



SOCIO-ECONOMIC IMPACT OF THE SOFTWOOD PLANTATION INDUSTRY IN THE CENTRAL WEST NSW FORESTRY HUB REGION, 2021-22

**A Report for the Central West NSW
Forestry Hub**

21 December 2023

Prepared by

**BDO EconSearch and
the University of Canberra**

Level 7, BDO Centre, 420 King William Street
Adelaide SA 5000

Tel: +61 (8) 7324 6190

<https://www.bdo.com.au/en-au/econsearch>

TABLE OF CONTENTS

Tables	iv
Figures.....	vi
Abbreviations.....	vii
Acknowledgments.....	vii
Document History and Status	viii
Executive Summary.....	ix
1. Introduction	1
2. Method and Data	2
2.1. Regions	2
2.2. Data.....	3
2.3. Economic Modelling	4
2.3.1. Economic activity	4
2.3.2. Indicators of economic activity defined	4
2.3.3. Categories of economic activity.....	6
2.3.4. Economic contribution modelling.....	7
3. Overview of the Industry	8
3.1. Industry Structure	8
3.2. Central West NSW Forestry Hub Softwood Plantation Industry	9
3.3. Integrated Processing Industry.....	10
3.4. Other Activities	10
4. Economic Contribution	11
4.1. Direct Economic Contribution.....	11
4.1.1. Output	11
4.1.2. Industry expenditure.....	11
4.1.3. Gross regional product	13
4.1.4. Household income.....	15
4.2. Total Economic Contribution.....	15

4.2.1.	Operating expenditure	15
4.2.2.	Capital expenditure	18
4.3.	Employment	22
4.3.1.	Direct employment (fte)	22
4.3.2.	Direct employment (total jobs)	22
4.3.3.	Direct employment by LGA	23
4.3.4.	Total employment.....	24
5.	Workforce	26
5.1.	Working Conditions	26
5.1.1.	Income	28
5.2.	Workforce Diversity and Sustainability	29
5.2.1.	Gender	29
5.2.2.	Age	30
5.2.3.	Aboriginal and Torres Strait Islanders	31
5.2.4.	Recruiting workers and contractors	32
5.3.	Industry Skills and Training Needs.....	32
6.	Business and Market Outlook	35
6.1.	Overall Business Conditions	35
6.2.	Future Business Expectations	35
6.3.	Business Challenges	36
7.	Community Perceptions of the Social, Economic, Service and Infrastructure Effects of the Forest Industry	38
7.1.	Quality of Life and Liveability	38
7.2.	Perceptions of Regional Industries	45
8.	Oberon LGA Case Study.....	49
8.1.	Overview of the Industry	49
8.2.	Economic Contribution.....	50
	References	57
	APPENDIX 1 Map of the Central Tablelands region	59

APPENDIX 2	2022-23 Regional Wellbeing Survey Methods and Additional Data	60
------------	---	----

TABLES

Table ES-1	Economic contribution of the operation of the CWFH forest industry in the CWFH region, by supply chain stage, 2021-22	x
Table ES-2	Economic contribution of the operation of the CWFH forest industry in NSW, by supply chain stage, 2021-22	xi
Table 2-1	Data collected for supply chain specific activities, 2021-22 Industry Survey	4
Table 4-1	Direct gross output (\$m) by the CWFH (2021-22) and CT (2015-16) forest industries, by supply chain stage	11
Table 4-2	Direct expenditure (\$m) by the CWFH (2021-22) and CT (2015-16) forest industries, by supply chain stage	12
Table 4-3	Direct operational and capital expenditure (\$m) by the CWFH (2012-22) and CT (2015-16) forest industries, by industry sector	13
Table 4-4	Direct contribution to GRP (\$m) by the CWFH (2021-22) and CT (2015-16) forest industries, by supply chain stage	14
Table 4-5	Direct contribution to household income (\$m) by the CWFH (2021-22) and CT (2015-16) forest industries, by supply chain stage	15
Table 4-6	Economic contributions of the operation of the CWFH forest industry in CWFH, by supply chain stage, 2021-22	17
Table 4-7	Economic contributions of the operation of the CWFH forest industry in NSW, by supply chain stage, 2021-22	18
Table 4-8	Average annual economic contributions of the capital expenditure by the CWFH forest industry in the CWFH region, by supply chain stage, 2021-22.....	20
Table 4-9	Average annual economic contribution of the capital expenditure by the CWFH forest industry in NSW, by supply chain stage, 2021-22	21
Table 4-10	Direct contribution to employment (fte) by the CWFH forest industry, by supply chain stage, 2021-22.....	22
Table 4-11	Direct contribution to employment (total jobs) by the CWFH (2021-22) and CT (2015-16) forest industries, by supply chain stage	23
Table 4-12	Key employment assumptions for the CWFH direct total jobs and direct fte jobs, 2021-22	23
Table 4-12	Usual residence of direct employment (total jobs) by the CWFH (2021-22) and CT (2015-16) forest industries, by local government area	24
Table 4-13	Direct and flow-on contribution to employment (total jobs) by the CWFH (2021-22) and CT (2015-16) forest industries, by supply chain stage	25
Table 4-14	Employment multipliers: indirect employment supported by the CWFH (2021-22) and CT (2015-16) forestry industries	25
Table 5-1	Proportion of workforce employed full-time and part-time within the CWFH, 2006-2021	26
Table 5-2	Full-time and part-time work in the softwood plantation industry, CWFH, 2021-22	27
Table 5-3	Proportion of workforce employed full-time and part-time in the CWFH, 2006-2021	27

Table 5-4	Income earned by workers in CWFH, 2006-2021	28
Table 5-5	Income earned by full-time workers in the CWFH, 2006-2021	29
Table 5-6	Workforce characteristics CWFH: gender	30
Table 5-7	Workforce by gender composition in the CWFH, 2006-2021	30
Table 5-8	Workforce by age in the CWFH, 2006-2021	31
Table 5-9	Aboriginal and Torres Strait Islander participation in workforce in the CWFH, 2006-2021	31
Table 5-10	Key challenges in recruiting workers into the forest industry.....	32
Table 5-11	Skills and accreditation needs reported by softwood plantation businesses in the CWFH ^a	33
Table 5-12	Formal education attainment: rates of attainment of high school and post-school qualifications, 2006 to 2021	34
Table 8-1	Direct expenditure (\$m) by the Oberon LGA forest industry, by supply chain stage, 2021-22	51
Table 8-2	Summary of the economic contributions of the operation of the CWFH forest industry to the Oberon LGA and the CWFH region, by supply chain stage, 2021-22.....	53
Table 8-3	Economic contributions of the operation of the CWFH forest industry in Oberon LGA, by supply chain stage, 2021-22.....	54
Table 8-4	Average annual economic contributions of the capital expenditure by the CWFH forest industry in Oberon LGA, by supply chain stage, 2021-22	55
Table 8-5	Total employment and forest industry related employment in the Oberon LGA, 2021 and 2021-22	55
Table 8-6	Average weekly income and average forest industry related weekly income in the Oberon LGA, 2021 and 2021-22	56

FIGURES

Figure 2-1	Map of Central West NSW Forestry Hub region	2
Figure 3-1	Stylised structure of the CWFH forest and wood products industry supply chain in Australia	9
Figure 4-1	Calculation and decomposition of direct contribution to GRP, CWFH, total industry, 2021-22.....	14
Figure 6-1	Business activity outlook for the next 12 months, 2021-22.....	36
Figure 6-2	Challenges experienced by softwood plantation businesses in the CWFH region, 2021-22	37
Figure 7-1	Perceptions about overall liveability and sense of belonging in the local region	39
Figure 7-2	Perceptions about safety and attractiveness of the local region	40
Figure 7-3	Perceptions about local economy and living costs	41
Figure 7-4	Perceptions about changes in liveability of the local region	42
Figure 7-5	Access to affordable housing, transport and good quality roads.....	43
Figure 7-6	Quality nature areas and action to reduce risk.....	44
Figure 7-7	Perceptions about community problems	44
Figure 7-8	Proportion of residents who views the forest industry as an ‘important industry’ in their local community	45
Figure 7-9	Proportion of CWFH residents who felt the forestry, farming and tourism industries had a positive and negative impact on different aspects of their local community	47
Figure 7-10	Proportion of Oberon residents who felt the forestry, farming and tourism industries had a positive and negative impact on different aspects of their local community	48
Appendix Figure 1-1	Map of the Central Tablelands region.....	59

ABBREVIATIONS

CT	Central Tablelands
CWFH	Central West NSW Forestry Hub
fte	full-time equivalent
GOS	Gross Operating Surplus
GRP	Gross Regional Product
GSP	Gross State Product
I-O	Input-Output
LGA	Local Government Area
NSW	New South Wales
OVA	Other Value Added
RISE	Regional Industry Structure & Employment

ACKNOWLEDGMENTS

This study was funded by the Central West NSW Forestry Hub. We thank these organisations for their support for the study. Many businesses, including the Oberon Shire Council, in the Central West NSW Forestry Hub region contributed considerable time to this study, providing detailed information about their operations and about the industry in the region more generally. We thank all those who provided their time, effort and expertise to inform the study.

DOCUMENT HISTORY AND STATUS

Doc Version	Doc Status	Issued To	Qty elec	Date	Reviewed	Approved
1	Draft	Craig Taylor Heath Molden	1 Word 1 PDF	01/09/2023	ADM	ADM
2	Revised Draft	Craig Taylor Heath Molden	1 Word 1 PDF	28/09/2023	ADM	ADM
3	Final	Craig Taylor Heath Molden	1 Word 1 PDF	21/12/2023	ADM	ADM

Last Saved: 21/12/2023 11:24:00 AM

File Name: I:\CLIENTS\Central West NSW Forestry Hub\ES2239_CWFH Socio-economic Impact Study\Reports\CWFH Socio-economic Impact Study Report_Final_231027.docx

Project Manager: Anders Magnusson

Principal Author/s: Anders Magnusson, Abbie Dix, Jasmine Douglas, Mel Mylek and Jacki Schirmer

Name of Client: Central West NSW Forestry Hub

Name of Project: Socio-economic Impact of the Softwood Plantation Industry in the Central West NSW Forestry Hub Region, 2021-22

Document Version: 3

Job Number: ES2239

EXECUTIVE SUMMARY

The forest industry in Australia contributes to jobs, economic activity and social wellbeing in multiple regional communities. This contribution results from the growing, management and harvesting of plantations and native forests, and processing of harvested wood.

In 2018, Forest and Wood Products Australia engaged the University of Canberra, working with BDO EconSearch, to provide a socio-economic assessment of the softwood plantation forest industry in the South West Slopes and Central Tablelands regions within New South Wales for the financial year of 2015-16 (Schirmer et al. 2018). In 2018, 4 Regional Forestry Hubs were announced under the *National Forestry Industry Plan 2018* (Department of Agriculture, Fisheries and Forestry 2023). The Central West New South Wales Forestry Hub (CWFH) was added in 2020.

The Central Tablelands focus region of the 2015-16 study encompasses the northern section of the CWFH region, and this area is where the forestry activity is concentrated. The CWFH engaged BDO EconSearch and the University of Canberra to investigate the socio-economic contributions of the softwood plantation industry within the CWFH region for the 2021-22 financial year. This report summarises the results of the study and presents findings for the forest industry in New South Wales (NSW) and the CWFH region. It includes activity dependent on softwood plantations only.

This study is an extension of the 2015-16 study as it produced comparable results for the 2021-22 financial year, with some differences in the regional boundaries and methods. The 2021-22 results for the CWFH region are compared to the 2015-16 results for the Central Tablelands region where appropriate throughout the report. The report also presents the results separately where possible for the Oberon Local Government Area (LGA), where a significant amount of the forestry activity in the CWFH is concentrated.

In addition to producing fibre to supply the wood processing industry, the softwood plantations provide a base for other socio-economic activities. The plantations in the CWFH region are involved in non-forestry activities including livestock grazing, bee keeping, mushroom foraging, prospecting, hunting, camping areas and others (2021-22 Industry Survey). The economic value of these other activities has not been estimated as part of this report, which includes only the economic value of the wood and fibre products produced from softwood plantations. However, these other activities generate important additional social and economic benefit from plantation areas for many residents living in or visiting the CWFH region.

Economic contribution

In 2021-22, the direct value of output generated by the CWFH forest industry up to the point of sale of primary processed products was \$458.9 million in the CWFH region (including \$432.3 million in the Oberon LGA). To avoid double counting this value excludes sales of products or services occurring within the industry supply chain prior to primary processing. Value of output, however, is a poor indicator of economic contribution, as it does not identify the extent to which the economy of a given region benefited from the industry's activity in the form of returns to business owners, wages and salaries, and taxes. Measuring the industry's contribution to Gross Regional Product (GRP - the regional equivalent of Gross Domestic Product) addresses this.

In 2021-22, the forest industry directly contributed approximately \$199.2 million to GRP in the CWFH region, and a total of \$260.5 million once flow-on effects in the broader economy were included. This total included \$38.6 million supported by growers and silviculture, \$53.0 million by harvest and haulage of logs and transport of processed products, and \$168.9 million by processors in the CWFH region. The total contribution

to GRP in Oberon LGA was \$181.1 million and the total contribution to GSP (Gross State Product) in NSW was \$495.7 million, each including flow-on effects.

The forest industry in the CWFH region supported a total of 899 direct full time equivalent (fte) jobs in 2021-22. This increased to a total 1,259 fte jobs once flow-on effects in the broader economy were included. Up to the point of primary processing, a total of 88 fte jobs by growers and silviculture, 358 fte jobs by harvest and haulage and transport, and 818 fte jobs by processors were supported in the CWFH region. The total contribution to employment in Oberon was 839 fte jobs and the total contribution in NSW was 2,534 fte jobs, each including flow-on effects.

Table ES-1 and Table ES-2 present a summary of the economic contribution of the CWFH forest industry within the CWFH region and NSW by supply chain stage.

Table ES-1 Economic contribution of the operation of the CWFH forest industry in the CWFH region, by supply chain stage, 2021-22

	Grower & Silviculture	H&H & Transport	Processing	Industry ^a
Direct Output (\$m)	85.2	64.4	444.4	458.9
GRP (\$m)				
Direct	34.2	40.2	124.8	199.2
Flow-on	4.5	12.8	44.1	61.3
Total	38.6	53.0	168.9	260.5
Household Income (\$m)				
Direct	6.9	17.8	54.4	79.1
Flow-on	2.2	6.3	21.8	30.3
Total	9.1	24.1	76.2	109.4
Employment (fte)				
Direct	61	281	558	899
Flow-on	28	77	260	359
Total	88	358	818	1,259

^a Industry output is lower than the sum of output for individual stages as it excludes transfers between stages to prevent double counting.

Source: BDO EconSearch analysis

Table ES-2 Economic contribution of the operation of the CWFH forest industry in NSW, by supply chain stage, 2021-22

	Grower & Silviculture	H&H & Transport	Processing	Industry ^a
Direct Output (\$m)	85.2	64.4	444.4	458.9
GSP (\$m)				
Direct	34.2	46.1	129.5	209.8
Flow-on	12.2	31.9	241.8	285.9
Total	46.4	78.0	371.3	495.7
Household Income (\$m)				
Direct	6.9	17.8	54.4	79.1
Flow-on	6.0	17.5	131.8	155.3
Total	12.9	35.4	186.2	234.5
Employment (fte)				
Direct	61	281	558	899
Flow-on	76	183	1,396	1,635
Total	136	464	1,954	2,534

^a Industry output is lower than the sum of output for individual stages as it excludes transfers between stages to prevent double counting.

Source: BDO EconSearch analysis

Workforce

Analyses were undertaken to describe the working conditions, workforce diversity and sustainability, and industry skills and training needs of the industry. Most workers in the CWFH region working in the forest industry are full-time workers, with 89 per cent working full-time in 2021, according to the ABS Census. This is significantly higher than the proportion of workers in the broader workforce in the CWFH region working full-time in 2021 (64 per cent). Additionally, 54 per cent of workers in the forest industry in the CWFH region earned \$1,250 or more per week in 2021, compared to 44 per cent of workers across the entire workforce (ABS Census). A survey of forest industry businesses in the CWFH conducted by ForestWorks in 2021 found that 86 per cent of workers across the forest industry in the CWFH are male, and 64 per cent are under the age of 45.

Business and market outlook

An industry survey was also conducted in 2021-22 which asked businesses about their perceptions on business and market outlook. A total of 57 per cent of surveyed businesses reported that business conditions were more challenging than usual in 2021-22. Surveyed businesses indicated that they were likely to invest in new capital equipment (86 per cent) and business systems (86 per cent) over the next 12 months, and no businesses were likely to scale down their workforce. Some of the largest challenges that surveyed businesses had encountered over the past three years were a rise in input costs, as well as obtaining labour to fill the jobs needed to meet current demand. Climate and natural disasters, and access to raw material inputs, were also a concern to some degree for most businesses.

Community perceptions

Community perceptions of the forest industry by residents of the CWFH region were measured as part of the 2022-23 Regional Wellbeing Survey and are summarised in this report (University of Canberra 2023). While the forest industry does not directly influence most factors that contribute to a community's liveability, it is important to understand community perceptions about liveability because, for an industry to be sustainable, it must rely on its workers being able to live in communities that provide a good quality of life. Monitoring community perceptions about quality of life helps identify where the industry may need to work with other community stakeholders to address key issues that are negatively affecting liveability, or to improve liveability overall.

A large majority of CWFH residents felt that their community was a great place to live (84 per cent), felt welcome in their community (81 per cent) and felt part of their community (76 per cent). Residents within the CWFH (55 per cent) were more likely to feel their community liveability was getting better compared to regional NSW overall (49 per cent), and more likely to feel that their local economy was improving, with 49 per cent of CWFH residents indicating this compared to 43 per cent of regional NSW residents. CWFH residents (59 per cent) were, however, less likely than regional NSW residents (64 per cent) to feel that the friendliness of their community was improving.

When asked about community safety, the surrounding environment and landscape amenity, CWFH residents were more likely to feel that their community is a safe place to live (85 per cent) compared to regional NSW residents as a whole (81 per cent). Residents in the CWFH were also less likely to feel that they had access to affordable housing (13 per cent), and more likely to feel they had access to quality local housing (43 per cent) when compared to regional NSW as a whole (18 per cent and 38 per cent respectively).

1. INTRODUCTION

The forest industry in Australia contributes to jobs, economic activity and social wellbeing in multiple regional communities. This contribution results from the growing, management and harvesting of plantations and native forests, and the processing of harvested wood.

In 2018, Forest and Wood Products Australia engaged the University of Canberra, working with BDO EconSearch, to provide a socio-economic assessment of the softwood plantation forest industry in the South West Slopes and Central Tablelands regions within New South Wales for the financial year of 2015-16 (Schirmer et al. 2018). In 2018, 4 Regional Forestry Hubs were announced under the National Forestry Industry Plan 2018 (Department of Agriculture, Fisheries and Forestry 2023). The Central West New South Wales Forestry Hub (CWFH) was added in 2020.

The Central Tablelands focus region of the 2015-16 study encompasses the northern section of the CWFH region, and this area is where the forestry activity is concentrated. The CWFH engaged BDO EconSearch and the University of Canberra to investigate the socio-economic contributions of the softwood plantation industry within the CWFH region for the 2021-22 financial year. This report summarises the results of the study and presents findings for the forest industry in New South Wales (NSW), the CWFH region and the Oberon LGA. It includes activity dependent on softwood plantations only.

This study is built upon the 2015-16 study as it produced comparable results for the 2021-22 financial year, with some differences in the regional boundaries and methods. The 2021-22 results for the CWFH region are compared to the 2015-16 results for the Central Tablelands region where appropriate throughout the report. The report also presents the results separately where possible for the Oberon Local Government Area (LGA), where a significant amount of the forestry activity in the CWFH is concentrated.

This report examines the following aspects of the CWFH forest industry:

1. Economic value of the industry, including direct and flow-on economic activity in terms of:
 - Output
 - Expenditure
 - Gross Regional Product
 - Household Income
2. Employment supported by the industry, including direct and flow-on jobs
3. Other contributions of the industry including:
 - Workforce
 - Business and market outlook
 - Community perceptions (of the social, economic, service and infrastructure effects of the CWFH forestry industry)
4. A case study of Oberon LGA located within the CWFH region.

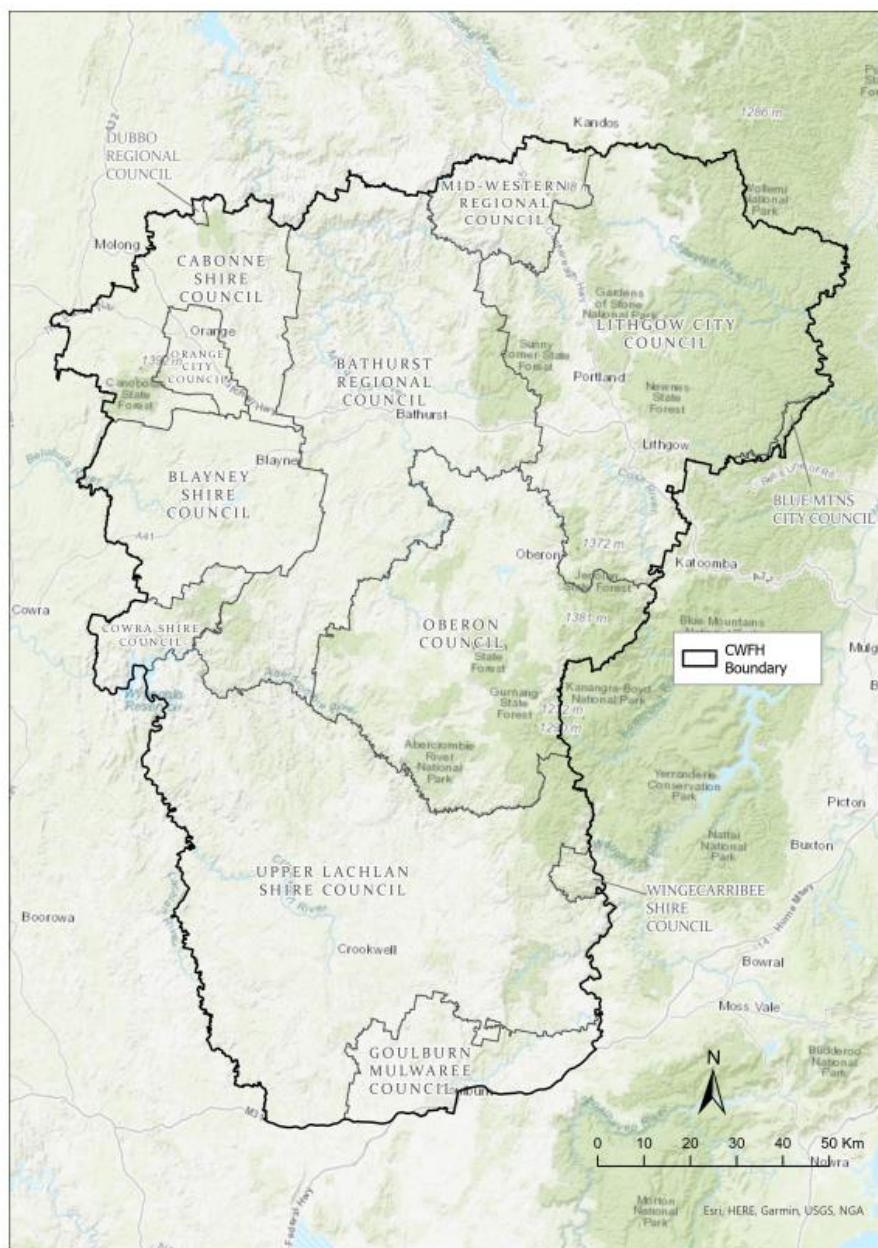
2. METHOD AND DATA

The method included industry consultation, forest activity modelling, regional economic contribution modelling and other analysis. This section describes these components.

2.1. Regions

This report presents economic contributions for the Central West NSW Forestry Hub (CWFH) and Oberon LGA which is located within the CWFH. The CWFH region and the Oberon LGA within it are shown in Figure 2-1. A map of the Central Tablelands focus region of the 2015-16 study is also included in Appendix 1.

Figure 2-1 Map of Central West NSW Forestry Hub region



Source: Greenwood Strategy 2022b

2.2. Data

The data analysed for this report was drawn from the following sources:

- Industry Consultation: A number of face to face consultations occurred before the launch of the industry survey to gain a better understanding of local government issue, the industry and businesses operating within the CWFH, and to inform the industry survey.
- 2021-22 Industry Survey: A survey of forest industry businesses operating within the CWFH conducted between March and July 2023. There were 12 known businesses operating in the industry in the CWFH (including plantation management businesses, silvicultural contractors, harvest and haulage contractors, and primary processors). Of these, a total of 6 participated in the full survey, 2 provided information by phone or completed part of the survey. Information on the remaining 4 was provided by the CWFH which included businesses that contracted, supplied or otherwise engaged with these businesses. The industry survey collected the following data:
 - Business details: name, locations, and business activities
 - Employment: number of workers by full-time and part-time, hours worked and usual residence by LGA
 - Financials: total business turnover and expenditure across 16 expenditure categories as well as the location of each supplier
 - Capital: capital expenditures over the last 5 years, location of each supplier and the anticipated capital expenditure in the next 5 years
 - Outlook: business conditions and challenges, and likelihood of future investments
 - Supply chain activities: see Table 2-1 below.
- 2022-23 Regional Wellbeing Survey: A large survey of 16,000 Australians living in regional and rural areas which included survey of the perceptions of the forest industry by residents of the CWFH. More information is provided in Appendix 1.
- 2006, 2011, 2016 and 2021 Census: Data from the Australian Bureau of Statistics (ABS) *Census of Population and Housing* are drawn on to examine working conditions of the industry's workforce.
- ForestWorks Central West Forestry Hub Skills and Employment Survey (2021): The results of the report survey were drawn from where possible.
- Schirmer et al. 2018: The results of the socio-economic assessment of the softwood plantation forest industry in the Central Tablelands region within New South Wales for the financial year of 2015-16 were drawn on for comparison with the results of this study where possible.

Table 2-1 Data collected for supply chain specific activities, 2021-22 Industry Survey

Supply Chain Stage	Description
Grower	- Forest area managed and involving active operations in the Oberon LGA and CWFH region - Volume sold to each business type and to the Oberon LGA and CWFH region.
Silviculture	Percentage of revenue: earned in each activity type and earned in the Oberon LGA and CWFH region.
Harvest & haulage, & transport	- Percentage of revenue: earned in harvest vs haulage vs transport, and earned in the Oberon LGA and CWFH region. - Volume of forest resource harvested, chipped in-field and/or hauled in the Oberon LGA and CWFH region.
Processing	- Mill names and locations - Input volumes, mill-door prices and source regions - Total production volume, value and market destination (or final use) across product categories.

Source: BDO EconSearch analysis

2.3. Economic Modelling

The economic contribution of the CWFH forest industry was estimated using regional input-output analysis. This section describes the economic activity indicators estimated in this analysis and their components (direct, flow-on and total contribution).

2.3.1. Economic activity

Economic activity indicators: the focus of this report is the generation of economic activity resulting from the existence of the forest industry. The key economic activity indicators considered in the analysis are output, industry expenditure, gross state product (GSP), gross regional product (GRP), and employment.

Economic contribution: the existing (baseline) level of economic activity supported by an activity is referred to as economic contribution. In this analysis the concept of economic contribution includes the whole forest industry supply chain (unless specified) and the economic activity that supports it from all industries.

2.3.2. Indicators of economic activity defined

Output (Value of production) of an industry is a relatively simple measure. It is the total revenue earned by forest industry businesses from sales of goods and services. When reporting value of output, it is important to estimate value at a specific 'end point of sale' - i.e. a particular point in the supply chain. In this report, the 'end point of sale' is the value of the sale of goods from primary processing. This value excludes sales of products and services between industry businesses at earlier points in the forest industry supply chain to avoid double counting. This value includes sales of intermediate products and services to businesses outside

the CWFH forestry industry, such as logs harvested in the CWFH region that are sold to processors outside of the region.

While this indicator provides a useful sales value at a particular stage of production - in this case, at the point of sale of primary processed wood products - it does not provide substantial information about how that industry contributes to the local economy, for two key reasons:

1. It doesn't consider the cost of producing the output. For example, an industry with a turnover (output) of \$200 million and expenditure on goods and services of \$150 million creates less value-add than one that has a turnover of \$200 million and expenditure on goods and services of \$100 million.
2. It matters where expenditures occur when considering flow-on effects. For example, an industry might generate \$200 million of sales in a given region, but rely largely on imported goods and services to produce its output, generating very little local spending or employment as a result. Another industry, meanwhile, might also generate \$200 million of sales, but do this through a locally based supply chain stage, generating substantial jobs and expenditure in the local area as a result.

Industry expenditure is a measure of how much is spent by the industry on goods and services as part of generating the final goods and services sold. When measured at regional level, this indicator provides an idea of the extent to which the industry contributes to the economy locally, as it will show how much the industry has spent within the region versus outside it. Value of expenditure can be measured in two ways, both of which are presented in this report:

1. *Gross expenditure* - total expenditure by all forest industry businesses, including spending within and outside the industry. This means some expenditure is 'double counted' as it involves 'within industry transfers'. For example, if expenditure by a wood processor purchasing logs from a plantation growing company is included as well as the expenditure incurred by that company in growing the plantations, this results in 'double counting': the gross expenditure includes the amount spent by the processor on the logs, and also includes the amount spent by growers to produce those logs. Because of this double counting, gross expenditure does not indicate the extent to which spending by the industry contributes to the broader economy.
2. *Net expenditure* - expenditure by the forest industry excluding transfers within the industry. This measure excludes payments made by businesses in one part of the industry to businesses in another part of the industry. It is a better indicator of the overall economic activity the industry contributes to the local economy.

Measures of expenditure differ to value of output, for a range of reasons. In particular, expenditure excludes business profits (which are captured in value of output), expenditure can sometimes be higher than value of sales over a given period depending on business investment and timing of production; and not all the expenditure used to produce a given amount of output will have occurred in the region in which expenditure is being estimated. For example, a business may have generated \$1 million in sales in a given region, but only spend \$200,000 in that region as part of generating those sales, with the business purchasing most goods and services from other regions as part of the production process.

Industry expenditure is a useful indicator and provides more concrete data on the extent to which production of wood products results in local economic activity compared to value of output measures. However, it is still subject to some problems of double counting: if the net expenditure of all industries in a region is added together, it will result in a value that is larger than the total value of production in that economy. This is due to the multiple transactions occurring between different industries in any given economy, some

of which are double counted when expenditure of each individual industry is added together. This potential for double counting means it is also important to identify the net contribution of the industry to a regional economy, after taking into account the interactions between all sectors of the economy. This is done through identifying industry contribution to Gross Regional Production (GRP), described below.

Employment units: Employment numbers are usually reported in either full time equivalent (fte) units or total job units defined as:

1. *fte*: is a way to measure a worker's involvement in a project or industry activity. An fte of 1.0 means that the person is equivalent to a full-time worker, while an fte of 0.5 signals that the worker is only half-time. Typically, different scales are used to calibrate this number, depending on the type of industry and scope of the analysis but the basic calculation is the total hours worked divided by average annual hours worked in full-time jobs.

In this report, an fte of 1.0 was calculated as equivalent to a 37.5 hr working week.

2. *Jobs*: is used to refer to the number of workers employed (regardless of full- or part-time) in an industry or on a project at any point in time. It typically refers to either:
 - the *maximum* number of workers required at any point over the analytical period or the duration of the project; or
 - the *average* number of workers required over the analytical period/duration of the project. This can be calculated on a daily, weekly, monthly or annual basis.

In this report, employment is reported in terms of total and full-time equivalent jobs on a per annum basis.

Gross regional product (GRP): is a measure of the contribution of an activity to the regional economy. GRP is measured as value of gross output (revenue) less the cost of goods and services (including imports) used in producing the output. In other words, it can be measured as the sum of household income, gross operating surplus and gross mixed income net of payments to owner managers and taxes less subsidies on products and production. It represents payments to the primary inputs of production (labour, capital and land). Using GRP as a measure of economic contribution avoids the problem of double counting that may arise from using value of output for this purpose. Gross state product (GSP) is the equivalent of GRP at the state level.

Household income: is income earned by employees of businesses and owner-operators. This is a component of GRP that describes how much of the GRP is passed directly to households so it is a useful indicator of the welfare of households.

2.3.3. Categories of economic activity

A useful way to think about economic contribution is using the concept of a 'supply chain'. The supply chain, in the context of the forest industry, includes forest management and silviculture, harvest and haulage of logs and transport of processed products, and primary processing.

Broadly speaking there are four categories of activity along the forestry supply chain.

1. *Direct activity* - refers to activity of firms, businesses and organisations that are directly engaged in providing goods and services to the industry. In this analysis this refers to all activity that handles forest resources from growing to processing.
2. *First round activity* - refers to activity of firms that supply inputs and services to the 'direct activity' businesses. For example, first round activity associated with harvest and haulage businesses includes

fuel supply, repairs and maintenance to equipment and business administration services such as insurance services, legal services, communications and so on.

3. *Industrial-support activity* - refers to the 'second and subsequent round' effects as successive waves of output increases occur in the economy to provide industrial support, as a response to the original wave of expenditure.
4. *Consumption-induced activity* - is the term applied to those effects induced by the household income associated with the original expenditure and its flow-on effects. The expenditure of this increased household income, a result of all three categories of activity (direct, first round and industrial-support), will generate economic activity that will in itself generate further activity.

Flow-on (or indirect) economic contribution is the sum of categories 2, 3 and 4. In this analysis *direct (1)*, *production-induced (2+3)* and *consumption-induced (4)* activity is reported.

2.3.4. Economic contribution modelling

Over the past decade BDO EconSearch has developed an extended input-output (I-O) model known as the RISE model (Regional Industry Structure & Employment). RISE models based on the 2020-21 financial year of the Oberon LGA, CWFH region and state of NSW were developed and used for this analysis.

Input-output models are widely used to assess the economic contribution of existing levels of economic activity and the economic effects of shocks. The models are based on I-O tables that describe the interdependencies between industries within the regional economy and with the economy outside of the region. This makes the comprehensive economic framework provided by the RISE model extremely useful for disentangling the direct and flow-on effects of activity in a regional economy.

3. OVERVIEW OF THE INDUSTRY

While in many regions of Australia jobs in the forest industry are supported by native forest, hardwood plantations and softwood plantations, in the CWFH region, forest industry jobs rely on softwood plantations. The softwood plantation industry in the CWFH region represents a significant part of Australia's total softwood plantation estate and associated processing. In total, the 89,800 hectares of softwood plantations established in the region makes up 9 per cent of Australia's total of 1,028,000 hectares of softwood plantations (Greenwood Strategy 2022a and ABARES 2021).

This section briefly describes the softwood plantation industry in the CWFH region. First, the structure of the industry is examined by focusing on understanding the supply chain, from the growing of plantations to the processing of a range of softwood products. Then the softwood plantation industry is examined in more detail.

3.1. Industry Structure

The forest industry in the CWFH region, like most of Australia, has a supply chain with three distinct parts: primary production, primary processing and secondary processing. Each stage is described below:

1. Jobs supported by primary production of wood and fibre products.

In this part of the industry, trees are grown and harvested to produce roundwood (logs). The activities involved in primary production include management of plantation by forest management businesses and agencies, silvicultural contractors, and harvesting and haulage of logs to primary processors.

2. Jobs supported up to and including primary processing of wood and fibre products.

Primary processing means processing of logs into initial wood and timber products. Primary processing activities in the CWFH region are based almost entirely on wood and fibre grown in the region. This means that the primary production of logs and primary processing combine to create a strongly inter-linked supply chain within the region. This supply chain generates employment and economic activity based on the management and harvesting of mostly locally grown softwood logs for wood and fibre production. Harvested logs are processed into a range of primary products including sawn timber and composite wood products such as particleboard and medium density fibreboard (MDF). Residues from processing are generally used as inputs to production for particleboard manufacturing or drying of green sawn product. Recycled timber is also used as an input to particle board manufacturing. The products from primary processing are then either sold directly into end use markets such as the construction industry or sold for further processing into 'secondary' products by other processors.

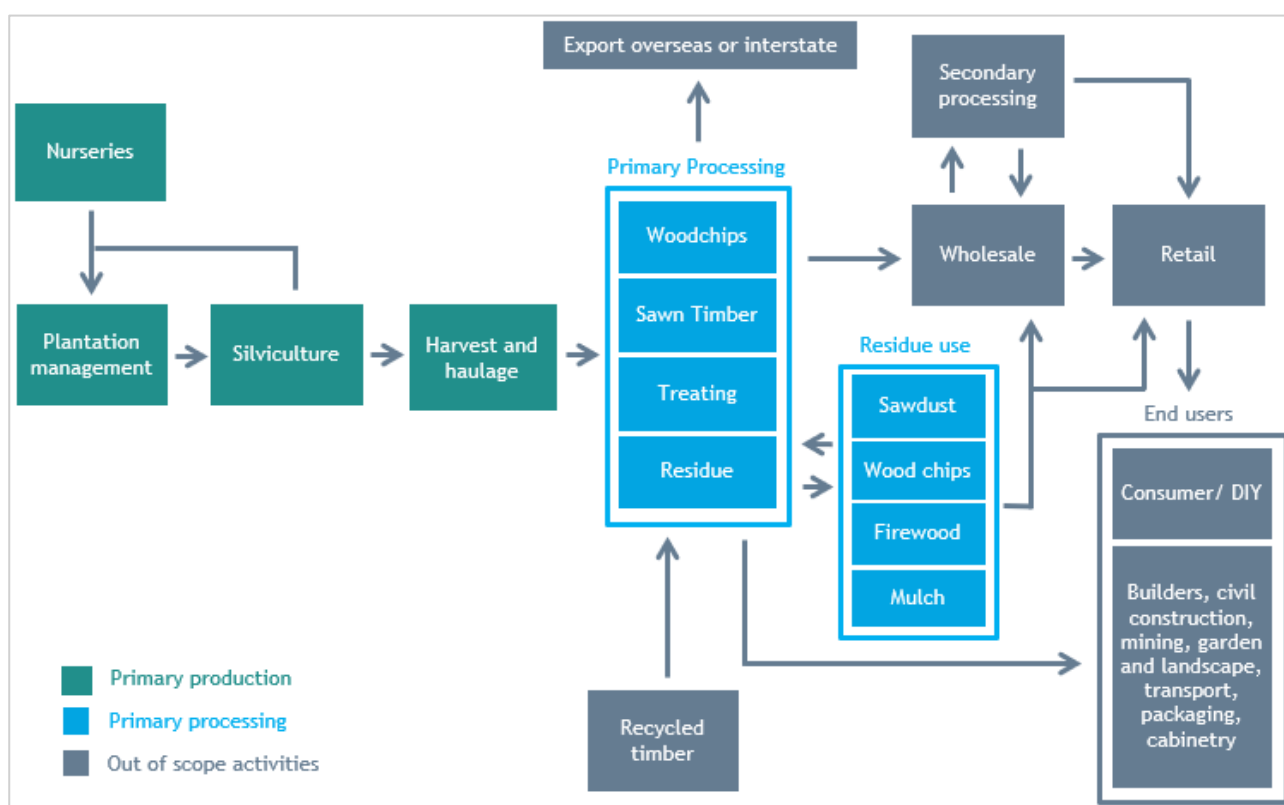
3. Jobs supported by 'secondary' processing.

Secondary processing involves further processing of primary processed wood and fibre (for example, rough sawn timber or fibreboard) into a range of further products such as cabinets, furniture or house frames. While these jobs still rely on timber as a key input in processing, the wood and fibre inputs are often combined with other products such as fabric covers on furniture and melamine on cabinets. The inputs may be sourced from timber grown locally, or from timber that has been grown and undergone primary processing in other parts of Australia or other countries. Additionally, some of the residues produced in primary processing (for example, bark, sawdust and docking ends of logs) are sold to businesses such as agricultural businesses for use as animal bedding, garden and landscape businesses and firewood sellers. Secondary processing is often concentrated in major urban areas and regional

cities; in New South Wales, much occurs in Sydney and coastal cities, and less in regional cities such as Bathurst, Albury and Wagga Wagga. This means that there are relatively small amounts of employment in secondary processing in the CWFH region but significant employment supported in the rest of NSW.

Figure 3-1 provides a stylised representation of this structure, note that some of the supply chain occurs outside of the CWFH region. This report focuses primarily on understanding the employment and activity supported by the industry up to and including the ‘primary processing’ stage. The primary processing stage was defined for this report as including all processors who take roundwood (logs) harvested from softwood plantations, and includes all products from those processors. In some cases, a single processor may process roundwood into multiple products on a single site, including engaging in some activities often considered part of the secondary processing sector. In these cases, all that processor’s activities were included in the analysis.

Figure 3-1 Stylised structure of the CWFH forest and wood products industry supply chain in Australia



3.2. Central West NSW Forestry Hub Softwood Plantation Industry

The CWFH region of NSW has approximately 89,800 hectares of softwood plantations, the majority (79 per cent) are publicly owned and managed by ForestryCorp, and the remaining 21 per cent are owned by private land managers (Greenwood Strategy 2022a). The region includes the local government areas of Bathurst, Blayney, Cabonne, Cowram, Goulburn, Lachlan, Lithgow, Mid-Western, Oberon, Orange and Wingecarribee. The majority of the timber harvested from these plantations is processed at local processing facilities.

In 2022, the processing industry reliant on plantations grown in the CWFH region included:

- Australian Softwood (Bathurst), producing treated and untreated sawnwood, framing, palings and residues
- Australian United Timbers (Bathurst), producing treated outdoor timber products, and residues
- Borg Oberon (Oberon), producing medium density fibreboard (MDF), particle board and value added products
- Highland Pine Products (Oberon), producing dressed and treated sawn timber for framing and trusses, packaging and residues
- Oberon Bearers (Oberon), producing dressed and treated sawn timber and sawdust.

3.3. Integrated Processing Industry

The CWFH region is an example of an integrated processing hub, in which a number of processing facilities have been established and enable use of all parts of the logs harvested from the softwood plantations in the region. Residues such as woodchips and shavings produced as by-products at sawmills are used in the manufacture of products such as MDF and particleboard at other processing facilities in the region. Smaller logs are processed by particleboard and MDF manufacturers.

Other residues produced in the manufacturing process are typically used as fuel for onsite energy needs, or in some cases sold to local landscapers or other industries requiring wood shavings and bark. This results in the utilisation of the full log through more than one stage of production, thus maximising fibre recovery and minimising potential waste.

The need to source fibre from outside the region to meet current supply needs for the region's mills presents a challenge for the industry, with several businesses in the CWFH region reporting that access to raw material inputs is a challenge (2021-22 Industry Survey).

3.4. Other Activities

In addition to producing fibre to supply the wood processing industry, the softwood plantations provide a base for other socio-economic activities. The plantations in the CWFH region are involved in non-forestry activities including:

- Livestock grazing
- Bee keeping
- Mushroom foraging
- Prospecting
- Hunting
- Camping areas
- Motorbike events and car rallies (2021-22 Industry Survey).

The economic value of these other activities has not been estimated as part of this report, which includes only the economic value of the wood and fibre products produced from softwood plantations. However, these other activities generate important additional social and economic benefit from plantation areas for many residents living in or visiting the CWFH region.

4. ECONOMIC CONTRIBUTION

Economic contribution analysis was completed for the forestry activity within the CWFH region. The flow on effects to the economy both within the CWFH region and more broadly to the state of NSW were estimated. The 2021-22 economic contribution results for the CWFH region are compared to the 2015-16 results for the Central Tablelands region where appropriate as described in Section 1.

A case study analysis was also conducted for the Oberon LGA region which is detailed in Section 8.2.

4.1. Direct Economic Contribution

4.1.1. Output

In 2021-22, the direct output from the growing, silviculture, harvesting, haulage, transport, and primary processing forestry activity in the Central West NSW Forestry Hub (CWFH) was \$458.9 million. This excludes sales of products or services occurring at earlier points in the supply chain prior to primary processing, to avoid double counting. By supply chain stage, \$85.2 million was generated by growers and silviculture, \$64.4 million by haulage and harvest and transport, and \$444.4 million by processors. In comparison, direct output for the Central Tablelands (CT) region in 2015-16 was \$285.6 million (Table 4-1).

Table 4-1 Direct gross output (\$m) by the CWFH (2021-22) and CT (2015-16) forest industries, by supply chain stage

Supply Chain Stage	CT 2015-16	CWFH 2021-22
Grower & Silviculture	83.1	85.2
Harvest & Haulage & Transport	26.5	64.4
Processing	265.1	444.4
Other (including consultants, equipment sales, training) ^a	5.4	-
Total^b	285.6	458.9

^a The Other stage was not measured separately for the CWFH as that activity is included in the flow-on contribution for this study.

^b The total for combined stages is lower than the sum of individual stages as it excludes transfers between stages to prevent double counting.

Source: BDO EconSearch analysis and Schirmer et al. 2018

4.1.2. Industry expenditure

Value of output does not always provide a picture of the extent to which an industry contributes directly to the region it is located in. Examining expenditure helps to answer questions such as whether industry expenditure largely occurs locally, or is mostly occurring some distance from the region in which the business is located. In total, in 2021-22, the forest industry supported \$344.8 million in direct net expenditure in CWFH, up to and including the point of primary processing. This included \$13.4 million supported by growers and silviculture, \$46.8 million by haulage and harvest, and transport, and \$284.6 million by processors. In comparison, direct expenditure for the CT region in 2015-16 was \$231.7 million (Table 4-2).

To understand where industry expenditure is supported, Table 4-2 show both gross and net expenditure. While gross expenditure is not a true measure of economic contribution (due to double counting) it helps show the relative size of different parts of the supply chain. Net expenditure is a measure of economic

contribution and shows how much expenditure outside of the forest industry is added at different points in the supply chain.

Table 4-2 Direct expenditure (\$m) by the CWFH (2021-22) and CT (2015-16) forest industries, by supply chain stage

Supply Chain Stage	CT 2015-16		CWFH 2021-22	
	Gross	Net ^a	Gross	Net ^a
Grower & Silviculture	73.1	42.1	58.0	13.4
Harvest & Haulage & Transport	26.1	26.1	47.9	46.8
Processing	226.9	163.5	374.0	284.6
Total	N/A	231.7	N/A	344.8

^a This table shows expenditure net of transfers within the industry. The net figure ensures there is no double counting by ensuring that payments made from one part of the industry to another (and then expended in that other part of the industry) are not included. The transfers excluded from net figures include payments made to harvest, haulage, roading, earthworks and silvicultural contractors by plantation managers, and payments made to plantation managers or to other processors for fibre inputs used by processors.

Source: BDO EconSearch analysis and Schirmer et al. 2018

In both the CWFH and CT results, the largest expenditure within the respective region was on wages and salaries (19 per cent and 21 per cent respectively). The CWFH expenditure pattern deviates from the CT due to differences in the regional definitions, period of analysis and methods in each of the studies. As the CWFH region is smaller than the CT region, it is likely that less of the expenditure was concentrated in the defined local region in this study. Additionally, in the 2021-22 Industry Survey, businesses were asked detailed questions about the amount of expenditure that occurred locally within the specified region. This level of detail was not asked in the 2015-16 industry survey, so for the purpose of that study, assumptions were made about the amount spent within the region. The comprehensive 2021-22 Industry Survey data revealed that the 2015-16 study likely overestimated the expenditure within the region as a result. This resulted in a significantly lower proportion of local expenditure within the CWFH (31 per cent) (Table 4-3).

Table 4-3 Direct operational and capital expenditure (\$m) by the CWFH (2012-22) and CT (2015-16) forest industries, by industry sector

	CT 2015-16		CWFH 2021-22	
	Value (\$m)	Proportion of total (%)	Value (\$m)	Proportion of total (%)
Wages/Salaries	47.2	21%	79.1	19%
Construction	1.6	1%	21.4	5%
Communication	6.9	3%	8.0	2%
Other	4.3	2%	7.1	2%
Retail and Wholesale Trade	9.2	4%	6.8	2%
Transport, Postal and Warehousing	4.8	2%	4.1	1%
Electricity, Gas, Water and Waste Services	26.1	12%	2.3	1%
Other Services	27.7	12%	2.2	1%
Manufacturing	16.5	7%	0.8	0%
Professional, Scientific and Technical Services	4.3	2%	0.2	0%
Education and Training	2.4	1%	0.1	0%
Accommodation and Food Services	3.4	2%	0.0	0%
Agriculture	5.0	2%	0.0	0%
Mining	0.1	0%	0.0	0%
Sub-total	159.3	71%	132.0	31%
<i>Expenditure outside the respective region</i>	<i>63.9</i>	<i>29%</i>	<i>287.4</i>	<i>69%</i>
Total	326.2	100%	419.4	100%

Source: BDO EconSearch analysis and Schirmer et al. 2018

4.1.3. Gross regional product

Measures of the forest industry's contribution to GRP can be thought of as the value-added by the industry to the economy, or the value left once non-wage expenditure is subtracted from revenue. This means GRP represents the value contributed to the economy in the form of returns to business/resource owners (in the form of profits), workers (in the form of wages and salaries), and taxes to governments. Using GRP as a measure of economic contribution avoids the problem of double counting that may arise from using value of output for this purpose.

In total, in 2021-22, the forest industry contributed \$199.2 million in direct GRP in CWFH. This included \$34.2 million supported by growers and silviculture, \$40.2 million by haulage and harvest and transport, and \$124.8 million by processors. In comparison, direct GRP for the CT region in 2015-16 was \$101.1 million (Table 4-4).

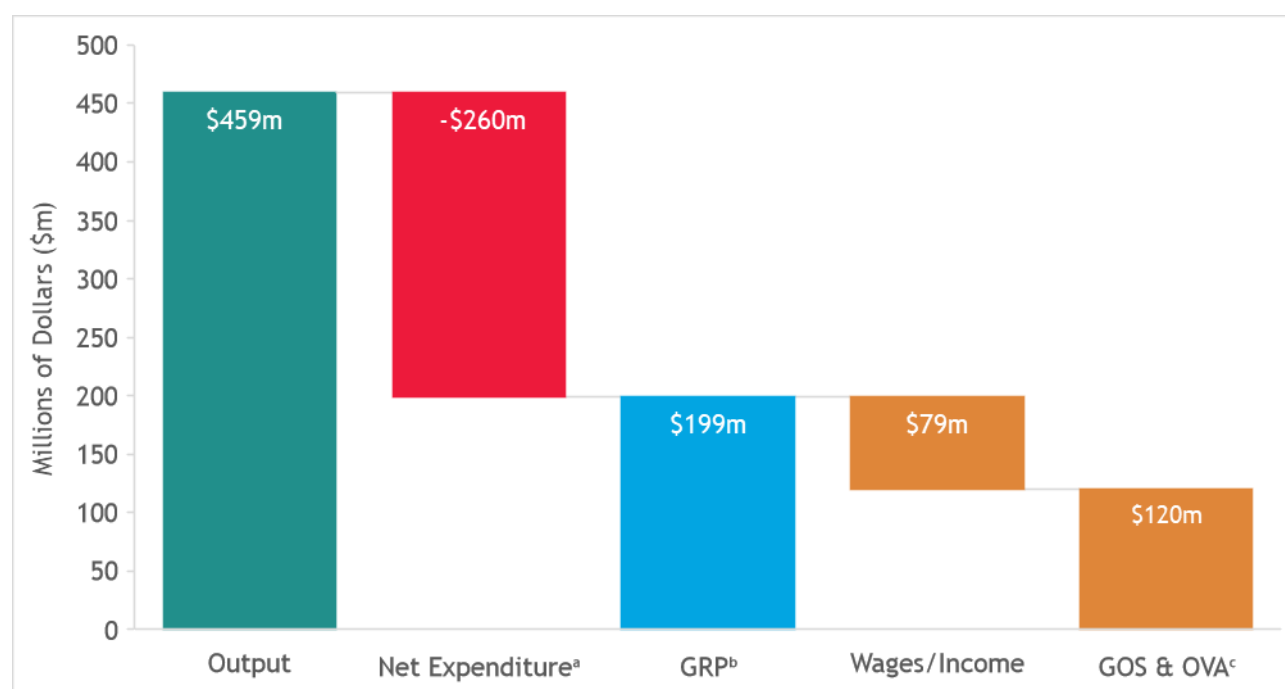
Table 4-4 Direct contribution to GRP (\$m) by the CWFH (2021-22) and CT (2015-16) forest industries, by supply chain stage

Supply Chain Stage	CT 2015-16	CWFH 2021-22
Grower & Silviculture	23.2	34.2
Harvest & Haulage & Transport	6.5	40.2
Processing	69.3	124.8
Other (including consultants, equipment sales, training) ^a	2.0	-
Total	101.1	199.2

^a The Other stage was not measured separately for the CWFH as that activity is included in the flow-on contributions for this study.

Source: BDO EconSearch analysis and Schirmer et al. 2018

Figure 4-1 Calculation and decomposition of direct contribution to GRP, CWFH, total industry, 2021-22



^a Net expenditure is defined in Table 4-2 except that wages are excluded because they are a component of GRP.

^b Gross Regional Product (GRP)

^c Gross Operating Surplus (GOS is before-tax business profit and Other Value-Added (OVA) is other kinds of income not already counted. In this case it is annuities paid by the growers and donations made by businesses anywhere along the forestry industry supply chain up to and including primary processing.

Source: BDO EconSearch analysis

Figure 4-1 shows the derivation of direct contribution to GRP by the forest industry in the CWFH region. The figure shows that GRP (blue) is what remains once non-wage net expenditure (red) is subtracted from value of output (green). The orange bars show that most of the direct contribution to GRP was gross operating surplus (GOS, before-tax business profit), followed by wages, and a small amount of Other Value Added (OVA, in this case annuities and donations).

4.1.4. Household income

Household income, a component of GRP, is a useful indicator of the welfare of households. In total, in 2021-22, the forest industry contributed \$79.1 million to household income in CWFH. This included \$6.9 million supported by growers and silviculture, \$17.8 million by harvest and haulage and transport, and \$54.4 million by processors. In comparison, direct household income for the CT region in 2015-16 was \$47.2 million (Table 4-5).

Table 4-5 Direct contribution to household income (\$m) by the CWFH (2021-22) and CT (2015-16) forest industries, by supply chain stage

Supply Chain Stage	CT 2015-16	CWFH 2021-22
Grower & Silviculture	8.6	6.9
Harvest & Haulage & Transport	6.1	17.8
Processing	31.2	54.4
Other (including consultants, equipment sales, training) ^a	1.5	-
Total	47.2	79.1

^a The Other stage was not measured separately for the CWFH as that activity is included in the flow-on contributions for this study.

Source: BDO EconSearch analysis and Schirmer et al. 2018

4.2. Total Economic Contribution

4.2.1. Operating expenditure

The direct expenditure of any industry generates further flow-on effects: expenditure by one industry generates economic activity in other parts of the economy, and therefore generates further jobs and economic activity beyond that occurring directly within the first industry. This flow-on activity can be production-induced, meaning it is supported as a result of the purchase of goods and services by the industry (e.g. purchasing fuel, mechanical services, accounting or financial services, to name a few), or consumption-induced, meaning it is supported as a result of workers in the industry and service industries spending their wages/salaries. 'Total' economic value refers to the total value an industry contributes to the economy when both direct and flow-on effects are included.

Value of output

In the CWFH region, the total value of output contributed by the industry in 2021-22 was \$572.0 million for the industry as a whole (excluding transfers), including \$93.2 million by growers and silviculture, \$87.4 million by harvest and haulage and transport, and \$526.4 million by processors (Table 4-6).

The total value of output contributed by the CWFH forestry industry in 2021-22 was \$1,004.8 million in NSW for the industry as a whole (excluding transfers), including \$107.0 million by growers and silviculture, \$121.6 million by harvest and haulage and transport, and \$911.2 million by processors (Table 4-7).

The CWFH forestry industry total output in the CWFH region was lower than total output in the CT region which was estimated to be \$699.7 million in 2015-16, however total output supported throughout NSW was higher (Table 4-6).

Contribution to GSP and GRP

In the CWFH region, the total contribution to the value of GRP in 2021-22 was \$260.5 million for the industry as a whole, including \$38.6 million by growers and silviculture, \$53.0 million by harvest and haulage and transport, and \$168.9 million by processors (Table 4-6).

The total contribution to the value of GSP in 2021-22 was \$495.7 million in NSW for the industry as a whole, including \$46.4 million by growers and silviculture, \$78.0 million by harvest and haulage and transport, and \$371.3 million by processors (Table 4-7).

The CWFH forestry industry total GRP in the CWFH region in 2021-22 was lower than total GRP in the CT region which was \$299.4 million in 2015-16, however total GSP supported throughout NSW was higher (Table 4-6).

Household income and employment

In the CWFH region, the total contribution to household income, a component of GRP, in 2021-22 was \$109.4 million for the industry as a whole, including \$9.1 million by growers and silviculture, \$24.1 million by harvest and haulage and transport, and \$76.2 million by processors (Table 4-6).

The total contribution to household income was \$234.5 million in NSW for the industry as a whole, including \$12.9 million by growers and silviculture, \$35.4 million by harvest and haulage and transport, and \$186.2 million by processors in 2021-22 (Table 4-7).

The CWFH forestry industry total household income in the CWFH region was lower than total household income in the CT region which was estimated at \$156.3 million in 2015-16, however in NSW, total household income was higher (Table 4-6).

In the CWFH region, the CWFH forestry industry contributed 1,259 fte jobs to employment, including 88 fte jobs by growers and silviculture, 358 fte jobs by harvest and haulage and transport, and 818 fte jobs by processors. This is equal to 1,220 total jobs in NSW, including 87 jobs contributed by growers and silviculture, 319 jobs by harvest and haulage and transport, and 819 jobs by processors (Table 4-6). Employment is discussed in more detail in Section 4.3.

For the NSW industry as a whole, forestry contributed 2,534 fte jobs to employment in NSW, including 136 fte jobs by growers and silviculture, 464 fte jobs by harvest and haulage and transport, and 1,954 fte jobs by processors. This equates to 2,515 total jobs in NSW, including 138 jobs contributed by growers and silviculture, 429 jobs by harvest and haulage and transport, and 1,969 jobs by processors (Table 4-7).

The CWFH forestry industry total employment in the CWFH region was lower than total employment in the CT region which was 2,027 jobs in 2015-16, however in NSW, total employment was higher (Table 4-6).

Table 4-6 Economic contributions of the operation of the CWFH forest industry in CWFH, by supply chain stage, 2021-22

Economic Indicator	Supply Chain Stage				Total CT ^{a,b} 2015-16
	Grower & Silviculture	Harvest & Haulage & Transport	Processing	Total CWFH ^a	
Output (\$m)	93.2	87.4	526.4	572.0	699.7
Direct	85.2	64.4	444.4	458.9	285.6
Production induced	1.0	4.3	22.9	28.2	245.3
Consumption induced	7.1	18.7	59.2	85.0	168.7
GRP (\$m)	38.6	53.0	168.9	260.5	299.4
Direct	34.2	40.2	124.8	199.2	101.1
Production induced	0.5	2.1	10.5	13.0	104.7
Consumption induced	4.0	10.6	33.6	48.3	93.6
Household Income (\$m)	9.1	24.1	76.2	109.4	156.3
Direct	6.9	17.8	54.4	79.1	47.2
Production induced	0.3	1.3	6.2	7.9	62.9
Consumption induced	1.9	4.9	15.6	22.4	46.1
Employment (fte)	88	358	818	1,259	-
Direct	61	281	558	899	-
Production induced	3	13	60	76	-
Consumption induced	24	64	199	283	-
Employment (total)	87	319	819	1,220	2,027
Direct	59	239	553	851	852
Production induced	3	13	57	72	605
Consumption induced	25	67	208	296	570

^a Industry output may be lower than the sum of output for individual stages as it excludes transfers between stages to prevent double counting.

^b Employment by fte was not reported for the CT forestry industry.

Source: BDO EconSearch analysis and Schirmer et al. 2018

Table 4-7 Economic contributions of the operation of the CWFH forest industry in NSW, by supply chain stage, 2021-22

	Supply Chain Stage			
	Grower & Silviculture	Harvest & Haulage & Transport	Processing	Total NSW ^a
Output (\$m)	107.0	121.6	911.2	1,004.8
Direct	85.2	64.4	444.4	458.9
Production induced	7.6	18.4	262.3	288.3
Consumption induced	14.1	38.9	204.6	257.6
GSP (\$m)	46.4	78.0	371.3	495.7
Direct	34.2	46.1	129.5	209.8
Production induced	4.0	9.4	123.0	136.4
Consumption induced	8.2	22.6	118.8	149.6
Household Income (\$m)	12.9	35.4	186.2	234.5
Direct	6.9	17.8	54.4	79.1
Production induced	1.9	6.3	72.6	80.7
Consumption induced	4.1	11.3	59.2	74.6
Employment (fte)	136	464	1,954	2,534
Direct	61	281	558	899
Production induced	30	60	753	833
Consumption induced	45	123	643	802
Employment (total)	138	429	1,969	2,515
Direct	59	239	553	851
Production induced	31	59	732	813
Consumption induced	48	131	683	851

^a Total output may be lower than the sum of output for individual stages as it excludes transfers between stages to prevent double counting.

^b Employment by fte was not reported for the CT forestry industry.

Source: BDO EconSearch analysis and Schirmer et al. 2018

4.2.2. Capital expenditure

The average annual capital expenditure of the industry is detailed in Table 4-8 and Table 4-9. The industry was estimated to have an average of \$74.7 million each year between 2017-18 to 2021-22. This included expenditure items such as trucks and harvesters, visual graders, particle and thin board lines, land purchases and road upgrades. The economic contribution of the CWFH forestry industry capital expenditure is determined by the extent of local labour and raw materials used and the level of expenditure associated with the specialised contractors and equipment that will occur in the region. Of the total capital expenditure, an estimated \$26.0 million (35 per cent) is expected to be purchased from goods and service providers from within the CWFH region each year.

Value of output

In the CWFH region, the total value of output contributed by the industry in 2021-22 was \$48.5 million, \$26.0 million directly and \$22.5 million in flow-on effects. Of that, \$4.3 million was generated by growers and silviculture, \$0.3 million by harvest and haulage and transport, and \$43.9 million by processors (Table 4-8).

The total value of output contributed by the industry in 2021-22 was \$167.5 million in NSW, \$66.5 million directly and \$101.0 million in flow-on effects. Of that, \$6.4 million was generated by growers and silviculture, \$25.5 million by harvest and haulage and transport, and \$135.6 million by processors (Table 4-9).

Contribution to GSP and GRP

In the CWFH region, the total contribution to GRP is estimated to be approximately \$20.0 million, \$9.8 million directly and \$10.5 million in flow-on effects. Of that, \$1.9 million was supported by growers and silviculture, \$0.1 million by harvest and haulage and transport, and \$18.0 million by processors (Table 4-8).

The total contribution to GSP is estimated to be approximately \$82.6 million, \$29.2 million directly and \$53.4 million in flow-on effects. Of that, \$3.2 million was supported by growers and silviculture, \$12.5 million by harvest and haulage and transport, and \$66.9 million by processors (Table 4-9).

Household income and employment

In the CWFH region, the total contribution to household income was \$13.0 million, \$7.5 million directly and \$5.5 million in flow-on effects. Of that, \$1.0 million was supported by growers and silviculture, \$0.1 million by harvest and haulage and transport, and \$12.0 million by processors (Table 4-8).

The total contribution to household income, a component of GSP/GRP, was \$51.5 million in NSW, \$20.9 million directly and \$30.6 million in flow-on effects. Of that, \$1.7 million was supported by growers and silviculture, \$7.5 million by harvest and haulage and transport, and \$42.2 million by processors (Table 4-9).

In the CWFH region, the forestry industry contributed 142 fte jobs in the CWFH, 77 fte jobs directly and 65 fte jobs in flow-on effects. Of that, 9 fte jobs were supported by growers and silviculture, 1 fte jobs by harvest and haulage and transport, and 134 fte jobs by processors. This equates to 131 total jobs to employment in the CWFH, 68 jobs directly and 63 jobs in flow-on effects. Of that, 9 jobs were supported by growers and silviculture, 1 job by harvest and haulage and transport, and 123 jobs by processors (Table 4-8).

For the industry as a whole, forestry contributed 518 fte jobs to employment in NSW, 211 fte jobs directly and 308 fte jobs in flow-on effects. Of that, 15 fte jobs were supported by growers and silviculture, 77 fte jobs by harvest and haulage and transport, and 426 fte jobs by processors. This equates to 514 total jobs to employment in NSW, 200 jobs directly and 314 jobs in flow-on effects. Of that, 15 jobs were supported by growers and silviculture, 77 job by harvest and haulage and transport, and 422 jobs by processors (Table 4-9).

Table 4-8 Average annual economic contributions of the capital expenditure by the CWFH forest industry in the CWFH region, by supply chain stage, 2021-22

Economic Indicator	Supply Chain Stage			
	Grower & Silviculture	Harvest & Haulage & Transport	Processing	Total
Output (\$m)	4.3	0.3	43.9	48.5
Direct	2.3	0.2	23.6	26.0
Production induced	1.2	0.1	11.1	12.4
Consumption induced	0.8	0.1	9.3	10.1
GRP (\$m)	1.9	0.1	18.0	20.0
Direct	0.9	0.1	8.8	9.8
Production induced	0.5	0.0	3.9	4.5
Consumption induced	0.4	0.0	5.3	5.7
Household Income (\$m)	1.0	0.1	12.0	13.0
Direct	0.5	0.1	6.9	7.5
Production induced	0.3	0.0	2.6	2.9
Consumption induced	0.2	0.0	2.4	2.7
Employment (fte)	9	1	134	142
Direct	3	0	74	77
Production induced	4	0	29	33
Consumption induced	2	0	30	32
Employment (total)	9	1	123	131
Direct	3	0	65	68
Production induced	3	0	26	30
Consumption induced	3	0	31	34

^a The Other stage was not measured separately for the CWFH as that activity is included in the flow-on contributions for this study.

Source: BDO EconSearch analysis

Table 4-9 Average annual economic contribution of the capital expenditure by the CWFH forest industry in NSW, by supply chain stage, 2021-22

Economic Indicator	Supply Chain Stage			
	Grower & Silviculture	Harvest & Haulage & Transport	Processing	Total
Output (\$m)	6.4	25.5	135.6	167.5
Direct	2.5	10.6	53.5	66.5
Production induced	2.0	6.7	35.7	44.4
Consumption induced	1.9	8.3	46.4	56.6
GRP (\$m)	3.2	12.5	66.9	82.6
Direct	1.0	4.5	23.7	29.2
Production induced	1.0	3.3	16.2	20.5
Consumption induced	1.1	4.8	26.9	32.8
Household Income (\$m)	1.7	7.5	42.2	51.5
Direct	0.5	2.9	17.5	20.9
Production induced	0.7	2.2	11.3	14.2
Consumption induced	0.5	2.4	13.4	16.4
Employment (fte)	15	77	426	518
Direct	4	32	176	211
Production induced	5	20	106	132
Consumption induced	6	26	144	176
Employment (total)	15	77	422	514
Direct	3	31	166	200
Production induced	5	19	102	127
Consumption induced	6	27	153	187

^a The Other stage was not measured separately for the CWFH as that activity is included in the flow-on contributions for this study.

Source: BDO EconSearch analysis

4.3. Employment

4.3.1. Direct employment (fte)

The forest industry supported 899 direct fte jobs in 2021-22. 'Direct' jobs include jobs that depend on the presence of the industry, and include employment supported in nurseries, silvicultural contracting, harvest and haulage of logs to processors, and primary processing of logs. They do not include jobs supported in mechanical services, fuel supply, or supply of other goods and services to the industry, which are included in flow-on employment.

Across the CWFH forestry region, 61 fte jobs were supported by growers and silviculture, 281 fte jobs by harvest and haulage and transport, and 558 fte jobs by processors (Table 4-10).

Table 4-10 Direct contribution to employment (fte) by the CWFH forest industry, by supply chain stage, 2021-22

Supply Chain Stage	CWFH
Grower & Silviculture	61
Harvest & Haulage & Transport	281
Processing	558
Total	899

Source: BDO EconSearch analysis

4.3.2. Direct employment (total jobs)

The forest industry supported 851 direct jobs in 2021-22, of which 850 jobs were filled by persons who lived within the CWFH region. Across the CWFH forestry region, 59 jobs were supported by growers and silviculture, 239 jobs by harvest and haulage and transport, and 553 fte jobs by processors. In comparison, direct expenditure for the CT region in 2015-16 was 852 jobs, 817 of which were employees located within the region (Table 4-11).

The number of total direct jobs reported is lower than the number of fte jobs described in Section 4.3.1. This is because the assumed economy-wide average hours worked per week for an fte employee is 37.5, and the 2021-22 Industry Survey indicated that the average employee in the forest industry worked greater than 37.5 hours per week in 2021-22. The 2021-22 Industry Survey indicated that 99 per cent of forest industry workers in the CWFH region worked full-time positions, and that these employees worked 40 hours per week on average in 2021-22 (Table 4-12).

Using the assumption that the average fte employee works 37.5 hours per week, the total direct forest industry employment in the CWFH region in 2021-22 of 851 jobs equated to 899 fte jobs (Table 4-12). Fte jobs is a useful indicator to compare employment between industries as it gives a standardised measure of the labour required for a given activity.

Table 4-11 Direct contribution to employment (total jobs) by the CWFH (2021-22) and CT (2015-16) forest industries, by supply chain stage

Supply Chain Stage	CT 2015-16		CWFH 2021-22	
	Total direct employment	Jobs located in the region (persons)	Total direct employment	Jobs located in the region (persons)
Grower & Silviculture	107	92	59	59
Harvest & Haulage & Transport	98	88	239	239
Processing	620	616	553	552
Other (including consultants, equipment sales, training) ^a	27	21	-	-
Total direct employment	852	817	851	850

^a The Other stage was not measured separately for the CWFH as that activity is included in the flow-on contributions for this study.

Source: BDO EconSearch analysis and Schirmer et al. 2018

Table 4-12 Key employment assumptions for the CWFH direct total jobs and direct fte jobs, 2021-22

Key employment assumptions	
Proportion of CWFH direct forest industry employees that worked full-time in 2021-22	99%
Average weekly hours worked by CWFH direct forest industry employees in 2021-22	40 hours
Assumed average weekly hours worked by a full time equivalent	37.5 hours
Direct Forest Industry employment in the CWFH region 2021-22 (total jobs)	851
Direct Forest Industry employment in the CWFH region 2021-22 (fte jobs)	899

Source: 2021-22 Industry Survey and BDO EconSearch analysis

4.3.3. Direct employment by LGA

The usual residence of workers employed within the CWFH forestry industry are located in just a few local government areas (LGA). To understand how dependent an LGA is on the industry, it helps to examine both the total number of jobs supported, and also the usual residence of the workers that depend on the industry. This provides an understanding of the extent to which a local area depends on the industry for employment of its workforce. In 2021-22, over half of the workers employed within the CWFH forestry industry resided in Oberon, just over 30 per cent lived in Bathurst and the rest spread between the other LGAs. This was similar to the spread of workers in the CT forestry industry in 2015-16 (Table 4-13).

Table 4-13 Usual residence of direct employment (total jobs) by the CWFH (2021-22) and CT (2015-16) forest industries, by local government area

Local Government Area	CT 2015-16	CWFH 2021-22
Bathurst	260	260
Blayney	25	6
Cabonne	19	12
Cowra ^a	-	0
Goulburn ^a	-	0
Lachlan ^a	-	0
Lithgow	43	39
Mid-Western ^a	-	0
Oberon	417	528
Orange	53	5
Wingecarribee ^a	-	0
Outside the region	35	1
Total workers	852	851

^a These LGAs are not encompassed in the CT region.

Source: BDO EconSearch analysis and Schirmer et al. 2018

4.3.4. Total employment

As discussed above, 851 direct jobs were supported by the CWFH forestry industry in the region, with the majority being within the processing sector (553 jobs). Industry wide direct jobs were similar to what was reported for the CT forestry industry in 2015-16 (852 jobs).

However, flow-on jobs supported by the industry were significantly lower in the CWFH region (369 indirect jobs) than in the CT region (1,175 jobs). Total (direct and flow-on) jobs supported by the CWFH forestry industry were 1,220 jobs, just over half that of the CT region in 2015-16 (Table 4-14). As the CWFH region is smaller than the CT region, it is likely that less of the expenditure was concentrated in the defined local region in this study. Additionally, in the 2021-22 Industry Survey, businesses were asked detailed questions about the amount of expenditure that occurred locally within the specified region. This level of detail was not asked in the 2015-16 industry survey, so for the purpose of that study, assumptions were made about the amount spent within the region. The comprehensive 2021-22 Industry Survey data revealed that the 2015-16 study likely overestimated the expenditure within the region as a result. The expenditure within the local region drives the flow-on effects of the activity within the economic modelling, including the flow-on employment. The large difference in flow-on effects observed between the studies is therefore mainly attributable to improved resolution of the industry survey data.

The total multiplier estimates that for every direct job supported by the industry in the CWFH region a total of 1.4 jobs were supported in the region through a combination of production-induced and consumption-induced effects (Table 4-15).

Table 4-14 Direct and flow-on contribution to employment (total jobs) by the CWFH (2021-22) and CT (2015-16) forest industries, by supply chain stage

Supply Chain Stage	Central Tablelands 2015-16		CWFH 2021-22	
	Total direct employment	Jobs located in the region (persons)	Total direct employment	Jobs located in the region (persons)
Grower & Silviculture	107	92	59	59
Harvest & Haulage & Transport	98	88	239	239
Processing	620	616	553	552
Other (including consultants, equipment sales, training) ^a	27	21	-	-
Total direct employment	852	817	851	850
Flow-on (indirect jobs)	1,175	1,175	369	369
Total direct + flow-on employment	2,027	1,992	1,220	1,219

Source: BDO EconSearch analysis and Schirmer et al. 2018

Table 4-15 Employment multipliers: indirect employment supported by the CWFH (2021-22) and CT (2015-16) forestry industries

Type of multiplier	Description	Central Tablelands 2015-16		CWFH 2021-22	
		Multiplier estimate	Total employment	Multiplier estimate	Total employment
None	Direct jobs only	1	852	1	851
Type I	Direct jobs + production induced jobs	1.70	1,457	1.08	923
Type II	Direct jobs + production induced jobs + consumption induced jobs	2.40	2,027	1.43	1,220

Source: BDO EconSearch analysis and Schirmer et al. 2018

5. WORKFORCE

5.1. Working Conditions

Regionally based industries can often find it difficult to recruit and maintain an effective workforce as these areas generally have a smaller labour force compared to more populated urban centres. This section explores the working conditions and the diversity of the workforce in the forest industry within the CWFH, focussing on factors that contribute to positive working conditions and influence the ability of businesses in the industry to both recruit new workers and to retain their existing workforce. These include income, working hours and the diversity of the workforce. ABS Census data and data from recent surveys and interviews conducted by ForestWorks in 2021 are examined.

A large majority of the workers in most parts of the forest industry were working full-time in 2021, according to ABS Census data (Table 5-1). Only 11 per cent of forest industry workers were employed part-time, compared to 36 per cent of the broader workforce in the CWFH. Full-time work was most common in the logging sector (95 per cent working full-time) followed by the wood product manufacturing sector (93 per cent working full-time).

Table 5-1 Proportion of workforce employed full-time and part-time within the CWFH, 2006-2021

Industry sector (ABS classification)	% workers employed full-time, CWFH				% workers employed part-time, CWFH			
	2006	2011	2016	2021	2006	2011	2016	2021
Forestry	83%	89%	87%	88%	17%	11%	13%	12%
Logging	86%	90%	94%	95%	14%	10%	6%	5%
Forestry Support Services	68%	65%	72%	76%	32%	35%	28%	24%
Wood product manufacturing	87%	87%	93%	89%	13%	13%	7%	11%
Pulp and paper manufacturing	75%	68%	82%	77%	25%	32%	18%	23%
Forest industry workforce	86%	86%	91%	89%	14%	14%	9%	11%
Employed labour force (all industries)	67%	67%	65%	64%	33%	33%	35%	36%

Source: ABS Census of Population and Housing, 2006, 2011, 2016, 2021, TableBuilderPro Place of Usual Residence database. Workers who were away from work or did not report their working details were excluded from the analysis. Reporting area includes the Local Government Areas within the Central West Forestry Hub.

This is consistent with findings from the businesses surveyed in the region, who were asked to report on the proportion of their workforce working full-time and part-time positions. The majority of jobs were full-time, comprising 95 per cent of workers employed in plantation growing and silviculture businesses; 99 per cent of harvest and haulage and transport contractors; 99 per cent of processing workers (Table 5-2). Overall, 99 per cent of industry workers had full-time jobs¹ and 1 per cent worked part-time.

¹ This includes a small number of workers who were subcontracted rather than directly employed: subcontractors typically worked full-time hours.

Table 5-2 Full-time and part-time work in the softwood plantation industry, CWFH, 2021-22

Supply Chain Stage	Full-time	Part-time
Grower & Silviculture	95%	5%
Harvest & Haul & Transport	99%	1%
Processing	99%	1%
Total	99%	1%

Source: 2021-22 Industry Survey

Working long hours can contribute to negative health and wellbeing outcomes for workers, as can working fewer hours than desired can also have negative impacts for workers. Census data were examined to identify whether forest industry workers were working high or low numbers of hours per week (although it was not possible to identify from Census data whether a worker was satisfied with the number of hours they were working).

A total of 19 per cent of workers across the entire workforce of CWFH worked more than 48 hours per week in 2021, compared to 30 per cent of workers in the forest industry (Table 5-3). Conversely only 11 per cent of the forest industry worked less than 25 hours per week, compared to 33 per cent of workers across the workforce as a whole. These proportions have remained fairly stable since the 2006 Census. This reflects not only the high proportion of people working full-time in the industry, but also long working hours in some parts of the industry, particularly in the forest logging sector. These long hours can act as a disincentive to workers and reduce retention of workers.

Table 5-3 Proportion of workforce employed full-time and part-time in the CWFH, 2006-2021

Industry sector (ABS classification)	% workers who worked < 25 hours in week prior to Census, CWFH				% workers who worked > 48 hours in week prior to Census, CWFH			
	2006	2011	2016	2021	2006	2011	2016	2021
Forestry	16%	20%	20%	15%	18%	17%	25%	34%
Logging	13%	10%	4%	6%	56%	63%	64%	68%
Forestry Support Services	26%	23%	10%	27%	23%	0%	24%	27%
Wood product manufacturing	10%	9%	8%	10%	24%	22%	19%	27%
Pulp and paper manufacturing	22%	28%	23%	25%	6%	25%	15%	13%
Forest industry workforce	12%	11%	9%	11%	25%	24%	25%	30%
Employed labour force (all industries)	26%	25%	26%	33%	19%	19%	17%	19%

Source: ABS Census of Population and Housing, 2006, 2011, 2016, 2021, TableBuilderPro Place of Usual Residence database. Workers who were away from work or did not report their working details were excluded from the analysis. Reporting area includes the Local Government Areas within the Central West Forestry Hub.

5.1.1. Income

According to ABS Census data, forest industry workers in the CWFH have consistently earned higher incomes than the workforce as a whole over the last decade (Table 5-4). In 2021 only 6 per cent of forest industry workers earned less than \$649 per week, compared to 21 per cent of the workforce as a whole in the CWFH, and 54 per cent earned \$1,250 or more per week, compared to 44 per cent of the overall employed labour force. This difference can be attributed to the higher rates of full-time work in the forest industry, resulting in overall higher income per worker on average. The proportion of full-time workers earning low and high income was therefore also compared (Table 5-5). While a slightly lower proportion of full-time forest industry workers in the CWFH (3 per cent) were earning less than \$649 per week in 2021 compared to 6 per cent of full-time workers across the broader workforce, there was no difference in full-time workers earning a higher income.

Table 5-4 Income earned by workers in CWFH, 2006-2021

Industry sector (ABS classification)	% all workers earning <\$600/\$649 per week, CWFH				% all workers earning > \$1299 or \$1250 per week, CWFH			
	2006 (\$600/ wk)	2011 (\$600/ wk)	2016 (\$649/ wk)	2021 (\$649/ wk)	2006 (\$1299/ wk)	2011 (\$1250/ wk)	2016 (\$1250/ wk)	2021 (\$1250/ wk)
Forestry	30%	10%	11%	5%	10%	37%	47%	72%
Logging	20%	9%	4%	8%	17%	40%	59%	70%
Forestry Support Services	67%	22%	7%	7%	13%	22%	56%	36%
Wood product manufacturing	30%	19%	9%	6%	13%	27%	34%	51%
Pulp and paper manufacturing	37%	20%	26%	0%	9%	23%	58%	53%
Forest industry workforce	30%	17%	9%	6%	13%	29%	40%	54%
Employed labour force (all industries)	45%	33%	29%	21%	15%	26%	33%	44%

Source: ABS Census of Population and Housing, 2006, 2011, 2016, 2021, TableBuilderPro Place of Usual Residence database. Workers who were away from work or did not report their working details were excluded from the analysis. Reporting area includes the Local Government Areas within the Central West Forestry Hub.

Table 5-5 Income earned by full-time workers in the CWFH, 2006-2021

Industry sector (ABS classification)	% all workers earning <\$600/\$649 per week, CWFH				% all workers earning > \$1299 or \$1250 per week, CWFH			
	2006 (\$600/ wk)	2011 (\$600/ wk)	2016 (\$649/ wk)	2021 (\$649/ wk)	2006 (\$1299/ wk)	2011 (\$1250/ wk)	2016 (\$1250/ wk)	2021 (\$1250/ wk)
Forestry	17%	4%	0%	5%	12%	41%	59%	71%
Logging	11%	10%	0%	0%	15%	38%	59%	73%
Forestry Support Services	30%	13%	0%	0%	30%	26%	67%	67%
Wood product manufacturing	25%	14%	8%	3%	14%	28%	38%	54%
Pulp and paper manufacturing	11%	0%	0%	0%	11%	37%	100%	64%
Forest industry workforce	23%	13%	6%	3%	14%	30%	44%	58%
Employed labour force (all industries)	29%	16%	12%	6%	21%	36%	45%	59%

Source: ABS Census of Population and Housing, 2006, 2011, 2016, 2021, TableBuilderPro Place of Usual Residence database. Workers who were away from work or did not report their working details were excluded from the analysis. Reporting area includes the Local Government Areas within the Central West Forestry Hub.

5.2. Workforce Diversity and Sustainability

This section explores whether the forest industry is recruiting workers from all parts of the labour force (using ABS Census data), and some of the challenges forest industry businesses within the CWFH have with recruiting workers (using data collected in 2021 by ForestWorks for the CWFH).

5.2.1. Gender

Relatively few women have traditionally been employed in Australia's forest industry (ABARES 2015). The results of a survey of forest industry businesses in the CWFH conducted by ForestWorks in 2021 suggests that women remain under-represented in the forest industry, with 14 per cent of workers across the industry in the CWFH being female. Only 8 per cent of harvest and haulage contractors were female, 15 per cent of those employed in wood and paper processing were female, and 21 per cent in the growing sector were female (Table 5-6).

Table 5-6 Workforce characteristics CWFH: gender

	Male workers	Female workers
Growers	79%	21%
Harvest and haulage contractors	92%	8%
Processors	85%	15%
Whole industry	86%	14%

Source: ForestWorks data collected in 2021 for CWFH

ABS Census data suggests that there has not been substantial change in the composition of male and female workers within the forest industry in the CWFH over time (Table 5-7). As of 2021, 49 per cent of the labour force in the CWFH was female, while in the forest industry female representation in the workforce remained at 17 per cent since 2016. The factors affecting female participation in the industry need to be better understood to enable the industry to more successfully recruit from the large proportion of the workforce that is female.

Table 5-7 Workforce by gender composition in the CWFH, 2006-2021

Industry sector (ABS classification)	% male, CWFH				% female, CWFH			
	2006	2011	2016	2021	2006	2011	2016	2021
Forestry	88%	86%	81%	83%	12%	14%	19%	17%
Logging	93%	86%	93%	84%	7%	14%	7%	16%
Forestry Support Services	72%	78%	76%	69%	28%	22%	24%	31%
Wood product manufacturing	82%	84%	84%	85%	18%	16%	16%	15%
Pulp and paper manufacturing	63%	67%	64%	65%	37%	33%	36%	35%
Forest industry workforce	82%	84%	83%	83%	18%	16%	17%	17%
Employed labour force (all industries)	54%	54%	52%	51%	46%	46%	48%	49%

Source: ABS Census of Population and Housing, 2006, 2011, 2016, 2021, TableBuilderPro Place of Usual Residence database. Workers who were away from work or did not report their working details were excluded from the analysis. Reporting area includes the Local Government Areas within the Central West Forestry Hub.

5.2.2. Age

Between 2006 and 2021, the forest industry workforce had a relatively similar age distribution to the rest of the workforce in the CWFH, with slightly fewer workers aged 55 and older prior to 2016 compared to the average for the workforce as a whole (17 per cent in 2011 compared to 23 per cent for the workforce as a whole, and 13 per cent compared to 19 per cent in 2006) (Table 5-8). By 2021, the forest industry had a similar proportion aged 55 and older (25 per cent compared to 26 per cent in the broader workforce). While the forest industry workforce appears to have aged at a more rapid rate than the region's workforce overall,

as of 2021 the forest industry workforce as a whole was not substantially older than was typical for the CWFH workforce overall. However, some sectors of the industry had a substantially higher proportion of workers over 55 compared to the workforce as a whole, in particular the logging sector with 34 per cent aged over 55 years. This is consistent with ForestWorks 2021 survey findings, where the harvest and haulage sector in particular had a higher proportion of workers aged over 45 years of age.

Table 5-8 Workforce by age in the CWFH, 2006-2021

Industry sector (ABS classification)	% aged < 35 years, CWFH				% aged 55 and older, CWFH			
	2006	2011	2016	2021	2006	2011	2016	2021
Forestry	39%	36%	21%	11%	22%	17%	26%	30%
Logging	41%	41%	29%	19%	10%	18%	25%	34%
Forestry Support Services	36%	22%	23%	28%	17%	33%	9%	28%
Wood product manufacturing	41%	33%	35%	37%	12%	15%	20%	23%
Pulp and paper manufacturing	16%	9%	0%	36%	12%	34%	32%	45%
Forest industry workforce	39%	33%	31%	33%	13%	17%	21%	25%
Employed labour force (all industries)	32%	31%	32%	34%	19%	23%	25%	26%

Source: ABS Census of Population and Housing, 2006, 2011, 2016, 2021, TableBuilderPro Place of Usual Residence database. Workers who were away from work or did not report their working details were excluded from the analysis. Reporting area includes the Local Government Areas within the Central West Forestry Hub.

5.2.3. Aboriginal and Torres Strait Islanders

Employment of Aboriginal and Torres Strait Islander peoples was similar in the forest industry to the overall workforce in the CWFH (Table 5-9), increasing from 2006 to 2016, but remaining at 4 per cent in 2021.

Table 5-9 Aboriginal and Torres Strait Islander participation in workforce in the CWFH, 2006-2021

Industry sector (ABS classification)	% workforce identifying as Aboriginal or Torres Strait Islander, CWFH			
	2006	2011	2016	2021
Forestry	0%	3%	0%	0%
Logging	0%	0%	0%	0%
Forestry Support Services	0%	0%	0%	10%
Wood product manufacturing	1%	2%	3%	5%
Pulp and paper manufacturing	5%	0%	5%	0%
Forest industry workforce	1%	2%	4%	4%
Employed labour force (all industries)	2%	2%	3%	4%

Source: ABS Census of Population and Housing, 2006, 2011, 2016, 2021, TableBuilderPro Place of Usual Residence database. Workers who were away from work or did not report their working details were excluded from the analysis. Reporting area includes the Local Government Areas within the Central West Forestry Hub.

5.2.4. Recruiting workers and contractors

In 2021, ForestWorks conducted interviews and surveys of forest industry businesses in the CWFH, focusing on recruitment and retention of workers, and skills and training needs. A total of 70 per cent of businesses interviewed reported that they had problems recruiting people with the right skills, particularly in technical trades (such as machinists, fitters, engineers etc), heavy machinery operators such as harvesting operators and truck drivers), forest scientists with skills in IT, and people with leadership skills.

When asked what factors made it difficult to recruit staff (Table 5-10), a lack of available workers with appropriate skills was the top issue identified by businesses, followed by the lack of applicants with appropriate skills and difficulties attracting workers to rural areas.

Table 5-10 Key challenges in recruiting workers into the forest industry

Key challenges	Number of businesses who selected this (businesses could select more than one)
People think that our wages/salaries too low	3
People don't want to work in our industry	3
Applicants have a poor attitude to work or work ethic	3
People think that our workplace is remote	4
People don't like our working conditions (e.g. shift work, seasonal work, hours of work)	5
Few applicants with the skills needed	6
Shortage of skilled and experienced people in the industry	9

Source: ForestWorks interview data 2021

5.3. Industry Skills and Training Needs

This section summarises the skills and training needs of the forest industry in the CWFH, based on data collected by ForestWorks in their 2021 survey and interviews of forest industry businesses in the region, and ABS Census data.

The forest industry requires a huge variety of skills, from growing strong seedlings for best fibre, through to mechanics and technicians needed at processing facilities. Specialised skills needed by the industry include scientists, heavy plant operators, mechanics, financial managers, managers, communications and IT staff. These skills evolve over time as the technologies used in the industry evolve. In 2021, ForestWorks identified the ways in which businesses filled their skills gaps. The most common way forest industry businesses in the CWFH filled skills gaps was by recruiting experienced workers from other industries, followed by building the skills of existing workers with both accredited and non-accredited training, recruiting school leavers and outsourcing to other businesses.

Businesses were asked the reasons for supporting non-accredited training of existing staff, as this was a common way to fill skills gaps for many businesses. The most common reasons were:

- To meet specific training needs
- To maintain a flexible and responsive workforce
- Career development
- Legislative, regulatory or licencing requirements
- To improve the quality of products or services
- To remain competitive
- To use new technology

Businesses were also asked what skill level was required for each type of occupation (Table 5-11). Businesses most commonly reported needing university degrees for positions such as managers, professionals and sales workers, and certificate level skills for positions such as managers, admin staff, technicians and trade workers, and professionals. Year 10 and above was most commonly needed for machine operators and drivers, technicians and trade workers, admin staff and labourers, while year 9 was a minimum for labourers, sales workers, machine operators and drivers.

Table 5-11 Skills and accreditation needs reported by softwood plantation businesses in the CWFH^a

	Number of businesses that require this skill level			
	University degree	Cert II, III or IV	Year 10 and above	Year 9 and below
Manager	4	7	0	1
Professionals	6	3	0	1
Technicians and trade workers	0	4	5	1
Admin staff	0	5	4	2
Sales staff	1	1	1	3
Machinery operators and drivers	0	1	6	2
Labourers	0	0	3	4

^a Skills and accreditation needs reported by softwood plantation businesses in the CWFH.

Source: ForestWorks survey of forest industry businesses, 2021

Formal qualifications don't always reflect the skills of a workforce, especially where skills have been learned on the job. But formal qualification can provide employers with an idea of the extent to which workers have skills that are formally recognised and are able to be transferred between workplaces and even industries.

As of 2021, forest industry workers in most parts of the industry were less likely to have completed high school than those working in other industries (Table 5-12), although high school attainment rates grew at a similar rate in the forest industry as the overall workforce between 2006 and 2021. However, forest industry workers were slightly more likely to have completed a certificate qualification than those in other parts of the workforce. Completion of a bachelor's degree or other university qualification was higher than the average for those employed in forest growing/management and forestry support services, but lower than average in all other parts of the industry.

Table 5-12 Formal education attainment: rates of attainment of high school and post-school qualifications, 2006 to 2021

Industry sector (ABS classification)	% aged < 35 years				% aged 55 and older				% with Certificate qualification				% with Bachelor or postgraduate degree			
	2006	2011	2016	2021	2006	2011	2016	2021	2006	2011	2016	2021	2006	2011	2016	2021
Forestry	20%	37%	51%	51%	56%	48%	42%	37%	29%	31%	34%	33%	15%	21%	25%	30%
Logging	18%	20%	21%	24%	64%	54%	53%	48%	36%	42%	47%	52%	0%	4%	0%	0%
Forestry Support Services	53%	30%	60%	51%	30%	48%	35%	31%	60%	35%	21%	46%	10%	17%	44%	23%
Wood product manufacturing	30%	29%	38%	41%	52%	53%	47%	44%	43%	45%	48%	47%	5%	2%	5%	9%
Pulp and paper manufacturing	38%	44%	47%	50%	40%	35%	35%	46%	55%	49%	65%	54%	6%	16%	0%	0%
Forest industry workforce	29%	33%	39%	41%	52%	47%	47%	43%	42%	45%	46%	46%	6%	8%	8%	11%
Employed labour force (all industries)	42%	47%	52%	56%	46%	40%	40%	35%	38%	40%	36%	43%	16%	18%	24%	23%

Source: ABS Census of Population and Housing, 2006, 2011, 2016, 2021, TableBuilderPro Place of Usual Residence database. Workers who were away from work or did not report their working details were excluded from the analysis.

6. BUSINESS AND MARKET OUTLOOK

In the 2021-22 Industry Survey, businesses were asked about the business and market conditions and challenges they were experiencing, and the extent to which they could cope with difficult business conditions. These questions help identify both areas of strength and areas of challenge being experienced by the industry.

6.1. Overall Business Conditions

Businesses were asked ‘how would you describe business conditions for your business at the moment?’ in the 2021-22 Industry Survey. Overall, 14 per cent of businesses reported that conditions were ‘easier than usual’; 57 per cent reported they were ‘more challenging than usual’ and 29 per cent reported that they were ‘about the same as usual’.

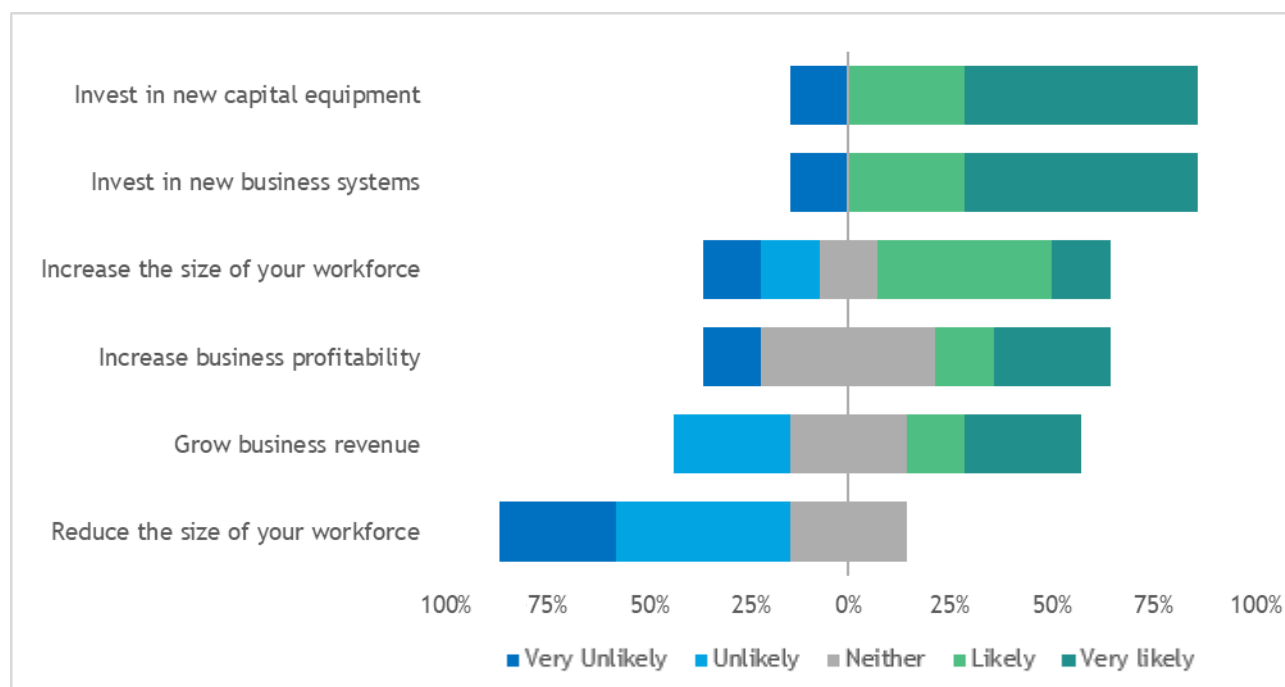
Comparatively, in the 2015-16 Industry Survey of the South West Slopes and Central Tablelands, no business reported that conditions were ‘easier than usual’; 54 per cent reported they were ‘more challenging than usual’ and 46 per cent that they were ‘about the same as usual’ (Schirmer et al. 2018). This includes business located in the South West Slopes, who were excluded from this study.

6.2. Future Business Expectations

Businesses who were surveyed indicated that they were likely to invest in new capital equipment (86 per cent) and business systems (86 per cent) over the next 12 months, with the possibility of expanding their workforce (57 per cent). No business surveyed is considering scaling down their workforce (Figure 6-1). Investing in new capital equipment and business systems were the most likely to occur when the same questions were asked of South West Slopes and Central Tablelands businesses in 2015-16. The largest difference between the two surveys is those considering increasing the size of their workforce, with only 11 per cent in of respondents to the South West Slopes and Central Tablelands 2015-16 survey indicating it was likely (Schirmer et al. 2018).

Despite the indication of growth in business activity, businesses were divided when asked about their thoughts on the demand for their products and services, 29 per cent of businesses felt demand would fall over the next 12 months, 29 per cent thought it would grow, and 43 per cent thought demand would remain the same. This is similar to results seen from the South West Slopes and Central Tablelands 2015-16 survey, with 26 per cent feeling that demand would grow, 61 percent felt it would stay the same and only 13 per cent thought it would fall (Schirmer et al. 2018). In the CWFH region, businesses felt that an improved economic environment and strengthening in the housing market, along with reducing barriers for investment and operations (such as reduced land costs) would foster further investment and growth of the industry.

Figure 6-1 Business activity outlook for the next 12 months, 2021-22



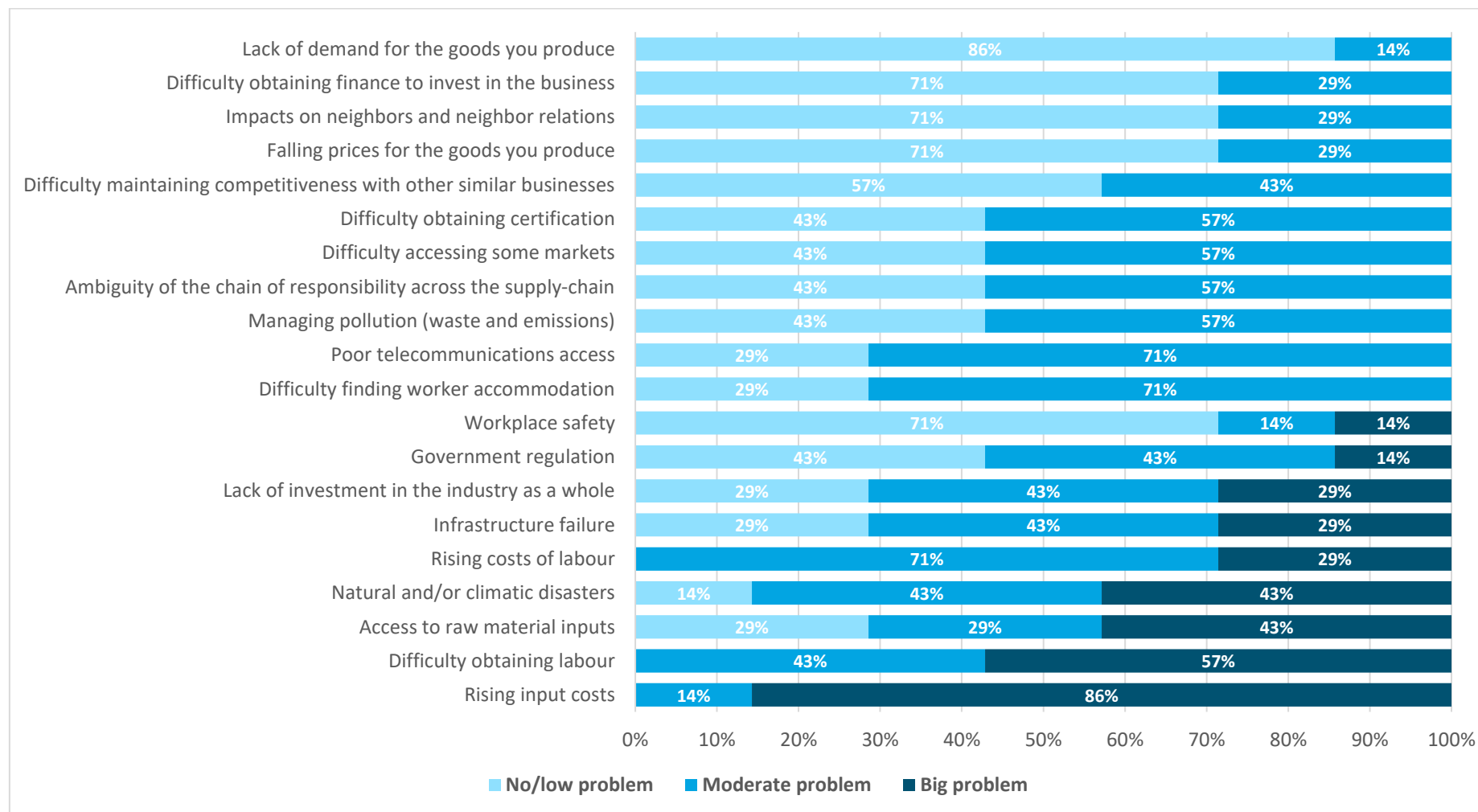
Source: 2021-22 Industry Survey

6.3. Business Challenges

Some of the largest challenges that surveyed businesses had encountered over the past three years were a rise in input costs, as well as obtaining labour to fill the jobs needed to meet current demand. Climate and natural disasters, and access to raw material inputs, were also a concern to some degree for most businesses. These businesses indicated that demand for products and services is generally not a challenge, neither is obtaining finance for reinvestment, falling prices, or the impact on neighbours and neighbour relations. Detailed results on potential business challenges are presented in Figure 6-2.

Interestingly, in the 2015-16 Industry Survey of the South West Slopes and Central Tablelands, the same two key challenges were reported, those being rising input costs and difficultly obtaining labour (Schirmer et al. 2018).

Figure 6-2 Challenges experienced by softwood plantation businesses in the CWFH region, 2021-22



Source: 2021-22 Industry Survey

7. COMMUNITY PERCEPTIONS OF THE SOCIAL, ECONOMIC, SERVICE AND INFRASTRUCTURE EFFECTS OF THE FOREST INDUSTRY

Residents living in communities within the CWFH as well as across Australia were asked questions about the quality of life and liveability of their community, and the extent to which they felt the different industries that operated in their region affected different social and economic aspects of their lives. Understanding community perceptions about community liveability and the industries that operate in their region help to further evaluate the socio-economic effects of the forest industry in the CWFH as well as the sustainability of the forest industry overall.

These questions were asked as part of the 2022-23 Regional Wellbeing Survey, a large-scale nationwide survey of 16,000 people living in rural and regional areas of Australia (University of Canberra 2023). More information about the methods used can be found in Appendix 1, and more information about the Regional Wellbeing Survey, including past report and public data tables, can be found at www.regionalwellbeing.org.au.

7.1. Quality of Life and Liveability

While the forest industry does not directly influence most factors that contribute to a community's liveability, it is important to understand community perceptions about liveability because for an industry to be sustainable it must rely on its workers being able to live in communities that provide a good quality of life. Monitoring community perceptions about quality of life helps identify where the industry may need to work with other community stakeholders to address key issues that are negatively affecting liveability, or to improve liveability overall.

Quality of life and liveability of local regions was examined by analysing responses to survey questions which asked residents living in rural and regional areas how they viewed the overall liveability, economy, roads, friendliness, safety, landscape and environmental health of their local community.

The experiences from the following groups were compared to evaluate whether people living in the CWFH, and specifically Oberon LGA, were more or less likely to feel that their community was a good place to live compared to broader regional NSW:

- Regional NSW residents - the views of those living in rural and regional areas (defined as all areas outside Sydney): a total of 4,379 people from NSW participated in the survey
- CWFH residents - including those from the LGAs of Bathurst Regional, Blayney, Cabonne, Cowra, Goulburn Mulwaree, Lithgow, Mid-Western Regional, Oberon, Orange, Upper Lachlan Shire and Wingecarribee: a total of 823 residents living in this regions participated in the survey
- Those living in the Oberon LGA (High forest industry dependence): a total of 107 residents living in this region participated in the survey
- Those living in the rest of the CWFH, excluding Oberon LGA (lower forest industry dependence): a total of 716 residents living in this region participated in the survey

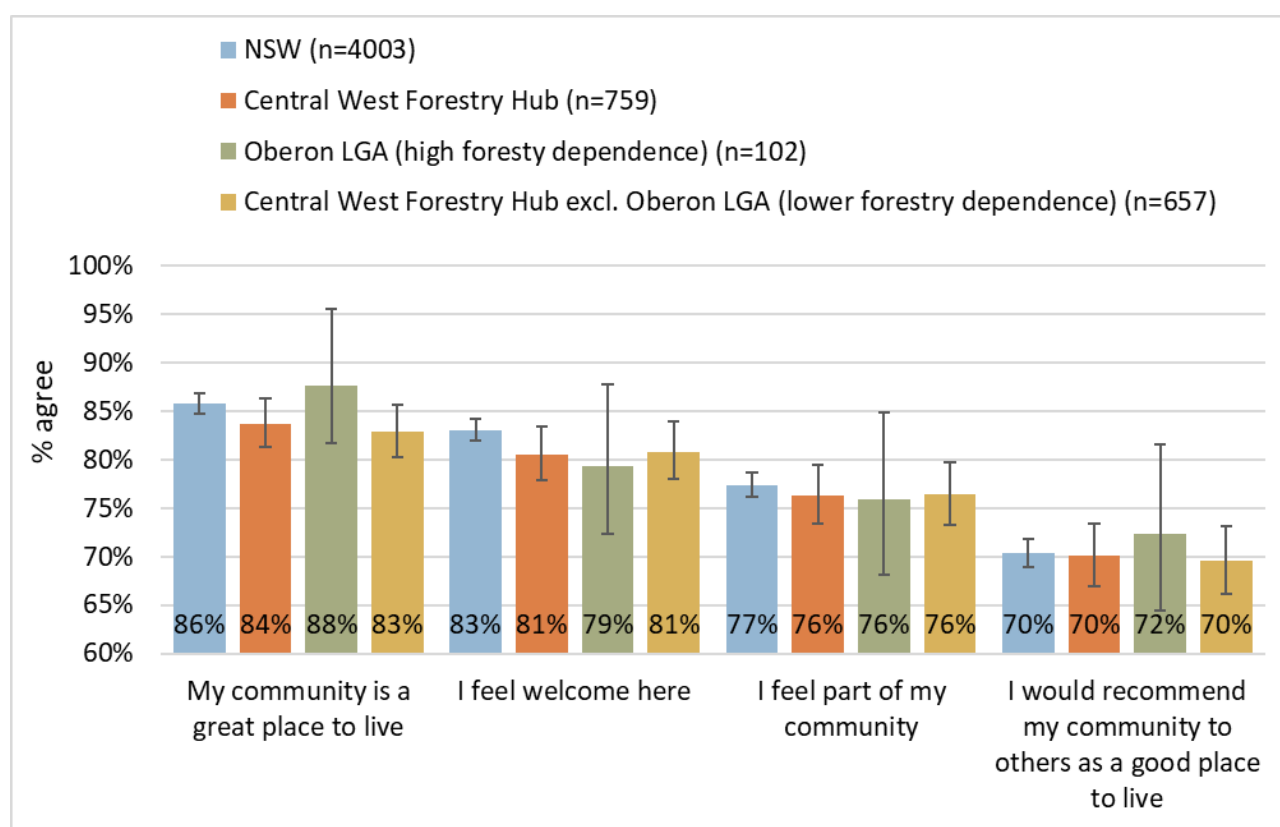
Not all participants answered every question asked in the survey, so the total 'n' reported for each question differs.

Comparing the different regions gives a useful indication of whether residents of forest industry dependent communities report substantially different experiences of liveability compared to those in other communities. However, where there are differences they may be driven by a range of factors, only one of which is the presence of the forest industry.

Survey participants were asked whether they agreed or disagreed with several questions about the liveability of their community, on a scale from 1 'strongly disagree' to 7 'strongly agree'. Participants could also select 'don't know', however only a small proportion of respondents selected this option. Overall, people living in the CWFH region were satisfied with the liveability of their community, with little difference between regional NSW residents, CWFH residents, communities with high dependence on the forest industry (Oberon LGA) and lower dependence on the forest industry within the CWFH (Figure 7-1).

A large majority of CWFH residents felt that their community was a great place to live (84 per cent), felt welcome in their community (81 per cent) and felt part of their community (76 per cent), but only 70 per cent would recommend their community as a good place to live, with no significant differences in responses from regional NSW residents as a whole or communities with high forest industry dependence in the CWFH (Figure 7-1).

Figure 7-1 Perceptions about overall liveability and sense of belonging in the local region



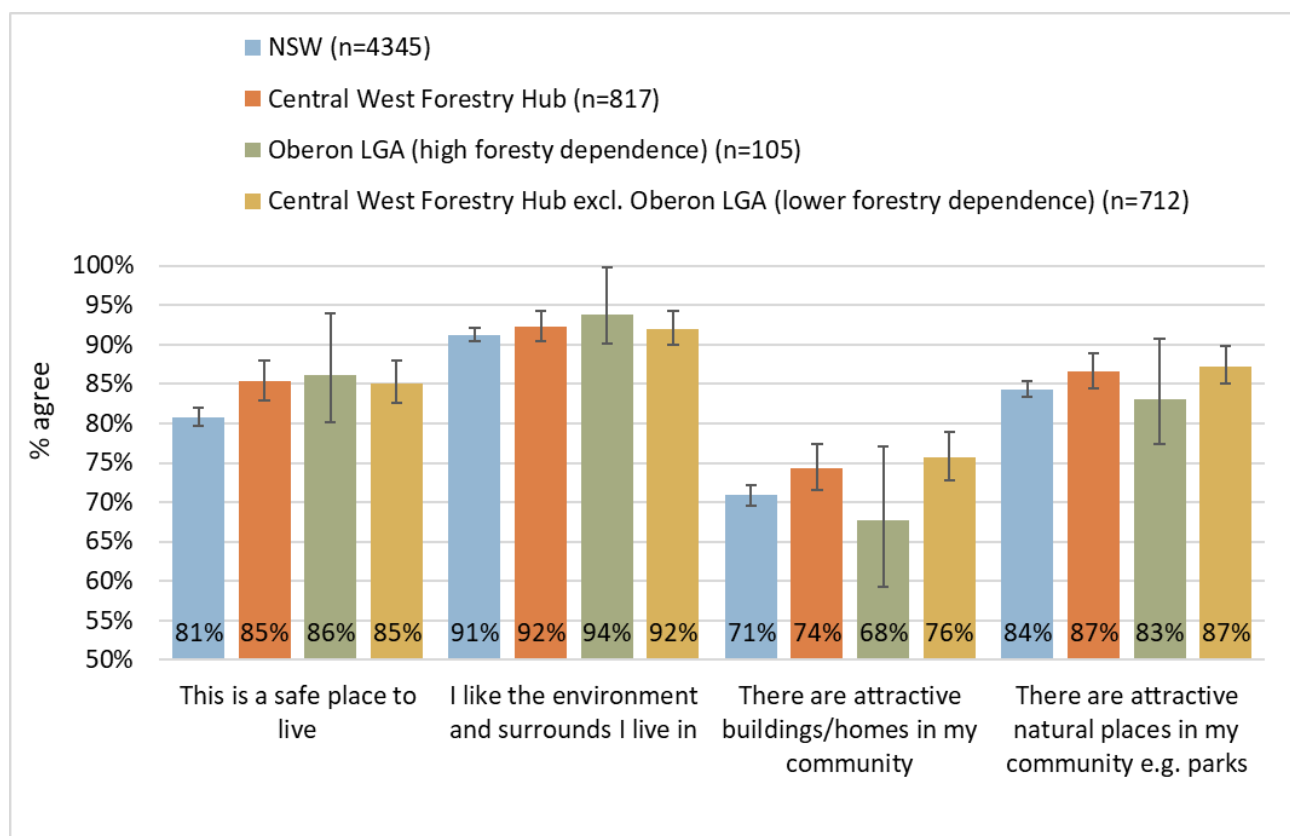
Source: 2022-23 Regional Wellbeing Survey

When asked about community safety, the surrounding environment and landscape amenity (Figure 7-2):

- CWFH residents were significantly more likely to feel that their community is a safe place to live (85 per cent) compared to regional NSW residents as a whole (81 per cent).

- A total of 92 per cent of CWFH residents and residents in communities with lower forest industry dependence, and 94 per cent residents in communities with high dependence on the forest industry in the CWFH indicated they liked the environment and surrounds they live in, similar to the 91 per cent of regional NSW residents who felt this way.
- A large majority of regional NSW (84 per cent) and CWFH residents (87 per cent), including both highly forest industry dependent communities (83 per cent) and lower forest industry dependent communities (87 per cent), felt that there were attractive natural places in their community.
- A lower proportion overall felt that there were attractive buildings/homes in their community, with 74 per cent of CWFH residents indicating this was the case, and slightly (but not significantly) less from communities with high dependence on the forest industry (68 per cent) indicating the buildings in their community had high amenity.

Figure 7-2 Perceptions about safety and attractiveness of the local region



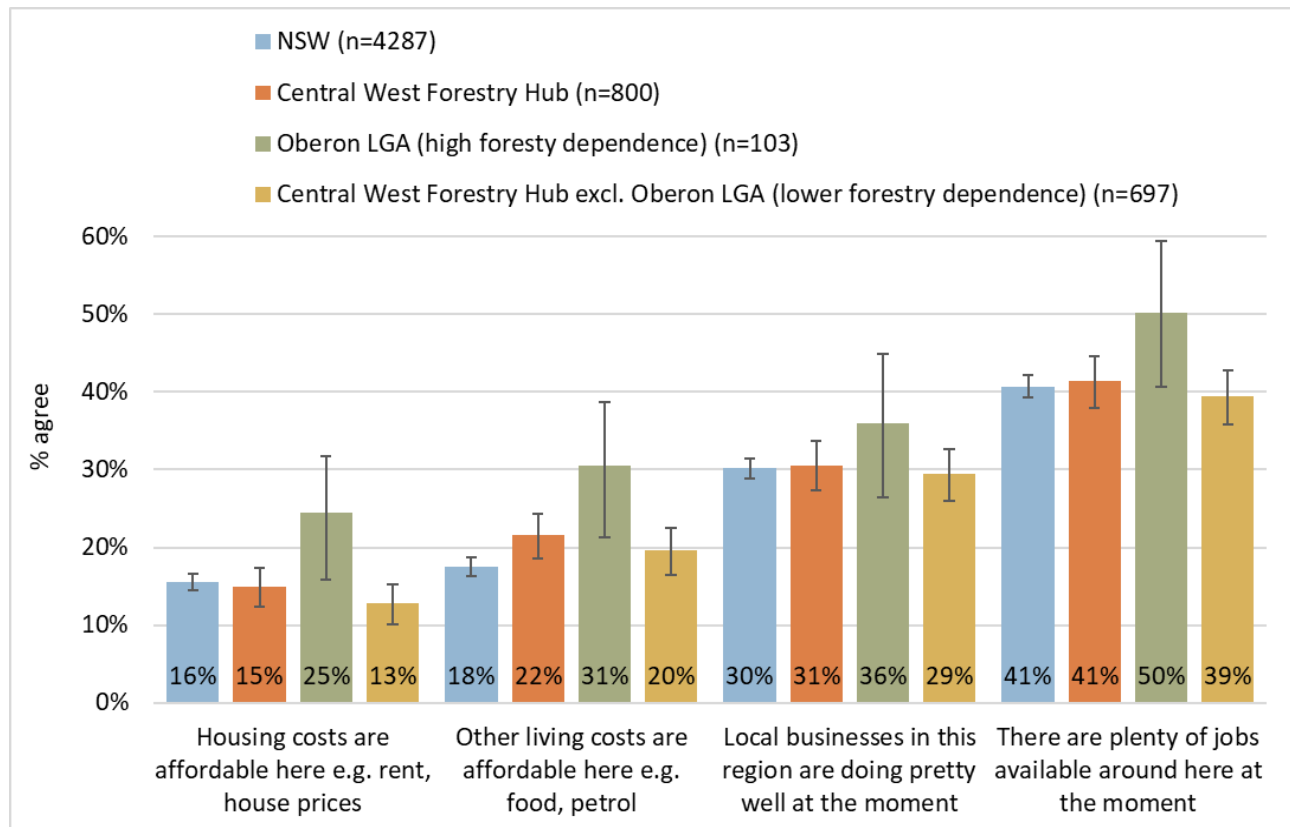
Source: 2022-23 Regional Wellbeing Survey

Residents living in communities with high dependence on the forest industry within CWFH were (Figure 7-3):

- Significantly more likely to indicate that housing costs were affordable in their community (25 per cent) compared to residents in lower forest industry dependent communities within CWFH (13 per cent)
- Significantly more likely to feel that other living costs were affordable (31 per cent) compared to regional NSW residents as a whole (18 per cent).

- Slightly more likely to feel that local businesses in their region were doing well (36 per cent) and there were plenty of jobs in the region (50 per cent) compared to regional NSW, CWFH as a whole and lower forest industry dependent communities in the CWFH, however this difference was not significant.

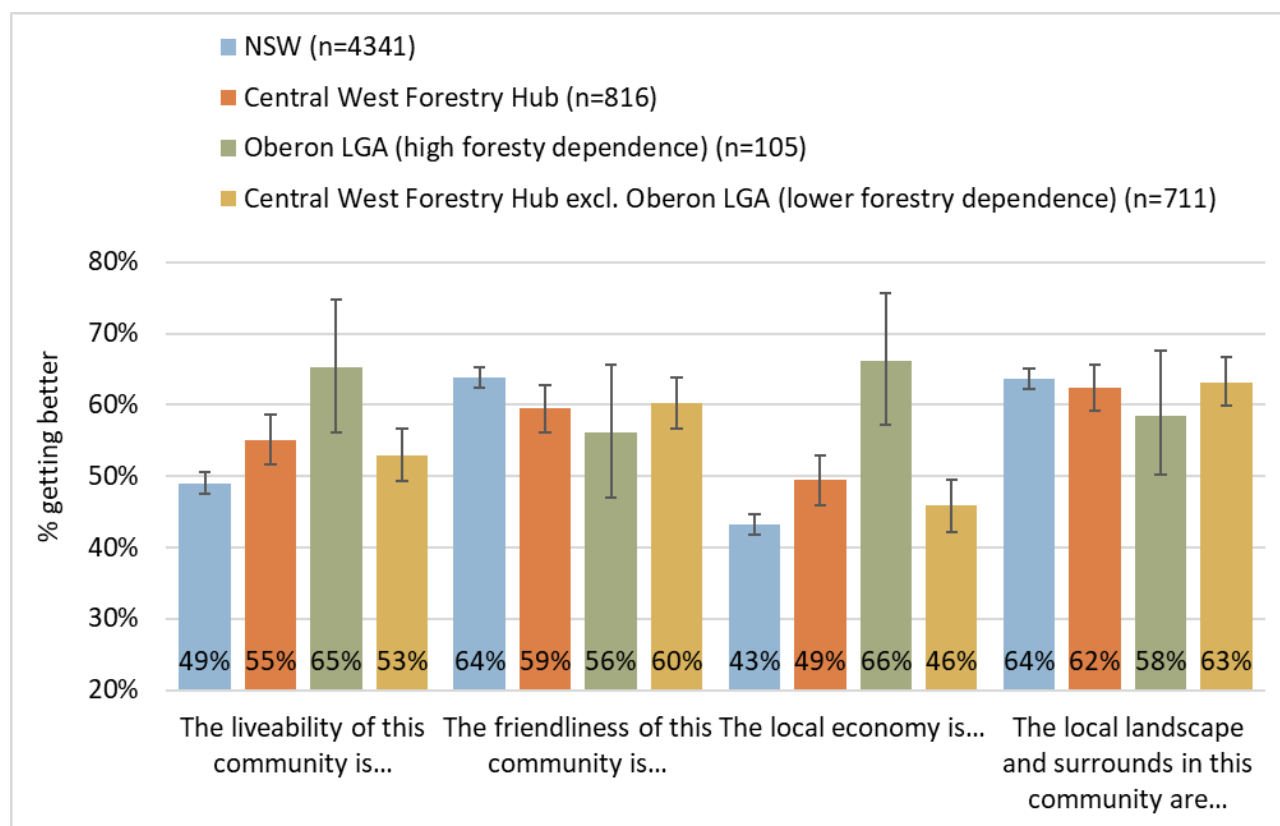
Figure 7-3 Perceptions about local economy and living costs



Source: 2022-23 Regional Wellbeing Survey

Survey participants were also asked whether the local liveability, friendliness of, economy and landscape in their local region was getting better or worse, from 1 'getting worse' to 7 'getting better'. They were also given a 'don't know' option. Residents within the CWFH (55 per cent), in particular from communities highly dependent on the forest industry (65 per cent), were significantly more likely to feel their community liveability was getting better compared to regional NSW overall (49 per cent), and that their local economy was getting better, with 66 per cent of residents in communities highly dependent on the forest industry within the CWFH, and 49 per cent of CWFH residents as a whole indicating this compared to 43 per cent of regional NSW residents (Figure 7-4). CWFH residents (59 per cent) were, however, less likely than regional NSW residents (64 per cent) to feel that the friendliness of their community was getting better.

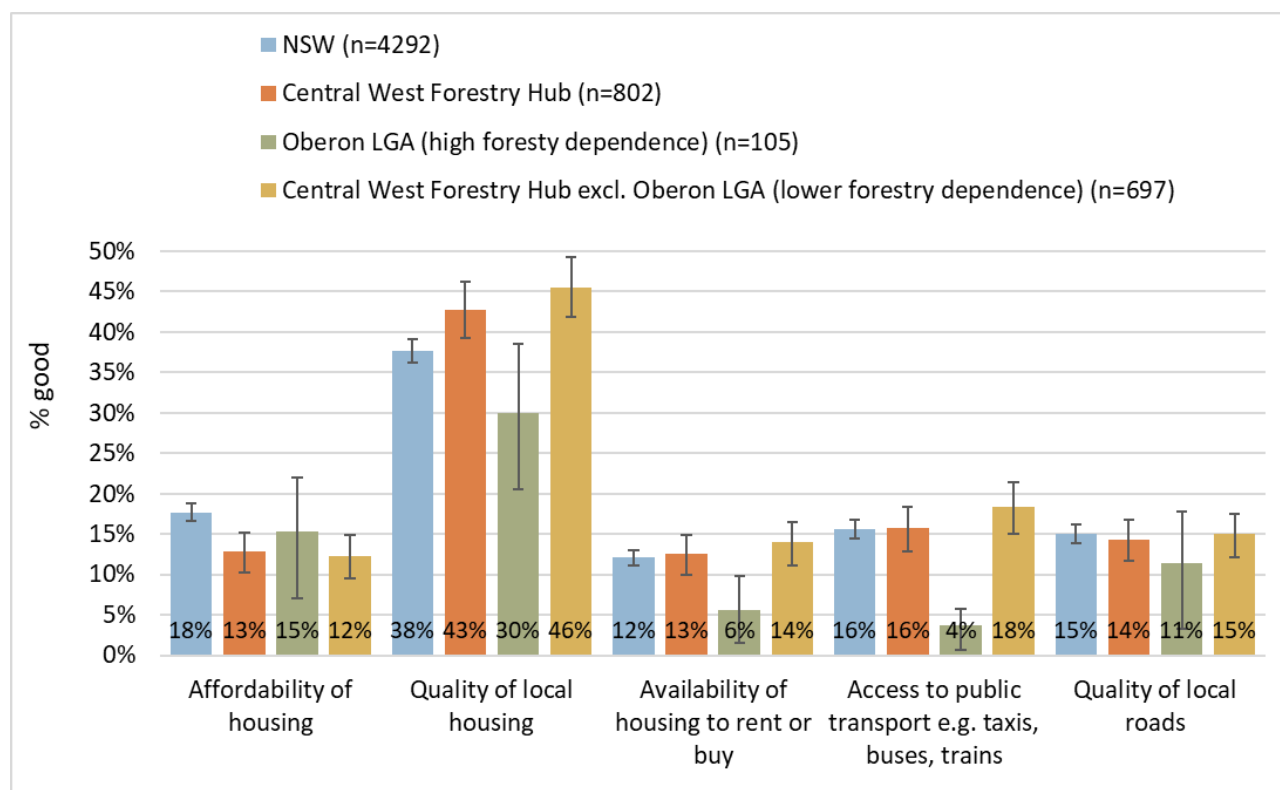
Figure 7-4 Perceptions about changes in liveability of the local region



Source: 2022-23 Regional Wellbeing Survey

Survey respondents were then asked about how good their access to different services and infrastructures was in their region, on a scale from 1 'very poor' to 7 'very good'. A 'don't know' option was also provided. Residents in the CWFH (13 per cent), particularly those in areas of lower forest industry dependence (12 per cent), were significantly less likely to feel that they had access to affordable housing compared to regional NSW as a whole (18 per cent), and residents in communities with high forest industry dependence (6 per cent) were significantly less likely to indicate there was sufficient availability of houses to rent or buy compared to regional NSW as a whole (12 per cent), CWFH as a whole (13 per cent) or lower forest industry dependent communities within the CWFH (14 per cent) (Figure 7-5). Communities with high forest industry dependence (30 per cent) were also significantly less likely to feel they had access to quality local housing compared to the CWFH as a whole (43 per cent) and communities with lower dependence on the forest industry in the CWFH (46 per cent). Residents of regional NSW and CWFH as a whole were also four times more likely to indicate they had good access to public transport (16 per cent) compared to communities with high dependence on the forest industry in CWFH (4 per cent). There were no significant differences in perceptions about the quality of local roads within the different regions reported, with 15 per cent or less across all regions reporting that the quality of roads was good.

Figure 7-5 Access to affordable housing, transport and good quality roads

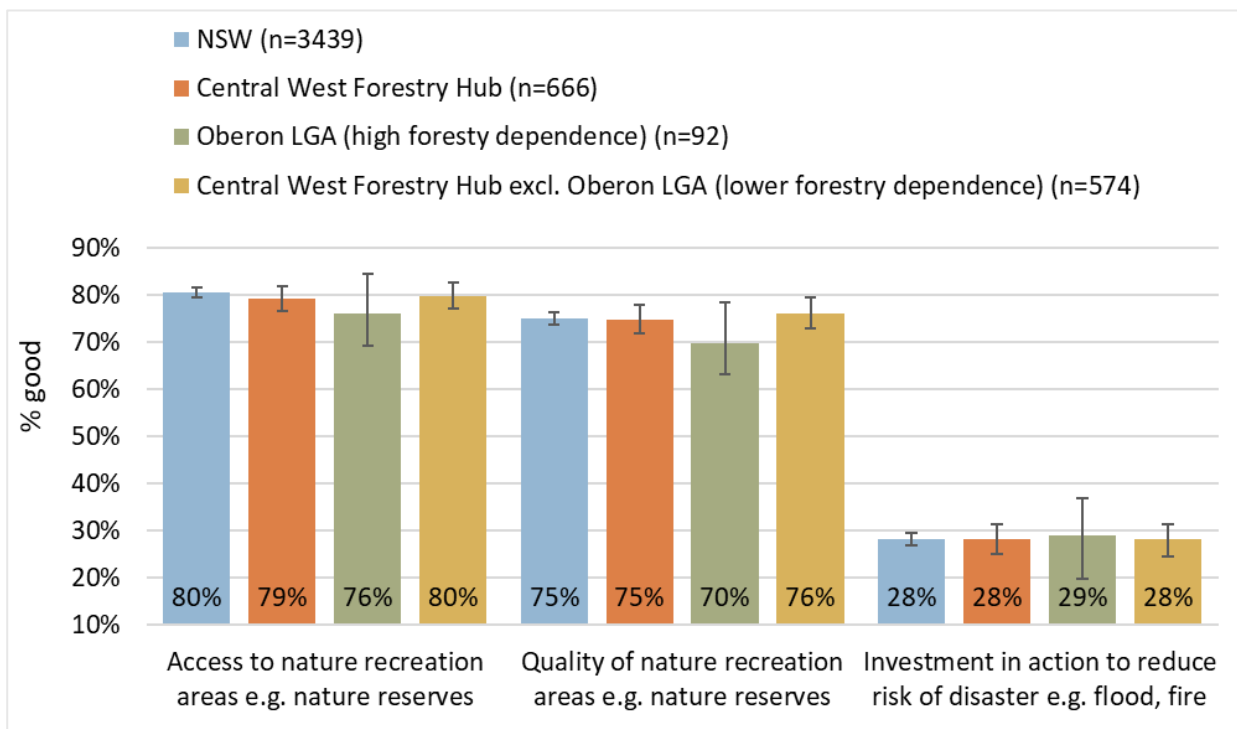


Source: 2022-23 Regional Wellbeing Survey

When access to and quality of local nature recreation areas were asked about (Figure 7-6), those living in more and less forest industry dependent communities had similar (and positive) perceptions of their local landscape to residents of regional NSW and CWFH as a whole, with more than 75 per cent indicating that access to nature recreation areas was good, and 70 per cent or more indicating that the quality of nature reserves was good in their local region. There were no significant differences between regional NSW, CWFH and high or low forest industry dependent communities in the CWFH (less than 30 per cent in all regions) in perceptions about the level of investment taken to reduce risk of disasters.

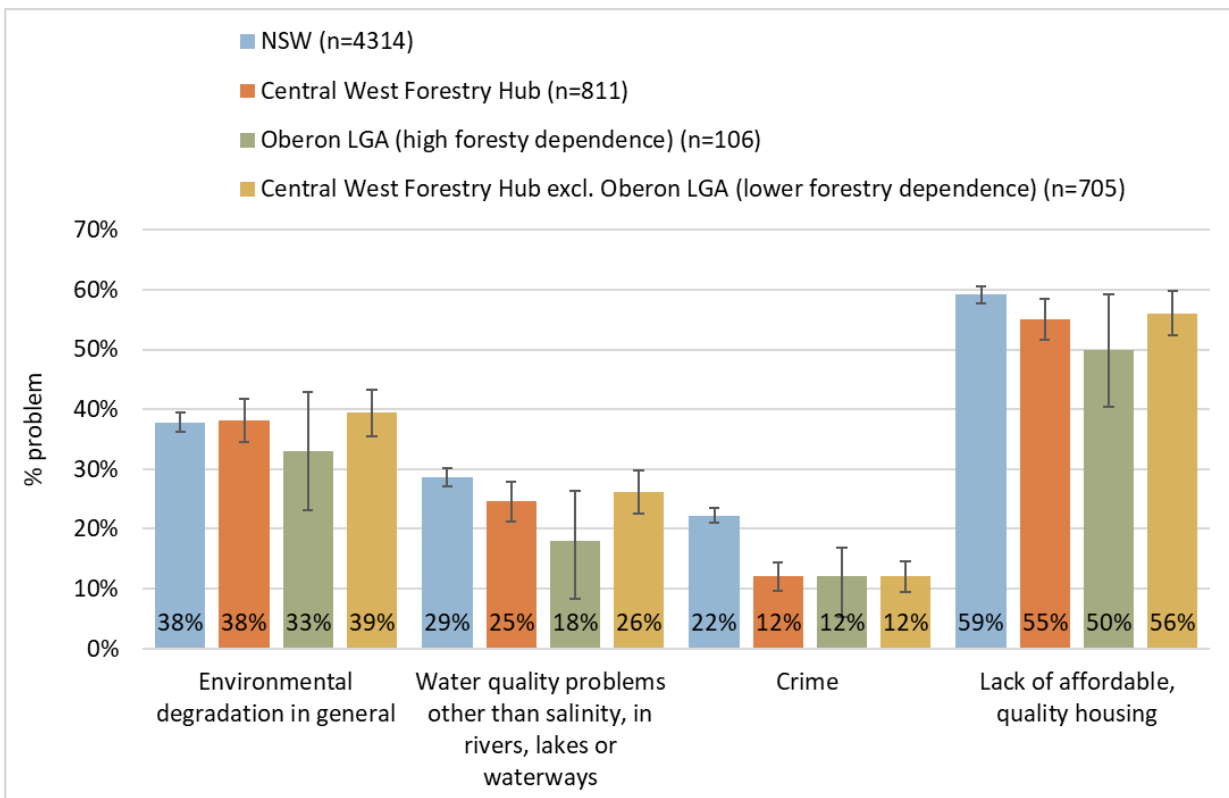
Survey respondents were also asked about problems in their region, including environmental problems, crime and lack of affordable quality housing on a scale from 1 'not a problem' to 7 'very big problem' (Figure 7-7). Those living in communities highly dependent on the forest industry in the CWFH (18 per cent) were significantly less likely to feel that there were problems with water quality in the region compared to regional NSW as a whole (29 per cent), but just as likely as other regions to feel environmental degradation was a problem (33 per cent or more). A significantly lower proportion of residents within the CWFH (12 per cent), including those in communities with high forest industry dependence (12 per cent) and low forest industry dependence (12 per cent) felt that crime was a problem, compared to 22 per cent of regional NSW residents as a whole. CWFH residents (55 per cent) were also less likely to indicate that affordable quality housing was a problem in the region compared to regional NSW as a whole (59 per cent).

Figure 7-6 Quality nature areas and action to reduce risk



Source: 2022-23 Regional Wellbeing Survey

Figure 7-7 Perceptions about community problems

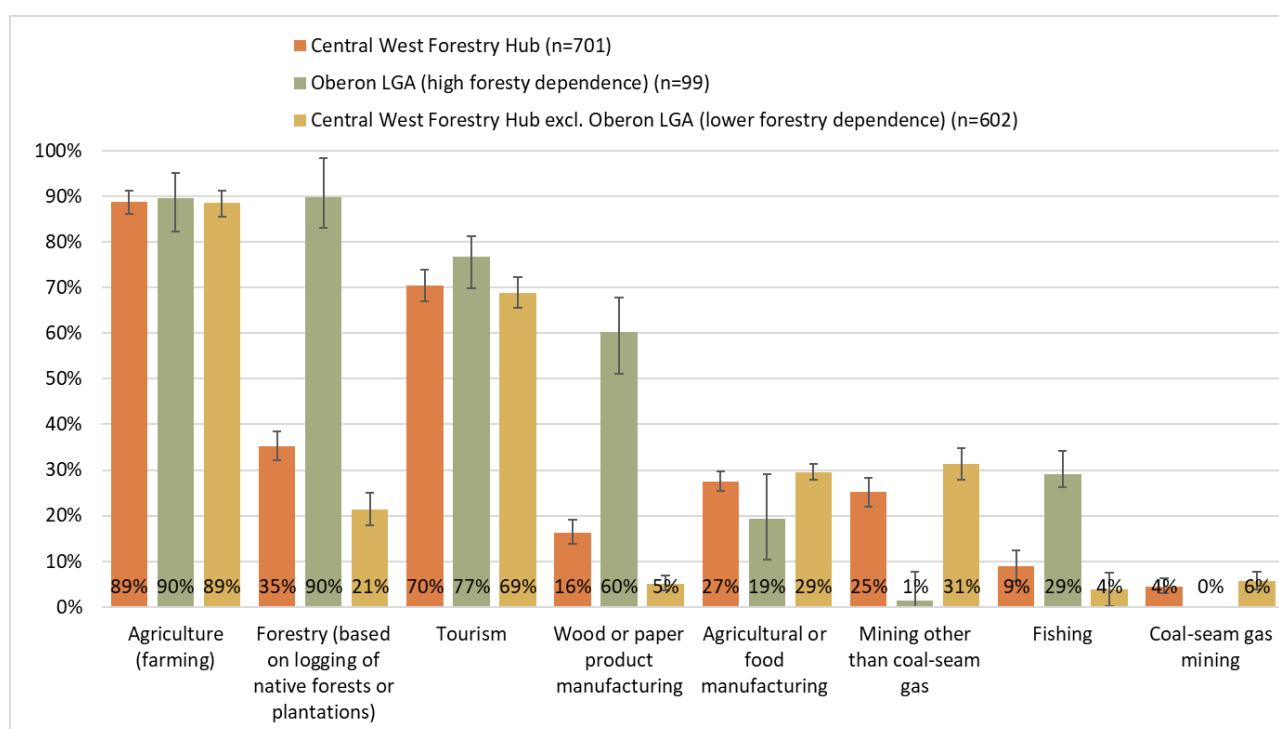


Source: 2022-23 Regional Wellbeing Survey

7.2. Perceptions of Regional Industries

After asking survey participants about the liveability of their communities, they were asked about their perceptions about important industries in their region, and then their views about how different local industries contribute to that liveability. A large majority of residents living in communities with high forest industry dependence within the CWFH (90 per cent) indicated that forestry was an important industry in their region, identical to agriculture (farming) (Figure 7-8). Less (77 per cent) indicated that tourism was important in the region, followed by wood or paper product manufacturing (60 per cent). A significantly lower proportion of residents in CWFH overall (35 per cent) and in communities with low forest industry dependence (21 per cent) felt that forestry was an important industry, and less than 20 per cent felt that wood or paper product manufacturing was important outside of highly forest industry dependent communities.

Figure 7-8 Proportion of residents who views the forest industry as an ‘important industry’ in their local community



Source: 2022-23 Regional Wellbeing Survey

Survey participants were then asked to choose one industry to answer additional questions about whether they felt the industry had a negative impact, positive impact, or no impact, on the following in their local community:

- Local employment
- Cost of living (food, rent)
- Friendliness of the local community
- Health of local residents
- Traffic on local roads

- Quality of local roads
- Attractiveness of the local landscape
- Local water quality
- Health of local environment
- Bushfire risk
- Land prices
- Climate change related risk

When asked to assess this for the forest industry, survey participants were asked to assess forestry, wood and paper manufacturing together.

In the CWFH, with the exception of impacts on local employment, residents were significantly less likely to feel the forest industry had a positive impact on the liveability of their community compared to agriculture, and in most cases also tourism (Figure 7-9). For some aspects of community liveability, they were also significantly more likely to feel that the forest industry had a negative impact. This was particularly the case for impacts on the health of local residents, the quality of local roads, the attractiveness of the local landscape and bushfire risk.

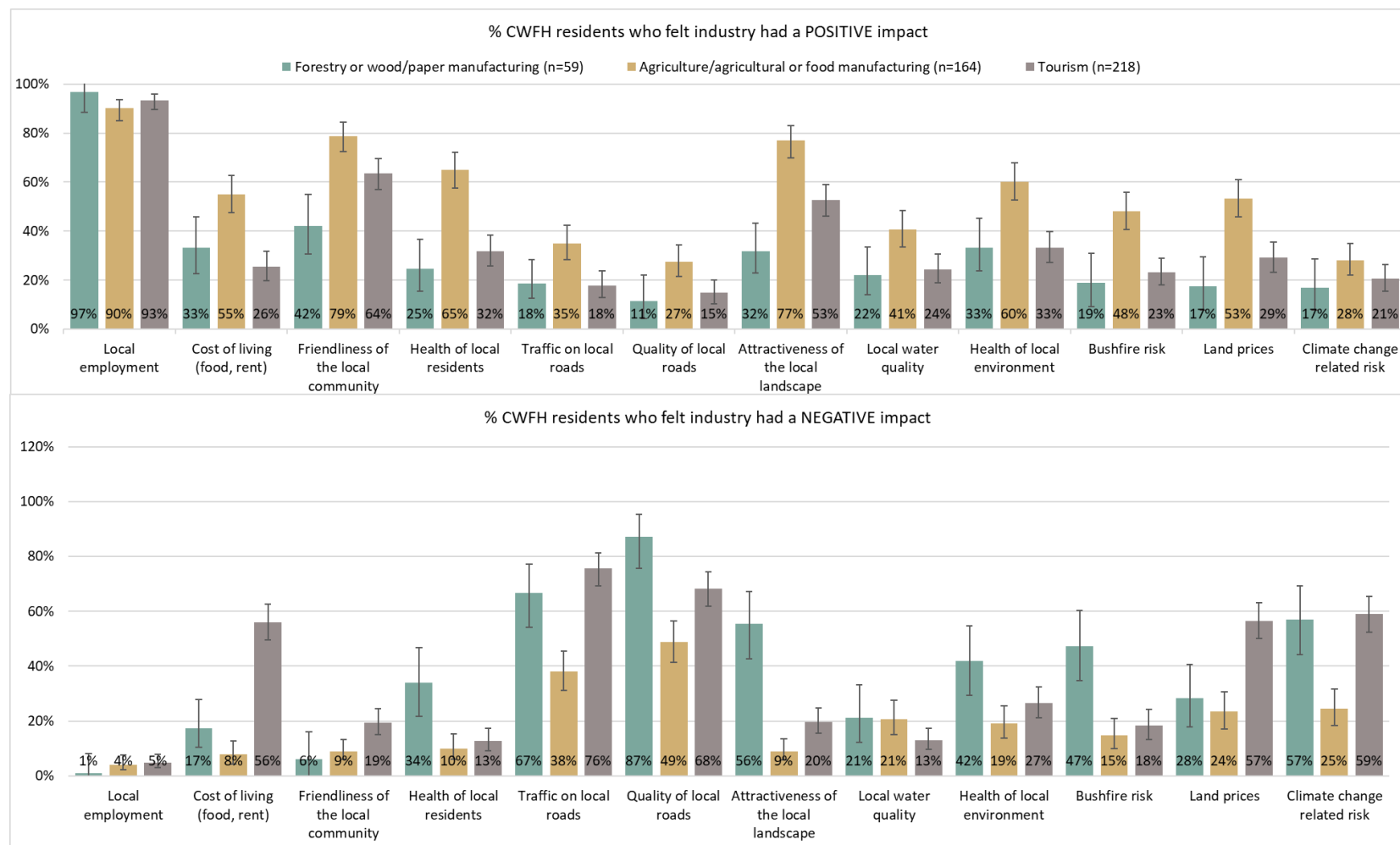
A large majority of residents (97 per cent) felt the industry had positive impacts on local employment, while 42 per cent felt it had a positive effect on friendliness of their local community, and 33 per cent felt it had a positive impact on the cost of living. The most common concern was related to road impacts, with 87 per cent believing the industry had a negative impact on the quality of local roads, and 67 per cent that it had a negative impact on local traffic. Over half (57 per cent) felt that the industry had a negative impact on climate change related risk, and 47 per cent felt the industry had a negative effect on bushfire risk.

When examining communities with high dependence on the forest industry (Oberon LGA) (Figure 7-10) the results are similar, but with much larger confidence intervals and therefore less significant results due to the small proportion of residents who chose to answer questions about agriculture and tourism. Caution is therefore needed in interpreting these findings. Oberon LGA residents were:

- Significantly less likely to feel that the forest industry had a positive impact on the health of local residents (25 per cent), attractiveness of the local landscape (32 per cent), bushfire risk (17 per cent), land prices (17 per cent) and climate change related risk (17 per cent) compared to agriculture (all above 60 per cent).
- Significantly more likely to feel the industry had negative impacts on bushfire risk (49 per cent) and climate change related risk (58 per cent) compared to agriculture (1 per cent and 13 per cent respectively).
- More likely to feel tourism had more negative impacts and less positive impacts than agriculture, however these differences were generally not significant.

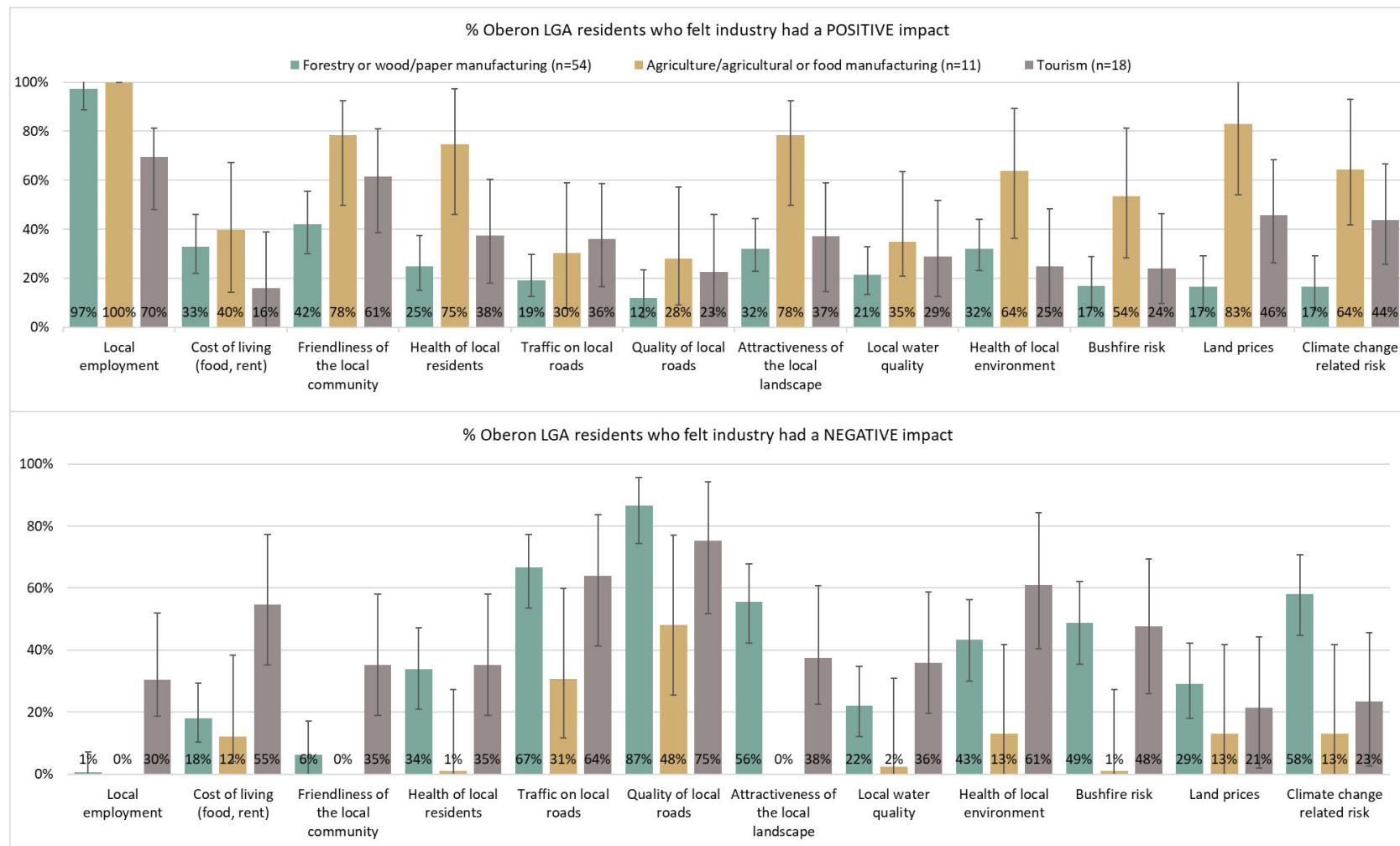
The results suggest that the forest industry is not viewed as either being as important an industry as agriculture and tourism in the broader CWFH region, or as having positive outcomes for many aspects of community life other than employment. While these perceptions are not always reflecting reality, for example impacts on human health, these perceptions are important to understand because they reflect how residents experience an industry. Working to address concerns about traffic risk, road quality, bushfire risk, climate change related risk, landscape aesthetics and environmental health can help address the less positive perception of the forest industry compared to agriculture and tourism in the region.

Figure 7-9 Proportion of CWFH residents who felt the forestry, farming and tourism industries had a positive and negative impact on different aspects of their local community



Source: 2022-23 Regional Wellbeing Survey

Figure 7-10 Proportion of Oberon residents who felt the forestry, farming and tourism industries had a positive and negative impact on different aspects of their local community



Source: 2022-23 Regional Wellbeing Survey

8. OBERON LGA CASE STUDY

8.1. Overview of the Industry

Located in the alpine region between the Central West and Blue Mountains, the Oberon Local Government Area (LGA) has a population of approximately 5,580 (ABS 2021). Oberon plays a significant role in the CWFH forestry industry due to its location, hosting many of the larger businesses along the forestry industry supply chain.

Oberon has approximately 52,000 hectares of softwood plantations, the majority (85 per cent) publicly owned and managed by Forestry Corporation of NSW, and the remaining 15 per cent owned by private land managers (2021-22 Industry Survey). From these plantations, approximately 992,000m³ worth of softwood timber was produced in 2021-22, which is over 80 per cent of total timber produced in the CWFH region (2021-22 Industry Survey). The majority of the timber harvested from these plantations is processed at local processing facilities. These processing facilities are the biggest source of employment in the region (Oberon Council 2023).

In 2022, the processing industry reliant on plantations grown in Oberon included:

- Borg Oberon (Oberon), producing medium density fibreboard (MDF)
- Highland Pine Products (Oberon), producing dressed and treated sawn timber for framing and trusses
- Oberon Bearers (Oberon), producing dressed and treated sawn timber and sawdust.

The harvest and haul, and transport sector accounts for almost a quarter of the employment within the CWFH forestry industry in Oberon (2021-22 Industry Survey). It is estimated that the forestry industry contributes approximately 67,800 truck movements per year to the Oberon road system, equating to approximately 271 daily truck movements per working day (assuming 250 working days per year) (CWFH, pers. comm.). The 992,000m³ of softwood timber products in 2021-22 that were produced in Oberon and hauled by trucking businesses located in and around Oberon, could be used to build approximately 39,700 new houses^{2,3}. Therefore, it is worthwhile to understand the significance of the Oberon LGA's part in the CWFH forestry industry.

A total of 759 CWFH region residents participated in the 2022-23 Regional Wellbeing survey, including 107 residents in the Oberon LGA. The results in Section 7 are presented separately for CWFH residents within the Oberon LGA, and those within the CWFH but outside of the Oberon LGA. Residents in the Oberon LGA were:

- More likely to feel that their community was a great place to live (88 per cent) when compared with the rest of the CWFH region (83 per cent).
- Less likely to feel that there are attractive buildings/homes in their community (68 per cent) and that there are attractive natural places in their community (83 per cent) than the rest of the CWFH region (76 per cent and 87 per cent respectively).

² The average house requires 15m³ of structural timber (Forest and Wood Products Australia, 2022).

³ Trucks hold approximately 40 per cent landscaping timber and 60 per cent framing timber (2021-22 Industry Survey).

- Considerably more likely to indicate that housing costs were affordable in their community (25 per cent) and feel that other living costs were affordable (31 per cent) compared to the rest of CWFH (13 per cent and 20 per cent respectively).
- More likely to feel that local businesses in their region were doing well (36 per cent) and there were plenty of jobs in the region (50 per cent) compared to the rest of the CWFH (29 per cent and 39 per cent respectively).
- Significantly more likely to feel that the local economy is getting better (66 per cent) and that the liveability of the community is improving (65 per cent) compared to the rest of the CWFH (46 per cent and 53 per cent respectively).
- Significantly less likely to feel that the quality of local housing is good (30 per cent) and that there is availability of housing to rent or buy (6 per cent) when compared to the rest of the CWFH (46 per cent and 14 per cent respectively).
- Significantly less likely to feel that there is good access to public roads and transport (4 per cent) when compared to the rest of the CWFH (18 per cent). Also, less likely to feel that the quality of local roads is good (11 per cent) when compared to the rest of the CWFH (15 per cent).
- Less likely to perceive environment degradation as a community problem (33 per cent), and perceive water quality as an issue (18 per cent) when compared to the rest of the CWFH (39 per cent and 26 per cent respectively).

8.2. Economic Contribution

Estimates of the economic contribution supported in 2021-22 by the CWFH forestry industry in the Oberon LGA region are provided in Table 8-2 to Table 8-4.

For each measure of economic activity, the contributions at the CWFH level are greater than the sum of the Oberon LGA level contributions. This is to be expected, as the Oberon LGA contribution is simply a component, albeit a significant one, of the total CWFH contribution.

Industry expenditure

In total, in 2021-22, the CWFH forest industry supported \$369.5 million in direct net expenditure in Oberon LGA as a whole, up to and including the point of primary processing. This included \$29.1 million supported by growers and silviculture, \$41.3 million by haulage and harvest, and transport, and \$299.2 million by processors (Table 8-1).

To help understand where industry expenditure is supported, Table 8-1 show both gross and net expenditure: while gross expenditure is not a true measure of economic contribution, as it double counts some expenditure that involves transfers within the industry, it helps show the relative size of different parts of the supply chain. Net expenditure is a measure of economic contribution and shows how much expenditure outside of the forest industry is added at different points in the supply chain.

Table 8-1 Direct expenditure (\$m) by the Oberon LGA forest industry, by supply chain stage, 2021-22

Supply Chain Stage	Gross	Net ^a
Grower & Silviculture	53.3	29.1
Harvest & Haulage & Transport	41.8	41.3
Processing	354.5	299.2
Total	N/A	369.5

^a This table shows expenditure net of transfers within the industry. The net figure ensures there is no double counting by ensuring that payments made from one part of the industry to another (and then expended in that other part of the industry) are not included. The transfers excluded from net figures include payments made to harvest, haulage, roading, earthworks and silvicultural contractors by plantation managers, and payments made to plantation managers or to other processors for fibre inputs used by wood and paper processors.

Source: BDO EconSearch analysis and Schirmer et al. 2018

Output

In 2021-22, the direct output in the Oberon LGA was \$432.3 million. The Oberon LGA contributed 94 per cent of the CWFH forest industry's total direct forestry output in 2021-22 (Table 8-2). This excludes sales of products or services occurring at earlier points in the supply chain prior to primary processing, to avoid double counting. By supply chain stage, \$51.9 million was generated by growers and silviculture, \$40.4 million by haulage and harvest, and transport, and \$420.0 million by processors (Table 8-3).

Flow-ons to other sectors of the regional economy added another \$46.1 million in output. The total output contribution in Oberon LGA was estimated to be \$478.4 million in 2021-22 (\$53.2 million by growers and silviculture, \$50.2 million by haulage and harvest, and transport, and \$455.0 million by processors).

For the capital expenditure spent in the Oberon LGA by forestry businesses, total value of output contributed was \$37.2 million in Oberon LGA for the industry as a whole, \$22.1 million directly and \$15.1 million generated by flow-on effects (Table 8-4).

Gross regional product

In total, in 2021-22, the forest industry contributed \$161.9 million in direct GRP in Oberon LGA. This included \$20.9 million supported by growers and silviculture, \$26.1 million by haulage and harvest, and transport, and \$114.9 million by processors (Table 8-3).

Flow-ons to other sectors of the regional economy added another \$25.8 million in GRP. The total GRP contribution in Oberon LGA was estimated to be \$187.7 million in 2021-22 (\$21.7 million by growers and silviculture, \$31.8 million by haulage and harvest, and transport, and \$134.2 million by processors).

The Oberon LGA contributed 79 per cent of the CWFH forest industry's direct GRP in 2021-22, and 72 per cent of the CWFH forest industry's total GRP (Table 8-2).

For the capital expenditure spent in the Oberon LGA by forestry businesses, total value of GRP contributed was \$14.1 million in Oberon LGA for the industry as a whole, \$8.0 million directly and \$6.1 million supported by flow-on effects (Table 8-4).

Household income

In total, in 2021-22, the forest industry contributed \$67.1 million to direct household income in Oberon LGA, equating to an average of \$23,784 per household in Oberon⁴. This included \$4.1 million supported by growers and silviculture, \$12.5 million by harvest and haulage and transport, and \$50.4 million by processors (Table 8-3).

Flow-ons to other sectors of the regional economy added another \$10.8 million in household income. The total contribution in Oberon LGA was estimated to be \$77.8 million in 2021-22 (\$4.4 million by growers and silviculture, \$14.8 million by haulage and harvest, and transport, and \$58.6 million by processors).

The Oberon LGA contributed 85 per cent of the CWFH forest industry's direct household income in 2021-22, and 71 per cent of the CWFH forest industry's total household income (Table 8-2).

For the capital expenditure spent in the Oberon LGA by forestry businesses, total value of household income contributed was \$8.8 million in Oberon LGA for the industry as a whole, \$5.9 million directly and \$2.9 million supported by flow-on effects (Table 8-4).

The median personal income in the Oberon LGA across all industries in 2021 was \$759 per week, and the median personal income for a full-time worker in the Oberon LGA was \$1,375 per week (ABS 2021). The average weekly wage of direct forest industry employees in 2021-22 in Oberon was \$1,846, significantly higher than the Oberon average across all industries. The high wage of forestry industry employees in the Oberon LGA may be partly explained by the high average number of hours worked per week by workers in the industry as discussed in Section 4.3.2. The average wage of flow-on forest industry employees in Oberon LGA was \$1,519 in 2021-22 (Table 8-5), these flow-on employees are the employees of local suppliers working in industries that support the forest industry.

Employment fte

The forest industry supported 720 direct fte jobs in 2021-22. Across the Oberon LGA, 35 fte jobs were supported by growers and silviculture, 176 fte jobs by harvest and haulage and transport, and 509 fte jobs by processors (Table 8-3).

Flow-ons to other sectors of the regional economy added another 129 fte. The total contribution in Oberon LGA was estimated to be 849 fte jobs in 2021-22 (39 fte jobs by growers and silviculture, 205 fte jobs by haulage and harvest, and transport, and 608 fte jobs by processors).

The Oberon LGA contributed 80 per cent of the CWFH forest industry's direct fte employment in 2021-22, and 67 per cent of the CWFH forest industry's total fte employment (Table 8-2).

For the capital expenditure spent in the Oberon LGA by forestry businesses, total fte jobs contributed was 106 in Oberon LGA for the industry as a whole, 67 fte jobs directly and 40 fte jobs supported by flow-on effects (Table 8-4).

Employment total jobs

The forest industry supported 699 direct jobs in 2021-22. Across the Oberon LGA, 35 jobs were supported by growers and silviculture, 159 jobs by harvest and haulage and transport, and 505 fte jobs by processors (Table 8-3).

⁴ There were 2,820 private dwellings in the Oberon LGA in 2021 (ABS, 2021)

Flow-ons to other sectors of the regional economy added another 136 jobs. The total contribution in Oberon LGA was estimated to be 835 jobs in 2021-22 (39 jobs by growers and silviculture, 189 jobs by haulage and harvest, and transport, and 608 jobs by processors).

For the capital expenditure spent in the Oberon LGA by forestry businesses, total jobs contributed was 97 in Oberon LGA for the industry as a whole, 60 fte jobs directly and 37 fte jobs supported by flow-on effects (Table 8-4).

The number of employees working full-time or part-time jobs in the Oberon LGA was 2,257 in 2021 (ABS 2021). The direct employment of forest industry workers in the Oberon LGA was 699 total jobs in 2021-22, accounting for approximately 31 per cent of employees in Oberon. When including the flow-on forest industry employees in Oberon (the employees of local suppliers working in industries that support the forest industry), the total employment was 824 total jobs in 2021-22, accounting for approximately 36 per cent of employees in Oberon.

Table 8-2 Summary of the economic contributions of the operation of the CWFH forest industry to the Oberon LGA and the CWFH region, by supply chain stage, 2021-22

	Oberon LGA	CWFH region	Oberon LGA contribution as a proportion of the CWFH region
Direct Output (\$m)	432.3	458.9	94%
GRP (\$m)			
Direct	161.9	199.2	81%
Flow-on	25.8	61.3	42%
Total	187.7	260.5	72%
Household Income (\$m)			
Direct	67.1	79.1	85%
Flow-on	10.8	30.3	36%
Total	77.8	109.4	71%
Employment (fte)			
Direct	720	899	80%
Flow-on	129	359	36%
Total	849	1,259	67%

Source: BDO EconSearch analysis.

Table 8-3 Economic contributions of the operation of the CWFH forest industry in Oberon LGA, by supply chain stage, 2021-22

	Grower & Silviculture	Harvest & Haulage & Transport	Processing	Total ^a
Output (\$m)	53.2	50.2	455.0	478.4
Direct	51.9	40.4	420.0	432.3
Production induced	0.2	3.6	16.0	19.9
Consumption induced	1.1	6.2	19.0	26.2
GRP (\$m)	21.7	31.8	134.2	187.7
Direct	20.9	26.1	114.9	161.9
Production induced	0.1	1.8	7.3	9.2
Consumption induced	0.7	3.9	12.0	16.7
Household Income (\$m)	4.4	14.8	58.6	77.8
Direct	4.1	12.5	50.4	67.1
Production induced	0.1	1.1	4.5	5.7
Consumption induced	0.2	1.2	3.6	5.0
Employment (fte)	39	205	608	849
Direct	35	176	509	720
Production induced	1	12	47	59
Consumption induced	3	17	51	70
Employment (total)	39	189	608	835
Direct	35	159	505	699
Production induced	1	12	46	58
Consumption induced	3	19	57	78

^a Industry output may be lower than the sum of output for individual stages as it excludes transfers between stages to prevent double counting.

Source: BDO EconSearch analysis.

Table 8-4 Average annual economic contributions of the capital expenditure by the CWFH forest industry in Oberon LGA, by supply chain stage, 2021-22

	Grower & Silviculture	Harvest & Haulage & Transport	Processing	Total
Output (\$m)	0.8	0.0	36.4	37.2
Direct	0.5	0.0	21.5	22.1
Production induced	0.2	0.0	11.0	11.2
Consumption induced	0.1	0.0	3.8	3.9
GRP (\$m)	0.3	0.0	13.8	14.1
Direct	0.2	0.0	7.8	8.0
Production induced	0.1	0.0	3.6	3.7
Consumption induced	0.0	0.0	2.4	2.5
Household Income (\$m)	0.2	0.0	8.6	8.8
Direct	0.1	0.0	5.8	5.9
Production induced	0.0	0.0	2.1	2.1
Consumption induced	0.0	0.0	0.7	0.7
Employment (fte)	2	0	105	106
Direct	1	0	66	67
Production induced	1	0	29	29
Consumption induced	0	0	10	10
Employment (total)	2	0	96	97
Direct	1	0	60	60
Production induced	1	0	25	26
Consumption induced	0	0	11	12

Source: BDO EconSearch analysis and Schirmer et al. 2018.

Table 8-5 Total employment and forest industry related employment in the Oberon LGA, 2021 and 2021-22

	Number of Employees	Proportion of Total Oberon LGA Employees
Number of employees in Oberon employed full-time or part-time in 2021	2,257	100%
Direct forest industry employment in Oberon LGA in 2021-22	699	31%
Flow-on forest industry employment in Oberon LGA in 2021-22	125	6%
Total forest industry employment in Oberon LGA in 2021-22	824	36%

Source: ABS 2021 and BDO EconSearch analysis

Table 8-6 Average weekly income and average forest industry related weekly income in the Oberon LGA, 2021 and 2021-22

	Average Weekly Income
Median personal income in Oberon	\$759
Median personal income for full-time workers in Oberon	\$1,375
Median household income in Oberon	\$1,441
Direct forest industry employee average income in Oberon LGA in 2021-22	\$1,846
Flow-on forest industry employee average income in Oberon LGA in 2021-22	\$1,519
Total forest industry employee average income in Oberon LGA in 2021-22	\$1,796

Source: ABS 2021, ABS Census of Population and Housing, 2021, TableBuilderPro Place of Usual Residence database and BDO EconSearch analysis.

REFERENCES

- Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) 2015, *Diversity in Australia's forest industry workforce*. Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.
- Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) 2021, *Australian plantation statistics and log availability report 2021*, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra, October
- Australian Bureau of Statistics (ABS) 2021, *Oberon*, <https://abs.gov.au/census/find-census-data/quickstats/2021/LGA16100>
- Central Tablelands Local Land Services 2021, *Wild Dog Management Plan 2021-2026*, report prepared for NSW Local Lands Service, September 2021.
- Department of Agriculture, Fisheries and Forestry (DAFF) 2023, *Regional Forestry Hubs*, 2023, <https://www.agriculture.gov.au/agriculture-land/forestry/regional-forestry-hubs>
- Forest and Wood Products Australia 2022, *How much wood in an average house: 14.58 m3 (not 42)*, <https://fwpa.com.au/how-much-wood-in-an-average-house-14-58-m3-not-42/>
- ForestWorks 2022, *Central West Forestry Hub skills and employment survey 2021*, report prepared for the Central West NSW Forestry Hub, February 2022.
- Greenwood Strategy 2022a, *Development of a Spatial Database*, report prepared for the Central West NSW Forestry Hub, January 2022.
- Greenwood Strategy 2022b, *Plantation Capability Mapping*, report prepared for the Central West NSW Forestry Hub, February 2022.
- Johnson, T.P., and Wislar, J.S. 2012. *Response rates and nonresponse errors in surveys*. Journal of the American Medical Association 307(17), 1805-1806.
- Oberon Council 2023, *About the Oberon Region*, <https://www.oberon.nsw.gov.au/Community/Events-directory/About-Oberon>
- Schirmer, J., Yabsley, B., Mylek, M. & Peel, D. 2016. *Wellbeing, Resilience and Liveability in Regional Australia: the 2015 Regional Wellbeing Survey*. University of Canberra. <https://www.regionalwellbeing.org.au/reports-to-date/>
- Schirmer, J., Gibbs, E., Mylek, M, Magnusson, A., Morison, J., 2018, *Socio-economic impacts of the softwood plantation industry, South West Slopes and Central Tablelands regions, NSW*, report prepared for Forest & Wood Products Australia, Canberra, April.
- University of Canberra 2023, *2022-23 Regional Wellbeing Survey*, www.regionalwellbeing.org.au.

Disclaimer

The assignment is a consulting engagement as outlined in the 'Framework for Assurance Engagements', issued by the Auditing and Assurances Standards Board, Section 17. Consulting engagements employ an assurance practitioner's technical skills, education, observations, experiences and knowledge of the consulting process. The consulting process is an analytical process that typically involves some combination of activities relating to: objective-setting, fact-finding, definition of problems or opportunities, evaluation of alternatives, development of recommendations including actions, communication of results, and sometimes implementation and follow-up.

The nature and scope of work has been determined by agreement between BDO and the Client. This consulting engagement does not meet the definition of an assurance engagement as defined in the 'Framework for Assurance Engagements', issued by the Auditing and Assurances Standards Board, Section 10.

Except as otherwise noted in this report, we have not performed any testing on the information provided to confirm its completeness and accuracy. Accordingly, we do not express such an audit opinion and readers of the report should draw their own conclusions from the results of the review, based on the scope, agreed-upon procedures carried out and findings.

APPENDIX 2 2022-23 Regional Wellbeing Survey Methods and Additional Data

The University of Canberra's annual Regional Wellbeing Survey (RWS) was launched in 2013 and aims to understand wellbeing, resilience and livability in Australia's rural and regional areas. The survey has since expanded to include a sample of people living in major cities (Schirmer et al. 2016). The 2022-23 RWS was used in this project to examine community livability and perceptions of the social, economic, service and infrastructure effects of the forest industry in the CWFH. The RWS is open to all adult residents of Australia.

The 2022-23 RWS was open between April and July 2023, and could be completed either online (at www.regionalwellbeing.org.au or via a direct email invitation to participate), or on paper. Large omnibus surveys such as the RWS typically have large numbers of participants, and not all survey questions are asked of every participant. The survey items related to this project were asked of all respondents living in New South Wales.

Sampling frame and recruitment

The RWS sampling frame includes a random sample from across Australia, stratified by population density (with more intensive sampling of regional and rural populations compared to urban populations), as well as several intensively sampled regions. In 2023, all mailboxes in the Oberon LGA were sent a letter invitation to the survey, followed by a reminder letter six weeks later. Weighting of the data set (described in detail below) is used to correct deliberate biases introduced due to the stratification of the sample, as well as to correct unintentional biases.

Survey participants in 2022-23 survey were recruited via (i) selecting addresses at random from available databases (general population and Farmbase), (ii) inviting previous participants to participate in the survey again, (iii) targeted social media advertising on platforms such as Facebook, Instagram and Twitter (including specific ads used for the Oberon region), (v) promotion by rural and regional organisations including the CWFH and Oberon Council, and (vi) promotion of the RWS prize draw to increase survey participation.

Survey responses

Over 16,000 people took part in the 2022-23 RWS, including 308 within the CWFH and 107 within the Oberon LGA. Note that not all respondents answered every question measuring social and wellbeing indicators, therefore response 'n's' reported in Section 6 will vary between different indicators reported on.

Data weighting

As the RWS uses non-traditional survey recruitment methods, it is not possible to accurately estimate a survey response rate. Response rates are also not always the best indication of the representativeness of survey responses (Johnson and Wislar, 2012). Instead, representativeness is explored by comparing the characteristics of survey respondents to those of people living in rural and regional Australia, followed by weighting of the data to correct intentional and unintentional biases. This analysis considers both the groups and regions that are deliberately oversampled in the survey. As intended, the survey sample over-represented farmers and some regions. There was also an unintended bias towards older respondents, female respondents and respondents who usually speak English at home, an issue that is observed in many surveys. While the biases identified are expected, they need to be addressed when analysing data. We do this through weighting the data.

‘Weighting’ refers to a statistical process where known biases in the responses received are corrected for. The weighting of responses involves adjusting the relative contribution each survey respondent makes to the whole when analysing survey results, so analysis of the sample more accurately represents the population from which it was drawn. Weighting does not change the answers people gave to survey items.

Weighting has been applied to analyses in this report when presenting the views of the population of different groups so that survey estimates agree with external benchmarks, which were obtained from the 2016 and 2021 Australian Bureau of Statistics (ABS) *Census of Population and Housing*. Weights were assigned using the ‘Rake Weights’ command in IBM SPSS Statistics 27. This uses a raking process to iteratively assign weights. The benchmarks used were age (18-39, 40-54, 55-69, 70+), gender (female, male), agricultural occupation (farmer, not-farmer), State and Territories, and remoteness.

Data analysis and reporting

Analysis of data for this report was undertaken using IBM SPSS Statistics 27 and Microsoft Excel. In this report, 95% confidence intervals are shown as part of the RWS results. This is a measure of how confident we can be in the results. Confidence intervals identify the boundaries between which the mean value of a given variable would be 95% likely to fall if the survey was repeated multiple times with a similar sample. In general, confidence is higher if there is a large sample size and little deviation in responses.



1300 138 991

www.bdo.com.au

NEW SOUTH WALES
NORTHERN TERRITORY
QUEENSLAND
SOUTH AUSTRALIA
TASMANIA
VICTORIA
WESTERN AUSTRALIA

AUDIT • TAX • ADVISORY

BDO Services Pty Ltd ABN 45 134 242 434 is a member of a national association of independent entities which are all members of BDO Australia Ltd ABN 77 050 110 275, an Australian company limited by guarantee. BDO Services Pty Ltd and BDO Australia Ltd are members of BDO International Ltd, a UK company limited by guarantee, and form part of the international BDO network of independent member firms. Liability limited by a scheme approved under Professional Standards Legislation.

