Forest & Wood Products Australia

Socio-economic impacts of the softwood plantation industry

South West Slopes and Central Tablelands regions, NSW

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Executive Summary

Introduction

The forest industry in Australia contributes to jobs and economic activity in many communities. During the last decade, there has been little information on how the industry is changing in different regions, including change in the number of jobs generated, dependence of different communities on the economic activity generated by the industry, the type and quality of work generated in the industry, and how residents of forest-industry dependent communities view the industry and its effects. Forest and Wood Products Australia has invested in research to produce up-to-date information on the socio-economic impacts of the forest industry in parts of New South Wales, Victoria, South Australia, Tasmania, Queensland and Western Australia. This report presents findings for the softwood plantation industry in the South West Slopes and Central Tablelands regions of New South Wales (NSW). These regions together contain around a quarter of Australia's softwood plantations, and a large wood and paper processing industry that utilises logs (fibre) harvested from these plantations.

Methods

The data analysed for this report was drawn from (i) a survey of forest industry businesses operating in the two regions, conducted between October 2016 and February 2017; (ii) data from the 2006, 2011 and 2016 Australian Bureau of Statistics (ABS) *Census of Population and Housing*, (iii) economic modelling using EconSearch's RISE regional input-output model; and (iv) the 2016 Regional Wellbeing Survey, used to examine perceptions of the forest industry by residents living in communities in which the forest industry operates.

Overview of the plantation industry in the South West Slopes and Central Tablelands

The South West Slopes region is the base for a large wood and paper processing industry that has developed in proximity to 165,000 hectares softwood plantations established in the region from the 1920s onwards, producing 2.55 million tonnes of fibre annually to several wood and paper processors. Locally-based wood and paper processors use a total of 3.26 million tonnes of fibre annually, drawing in softwood fibre from plantations grown outside the region as well as from those grown in the region. Wood and paper processors in the region produce pulp, paper, a range of sawntimber products, particleboard and plywood producers, as well as a small number of other products. The Central Tablelands region has 85,600 hectares of softwood plantations. The majority of the timber harvested from these plantations is processed at local processing facilities, while some is transported to processors in the South West Slopes. Processors in the region produce a range of sawntimber products, particleboard, and medium density fibreboard. Both regions are examples of integrated processing hubs, 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 two regions. Residues such as woodchips and shavings produced as by-products at sawmills are used in the manufacture of products such as paper, cardboard, MDF and particleboard at other processing facilities in the region. Smaller logs are processed at pulp and paper mills or utilised by particleboard and MDF manufacturers. The need to source fibre from outside the region to meet current supply needs for the region's mills presents some challenges for the industry, with several processors in the South West Slopes and Central Tablelands reporting that they cannot source additional fibre inputs

within an economic transport distance of their mills, curtailing potential expansion and creating a risk to current production if any of the fibre inputs currently imported from other regions become unavailable.

In addition to producing fibre to supply the wood and paper processing industry of the two regions, the softwood plantations in the South West Slopes and Central Tablelands provide a base for other socio-economic activities such as livestock grazing, bee keeping, mountain biking, bushwalking, and horse riding, amongst others. The economic value of these other activities has not been estimated as part of this report, which includes only the economic value of the fibre, wood and paper products produced from softwood plantations. However, these other activities generate important additional social and economic benefit from plantation areas for many residents.

Understanding the forest industry

In most parts of Australia, the forest industry has a supply chain with three distinct parts. In the first two parts – primary production and primary processing - native forest and plantations are grown and harvested (primary production), and logs are processed into primary products such as sawntimber and woodchips (primary processing). In primary production and primary processing, the jobs generated depend almost entirely on harvest of wood and fibre from native forest and plantations grown within a relatively short distance of primary processing facilities. These 'primary' products are then either sold directly into end-use markets, for example into industries such as construction; or are sold for further processing into 'secondary' products by other processors. In the third part of the supply chain, the 'secondary processing' sector, those primary wood and fibre products that were not sold for direct use are further processed into a range of products (for example, cabinets, furniture, and paper packaging products). Secondary processors tend to be clustered in major cities and regional centres, and often obtain primary processed wood products from a range of locations, including locations in Australia and from other countries.

Which parts of the forest industry are analysed in this report?

In the South West Slopes and Central Tablelands, the majority of employment in the forest industry is generated by primary production and primary processing of softwood plantations grown in these regions. There is also a small amount of employment generated based on native forests, and a small amount of secondary processing, This report examines the employment and economic impacts of the primary production and primary processing parts of the softwood plantations in the region. In addition, a limited amount of data on secondary processing is provided separately, drawing on employment data from the Australian Bureau of Statistics (ABS) *Census of Population and Housing* (Census). This information on secondary processing is presented separately to the main part of the report, as secondary processing does not always rely on products sourced from local primary processors, so does not rely solely (or in some cases at all) on the region's softwood plantations. This report therefore focuses on the employment and economic activity generated as a result of harvesting of wood and fibre from the softwood plantations of the South West Slopes and Central Tablelands, processing of these into wood products, as well as briefly identifying employment generated by secondary processing of wood and paper products in this region.

As the South West Slopes and Central Tablelands are relatively distinct regions, albeit with some transfer of primary products between them, each region is examined separately in this report.

Economic value

In 2015-16, the direct value of output generated by the softwood plantation industry of the South West Slopes at the point of sale of primary processed products was $1,050 million, and in the Central Tablelands was $265 million. This increased to $2,130 million and $700 million in the two regions respectively when the flow-on effects generated in other industries as a result of spending by the forest industry were included. Most of this expenditure was generated by the processing of wood and paper products. However, value of output is not always a good indicator of the industry's overall contribution to the local economy, 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) helps address this. Measures of GRP quantify the value added by the industry to the local economy as a whole, meaning value contributed after subtracting non-wage expenditure from revenue. In 2015-16, the forest industry directly contributed around $1,014 million to GRP in the South West Slopes, and $299 million in the Central Tablelands. When flow-on effects were included, the total (direct plus flow-on) effects of the softwood plantation industry in the two regions to the economy of New South Wales in 2015-16 was approximately $1,549 million in GRP, of which $805 million was household income.

Employment

The softwood plantation industry generated a total of 1,917 direct jobs and a further 3,458 flow-on jobs in the South West Slopes in 2015-16, with a total of 5,375 direct and flow-on jobs generated up to and including the point of primary processing. In the Central Tablelands, the industry generated 852 direct jobs and a further 1,175 flow-on jobs, with a total of 2,027 direct and flow-on jobs in the Central Tablelands. The majority of direct jobs – two thirds – are generated in the processing of wood and paper products, while just over 30% are generated by the growing and harvest of plantations. More than 90% of the direct jobs generated by the industry are located within the two regions. In addition to the flow-on employment generated in each region by the plantation industry, a further 1,407 flow-on jobs were generated in other parts of NSW as a result of (i) the demand created by the South West Slopes and Central Tablelands softwood plantation industry for supplies and inputs such as fuel and mechanical servicing, and (ii) spending of salaries and wages by workers.

Most of the jobs generated by the industry are located in just a few local government areas (LGAs). In the South West Slopes, jobs are concentrated in the Snowy Valleys Council (903 jobs in the area previously forming Tumut Shire and 234 in the previous Tumbarumba Shire), with another 240 in the Bombala region of Snowy-Monaro Regional Council, 160 living in Albury and 175 in Wagga Wagga. In the Central Tablelands, the largest numbers of workers live in Oberon (417) and Bathurst (260). Many of those who live in Bathurst, Lithgow, Orange and Cabonne are employed in Oberon and commute from towns in these LGAs to work in Oberon, with the major processors established in Oberon providing a large proportion of the employment generated in all LGAs in the Central Tablelands region. In Oberon, a smaller LGA with a workforce of 2,318 people in total in 2011, 18% of the workforce is directly employed in the forest industry.

Some further jobs were generated by secondary processing, with the 2016 ABS Census recording 149 people employed in further processing of wood and paper products in the South West Slopes, and 219 people in the Central Tablelands. However, it is not known how many of these jobs rely on

the softwood plantations grown in the two regions, versus on wood or fibre sourced from native forests or from other regions.

There is little information on how employment is changing in the plantation industry over time. The only data that give reliable insight into change over time are data from the ABS Census. Census data suggest that between 2006 and 2016 , the number of workers employed in the forest, wood and paper industries recorded in the Census fell in most local government areas in both the South West Slopes and Central Tablelands, with the exception of those in which there had been investment in either new processing facilities, or substantial expansion of existing facilities. Investment in expansion of processing in the South West Slopes – particularly in the Snowy Valleys and Snowy-Monaro LGAs – reduced the amount of employment decline, with forest industry employment declining in the South West Slopes region by 4.3% between 2011 and 2016, compared to a 12.0% decline in the Central Tablelands during the same period.

Working conditions

Successfully recruiting and maintaining a strong workforce can be challenging for a regionally-based industry. Overall, in 2016-17, 88% of forest industry workers in the two regions had full-time jobs, 2% worked part-time and 10% were casual workers. However, 27% of forest industry workers reported working 49 hours or more per week in 2016 (compared to 17% of the broader workforce in the two regions), with long work hours common in some parts of the industry, particularly harvesting and haulage firms.

Forest industry workers in the South West Slopes and Central Tablelands regions generally earned higher incomes than the average for the region as of 2016; full-time forest industry workers were less likely than full-time workers employed in other industries in the two regions to earn low levels of income (6% of forest industry workers compared to 12% in the whole workforce), and more likely to earn high income compared to other workers (50% compared to 43%).

Workforce diversity and sustainability

The forest industry workforce has a similar age profile to other industries, although between 2006 and 2016 the industry workforce evolved from one that employed fewer people aged 55 and over compared to other industries, to one employing similar proportions of older workers and slightly fewer workers aged under 35 than other industries in the region. The industry employs relatively few women, with only 15% of workers being female, and little change in recruitment of women into the workforce between 2006 and 2016. Many forest industry businesses reported difficulty recruiting some types of workers and contractors, particularly managers and high level professional staff (94% of businesses reporting difficulty recruiting this type of worker), transport workers (67%), finance/book keeping staff (62%), and skilled machinery operators (60%). When asked what factors made it difficult to recruit staff, a lack of available workers with appropriate skills was the top issue identified by businesses, with 85% reporting that this was a big issue for them. For 80%, the investment and time required to build workforce skills was a big issue, while 65% reported there was a lack of local workers with skills needed by their business. In many cases (60% of businesses), skills obtained in other industries were not easily transferable to the softwood industry. Almost two-thirds (65%) of businesses reported that a key challenge was workers not wishing to shift to the community their employer was based in. Related to this, 58% reported that a lack of employment opportunities

for partners/spouses of workers in the local region affected their ability to recruit workers. Less than 36% of businesses reported that competition from other industries on wages or working conditions, negative perceptions or lack of confidence in the industry, or lack of affordable accommodation, were issues for recruitment.

Industry skills and training needs

Forest industry businesses were asked what types of skills were needed by their workforce, whether they required workers to have formal accreditation in these skills, and how they currently provided training. Businesses most commonly reported needing workers with general skills that are relevant to many types of businesses: occupational health and safety training, and business and financial management, with 86% of businesses reporting a need for skilled workers in these areas, and 64% requiring some kind of formal accreditation of staff. The next most common skills needed by businesses were heavy machinery operating skills, compliance training (e.g. training in meeting compliance standards of regulatory or certification authorities), and fire-fighting, required by between 77% and 82% of businesses, with formal accreditation required by 59% to 64%. Training in ICT products specialised to the industry was needed by 64% of businesses; however, few businesses required workers to have formal accreditation in these skills, with the exception of some processors.

As of 2016, forest industry workers in most parts of the industry were less likely to have completed high school than those working in other industries. Forest industry workers were slightly more likely to have completed a certificate qualification than those in other parts of the workforce.

Business and market outlook

When asked about business conditions, 54% of forest industry businesses in the two regions reported conditions were 'more challenging than usual' and 46% that they were 'about the same as usual'. Despite this, almost half (47%) of businesses felt they were likely to grow their profitability in the next year, and 37% that revenue would grow, with only 21% and 16% respectively feeling their business was unlikely to achieve these two things in the next 12 months. Most businesses (61%) felt demand for their services or products would remain the same over the next 12 months, a quarter (26%) that demand would grow and few (13%) that demand would reduce. Factors that would encourage greater investment in their business included increased demand for logs, cheaper land for plantation establishment, longer term secure contracts for contractors, access to a larger wood and fibre resource, and growth in markets for wood and paper products.

When asked to rate the extent to which different factors had been a challenge or problems for their business in the last three years, the most common challenges were rising input costs, difficulty obtaining labour, and falling prices for goods and services, with around half of all businesses reporting these issues. Poor telecommunications and lack of industry investment were also challenges for a significant proportion (39% to 42%) of all businesses.

Community perceptions of the social-economic effects of the forest industry

Overall, people living in the South West Slopes and Central Tablelands, and in communities within these regions with higher and lower dependence on the forest industry, were satisfied with the liveability of their community. Eighty eight per cent of those living in the two regions found their community a great place to live, identical to the average for all NSW residents, and 80% would

recommend their community to others as a good place to live. There was little difference between communities with higher and lower dependence on the forest industry within these regions.

There were similar findings when resident's perceptions of the overall friendliness, safety, aesthetics and environmental health in their community were examined. Overall, these results suggest that the overall perceptions residents have of the liveability of their communities are very similar for communities that have higher and lower economic dependence on the forest industry, and are mostly positive.

Eighty seven per cent of those who lived in the parts of the South West Slopes and Central Tablelands in which a large proportion of jobs rely on the forest industry (Tumut, Tumbarumba, Bombala, Oberon) identified that the forest industry was important to their local community, compared to 27% of those living in other parts of the two regions. The other industries also commonly identified as important to the local community were agriculture and tourism.

While most residents – 84% - felt the forest industry had positive impacts on local employment, fewer felt it had positive effects on other aspects of community life such as friendliness, roads, or local landscape. Three quarters (76%) believed the industry had a negative impact on the quality of local roads, and close to half reported concerns about effects on bushfire risk and attractiveness of the local landscape. The results suggest that while being just as satisfied with the liveability of their communities as residents of communities with little to no forest industry activity, residents of forest industry communities do not view the industry as either being as important an industry as agriculture and tourism, or as having positive outcomes for many aspects of community life other than employment. These perceptions will not always reflect objective measures of outcomes, but do reflect how residents experience an industry and view it.

Conclusions

The softwood plantation industry is an important part of the economy and communities of the South West Slopes and Central Tablelands regions. In some parts – in particular, Tumut, Tumbarumba, Oberon and Bombala – the industry generates a significant proportion of all employment. The industry is unusual in generating a very high proportion of full-time jobs and higher than average income for workers, but often involves long working hours. The industry has a workforce of similar age structure to the broader workforce, however it predominantly employs men, and many businesses report difficulty recruiting skilled workers. There is an ongoing need for skilled workers, and key challenges in recruiting these workers include a lack of appropriately qualified workers in the local workforce, and workers from elsewhere finding it difficult to shift to the region. Residents living in communities with high reliance on the forest industry employment are as satisfied with the liveability and quality of life in their communities as those in other parts of rural and regional NSW, and believe the industry positively contributes to local employment, but do not typically perceive the industry as contributing in other ways to their local community.

Introduction

The forest industry in Australia contributes to jobs and economic activity in many communities. This contribution results from the growing, management and harvesting of plantations and native forests, and processing of logs into wood and fibre products such as sawn timber for use in construction, appearance products such as flooring and decking, woodchips for export, pulp and paper.

Like many other industries, Australia's forest, wood and paper industries are changing rapidly, with ongoing investment in new technology and changing markets contributing to evolving skills, training and technology needs. During the last decade, there has been little information on how the industry is changing in different regions, including change in the number of jobs generated, dependence of different communities on the economic activity generated by the industry, the type and quality of work generated in the industry, and how residents of forest-industry dependent communities view the industry and its effects.

Forest and Wood Products Australia has invested in research to produce up-to-date information on the socio-economic impacts of the forest industry in Queensland, South Australia, Tasmania, Victoria, and parts of New South Wales. This report presents findings for the softwood plantation industry in the South West Slopes and Central Tablelands regions of New South Wales (NSW)[1]. These regions together contain around a quarter of Australia's softwood plantations, and a large wood and paper processing industry that utilises logs (fibre) harvested from these plantations. While mostly operating as two separate hubs of industry activity, with the large majority of the fibre harvested in each region processed at facilities in that region, there is some interlinkage between the two regions, with some fibre harvested in the Central Tablelands processed in the South West Slopes, and several plantation management, harvest, haulage and silvicultural businesses operating in both regions.

This report examines the following aspects of the industry in the South West Slopes and Central Tablelands regions:

- Employment generated by the industry, including direct and flow-on jobs
- Economic value of the industry, including direct and flow-on economic activity
- Working conditions, workforce diversity, and workforce sustainability
- Skills and training needs for the forest industry
- Business and market outlook reported by businesses operating in the industry, and
- Community perceptions of the industry.

[1] This report does not include the smaller number of jobs dependent on native forest harvesting in these regions unless otherwise identified.

Methods

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

- 2016-17 Industry Survey: A survey of forest industry businesses operating in the two regions, conducted between October 2016 and February 2017. Of 75 businesses operating in the industry in the two regions (including nurseries, plantation management businesses, silvicultural contractors, harvest and haulage contractors, and wood and paper processors), 43 completed the full survey, 14 provided information by phone or completed part of the survey, and information on the remaining 17 was provided by industry experts including businesses that contracted, supplied or otherwise engaged with these businesses.
- 2006, 2011 and 2016 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.
- Economic modelling: Economic modelling using EconSearch's RISE regional input-output model has been used to identify flow-on jobs and economic activity generated by the forest industry
- 2016 Regional Wellbeing Survey: Perceptions of the forest industry by residents of the South West Slopes and Central Tablelands were measured as part of the Regional Wellbeing Survey, a large survey of 13,000 Australians living in regional and rural areas.

Overview of the industry

While in many regions of Australia jobs in the forest industry are generated from native forest, hardwood plantations and softwood plantations, in the South West Slopes and Central Tablelands the large majority of forest industry jobs rely on softwood plantations. The softwood plantation industry in the South West Slopes and Central Tablelands represents a significant part of Australia's total softwood plantation estate and associated processing. In total, the 250,600 hectares of softwood plantations established in these two regions makes up almost a quarter (24.2%) of Australia's total of 1,035,400 hectares of softwood plantations (ABARES 2016). There are also a smaller number of jobs generated from harvesting and processing of native forests; these are not examined in this report.

This section briefly describes the softwood plantation industry in each region. First, the structure of the industry is examined, focusing on understanding the supply chain from growing of plantations to processing of a range of softwood products. The second part then examines the softwood plantation industry in each region in more detail.

Industry structure

The forest industry in the South West Slopes and Central Tablelands, like most of Australia, has a supply chain with three distinct parts: primary production, primary processing and secondary processing. Primary production involves the establishing, growing and harvesting of logs ready for primary processing. Primary processing involves processing of roundwood (harvested logs) into initial products such as sawn timber and woodchips, and usually uses logs from plantation or native forest (in this region, predominantly softwood plantations) grown within a relatively short distance of the processing plant (less than 200 kilometres in most cases). Secondary processing involves further processing of these initial products into a wide range of further processed products, and is less reliant on locally-grown timber, with secondary processors often importing their wood and paper inputs from other states or other countries as well as purchasing them from local primary processors. Each stage is described in more detail below.

1. Jobs generated in 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 native forest and plantation by forest management businesses and agencies, silvicultural contractors, and harvesting and haulage of logs to primary processors.

2. Jobs generated up to and including primary processing of wood and fibre products. Primary processing means processing of logs into initial wood and paper products. Primary processing activities in the South West Slopes and Central Tablelands are based almost entirely on wood and fibre grown in these two regions. This means that the primary production of logs and primary processing combine to create a strongly inter-linked supply chain within each of the two regions, with some transport of fibre also occurring between the two regions. 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 from logs into a range of primary products including sawn timber, composite wood products such as particleboard, pulp and paper. 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 generated in 'secondary' processing. Secondary processing involves further processing of primary processed wood and fibre (for example, rough sawn timber or paper) into a range of further products (for example, cabinets, furniture, paper-based packaging products). While these jobs still rely on wood and fibre as a key input in processing, the wood and fibre inputs are often combined with other products (for example, fabric covers on furniture, plastic components), and may be sourced from wood and fibre grown locally, or from wood and fibre that has been grown and undergone primary processing in other parts of Australia or other countries. In addition to this, many of the residues produced in primary processing (for example, bark, sawdust and docking ends of logs) are sold to businesses such as firewood sellers, agricultural businesses for use as animal bedding, and garden and landscape businesses. 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 Albury, Wagga Wagga and Bathurst. This means that there are relatively small amounts of employment in secondary processing in the South West Slopes and Central Tablelands.

Figure 1 provides a stylised representation of this structure. This report focuses primarily on understanding the employment and activity generated 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.

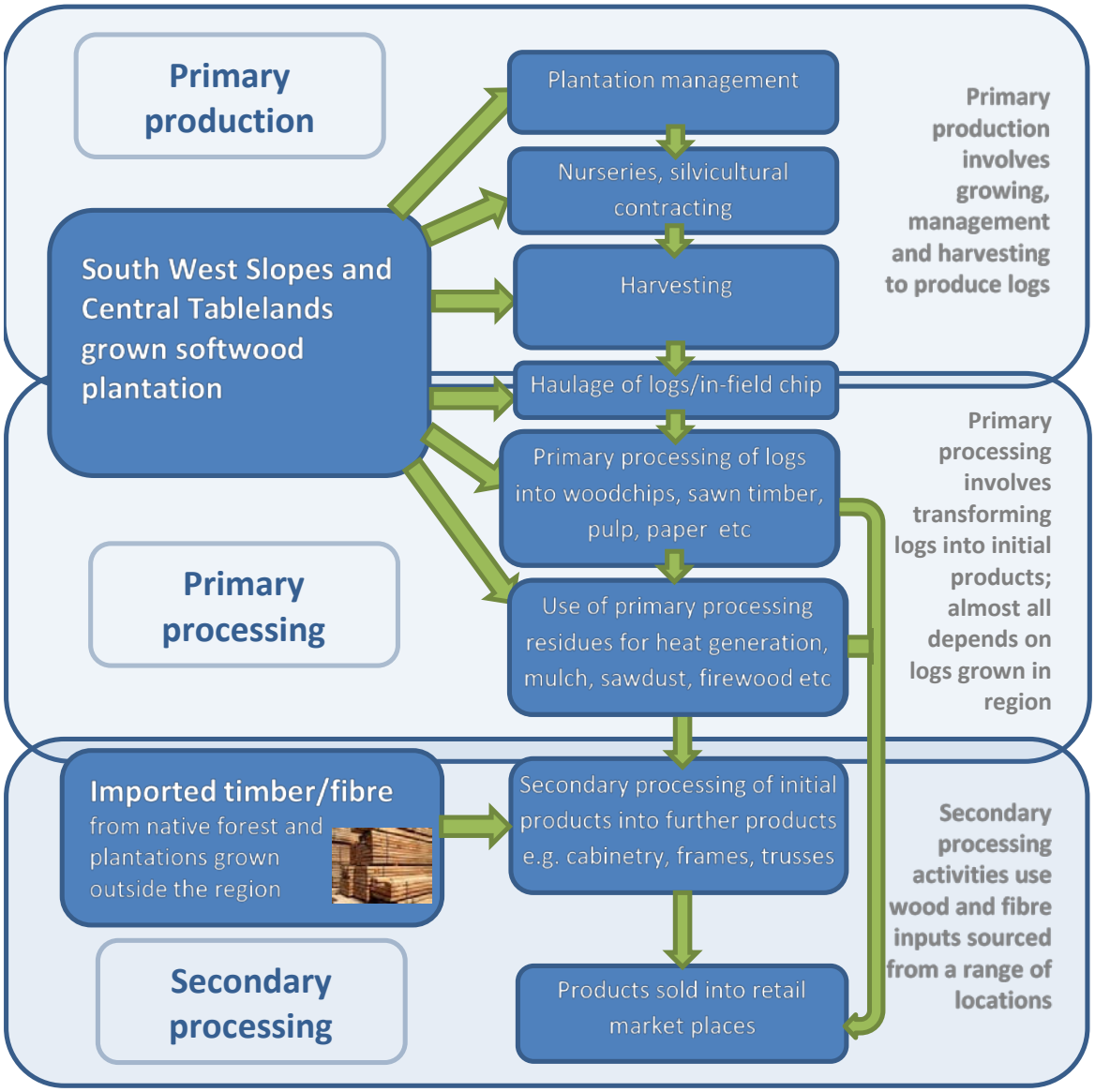

Figure 1 Stylised structure of the forest and wood products industry

In addition to examining the industry up to primary processing, basic data on secondary processing is provided in this report, using data from the Australian Bureau of Statistics (ABS) *Census of Population and Housing*. However, as jobs in secondary processing do not necessarily depend on softwood plantations, these data are presented separately to data on the softwood plantation industry in the South West Slopes and Central Tablelands.

Softwood plantation industry - South West Slopes

The South West Slopes region of New South Wales (NSW) is the base for a large wood and paper processing industry that has developed in proximity to 165,000 hectares softwood plantations established in the region from the 1920s onwards (63% in public ownership by ForestryCorp, and the remainder privately owned), producing 2.55 million tonnes of fibre annually to several wood and paper processors. As these wood and paper processors use a total of 3.26 million tonnes of fibre

annually, the region also draws in softwood fibre from plantations grown outside the region, particularly from northern Victoria, the Central Tablelands region, and the Australian Capital Territory (ACT).

This region includes the local government areas of Albury City, Shire of Bombala, Cootamundra-Gundagai Regional Council, Greater Hume Shire, Snowy Monaro Regional Council, Snowy Valleys Council and City of Wagga Wagga.

The majority of timber grown in the South West Slopes (approximately 86% of total harvested volume) is processed at facilities within the region. Much of the 14% not processed locally is fibre harvested around the Bombala region that is transported to locations including the ACT for processing.

In 2017, the processing industry reliant on plantations grown in the South West Slope included:

- Visy Industries (Tumut), producing kraft paper
- Norske Skog (Albury), producing newsprint paper.
- Carter Holt Harvey (CHH) Sawmill (Tumut), producing kiln-dried structural sawn wood and treated pine sleepers
- Carter Holt Harvey (CHH) Woodproducts (Tumut), producing rawboard (particleboard [PBD]) and laminated particleboard
- Hyne Timber (Tumbarumba), producing kiln-dried structural sawn wood and treated timber.
- Big River Group (Wagga Wagga), producing plywood
- Dongwha Timbers (Bombala), producing treated structural sawn wood, decking, sleepers, fencing and landscaping timbers and decorative interior boards
- AusWest Timbers (Canberra), producing roof tiling battens.

In 2017, XLam was constructing Australia's first cross laminated timber (CLT) plant in Wodonga.

Softwood plantation industry – Central Tablelands

The Central Tablelands region of NSW has 85,600 hectares of softwood plantations, the majority (88%) publicly owned and managed by ForestryCorp, and the remaining 12% owned by private land managers. The region includes the local government areas of Bathurst, Blayney, Cabonne, Lithgow, Oberon, and Orange. The majority of the timber harvested from these plantations is processed at local processing facilities, while some is transported to processors in the South West Slopes.

In 2017, the processing industry reliant on plantations grown in the Central Tablelands included:

- CHH Structaflor (Oberon), producing particleboard flooring
- Allied Timber Products (Bathurst), producing treated and untreated sawnwood, framing and palings
- Australian United Timbers (Burraga), producing treated outdoor timber products
- Highland Pine Products (Oberon), producing dressed and treated sawn timber for framing and trusses
- Borg Oberon (Oberon), producing medium density fibreboard (MDF)
- HLM Hayter and Sons (Werombi), sawn and treated timber.

Integrated processing industry

The South West Slopes and the Central Tablelands are examples of integrated processing hubs, 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 two regions. Residues such as woodchips and shavings produced as by-products at sawmills are used in the manufacture of products such as paper, cardboard, MDF and particleboard at other processing facilities in the region. Smaller logs are processed at pulp and paper mills or utilised 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 some challenges for the industry, with several processors in the South West Slopes and Central Tablelands reporting that they cannot source additional fibre inputs within an economic transport distance of their mills, curtailing potential expansion and creating a risk to current production if any of the fibre inputs currently imported from other regions become unavailable.

Other activities

In addition to producing fibre to supply the wood and paper processing industry of the two regions, the softwood plantations in the South West Slopes and Central Tablelands provide a base for other socio-economic activities. These include:

- **Livestock grazing:** This occurs on around 33,700 hectares of land managed by softwood plantation businesses
- **Bee keeping:** Bee keeping occurs on around 29,000 hectares of land managed by softwood plantation managers in the region (some of this occurs in native forest areas also managed by ForestryCorp)
- **Mountain biking:** Around 1,000 hectares of land managed by ForestryCorp has mountain bike trails on it. This supports regular mountain biking and also an annual 3-hour mountain bike racing event, which generates economic activity in the form of accommodation, food and services for the event participants
- **Bushwalking, picnic and camping areas:** There are bushwalking trails, picnic and camping areas in some of the plantation areas managed by ForestryCorp
- **Four wheel drive and dirt bike riding**: These activities occur in the plantation areas managed by both ForestryCorp and some private plantation managers, with trails on an estimated 32,000 hectares of the land managed for plantation production used for this purpose
- **Horse riding:** Horse riding occurs on trails in softwood plantations managed by both public and private land managers, with these trails occurring on around 7,000 hectares of the land managed for softwood plantations
- **Hunting:** Hunting occurs in the softwood plantations managed by both public and private land managers
- **Car rallies:** Car rallies occur in softwood plantation areas managed by ForestryCorp
- **Other uses** identified by plantation land managers were fossicking, mushrooming, and a school camp area.

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

Economic value

This section examines the economic value generated by the softwood plantation industry in the South West Slopes and Central Tablelands, up to and including the point of primary processing. As economic value can be estimated using multiple approaches, we first describe the measures used in this report. This is followed by analysis of:

(i) the *direct* value of the industry – the value of the activity generated by the forest industry, without including flow-on effects of this activity through the broader economy, and

(ii) the *total* economic value of the industry, which includes both economic activity generated directly by forest industry businesses, and the flow-on effects of this activity through the broader economy.

Measuring economic impact

A number of economic indicators can be used to examine the value of an industry and estimate its impact on a specific regional economy. These range from simple measures of expenditure, to modelled estimates of the net contribution of an industry to the total value of economic activity in a given region (Gross Regional Production, or GRP). This section explains the measures used in this report, and why each is used.

Categories of economic impact

When using any measure of economic impact – whether it is value of output, expenditure by an industry, contribution of an industry to GRP, or generation of employment – it is possible to model this with a focus solely on the industry's direct activities, or with a broader focus on how these activities flow-on through the economy. In this report, we model economic impact based on (i) direct impacts of the industry, and (ii) total impacts which are the sum of direct impacts plus flow-on (indirect) impacts of the industry across the whole economy:

- *Direct impact* is generated directly by firms, businesses and organisations engaged in a particular industry, in this case the forest industry.
- *Flow-on or indirect* impacts are the economic activity generated in other industries as a result of the activity of the forest industry. Total flow-on or indirect impact is the sum of *production-induced* and *consumption-induced* impacts.
    - *Production-induced impact* is generated by businesses outside the forest industry that supply forest industry businesses. It also includes impacts generated by the suppliers of those suppliers and so on as successive waves of impact occur in the economy.
    - *Consumption-induced impact* is generated when workers involved in the forest industry, and in businesses that supply the forest industry, spend their wages on goods and services. The impact generated as a result of spending of wages on these goods and services is *consumption-induced*.
- *Total impact* is the sum of *direct* and *flow-on (or indirect)* impacts.

When calculating direct and total economic value in this report, the forest industry is treated as a vertically integrated industry (one part of the industry supplies goods and services to the next in a

chain of supply), in which there are transfers between different parts of the industry at each point in the supply chain. When calculating economic value, transfers between forest industry businesses are cancelled out so economic value can be quantified in terms of the interaction between the forest industry and the rest of the economy. Unless otherwise specified, all economic value estimates exclude transfers occurring within the forest industry.

Direct and flow-on (indirect) impacts of the industry are estimated using four key measures of economic impact: value of output, value of industry expenditure, contribution to GRP, and employment.

Value of output

The total *value of output* of an industry is a relatively simple measure: it is the total revenue earned by forest industry businesses from sales of goods and services. This provides useful information about the total economic size of an industry and its output. 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. Note that this value excludes sales of products and services between industry businesses at earlier points in the forest industry supply chain, to avoid double counting.

While this indicator provides a useful estimate of total value of an industry at a particular stage of production – in this case, at the point of sale of primary processed wood and paper products – it does not provide substantial information about how that industry has contributed to the local economy, for two key reasons. First, it doesn't consider the cost of producing the output. For example, an industry with a turnover (output) of two billion dollars and expenditure on goods and services of two billion dollars creates less value-add than one that has a turnover of two billion dollars and expenditure on goods and services of one billion dollars. Secondly, it matters where expenditures occur when considering flow-on impact. For example, an industry might generate two billion dollars 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 two billion dollars of sales, but do this through a locally-based supply chain, generating substantial jobs and expenditure in the local area as a result. To better understand this, economic modelling can be used to estimate how much additional value of output is generated in other industries in a given region as a result of the expenditure of the forest industry in that region. This can be done by modelling *production-induced* and *consumption-induced* effects, as defined earlier.

Given the importance of expenditure to understand how an industry contributes to an economy, it follows that the amount and location of expenditure should be considered when determining the economic value of an industry to a region.

Industry expenditure

Industry activity can also be measured by examining *value of expenditure*. This indicator measures 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.

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 generate $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.

Value of expenditure can be measured in two ways, both of which are presented in this report:

- 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 whole industry contributes to the broader economy.
- 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 provides to the local economy, as it identifies the net expenditure the industry as a whole contributes to the rest of the economy.

Industry expenditure is a useful indicator and provides more concrete data on the extent to which production of wood and paper products in the South West Slopes and Central Tablelands result 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 Product (GRP), described below.

Industry contribution to Gross Regional Product (GRP)

Gross Regional Product (GRP) is the total value of economic production in a region over a period of time. This can be defined as the sale value of all final goods and services produced in a region over a given period, less the expenditure on goods and services used to produce them (such as fuel, utilities, wood and fibre, accountants, office supplies, etc.). Operating a business requires more than just goods and services as inputs, it also requires capital (such as vehicles, machines and buildings), labour and land. These are known as 'primary factors of production' and GRP is the total amount paid to the owners of these primary factors. Workers 'own' labour and are paid a wage for it,

business owners own land and/or capital and are paid a profit for them. Different types of businesses use different amounts of each primary factor.

GRP includes taxes because it concerns the whole economy, not just the business sector. Even though the business sector pays some profit to governments, that value is just a transfer within the economy of value that each business produced. By the same logic, donations made by businesses are also included in GRP. Annuities paid by growers are payments to the owner of the land used in production. While these are costs to businesses, they are income to owners of land so are included in GRP.

This report describes the direct and total contribution to GRP of the forest industry. The direct contribution to GRP is the GRP created by forest businesses themselves. Total contribution to GRP is the GRP created by forest businesses, plus the proportion of GRP created in the rest of the economy due to the flow-on activity created by the forest industry (the production-induced and consumption induced flow-on effects described earlier). GRP is the preferred measure of economic contribution because it avoids the problem of double counting that can arise from using value of output or industry expenditure.

Employment

Subsequent parts of this report describe the employment generated by the forest industry in detail. Employment is defined in this report as the total number of people employed in the industry. It is measured as both direct employment (generated by the forest industry) and flow-on/indirect employment generated in other industries as a result of forest industry activity. Employment in this report is reported based on the total number of people employed, rather than full-time equivalents (FTE). This is done for two reasons: first, because a person whose job is in the industry is likely to rely on that income for their livelihood irrespective of whether the job is part-time or full-time; and second, because data from other sources such as the Australian Bureau of Statistics (ABS) measure jobs in terms of numbers of people, not FTE.

Direct economic value

This section examines the 'direct' value of the softwood plantation industry in the South West Slopes and Central Tablelands, meaning the value of the output produced by the industry, expenditure made by the industry, and the subsequent contribution of the industry to GRP. These direct estimates do not take into account the flow-on, or indirect, activity that is generated in other parts of the economy as a result of forest industry activity. This information provides context on the overall economic size of the industry and its activities. The next section then examines the total economic contribution of the industry after taking into account interactions between the forest industry and other parts of the economy.

Direct value of output

In 2015-16, the direct value of output from the wood and paper processors of the South West Slopes region at the point of sale of primary processed products was $1,050 million, and in the Central Tablelands was $265 million. This excludes sales of products or services occurring at earlier points in the supply chain prior to primary processing, to avoid double counting. These figures do not include the value of the output generated beyond this point by secondary processing which, as described earlier, generates additional value and draws on both wood and fibre produced from softwood

plantations grown in the two regions, and on wood and fibre products imported from other states or from other countries.

Direct expenditure

Value of output does not 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 2015-16, the forest industry generated $734.8 million in direct net expenditure within the South West Slopes region, and $231.7 million in the Central Tablelands region, indicating that a substantial proportion of the economic activity generated by the industry is captured within the regions it is located in. Most of this expenditure is generated by the processing of wood and paper products, as shown in Table 1.

To help understand where industry expenditure is generated, Tables 2 shows 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 shows 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. Most expenditure is generated at the stage of primary processing of wood products, as shown in Table 1.

Table 1 Direct expenditure generated by the South West Slopes and Central Tablelands softwood plantation industry, 2015-16, by supply chain stage

	South West Slopes region		Central Tablelands region	
Supply chain stage	**Gross total expenditure in 2015-16 ($m)**	**Net expenditure excluding transfers to other plantation sectors ($m)**	**Gross total expenditure in 2015-16 ($m)**	**Net expenditure excluding transfers to other plantation sectors ($m)**
Establishing & growing plantations	148.2	64.4	73.1	42.1
Harvest & haulage of logs to processors	68.8	68.8	26.1	26.1
Wood and paper processing	846.4	601.5	226.9	163.5
TOTAL	**N/A**	**734.8**	**N/A**	**231.7**

This table shows both 'gross' expenditure, and 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.

While some additional expenditure is generated by the secondary processing sector, it was not possible to estimate the value of this or the extent to which expenditure in the secondary processing sector relies on the softwood plantations grown in the region, versus on wood and fibre from native forest, or wood and fibre imported from other parts of Australia or from other countries.

The types of expenditure generated by different industries vary. The largest single item of direct expenditure by the forest industry in both regions is wages and salaries, as shown in Appendix 1, with around $1 in every $5 of expenditure on wages and salaries (the industry spent a total of

$155.2 million on wages and salaries of workers in the South West Slopes, and $47.2 million in the Central Tablelands).

Contribution of the forest industry to Gross Regional Production

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. In 2015-16, the direct contribution to GRP from the growing, harvesting and primary processing of wood products in the South West Slopes was $433.9 million, and in the Central Tablelands was $101.1 million (see Appendix 1 for detailed data). These figures do not include the GRP generated beyond this point by secondary processing.

Total economic value including both direct and flow-on effects

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 generated 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 generated 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.

When these flow-on effects are taken into account (see Table 2 and Appendix 1 for detailed data):

- The total value of output contributed by the industry in 2015-16 was $2,130 million in the South West Slopes and $700 million in the Central Tablelands (counting only impacts of the industry within each region)
- The total contribution to the value of GRP was $1,014 million in the South West Slopes, and $299 million in the Central Tablelands (counting only direct and flow-on effects within each region and not outside the two regions)
- The total contribution to the household income component of GRP was $468 million in the South West Slopes, and $156 million in the Central Tablelands

The figures above consider only the flow-on effects of the industry within each of the two regions. However, the contribution of the industry to the economy of New South Wales is larger than that to the South West Slopes and Central Tablelands regions combined, because some of the direct and indirect expenditure by the industry occurs outside of these regions. The combined contribution of the South West Slopes and Central Tablelands plantation industry to the economy of New South Wales as a whole in 2015-16 was around $1,549 million in GRP of which $805 million was household income (see Appendix 1).

Table 2 Economic impacts of the softwood plantation industry – South West Slopes and Central Tablelands

	South West Slopes *Flow-on impacts include flow-on occurring within South West Slopes region only*	**Central Tablelands** *Flow-on impacts include flow-on occurring within Central Tablelands region only*	**South West Slopes and Central Tablelands.** *Combined impacts of both regions, on NSW economy*[a]
Output[b] **($m)**	**2,129.7**	**699.7**	**3,449.0**
Direct ($m)	1,013.5	285.6	1,248.7
Production-induced ($m)	487.8	245.3	1,140.9
Consumption-induced ($m)	467.0	168.7	1,059.5
GRP ($m)	**1,014.2**	**299.4**	**1,548.6**
Direct ($m)	433.9	101.1	484.6
Production-induced ($m)	306.3	104.7	483.4
Consumption-induced ($m)	274.0	93.6	580.6
Household Income ($m)	**467.5**	**156.3**	**804.8**
Direct ($m)	155.2	47.2	202.4
Production-induced ($m)	177.7	62.9	298.9
Consumption-induced ($m)	134.6	46.1	303.5
Employment (total)[c]	**5,375**	**2,027**	**8,627**
Direct (total to point of sale of primary processed products)	1,917	852	2,769
Production-induced (total)	1,765	605	2,541
Consumption-induced (total)	1,693	570	3,316

a - Direct and indirect impacts in NSW as a whole are greater than the sum of the two regions as some flow-on impacts occur outside of the regions

b - Total output for combined sectors may be lower than the sum of output for individual sectors as it excludes transfers between sectors to prevent double counting.

c – Employment is discussed in more detail in the next section; the data here show employment disaggregated by production-induced and consumption-induced effects for simplicity of presentation.

Employment

This section examines the employment generated by the softwood plantation industry in the South West Slopes and Central Tablelands. This section provides a brief summary of key findings. This is followed by more detailed examination of the direct employment generated in the industry, with direct employment first defined, followed by analysis of the number of jobs generated directly in different regions, different local government areas, and different sectors of the industry. This is followed by examination of the flow-on jobs generated in other industries as a result of the activity generated by the forest industry.

The softwood plantation industry generated a total of 1,917 direct jobs and a further 3,458 flow-on jobs in the South West Slopes in 2016, with a total of 5,375 direct and flow-on jobs generated up to and including the point of primary processing. In the Central Tablelands, the industry generated 852 direct jobs and a further 1,175 flow-on jobs, with a total of 2,027 direct and flow-on jobs in the Central Tablelands. In addition to the flow-on employment generated in each region by the plantation industry, a further 1,407 flow-on jobs were generated in other parts of NSW as a result of (i) the demand created by the South West Slopes and Central Tablelands softwood plantation industry for supplies and inputs such as fuel and mechanical servicing, and (ii) spending of salaries and wages by workers.

In addition to employment generated up to primary processing by softwood plantations, a small number of additional jobs are generated based on native forests. These were not examined in this report. Beyond primary processing, 149 jobs were generated in secondary processing in the South West Slopes in 2016, and 219 jobs in the Central Tablelands. Not all of these will depend on the softwood plantations, and the proportion that depend on softwood plantations grown in the region versus on wood and fibre from other sources is unknown.

Direct employment

This section examines the employment generated directly by softwood plantations in the South West Slopes and Central Tablelands up to and including primary processing, including detailed examination of where jobs are located and some analysis of change over time.

Defining 'direct' employment

In this section, the industry's direct employment is defined as including:

- Primary production: Plantation managers, harvest and haulage contractors, nurseries growing seedlings for commercial plantations, and silvicultural contractors. Employment estimates are based on the direct survey of the industry undertaken for this project, unless otherwise stated.
- Primary processing: All types of manufacturing in which roundwood (logs) are processed into initial wood and paper products. All manufacturing on a site is included, even if initial wood or paper products are further processed into more complex products in a multiple-stage process. Employment estimates are based on the direct survey of the industry undertaken for this project, unless otherwise stated.
- Secondary processing: Further manufacturing of initial wood products into further products, for example processing of sawn timber into trusses and frames, or construction of wooden cabinetry such as kitchen cabinets. Employment estimates are based on data from the ABS

Census, as businesses in this part of the industry were not directly surveyed, and these jobs do not necessarily depend on softwood plantations grown in the region.

In addition to these three core parts of the industry, when comparing employment over time using ABS Census data, employment in timber and paper wholesaling is included in the total estimates (this is noted in the relevant tables).

Data on employment are presented based on a worker's place of residence (where they usually live), rather than based on their office location (where they work). This is done for two reasons. First, some forest industry workers have multiple work locations, rather than working from a single office: for example, harvest and haulage contractors will work in multiple locations in a given year. This means it is often easier to identify these types of workers based on their place of residence rather than the location of their work. Second, the wages and salaries earned by workers are typically predominantly spent in the communities they live in, rather than near their place of work. While many workers live and work in the same community, there are some who do not, and in these cases using their place of residence enables better estimation of the true economic impact of the industry, as it enables estimation of spending of wages and salaries by workers in the local government areas (LGAs) they live in.

Direct employment generated by the industry in 2016

As shown in Table 3, up to the sale of primary processed products, the softwood plantation industry generated 1,917 direct jobs in the South West Slopes and 852 direct jobs in the Central Tablelands in 2016. 'Direct' jobs include jobs that depend on the presence of the industry, in nurseries, silvicultural contracting, harvest and haulage of logs to processors, and processing of logs and residues into wood and paper products. They do not include jobs generated in mechanical services, fuel supply, or supply of other goods and services to the industry, which are included in flow-on employment. The majority of jobs – two thirds – are generated in the processing of wood and paper products, while just over 30% are generated by the growing and harvest of plantations. This highlights the importance of establishment of local processing facilities to generating regional economic activity from the industry. The industry also generates a large number of 'flow-on' jobs, described in detail in the next section, with the total number of jobs generated by softwood plantations increasing to 6219 in the South West Slopes and 2408 in the Central Tablelands once flow-on jobs were included.

More than 90% of the direct jobs generated by the industry are located within the two regions, largely due to the establishment of multiple wood and paper processing facilities in the region. As well as generating employment locally, the jobs of some people living in other regions depend on the softwood plantations of the South West Slopes and Central Tablelands.

Employment by local government area

Most of the jobs generated by the industry are located in just a few local government areas (LGAs). To understand how dependent an LGA is on the industry, it helps to examine both the total number of jobs generated, and also the overall proportion of jobs 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. To do this, we identified the proportion of the *employed workforce* in each LGA that was employed directly in the softwood plantation industry.

Table 3 Direct employment generated by the softwood plantation industry, 2016

	South West Slopes		Central Tablelands	
Industry sector	**TOTAL direct employment**	**Jobs located in the region (persons)**	**TOTAL direct employment**	**Jobs located in the region (persons)**
Growers (forest management companies)[1]	174	153	71	70
Nurseries, silvicultural & roading contracting businesses	117	79	36	22
Harvest & haulage contracting businesses	341	318	98	88
Wood and paper processing[2]	1261	1199	620	616
Other (including consultants, equipment sales, training)2	24	21	27	21
TOTAL direct employment	**1917**	**1770**	**852**	**817**
Flow-on (indirect jobs)	4302[3]	3458	1556[3]	1175
TOTAL direct + flow-on employment	**6219**	**5228**	**2408**	**1992**

[1]Data includes some jobs in nursery sector where a grower had an integrated nursery operation
[2]The jobs generated in these sectors includes people involved in wholesaling of products produced by these processors.
[3]This estimate includes all jobs generated in NSW as a result of flow-on effects of the activities of the softwood plantation industry in the South West Slopes and Central Tablelands; see Appendix 1 for further detail

Workers are analysed based on their LGA of residence, rather than their place of work. In other words, a worker employed at a Snowy Valleys wood processor who lives in Albury is counted in the LGA of Albury. Workers are counted based on where they live, rather than where they work, because most of their spending and other social and economic activity will occur in the community they live in, rather than the one they work in.

In the South West Slopes (Table 4), jobs were concentrated in the Snowy Valleys Council in 2016 (833 jobs in the area previously forming Tumut Shire and 234 in the previous Tumbarumba Shire), with another 240 in the Bombala region of Snowy-Monaro Regional Council, 229 living in Albury and 175 in Wagga Wagga. Close to 1 in 5 jobs in Snowy Valleys Council, and in the Bombala part of Snowy Monaro Regional Council, were generated directly in the industry. The softwood plantation workforce made up a small part of the overall large workforce of the two regional cities of Albury and Wagga Wagga. In the Central Tablelands (Table 5), the largest numbers of workers lived in Oberon (417) and Bathurst (260). Many of those who live in Bathurst, Lithgow, Orange and Cabonne are employed in Oberon and commute from towns in these LGAs to work in Oberon, with the major processors established in Oberon providing a large proportion of the employment generated in all LGAs in the Central Tablelands region. In Oberon, a smaller LGA with a workforce of 2,244 people in total in 2016, just under 19% of the workforce was directly employed in the forest industry. In Bathurst, a large regional city with a workforce of more than 18,000 in 2016, the industry's workforce made up a relatively small proportion of the overall workforce (1.4%).

Table 4 Direct employment generated by the South West Slopes softwood plantation industry, 2016, by local government area

Local government area name (2017)	**Local government area name prior to council mergers (if applicable)**	**Employed in establishing, managing, harvesting softwood plantations *(nurseries, managers, silvicultural contractors, harvest & haulage)***	**Employed in primary processing dependent on softwood plantations (wood or paper)**	**Total number of people directly employed in the softwood plantation industry (excluding secondary processing)**	**Employed labour force, 2011**	**Employed labour force, 2016**	**% employed labour force employed directly in the plantation industry** *2016 data used wherever available; 2011 data used for LGAs that no longer existed in 2016*[3]
City of Albury[1,2]		32	197	229	22433	22901	1.0%
City of Wagga Wagga		15	160	175	29070	29834	0.6%
Greater Hume Shire		22	19	41	4559	4610	0.9%
Cootamundra-Gundagai Regional Council	*Gundagai Shire Council*	*12*	*5*	*17*	*1682*	*N/A*	1.0%
	Cootamundra Shire	*0*	*0*	*0*	*2786*	*N/A*	0.0%
	Total	12	5	17	4468	4376	0.4%
Snowy-Monaro Regional Council	*Bombala Shire*	*122*	*118*	*240*	*1092*	*N/A*	22.0%
	Cooma-Monaro Shire	*1*	*0*	*1*	*4486*	*N/A*	0.0%
	Snowy River Shire	*0*	*0*	*0*	*3870*	*N/A*	0.0%
	Total	122	118	240	9448	9860	2.4%
Snowy Valleys Council	*Tumbarumba Shire*	*80*	*154*	*234*	*1,446*	*N/A*	16.2%
	Tumut Shire[2]	*287*	*546*	*833*	*4,858*	*N/A*	17.1%
	Total	367	700	1067	6304	5990	17.8%
South West Slopes – all workers living in region		570	1199	1769	76282	77571	2.3%
Nearby LGAs (Bega, Narrandera, Yass, Wodonga)		40	40	80	N/A	N/A	N/A
Employment located in other regions		46	22	68	N/A	N/A	N/A
South West Slopes – all workers dependent on plantations grown in region		**656**	**1261**	**1917**	**N/A**	**N/A**	**N/A**

[1] Note that this does not include workers who live in Wodonga; approximately 50 workers employed in Albury live in Wodonga and are recorded in 'nearby LGAs'. The data shows workers based on their place of residence, rather than their place of work (most workers live in the same LGA they work in). Data is also presented using LGA boundaries that existed prior to the mergers of LGAs that began in 2016. This enables more precise identification of where workers are located.

[2] In the first edition of this report, employment in Albury was estimated as having 70 fewer jobs and employment in Tumut as having 70 more jobs. Subsequent checking with key employers identified that 70 workers who were employed in Tumut had erroneously been reported as living in Tumut when they in fact lived in Albury.

[3]Data source: ABS 2011, 2016 *Census of Population and Housing,* data obtained from TableBuilderPro Place of Usual Residence database.

Table 5 Direct employment generated by the Central Tablelands softwood plantation industry, 2016, by local government area

Local government area name (2017)	**Local government area name prior to council mergers (if applicable)**	**Employed in establishing, managing, harvesting softwood plantations *(nurseries, managers, silvicultural contractors, harvest & haulage)***	**Employed in primary processing dependent on softwood plantations (wood or paper)**	**Total number of people directly employed in the softwood plantation industry (excluding secondary processing)**	**Employed labour force, 2011**	**Employed labour force, 2016**	**% employed labour force employed directly in the plantation industry** *2016 data used wherever available; 2011 data used for LGAs that no longer existed in 2016*[1]
Bathurst Regional Council		70	190	260	17531	18166	1.4%
Blayney Shire Council		8	17	25	3113	3225	0.8%
Cabonne Council		9	10	19	6027	6028	0.3%
Lithgow City Council		4	39	43	8060	7797	0.6%
Oberon Council		102	315	417	2318	2244	18.6%
Orange City Council		8	45	53	17247	17812	0.3%
Central Tablelands – all workers living within region		201	616	817	54296	55272	1.5%
Nearby LGAs (Mid-Western Regional, Snowy Valleys)		9	0	9	N/A	N/A	N/A
Employment located in other regions		21	5	26	N/A	N/A	N/A
Central Tablelands – all workers dependent on plantations grown in region		**231**	**621**	**852**	**N/A**	**N/A**	**N/A**

[1]Data source: ABS 2011, 2016 *Census of Population and Housing,* data obtained from TableBuilderPro Place of Usual Residence database.

Flow-on employment

When flow-on impacts are included, a further 3,458 indirect jobs were generated in the South West Slopes and a further 1,175 indirect jobs in the Central Tablelands (Table 6), together with a further 1,407 jobs in other parts of NSW as a result of (i) the demand created by the plantation industry for supplies and inputs such as fuel and mechanical servicing, and (ii) spending of salaries and wages by workers. This high number of flow-on jobs is predominantly due to the presence of the large wood and paper manufacturing sector in the region, which generates substantial flow-on effects.

Economic modelling using the EconSearch RISE model identified that for every direct job generated by the industry in the South West Slopes a total of 2.8 jobs were created in the region through a combination of production-induced and consumption-induced effects; for every direct job generated in the Central Tablelands a total of 2.4 jobs were created in the region (see Table 6).

These multipliers are higher than those for some other regions and identified in past studies. This is likely to be due in part to increasing labour productivity in the industry, with output increasing relative to employment in the industry over time. As labour productivity grows, more inputs and support services will be demanded per direct job in forestry. With the regions having several mills that have invested in recent years in new technology and processes that increase labour productivity, the result is an increase in flow-on employment across the region per direct job in forestry, which explains an increase in the employment multiplier over time. Second, both regions are unusually self-contained compared to many other regions as they include major regional cities (Albury, Wagga Wagga, Bathurst, Orange) that supply the inputs and services to industry that would need to be imported by industry in other regions. This reduces 'leakage' of economic value to other regions and means a high proportion of flow-on effects are captured within each region. The highly integrated nature of the plantation industry also contributes to this.

Table 6 Employment multipliers: indirect employment generated by the South West Slopes plantation industry

		South West Slopes		Central Tablelands	
Type of multiplier	**Description**	**Multiplier estimate**	**Total employment**	**Multiplier estimate**	**Total employment**
None	Direct jobs only	1.0	1,917	1.0	852
Type I	Direct jobs + production-induced jobs	1.9	3,682	1.7	1,457
Type II	Direct jobs + production-induced jobs + consumption-induced jobs	2.8	5,375	2.4	2,027

The flow-on effects vary in size in different parts of the industry (see Appendix 1), with the largest flow-on effects generated by the processing of wood and paper products, and growing, harvest and haulage activities having smaller flow-on effects to the rest of the economy.

Direct employment in secondary processing

As explained earlier in this report, in addition to the employment generated up to the point of sale of primary processed products from softwood plantations, some employment is generated in each of the two regions in secondary processing. However, it is not possible to identify the proportion of these secondary processing jobs that rely on softwood plantations grown in the region.

In total, 149 secondary processing jobs were recorded in the South West Slopes in the 2016 Census[2], including:

- 54 in Wagga Wagga
- 46 in Albury
- 17 in Gundagai-Cootamundra
- 9 in Snowy-Monaro Regional
- 5 in each of Snowy Valleys and Greater Hume Shire

In the Central Tablelands, a total of 219 secondary processing jobs were recorded in the 2016 Census, including:

- 87 in Bathurst Regional
- 59 in Oberon
- 42 in Orange
- 24 in Lithgow
- 9 in Cabonne
- 3 in Blayney.

The Census data suggest that, consistent with other regions, the majority of secondary processing jobs are located in the major regional centres of each region. Most secondary processing jobs were in the category 'wooden structural fitting and component manufacturing', in which businesses use primary processed wooden products to make fittings such as wooden cupboards and cabinets, or to construct trusses and frames.

Employment over time

There is little information on how employment is changing in the softwood plantation industry over time. Few studies have estimated the employment generated by the industry in each region, and differences in definitions and methods used means the figures published in past studies are not always comparable.

The only data that give reliable insight into change over time are data from the ABS Census, which include information on the number of people employed in different industries. However, the ABS classifies the industry into specific categories that are not as distinct or comprehensive as those

[2] All data on secondary processing sources from the 2016 ABS Census, TableBuilderPro, calculated as sum of the following ANZSIC industry categories: Prefabricated wooden building manufacturing, Wooden structural fitting and component manufacturing, Other wood product manufacturing nec, Paper bag manufacturing, Paper stationery manufacturing, Sanitary paper product manufacturing, Other converted paper product manufacturing.

referred to elsewhere in this report. Employment in the forest industry is reported in the following categories by the ABS:

- ***Forestry:*** This industry category includes those involved in managing forest and plantations and some field workers employed in general forest/plantation management activities
- ***Logging:*** This industry category includes those employed in harvesting of trees, but excludes most employed in log haulage, meaning employment estimates are generally low compared to the full number of people who are employed by harvest and haulage contracting businesses
- ***Services to Forestry:*** This industry category includes a wide mix of activities including some silvicultural contractors, some nursery activity if it is specific to the industry, some consultants and experts providing advice or services such as surveying; this category typically underestimates total employment in these activities as businesses who operate in the forest industry and other industries are often not included in this category
- ***Wood Product Manufacturing***: This industry category includes a wide range of wood processing activities. These include several that involve 'primary processing' in which the processors typically uses harvested logs as an input (sometimes in combination with takng inputs such as woodchips from other mills) and produces basic product from them, for example production of woodchips, rough and dressed sawntimber, logs and poles, veneer, and composite wood products such as particleboard and medium density fibreboard. It also includes processors who primarily engage in secondary processing – in which primary products are further processed, for example rough sawn timber is constructed into pallets, other containers, frames, wooden joinery or cabinetry, or craft products, to name a few. A key distinction between primary and secondary processing is that primary processors typically rely on wood and fibre harvested from nearby forest and plantation, whereas secondary processors may import their wood and fibre inputs from a wider range of locations, including both Australian and international suppliers:
    - Primary processing categories include ***log sawmilling, wood chipping, timber resawing and dressing, veneer and plywood manufacturing*****,** and ***reconstituted wood product manufacturing*****.**
    - Secondary processing categories include ***prefabricated wooden building manufacturing, wooden structural fitting and component manufacturing,*** and ***other wood product manufacturing not elsewhere classified.***
- ***Pulp, paper and converted paper product manufacturing***: This category includes the manufacture of pulp, paper products and converted paper products such as paper based containers, boxes, sanitary products and paper bags. Similar to wood product manufacturing, some of these are primary processing activities that typically rely on use of logs and fibre grown within a short distance (particularly pulp production), while others may use products imported from a distance away to produce 'secondary' products.

In addition to the industry classifications listed above:

- Some jobs directly dependent on the forest industry are classified into other industries in Census data. In particular, many log haulage workers are classified as being part of the transport industry, and some workers do not provide enough information to classify them

into any of the industry categories. This means that Census data typically underestimate the total number of people employed in the industry.

- Some other classifications report on both jobs in the forest industry and in other industries. In particular:
    - **Timber wholesaling**: Employment in this industry category includes both people who wholesale logs and basic wood and fibre products, and those who wholesale highly processing wood products to the retail sector. Wholesalers include people who are engaged in selling timber products produced from Australian timber, and people who sell timber products imported from other countries
    - **Paper product wholesaling:** This category includes both people who sell paper products from local processors, and those who sell a wide range of paper products imported from other countries.
    - **Wooden furniture and upholstered seat manufacturing:** This category includes not only people who make wooden furniture, but also those who make seats and lounges with metal frames covered in upholstery, and re-upholsterers. A large part of the employment in this category is therefore not dependent on wood products.

In general, the industry classifications reported by the ABS cover a large part of the forest industry, but not all of it, and do not enable identification of the extent to which jobs rely on softwood plantations versus on native forest, or on locally grown wood and fibre versus product imported from other Australian regions or other countries.

Despite the limitations noted above, Census data do provide insight into how employment in the industry is changing over time. As shown in Table 7, between 2006 and 2016, the number of workers employed in the forest, wood and paper industries recorded in the Census fell in most local government areas in both the South West Slopes and Central Tablelands, with the exception of those in which there had been investment in either new processing facilities, or substantial expansion of existing facilities. Investment in expansion of processing in the South West Slopes – particularly in the Snowy Valleys and Snowy-Monaro LGAs – reduced the amount of employment decline, with forest industry employment declining in the South West Slopes region by 4.3% between 2011 and 2016, compared to a 12.0% decline in the Central Tablelands during the same period.

Table 7 Forest industry employment recorded in the ABS Census of Population and Housing over time

Region	Local government area name (2017)	Jobs in ***Forestry, Logging, Services to Forestry*** (broadly equivalent to 'establishing, managing, harvesting plantations in Table 4)					Jobs in ***Wood and Paper Product Manufacturing*** (primary and secondary processing)					Total forest industry dependent jobs recorded in Census (includes wholesaling)				
		2006	**2011**	**2016**	**Change 2006-2011[1]**	**Change 2011-2016[1]**	**2006**	**2011**	**2016**	**Change 2006-2011[1]**	**Change 2011-2016[1]**	**2006**	**2011**	**2016**	**Change 2006-2011[1]**	**Change 2011-2016[1]**
South West Slopes	City of Albury	23	12	20	-47.8%	66.7%	360	283	246	-21.4%	-13.1%	424	340	286	-19.8%	-15.9%
	City of Wagga Wagga	16	0	13			201	242	183	20.4%	-24.4%	251	303	233	20.7%	-23.1%
	Greater Hume Shire	5	3	10			109	45	29	-58.7%	-35.6%	116	56	49	-51.7%	-12.5%
	Cootamundra-Gundagai Regional Council	12	0	10			26	34	43	30.8%	26.5%	38	34	54	-10.5%	58.8%
	Snowy-Monaro Regional Council	98	78	74	-20.4%	-5.1%	60	75	91	25.0%	21.3%	158	163	181	3.2%	11.0%
	Snowy Valleys Council	270	213	260	-21.1%	22.1%	653	669	647	2.5%	-3.3%	948	903	908	-4.7%	0.6%
	South West Slopes region	**416**	**319**	**395**	**-23.3%**	**23.8%**	**1398**	**1362**	**1258**	**-2.6%**	**-7.6%**	**1919**	**1790**	**1713**	**-6.7%**	**-4.3%**
Central Table-lands	Bathurst Regional Council	78	90	102	15.4%	13.3%	288	210	198	-27.1%	-5.7%	372	325	316	-12.6%	-2.8%
	Blayney Shire Council	6	4	13			25	20	6	-20.0%	-70.0%	33	26	19	-21.2%	-26.9%
	Cabonne Council	0	6	3			23	25	9	8.7%	-64.0%	34	34	26	0.0%	-23.5%
	Lithgow City Council	11	11	17	0.0%	54.5%	80	46	40	-42.5%	-13.0%	104	67	57	-35.6%	-14.9%
	Oberon Council	81	81	70	0.0%	-13.6%	340	306	254	-10.0%	-17.0%	426	394	326	-7.5%	-17.3%
	Orange City Council	8	6	6			109	70	53	-35.8%	-24.3%	132	103	93	-22.0%	-9.7%
	Central Tablelands region	**190**	**208**	**206**	**9.5%**	**-1.0%**	**868**	**676**	**556**	**-22.1%**	**-17.8%**	**1105**	**945**	**832**	**-14.5%**	**-12.0%**

[1]Change was only calculated if the total workers was >10, as randomisation of numbers by the ABS means change below this threshold may not be meaningful

Working conditions

Successfully recruiting and maintaining a strong workforce can be challenging for a regionally-based industry, with many rural and regional areas having a relatively small labour force compared to larger urban areas. This section examines whether the forest industry is providing positive working conditions relative to other industries in the South West Slopes and Central Tablelands regions. The working conditions in the industry will influence the ability of businesses in the industry to both recruit new workers and to retain their existing workforce. Many factors are important to creating a positive working environment (see for example Mylek and Schirmer 2014, 2015). Two can be examined readily based on data from businesses in the industry, and the ABS Census: working hours, and income.

Working hours

All businesses in the two regions were asked to report on the proportion of their workforce working full-time, part-time and in casual positions as part of the survey of businesses. The majority of jobs were full-time, comprising 72% of workers employed in plantation growing businesses; 88% of harvest and haulage contractors; 93% of wood and paper processing workers, and 57% of silvicultural and nursery workers (Table 8). Overall, 88% of industry workers had full-time jobs[3], 2% worked part-time and 10% were casual workers. Casual work was more common than part-time, predominantly in growing, nursery and silvicultural businesses in which casual workers contribute to seasonal activities such as tree planting.

Table 8 Full-time, part-time and casual work in the softwood plantation industry, 2016-17 – industry survey results

	Full-time	Part-time	Casual
Growers	72%	3%	26%
Harvest and haulage contractors	88%	6%	6%
Processors	93%	1%	6%
Silvicultural contracting and nurseries	57%	0%	43%
Whole industry	**88%**	**2%**	**10%**

Data source: 2016-17 Industry Survey (South West Slopes and Central Tablelands). Data are reported for both regions together as results were almost identical for both regions, and some businesses operated in both regions.

This is consistent with data from the ABS Census, which also shows a predominance of full-time workers in most parts of the industry. Table 9 shows that in 2016 only 12% of forest industry workers were employed part-time, compared to 34% of the broader workforce in the South West Slopes and Central Tablelands[4].

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

[4] This is based on the information provided by employed people to the Census, and excludes those who were away from work, or who did not answer the relevant question on the Census.

Table 9 Proportion of workforce employed full-time and part-time, 2006-2016 – ABS Census of Population and Housing

Industry sector (ABS classification)	% workers employed full-time			% workers employed part-time		
	2006	2011	2016	2006	2011	2016
Forestry	88%	89%	89%	12%	11%	11%
Logging	93%	93%	89%	7%	7%	11%
Forestry Support Services	80%	75%	76%	20%	25%	24%
Wood product manufacturing	91%	91%	91%	9%	9%	9%
Pulp and paper manufacturing	90%	93%	90%	10%	7%	10%
Forest industry workforce	**90 %**	**88%**	**88%**	**10%**	**12%**	**12%**
Employed labour force (all industries)	68%	68%	66%	32%	32%	34%

Data source: ABS Census of Population and Housing, 2006, 2011. TableBuilderPro *Place of Usual Residence* database. Data are reported for both regions together as results were almost identical for both regions, and some businesses operated in both regions. Workers who were away from work or did not report their working hours were excluded from the analysis.

Census data were also analysed to identify whether many workers were working high numbers of hours per week. Working long hours (often defined as more than 49 hours per week) has been shown to contribute to negative health and wellbeing outcomes for many workers. Under-employment – working fewer hours than desired – can also have negative impacts for workers, however it is not possible to identify from Census data whether a worker was satisfied with the number of hours they were working.

Across the entire workforce of the South West Slopes and Central Tablelands, 17% of workers reported working 49 or more hours a week in 2016 (Table 10). In the forest industry, however, 27% of workers reported working 49 hours or more per week. This reflects both the relatively high proportion of people who work full-time in the industry, but also reflects long working hours being typical in some parts of the industry, due to shift work. These long hours can act as a disincentive to workers and reduce retention of workers.

Table 10 Working hours by industry sector, 2006-2016 – ABS Census of Population and Housing

Industry sector (ABS classification)	% workers who worked < 25 hours in week prior to Census			% workers who worked > 48 hours in week prior to Census		
	2006	2011	2016	2006	2011	2016
Forestry	7%	16%	13%	20%	20%	22%
Logging	7%	9%	10%	65%	66%	64%
Forestry Support Services	13%	18%	14%	20%	25%	20%
Wood product manufacturing	6%	8%	7%	24%	19%	21%
Pulp and paper manufacturing	6%	12%	12%	32%	34%	33%
Forest industry workforce	**7%**	**11%**	**11%**	**27%**	**26%**	**27%**
Employed labour force (all industries)	22%	25%	25%	20%	18%	17%

Data source: ABS Census of Population and Housing, 2006, 2011, TableBuilderPro *Place of Usual Residence* database. Data are reported for both regions together as results were almost identical for both regions, and some businesses operated in both regions. Workers who were away from work or did not report their working hours were excluded from the analysis.

Income

ABS Census data shows that forest industry workers in the South West Slopes and Central Tablelands regions generally earned higher incomes than the average for the region (Table 11): in 2016, only 12% of forest industry workers earned less than $649 per week, compared to 29% of all workers in the South West Slopes and Central Tablelands regions, and 46% earned $1,250 or more per week, compared to 32% of the overall employed labour force. Much of this difference is due to the higher rates of full-time work in the forest industry, which result in overall higher income per worker on average. To identify whether the wages/salaries paid in the forest industry are higher than average after taking hours of work into account, the proportion of full-time workers earned low and high income was compared (Table 12). While differences were smaller when comparing only full-time workers, there was a difference. Forest industry workers were less likely to earn low levels of income (6% of full-time forestry workers earned less than $649/week in 2016, compared to 12% of full-time workers across the workforce of the two regions), and more likely to earn high income compared to other workers in the same local government areas (50% compared to 43%).

Table 11 Income earned by workers, 2006-2016 – ABS Census of Population and Housing

Industry sector (ABS classification)	% all workers earning <$600/$649 per week			% all workers earning > $1299 or $1250 per week		
	2006 ($600/wk)	2011 ($600/wk)	2016 ($649/wk)	2006 ($1299/wk)	2011 ($1250/wk)	2016 ($1250/wk)
Forestry	21%	8%	9%	19%	37%	47%
Logging	11%	12%	6%	18%	48%	60%
Forestry Support Services	31%	16%	19%	24%	22%	46%
Wood product manufacturing	29%	15%	11%	12%	23%	33%
Pulp and paper manufacturing	10%	4%	4%	53%	70%	74%
Forest industry workforce	**25%**	**14%**	**12%**	**20%**	**34%**	**46%**
Employed labour force (all industries)	45%	32%	29%	14%	25%	32%

Data source: ABS Census of Population and Housing, 2006, 2011, TableBuilderPro *Place of Usual Residence* database. Data are reported for both regions together as results were almost identical for both regions, and some businesses operated in both regions. Workers who were away from work or did not report their working hours were excluded from the analysis.

Table 12 Income earned by full-time workers, 2006-2016 – ABS Census of Population and Housing

Industry sector (ABS classification)	% full-time workers earning <$600 per week			% full-time workers earning > $1299 or $1250 per week		
	2006	2011	2016	2006 ($1299/wk)	2011 ($1250/wk)	2016
Forestry	17%	5%	8%	19%	39%	53%
Logging	8%	6%	2%	17%	49%	63%
Forestry Support Services	19%	9%	5%	29%	39%	63%
Wood product manufacturing	27%	11%	7%	12%	23%	35%
Pulp and paper manufacturing	5%	4%	2%	58%	73%	80%
Forest industry workforce	**21%**	**9%**	**6%**	**21%**	**37%**	**50%**
Employed labour force (all industries)	29%	15%	12%	18%	34%	43%

Data source: ABS Census of Population and Housing, 2006, 2011, TableBuilderPro *Place of Usual Residence* database. Data are reported for both regions together as results were almost identical for both regions, and some businesses operated in both regions. Workers who were away from work or did not report their working hours were excluded from the analysis.

Workforce diversity and sustainability

To be sustainable over time, every industry needs to successfully recruit and retain workers. This section examines whether the forest industry is successfully recruiting workers from all parts of the labour force, and whether forest industry businesses in the South West Slopes and Central Tablelands find it easy or difficult to recruit workers.

Gender

The forest industry in Australia has traditionally predominantly employed men, with relatively few women working in the industry (ABARES 2015). In 2016-17, results of the industry survey showed employment of women was highest amongst forest management companies (growers), where 17% of workers were female, and in silvicultural contracting and nursery worker (15%). Only 8% of harvest and haulage contractors were female, and 10% of those employed in wood and paper processing (Table 13). This suggests the industry is not successfully accessing the female labour force in the South West Slopes and Central Tablelands regions.

Analysis of Census data suggests that there has not been substantial change in this gender composition of the workforce over time, with little growth in the proportion of the forest industry workforce who are female (Table 14). As of 2016, 48% of the labour force in the South West Slopes and Central Tablelands regions was female, a 2% increase since 2006. In the forest industry workforce, female representation in the workforce did not change over the same period, at 16% in both 2006 and 2016. The factors affecting female participation in the industry need to be better understood and addressed to enable the industry to more successfully recruit from the large proportion of the workforce that is female.

Table 13 Workforce characteristics: gender (2016-17 Industry survey)

	Male workers	Female workers	Full-time men	Full-time women	Part-time/ casual men	Part-time/ casual women
Growers	83%	17%	83%	17%	83%	17%
Harvest and haulage contractors	92%	8%	92%	8%	91%	9%
Processors	90%	10%	91%	9%	80%	20%
Silvicultural contractors and nurseries	85%	15%	88%	12%	81%	19%
Whole industry	89%	11%	90%	10%	82%	18%

Data source: 2016-17 survey of South West Slopes and Central Tablelands softwood plantation businesses

Table 14 Workforce by gender composition, 2006-2016 – ABS Census of Population and Housing

	% male			% female		
Industry sector (ABS classification)	**2006**	**2011**	**2016**	**2006**	**2011**	**2016**
Forestry	89%	87%	82%	11%	13%	18%
Logging	92%	91%	91%	8%	9%	9%
Forestry Support Services	87%	80%	75%	13%	20%	25%
Wood product manufacturing	83%	87%	85%	17%	13%	15%
Pulp and paper manufacturing	86%	90%	89%	14%	10%	11%
Forest industry workforce	**84%**	**85%**	**84%**	**16%**	**15%**	**16%**
Employed labour force (all industries)	54%	53%	52%	46%	47%	48%

Data source: ABS Census of Population and Housing, 2006, 2011, TableBuilderPro *Place of Usual Residence* database.
Data are reported for both regions together as results were almost identical for both regions, and some businesses

operated in both regions. Workers who were away from work or did not report their working hours were excluded from the analysis.

Age

Australia's workforce is ageing, as is the population overall. Between 2006 and 2016, the forest industry workforce had a relatively similar age distribution to the rest of the workforce in the South West Slopes and Central Tablelands region, although prior to 2016 the industry had fewer workers aged 55 and older compared to the average for the workforce as a whole (16% in 2011, compared to 20% for the workforce as a whole) (Table 15). By 2016, the forest industry had slightly fewer workers aged under 35 than the broader workforce (31% compared to 35%), and a similar proportion aged 55 and older (22% compared to 23% in the broader workforce). Overall, this suggests that as of 2016 the forest industry workforce was not substantially older than was typical for the South West Slopes and Central Tablelands regions as a whole; however, the workforce was ageing at a more rapid rate than other industries, having previously had fewer workers aged 55 and older than other industries in the region.

Table 15 Workforce by age, 2006-2016 – ABS Census of Population and Housing

Industry sector (ABS classification)	% aged < 35 years			% aged 55 and older		
	2006	2011	2016	2006	2011	2016
Forestry	36%	30%	30%	16%	17%	23%
Logging	36%	34%	27%	12%	17%	26%
Forestry Support Services	36%	29%	32%	20%	22%	15%
Wood product manufacturing	40%	35%	32%	11%	15%	22%
Pulp and paper manufacturing	28%	28%	25%	11%	15%	23%
Forest industry workforce	**37%**	**33%**	**31%**	**12%**	**16%**	**22%**
Employed labour force (all industries)	37%	35%	35%	17%	20%	23%

Data source: ABS Census of Population and Housing, 2006, 2011, TableBuilderPro *Place of Usual Residence* database. Data are reported for both regions together as results were almost identical for both regions, and some businesses operated in both regions. Workers who did not complete this question on the Census were excluded from the analysis.

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 South West Slopes and Central Tablelands regions (Table 16), and increased between 2006 and 2016.

Table 16 Aboriginal and Torres Strait Islander participation in workforce, 2006-2016 – ABS Census

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

Data source: ABS Census of Population and Housing, 2006, 2011, TableBuilderPro *Place of Usual Residence* database. Data are reported for both regions together as results were almost identical for both regions, and some businesses operated in both regions. Workers who did not complete this question on the Census were excluded from the analysis.

Recruiting workers and contractors

Forest industry businesses were asked how easy or difficult they found it to recruit workers and contractors. They were then asked what factors contributed to difficulty recruiting workers. The types of staff that were most challenging to recruit were managers and high level professional staff (Figure 2), with 94% of businesses reporting difficulty recruiting these types of workers. This was followed by transport workers, with 67% finding it difficult to recruit staff. Sixty two per cent found it challenging to source finance/book keeping staff, and only 23% found this easy. Sixty per cent found it difficult to source skilled machinery operators, and the remainder found it 'neither difficult or easy'. Recruiting field staff was somewhat easier, although 33% still found this difficult. Most businesses found it relatively easy to source administrative workers.

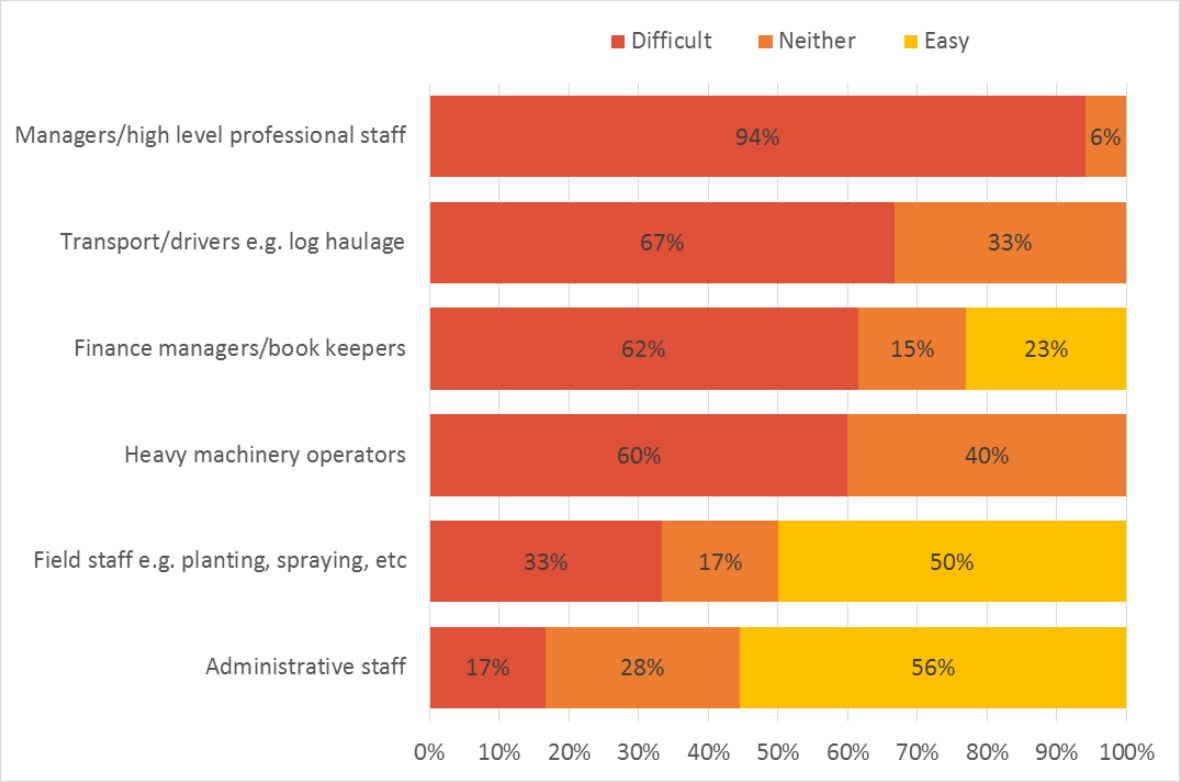

Figure 2 Level of difficulty involved in recruiting different types of workers, as rated by forest industry businesses

When plantation managers were asked about accessing skilled contractors, most reported finding it easy to source skilled contractors in the areas of harvest, haulage, roading and earthmoving, nurseries and pruning. Silvicultural contractors who undertake site preparation, planting, spraying and fertilising were more difficult to source (Figure 3).

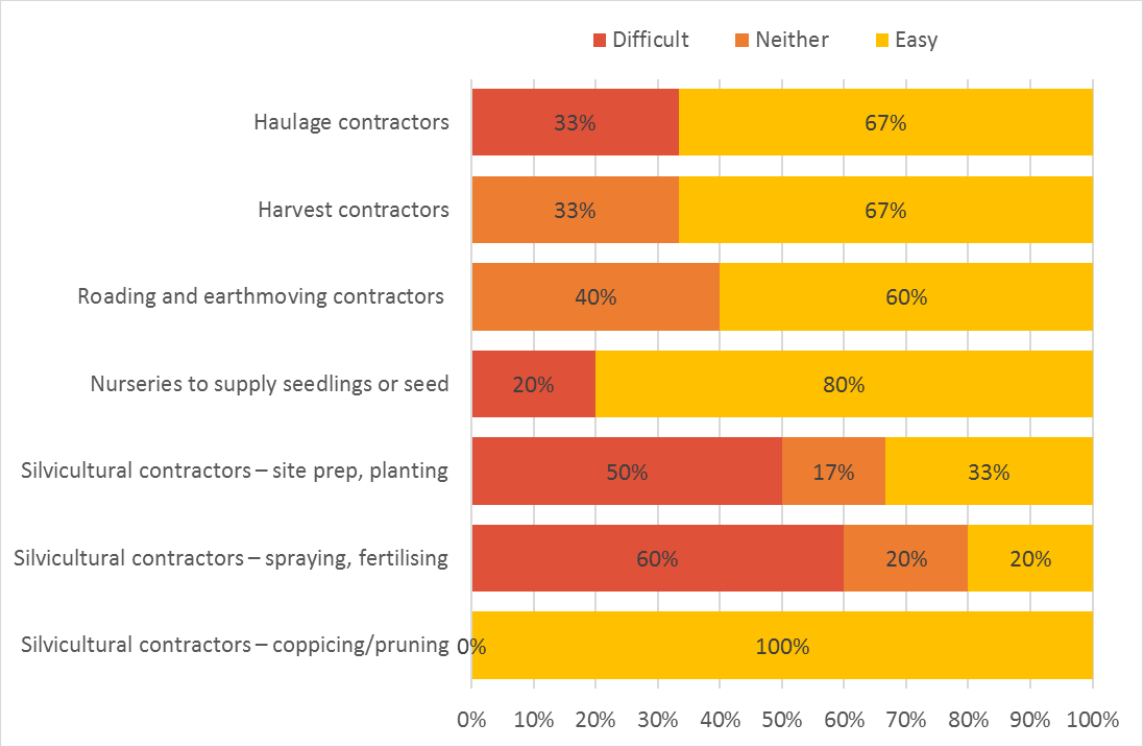

Figure 3 Level of difficulty involved in recruiting different types of contractors, as rated by South West Slopes businesses involved in engaging contractors

When asked what factors made it difficult to recruit staff, a lack of available workers with appropriate skills was the top issue identified by businesses, with 85% reporting that this was a big issue for them (Figure 4)[5]. For 80%, the investment and time required to build workforce skills was a big issue, while 65% reported there was a lack of local workers with skills needed by their business. In many cases (60% of businesses), skills obtained in other industries were not easily transferable to the softwood industry, reducing the ability of businesses to recruit workers from other industries.

Almost two-thirds (65%) of businesses reported that a key challenge was workers not wishing to shift to the community their employer was based in. Related to this, 58% reported that a lack of employment opportunities for partners/spouses of workers in the local region affected their ability to recruit workers.

Less than 36% of businesses reported that competition from other industries on wages or working conditions, negative perceptions or lack of confidence in the industry, or lack of affordable accommodation, were issues for recruitment.

[5] As results were almost identical for businesses in the South West Slopes and Central Tablelands regions, and some businesses operating across both regions answered the questions for both regions simultaneously, findings have been combined for the two regions.

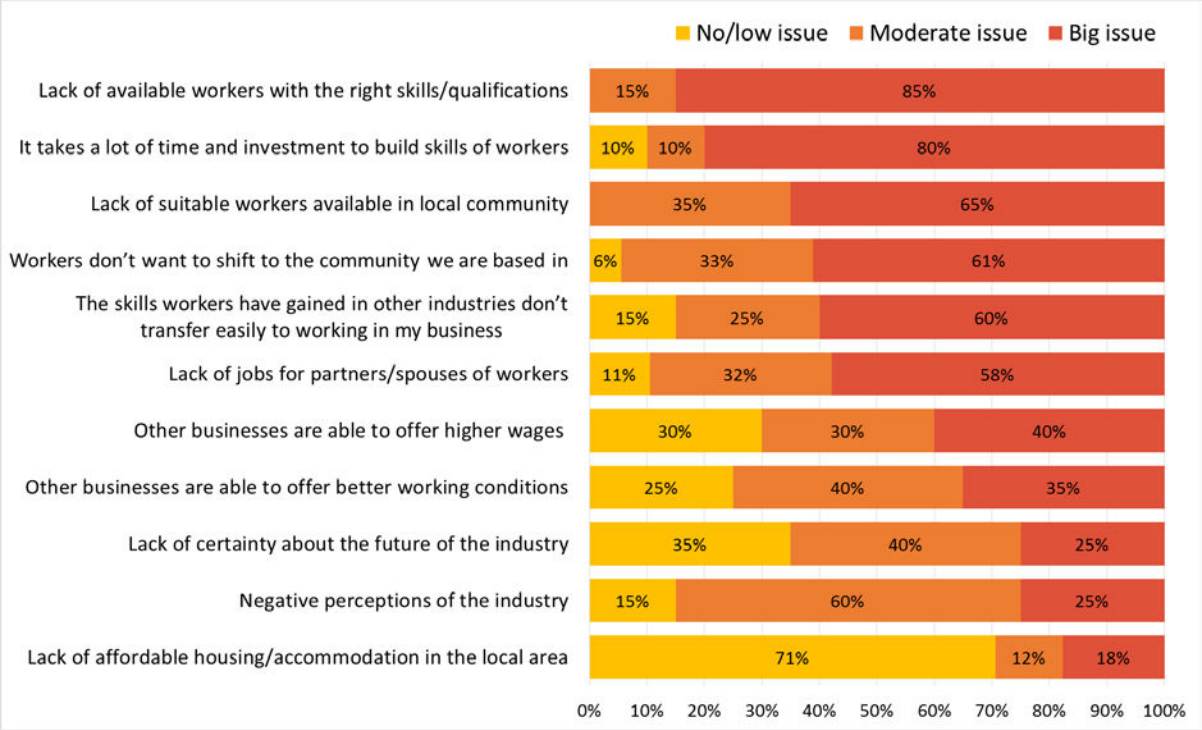

Figure 4 Key issues preventing recruitment of skilled workers into the South West Slopes and Central Tablelands softwood plantation industry

Recruiting skilled managers and professional staff, transport workers, finance managers and heavy machinery operators is difficult for many businesses in both the South West Slopes and Central Tablelands regions, suggesting a critical need to address the challenges that are causing a lack of skilled staff. These challenges include a lack of suitably skilled local workers, the high cost of in-house training of staff, and difficulty attracting skilled workers from elsewhere to live in these regions.

Industry skills and training needs

This section examines the skills and training needs of the forest industry in the South West Slopes and Central Tablelands. The softwood plantation industry needs workers with a diverse range of skills. Workers in the industry include experts in breeding trees to produce optimal fibre characteristics; nursery growers; skilled machinery operators; operational managers able to optimise complex plantation establishment, management and harvest schedules; engineers and chemists able to manage processing operations to produce composite wood products and pulp and paper and finance and administration professionals. The specialised skills required in the workforce are evolving over time as the technologies used in the industry evolve in areas as diverse as plantation management, harvest, haulage and wood and paper processing.

Forest industry businesses were asked what types of skills were needed by their workforce, whether they required workers to have formal accreditation in these skills, and how they currently provided training. Note that the data captured in the survey did not identify the total number of workers requiring skills within each business (for example, how many heavy machinery operators a business needed if they identified they had a need for this). Table 17 shows the proportion of businesses reporting that some or all of their workers required skills in each of twelve competency areas, and the proportion who required formal accreditation of these skills. Businesses most commonly reported needing workers with general skills that are relevant to many types of businesses: occupational health and safety training, and business and financial management, with 86% of businesses reporting a need for skilled workers in these areas, and 64% requiring some kind of formal accreditation of staff. Businesses that did not report a need for these skills were generally smaller-sized contracting businesses (harvest, haulage and silvicultural).

The next most common skills needed by businesses were heavy machinery operating skills, compliance training (e.g. training in meeting compliance standards of regulatory or certification authorities), and fire-fighting, required by between 77% and 82% of businesses, with formal accreditation required by 59% to 64%.

Training in ICT products specialised to the industry was needed by 64% of businesses (least commonly by processors and silvicultural contractors); however, few businesses required workers to have formal accreditation in these skills, with the exception of some processors.

Other skills were needed by a smaller proportion of businesses, with some being specialised to particular parts of the industry. For example, processors did not typically require forest operations planning and management or forest ecology and silviculture, while these were important skills for growers, silvicultural contractors, and for many harvest and haulage contractors. Road transport and driver training was most important for harvest and haulage contractors, although it was also important to many others in the industry.

Table 17 Skills and accreditation needs reported by softwood plantation businesses in the South West Slopes and Central Tablelands

	All businesses (includes silvicultural contractors)		**Growers**		**Harvest and haulage contractors**		**Processors**	
	Need skills	Require accred-itation	Need skills	Require accred-itation	Need skills	Require accred-itation	Need skills	Require accred-itation
Occupational health and safety training	86%	64%	100%	25%	83%	83%	100%	86%
Business and financial management	86%	64%	100%	25%	83%	67%	100%	100%
Heavy machinery operation	82%	59%	50%	50%	100%	83%	100%	57%
Compliance training	82%	64%	100%	50%	83%	67%	100%	86%
Fire fighting	77%	59%	100%	75%	83%	50%	86%	71%
Chainsaw and other hand-held machinery	64%	59%	100%	100%	50%	67%	57%	43%
IT/ software training specialised to the industry	64%	23%	100%	0%	83%	17%	71%	57%
Forest operations planning and management	50%	32%	100%	75%	100%	50%	14%	14%
Marketing/sales	45%	18%	100%	0%	17%	17%	57%	43%
Road transport/driver training for haulage drivers	50%	45%	25%	0%	83%	83%	43%	43%
Community relations/ engagement	41%	14%	100%	0%	33%	17%	43%	29%
Forest ecology and silviculture	27%	23%	100%	50%	33%	33%	0%	0%

Businesses were also asked to identify whether they delivered skills training in different competency areas via in-house training by other staff, in-house training by an expert, or training via a registered training organisation, and were able to select more than one of these (Table 18):

- Registered training organisations were most commonly used to provide training in hand-held machinery operation, occupational health and safety, and road transport and driver training; in some cases this was supplemented by in-house training
- Registered training organisations were also the most common methods for training in business and financial management, forest operations and management, heavy machinery operation, and fire fighting, although less than 75% of businesses used this formal training and many businesses opted for in-house training by other staff
- Compliance training was delivered through an RTO for just over half of all businesses, and as in-house training by other staff for most remaining businesses, suggesting opportunities for additional provision of training in this area through more formal mechanisms
- In-house training was more common than use of a registered training organisation for marketing/sales, IT/software training, and community relations/engagement.

Table 18 Types of training used to build staff skills

	Registered training organisation	In-house training by other staff	In-house training by expert
Chainsaw and other hand-held machinery (eg brushcutter, pruning)	93%	21%	0%
Road transport/driver training for haulage drivers	82%	18%	18%
Occupational health and safety training.	79%	37%	26%
Business and financial management	74%	32%	26%
Forest operations planning and management	73%	18%	9%
Heavy machinery operation	61%	39%	17%
Compliance training e.g. training in compliance needed for regulatory or certification bodies	56%	50%	17%
Fire fighting	53%	29%	24%
Forest ecology and silviculture including plant identification	50%	50%	0%
Marketing/sales	30%	50%	20%
Community relations/community engagement	22%	44%	11%
IT/ software training specialised to the industry e.g. for plant operation, in-field survey	21%	36%	36%

Formal skills attainment

Formal qualifications do not always reflect the skills of a given workforce, particularly in cases where skills have been learned on the job – for example, through in-house business training such as that identified in the previous section. Having a formal qualification does, however, provide an idea of the extent to which workers have skills that are formally recognised and thus able to be better transferred between workplaces and even industries. Formal educational attainment is also an

important indicator of the extent to which workers have foundational skills in literacy and numeracy that are widely recognised as critical to enabling workers to gain new skills and competencies through their working life (Skills Australia 2010). Engaging in formal educational attainment is also beneficial beyond enabling workers to attain specific competencies: the process of formal learning builds foundational learning, literacy and numeracy skills that enable workers to have the ability to more rapidly adapt to changing industry requirements, and which have been identified as critical to increasing the productivity of Australia's labour force into the future (Skills Australia 2010).

As of 2016, forest industry workers in most parts of the industry were less likely to have completed high school than those working in other industries (Table 19), although high school attainment rates grew at a similar rate in the forest industry as the overall workforce between 2006 and 2016 (and at a slightly faster rate between 2011 and 2016). 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 degree or other university qualification was higher than the average for those employed in forestry support services, but lower than average in all other parts of the industry. Low rates of high school attainment are a concern as they indicate many members of the workforce may have relatively poor literacy and numeracy skills. However, rates of certificate qualifications similar to the rest of the workforce suggest that numeracy and literacy skills may be achieved by many industry workers in ways other than completion of high school.

Table 19 Formal education attainment: rates of attainment of high school and post-school qualifications, 2006 to 2016

	% completed high school (Year 12 or equivalent)			% with no post-school qualification			% with Certificate qualification			% with Bachelor or postgraduate degree		
Industry sector (ABS classification)	**2006**	**2011**	**2016**	**2006**	**2011**	**2016**	**2006**	**2011**	**2016**	**2006**	**2011**	**2016**
Forestry	30%	39%	50%	59%	50%	41%	19%	23%	39%	18%	22%	22%
Logging	15%	20%	23%	60%	58%	58%	35%	37%	43%	2%	2%	10%
Forestry Support Services	28%	42%	58%	51%	54%	27%	31%	25%	29%	17%	15%	42%
Wood product manufacturing	28%	28%	33%	55%	52%	48%	37%	42%	48%	4%	3%	4%
Pulp & paper manufacturing	45%	47%	45%	33%	33%	29%	41%	42%	56%	15%	16%	15%
Forest industry workforce	31%	33%	39%	52%	48%	43%	35%	39%	47%	8%	8%	10%
Employed labour force (all industries)	44%	48%	53%	47%	42%	36%	29%	31%	43%	16%	19%	22%

Data source: ABS Census of Population and Housing, 2006, 2011, TableBuilderPro *Place of Usual Residence* database. Data are reported for both regions together as results were almost identical for both regions, and some businesses operated in both regions. Workers who did not complete this question on the Census were excluded from the analysis.

Business and market outlook

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.

Overall business conditions

Businesses were asked 'how would you describe business conditions for your business at the moment?' No businesses in either the South West Slopes or Central Tablelands reported that conditions were 'easier than usual'; 54% reported they were 'more challenging than usual' and 46% that they were 'about the same as usual'. This was similar in all parts of the industry: around half of businesses involved in growing, contracting and processing identified experiencing challenging conditions and half typical conditions.

Future business expectations

Businesses were asked how likely or unlikely it was that in the next year they would invest in new business systems or new capital equipment; reduce or increase their workforce; grow their business revenue or increase business profitability. As shown in Figure 5:

- 47% of businesses felt they were likely to grow their profitability, and 37% that revenue would grow, with only 21% and 16% respectively feeling their business was unlikely to achieve these two things in the next 12 months
- Most businesses felt their workforce would remain stable over the next 12 months, although there may be a slight reduction in the overall workforce as only 11% of businesses expected to increasing workforce size while 21% expected to reduce their number of workers
- Most planned to invest in their business: 68% were planning to invest in new capital equipment and 63% in new business systems, with few reporting that they were unlikely to invest in their business.

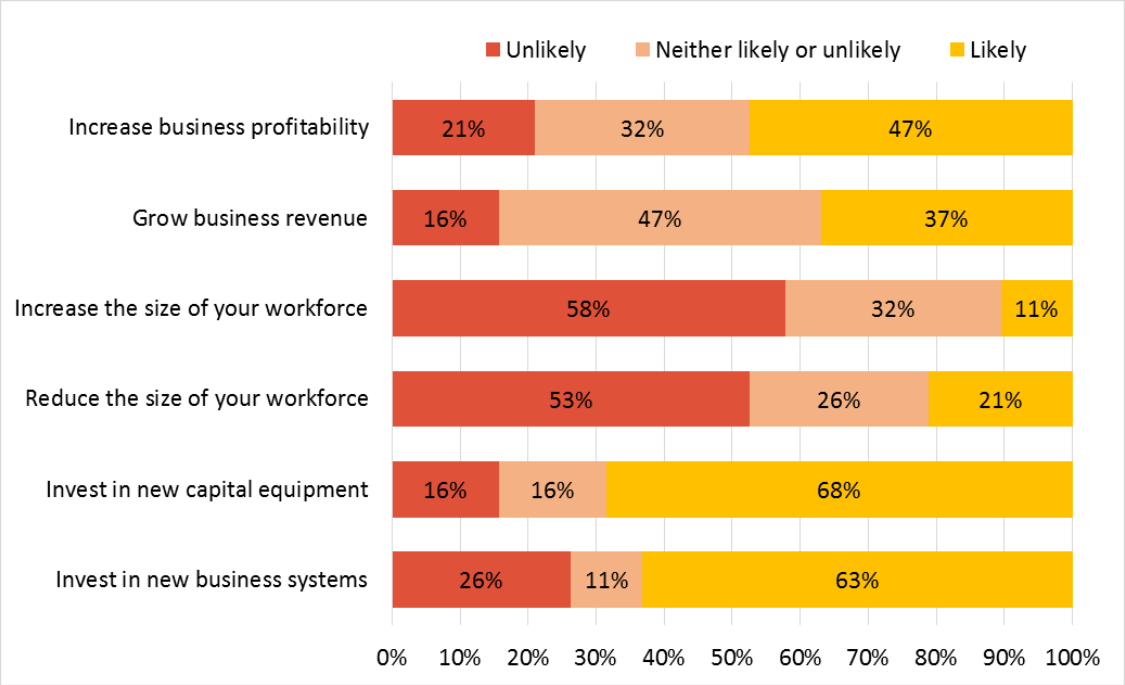

Figure 5 Expectations for business revenue, profitability, workforce size and investment over the next 12 months

Businesses were also asked whether they felt that, over the next 12 months, demand for their services or products were likely to grow, remain about the same, or shrink. Most (61%) felt demand would remain the same, a quarter (26%) that demand would grow and few (13%) that demand would reduce.

Businesses were asked what factors would enable them to invest more in their business. This question was either completed in the survey, or answered on the phone, with a total of 29 businesses providing their perspectives:

- Growers most commonly reported that having substantially increased demand for logs, and cheaper land to enable expansion of plantations in response to increased demand, would enable them to expand investment; increased demand was defined by one as being a guarantee of a market for logs at the end of the first rotation if they invested in expanding the area of plantations managed
- Harvest, haulage and silvicultural contractors most commonly identified having secure and longer term contracts as the factor affecting their ability to invest, with all respondents in these categories reporting that having better security of contracts would enable them to invest more in their business
- Processors reported a need for increased access to raw fibre (logs or residues from other processors), growth in market demand and market share, and need to reduce cost of inputs and transport. Cost related needs were particularly reported by those transporting logs from outside their region to feed into their mills with associated high transport costs.

Business challenges

Businesses were asked ‘what factors would trigger you to downsize or close your business?’ Answers to this question were very consistent and not surprisingly mostly related to demand for products or services, however some businesses also identified other potential challenges:

- Growers reported two key potential challenges: loss of demand for timber products, with any downturn in use of timber having a flow-through effect in the form of reducing demand for logs produced from their plantations; and loss of clients in the form of plantation owners seeking management services, an issue reported by the businesses who specialise in managing plantations on behalf of institutional owners[6]
- Contractors reported non-renewal of contracts as a key factors that would trigger downsizing or closure; a smaller number also mentioned changes in industrial relations, complexity of managing work health and safety regulations, and change in government policy regarding the forest industry as potential triggers
- Processors most commonly reported lack of fibre supply in the region as a factor likely to trigger downsizing, particularly lack of access to quality wood resources. This was a significant concern for several processors who reported that a critical need for them was a larger plantation resource established within an economic transport distance of their mill. Declining market conditions were the other common trigger for downsizing/closure identified, and this was associated with concern about the effects about increasing competition from imported products and growing costs of production, particularly electricity costs for some.

Businesses were then asked to rate the extent to which different factors had been a challenge or problems for their business in the last three years. Of the businesses who completed these questions, including the majority of large employers in the softwood industry in both regions, the most common challenges in the last three years were rising input costs, difficulty obtaining labour, and falling prices for goods and services, with around half of all businesses reporting these issues (Figure 6). Poor telecommunications and lack of industry investment were also challenges for a significant proportion (39% to 42%) of all businesses. Lack of industry investment meant different things to different businesses; based on responses to other parts of the survey, concerns about investment typically related to (i) growers wanting more investment in processing facilities that create enough demand to justify investment in expanding plantation areas, and (ii) processors seeking additional areas of plantation to be established to enable them to justify investing in additional processing capacity.

Rising input costs and rising costs of labour were more commonly reported by wood and paper processors than any other type of business. Poor telecommunications (poor access to internet and/or mobile phone reception), meanwhile, was not typically reported as a problem by processors, but was an issue for most growers and contracting businesses. When asked this question, some growers and contracting businesses described poor mobile phone reception, particularly in and around plantation areas, as limiting their ability to a range of devices in the field, as it was often not possible to readily capture and upload data (for example on plantation growth rates, soil characteristics, etc) in the field.

[6] Currently, many of the businesses managing plantations do not also own these plantations, but are professional management businesses who have been contracted by plantation owners (e.g. superannuation companies who have invested in an area of plantation, or small private plantation owners) to provide management services.

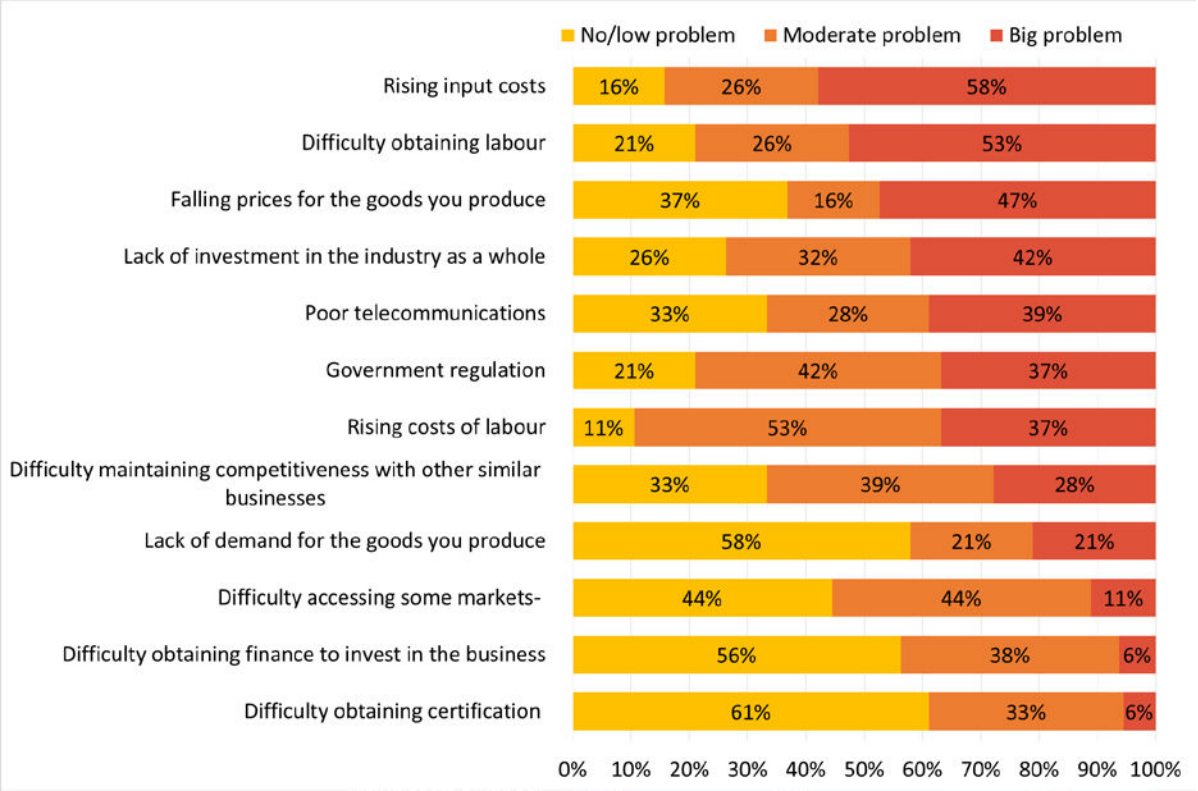

Figure 6 Challenges experienced by softwood plantation businesses in the South West Slopes and Central Tablelands

Community perceptions of the social, economic, service and infrastructure effects of the forest industry

To further evaluate the socio-economic effects of the forest industry in the communities in which it operates, residents living in communities across Australia, including the South West Slopes and Central Tablelands, were asked about (i) their overall views about quality of life and liveability of their community, and (ii) the extent to which they felt the different industries that operated in their region affected different social and economic aspects of their lives.

These questions were asked as part of the 2016 Regional Wellbeing Survey, a large-scale survey of 13,000 people living in rural and regional areas of Australia.

Quality of life and liveability

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. To identify whether the forest industry may be contributing to differences in these experiences, the following groups were compared:

- NSW residents – the views of those living in rural and regional areas (defined as all areas outside Sydney): a total of around 3,400 people from NSW participated in the survey[7]

[7] not all answered every question, and as such the 'n' changes slightly for different results presented below

- South West Slopes and Central Tablelands residents: a total of around 588 residents living in these two regions answered survey questions
- Those living in LGAs and towns of the South West Slopes and Central Tablelands with high forest industry dependence, defined as more than 10% of jobs directly dependent on the industry. This included residents of Snowy Valleys Council (Tumut, Tumbarumba), Oberon and Bombala: a total of around 140 residents participated in the survey
- Those living in LGAs and towns of the South West Slopes and Central Tablelands with low forest industry dependence, defined as less than 2% of jobs directly dependent on the industry. This included residents of Albury, Wagga Wagga, Greater Hume Shire, Bathurst, Blayney, Lithgow, Orange, Gundagai and parts of Snowy-Monaro Regional Council other than Bombala: A total of around 448 residents participated in the survey.

The analysis below compares experiences of those living in NSW as a whole, in the Central Tablelands and South West Slopes, and in communities within the South West Slopes and Central Tablelands with high and low forest industry dependence. This 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. For example, the communities with high dependence on the forest industry tend to have smaller overall populations, while regional cities such as Orange, Bathurst, Wagga Wagga and Albury have a large population and low dependence on the forest industry. Some of the differences between these communities is likely to be due more to their differences in overall population size than to the presence of the forest industry.

Overall, people living in the South West Slopes and Central Tablelands, and in communities within these regions with higher and lower dependence on the forest industry, were satisfied with the liveability of their community (Figure 7). Eighty eight per cent of those living in the two regions found their community a great place to live, identical to the average for all NSW residents, and 80% would recommend their community to others as a good place to live. Around half found living costs affordable, while only one in three felt their local roads were good quality, and one in five that there were plenty of jobs available.

Overall, there was little difference between the NSW average, the South West Slopes and Central Tablelands regions, and between communities with higher and lower dependence on the forest industry within these regions. Those living in communities with high dependence on the forest industry were slightly less satisfied with liveability, living costs and roads, but the differences were small and not statistically significant.

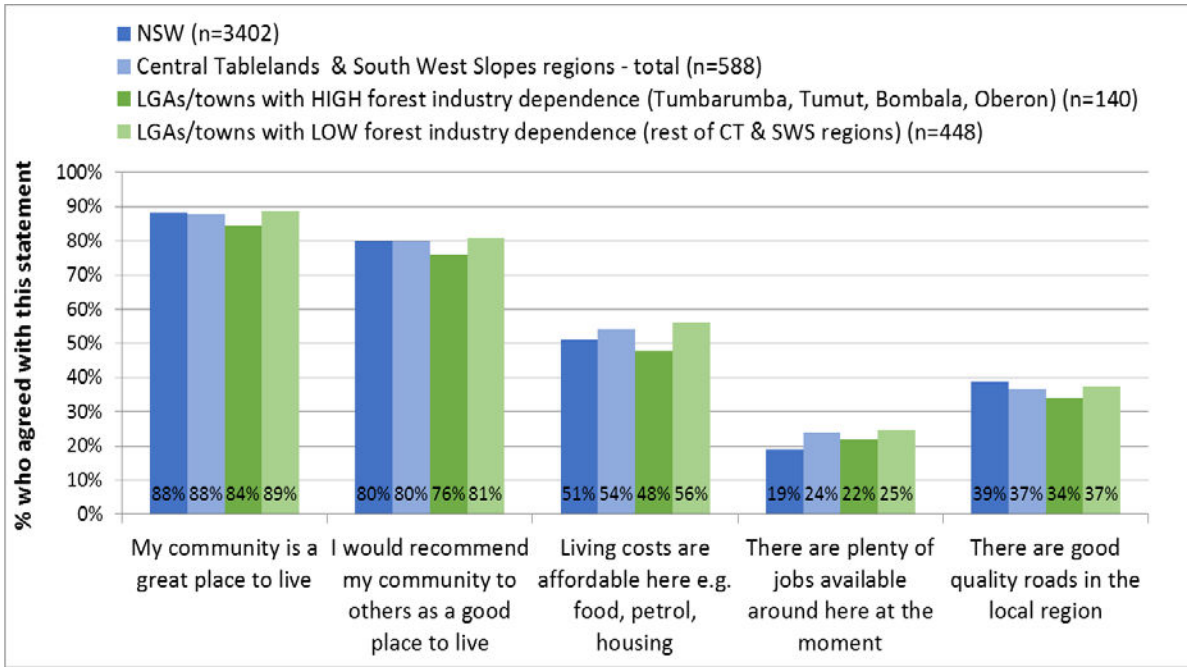

Figure 7 Perceptions of overall liveability and economy of local region – Regional Wellbeing Survey 2016

There were similar findings when resident's perceptions of the overall friendliness and safety of their community were examined (Figure 8). The large majority of people living in rural and regional areas of NSW, and in the South West Slopes and Central Tablelands regions, feel welcome in and part of their communities, and feel their community is a safe place to live; a minority feel there is a high crime rate in their community. Those living in communities with high dependence on the forest industry were less likely to report that there was a high crime rate in their community compared to the average for NSW or the rest of the South West Slopes and Central Tablelands regions. This is likely to reflect the smaller population size of most of these forest industry dependent communities, rather than to be linked to the presence of the forest industry: those living in regional cities such as Wagga Wagga, Bathurst and Orange are more likely to report concerns about crime than those living in smaller towns and rural areas, and the regional cities also tend to have only a small proportion of their workforce employed in the forest industry.

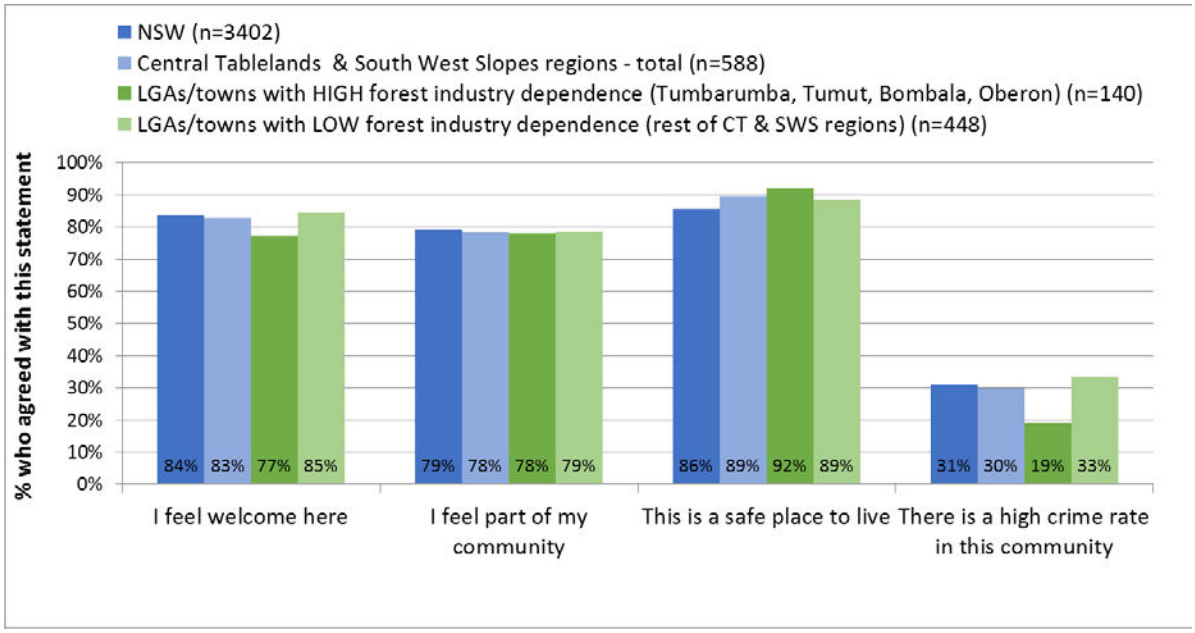

Figure 8 Perceptions of friendliness, safety and crime

When perceptions of local landscape aesthetics and environmental health were asked about (Figure 9), those living in more and less forestry dependent communities had similar (and highly positive) perceptions of their local landscape, with more than 90% stating that they liked the environment and surrounds they lived in, and 88% to 90% that there were attractive natural places in their community. Most felt environmental degradation was a big problem in their local region, despite finding the local landscape pleasant, indicating a high awareness that a visually pleasant landscape can still be one in which environmental degradation has occurred. Those living in communities with high dependence on the forest industry were less likely than those in other communities to feel there were attractive buildings and homes in their community, although a majority still agreed that there were (66% compared to 76% across all of NSW). Those living in communities with high dependence on the forest industry were slightly less likely to report concerns about water quality compared to those living in other regions in NSW (19% compared to 28%).

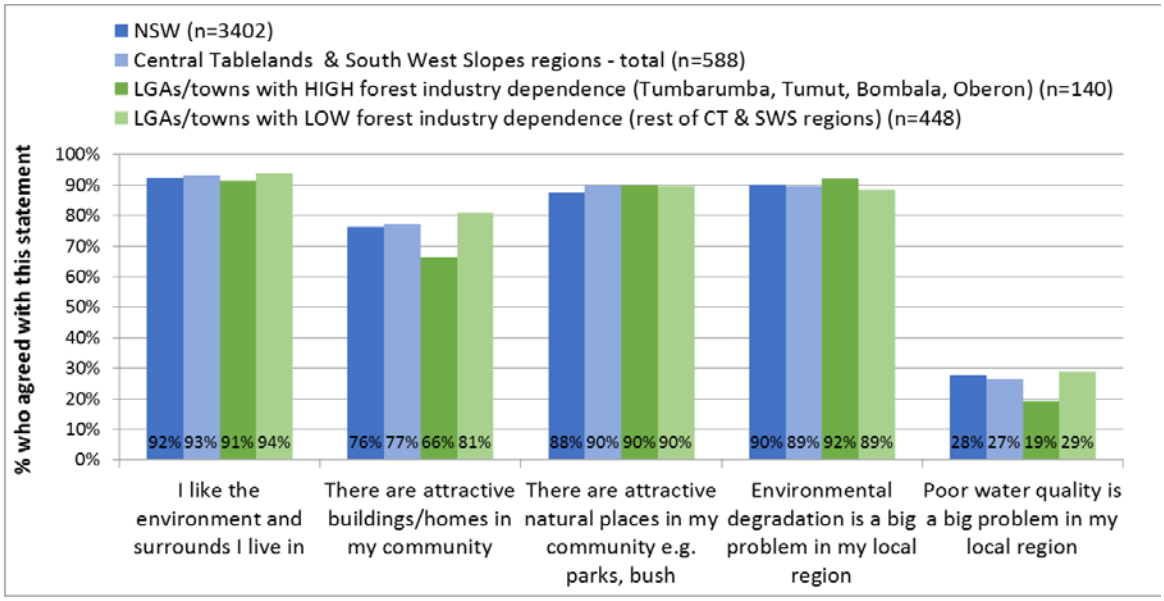

Figure 9 Perceptions of landscape aesthetics and environmental health

Overall, these results suggest that the overall perceptions residents have of the liveability of their communities are very similar for communities that have higher and lower economic dependence on the forest industry, and are mostly positive.

Perceptions of regional industries

After asking their overall perceptions of the liveability of their communities, residents were asked their views about how different local industries contribute to that liveability. In total, 475 residents living in the South West Slopes and Central Tablelands region answered questions about the socio-economic effects of different industries. This included 136 living in the Central Tablelands and 339 living in the South West Slopes. Of these, a total of 125 lived in local government areas or towns with high dependence on the forest industry for employment (defined as the LGAs of Oberon, Snowy Valleys and the Bombala part of Snowy-Monaro Regional Council), while the other 350 lived in LGAs in which less than 2% of jobs were directly dependent on the forest industry (including wood and paper processing).

As shown in Figure 10, 87% of those who lived in the parts of the South West Slopes and Central Tablelands in which a large proportion of jobs rely on the industry (Tumut, Tumbarumba, Bombala, Oberon) identified that the forest industry was important to their local community, compared to 27% of those living in other parts of the two regions. However, only 58% of those living in 'high forest industry dependence' communities identified that wood or paper product manufacturing was important to their local community, despite the majority of jobs in the industry in all of those communities being generated by the processing of wood and paper products. The other industries also commonly identified in 'high forestry dependence' areas were agriculture and tourism.

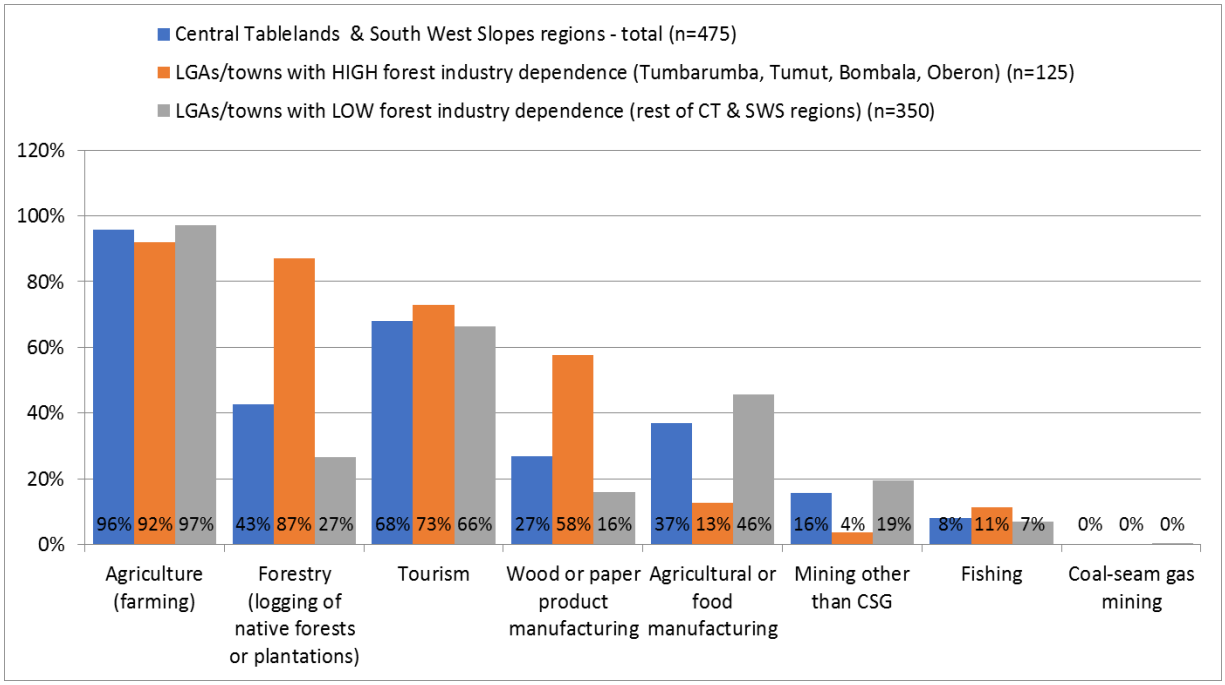

Figure 10 Proportion of residents who views the forest industry as an 'important industry' in their local community

Those who identified that each industry was important were then asked to rate 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.

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

In the South West Slopes and Central Tablelands, residents generally perceived the forest industry as having more negative and fewer positive effects than the farming and tourism industries (the other industries most commonly rated as being important to the local region) (Figures 11 and 12). This finding was usually stronger for those who lived in towns and local government areas with greater dependence on the forest industry, and less strong for those LGAs in the two regions in which fewer jobs depended on the industry (see Appendix 1).

The large majority of residents – 84% - felt the industry had positive impacts on local employment, while 40% felt it had a positive effect on friendliness of their local community. The most common concern about negative impacts was related to road impacts, with 76% believing the industry had a negative impact on the quality of local roads, and 70% that it had a negative impact on local traffic. Half (50%) felt the industry had a negative effect on bushfire risk, while 24% felt it had a positive effect; 47% felt it had a negative effect on attractiveness of the local landscape and 45% on health of the local environment, while 23% and 17% reported positive perceptions of the industry's impacts on local landscape aesthetics and environmental health.

The results suggest that the forest industry is not viewed as either being as important an industry as agriculture and tourism, or as having positive outcomes for many aspects of community life other than employment. These perceptions will not always reflect objective measures of outcomes such as bushfire risk or environmental health; however, perceptions reflect how residents experience an industry and view it. In particular, the results suggest a lack of connection by many residents with the industry, with fewer feeling the industry contributes to friendliness of the local community compared to the agriculture and tourism industries, despite most recognising the positive contributions the industry makes to jobs in the South West Slopes and Central Tablelands regions. Working to address concerns about traffic risk, road quality, bushfire risk, landscape aesthetics and environmental health, as well as to increase positive experiences of friendliness, can help address the less positive perception of the forest industry compared to agriculture and tourism in the region.

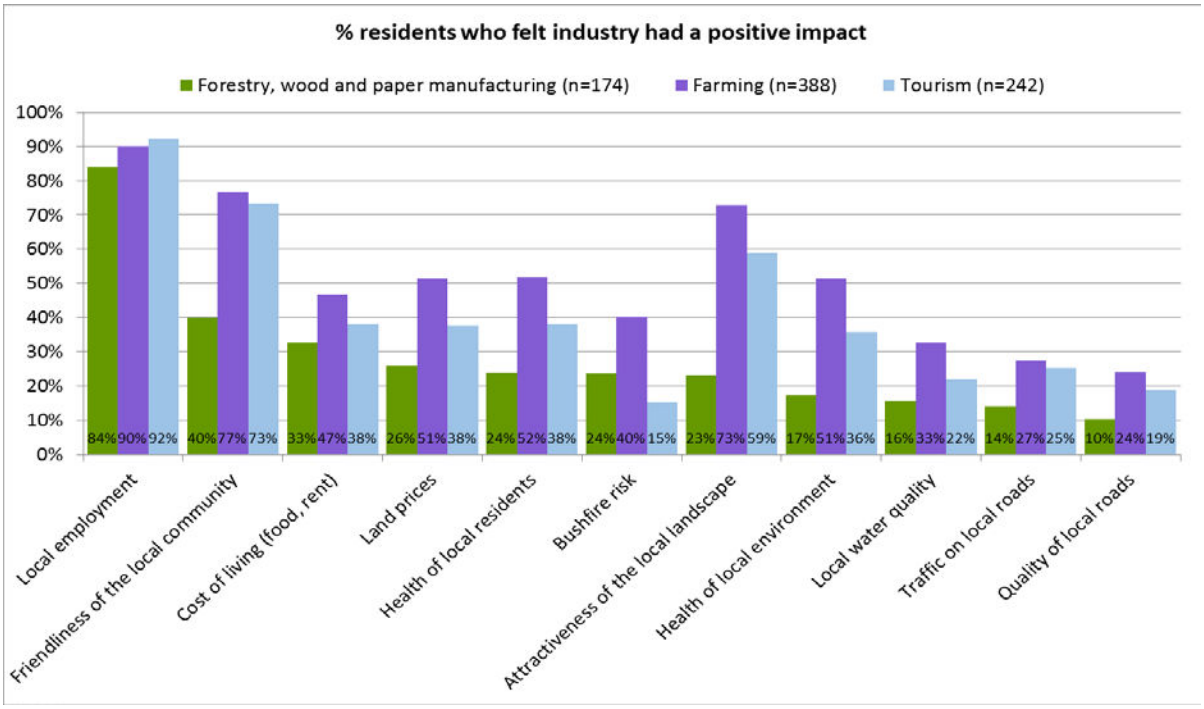

Figure 11 Proportion of residents who felt the forestry, farming and tourism industries had a positive impact on different aspects of their local community

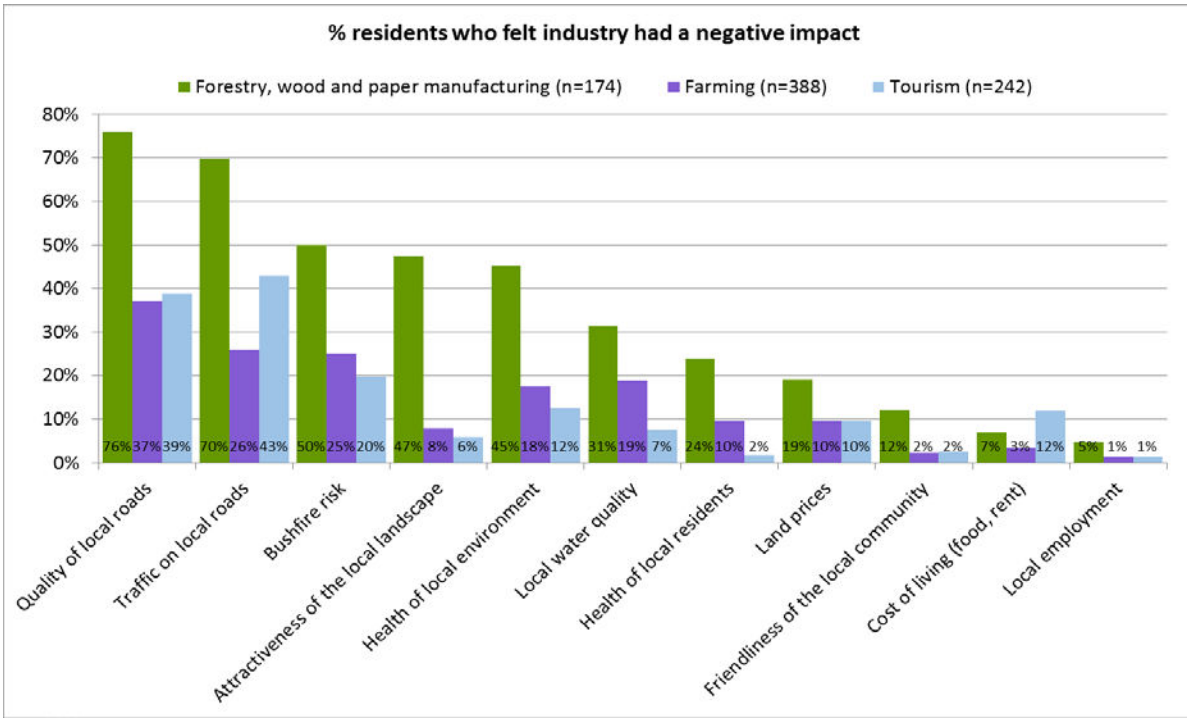

Figure 12 Proportion of residents who felt the forestry, farming and tourism industries had a negative impact on different aspects of their local community

The second edition of this report will draw on data from the 2016 Census to further examine how social and economic conditions in communities with high dependence on the forest industry have changed compared to conditions in other communities.

Conclusions

The softwood plantation industry is an important part of the economy and communities of the South West Slopes and Central Tablelands regions. In some parts – in particular, Tumut, Tumbarumba, Oberon and Bombala – the industry is critical to the local economy, generating a large proportion of all employment. In other parts of these regions, the industry represents a relatively small proportion of jobs, and forms part of a range of industries that together provide diversity into the regional economy.

The industry is unusual in generating a very high proportion of full-time jobs; those employed in the industry earn higher than average incomes both because they typically work full-time hours, and also because they earn incomes that are higher than the average for both regions. In some parts of the industry, particularly harvesting contracting work, many workers are working long hours, which can impact the wellbeing of those workers.

The industry has a workforce of similar age structure to others operating in the two regions, however it predominantly employs men, and many businesses report difficulty recruiting skilled workers. There is an ongoing need for skilled workers, and key challenges in recruiting these workers include a lack of appropriately qualified workers in the local workforce, and workers from elsewhere finding it difficult to shift to the region. Addressing these gaps can help support sustainability of the workforce into the future.

Residents living in communities with high reliance on the forest industry employment are as satisfied with the liveability and quality of life in their communities as those in other parts of rural and regional NSW. However, while they typically view the forest industry as contributing positively to local employment, many do not perceive the industry as contributing as much as other industries to other social and economic outcomes such as friendliness of the community or attractiveness of the local landscape. While overall ratings of road quality are similar across rural and regional communities in NSW irrespective of the extent of forest industry activity, residents report greater concern about road safety of traffic resulting from the forest industry compared to other industries. These findings suggest a need to better understand why the industry is less commonly perceived to be contributing to the high liveability of the regions it operates in compared to other industries operating in the same region.

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Appendix 1 Data tables

Table A1.1 Expenditure by the plantation industry, 2015-16, by industry sector

Type of expenditure	South West Slopes		Central Tablelands	
	Value ($m)	Proportion of total (%)	Value ($m)	Proportion of total (%)
Wages/Salaries	155.2	21%	47.2	21%
Other Services	103.3	14%	27.7	12%
Electricity, Gas, Water and Waste Services	78.5	11%	26.1	12%
Manufacturing	58.5	8%	16.5	7%
Retail and Wholesale Trade	38.4	5%	9.2	4%
Communication	21.4	3%	6.9	3%
Transport, Postal and Warehousing	17.1	2%	4.8	2%
Agriculture	14.9	2%	5.0	2%
Other	13.6	2%	4.3	2%
Accommodation and Food Services	10.4	1%	3.4	2%
Professional, Scientific and Technical Services	9.4	1%	4.3	2%
Education and Training	5.7	1%	2.4	1%
Construction	5.1	1%	1.6	1%
Mining	0.3	0%	0.1	0%
Sub-total	**531.9**	**72%**	**159.3**	71%
Expenditure outside the respective region	202.9	28%	63.9	29%
Total	**734.8**	**100%**	**326.2**	**100%**

Table A1.2 Economic impacts of the South West Slopes plantation industry, by sector, on the South West Slopes region

	Growers (forest management companies)	Wood and paper processing	Harvest & haulage contracting businesses	Other (including consultants, equipment sales, training)	Nurseries, silvicultural & roading contracting businesses	Whole Industry (excludes transfers)
Output ($m)	**255.0**	**1,983.5**	**165.9**	**8.9**	**45.0**	**2,129.7**
Direct ($m)	195.8	1,049.6	72.3	3.9	20.6	1,013.5
Production-induced ($m)	21.9	419.8	35.7	1.7	8.8	487.8
Consumption-induced ($m)	30.8	373.2	47.1	2.8	13.1	467.0
GRP ($m)	**113.7**	**803.8**	**71.4**	**4.5**	**20.9**	**1,014.2**
Direct ($m)	82.6	319.4	22.4	1.7	7.9	433.9
Production-induced ($m)	13.0	265.4	21.4	1.1	5.3	306.3
Consumption-induced ($m)	18.1	219.0	27.6	1.7	7.7	274.0
Household Income ($m)	**30.9**	**373.6**	**47.1**	**2.8**	**13.1**	**467.5**
Direct ($m)	13.1	116.2	18.9	1.2	5.7	155.2
Production-induced ($m)	8.8	149.8	14.7	0.8	3.7	177.7
Consumption-induced ($m)	8.9	107.5	13.6	0.8	3.8	134.6
Employment (total)	**385**	**4,078**	**669**	**42**	**202**	**5,375**
Direct (total)	174	1,261	342	24	117	1,917
Production-induced (total)	99	1,464	157	8	37	1,765
Consumption-induced (total)	112	1,353	171	10	47	1,693

Table A1.3 Economic impacts of the Central Tablelands plantation industry, by sector, on the Central Tablelands region

	Growers (forest management companies)	Wood and paper processing	Harvest & haulage contracting businesses	Other (including consultants, equipment sales, training)	Nurseries, silvicultural & roading contracting businesses	Whole Industry (excludes transfers)
Output ($m)	**121.0**	**582.3**	**67.9**	**12.5**	**10.4**	**699.7**
Direct ($m)	78.6	265.1	26.5	5.4	4.5	285.6
Production-induced ($m)	21.3	196.0	22.1	3.3	2.7	245.3
Consumption-induced ($m)	21.2	121.2	19.4	3.8	3.2	168.7
GRP ($m)	**43.0**	**219.2**	**26.8**	**5.7**	**4.7**	**299.4**
Direct ($m)	21.5	69.3	6.5	2.0	1.7	101.1
Production-induced ($m)	9.7	82.6	9.6	1.5	1.2	104.7
Consumption-induced ($m)	11.8	67.2	10.7	2.1	1.8	93.6
Household Income ($m)	**19.6**	**112.2**	**17.9**	**3.5**	**2.9**	**156.3**
Direct ($m)	7.3	31.2	6.1	1.5	1.3	47.2
Production-induced ($m)	6.6	47.9	6.6	1.0	0.8	62.9
Consumption-induced ($m)	5.8	33.1	5.3	1.0	0.9	46.1
Employment (total)	**211**	**1,481**	**230**	**50**	**55**	**2,027**
Direct (total)	71	620	98	27	36	852
Production-induced (total)	68	451	67	10	8	605
Consumption-induced (total)	72	410	65	13	11	570

Table A1.4 Economic impacts of the South West Slopes and Central Tablelands plantation industry, by sector, on New South Wales

	Growers (forest management companies)	Wood and paper processing	Harvest & haulage contracting businesses	Other (including consultants, equipment sales, training)	Nurseries, silvicultural & roading contracting businesses	Whole Industry (excludes transfers)
Output ($m)	**444.6**	**3,068.1**	**311.0**	**28.3**	**70.5**	**3,449.0**
Direct ($m)	274.4	1,314.6	98.7	9.3	25.1	1,248.7
Production-induced ($m)	77.6	937.8	98.7	7.9	18.8	1,140.9
Consumption-induced ($m)	92.6	815.6	113.6	11.1	26.6	1,059.5
GRP ($m)	**188.8**	**1,180.8**	**133.1**	**13.5**	**32.4**	**1,548.6**
Direct ($m)	104.1	338.3	28.8	3.7	9.7	484.6
Production-induced ($m)	33.9	395.5	42.1	3.7	8.2	483.4
Consumption-induced ($m)	50.7	447.0	62.2	6.1	14.6	580.6
Household Income ($m)	**70.3**	**619.6**	**86.3**	**8.4**	**20.2**	**804.8**
Direct ($m)	20.4	147.4	25.0	2.7	6.9	202.4
Production-induced ($m)	23.4	238.5	28.8	2.5	5.7	298.9
Consumption-induced ($m)	26.5	233.7	32.5	3.2	7.6	303.5
Employment (total)	**745**	**6,432**	**1,053**	**109**	**288**	**8,627**
Direct (total)	245	1,881	439	51	153	2,769
Production-induced (total)	211	1,997	258	22	52	2,541
Consumption-induced (total)	290	2,553	355	35	83	3,316

Table A1.5 Proportion of residents who reported the forest, farming and tourism industries had a NEGATIVE impact on different aspects of community life

	All residents	LGAs with LOW forest industry dependence	LGAs with HIGH forest industry dependence	All residents	LGAs with LOW forest industry dependence	LGAs with HIGH forest industry dependence	All residents	LGAs with LOW forest industry dependence	LGAs with HIGH forest industry dependence
	Forestry, wood & paper manufacturing (n=174)	Forestry, wood & paper manufacturing (n=82)	Forestry, wood & paper manufacturing (n=92)	Farming (n=388)	Farming (n=306)	Farming (n=80)	Tourism (n=242)	Tourism (n=188)	Tourism (n=54)
Local employment	5%	5%	4%	1%	2%	0%	1%	2%	0%
Cost of living (food, rent)	7%	9%	5%	3%	4%	3%	12%	14%	6%
Friendliness of the local community	12%	7%	16%	2%	3%	1%	2%	3%	0%
Health of local residents	24%	15%	32%	10%	10%	7%	2%	2%	0%
Traffic on local roads	70%	64%	75%	26%	28%	19%	43%	45%	37%
Quality of local roads	76%	70%	82%	37%	40%	27%	39%	41%	30%
Attractiveness of the local landscape	47%	45%	50%	8%	8%	6%	6%	5%	9%
Local water quality	31%	33%	30%	19%	18%	24%	7%	8%	6%
Health of local environment	45%	40%	49%	18%	18%	18%	12%	11%	17%
Bushfire risk	50%	45%	54%	25%	25%	25%	20%	15%	37%
Land prices	19%	15%	23%	10%	11%	2%	10%	11%	6%

Table A1.6 Proportion of residents who reported the forest, farming and tourism industries had a POSITIVE impact on different aspects of community life

	All residents	LGAs with LOW forest industry dependence	LGAs with HIGH forest industry dependence	All residents	LGAs with LOW forest industry dependence	LGAs with HIGH forest industry dependence	All residents	LGAs with LOW forest industry dependence	LGAs with HIGH forest industry dependence
	Forestry, wood & paper manufacturing (n=174)	Forestry, wood & paper manufacturing (n=82)	Forestry, wood & paper manufacturing (n=92)	Farming (n=388)	Farming (n=306)	Farming (n=80)	Tourism (n=242)	Tourism (n=188)	Tourism (n=54)
Local employment	84%	80%	87%	90%	90%	91%	92%	93%	91%
Cost of living (food, rent)	33%	22%	42%	47%	48%	41%	38%	39%	33%
Friendliness of the local community	40%	30%	48%	77%	76%	78%	73%	72%	76%
Health of local residents	24%	18%	29%	52%	50%	57%	38%	38%	37%
Traffic on local roads	14%	11%	16%	27%	27%	30%	25%	26%	22%
Quality of local roads	10%	9%	12%	24%	23%	26%	19%	20%	15%
Attractiveness of the local landscape	23%	18%	28%	73%	73%	74%	59%	61%	50%
Local water quality	16%	13%	18%	33%	32%	34%	22%	25%	11%
Health of local environment	17%	17%	18%	51%	50%	55%	36%	40%	20%
Bushfire risk	24%	23%	24%	40%	39%	44%	15%	20%	0%
Land prices	26%	18%	33%	51%	49%	62%	38%	41%	24%