

**The Economic Impact of Rural Subdivision
and the Forest Industry with particular
reference to the Central Tablelands region
and the Oberon Shire of NSW**

Prepared for: Central Western Regional Development Board

By the Western Research Institute

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EXECUTIVE SUMMARY

This report uses input-output analysis to determine the economic contribution of the forestry industry to the Oberon Shire and the Central Tablelands. The economic impact of small acreage subdivision was also determined in the Oberon Shire to allow analysis of the competitive and complementary features of the two activities.

In total, the forestry industry contributed \$357 million to output and \$137 million to Oberon's gross regional product (GRP) in the 2003-04 financial year. This is equivalent to 59% of GRP in the region and clearly indicates that the forestry industry is the backbone of the Oberon economy. Forestry activities in the Oberon region also play a significant role in the Central Tablelands and New South Wales economies respectively accounting for 5.8% and 0.1% of GRP and gross state product (GSP).

Most forestry activity in the Central Tablelands occurs in the Oberon Shire, however there are a number of other smaller operations that also make a significant contribution to the Central Tablelands economy. In total, the forestry industry contributes around \$525 million in output, \$226 million in GRP, \$91 million in household income and almost 2,000 full-time equivalent jobs, to the Central Tablelands region.

The relatively low flow-on benefits to the Oberon community resulting from forestry expenditure in the Oberon Shire, indicates that the economy is not thick enough to capture all of the benefits generated by the industry. In particular, the Oberon economy needs strengthening in the retail and service sectors. Any other economic activity which diversifies the industry base of the Oberon economy, would build the regions capacity to capture local expenditure.

There are a number of initiatives that could help strengthen the Oberon economy. These include the:

- extension of the forestry industry chain through the development of support services such as information technology and engineering; and the
- in-migration of new residents, hence increasing demand from some of these weaker sectors.

This study in particular, was required to focus on the impact of small acreage subdivision.

Initial investment in the development of small acreage subdivision in the Oberon Shire contributes around \$2 million to GRP. The ongoing maintenance of these properties and living expenses of those who own or occupy them is estimated to contribute around \$0.7 million in GRP annually to the Oberon economy.

While the forestry industry may be the backbone of the Oberon economy, contributing a majority of GRP and significant employment to the region, alternative forms of investment in the region are required to help retain the benefits generated by forestry operations. Thus, it appears as though small acreage subdivision and the forestry industry in the Oberon Shire are complementary rather than competitive in terms of the development of the Oberon economy.

This economic view of the Oberon Shire, does not take into account the social impact of the forestry industry or rural subdivision. It is acknowledged, both in the literature and in a recent community perception study held in Oberon, that the relations between industry and the community must be managed. This is particularly true of new residents to the region, who are more likely to voice their concerns about forestry operations. Communication with the community and the implementation of policies to manage conflict will be critical in the development of social capital in the Shire and the ongoing prosperity of the forestry industry.

1 INTRODUCTION

1.1 Project Background

Resulting largely from a series of government initiatives, generating both public and private investment in softwood plantations in the later half of the last century a significant plantation resource has been established in the region.

The size of this resource and its maturing age structure has provided opportunities for investment in downstream processing of the resource, much of which is world class in its technology and scale. The outcome from this investment has been a major shift in the Oberon economy, from its traditional reliance on agriculture to forestry and timber processing.

Due to the region's close proximity to Sydney and the relaxed country lifestyle it offers, the Oberon Shire is becoming a popular location for investment in small acreage subdivision. The development of small acreage lots from larger farming properties also provides farmers with a new means of generating income. In recent years, these trends have seen a number of new small acreage subdivisions emerging across the Oberon Shire.

The Central Western Regional Development Board (CWRDB) commissioned the Western Research Institute (WRI) to compare the economic impact of rural subdivision and the forest industry in the Oberon Shire and Central Tablelands. This report outlines the economic contribution of these two activities in terms of:

Forestry

1. plantation and harvesting
2. processing
3. resin manufacture

Rural Subdivision

1. land development
2. land use
3. living expenses

1.2 Project Objectives

The aim of this study is to provide some insight into the economic contribution of forestry and small acreage subdivision activities conducted in the Oberon Shire and across the Central Tablelands. The objectives of the report are to provide:

1. economic indicators that allow the merits of the forestry industry and rural subdivision to be compared; and
2. discussion around whether there is any indication of either forestry or rural subdivision influencing the economic indicators of the other.

1.3 The Oberon Shire

The Oberon Shire is an area of rich agricultural land situated around 180 km west of Sydney. The estimated resident population of the Shire for 2003 is 5,086 (ABS, 2004) with over 2,500 of these residents living in the town of Oberon. The plantation forestry and timber processing industries are the region's major employers; however the agriculture and tourism sectors are also strong. Some of the key statistics relating to the Oberon Shire are shown below¹.

Key Statistics

Population	5,086
Average age of residents	35
Average individual income	\$300 - \$399 p/w
Average household size	2.7 persons
Unemployment rate	3.5%
Participation rate	64.8%

¹ Note: Statistics calculated by the Western Research Institute based on figures provided by the Australian Bureau of Statistics (2001) and the Commonwealth Government Department of Employment and Workplace Relations (2004).

1.4 The Central Tablelands

The Central Tablelands is diverse area of mainly agricultural land that stretches from the Blayney Shire in the west to the Greater Lithgow area in the east covering around 18,007.3 square km (ABS, 2001). The estimated resident population of the Central Tablelands for 2003 is 113,325 (ABS, 2004). The Central Tablelands includes the cities of Bathurst, Orange and Lithgow and a number of smaller towns and villages. Employment in the Central Tablelands is strongest in the retail and manufacturing sectors. Some of the key statistics relating to the Central Tablelands are shown below.

Key Statistics

Population	113,325
Average age of residents	34
Average individual income	\$300 - \$399 p/w
Average household size	2.6 persons
Unemployment rate	5.7%
Participation rate	67.0%

1.5 Definitions

The following definitions apply to this report:

Forestry Industry: includes the plantation, management, harvesting, processing and transport of wood and wood products.

Forestry and Logging: an industry sector defined by the ABS to include the growth, felling and cutting of timber and services to forestry such as pest control, pruning and thinning in forests.

Sawmill Products: includes log sawmilling, wood chipping and timber resawing and dressing.

Other Wood Products: includes the manufacture of plywood, veneer, fabricated wood, wooden structural components and other wood products such as wooden containers.

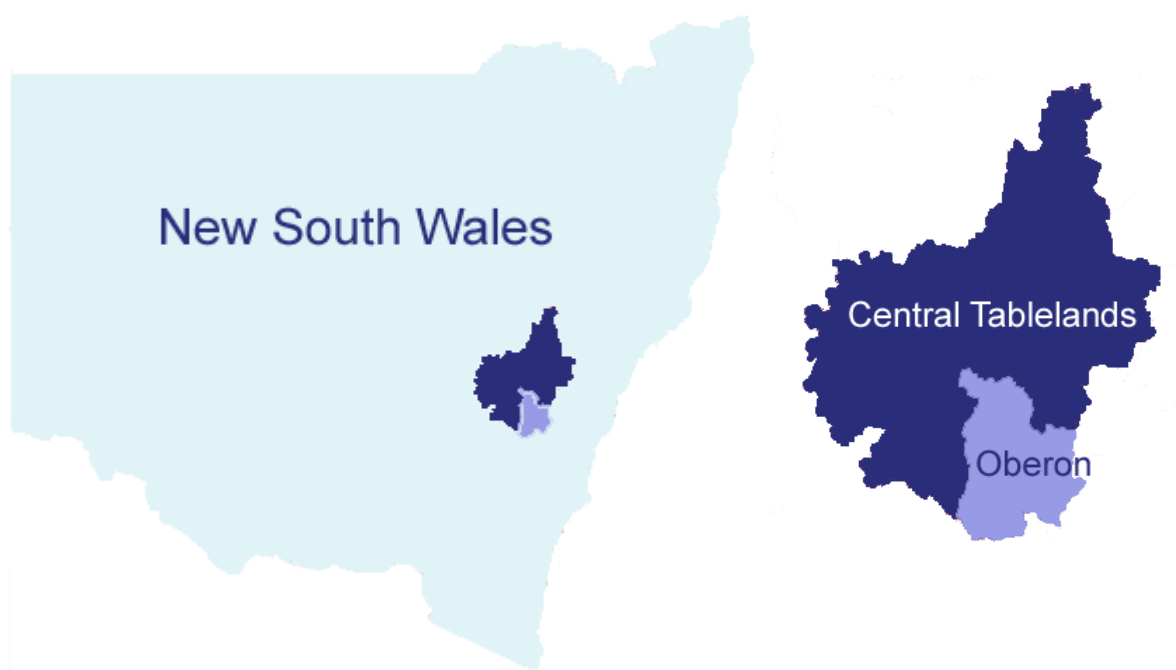
Basic Chemical Manufacturing: includes fertiliser, industrial gas, synthetic resin, organic and inorganic chemical manufacturing (includes the resin manufacturing component of the Oberon forestry industry chain).

Small Acreage Subdivision: includes the development and use of land between 2 and 40 ha. This categorisation is based on the Oberon Shire Council LEP.

2 METHODOLOGY

The WRI used input-output analysis to estimate the economic impact of forestry and rural subdivision activities in the Oberon LGA, Central Tablelands and NSW as shown in Diagram 1 below. Input-output modelling provides a detailed picture of the structure of the economy at a particular point in time. The input-output tables constructed for the CWRDB are for the 2003/04 financial year and so estimate the impact of forestry and rural subdivision in that year. All tables were constructed using *Input-Output Analysis for Practitioners* version 8.0.0² software.

Diagram 1: The Central Tablelands and Oberon Local Government Area



Note: The Central Tablelands includes the ABS Statistical sub-divisions of: Rylstone, Greater Lithgow, Oberon, Evans, Blayney, Cabonne (Part A and B), Bathurst and Orange.

² Input-Output Analysis for Practitioners ©2003 Centre for Economic Policy Modelling, University of Queensland. Programmed by Guy West.

2.1 Constructing the Tables

The input-output tables for this project were extracted from the Australian Bureau of Statistics (ABS) 1998-99 National input-output table using the Generation of Regional Input-Output Tables (GRIT) technique³. This technique derives regional input-output tables by using detailed employment data, location quotients and industry data (in this case, information regarding forestry in the Oberon Shire). The GRIT technique provides tables that are: consistent with each other and the ABS National table; holistically accurate; and able to be updated as new information becomes available.

2.2 Impact Analysis

The impact of the forestry industry and small acreage subdivision in each region has been provided in terms of:

- **Output** is the value of goods and services that are produced within an establishment that become available for use outside that establishment, plus any goods and services produced for own final use. Output is equal to total revenue plus any internal consumption.
- **Value added** by an industry is equal to gross output minus intermediate inputs. Value added is equivalent to the contribution to gross domestic product (GDP) at the national level, gross state product (GSP) at the state level and gross regional product (GRP) at the local level.
- **Household Income** measures the benefit received by regional households from economic activity. Typically income includes compensation of employees, but may also include the gross mixed income of unincorporated enterprises, gross operating surplus on dwellings owned by persons, property income receivable and transfers receivable (such as social assistance benefits and non-life insurance claims).
- **Employment** (full-time equivalent or FTE) is a measure of the total level of staff resources used. The FTE of a full-time staff member is equal to 1.0. The FTE of a part-time worker will be a fraction of this depending on the relative number of hours worked.

³ The GRIT procedure was developed by Associate Professor Guy West and Professor Rod Jensen of the University of Queensland and is the most widely used method of constructing regional input-output tables in Australia. The GRIT method is also widely used in America and Europe.

All impacts estimated in this report are based on the use of marginal coefficients to provide a more accurate representation of the flow-on effects of expenditure than would be possible using a linear model⁴. That is, the marginal coefficients model largely overcomes the overestimation of impacts that can result from using the linear approach. A more detailed description of the marginal coefficients approach can be found in Appendix 1.

2.2.1 Multipliers

A multiplier expresses the amount of flow-on benefit generated by initial expenditure in a region. Therefore, multipliers included in this report indicate the relative magnitude of the flow-on effects of the forestry industry compared to the direct effect of the industry. Type II A multipliers, which are the type used in this report, show the initial impact plus any flow-on effects that may occur. That is, a multiplier of 1.5 indicates that for every \$1 of direct impact there will be 50c flow-on.

Type II A multipliers are calculated as the ratio of the total economic impact of the forestry industry (i.e. direct plus indirect effects) divided by the direct effects of the forestry industry. For example, the employment multiplier for the Oberon Shire indicates that for every person employed in the forestry industry an additional 0.46 persons are employed by all industries in the Oberon economy.

The multiplier in each region is most affected by household expenditure. Whether or not households spend their money on goods and services that are produced locally or are imported into the region will affect the size of the multiplier and therefore the amount of flow-on benefits to the region. For example, the value added multiplier for the forestry industry in the Oberon Shire is 1.18; the equivalent figure in the Central Tablelands is 1.63. This means that for each dollar spent in the Oberon region by the forestry industry 18c will remain in the Oberon economy. Alternatively, for each dollar spent by the forestry industry in the Central Tablelands, 63c will remain in the region. This difference is due to a higher level of expenditure on imports occurring in the Oberon Shire than in the Central Tablelands.

Generally, the bigger the region studied the larger the multiplier, as more of the initial impact is captured by goods and services produced locally. Therefore you would expect the multipliers in the Oberon Shire to be smaller than those in the Central Tablelands, which should in turn be smaller than those in NSW. This effect is evidenced by larger flow-on and total impacts in the Central Tablelands and NSW occurring as a result of the same initial impact made by the Oberon forestry industry.

⁴ West, G. & Gamage, A. (1997). Differential Multipliers for Tourism in Victoria. *Tourism Economics*, 3 (1), 57-68.

2.2.2 Industry Significance

Input-output tables are frequently used to provide estimates of the significance of a particular industry or organisation in terms of its contribution to the economy. This is done by examining the effects of the industry shutting down and ceasing all economic activities. This method provides an estimate of the level of economic activity that can be attributed to that particular industry. In this report, the significance of the forestry and logging, sawmill products manufacturing, other wood products manufacturing and basic chemical manufacturing industries were determined in this manner.

2.2.3 Final Demand Impacts

Input-output tables can also be used to determine the effects of a given economic stimulus on the local economy through the use of final demand impacts. This is done by entering the direct impacts of the stimulus as final demand expenditure to allow analysis of the initial and flow-on effects that result. The economic impacts of small acreage subdivision were calculated using this method.

3 ECONOMIC IMPACT OF THE OBERON FORESTRY INDUSTRY

This chapter details the economic significance of the Oberon forestry industry to the Oberon (section 3.1), Central Tablelands and New South Wales (section 3.2) economies. Impacts are provided in terms of the entire forestry industry⁵ as well as the separate impacts of each industry component. That is the forestry and logging, sawmill products manufacturing, other wood products manufacturing and basic chemical manufacturing industry groups.

3.1 Economic Significance of the Forestry Industry to the Oberon Economy

The forestry industry contributes around \$137 million to Gross Regional Product (GRP) in the Oberon Shire. This total impact, including flow-on effects, is equivalent to 59% of GRP. The industry also contributes \$45 million or 49% to household income and almost 820 full-time equivalent jobs to the region. Employment generated by the forestry industry in Oberon accounts for one third of employment in the Shire. Table 3.1 below shows the total contribution of the Oberon forestry industry including forestry and logging, sawmill products, other wood products and basic chemical manufacturing.

Table 3.1: Economic Significance of the Oberon Forestry Industry

Economic Indicator	Initial	Flow-on	Total	Multiplier
Output (\$'000)	297,747	59,476	357,222	1.20
Value Added (\$'000)	115,977	20,908	136,885	1.18
Household Income (\$'000)	36,481	8,747	45,228	1.24
Employment (FTE)	558	259	817	1.46

⁵ Detailed analysis of the flow-on impact of the forestry industry in the Oberon Shire has been provided in Appendix 5.

3.1.1 Economic Significance of Forestry and Logging to the Oberon Economy

The forestry and logging sector includes plantation forestry and harvesting. This industry group specifically refers to the operations of state forests and other private plantation owners as well as harvesting companies. The forestry and logging industry group contributes around 7% to GRP and 4% to employment in the Oberon Shire. Table 3.1.1 below shows the economic significance of forestry and logging to the Oberon economy, the proportion of the forestry industry this group comprises, and the percent of total output, value added, income and employment forestry and logging contributes to the Oberon economy.

Table 3.1.1: Economic Significance of Forestry and Logging

Economic Indicator	Initial	Flow-on	Total	Percent of Industry	Percent of Oberon
Output (\$'000)	25,440	3,223	28,663	8.0%	5.4%
Value Added (\$'000)	15,284	1,630	16,913	12.4%	7.3%
Household Income (\$'000)	1,787	933	2,720	6.0%	2.9%
Employment (FTE)	67	22	89	10.9%	3.8%

3.1.2 Economic Significance of Sawmill Product Manufacturing to the Oberon Economy

Sawmill product manufacturing mainly includes operations manufacturing building timber, dressed timber, sawn timber or woodchips. The impact of sawmill product manufacturing on the Oberon economy is around 5% of GRP and almost 10% of the Shire's employment. Table 3.1.2 below shows the economic significance of sawmill product manufacturing to the Oberon economy.

Table 3.1.2: Economic Significance of Sawmill Product Manufacturing

Economic Indicator	Initial	Flow-on	Total	Percent of Industry	Percent of Oberon
Output (\$'000)	59,049	6,158	65,207	18.3%	12.4%
Value Added (\$'000)	8,745	3,011	11,756	8.6%	5.1%
Household Income (\$'000)	10,999	1,452	12,451	27.5%	13.4%
Employment (FTE)	190	45	235	28.8%	9.9%

3.1.3 Economic Significance of Other Wood Product Manufacturing to the Oberon Economy

Other wood product manufacturing includes the manufacture of MDF board, mouldings and a number of other bonded wood products. This industry group is the most elaborately transformed component of the Oberon forestry industry. The high wage rates in these operations result in a large multiplier, or flow-on, effect. The other wood product manufacturing group makes the largest overall contribution to the Oberon economy with 44% of GRP and 19% of employment attributable to its operation. Table 3.1.3 below shows the economic significance of other wood product manufacturing to the Oberon economy.

Table 3.1.3: Economic Significance of Other Wood Product Manufacturing

Economic Indicator	Initial	Flow-on	Total	Percent of Industry	Percent of Oberon
Output (\$'000)	183,302	48,282	231,585	64.8%	44.0%
Value Added (\$'000)	86,389	15,430	101,819	74.4%	43.8%
Household Income (\$'000)	21,877	5,988	27,864	61.6%	29.9%
Employment (FTE)	278	180	458	56.1%	19.4%

3.1.4 Economic Significance of Basic Chemical Manufacturing to the Oberon Economy

The basic chemical manufacturing industry group includes the manufacture of a number of chemical products including fertiliser and industrial gas. In the Oberon Shire, this term refers to the manufacture of resin for the other wood products sector. The initial impact of basic chemical manufacturing in the Oberon Shire is the smallest of the forestry industry; however this type of operation still contributes around 3% to GRP and 2% of total employment to the region. Table 3.1.4 below shows the economic significance of basic chemical manufacturing to the Oberon economy.

Table 3.1.4: Economic Significance of Basic Chemical Manufacturing

Economic Indicator	Initial	Flow-on	Total	Percent of Industry	Percent of Oberon
Output (\$'000)	29,955	1,812	31,767	8.9%	6.0%
Value Added (\$'000)	5,559	838	6,397	4.7%	2.8%
Household Income (\$'000)	1,818	374	2,193	4.8%	2.4%
Employment (FTE)	23	12	34	4.2%	1.5%

3.2 Economic Significance of the Oberon Forestry Industry to the Central Tablelands and New South Wales Economies

The forestry industry is also an important component of the Central Tablelands economy. The Oberon forestry industry specifically plays a central role in the region contributing around \$188 million or 5.8% to Gross Regional Product (GRP) in the Central Tablelands. The Oberon forestry industry also contributes \$74 million or 4% in household income and around 3% or 1,500 full-time equivalent jobs to the Central Tablelands region.

The Oberon forestry industry also makes an important contribution to the larger New South Wales economy. In total, activities associated with the Oberon forestry industry contribute around \$264 million or 0.12% to Gross State Product (GSP). The industry also generates around 0.1% of household income and employment in New South Wales. Table 3.2 below shows the total contribution of the Oberon forestry industry in the Central Tablelands and New South Wales including forestry and logging, sawmill products, other wood products and basic chemical manufacturing.

Table 3.2: Economic Significance of the Oberon Forestry Industry

Region	Output (\$'000)	Value Added (\$'000)	Household Income (\$'000)	Employment (FTE)
Central Tablelands	482,597	188,109	74,435	1,508
New South Wales	664,877	264,427	120,656	2,389

Note: the total impact of the Oberon forestry industry is larger in the Central Tablelands and NSW due to increased multipliers (or flow-on effects) in these larger areas. This concept is explained fully in the methodology chapter.

3.3 Conclusion

The forestry industry in the Oberon Shire is clearly the single most important contributor to the economy of the region. Contributing around \$137 million or 59% to GRP in the Shire, the forestry industry is the backbone of the Oberon economy. Not surprisingly, the Oberon forestry industry also plays a significant role in the Central Tablelands and New South Wales economies respectively accounting for 5.8% and 0.1% of GRP and GSP.

The Oberon region is particularly suited to the production of wood and wood products and the industry is heavily embedded in the culture of the region. Over 20% of employment in the Oberon Shire is directly associated with the forestry industry and a further 13% of employment is generated by industry flow-on effects. The below average unemployment rate in the Oberon Shire can be linked to employment opportunities in the forestry industry, ensuring an improved social composition.

4 ECONOMIC IMPACT OF THE CENTRAL TABLELANDS FORESTRY INDUSTRY

This chapter details the economic significance of the forestry industry in the Central Tablelands. The impacts of the entire forestry industry as well as the separate impacts of each industry component have been provided, these include the forestry and logging, sawmill products manufacturing and other wood products manufacturing industry groups.

4.1 Economic Significance of the Forestry Industry to the Central Tablelands Economy

The forestry industry contributes around \$226 million to Gross Regional Product (GRP) in the Central Tablelands. This total impact, including flow-on effects, is equivalent to 6.9% of GRP. The industry also contributes almost \$91 million or 5.4% to household income and almost 2,000 full-time equivalent jobs to the region. Employment generated by the forestry industry in the Central Tablelands accounts for almost 4% employment in the region. Table 4.1 below shows the total contribution of the forestry industry to the Central Tablelands economy including forestry and logging, sawmill products, other wood products and basic chemical manufacturing.

Table 4.1: Economic Significance of the Central Tablelands Forestry Industry

Economic Indicator	Initial	Flow-on	Total	Multiplier
Output (\$'000)	315,461	209,897	525,358	1.67
Value Added (\$'000)	139,031	87,341	226,371	1.63
Household Income (\$'000)	57,708	33,169	90,877	1.57
Employment (FTE)	940	1,008	1,947	2.07

The Oberon forestry industry in particular contributes a majority of this impact, even though it encompasses the wider Central Tablelands region. Activities associated with the forestry industry in the Oberon Shire account for 92% of output, 83% value added, 81% household income and 77% employment in the forestry industry across the Central Tablelands.

There are a number of smaller, but still significant, forestry operations in the Central Tablelands outside of the Oberon Shire. These operations specifically, in addition to the contribution made by the Oberon forestry industry, contribute \$42 million in output, \$38 million in GRP, \$17 million in household income and over 400 full-time jobs to the Central Tablelands Economy.

4.1.1 Economic Significance of Forestry and Logging to the Central Tablelands Economy

The forestry and logging industry group contributes a total of around \$54 million or 1.6% of GRP and 0.7% of employment or 360 full-time jobs in the Central Tablelands. Table 4.1.1 below shows the economic significance of forestry and logging to the Central Tablelands economy. Almost 52% of the GRP produced by forestry and logging in the Central Tablelands is generated by the Oberon forestry and logging sector. A majority of the employment generated by the forestry and logging sector also originates in the Oberon Shire.

Table 4.1.1: Economic Significance of Forestry and Logging

Economic Indicator	Initial	Flow-on	Total	Percent of Industry	Percent of Central Tablelands
Output (\$'000)	58,985	28,177	87,161	16.6%	1.4%
Value Added (\$'000)	40,659	13,020	53,679	23.7%	1.6%
Household Income (\$'000)	17,297	6,211	23,508	25.9%	1.4%
Employment (FTE)	152	208	360	18.5%	0.7%

4.1.2 Economic Significance of Sawmill Product Manufacturing to the Central Tablelands Economy

The impact of sawmill product manufacturing on the Central Tablelands economy is around \$40 million or 1.2% in GRP and 545 full-time jobs or 1% of the region's employment. Table 4.1.2 below shows the economic significance of sawmill product manufacturing to the Central Tablelands economy. The operation of the Oberon sawmill contributes around 60% of the total GRP produced in this sector across the Central Tablelands. Seventy three percent of employment associated with sawmill product manufacturing in the region is generated by the Oberon sawmill.

Table 4.1.2: Economic Significance of Sawmill Product Manufacturing

Economic Indicator	Initial	Flow-on	Total	Percent of Industry	Percent of Central Tablelands
Output (\$'000)	63,446	55,732	119,178	22.7%	1.9%
Value Added (\$'000)	10,742	28,774	39,516	17.5%	1.2%
Household Income (\$'000)	12,749	9,112	21,861	24.1%	1.3%
Employment (FTE)	297	248	545	28.0%	1.0%

4.1.3 Economic Significance of Other Wood Product Manufacturing to the Central Tablelands Economy

The other wood product manufacturing group makes the largest overall contribution to the Central Tablelands economy with 4% of GRP and 2% of employment attributable to its operation. Table 4.1.3 below shows the economic significance of other wood product manufacturing to the Central Tablelands economy. There is very little other wood product manufacturing in the Central Tablelands outside of the Oberon Shire.

Table 4.1.3: Economic Significance of Other Wood Product Manufacturing

Economic Indicator	Initial	Flow-on	Total	Percent of Industry	Percent of Central Tablelands
Output (\$'000)	193,030	125,989	319,019	60.7%	5.0%
Value Added (\$'000)	87,630	45,547	133,176	58.8%	4.1%
Household Income (\$'000)	27,662	17,847	45,508	50.1%	2.7%
Employment (FTE)	491	552	1,043	53.6%	2.0%

4.2 Conclusion

The forestry industry is an important component of the Central Tablelands economy. Although this larger region is not as dependant on the forestry industry as is the Oberon Shire, the forestry industry in the Central Tablelands contributes around \$226 million or 6.9% of total Gross Regional Product (GRP). The industry also contributes almost \$91 million or 5.4% to household income and almost 2,000 full-time equivalent jobs, accounting for almost 4% employment, to the region.

The forestry industry in the Central Tablelands is underpinned by operations carried out in the Oberon Shire. Activities associated with the Oberon forestry industry account for a majority of output, value added, household income and employment in the forestry industry across the Central Tablelands. There are also a number of smaller forestry operations in the Central Tablelands outside of the Oberon Shire. These operations, in combination with those in Oberon make a significant contribution to the Central Tablelands economy.

5 COMPARISON WITH EARLIER STUDIES

An earlier study into the economic impact of the Oberon forestry industry was conducted over the period 1985 to 1993 by Dwyer Leslie Pty. Ltd and Dr Roy Powell (hereafter referred to as the Powell study). The study included an in-depth examination of the Oberon forestry industry to quantify the economic benefits generated by the industry and to identify any potential negative outcomes. The Powell study included economic and social impacts, of which the economic impact was determined using input-output analysis, as was done in this report. This chapter compares the results of the two studies to highlight changes to the forestry industry in the period between the two studies that may have affected input-output results.

This study has shown the Oberon forestry industry to make a significant contribution not only to the Oberon Shire but also to the Central Tablelands. The Powell study also came to a similar conclusion. Differences between the total impacts estimated in the two studies can be attributed to a number of key influences including:

- general industry shifts in the Australian economy;
- the increased size of the Oberon forestry industry;
- increased productivity and mechanisation across the forestry industry; and
- the decreased price of natural resources, including wood, relative to other prices.

In general, these influences lead to changes in both the initial impact and the flow-on or multiplier effects of the forestry industry.

5.1 Changes in the Initial Impact of the Forestry Industry

Some of the industry group impacts and all of the forestry industry impacts calculated in this study are greater than those reported in the Powell study due to expansion in the industry increasing the initial impact. Table 5.1 below shows the changes in the initial impact of the forestry industry in the Oberon Shire and Central Tablelands (estimates of impacts in NSW and for value added not provided in the Powell study).

Table 5.1: Changes in the Initial Impact of the Forestry Industry 1993 – 2004

Region	Output (\$'000)		Household Income (\$'000)		Employment (FTE)	
	1992-93	2003-04	1992-93	2003-04	1992-93	2003-04
Oberon Shire	127,259	297,747	15,169	36,481	389	558
Central Tablelands	146,773	315,461	19,934	57,708	513	940

Note: Dollar values from the Powell study have been inflated to 2003/04 prices using ABS data.

5.2 Changes in the Flow-on Effects of the Forestry Industry

When comparing the two studies it is important to consider the differences in methodology used. While both studies used the GRIT technique to develop regional tables, judgements made by the analyst throughout table construction may result in similar but not exact outcomes each time a table is made. Additionally, advances in understanding and practices regarding input-output since the Powell study would suggest that the latest figures provide a more accurate representation of the impact of the forestry industry. Specifically, the use of marginal coefficients to determine the magnitude of the flow-on effects of an impact has superseded the use of the linear model undertaken by the Powell study. This means that some of the differences in the multipliers may be due to differences in methodology, rather than changes in the industry itself.

Table 5.2 below shows the multipliers for the forestry industry in the Oberon Shire and Central Tablelands from each of the studies (estimates of the impact in NSW and for value added not provided in the Powell study).

Table 5.2: Changes in the Multipliers of the Forestry Industry 1993 – 2004

Region	Output		Household Income		Employment	
	1992-93	2003-04	1992-93	2003-04	1992-93	2003-04
Oberon Shire	1.38	1.20	2.05	1.24	2.19	1.46
Central Tablelands	1.86	1.60	2.85	1.69	3.13	2.35

Overall it can be said that the multiplier effects determined by this study are marginally lower than those calculated in the earlier Powell study. These lower multipliers can be explained by:

- the use of marginal coefficients which provides a lower and more accurate representation of the flow-on effects of an industry;
- shifts in the Australian economy; and
- increased productivity and mechanisation in the forestry industry, as has occurred across most of the manufacturing industry.

5.3 Conclusion

The results of this study are somewhat similar to those of the Powell study. While the increased size of the forestry industry in the Oberon Shire and the Central Tablelands makes comparison difficult, the multipliers show reduced but still significant flow-on in each region. The larger decline in the household income and employment multipliers (fall of between 25% and 40%) can be attributed to increased mechanisation across the forestry industry.

6 ECONOMIC IMPACT OF SMALL ACREAGE SUBDIVISION IN OBERON

This chapter details the economic impact of small acreage subdivision on the Oberon economy. Small acreage subdivision refers to those properties between 2 and 40 ha as outlined in the Oberon Shire Council Local Environmental Plan. Section 4.1 examines the initial impact of the development of small acreage blocks and section 4.2 considers the ongoing impact of these developments. Section 4.3 examines the total contribution of agriculture to the Oberon economy including small and large farming operations in the Shire.

The economic impact of small acreage subdivision has been determined using final demand impact analysis⁶. The size of the impact of small acreage development and maintenance was determined through interviews with local experts and extrapolation of data provided by Oberon Shire Council regarding the value of development applications and building approvals and reported in the ABS Household Expenditure Survey (cat. no. 6530.0). A more detailed description of how final demand impacts were determined can be found in Appendix 4.

6.1 Development Impact of Small Acreage Subdivision

The development of a small acreage property is a source of final demand, with the construction, business services and government administration sectors particularly affected by the associated expenditure. It has been assumed that around three-quarters of construction spending would be captured locally, with all other expenditure expected to be captured in the Central Tablelands⁷.

Table 6.1 over the page shows the economic impact of small acreage development in the 2003-04 financial year. These estimates are indicative only, as the direct cost of development will vary from year to year and depend upon a range of factors. However, this final demand impact analysis indicates that in the 2003-04 financial year, small acreage subdivision provides a significant economic stimulus to the region.

⁶ Detailed analysis of the flow-on impact of small acreage subdivision in the Oberon Shire has been provided in Appendix 6.

⁷ This methodology has been used in WRI economic impact studies for Australian Pork Limited Pty Ltd and was based on a survey of regional farmers across Australia.

Table 6.1: Initial Development Impact of Small Acreage Subdivision

Economic Indicator	Initial	Flow-on	Total	Percent of Oberon
Output (\$'000)	3,439	1,515	4,954	0.94%
Value Added (\$'000)	1,384	622	2,006	0.86%
Household Income (\$'000)	591	290	882	0.95%
Employment (FTE)	21	8	29	1.23%

6.2 Operational Impact of Small Acreage Subdivision

The ongoing use and management of a small acreage property is also a source of final demand, where expenditure by the owner for household and property purposes is measured as additional consumption in the input-output table. The impact of running a small acreage property included the retail, utilities, transport, construction, business services and government administration sectors.

Information on average household expenditure was gathered from the ABS Household Expenditure survey. Information regarding property associated expenditure was provided by local experts. This analysis included properties between 8 and 40 ha (as indicated by local experts to be of sufficient size to generate income) and total expenditure was based on the assumption that one steer per hectare would be run on each property. The assumptions used in this analysis are detailed in Appendix 4.

While the development impact of small acreage subdivision only provides a one-off economic benefit to the region, the ongoing use and management of these properties would provide continued benefits to the Oberon Shire. Table 6.2 shows the ongoing economic impact of small acreage subdivision in the Oberon Shire.

Table 6.2: Ongoing Economic Impact of Small Acreage Subdivision

Economic Indicator	Initial	Flow-on	Total	Percent of Oberon
Output (\$'000)	1,001	422	1,423	0.27%
Value Added (\$'000)	510	200	710	0.31%
Household Income (\$'000)	277	98	375	0.40%
Employment (FTE)	7	3	10	0.41%

6.3 The Economic Significance of the Agriculture Industry to the Oberon Economy

The second largest employer in the Oberon Shire, after forestry, is the agriculture industry. Most of the Oberon Shire is made up of farming land, most commonly used for raising sheep and beef cattle. Small acreage subdivision is only one small part of the agriculture industry in the Shire, the total economic significance of the Oberon agriculture industry is shown in Table 6.3.1 below. Each year the agriculture industry contributes around \$14 million or 6% to GRP and 313 full-time equivalent jobs or 13% to employment in the Oberon region.

Table 6.3.1: The Economic Significance of Agriculture to Oberon

Economic Indicator	Initial	Flow-on	Total	Percent of Oberon
Output (\$'000)	21,419	5,491	26,911	5.1%
Value Added (\$'000)	11,519	2,375	13,894	6.0%
Household Income (\$'000)	2,226	1,112	3,337	3.6%
Employment (FTE)	279	33	313	13.2%

6.4 Conclusion

Initial investment in the development of small acreage subdivision in the Oberon Shire contributes around \$2 million to GRP. The ongoing maintenance of these properties and living expenses of those who own or occupy them is estimated to contribute around \$710,000 in GRP annually to the Oberon economy. Industry sectors benefiting from the establishment of such properties include the retail, utilities, transport, construction, business services and government administration sectors.

However, the real value of small acreage subdivision may not be best measured by the GRP contributed but by the flow-on effects resulting from increased expenditure in the Oberon Shire. The continual introduction of new residents into the Shire not only helps avoid stagnation, but also invites wealth generated outside the region to be spent in the Shire. This impact will strengthen the Oberon economy and help to improve the retail and service sectors, thus improving the regions ability to retain wealth. The complementarity of and the interactions between the forestry industry and small acreage developments are discussed further in Chapter 7.

7 ANALYSIS OF INTERACTIONS

The relatively large size of the Oberon forestry industry means that there is a lot of money being generated in the region, a significant portion of which is leaking out to other regions. The inability of businesses in the Oberon Shire to soak up expenditure in the region is evidence that the economy needs to be strengthened in areas other than forestry. The diversification of the Oberon industry base through in-migration of new residents, establishment of new farming enterprises and other additional activities such as clustering of forestry support services, would build the regions capacity to capture local expenditure.

In particular, leakages from the Oberon economy to the Central Tablelands and beyond are evident in the hospitality, education, health, retail, wholesale, transport and business and financial services industry sectors. Such outflows are often evident in small regional areas, a similar example can be found in the Mudgee region where expenditure resulting from the large mining industry is largely consumed by imports. This trend can be turned around, as evidenced in the Greater Lithgow region, by a thickening of the retail, hospitality and community and business services industries, where increased supply makes the region a more attractive and practical place to live for the more highly skilled and wealthy people to live.

A number of these key sectors, including hospitality, retail, transport and business services are influenced by both the forestry industry and small acreage subdivision. Table 7.1 over the page outlines the industry sectors most affected by the flow-on from these two activities. It appears as though the proportional contribution of forestry and subdivision to retail and community services is similar while small acreage makes a larger contribution to business services and forestry has the larger impact on the transport industry. Additional stimulus provided to retail, hospitality and community services by the development of small acreage subdivision would help to close the apparent gaps in the Oberon economy.

Table 7.1: Forestry and Small Acreage Subdivision Flow-on to the Oberon Economy

Industry Sector	Proportion of flow-on Subdivision	Proportion of flow-on Forestry Industry
Business Services	26%	7%
Retail Trade	18%	19%
Government Administration	6%	17%
Transport	2%	11%
Hospitality	9%	9%
Personal Services	8%	9%

Note: The business services sector includes property services; research and technical services; legal, accounting, marketing and management services; employment placement; and cleaning and other services. The personal services sector includes personal and household goods hiring; services such as hairdressing and gardening; religious organisations; business and professional associations; and public order and safety services.

New residents moving to the Oberon Shire would not only demand more from the retail, hospitality and community services sectors but also help to maintain property prices. This could make the Oberon region appear more attractive as a place to live and increase the region's capacity to retain local expenditure resulting in more of the economic benefits generated by the forestry industry remaining in the Oberon region. Such improvement could see more of the highly skilled timber workers, such as senior management, living in the region and help to meet community expectations of increased local employment.

It appears as though small acreage subdivision and the forestry industry in the Oberon Shire are complementary rather than competitive in terms of the development of the Oberon economy. Both provide a significant flow-on stimulus to important industry sectors including retail and community services that help to strengthen the ability of the region to retain wealth. However, in addition to examining the economic synergies between the two activities, it is also necessary to consider the social impacts of the forestry industry and rural subdivision.

While it is not the place of this report to examine the relations between the forestry industry and the community, it is acknowledged that a management policy will be required to provide a framework for collaboration between industry and the community. This is particularly true in areas where there is a high level of in-migration such as the Oberon Shire.

The Oberon Shire appears to have a net in-migration of those aged between 50 and 65 and a net out-migration of those aged 15 to 29 (ABS, 2001). The in-migration of these older, rural lifestyle seekers to the Oberon region may bring about a more critical view of the forestry industry in the community. New residents value for the environment and the socio-cultural aspects of community will not be swayed by the economic benefits provided by the industry.

However this problem can be overcome through building an understanding of the community through social research; involvement and communication with the community; and helping to develop social capital and the prospects of the region. These concepts are developed more fully in another report prepared by the WRI: *“A literature review of how industries have managed community perceptions during demographic change”*.

8 CONCLUSION

The Oberon Shire, while dominated by farming land, is heavily reliant on the forestry industry. Contributing around \$137 million or 59% to GRP in the Shire, the forestry industry is the backbone of the Oberon economy. Additionally, over 20% of employment in the Oberon Shire is directly associated with the forestry industry and a further 13% of employment is generated by industry flow-on effects.

Despite significant expenditure and value added by the forestry industry in the Oberon Shire, the flow-on effects are quite small. These relatively low multiplier effects indicate that the Oberon economy is not thick enough to capture all of the benefits generated by the forestry industry. Investment in other economic activity which diversifies the industry base of the Oberon economy, particularly those which require inputs from retail, hospitality and community service sectors, would build the regions capacity to capture local expenditure.

One such type of investment is the development of small acreage subdivisions. The influx of new residents to the Oberon Shire associated with subdivision could not only see increased demand for retail, hospitality and community services but also help to maintain property prices. While the contribution of small acreage subdivision in the Oberon Shire appears to be quite small, with the initial development contributing around \$2 million to GRP and the ongoing maintenance of properties contributing around \$710,000 in GRP to the Oberon economy the real value of small acreage subdivision is more accurately measured by the flow-on benefits to the Oberon community.

A thickening of the Oberon economy through the retail, hospitality and community and business service sectors could increase the region's capacity to retain local expenditure and make the region a more attractive place to live. This could result in an in-migration of a more affluent population to the Oberon Shire as has occurred in the Greater Lithgow area. The operation of the forestry industry and the development of small acreage subdivision both provide significant stimulus to these important industry sectors and help to strengthen the ability of the region to retain wealth. Small acreage subdivision and the forestry industry in the Oberon Shire are complementary rather than competitive in terms of the development of the Oberon economy.

It should be noted however, that this report takes no account of the social impacts of either the forestry industry or rural subdivision. It is likely that community perceptions of the forestry industry may change with a changing demographic. The industry will therefore need to develop a framework for collaboration with the community to identify and overcome areas of potential conflict. These issues are discussed more fully in the WRI report “*A literature review of how industries have managed community perceptions during demographic change*”.

APPENDIX 1: ECONOMIC IMPACT ANALYSIS

This Appendix discusses the basics of economic impact analysis, including an overview of what input-output tables are, how the tables are constructed and the assumptions of the model. The Appendix also describes the input-output table used in this study.

A1.1 Input-Output Tables

An input-output model provides a detailed picture of the structure of an economy at a particular point in time. The rows of an input-output table show the disposal of the output of an industry to itself and to other industries as well as final demand categories (i.e. exports and household consumption). The columns show the origin of inputs into production, whether they are intermediate inputs (i.e. intra- and inter-industry purchases) or primary inputs (i.e. labour and capital).

One of the main attractions of input-output models is their relative ease of use and the level of detail obtained concerning the structure of the economy. The Australian Bureau of Statistics (ABS) notes the usefulness of input-output tables:

“Input-output tables provide detailed information about the supply and disposition of commodities in the Australian economy and about the structure of, and inter-relationships between, Australian industries. Detailed data on supply and use of commodities, inter-industry flows and a range of derived data, such as input-output multipliers, are provided for economic planning and analysis, and construction of models for forecasting purposes.” (ABS *Introduction to Input-Output Multipliers*, Cat. 5246.0)

A1.2 Methodology of Table Construction

Input-output tables have been constructed for the Oberon Shire, Central Tablelands and NSW. Base tables were constructed from the National input-output table provided by the Australian Bureau of Statistics in the publication: *Australian National Accounts: Input-Output Tables* (cat. no. 5209.0.55.001⁸). The National table was adjusted to the regional level using location quotients derived from detailed ABS employment data for 2001⁹ and estimates of wages and salaries, gross operating surplus and final demands based on the ABS publication *Australian National Accounts State Accounts 2003-04* (cat. No. 5220.0).

⁸ Table 2 from this publication was used to construct the tables. Table 2: use table - input by industry and final use category and supply by product group 1998-99 indirect allocation of competing imports, basic prices, recording intra-industry flows, 106 industries.

⁹ Employment was inflated from 2001 to 2003 using state employment growth by industry calculated from figures reported in the ABS State Accounts.

The methodology described beforehand is a form of the Generation of Regional Input-Output Tables (GRIT) technique. The GRIT technique is basically a hybrid method of deriving regional input-output tables from the National input-output table. This procedure was developed by Associate Professor Guy West and Professor Rod Jensen of the University of Queensland and is the most widely used method of constructing input-output tables in Australia. The GRIT method is also widely used in America and Europe.

The GRIT system uses “variable interference” in that the analyst is able to determine the extent to which they interfere with the mechanical processes of table development by introducing primary or other superior data. The system is designed to produce regional tables that are: consistent in accounting terms with each other and with the National table; capable of calculations to a reasonable degree of holistic accuracy; and capable of being updated with minimum effort as new data becomes available.

The final step in the construction of the input-output tables was to balance the table using the RAS technique.¹⁰ The RAS technique is a bi-proportional iterative adjustment method that modifies the base input-output matrix to fit the new region. The rows and columns of the new table are simply adjusted proportionally to the row and column totals in turn until the actual row and column totals converge to the specified values. After the tables were balanced, their consistency was checked to identify any large discrepancies or obvious anomalies.

A1.3 Assumptions of the Input-Output Model

The use of an input-output table in economic impact analysis requires a number of explicit assumptions. The specific assumptions are as follows:

- The inputs purchased by each sector are a function of the output of that sector. The input function is generally assumed linear and homogeneous of degree one, which implies constant returns to scale and no substitution between inputs. The technology is also assumed constant.
- Each commodity (or group of commodities) is supplied by a single industry or sector of production. This implies that there is only one method used to produce each commodity and that each sector has only a single primary output. In other words, there are no joint products.

¹⁰ The RAS technique is explained in Appendix A of the ABS *Input-Output Tables 1996-97* publication (Cat. 5209.0). The RAS technique provides balanced, workable tables by minimising the error in any given cell.

- The total effect of several types of production is the sum of the separate effects. This rules out external economies and diseconomies and is known simply as the additivity assumption.
- The system is in equilibrium at given prices.
- In the static input-output model, there are no capacity constraints so that the supply of each good is perfectly elastic. Each industry can supply whatever quantity is demanded of it and there are no capital restrictions.

In terms of applied input-output analysis, the focus of these assumptions comes down primarily to the linearity property. The assumption of a linear relationship between the input coefficients and output unrealistically implies that supply is infinitely elastic. This limitation generally leads to an overestimation of the multiplier effects generated by any initial change in expenditure. The overestimation of impacts can occur in the short run, when a firm has excess capacity and in the long run if a firm is experiencing increasing returns to scale. In both cases an increase in output can occur that is less than proportional to the necessary increase in inputs, and the linear coefficients assumption is violated. This problem can be overcome by the use of marginal coefficients when estimating impacts.

Transfer and expenditure switching is the second major problem that arises when using input-output tables, as economic impacts tend to be overstated. The Bureau of Industry Economics (1984: page 3) argues that expenditure transfers occur when expenditure on a particular good or service is transferred from one location to another. Expenditure switching, on the other hand, is when expenditure is switched from one good or service to another. When such transfers of expenditure occur within the region under investigation then the economic impact can be overstated to the extent of that transfer.

A1.4 Marginal Coefficients

One of the main limitations of input-output tables, the assumption of linear coefficients, can be overcome by the use of marginal coefficients. This method attempts to remove the assumption of linear coefficients for the household sector. The household sector is the dominant component of multiplier effects in an input-output table, so using marginal income coefficients for the household sector provides a more accurate estimate of the multiplier effects and provides results closer to those of a computable general equilibrium (CGE) model. Following West and Gamage (1997) the linear coefficients assumption between other intermediate sectors of the input-output table is maintained, but the relationships between the primary factors are non-linear.

The marginal coefficients model discounts the initial effect of an impacting agent according to the household income elasticity of the relevant sector. This causes a reduction in the flow-on effects of the impacting agent therefore the estimated multipliers for the marginal coefficients model would typically be higher than those for a traditional input-output model, even though the total economic impact in value terms (and jobs) is lower in the marginal coefficients model. Extreme care is therefore required when using multipliers derived from a marginal coefficients model, as it is less valid to separate its results into initial and flow-on effects.

A1.5 CWRDB Input-Output Tables

The input-output tables used in this study contain 34 sectors based on the Australian and New Zealand Standard Industry Classification (ANZSIC 1993 Edition) as shown in Table A.

Table A1.1 Sector classification

Industry Sector	ANZSIC Classification
Agriculture	Division A (exc. sub-division 3)
Forestry and logging	Sub-Division 3
Forestry and logging (Oberon)	Sub-Division 3
Mining	Division B
Food & beverages manufacturing	Sub-Division 21
Textiles, clothing & footwear manufacturing	Sub-Division 22
Sawmill products manufacturing	Group 231
Sawmill products manufacturing (Oberon)	Group 231
Other wood products manufacturing	Group 232
Other wood products manufacturing (Oberon)	Group 232
Paper and paper products manufacturing	Group 233
Printing and publishing	Sub-Division 24
Chemical Manufacturing	Sub-Division 25 (exc. group 253)
Basic Chemical Manufacturing	Group 253
Basic Chemical Manufacturing (Oberon)	Group 253
Non-metallic mineral product manufacturing	Sub-Division 26
Metal product manufacturing	Sub-Division 27
Machinery and equipment manufacturing	Sub-Division 28
Other manufacturing	Sub-Division 29
Utilities (i.e. electricity, gas and water supply)	Division D
Construction	Division E
Wholesale Trade	Division F
Retail and repairs	Division G
Accommodation, cafes and restaurants	Division H
Transport & storage	Division I
Communication services	Division J
Finance & insurance services	Division K
Ownership of dwellings	Based on National Input-Output Table
Business services (including property services)	Division L
Government administration and defence	Division M
Education services	Division N
Health and community services	Division O
Recreational and cultural services	Division P
Personal and other services	Division Q

APPENDIX 2: DETAILED ANALYSIS CENTRAL TABLELANDS

The following tables include detailed impacts of the Oberon forestry industry in the Central Tablelands.

Table A2.1: Economic Significance of the Oberon Forestry Industry to the Central Tablelands Economy

Economic Indicator	Initial	Flow-on	Total	Multiplier
Output (\$'000)	302,457	180,140	482,597	1.60
Value Added (\$'000)	120,389	67,721	188,109	1.56
Household Income (\$'000)	44,134	30,301	74,435	1.69
Employment (FTE)	643	865	1,508	2.35

Table A2.2: Economic Significance of Oberon Forestry and Logging to the Central Tablelands Economy

Economic Indicator	Initial	Flow-on	Total	Percent of Central Tablelands
Output (\$'000)	31,154	11,259	42,413	0.7%
Value Added (\$'000)	22,979	5,178	28,157	0.9%
Household Income (\$'000)	6,094	2,556	8,651	0.5%
Employment (FTE)	75	74	149	0.3%

Table A2.3: Economic Significance of Oberon Sawmill Products Manufacturing to the Central Tablelands Economy

Economic Indicator	Initial	Flow-on	Total	Percent of Central Tablelands
Output (\$'000)	58,000	36,799	94,799	1.5%
Value Added (\$'000)	7,949	15,833	23,783	0.7%
Household Income (\$'000)	11,107	7,483	18,590	1.1%
Employment (FTE)	194	203	397	0.8%

Table A2.4: Economic Significance of Oberon Other Wood Products Manufacturing to the Central Tablelands Economy

Economic Indicator	Initial	Flow-on	Total	Percent of Central Tablelands
Output (\$'000)	183,303	128,051	311,354	4.9%
Value Added (\$'000)	83,972	44,944	128,915	4.0%
Household Income (\$'000)	25,137	19,454	44,591	2.7%
Employment (FTE)	351	562	913	1.7%

Table A2.5: Economic Significance of Oberon Basic Chemical Manufacturing to the Central Tablelands Economy

Economic Indicator	Initial	Flow-on	Total	Percent of Central Tablelands
Output (\$'000)	30,000	4,031	34,031	0.5%
Value Added (\$'000)	5,489	1,766	7,255	0.2%
Household Income (\$'000)	1,795	808	2,603	0.2%
Employment (FTE)	24	27	50	0.1%

APPENDIX 3: DETAILED ANALYSIS NEW SOUTH WALES

The following tables include detailed impacts of the Oberon forestry industry in New South Wales.

Table A3.1: Economic Significance of the Oberon Forestry Industry to the NSW

Economy

Economic Indicator	Initial	Flow-on	Total	Multiplier
Output (\$'000)	302,457	362,420	664,877	2.20
Value Added (\$'000)	125,125	139,301	264,427	2.11
Household Income (\$'000)	45,712	74,944	120,656	2.64
Employment (FTE)	643	1,746	2,389	3.72

Table A3.2: Economic Significance of Oberon Forestry and Logging to the NSW

Economy

Economic Indicator	Initial	Flow-on	Total	Percent of NSW
Output (\$'000)	31,154	29,065	60,219	0.01%
Value Added (\$'000)	23,448	12,208	35,657	0.02%
Household Income (\$'000)	6,164	6,964	13,128	0.01%
Employment (FTE)	75	161	235	0.01%

Table A3.3: Economic Significance of Oberon Sawmill Products Manufacturing to the NSW Economy

Economic Indicator	Initial	Flow-on	Total	Percent of NSW
Output (\$'000)	58,000	81,854	139,854	0.03%
Value Added (\$'000)	8,155	33,539	41,694	0.02%
Household Income (\$'000)	11,475	18,538	30,014	0.02%
Employment (FTE)	194	429	623	0.02%

Table A3.4: Economic Significance of Oberon Other Wood Products Manufacturing to the NSW Economy

Economic Indicator	Initial	Flow-on	Total	Percent of NSW
Output (\$'000)	183,303	224,008	407,312	0.10%
Value Added (\$'000)	87,574	83,943	171,517	0.08%
Household Income (\$'000)	26,228	44,393	70,621	0.05%
Employment (FTE)	351	1,040	1,391	0.04%

Table A3.5: Economic Significance of Oberon Basic Chemical Manufacturing to the NSW Economy

Economic Indicator	Initial	Flow-on	Total	Percent of NSW
Output (\$'000)	30,000	27,493	57,493	0.01%
Value Added (\$'000)	5,947	9,611	15,558	0.01%
Household Income (\$'000)	1,844	5,049	6,893	0.01%
Employment (FTE)	24	116	140	0.00%

APPENDIX 4: IMPACT OF SMALL ACREAGE SUBDIVISION

The impact of small acreage subdivision on the Oberon economy was determined from the development and ongoing expenses associated with such properties. Note that this analysis does not include the initial purchase of small acreage properties as this is considered to be an accounting transfer only and is not applied to input-output tables. The total value of small acreage properties sold in the Oberon Shire in the 2003-04 financial year based on the average price per hectare was \$21 million.

A4.1 Development Costs

The development costs of small acreage subdivision included fees charged by council for sales certificates and building applications; the value of building and or development; solicitor fees; and agent commission arising from the sale of property. Table A4.1 below shows the data and sources used.

Table A4.1 Small Acreage Development Costs

Expense	Value (\$)	Industry Sector	Source
Building Applications	42,882	Government Administration	Oberon Shire Council
Sales Certificates	14,760	Government Administration	Oberon Shire Council
Construction/Development	2,546,953	Construction	Oberon Shire Council
Solicitors Fees	139,027	Business Services	Kenny Spring Solicitors, Colin Brett Real Estate, Oberon Shire Council
Real Estate Agents Commission	695,134	Business Services	Colin Brett Real Estate, Oberon Shire Council

The above figures incorporate the following assumptions based on information provided by Colin Brett Real Estate and Kenny Spring Solicitors:

- Agents commission of 4% sale price
- Solicitor fee of 10% agents commission
- Three quarters of construction completed by local companies

A4.2 Ongoing Costs

The ongoing expenses associated with small acreage subdivision included rates charged by council; household expenditure; and farming expenses. These impacts were calculated based on an increase in final demand expenditure by property owners and does not include revenue generated by such properties. This method seems fair given that the standard one steer per hectare applies to properties regardless of size, therefore it can be assumed that a property will generate the same level of revenue whether it has been subdivided or not. Table A4.2 below shows the data and sources used.

Table A4.1 Small Acreage Development Costs

Expense	Value (\$)	Industry Sector	Source
Rates	338,776	Government Administration	Oberon Shire Council
Household Expenditure	59,016	Government Administration	ABS
	7,597	Utilities	ABS
	149,047	Retail	ABS
	75,352	Transport	ABS
Farming Expenses	27,673	Transport	Colin Brett
	55,347	Retail	Colin Brett
	287,804	Business Services	Colin Brett

The above figures incorporate the following assumptions based on information provided by Oberon Shire Council and Colin Brett Real Estate:

- All rural subdivision owners are in the highest income quintile
- Rural subdivision owners spend at least one week per month in the Oberon Shire
- All household expenditure by rural subdivision owners is incurred in the Oberon Shire
- The number of small acreage subdivisions is 345
- All properties between 8 and 40 ha farm steers at one steer per hectare
- All farm related expenses are incurred in the Oberon Shire
- The average size of properties between 8 and 40 ha is 19 ha.

APPENDIX 5: FLOW-ON - FORESTRY IN THE OBERON SHIRE

Table A5.1: Value Added Impact of the Forestry Industry in the Oberon Shire

Sector	Initial (\$'000)	Flow-on (\$'000)	Total (\$'000)
Agriculture	0	157	157
Forestry and Logging	15,284	2	15,286
Mining	0	0	0
Food Manufacturing	0	164	164
Textiles Manufacturing	0	31	31
Sawmill Products Manufacturing	8,745	(0)	8,745
Other Wood Manufacturing	86,389	8	86,397
Paper Manufacturing	0	0	0
Printing Manufacturing	0	84	84
Chemicals Manufacturing	0	26	26
Basic Chemicals Manufacturing	5,559	2,845	8,404
Non-metals Manufacturing	0	3	3
Metals Manufacturing	0	187	187
Machinery Manufacturing	0	143	143
Other Manufacturing	0	47	47
Utilities	0	369	369
Construction	0	52	52
Wholesale	0	1,213	1,213
Retail	0	3,695	3,695
Hospitality	0	1,595	1,595
Transport	0	3,858	3,858
Communications	0	221	221
Finance	0	508	508
Dwellings	0	0	0
Business	0	1,075	1,075
Government	0	1,070	1,070
Education	0	649	649
Health	0	982	982
Recreational	0	417	417
Personal	0	1,507	1,507
Total	115,977	20,908	136,885

Table A5.2: Employment Impact of the Forestry Industry in the Oberon Shire

Sector	Initial (\$'000)	Flow-on (\$'000)	Total (\$'000)
Agriculture	0	2	2
Forestry and Logging	67	0	67
Mining	0	0	0
Food Manufacturing	0	1	1
Textiles Manufacturing	0	0	0
Sawmill Products Manufacturing	190	0	190
Other Wood Manufacturing	278	0	278
Paper Manufacturing	0	0	0
Printing Manufacturing	0	0	0
Chemicals Manufacturing	0	0	0
Basic Chemicals Manufacturing	23	5	28
Non-metals Manufacturing	0	0	0
Metals Manufacturing	0	3	3
Machinery Manufacturing	0	2	2
Other Manufacturing	0	0	0
Utilities	0	1	1
Construction	0	1	1
Wholesale	0	18	18
Retail	0	64	64
Hospitality	0	27	27
Transport	0	48	48
Communications	0	2	2
Finance	0	5	5
Dwellings	0	0	0
Business	0	14	14
Government	0	13	13
Education	0	8	8
Health	0	14	14
Recreational	0	7	7
Personal	0	23	23
Total	558	259	817

APPENDIX 6: FLOW-ON - SUBDIVISION IN THE OBERON SHIRE

Table A6.1: Value Added Impact of Small Acreage Subdivision in the Oberon Shire

Sector	Initial (\$'000)	Flow-on (\$'000)	Total (\$'000)
Agriculture	0	7	7
Forestry and Logging	0	2	2
Mining	0	0	0
Food Manufacturing	0	6	6
Textiles Manufacturing	0	1	1
Sawmill Products Manufacturing	0	(1)	(1)
Other Wood Manufacturing	0	29	29
Paper Manufacturing	0	0	0
Printing Manufacturing	0	6	6
Chemicals Manufacturing	0	1	1
Basic Chemicals Manufacturing	0	3	3
Non-metals Manufacturing	0	17	17
Metals Manufacturing	0	54	54
Machinery Manufacturing	0	2	2
Other Manufacturing	0	3	3
Utilities	1	6	7
Construction	978	3	981
Wholesale	0	29	29
Retail	119	148	267
Hospitality	0	81	81
Transport	45	28	73
Communications	0	16	16
Finance	0	32	32
Dwellings	0	0	0
Business	505	187	692
Government	246	25	27
Education	0	28	28
Health	0	33	33
Recreational	0	18	18
Personal	0	57	57
Total	1,894	822	2,716

Table A6.2: Employment Impact of Small Acreage Subdivision in the Oberon Shire

Sector	Initial (\$'000)	Flow-on (\$'000)	Total (\$'000)
Agriculture	0	0	0
Forestry and Logging	0	0	0
Mining	0	0	0
Food Manufacturing	0	0	0
Textiles Manufacturing	0	0	0
Sawmill Products Manufacturing	0	0	0
Other Wood Manufacturing	0	0	0
Paper Manufacturing	0	0	0
Printing Manufacturing	0	0	0
Chemicals Manufacturing	0	0	0
Basic Chemicals Manufacturing	0	0	0
Non-metals Manufacturing	0	0	0
Metals Manufacturing	0	1	1
Machinery Manufacturing	0	0	0
Other Manufacturing	0	0	0
Utilities	0	0	0
Construction	15	0	15
Wholesale	0	0	0
Retail	2	3	5
Hospitality	0	1	1
Transport	1	0	1
Communications	0	0	0
Finance	0	0	0
Dwellings	0	0	0
Business	7	2	9
Government	3	0	3
Education	0	0	0
Health	0	0	0
Recreational	0	0	0
Personal	0	1	1
Total	28	11	39

APPENDIX 7: ANALYSIS OF MULTIPLIERS

The relationship between the direct and indirect contribution of an industry can be expressed as a multiplier. A multiplier indicates the relative magnitude of the flow-on effects of the industry compared to its direct effect (i.e. a multiplier of 1.5 indicates that for every \$1 of direct impact there will be \$0.50 in flow-on effects).

Table A7.1 over the page shows the Type II A multipliers for Oberon compared with those of the Mid-Western Regional Council¹¹. Type II A multipliers are calculated as the ratio of the total economic impact of an industry (i.e. direct plus indirect effects) divided by the direct effects of the industry.

All multipliers for the Mid-Western Regional Council area are higher than the equivalent multiplier in the Oberon Shire. This is as a result of two factors: firstly the Mid-Western Regional Council comprises of a number of larger centres including Mudgee, Rylstone, Kandos and Gulgong which capture a greater proportion of local expenditure and secondly the Oberon Shire is closer to larger centres such as Bathurst, Lithgow and even Sydney, which leads to increased expenditure leakages.

This comparison seeks to provide a frame of reference for the multipliers reported throughout this document and to highlight the degree to which wealth is leaking from the Oberon economy. As indicated in the main text of this report, such outflows are often evident in small regional areas and the Mid-Western Region was used as an example of a similar regional economy. This analysis indicates that the Oberon Shire is in fact subjected to greater level of import expenditure than even the Mudgee region.

¹¹ The multipliers shown for agriculture, mining, wood manufacturing and chemicals manufacturing are an average of the multipliers for the subdivisions used to analyse these industries in the input-output model.

Table A7.1: Value Added Multipliers Oberon Shire/Mid-Western Regional Council

Sector	Oberon Shire	Mid-Western Regional Council	Difference
Agriculture	1.20	1.95	0.75
Mining	0	3.33	3.33
Food	1.99	4.76	2.77
Textiles	2.03	2.70	0.67
Wood	1.32	1.96	0.64
Printing	1.52	1.90	0.38
Chemicals	1.43	4.16	2.73
Non-metals	1.99	2.59	0.60
Metals	1.51	2.43	0.92
Machinery	1.35	1.86	0.51
Other Mfg	1.36	1.50	0.14
Utilities	1.51	2.87	1.36
Construction	1.44	1.87	0.43
Wholesale	1.45	1.70	0.25
Retail	1.30	1.38	0.08
Hospitality	1.37	1.81	0.44
Transport	1.44	1.79	0.35
Communications	1.41	2.00	0.59
Finance	1.43	1.64	0.21
Business	1.47	1.87	0.4
Government	1.41	1.6	0.19
Education	1.35	1.27	(0.08)
Health	1.23	1.30	0.07
Recreational	1.42	1.71	0.29
Personal	1.32	1.42	0.10

Table A7.1: Employment Multipliers Oberon Shire/Mid-Western Regional Council

Sector	Oberon Shire	Mid-Western Regional Council	Difference
Agriculture	1.28	1.75	0.47
Mining	0	4.68	4.68
Food	2.47	6.03	3.56
Textiles	2.27	2.85	0.58
Wood	1.60	1.95	0.35
Printing	1.59	2.07	0.48
Chemicals	1.70	4.29	2.59
Non-metals	2.05	2.50	0.45
Metals	1.53	2.34	0.81
Machinery	1.34	1.93	0.59
Other Mfg	1.26	1.38	0.12
Utilities	1.67	3.17	1.50
Construction	1.33	1.75	0.42
Wholesale	1.46	1.72	0.26
Retail	1.25	1.33	0.08
Hospitality	1.32	1.72	0.40
Transport	1.43	1.87	0.44
Communications	1.56	2.39	0.83
Finance	1.56	1.79	0.23
Business	1.50	1.98	0.48
Government	1.47	1.71	0.24
Education	1.40	1.30	(0.10)
Health	1.25	1.31	0.06
Recreational	1.39	1.68	0.29
Personal	1.30	1.39	0.09

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