were calculated by dividing the population (ABS 1997f) by the estimated number of people per household obtained from ABS (1996b).

Other Final Demand and Exports

Other final demand (O.F.D.) is a combination of government current expenditure, government capital expenditure, private capital expenditure, public capital expenditure and the change in stocks. The State Accounts (ABS 1997c) provide aggregates of these, annually. These aggregates were then allocated across the sectors on the basis of the relationships in the national input-output table. For regions, the expenditure was estimated based on the relative proportion of the regional share of gross state product with adjustments using location quotients for spatial allocation.

Initially, exports were calculated as the residue of the total value of output for a sector less the sales made by that sector, to other sectors (including households and other final demand) within the region. The actual values attributed to exports from the primary and secondary sectors were estimated from ABS (1997b).

Note that exports from NSW (or any regional input-output model) also includes sales to other states/regions of Australia (ie exports equals all sales outside the region covered by the input-output model).

Once the input-output tables were generated using the GRIT program several consistency checks were made, resulting in further data checks and changes and several runs of the GRIT program for the input-output table. Final refinements were made to the tables in the GRIMP program. The NSW input-output table was also rationalised against the State Accounts ABS (1995).

6.1.4. Input-Output Sectors

The NSW 1995-96 input-output table is compatible with the recently released national 1993-94 input-output table which has 107 sectors and is based on the ANZIC. While the input-output tables are available at the 107 sector level, equivalent with the 1995-96 national input-output table which is based on ASIC, a typical sector aggregation is shown in Attachment 2 with the corresponding 107 sector description.

6.1.5. References

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ATTACHMENT 2: SECTOR CLASSIFICATION

Sector Aggregation	107 IO Sectors
Sheep	Sheep for meat and wool
Grains	Grains inc. cereals, oilseeds, legumes
Beef Cattle	Beef cattle
Dairy Cattle	Dairy cattle
Pigs	Pigs
Other Agriculture	Poultry for meat and eggs Other agriculture, inc. nurseries, vegetables, fruit, cotton, tobacco, sugar cane, herbs, hay, goats, horses, deer, beekeeping, pet breeding.
Services to agriculture	Cotton ginning, shearing and wool classing, aerial ag services, contract harvesting, seed grading, land clearing; hunting
Forestry & Fishing	Forestry and logging Commercial fishing and aquaculture
Mining	Coal; oil and gas Iron ores Non-ferrous metal ores Other mining inc. construction materials Services to mining inc. exploration
Food Mfg	Meat and meat products Dairy products Fruit and vegetable products Oils and fats Flour and cereal foods Bakery products Confectionery Other food products inc sugar, seafood, animal/bird feed, spices, herbs, savoury snacks, tea, honey - blended etc. Soft drinks, cordials, syrups Beer and malt Wine and spirits Tobacco products
Textile Mfg	Textile fibres, yarns and woven fabrics Textile products inc. blinds, awnings, curtains, sails, tents, carpets, rugs, ropes, nets, string, cord, bags, sacks etc. Knitting mill products Clothing Footwear Leather and leather products
Wood Mfg	Sawmill products inc sawn timber, woodchips, dressed timber Plywood, veneer, fabricated boards Other wood products inc. structural components - windows, doors, trusses, frames, containers, pallets, cases, log preservation.
Printing/Publishing	Pulp, paper and paper-board Paper bags and products Printing; services to printing Publishing; recorded media etc
Chemical Mfg	Petroleum and coal products Basic chemicals inc. fertilisers, industrial gas/chemicals, synthetic resins, dyes, acid, salt, urea, fluoride, chlorine etc. Paints Pharmaceuticals etc inc. drugs, medicines, medicinal preparations Soap and detergents Cosmetics and toiletries Other chemical products inc. explosives, ink, glue, polish, cleaners Rubber products Plastic products
Mineral Mfg	Glass and glass products Ceramic products Cement, lime and concrete slurry Plaster; other concrete products Non-metallic mineral. products nec inc. abrasives, chalk, stone products, insulation materials, ag/hydrated/quick lime,
Metal Mfg	Iron and steel rolling, galvanising, casting, forging, pipes and tubes Basic non-ferrous metals inc alumina, aluminium, copper, silver, lead, zinc, gold, bronze, nickel, tin – smelting, refining, rolling, drawing, extruding, casting, forging Structural metal products inc girders, reo-mesh, architectual products, doors, gates, windows etc Sheet metal products inc. containers, guttering, downpipes, tanks Fabricated metal products inc. tools, general hardware, springs, wire, nails, nuts, bolts, screws, rivets, metal coating, non-ferrous pipe fittings, miscellaneous metal products
Mach/Equip Mfg	Motor vehicles and parts etc

Sector Aggregation	107 IO Sectors
	Ships and boats Railway equipment Aircraft Scientific etc equipment inc photographic, optical, medical, surgical Electronic equipment inc. computer, telecommunication, radio, TV Household appliances Other electrical equipment inc. cable, wire, batteries, lights, signs, fuses, electric motors, generators, welding equip. etc Agricultural, mining, construction machinery inc lifting/handling Other machinery and equipment inc. food processing, machine tool/part, pumps/compressors, commercial heating/cooling equip.
Other Mfg	Prefabricated buildings Sheet metal, wooden and upholstered furniture, mattresses, pillows, cushions (not rubber) Other manufacturing inc jewellery, toy, sporting goods, brushes, miscellaneous goods
Utilities	Electricity generation, distribution and supply Gas distribution and town gas mfg/dist. Via mains Water supply, sewerage and drainage services
Resident. Building Other Construction	Residential building Non-residential building, Non-building construction inc. road/bridge, earthmoving, irrigation, mitigation
Wholesale Trade	Resale of new or used goods to business or institutional users.
Retail Trade	Resale of new or used goods to final consumers for personal or household consumption eg main-street establishments
Mechanical Repairs	Mechanical repairs
Other Repairs	Other repairs in. household equipment repairs etc
Accommodation Restaurants	Accommodation inc. hotels, motels, guest houses, youth hostels, student residences, camping grounds, caravan parks; cafes & restaurants; hospitality clubs, pubs, taverns and bars
Road Transport	Road freight and passenger transport
Rail Transport	Rail; pipeline; other inc. cable car, chair lift etc
Water Transport	International, coastal, inland water transport inc sea freight, cruise operation, boat charter, ferry.
Air Transport	Scheduled domestic and international air transport and non-scheduled air & space transport.
Transport Services	Services to road, water and air transport; travel agency, freight forwarding, customs agency; storage
Communication	Postal, courier, telecommunications
Banking	Reserve Bank; development, savings and trading banks
Non-bank Finance	Building societies, credit unions, money market dealers, deposit taking financiers etc
Investment & Insurance	Financial asset investors Insurance and services Services to finance and investment inc. brokers
Ownership of dwellings	Residential Property Operators
Property Services	Commercial property operators and developers, real estate agents, non-financial asset investors, machinery and equipment hiring and leasing
Technical, Computer Services	Scientific research, architectural, surveying, consultant engineering, other technical services, data processing, information storage and retrieval, computer maintenance and consultancy services.
Legal/Account/Mgt/Mkt'g	Legal, accounting, advertising, commercial art and display, market research, business administration and management services
Other business services	Employment placement, contract staff, secretarial, pest control, cleaning, packing, etc.
Public Administration	Federal, state, local government administration; justice Defence
Education	Education
Health	Hospitals, nursing homes, medical and health services; veterinary services
Community Care Services	Child care, accommodation for the aged, residential care services, non-residential care services eg meals on wheels, counselling.
Entertainment/ Media	Motion picture, film and video, radio and television
Cultural	Libraries, museums, parks and gardens, arts
Sport, Gambling	Sport, gambling and other recreation services
Personal Services	Personal and household goods hiring; laundries, drycleaners; photographic studios and processing, funeral directors etc, gardening, hairdressing etc; private households employing staff
Other Services	Religious organisations; Interest groups - business and professional associations; Public order and safety

ATTACHMENT 3: 107 SECTOR SHIFT-SHARE EMPLOYMENT ANALYSIS: SOUTH COAST SUB-REGION

Sector	Employment		Growth		Component				**Total**
	1996	1991	NSW Gni	Local Gri	State	Industry	**Total State**	Local	**Change**
Sheep	577	673	0.54	0.86	44	-354	**-310**	214	**-97**
Grains	36	7	2.20	5.03	0	8	**9**	21	**29**
Beef cattle	684	905	0.70	0.76	59	-330	**-272**	50	**-221**
Dairy cattle	820	860	1.00	0.95	56	-57	**-1**	-39	**-40**
Pigs	18	13	0.83	1.36	1	-3	**-2**	7	**5**
Poultry	17	49	0.86	0.35	3	-10	**-7**	-25	**-32**
Other agriculture	829	641	0.97	1.29	42	-60	**-18**	206	**188**
Services to agric.; hunting	191	175	0.91	1.09	11	-27	**-16**	31	**16**
Forestry and logging	174	194	1.07	0.90	13	1	**14**	-34	**-20**
Commercial fishing	385	379	1.00	1.02	25	-26	**-2**	8	**6**
Coal; oil and gas	208	227	0.86	0.92	15	-47	**-32**	14	**-18**
Iron ores	0	0	0.00	0.00	0	0	**0**	0	**0**
Non-ferrous metal ores	14	24	0.74	0.57	2	-8	**-6**	-4	**-10**
Other mining	195	260	1.11	0.75	17	12	**29**	-94	**-65**
Services to mining	41	17	1.03	2.42	1	-1	**1**	23	**24**
Meat and meat products	252	388	1.14	0.65	25	31	**56**	-191	**-136**
Dairy products	168	150	0.94	1.13	10	-19	**-9**	28	**19**
Fruit and vegetable products	19	33	1.04	0.58	2	-1	**1**	-15	**-14**
Oils and fats	3	0	0.88	0.00	0	0	**0**	3	**3**
Flour and cereal foods	129	93	1.02	1.39	6	-4	**2**	34	**36**
Bakery products	366	375	1.00	0.98	24	-24	**1**	-10	**-9**
Confectionery	20	20	0.96	0.99	1	-2	**-1**	1	**0**
Other food products	53	42	1.18	1.26	3	5	**8**	3	**11**
Soft drinks, cordials, syrups	3	26	0.94	0.13	2	-3	**-2**	-21	**-22**
Beer and malt	4	3	0.67	1.34	0	-1	**-1**	2	**1**
Wine and spirits	14	7	1.52	1.93	0	3	**4**	3	**7**
Tobacco products	3	0	0.69	0.00	0	0	**0**	3	**3**
Textile fibres, yarns etc	17	22	0.92	0.77	1	-3	**-2**	-3	**-5**
Textile products	93	68	0.74	1.38	4	-22	**-18**	43	**26**
Knitting mill products	3	8	0.56	0.42	1	-4	**-4**	-1	**-5**
Clothing	142	80	1.04	1.77	5	-2	**3**	59	**62**
Footwear	7	0	0.68	0.00	0	0	**0**	7	**7**
Leather and leather products	15	24	0.80	0.62	2	-6	**-5**	-4	**-9**
Sawmill products	292	212	1.38	1.38	14	67	**80**	-1	**80**
Other wood products	484	573	0.87	0.85	37	-114	**-77**	-11	**-89**
Pulp, paper and paperboard	417	509	0.81	0.82	33	-128	**-95**	4	**-91**
Paper bags and products	5	4	1.16	1.33	0	0	**1**	1	**1**
Printing; services to printing	431	382	1.08	1.13	25	5	**30**	19	**49**
Publishing; recorded media etc	529	442	1.34	1.20	29	122	**150**	-63	**87**
Petroleum and coal products	9	7	0.84	1.30	0	-2	**-1**	3	**2**
Basic chemicals	43	61	0.74	0.71	4	-20	**-16**	-2	**-18**
Paints	3	7	0.92	0.49	0	-1	**-1**	-3	**-3**
Pharmaceuticals etc	14	22	1.08	0.64	1	0	**2**	-10	**-8**
Soap and detergents	17	11	0.58	1.45	1	-6	**-5**	10	**5**
Cosmetics and toiletries	0	3	0.98	0.00	0	0	**0**	-3	**-3**
Other chemical products	38	4	0.79	10.81	0	-1	**-1**	36	**35**
Rubber products	171	115	1.22	1.49	7	18	**25**	32	**57**
Plastic products	31	42	0.84	0.73	3	-9	**-7**	-5	**-11**
Glass and glass products	56	26	0.89	2.21	2	-4	**-3**	34	**31**
Ceramic products	157	166	0.78	0.95	11	-47	**-37**	28	**-9**
Cement, lime and concrete slurry	374	419	0.66	0.89	27	-168	**-141**	97	**-45**
Plaster; other concrete products	122	170	0.77	0.72	11	-50	**-39**	-8	**-47**
Non-metallic min. products nec	51	69	0.98	0.73	4	-6	**-1**	-17	**-18**
Iron and steel	1	20	0.86	0.07	1	-4	**-3**	-16	**-18**
Basic non-ferrous metals etc	5	0	0.81	0.00	0	0	**0**	5	**5**
Structural metal products	366	423	0.93	0.87	27	-56	**-29**	-29	**-57**
Sheet metal products	86	111	0.98	0.78	7	-10	**-2**	-22	**-25**

Sector	Employment		Growth		Component				**Total**
	1996	1991	NSW Gni	Local Gri	State	Industry	**Total State**	Local	**Change**
Fabricated metal products	204	198	1.03	1.03	13	-7	**6**	0	**6**
Motor vehicles and parts etc	134	132	0.92	1.02	9	-20	**-11**	13	**2**
Ships and boats	89	64	0.68	1.38	4	-25	**-21**	45	**24**
Railway equipment	22	12	0.56	1.80	1	-6	**-5**	15	**10**
Aircraft	141	42	1.35	3.31	3	12	**15**	83	**98**
Scientific etc equipment	31	46	1.12	0.67	3	3	**6**	-21	**-15**
Electronic equipment	97	104	0.95	0.93	7	-11	**-5**	-2	**-7**
Household appliances	239	115	0.77	2.08	7	-34	**-27**	151	**124**
Other electrical equipment	141	209	0.69	0.67	14	-79	**-65**	-3	**-68**
Agricultural, mining etc machinery	256	60	2.26	4.28	4	71	**75**	121	**196**
Other machinery and equipment	102	348	0.66	0.29	23	-139	**-117**	-129	**-246**
Prefabricated buildings	30	0	0.00	0.00	0	0	**0**	30	**30**
Furniture	368	244	1.23	1.50	16	40	**56**	67	**123**
Other manufacturing	145	134	0.76	1.08	9	-40	**-32**	43	**11**
Electricity	541	792	0.67	0.68	51	-313	**-262**	11	**-251**
Gas	22	38	0.68	0.59	2	-15	**-12**	-3	**-16**
Water, sewerage & drainage	146	185	0.53	0.79	12	-99	**-87**	48	**-39**
Residential building	3611	3502	1.18	1.03	227	421	**647**	-538	**109**
Other construction	1003	1321	0.91	0.76	86	-209	**-123**	-195	**-318**
Wholesale trade	2276	2223	1.02	1.02	144	-109	**35**	17	**52**
Retail trade	8964	8365	1.02	1.07	542	-385	**156**	442	**599**
Mechanical repairs	1463	740	1.71	1.98	48	478	**526**	197	**723**
Other repairs	224	167	1.16	1.34	11	16	**27**	30	**57**
Accom. & restaurants	4931	3983	1.17	1.24	258	409	**667**	281	**948**
Road transport	1328	1249	0.92	1.06	81	-176	**-95**	175	**79**
Rail & other transport	132	226	0.74	0.58	15	-73	**-58**	-37	**-95**
Water transport	31	27	1.01	1.16	2	-1	**0**	4	**4**
Air and space transport	71	104	1.08	0.68	7	1	**8**	-41	**-33**
Transport srvs, storage	338	194	1.20	1.74	13	26	**39**	105	**143**
Communication services	1082	1032	1.24	1.05	67	186	**253**	-203	**50**
Banking	902	969	0.98	0.93	63	-81	**-18**	-49	**-67**
Non-bank finance	165	268	0.76	0.62	17	-82	**-64**	-39	**-103**
Financial asset investors	16	23	1.58	0.70	1	12	**13**	-20	**-7**
Insurance	184	203	0.90	0.90	13	-33	**-20**	1	**-19**
Services to finance etc	169	204	1.07	0.83	13	0	**13**	-48	**-35**
Ownership of dwellings	0	0	0.00	0.00	0	0	**0**	0	**0**
Other property services	952	877	1.03	1.09	57	-34	**23**	52	**75**
Scientific research etc	745	768	1.31	0.97	50	186	**235**	-258	**-22**
Legal, accounting srvs	1310	1041	1.35	1.26	67	298	**366**	-97	**268**
Other business services	1152	808	1.49	1.43	52	347	**399**	-55	**344**
Public administration	2565	2630	0.90	0.98	170	-431	**-260**	195	**-65**
Defence	1440	1716	0.81	0.84	111	-439	**-328**	52	**-276**
Education	4668	3898	1.10	1.20	252	143	**396**	374	**770**
Health services	4842	4094	1.10	1.18	265	162	**427**	322	**749**
Community services	1694	921	1.52	1.84	60	421	**481**	292	**773**
Motion picture, radio etc	148	147	1.25	1.01	9	27	**36**	-36	**1**
Libraries, museums, arts	364	266	1.39	1.37	17	87	**104**	-7	**98**
Sport, gambling etc	497	448	1.43	1.11	29	163	**192**	-143	**50**
Personal services	1261	973	1.27	1.30	63	197	**260**	28	**288**
Other services	995	977	1.04	1.02	63	-26	**38**	-19	**18**
TOTAL	**61435**	**56647**	**1.06**	**1.08**	**3667**	**-528**	**3140**	**1649**	**4788**

ATTACHMENT 4: 107 SECTOR SHIFT-SHARE EMPLOYMENT ANALYSIS: SOUTHERN TABLELANDS SUB-REGION

Sector	Employment		Growth		Component				**Total**
	1996	1991	NSW Gni	Local Gri	State	Industry	**Total State**	Local	**Change**
Sheep	1166	1335	0.54	0.87	86	-702	**-615**	446	**-169**
Grains	198	51	2.20	3.89	3	58	**61**	86	**147**
Beef cattle	719	852	0.70	0.84	55	-311	**-256**	122	**-133**
Dairy cattle	94	81	1.00	1.16	5	-5	**0**	13	**13**
Pigs	0	11	0.83	0.00	1	-3	**-2**	-9	**-11**
Poultry	4	18	0.86	0.22	1	-4	**-3**	-11	**-14**
Other agriculture	668	498	0.97	1.34	32	-46	**-14**	184	**170**
Services to agric.; hunting	115	110	0.91	1.05	7	-17	**-10**	15	**5**
Forestry and logging	424	426	1.07	0.99	28	3	**30**	-33	**-3**
Commercial fishing	21	27	1.00	0.77	2	-2	**0**	-6	**-6**
Coal; oil and gas	0	0	0.86	0.00	0	0	**0**	0	**0**
Iron ores	0	0	0.00	0.00	0	0	**0**	0	**0**
Non-ferrous metal ores	3	6	0.74	0.54	0	-2	**-2**	-1	**-3**
Other mining	23	14	1.11	1.68	1	1	**2**	8	**9**
Services to mining	0	0	1.03	0.00	0	0	**0**	0	**0**
Meat and meat products	80	46	1.14	1.74	3	4	**7**	28	**34**
Dairy products	0	3	0.94	0.00	0	0	**0**	-3	**-3**
Fruit and vegetable products	57	75	1.04	0.76	5	-2	**3**	-22	**-18**
Oils and fats	0	0	0.88	0.00	0	0	**0**	0	**0**
Flour and cereal foods	3	0	1.02	0.00	0	0	**0**	3	**3**
Bakery products	51	30	1.00	1.72	2	-2	**0**	21	**21**
Confectionery	0	0	0.96	0.00	0	0	**0**	0	**0**
Other food products	6	3	1.18	1.89	0	0	**1**	2	**3**
Soft drinks, cordials, syrups	3	3	0.94	0.96	0	0	**0**	0	**0**
Beer and malt	0	0	0.67	0.00	0	0	**0**	0	**0**
Wine and spirits	7	0	1.52	0.00	0	0	**0**	7	**7**
Tobacco products	0	0	0.69	0.00	0	0	**0**	0	**0**
Textile fibres, yarns etc	6	13	0.92	0.48	1	-2	**-1**	-6	**-7**
Textile products	0	0	0.74	0.00	0	0	**0**	0	**0**
Knitting mill products	0	0	0.56	0.00	0	0	**0**	0	**0**
Clothing	6	0	1.04	0.00	0	0	**0**	6	**6**
Footwear	0	3	0.68	0.00	0	-1	**-1**	-2	**-3**
Leather and leather products	3	10	0.80	0.32	1	-3	**-2**	-5	**-7**
Sawmill products	514	177	1.38	2.90	11	56	**67**	269	**337**
Other wood products	248	398	0.87	0.62	26	-80	**-54**	-97	**-150**
Pulp, paper and paperboard	7	11	0.81	0.68	1	-3	**-2**	-1	**-3**
Paper bags and products	0	0	1.16	0.00	0	0	**0**	0	**0**
Printing; services to printing	28	30	1.08	0.96	2	0	**2**	-3	**-1**
Publishing; recorded media etc	42	54	1.34	0.77	3	15	**18**	-31	**-12**
Petroleum and coal products	0	0	0.84	0.00	0	0	**0**	0	**0**
Basic chemicals	0	3	0.74	0.00	0	-1	**-1**	-2	**-3**
Paints	0	0	0.92	0.00	0	0	**0**	0	**0**
Pharmaceuticals etc	0	4	1.08	0.00	0	0	**0**	-5	**-4**
Soap and detergents	0	0	0.58	0.00	0	0	**0**	0	**0**
Cosmetics and toiletries	0	0	0.98	0.00	0	0	**0**	0	**0**
Other chemical products	0	0	0.79	0.00	0	0	**0**	0	**0**
Rubber products	0	0	1.22	0.00	0	0	**0**	0	**0**
Plastic products	6	0	0.84	0.00	0	0	**0**	6	**6**
Glass and glass products	7	10	0.89	0.71	1	-2	**-1**	-2	**-3**
Ceramic products	6	3	0.78	1.88	0	-1	**-1**	4	**3**
Cement, lime and concrete slurry	11	8	0.66	1.38	1	-3	**-3**	6	**3**
Plaster; other concrete products	0	7	0.77	0.00	0	-2	**-2**	-5	**-7**
Non-metallic min. products nec	16	13	0.98	1.19	1	-1	**0**	3	**3**
Iron and steel	0	3	0.86	0.00	0	-1	**0**	-3	**-3**
Basic non-ferrous metals etc	0	0	0.81	0.00	0	0	**0**	0	**0**
Structural metal products	35	38	0.93	0.92	2	-5	**-3**	0	**-3**
Sheet metal products	10	3	0.98	3.60	0	0	**0**	8	**7**

Sector	Employment		Growth		Component				**Total**
	1996	1991	NSW Gni	Local Gri	State	Industry	**Total State**	Local	**Change**
Fabricated metal products	36	23	1.03	1.58	1	-1	**1**	13	**13**
Motor vehicles and parts etc	11	11	0.92	0.93	1	-2	**-1**	0	**-1**
Ships and boats	0	0	0.68	0.00	0	0	**0**	0	**0**
Railway equipment	0	4	0.56	0.00	0	-2	**-2**	-2	**-4**
Aircraft	0	0	1.35	0.00	0	0	**0**	0	**0**
Scientific etc equipment	4	0	1.12	0.00	0	0	**0**	4	**4**
Electronic equipment	3	7	0.95	0.44	0	-1	**0**	-4	**-4**
Household appliances	0	0	0.77	0.00	0	0	**0**	0	**0**
Other electrical equipment	7	21	0.69	0.35	1	-8	**-7**	-7	**-14**
Agricultural, mining etc machinery	14	7	2.26	2.00	0	8	**9**	-2	**7**
Other machinery and equipment	9	14	0.66	0.67	1	-6	**-5**	0	**-5**
Prefabricated buildings	0	0	0.00	0.00	0	0	**0**	0	**0**
Furniture	31	13	1.23	2.38	1	2	**3**	15	**18**
Other manufacturing	25	19	0.76	1.34	1	-6	**-4**	11	**6**
Electricity	438	576	0.67	0.76	37	-228	**-191**	53	**-138**
Gas	0	3	0.68	0.00	0	-1	**-1**	-2	**-3**
Water, sewerage & drainage	42	64	0.53	0.65	4	-34	**-30**	8	**-22**
Residential building	366	405	1.18	0.90	26	49	**75**	-114	**-39**
Other construction	407	403	0.91	1.01	26	-64	**-38**	42	**4**
Wholesale trade	506	432	1.02	1.17	28	-21	**7**	67	**74**
Retail trade	1440	1490	1.02	0.97	96	-69	**28**	-78	**-50**
Mechanical repairs	260	146	1.71	1.79	9	94	**103**	11	**114**
Other repairs	35	25	1.16	1.40	2	2	**4**	6	**10**
Accom. & restaurants	1737	1551	1.17	1.12	100	159	**260**	-75	**185**
Road transport	410	369	0.92	1.11	24	-52	**-28**	69	**41**
Rail & other transport	47	59	0.74	0.80	4	-19	**-15**	3	**-12**
Water transport	0	0	1.01	0.00	0	0	**0**	0	**0**
Air and space transport	13	6	1.08	2.01	0	0	**1**	6	**7**
Transport srvs, storage	59	43	1.20	1.37	3	6	**9**	8	**16**
Communication services	172	181	1.24	0.95	12	33	**44**	-53	**-9**
Banking	190	223	0.98	0.85	14	-19	**-4**	-28	**-32**
Non-bank finance	15	18	0.76	0.85	1	-6	**-4**	2	**-3**
Financial asset investors	3	11	1.58	0.30	1	5	**6**	-14	**-8**
Insurance	13	15	0.90	0.90	1	-2	**-1**	0	**-1**
Services to finance etc	15	17	1.07	0.89	1	0	**1**	-3	**-2**
Ownership of dwellings	0	0	0.00	0.00	0	0	**0**	0	**0**
Other property services	100	102	1.03	0.98	7	-4	**3**	-5	**-2**
Scientific research etc	102	101	1.31	1.01	7	24	**31**	-30	**1**
Legal, accounting srvs	215	193	1.35	1.11	13	55	**68**	-46	**22**
Other business services	266	174	1.49	1.53	11	75	**86**	6	**92**
Public administration	575	566	0.90	1.02	37	-93	**-56**	65	**9**
Defence	14	55	0.81	0.26	4	-14	**-10**	-30	**-41**
Education	857	844	1.10	1.02	55	31	**86**	-72	**13**
Health services	736	692	1.10	1.06	45	27	**72**	-28	**44**
Community services	195	109	1.52	1.79	7	50	**57**	29	**86**
Motion picture, radio etc	19	9	1.25	2.11	1	2	**2**	8	**10**
Libraries, museums, arts	145	148	1.39	0.98	10	48	**58**	-61	**-3**
Sport, gambling etc	104	100	1.43	1.04	6	37	**43**	-39	**4**
Personal services	243	170	1.27	1.43	11	34	**45**	28	**74**
Other services	232	179	1.04	1.30	12	-5	**7**	47	**53**
TOTAL	**14705**	**13978**	**1.06**	**1.05**	**905**	**-976**	**-71**	**798**	**727**

ATTACHMENT 5: BASE CASE ECONOMIC IMPACTS: SOUTH COAST SUB-REGION

GROSS OUTPUT IMPACTS ($'000)

	Direct Effect	Flow-on Effects: Production Induced	Flow-on Effects: Consumption Induced	Flow-on Effects: Total Flow-on	**TOTAL IMPACT**
Local hardwood milling:					
HWD Forestry	2,652	1,012	1,438	2,450	**5,102**
SWD Forestry	47	9	13	22	**69**
PP Forestry	277	111	160	271	**548**
Logging/Haulage	2,763	810	1,313	2,123	**4,886**
Milling (net)	10,850	2,297	5,099	7,397	**18,246**
TOTAL (mill gate)	**16,589**	**4,239**	**8,023**	**12,262**	**28,850**
Downstream Freight	1,456	416	542	957	**2,413**
TOTAL HWD MILLING	**18,045**	**4,654**	**8,565**	**13,219**	**31,264**
Activities not directly related to local milling:					
SF Visitors	6,279	2,187	2,912	5,099	**11,378**
SF Grazing	-	-	-	-	**-**
SF Apiary	1,386	397	766	1,163	**2,549**
SF Mining	1,021	195	184	379	**1,400**
HWD Forestry (Other sales)	2,150	820	1,166	1,986	**4,136**
HWD Logging/Haulage (Other sales)	1,124	329	534	863	**1,987**
SWD Plantation Establishment	156	115	78	193	**349**
SWD Forestry (Other sales)	899	167	251	418	**1,317**
SWD Logging/Haulage (Other sales)	1,337	392	635	1,027	**2,364**
TOTAL	**14,353**	**4,603**	**6,525**	**11,128**	**25,481**
Local Softwood Milling:					
SWD Forestry	710	132	198	330	**1,040**
Logging/Haulage	573	168	272	440	**1,013**
Milling (net)	4,067	850	1,505	2,355	**6,423**
TOTAL (mill gate)	**5,350**	**1,150**	**1,975**	**3,125**	**8,476**
Downstream Freight	109	31	41	72	**181**
TOTAL SWD MILLING	**5,460**	**1,181**	**2,016**	**3,197**	**8,657**
Secondary Processing (net)	58,671	25,165	17,935	43,100	**101,771**

GROSS OUTPUT MULTIPLIERS

	Direct Effect	Flow-on Effects: Production Induced	Flow-on Effects: Consumption Induced	Flow-on Effects: Total Flow-on	TOTAL IMPACT	Type II Ratio
Local hardwood milling:						
HWD Forestry	1.000	0.382	0.542	0.924	1.924	1.924
SWD Forestry	1.000	0.186	0.279	0.464	1.464	1.464
PP Forestry	1.000	0.400	0.576	0.976	1.976	1.976
Logging/Haulage	1.000	0.293	0.475	0.768	1.768	1.768
Milling (net)	1.000	0.212	0.470	0.682	1.682	1.682
TOTAL (mill gate)	**1.000**	**0.256**	**0.484**	**0.739**	**1.739**	**1.739**
Downstream Freight	1.000	0.286	0.372	0.658	1.658	1.658
TOTAL HWD MILLING	**1.000**	**0.258**	**0.475**	**0.733**	**1.733**	**1.733**
Activities not directly related to local milling:						
SF Visitors	1.000	0.348	0.464	0.812	1.812	1.812
SF Grazing	-	-	-	-	-	-
SF Apiary	1.000	0.287	0.553	0.839	1.839	1.839
SF Mining	1.000	0.191	0.180	0.371	1.371	1.371
HWD Forestry (Other sales)	1.000	0.382	0.542	0.924	1.924	1.924
HWD Logging/Haulage (Other sales)	1.000	0.293	0.475	0.768	1.768	1.768
SWD Plantation Establishment	1.000	0.737	0.500	1.237	2.237	2.237
SWD Forestry (Other sales)	1.000	0.186	0.279	0.464	1.464	1.464
SWD Logging/Haulage (Other sales)	1.000	0.293	0.475	0.768	1.768	1.768
Local Softwood Milling:						
SWD Forestry	1.000	0.186	0.279	0.464	1.464	1.464
Logging/Haulage	1.000	0.293	0.475	0.768	1.768	1.768
Milling (net)	1.000	0.209	0.370	0.579	1.579	1.579
TOTAL (mill gate)	**1.000**	**0.215**	**0.369**	**0.584**	**1.584**	**1.584**
Downstream Freight	1.000	0.286	0.372	0.658	1.658	1.658
TOTAL SWD MILLING	**1.000**	**0.216**	**0.369**	**0.586**	**1.586**	**1.586**
Secondary Processing (net)	1.000	0.429	0.306	0.735	1.735	1.735

VALUE ADDED IMPACTS ($'000)

	Direct Effect	Flow-on Effects: Production Induced	Flow-on Effects: Consumption Induced	Flow-on Effects: Total Flow-on	**TOTAL IMPACT**
Local hardwood milling:					
HWD Forestry	1,571	559	799	1,357	**2,928**
SWD Forestry	38	5	7	12	**51**
PP Forestry	162	62	89	150	**312**
Logging/Haulage	1,797	455	729	1,184	**2,981**
Milling (net)	8,194	1,281	2,832	4,113	**12,307**
TOTAL (mill gate)	**11,762**	**2,361**	**4,456**	**6,817**	**18,579**
Downstream Freight	821	241	301	542	**1,363**
TOTAL HWD MILLING	**12,583**	**2,602**	**4,756**	**7,359**	**19,942**
Activities not directly related to local milling:					
SF Visitors	3,131	1,188	1,617	2,805	**5,936**
SF Grazing	-	-	-	-	**-**
SF Apiary	915	228	425	654	**1,569**
SF Mining	687	109	102	211	**897**
HWD Forestry (Other sales)	1,273	453	648	1,100	**2,374**
HWD Logging/Haulage (Other sales)	731	185	297	482	**1,213**
SWD Plantation Establishment	39	85	43	129	**168**
SWD Forestry (Other sales)	733	97	139	236	**969**
SWD Logging/Haulage (Other sales)	885	214	362	576	**1,461**
TOTAL	**8,394**	**2,559**	**3,633**	**6,192**	**14,586**
Local Softwood Milling:					
SWD Forestry	579	76	110	186	**765**
Logging/Haulage	379	92	155	247	**626**
Milling (net)	3,025	479	836	1,315	**4,340**
TOTAL (mill gate)	**3,983**	**647**	**1,101**	**1,748**	**5,731**
Downstream Freight	62	18	23	41	**102**
TOTAL SWD MILLING	**4,044**	**665**	**1,124**	**1,789**	**5,833**
Secondary Processing (net)	21,943	11,591	9,960	21,551	**43,493**

VALUE ADDED MULTIPLIERS (per$direct O/P effect)

	Direct Effect	Flow-on Effects: Production Induced	Flow-on Effects: Consumption Induced	Flow-on Effects: Total Flow-on	TOTAL IMPACT	Type II Ratio
Local hardwood milling:						
HWD Forestry	0.592	0.211	0.301	0.512	1.104	1.864
SWD Forestry	0.815	0.107	0.155	0.262	1.077	1.322
PP Forestry	0.584	0.222	0.320	0.542	1.126	1.928
Logging/Haulage	0.650	0.165	0.264	0.428	1.079	1.659
Milling (net)	0.755	0.118	0.261	0.379	1.134	1.502
TOTAL (mill gate)	**0.709**	**0.142**	**0.269**	**0.411**	**1.120**	**1.580**
Downstream Freight	0.564	0.166	0.207	0.372	0.936	1.660
TOTAL HWD MILLING	**0.697**	**0.144**	**0.264**	**0.408**	**1.105**	**1.585**
Activities not directly related to local milling:						
SF Visitors	0.499	0.189	0.258	0.447	0.945	1.896
SF Grazing	-	-	-	-	-	-
SF Apiary	0.660	0.165	0.307	0.472	1.132	1.714
SF Mining	0.672	0.107	0.100	0.206	0.879	1.307
HWD Forestry (Other sales)	0.592	0.211	0.301	0.512	1.104	1.864
HWD Logging/Haulage (Other sales)	0.650	0.165	0.264	0.428	1.079	1.659
SWD Plantation Establishment	0.252	0.546	0.278	0.823	1.076	4.262
SWD Forestry (Other sales)	0.815	0.107	0.155	0.262	1.077	1.322
SWD Logging/Haulage (Other sales)	0.662	0.160	0.271	0.431	1.093	1.651
TOTAL						
Local Softwood Milling:						
SWD Forestry	0.815	0.107	0.155	0.262	1.077	1.322
Logging/Haulage	0.662	0.160	0.271	0.431	1.093	1.651
Milling (net)	0.744	0.118	0.206	0.323	1.067	1.435
TOTAL (mill gate)	**0.744**	**0.121**	**0.206**	**0.327**	**1.071**	**1.439**
Downstream Freight	0.564	0.166	0.207	0.372	0.936	1.660
TOTAL SWD MILLING	**0.741**	**0.122**	**0.206**	**0.328**	**1.068**	**1.442**
Secondary Processing (net)	0.374	0.198	0.170	0.367	0.741	1.982

H-HOLD INCOME IMPACTS ($'000)

	Direct Effect	Flow-on Effects: Production Induced	Flow-on Effects: Consumption Induced	Flow-on Effects: Total Flow-on	**TOTAL IMPACT**
Local hardwood milling:					
HWD Forestry	1,004	336	388	724	**1,728**
SWD Forestry	9	3	4	7	**16**
PP Forestry	113	36	43	79	**192**
Logging/Haulage	946	277	354	631	**1,577**
Milling (net)	4,060	691	1,376	2,067	**6,127**
TOTAL (mill gate)	**6,132**	**1,342**	**2,165**	**3,507**	**9,640**
Downstream Freight	367	138	146	284	**651**
TOTAL HWD MILLING	**6,499**	**1,480**	**2,312**	**3,791**	**10,291**
Activities not directly related to local milling:					
SF Visitors	2,054	659	786	1,445	**3,499**
SF Grazing	-	-	-	-	**-**
SF Apiary	571	143	207	349	**920**
SF Mining	116	55	50	104	**221**
HWD Forestry (Other sales)	814	272	315	587	**1,401**
HWD Logging/Haulage (Other sales)	385	112	144	257	**641**
SWD Plantation Establishment	29	44	21	65	**94**
SWD Forestry (Other sales)	173	60	68	128	**301**
SWD Logging/Haulage (Other sales)	478	130	176	306	**783**
TOTAL	**4,620**	**1,475**	**1,766**	**3,241**	**7,861**
Local Softwood Milling:					
SWD Forestry	137	48	53	101	**238**
Logging/Haulage	205	56	75	131	**336**
Milling (net)	1,155	248	406	654	**1,808**
TOTAL (mill gate)	**1,496**	**351**	**535**	**886**	**2,382**
Downstream Freight	28	10	11	21	**49**
TOTAL SWD MILLING	**1,524**	**361**	**546**	**907**	**2,431**
Secondary Processing (net)	11,021	5,688	4,843	10,530	**21,552**

H-HOLD INCOME MULTIPLIERS (per$direct O/P effect)

	Direct Effect	Flow-on Effects: Production Induced	Flow-on Effects: Consumption Induced	Flow-on Effects: Total Flow-on	TOTAL IMPACT	Type II Ratio
Local hardwood milling:						
HWD Forestry	0.379	0.127	0.146	0.273	0.652	1.721
SWD Forestry	0.193	0.067	0.075	0.142	0.335	1.738
PP Forestry	0.406	0.130	0.155	0.286	0.692	1.704
Logging/Haulage	0.342	0.100	0.128	0.228	0.571	1.667
Milling (net)	0.374	0.064	0.127	0.191	0.565	1.509
TOTAL (mill gate)	**0.370**	**0.081**	**0.131**	**0.211**	**0.581**	**1.572**
Downstream Freight	0.252	0.095	0.100	0.195	0.447	1.775
TOTAL HWD MILLING	**0.360**	**0.082**	**0.128**	**0.210**	**0.570**	**1.583**
Activities not directly related to local milling:						
SF Visitors	0.327	0.105	0.125	0.230	0.557	1.704
SF Grazing	-	-	-	-	-	-
SF Apiary	0.412	0.103	0.149	0.252	0.664	1.612
SF Mining	0.114	0.054	0.049	0.102	0.216	1.896
HWD Forestry (Other sales)	0.379	0.127	0.146	0.273	0.652	1.721
HWD Logging/Haulage (Other sales)	0.342	0.100	0.128	0.228	0.571	1.667
SWD Plantation Establishment	0.183	0.283	0.135	0.418	0.601	3.277
SWD Forestry (Other sales)	0.193	0.067	0.075	0.142	0.335	1.738
SWD Logging/Haulage (Other sales)	0.357	0.097	0.132	0.229	0.586	1.640
TOTAL						
Local Softwood Milling:						
SWD Forestry	0.193	0.067	0.075	0.142	0.335	1.738
Logging/Haulage	0.357	0.097	0.132	0.229	0.586	1.640
Milling (net)	0.284	0.061	0.100	0.161	0.445	1.566
TOTAL (mill gate)	**0.280**	**0.066**	**0.100**	**0.166**	**0.445**	**1.592**
Downstream Freight	0.252	0.095	0.100	0.195	0.447	1.775
TOTAL SWD MILLING	**0.279**	**0.066**	**0.100**	**0.166**	**0.445**	**1.595**
Secondary Processing (net)	0.188	0.097	0.083	0.179	0.367	1.955

EMPLOYMENT IMPACTS (no.)

	Direct Effect	Flow-on Effects: Production Induced	Flow-on Effects: Consumption Induced	Flow-on Effects: Total Flow-on	**TOTAL IMPACT**
Local hardwood milling:					
HWD Forestry	30	12	16	28	**58**
SWD Forestry	0	0	0	0	**1**
PP Forestry	5	1	2	3	**8**
Logging/Haulage	30	10	15	25	**55**
Milling (net)	164	24	58	82	**246**
TOTAL (mill gate)	**229**	**47**	**91**	**138**	**367**
Downstream Freight	12	5	6	11	**23**
TOTAL HWD MILLING	**241**	**52**	**97**	**149**	**390**
Activities not directly related to local milling:					
SF Visitors	92	24	33	57	**149**
SF Grazing	-	-	-	-	**-**
SF Apiary	23	5	9	14	**37**
SF Mining	4	2	2	4	**8**
HWD Forestry (Other sales)	25	10	13	23	**47**
HWD Logging/Haulage (Other sales)	12	4	6	10	**22**
SWD Plantation Establishment	1	2	1	2	**3**
SWD Forestry (Other sales)	5	2	3	5	**10**
SWD Logging/Haulage (Other sales)	11	5	7	12	**23**
TOTAL	**173**	**54**	**74**	**127**	**300**
Local Softwood Milling:					
SWD Forestry	4	2	2	4	**8**
Logging/Haulage	5	2	3	5	**10**
Milling (net)	37	9	17	26	**62**
TOTAL (mill gate)	**45**	**12**	**22**	**35**	**80**
Downstream Freight	1	0	0	1	**2**
TOTAL SWD MILLING	**46**	**13**	**23**	**36**	**81**
Secondary Processing (net)	484	218	203	420	**904**

EMPLOYMENT MULTIPLIERS (per $'000 direct O/P effect)

	Direct Effect	Flow-on Effects: Production Induced	Flow-on Effects: Consumption Induced	Flow-on Effects: Total Flow-on	TOTAL IMPACT	Type II Ratio
Local hardwood milling:						
HWD Forestry	0.011	0.004	0.006	0.011	0.022	1.922
SWD Forestry	0.005	0.002	0.003	0.005	0.011	2.012
PP Forestry	0.017	0.005	0.007	0.011	0.028	1.676
Logging/Haulage	0.011	0.004	0.005	0.009	0.020	1.836
Milling (net)	0.015	0.002	0.005	0.008	0.023	1.498
TOTAL (mill gate)	**0.014**	**0.003**	**0.005**	**0.008**	**0.022**	**1.602**
Downstream Freight	0.008	0.003	0.004	0.008	0.016	1.899
TOTAL HWD MILLING	**0.013**	**0.003**	**0.005**	**0.008**	**0.022**	**1.618**
Activities not directly related to local milling:						
SF Visitors	0.015	0.004	0.005	0.009	0.024	1.618
SF Grazing	-	-	-	-	-	-
SF Apiary	0.016	0.004	0.006	0.010	0.027	1.614
SF Mining	0.004	0.002	0.002	0.004	0.008	1.985
HWD Forestry (Other sales)	0.011	0.004	0.006	0.011	0.022	1.922
HWD Logging/Haulage (Other sales)	0.011	0.004	0.005	0.009	0.020	1.836
SWD Plantation Establishment	0.007	0.010	0.006	0.015	0.022	3.344
SWD Forestry (Other sales)	0.005	0.002	0.003	0.005	0.011	2.012
SWD Logging/Haulage (Other sales)	0.008	0.004	0.006	0.009	0.017	2.132
TOTAL						
Local Softwood Milling:						
SWD Forestry	0.005	0.002	0.003	0.005	0.011	2.012
Logging/Haulage	0.008	0.004	0.006	0.009	0.017	2.132
Milling (net)	0.009	0.002	0.004	0.006	0.015	1.701
TOTAL (mill gate)	**0.008**	**0.002**	**0.004**	**0.006**	**0.015**	**1.771**
Downstream Freight	0.008	0.003	0.004	0.008	0.016	1.899
TOTAL SWD MILLING	**0.008**	**0.002**	**0.004**	**0.007**	**0.015**	**1.774**
Secondary Processing (net)	0.008	0.004	0.003	0.007	0.015	1.869

Rounding errors may occur

ATTACHMENT 6: BASE CASE ECONOMIC IMPACTS: SOUTHERN TABLELANDS SUB-REGION

	GROSS OUTPUT IMPACTS ($'000)					GROSS OUTPUT MULTIPLIERS					
		Flow-on Effects					Flow-on Effects				
	Direct Effect	Production Induced	Consumption Induced	Total Flow-on	**TOTAL IMPACT**	Direct Effect	Production Induced	Consumption Induced	Total Flow-on	TOTAL IMPACT	Type II Ratio
Local hardwood milling:											
HWD Forestry	1,167	406	290	696	**1,863**	1.000	0.348	0.248	0.597	1.597	1.597
SWD Forestry	0	0	0	0	**0**	-	-	-	-	-	-
PP Forestry	24	6	11	17	**41**	1.000	0.261	0.441	0.703	1.703	1.703
Logging/Haulage	2,043	424	715	1,139	**3,182**	1.000	0.207	0.350	0.557	1.557	1.557
Milling (net)	1,671	630	844	1,474	**3,145**	1.000	0.377	0.505	0.882	1.882	1.882
TOTAL (mill gate)	**4,905**	**1,466**	**1,860**	**3,326**	**8,231**	**1.000**	**0.299**	**0.379**	**0.678**	**1.678**	**1.678**
Downstream Freight	532	108	155	263	**795**	1.000	0.203	0.292	0.494	1.494	1.494
TOTAL HWD MILLING	**5,437**	**1,574**	**2,015**	**3,589**	**9,027**	**1.000**	**0.290**	**0.371**	**0.660**	**1.660**	**1.660**
Activities not directly related to local milling:											
SF Visitors	925	251	361	612	**1,537**	1.000	0.271	0.390	0.661	1.661	1.661
SF Grazing	0	0	0	0	**0**	-	-	-	-	-	-
SF Apiary	245	65	108	173	**418**	1.000	0.264	0.443	0.708	1.708	1.708
SF Mining	0	0	0	0	**0**	-	-	-	-	-	-
HWD Forestry (Other sales)	0	0	0	0	**0**	1.000	0.348	0.248	0.597	1.597	1.597
HWD Logging/Haulage (Other sales)	0	0	0	0	**0**	1.000	0.207	0.350	0.557	1.557	1.557
SWD Plantation Establishment	7,331	2,881	2,823	5,704	**13,035**	1.000	0.393	0.385	0.778	1.778	1.778
SWD Forestry (Other sales)	2,750	308	319	627	**3,377**	1.000	0.112	0.116	0.228	1.228	1.228
SWD Logging/Haulage (Other sales)	6,050	1,254	2,118	3,372	**9,422**	1.000	0.207	0.350	0.557	1.557	1.557
TOTAL	**17,300**	**4,759**	**5,729**	**10,488**	**27,788**						
Local Softwood Milling:											
SWD Forestry	34,650	3,883	4,016	7,898	**42,548**	1.000	0.112	0.116	0.228	1.228	1.228
Logging/Haulage	18,810	3,900	6,584	10,484	**29,294**	1.000	0.207	0.350	0.557	1.557	1.557
Milling (net)	88,540	15,110	31,440	46,550	**135,090**	1.000	0.171	0.355	0.526	1.526	1.526
TOTAL (mill gate)	**142,000**	**22,893**	**42,039**	**64,932**	**206,932**	**1.000**	**0.161**	**0.296**	**0.457**	**1.457**	**1.457**
Downstream Freight	2,840	576	828	1,404	**4,244**	1.000	0.203	0.292	0.494	1.494	1.494
TOTAL SWD MILLING	**144,840**	**23,469**	**42,867**	**66,336**	**211,176**	**1.000**	**0.162**	**0.296**	**0.458**	**1.458**	**1.458**
Secondary Processing (net)	0	0	0	0	**0**	-	-	-	-	-	-

	VALUE ADDED IMPACTS ($'000)					VALUE ADDED MULTIPLIERS (per$direct O/P effect)					
		Flow-on Effects					Flow-on Effects				
	Direct Effect	Production Induced	Consumption Induced	Total Flow-on	**TOTAL IMPACT**	Direct Effect	Production Induced	Consumption Induced	Total Flow-on	TOTAL IMPACT	Type II Ratio
Local hardwood milling:											
HWD Forestry	706	210	163	373	**1,079**	0.605	0.180	0.140	0.320	0.924	1.529
SWD Forestry	0	0	0	0	**0**	-	-	-	-	-	-
PP Forestry	14	4	6	10	**24**	0.585	0.160	0.249	0.408	0.993	1.698
Logging/Haulage	1,301	252	403	655	**1,956**	0.637	0.123	0.197	0.321	0.957	1.504
Milling (net)	712	371	475	847	**1,559**	0.426	0.222	0.285	0.507	0.933	2.189
TOTAL (mill gate)	**2,732**	**837**	**1,047**	**1,884**	**4,617**	**0.557**	**0.171**	**0.214**	**0.384**	**0.941**	**1.690**
Downstream Freight	300	66	87	153	**454**	0.564	0.124	0.164	0.288	0.852	1.510
TOTAL HWD MILLING	**3,033**	**903**	**1,135**	**2,038**	**5,070**	**0.558**	**0.166**	**0.209**	**0.375**	**0.932**	**1.672**
Activities not directly related to local milling:											
SF Visitors	457	143	203	346	**803**	0.494	0.154	0.220	0.374	0.868	1.758
SF Grazing	0	0	0	0	**0**	-	-	-	-	-	-
SF Apiary	161	39	61	100	**261**	0.660	0.158	0.250	0.408	1.068	1.617
SF Mining	0	0	0	0	**0**	-	-	-	-	-	-
HWD Forestry (Other sales)	0	0	0	0	**0**	0.500	0.149	0.116	0.264	0.764	1.529
HWD Logging/Haulage (Other sales)	0	0	0	0	**0**	0.600	0.116	0.186	0.302	0.902	1.504
SWD Plantation Establishment	2,900	1,690	1,590	3,280	**6,180**	0.396	0.231	0.217	0.447	0.843	2.131
SWD Forestry (Other sales)	2,325	176	179	356	**2,681**	0.845	0.064	0.065	0.129	0.975	1.153
SWD Logging/Haulage (Other sales)	3,981	742	1,276	2,018	**5,998**	0.658	0.123	0.211	0.333	0.991	1.507
TOTAL	**9,824**	**2,790**	**3,309**	**6,100**	**15,924**						
Local Softwood Milling:											
SWD Forestry	29,291	2,223	2,262	4,485	**33,775**	0.845	0.064	0.065	0.129	0.975	1.153
Logging/Haulage	12,377	2,307	3,966	6,273	**18,650**	0.658	0.123	0.211	0.333	0.991	1.507
Milling (net)	60,877	9,184	17,706	26,890	**87,767**	0.688	0.104	0.200	0.304	0.991	1.442
TOTAL (mill gate)	**102,545**	**13,714**	**23,933**	**37,647**	**140,192**	**0.722**	**0.097**	**0.169**	**0.265**	**0.987**	**1.367**
Downstream Freight	1,602	351	466	818	**2,420**	0.564	0.124	0.164	0.288	0.852	1.510
TOTAL SWD MILLING	**104,147**	**14,066**	**24,400**	**38,465**	**142,612**	**0.719**	**0.097**	**0.168**	**0.266**	**0.985**	**1.369**
Secondary Processing (net)	0	0	0	0	**0**	-	-	-	-	-	-

	H-HOLD INCOME IMPACTS ($'000)					H-HOLD INCOME MULTIPLIERS (per$direct O/P effect)					
		Flow-on Effects					Flow-on Effects				
	Direct Effect	Production Induced	Consumption Induced	Total Flow-on	**TOTAL IMPACT**	Direct Effect	Production Induced	Consumption Induced	Total Flow-on	TOTAL IMPACT	Type II Ratio
Local hardwood milling:											
HWD Forestry	190	131	73	205	**394**	0.163	0.113	0.063	0.175	0.338	2.078
SWD Forestry	0	0	0	0	**0**	-	-	-	-	-	-
PP Forestry	10	2	3	5	**15**	0.407	0.082	0.111	0.194	0.600	1.476
Logging/Haulage	663	129	181	310	**973**	0.325	0.063	0.088	0.152	0.476	1.467
Milling (net)	751	185	213	398	**1,149**	0.449	0.110	0.128	0.238	0.687	1.530
TOTAL (mill gate)	**1,614**	**447**	**469**	**917**	**2,531**	**0.329**	**0.091**	**0.096**	**0.187**	**0.516**	**1.568**
Downstream Freight	138	34	39	73	**211**	0.259	0.064	0.074	0.138	0.397	1.531
TOTAL HWD MILLING	**1,752**	**481**	**509**	**990**	**2,742**	**0.322**	**0.088**	**0.094**	**0.182**	**0.504**	**1.565**
Activities not directly related to local milling:											
SF Visitors	323	78	91	169	**492**	0.349	0.084	0.099	0.183	0.531	1.524
SF Grazing	0	0	0	0	**0**	-	-	-	-	-	-
SF Apiary	101	19	27	47	**147**	0.412	0.079	0.112	0.191	0.603	1.464
SF Mining	0	0	0	0	**0**	-	-	-	-	-	-
HWD Forestry (Other sales)	0	0	0	0	**0**	0.188	0.130	0.072	0.202	0.390	2.078
HWD Logging/Haulage (Other sales)	0	0	0	0	**0**	0.300	0.058	0.082	0.140	0.440	1.467
SWD Plantation Establishment	2,314	814	713	1,527	**3,841**	0.316	0.111	0.097	0.208	0.524	1.660
SWD Forestry (Other sales)	259	94	80	174	**434**	0.094	0.034	0.029	0.063	0.158	1.672
SWD Logging/Haulage (Other sales)	2,134	376	572	948	**3,082**	0.353	0.062	0.094	0.157	0.509	1.444
TOTAL	**5,131**	**1,381**	**1,483**	**2,864**	**7,995**						
Local Softwood Milling:											
SWD Forestry	3,268	1,182	1,014	2,195	**5,464**	0.094	0.034	0.029	0.063	0.158	1.672
Logging/Haulage	6,635	1,169	1,778	2,946	**9,581**	0.353	0.062	0.094	0.157	0.509	1.444
Milling (net)	30,634	4,208	7,936	12,144	**42,778**	0.346	0.048	0.090	0.137	0.483	1.396
TOTAL (mill gate)	**40,537**	**6,559**	**10,727**	**17,286**	**57,823**	**0.285**	**0.046**	**0.076**	**0.122**	**0.407**	**1.426**
Downstream Freight	736	182	209	391	**1,127**	0.259	0.064	0.074	0.138	0.397	1.531
TOTAL SWD MILLING	**41,273**	**6,740**	**10,936**	**17,677**	**58,950**	**0.285**	**0.047**	**0.076**	**0.122**	**0.407**	**1.428**
Secondary Processing (net)	0	0	0	0	**0**	-	-	-	-	-	-

	EMPLOYMENT IMPACTS (no.)					EMPLOYMENT MULTIPLIERS (per $'000 direct O/P effect)					
		Flow-on Effects					Flow-on Effects				
	Direct Effect	Production Induced	Consumption Induced	Total Flow-on	**TOTAL IMPACT**	Direct Effect	Production Induced	Consumption Induced	Total Flow-on	TOTAL IMPACT	Type II Ratio
Local hardwood milling:											
HWD Forestry	6	4	3	7	**13**	0.005	0.004	0.003	0.006	0.012	2.241
SWD Forestry	0	0	0	0	**0**	-	-	-	-	-	-
PP Forestry	0	0	0	0	**1**	0.017	0.003	0.005	0.008	0.024	1.447
Logging/Haulage	15	5	7	12	**27**	0.007	0.002	0.004	0.006	0.013	1.806
Milling (net)	48	7	9	15	**63**	0.029	0.004	0.005	0.009	0.038	1.319
TOTAL (mill gate)	**69**	**16**	**19**	**35**	**105**	**0.014**	**0.003**	**0.004**	**0.007**	**0.021**	**1.505**
Downstream Freight	5	1	2	3	**8**	0.010	0.002	0.003	0.005	0.015	1.559
TOTAL HWD MILLING	**75**	**17**	**21**	**38**	**112**	**0.014**	**0.003**	**0.004**	**0.007**	**0.021**	**1.508**
Activities not directly related to local milling:											
SF Visitors	13	3	4	7	**20**	0.014	0.003	0.004	0.007	0.021	1.507
SF Grazing	0	0	0	0	**0**	-	-	-	-	-	-
SF Apiary	4	1	1	2	**6**	0.017	0.003	0.005	0.007	0.024	1.447
SF Mining	0	0	0	0	**0**	-	-	-	-	-	-
HWD Forestry (Other sales)	0	0	0	0	**0**	0.006	0.004	0.003	0.007	0.013	2.241
HWD Logging/Haulage (Other sales)	0	0	0	0	**0**	0.008	0.002	0.004	0.006	0.014	1.806
SWD Plantation Establishment	66	28	29	57	**123**	0.009	0.004	0.004	0.008	0.017	1.866
SWD Forestry (Other sales)	6	3	3	6	**13**	0.002	0.001	0.001	0.002	0.005	1.994
SWD Logging/Haulage (Other sales)	59	13	23	37	**96**	0.010	0.002	0.004	0.006	0.016	1.630
TOTAL	**148**	**48**	**61**	**109**	**257**						
Local Softwood Milling:											
SWD Forestry	82	39	42	81	**163**	0.002	0.001	0.001	0.002	0.005	1.994
Logging/Haulage	182	42	73	115	**297**	0.010	0.002	0.004	0.006	0.016	1.630
Milling (net)	886	148	326	474	**1,360**	0.010	0.002	0.004	0.005	0.015	1.535
TOTAL (mill gate)	**1,150**	**229**	**440**	**670**	**1,819**	**0.008**	**0.002**	**0.003**	**0.005**	**0.013**	**1.582**
Downstream Freight	27	7	9	15	**42**	0.010	0.002	0.003	0.005	0.015	1.559
TOTAL SWD MILLING	**1,177**	**236**	**449**	**685**	**1,862**	**0.008**	**0.002**	**0.003**	**0.005**	**0.013**	**1.582**
Secondary Processing (net)	0	0	0	0	**0**	-	-	-	-	-	-

Rounding errors may occur

ATTACHMENT 7: PREFERRED OUTCOME ECONOMIC IMPACTS: SOUTH COAST SUB-REGION

SOUTH COAST: REGIONAL ECONOMIC IMPACTS: CURRENT COMMITMENTS

IMPACTS	Direct Effect	Flow-on Effects: Production Induced	Flow-on Effects: Consumption Induced	Flow-on Effects: Total Flow-on	TOTAL IMPACT
GROSS OUTPUT IMPACTS ($'000)					
Local hardwood milling:					
HWD Forestry	2,599	992	1,411	2,403	**5,002**
SWD Forestry	47	9	13	22	**69**
PP Forestry	277	111	160	271	**548**
Logging/Haulage	2,722	798	1,294	2,091	**4,813**
Milling (net)	10,686	2,268	5,002	7,270	**17,956**
TOTAL (mill gate)	**16,332**	**4,177**	**7,880**	**12,056**	**28,388**
Downstream Freight	1,432	409	533	942	**2,374**
TOTAL HWD MILLING	**17,764**	**4,586**	**8,412**	**12,998**	**30,763**
HWD Forestry (Other sales)	2,195	838	1,192	2,029	**4,224**
Logging/Haulage (Other sales)	1,124	329	534	863	**1,987**
TOTAL GROSS OUTPUT	**21,083**	**5,753**	**10,138**	**15,891**	**36,974**
VALUE ADDED IMPACTS ($'000)					
Local hardwood milling:					
HWD Forestry	1,539	547	784	1,331	**2,871**
SWD Forestry	38	5	7	12	**51**
PP Forestry	162	62	89	150	**312**
Logging/Haulage	1,771	448	718	1,166	**2,937**
Milling (net)	8,067	1,264	2,778	4,042	**12,109**
TOTAL (mill gate)	**11,577**	**2,326**	**4,376**	**6,702**	**18,279**
Downstream Freight	808	237	296	533	**1,341**
TOTAL HWD MILLING	**12,385**	**2,564**	**4,672**	**7,235**	**19,620**
HWD Forestry (Other sales)	1,300	462	662	1,124	**2,424**
Logging/Haulage (Other sales)	731	185	297	482	**1,213**
TOTAL VALUE ADDED	**14,416**	**3,211**	**5,630**	**8,841**	**23,257**
HOUSEHOLD INCOME IMPACTS ($'000)					
Local hardwood milling:					
HWD Forestry	986	329	381	710	**1,696**
SWD Forestry	9	3	4	7	**16**
PP Forestry	113	36	43	79	**192**
Logging/Haulage	933	272	349	622	**1,554**
Milling (net)	3,978	682	1,351	2,033	**6,011**
TOTAL (mill gate)	**6,018**	**1,323**	**2,128**	**3,450**	**9,469**
Downstream Freight	361	136	144	279	**640**
TOTAL HWD MILLING	**6,379**	**1,458**	**2,271**	**3,730**	**10,109**
HWD Forestry (Other sales)	833	278	322	600	**1,432**
Logging/Haulage (Other sales)	385	112	144	257	**642**
TOTAL HOUSEHOLD INCOME	**7,597**	**1,848**	**2,738**	**4,586**	**12,183**
EMPLOYMENT IMPACTS ($'000)					
Local hardwood milling:					
HWD Forestry	30	12	16	27	**57**
SWD Forestry	0	0	0	0	**1**
PP Forestry	5	1	2	3	**8**
Logging/Haulage	29	10	15	25	**54**
Milling (net)	162	24	57	80	**242**
TOTAL (mill gate)	**226**	**47**	**89**	**136**	**361**
Downstream Freight	12	5	6	11	**23**
TOTAL HWD MILLING	**238**	**52**	**95**	**147**	**384**
HWD Forestry (Other sales)	25	10	13	23	**48**
Logging/Haulage (Other sales)	12	4	6	10	**22**
TOTAL EMPLOYMENT	**275**	**65**	**115**	**180**	**455**

IMPACT CHANGES FROM BASE CASE (1998-99)

IMPACTS	Direct Effect	Flow-on Effects: Production Induced	Flow-on Effects: Consumption Induced	Flow-on Effects: Total Flow-on	TOTAL IMPACT
GROSS OUTPUT IMPACTS ($'000)					
Local hardwood milling:					
HWD Forestry	-53	-20	-27	-47	**-99**
SWD Forestry	0	0	0	0	**0**
PP Forestry	0	0	0	0	**0**
Logging/Haulage	-41	-12	-19	-32	**-73**
Milling (net)	-163	-29	-97	-127	**-290**
TOTAL (mill gate)	**-257**	**-62**	**-143**	**-205**	**-462**
Downstream Freight	-24	-7	-9	-16	**-39**
TOTAL HWD MILLING	**-280**	**-69**	**-152**	**-221**	**-501**
HWD Forestry (Other sales)	45	17	26	43	**88**
Logging/Haulage (Other sales)	0	0	0	0	**0**
TOTAL GROSS OUTPUT	**-235**	**-51**	**-126**	**-178**	**-413**
VALUE ADDED IMPACTS ($'000)					
Local hardwood milling:					
HWD Forestry	-31	-11	-15	-26	**-57**
SWD Forestry	0	0	0	0	**0**
PP Forestry	0	0	0	0	**0**
Logging/Haulage	-26	-7	-11	-18	**-44**
Milling (net)	-128	-17	-54	-71	**-199**
TOTAL (mill gate)	**-185**	**-35**	**-80**	**-115**	**-300**
Downstream Freight	-13	-4	-5	-9	**-22**
TOTAL HWD MILLING	**-198**	**-39**	**-85**	**-124**	**-322**
HWD Forestry (Other sales)	27	9	14	24	**50**
Logging/Haulage (Other sales)	0	0	0	0	**0**
TOTAL VALUE ADDED	**-172**	**-29**	**-70**	**-100**	**-271**
HOUSEHOLD INCOME IMPACTS ($'000)					
Local hardwood milling:					
HWD Forestry	-18	-7	-7	-14	**-32**
SWD Forestry	0	0	0	0	**0**
PP Forestry	0	0	0	0	**0**
Logging/Haulage	-14	-4	-5	-9	**-23**
Milling (net)	-82	-9	-26	-34	**-116**
TOTAL (mill gate)	**-114**	**-19**	**-38**	**-57**	**-171**
Downstream Freight	-6	-2	-2	-5	**-11**
TOTAL HWD MILLING	**-120**	**-22**	**-40**	**-62**	**-182**
HWD Forestry (Other sales)	18	6	7	13	**31**
Logging/Haulage (Other sales)	0	0	0	0	**0**
TOTAL HOUSEHOLD INCOME	**-101**	**-16**	**-33**	**-49**	**-150**
EMPLOYMENT IMPACTS ($'000)					
Local hardwood milling:					
HWD Forestry	-1	0	0	-1	**-1**
SWD Forestry	0	0	0	0	**0**
PP Forestry	0	0	0	0	**0**
Logging/Haulage	-1	0	0	0	**-1**
Milling (net)	-2	0	-1	-1	**-3**
TOTAL (mill gate)	**-3**	**-1**	**-2**	**-2**	**-6**
Downstream Freight	0	0	0	0	**0**
TOTAL HWD MILLING	**-4**	**-1**	**-2**	**-2**	**-6**
HWD Forestry (Other sales)	1	0	0	1	**1**
Logging/Haulage (Other sales)	0	0	0	0	**0**
TOTAL EMPLOYMENT	**-3**	**-1**	**-1**	**-2**	**-5**

Rounding errors may occur

ATTACHMENT 8: PREFERRED OUTCOME ECONOMIC IMPACTS: SOUTHERN TABLELANDS SUB-REGION

SOUTHERN TABLELANDS: REGIONAL ECONOMIC IMPACTS 1998-99 COMMITMENTS						IMPACT CHANGES FROM BASE CASE 1998-99 ACTUAL				
		Flow-on Effects					Flow-on Effects			
IMPACTS	Direct Effect	Production Induced	Consumption Induced	Total Flow-on	**TOTAL IMPACT**	Direct Effect	Production Induced	Consumption Induced	Total Flow-on	**TOTAL IMPACT**
GROSS OUTPUT IMPACTS ($'000)										
Local hardwood milling:										
HWD Forestry	1,562	544	330	874	**2,436**	395	138	40	178	**573**
SWD Forestry	0	0	0	0	**0**	0	0	0	0	**0**
PP Forestry	24	6	11	17	**41**	0	0	0	0	**0**
Logging/Haulage	2,326	483	812	1,295	**3,621**	282	60	97	156	**439**
Milling (net)	2,700	742	1,315	2,057	**4,757**	1,029	112	471	583	**1,612**
TOTAL (mill gate)	**6,612**	**1,776**	**2,468**	**4,243**	**10,855**	**1,707**	**309**	**608**	**917**	**2,624**
Downstream Freight	655	133	191	324	**979**	123	25	36	61	**183**
TOTAL HWD MILLING	**7,267**	**1,908**	**2,659**	**4,567**	**11,834**	**1,830**	**334**	**644**	**978**	**2,807**
HWD Forestry (Other sales)	0	0	0	0	**0**	0	0	0	0	**0**
Logging/Haulage (Other sales)	0	0	0	0	**0**	0	0	0	0	**0**
TOTAL GROSS OUTPUT	**7,267**	**1,908**	**2,659**	**4,567**	**11,834**	**1,830**	**334**	**644**	**978**	**2,807**
VALUE ADDED IMPACTS ($'000)										
Local hardwood milling:										
HWD Forestry	945	281	186	467	**1,411**	239	71	23	94	**333**
SWD Forestry	0	0	0	0	**0**	0	0	0	0	**0**
PP Forestry	14	4	6	10	**24**	0	0	0	0	**0**
Logging/Haulage	1,478	288	457	745	**2,223**	178	35	54	90	**267**
Milling (net)	1,535	441	741	1,182	**2,717**	823	70	265	335	**1,158**
TOTAL (mill gate)	**3,972**	**1,014**	**1,390**	**2,403**	**6,375**	**1,240**	**177**	**342**	**519**	**1,759**
Downstream Freight	369	81	108	189	**558**	69	15	20	35	**105**
TOTAL HWD MILLING	**4,342**	**1,095**	**1,497**	**2,592**	**6,934**	**1,309**	**192**	**362**	**554**	**1,863**
HWD Forestry (Other sales)	0	0	0	0	**0**	0	0	0	0	**0**
Logging/Haulage (Other sales)	0	0	0	0	**0**	0	0	0	0	**0**
TOTAL VALUE ADDED	**4,342**	**1,095**	**1,497**	**2,592**	**6,934**	**1,309**	**192**	**362**	**554**	**1,863**
HOUSEHOLD INCOME IMPACTS ($'000)										
Local hardwood milling:										
HWD Forestry	190	176	83	259	**449**	0	45	10	55	**55**
SWD Forestry	0	0	0	0	**0**	0	0	0	0	**0**
PP Forestry	10	2	3	5	**15**	0	0	0	0	**0**
Logging/Haulage	752	147	205	352	**1,105**	89	18	24	43	**131**
Milling (net)	1,245	213	332	545	**1,790**	494	28	119	147	**641**
TOTAL (mill gate)	**2,197**	**538**	**623**	**1,161**	**3,358**	**583**	**91**	**153**	**244**	**827**
Downstream Freight	170	42	48	90	**260**	32	8	9	17	**49**
TOTAL HWD MILLING	**2,367**	**580**	**671**	**1,251**	**3,618**	**615**	**99**	**162**	**261**	**876**
HWD Forestry (Other sales)	0	0	0	0	**0**	0	0	0	0	**0**
Logging/Haulage (Other sales)	0	0	0	0	**0**	0	0	0	0	**0**
TOTAL HOUSEHOLD INCOME	**2,367**	**580**	**671**	**1,251**	**3,618**	**615**	**99**	**162**	**261**	**876**
EMPLOYMENT IMPACTS ($'000)										
Local hardwood milling:										
HWD Forestry	6	6	3	9	**15**	0	2	0	2	**2**
SWD Forestry	0	0	0	0	**0**	0	0	0	0	**0**
PP Forestry	0	0	0	0	**1**	0	0	0	0	**0**
Logging/Haulage	19	5	8	14	**33**	4	1	1	2	**6**
Milling (net)	64	8	14	21	**85**	16	1	5	6	**22**
TOTAL (mill gate)	**89**	**19**	**26**	**45**	**134**	**20**	**3**	**6**	**9**	**29**
Downstream Freight	6	2	2	3	**10**	1	0	0	1	**2**
TOTAL HWD MILLING	**96**	**20**	**28**	**48**	**144**	**21**	**3**	**7**	**10**	**31**
HWD Forestry (Other sales)	0	0	0	0	**0**	0	0	0	0	**0**
Logging/Haulage (Other sales)	0	0	0	0	**0**	0	0	0	0	**0**
TOTAL EMPLOYMENT	**96**	**20**	**28**	**48**	**144**	**21**	**3**	**7**	**10**	**31**

Rounding errors may occur

SOUTHERN TABLELANDS: REGIONAL ECONOMIC IMPACTS 48,000m3 REFERENCE POINT

IMPACT CHANGES FROM BASE CASE 1998-99 ACTUAL

IMPACTS	Direct Effect	Flow-on Effects: Production Induced	Flow-on Effects: Consumption Induced	Flow-on Effects: Total Flow-on	TOTAL IMPACT	Direct Effect	Flow-on Effects: Production Induced	Flow-on Effects: Consumption Induced	Flow-on Effects: Total Flow-on	TOTAL IMPACT
GROSS OUTPUT IMPACTS ($'000)										
Local hardwood milling:										
HWD Forestry	1,622	565	336	901	**2,523**	456	159	46	205	**660**
SWD Forestry	0	0	0	0	**0**	0	0	0	0	**0**
PP Forestry	24	6	11	17	**41**	0	0	0	0	**0**
Logging/Haulage	2,914	604	1,019	1,624	**4,538**	871	181	304	485	**1,356**
Milling (net)	4,230	853	1,801	2,654	**6,884**	2,559	223	956	1,180	**3,739**
TOTAL (mill gate)	**8,791**	**2,029**	**3,167**	**5,196**	**13,986**	**3,886**	**563**	**1,307**	**1,870**	**5,755**
Downstream Freight	834	169	243	412	**1,247**	302	61	88	149	**451**
TOTAL HWD MILLING	**9,625**	**2,198**	**3,410**	**5,608**	**15,233**	**4,188**	**624**	**1,395**	**2,019**	**6,207**
HWD Forestry (Other sales)	0	0	0	0	**0**	0	0	0	0	**0**
Logging/Haulage (Other sales)	0	0	0	0	**0**	0	0	0	0	**0**
TOTAL GROSS OUTPUT	**9,625**	**2,198**	**3,410**	**5,608**	**15,233**	**4,188**	**624**	**1,395**	**2,019**	**6,207**
VALUE ADDED IMPACTS ($'000)										
Local hardwood milling:										
HWD Forestry	981	292	189	481	**1,462**	276	82	26	108	**383**
SWD Forestry	0	0	0	0	**0**	0	0	0	0	**0**
PP Forestry	14	4	6	10	**24**	0	0	0	0	**0**
Logging/Haulage	1,854	360	574	934	**2,788**	554	108	171	279	**833**
Milling (net)	2,848	506	1,014	1,520	**4,368**	2,136	134	539	673	**2,809**
TOTAL (mill gate)	**5,697**	**1,161**	**1,783**	**2,944**	**8,642**	**2,965**	**324**	**736**	**1,060**	**4,025**
Downstream Freight	471	103	137	240	**711**	170	37	50	87	**257**
TOTAL HWD MILLING	**6,168**	**1,264**	**1,920**	**3,185**	**9,353**	**3,136**	**361**	**786**	**1,147**	**4,282**
HWD Forestry (Other sales)	0	0	0	0	**0**	0	0	0	0	**0**
Logging/Haulage (Other sales)	0	0	0	0	**0**	0	0	0	0	**0**
TOTAL VALUE ADDED	**6,168**	**1,264**	**1,920**	**3,185**	**9,353**	**3,136**	**361**	**786**	**1,147**	**4,282**
HOUSEHOLD INCOME IMPACTS ($'000)										
Local hardwood milling:										
HWD Forestry	190	183	85	268	**457**	0	51	12	63	**63**
SWD Forestry	0	0	0	0	**0**	0	0	0	0	**0**
PP Forestry	10	2	3	5	**15**	0	0	0	0	**0**
Logging/Haulage	945	184	257	441	**1,387**	282	55	77	132	**414**
Milling (net)	1,752	244	455	698	**2,450**	1,001	59	241	300	**1,301**
TOTAL (mill gate)	**2,897**	**612**	**799**	**1,412**	**4,309**	**1,283**	**165**	**330**	**495**	**1,778**
Downstream Freight	216	53	61	115	**331**	78	19	22	42	**120**
TOTAL HWD MILLING	**3,113**	**666**	**861**	**1,527**	**4,640**	**1,361**	**185**	**352**	**537**	**1,898**
HWD Forestry (Other sales)	0	0	0	0	**0**	0	0	0	0	**0**
Logging/Haulage (Other sales)	0	0	0	0	**0**	0	0	0	0	**0**
TOTAL HOUSEHOLD INCOME	**3,113**	**666**	**861**	**1,527**	**4,640**	**1,361**	**185**	**352**	**537**	**1,898**
EMPLOYMENT IMPACTS ($'000)										
Local hardwood milling:										
HWD Forestry	6	6	3	10	**16**	0	2	0	2	**2**
SWD Forestry	0	0	0	0	**0**	0	0	0	0	**0**
PP Forestry	0	0	0	0	**1**	0	0	0	0	**0**
Logging/Haulage	23	7	11	17	**40**	8	2	3	5	**13**
Milling (net)	78	9	19	27	**105**	30	2	10	12	**42**
TOTAL (mill gate)	**107**	**22**	**33**	**54**	**162**	**38**	**6**	**14**	**19**	**57**
Downstream Freight	8	2	3	4	**12**	3	1	1	2	**4**
TOTAL HWD MILLING	**115**	**24**	**35**	**59**	**174**	**41**	**7**	**14**	**21**	**62**
HWD Forestry (Other sales)	0	0	0	0	**0**	0	0	0	0	**0**
Logging/Haulage (Other sales)	0	0	0	0	**0**	0	0	0	0	**0**
TOTAL EMPLOYMENT	**115**	**24**	**35**	**59**	**174**	**41**	**7**	**14**	**21**	**62**

Rounding errors may occur

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