

**Monitoring the social and economic impacts of forestry:
A case study of north east Tasmania**

**Report prepared for Department of Agriculture, Fisheries and
Forestry by the Fenner School of Environment and Society,
Canberra**

June 2008

J. Schirmer, E. Loxton and A. Campbell-Wilson

Executive Summary

This report presents results of a case study in which recommended indicators for monitoring the social and economic impacts of forestry were tested in north east Tasmania.

The indicators tested were developed as part of a project undertaken for the Forest Industries Branch of the Department of Agriculture, Fisheries and Forestry, which aims to identify cost effective indicators for monitoring social and economic impacts of Australian forestry. The indicators were developed by reviewing the types of information needed about social and economic impacts of forestry, followed by identifying methods that can be utilised to measure these impacts. The indicators were refined after a workshop in which key stakeholders were consulted, and then tested in two case study regions: the Green Triangle, and north east Tasmania. The final set of recommended indicators is described in detail in Schirmer *et al.* (2008a), while results of the Green Triangle case study are presented in Schirmer *et al.* (2008b).

North east Tasmania was selected as a case study region in which to test the indicators as it is an important forest industry region in Australia, in which both native forest and plantation based forestry activity is undertaken.

The indicators tested aim to identify key information that enables assessment of social and economic impacts of the forest industry in the region. In particular, the indicators aim to assess:

- Key characteristics of the forest industry;
- Impacts of the forest industry on the broader community;
- Impacts of the forest industry on its workforce; and
- Impacts of the forest industry on Indigenous people.

Two types of data were utilised to measure indicators: existing data produced by organisations such as the Australian Bureau of Statistics (ABS) and Bureau of Rural Sciences; and a survey of forestry workers which gathered information on aspects of impacts of the industry on its workforce for which data were not otherwise available.

Indicators were measured where possible for north east Tasmania, and for individual 'statistical local areas' (SLAs) within north east Tasmania. Each local government area in the region is made up of between one and three SLAs. Trends in north east Tasmania were compared to trends seen in Tasmania and Australia over the same period.

Five key characteristics of the forest industry were examined: direct employment in the industry; estimated value of production; estimated volume of production; efficiency of production; and consumption of wood and paper products.

A total of 1,852 people were employed in the north east Tasmanian forest industry in 2006, based on ABS data. This includes people employed in forestry and logging and wood and paper product manufacturing; it excludes people employed in transport of logs, and some silvicultural contractors, as these are not included in forestry employment figures by the ABS. Of these, 37.4% (691 people) were based in Launceston and 24.2% in Dorset (449 people). Other municipalities had fewer forestry workers, although Meander Valley, West Tamar and Break O'Day all had over 100 forest industry workers in 2006. Total employment in the forest industry in north east Tasmania followed the Australian average, with slight growth over 1996 to

2001 followed by decline over 2001 to 2006; while in Tasmania as a whole, employment declined over both periods, indicating the industry is more stable in the north east Tasmania than Tasmania as a whole. The majority of employment in the industry in 2006 – 65.7% of workers - was located in the manufacturing sector, while 34.3% of workers were employed in growing and harvesting trees, similar to the average across Tasmania. This is considerably different to the Australian average; across Australia an average of 87.3% of employment in the forest industry is located in the manufacturing sector.

North east Tasmania has a higher reliance on plantations for employment in the forest industry than the Tasmanian average. Approximately 40% of workers in north east Tasmania work in the plantation sector, compared to 31.7% in Tasmania as a whole, while 60% work in native forestry, compared to 68.3% in Tasmania.

The estimated volume and value of forestry production could only be measured at state scale, providing limited information about north east Tasmania. Growth in both volume and value of production was greater in Tasmania than the Australian average over 2000-01 to 2003-04, while over 2003-04 to 2006-07, volume and value of production fell in Tasmania while it grew in Australia. The efficiency of production was difficult to measure due to a lack of data on the labour required to produce different types of products; more detailed direct survey of the forest industry is needed to produce useful data on the productivity of labour.

Consumption of wood and paper products in Australia is a useful predictor of likely demand for the wood and paper products from north east Tasmania sold into domestic markets. Per capita consumption of paper and paperboard products grew over most of the period of 1994-95 to 2006-07, as did consumption of wood-based panel products. Consumption of sawnwood showed a more variable pattern, but grew over much of 1998-99 to 2003-04, and subsequently declined.

Impacts of the forest industry on the broader community were examined by measuring the dependence of the labour force on the forest industry; social characteristics of forestry dependent regions; the location of forest industry employment; and the impact of the forest industry on rural population. These indicators, as with all those reported here, represent a subset of the many ways the forest industry may impact on the broader community, and should be accompanied by in-depth studies which examine how people experience and interact with the forest industry, and the impact of changes to the forest industry.

Dependence on the forest industry was measured by calculating the proportion of the employed labour force who worked in the forest industry. All parts of north east Tasmania had higher dependence on forestry employment than the Australian average, and six municipalities had dependence higher than the Tasmanian average. Within north east Tasmania, the highest dependence occurs in the municipality of Dorset, where in 2006 almost 16% of the employed workforce worked in the industry. This measure of dependence only reflects direct dependence on forestry; indirect dependence through industries who supply the forest industry or rely on spending of wages and salaries by forestry workers should also be considered.

Overall dependence on the forest industry has fallen over time in almost all regions, a result of a broadening labour force and some decline in employment in the forest industry in recent years; the exception over 2001 to 2006 was Dorset, where

dependence on the forest industry grew slightly, indicating higher vulnerability to change in the forest industry.

Key social characteristics of local regions with differing levels of dependence on the forest industry, including total population, unemployment rates, education levels, median age, household income, the ratio of working age to child/retirement age population, and economic diversity, were compared. The goal was to identify whether local areas with high dependence on forestry differ to other areas of north east Tasmania. In areas with medium or high dependence on forestry, a slightly lower proportion of the adult population held a bachelor degree or higher qualification than areas with low dependence, and a slightly higher proportion held no post-school qualifications. Median household income was slightly lower in areas with medium and high dependence on forestry than other areas. It is possible these differences are not due to the forest industry but to other factors.

Forestry workers in north east Tasmania tend to be located in similar sized towns to the overall labour force, with the only difference being that a moderately higher proportion of forest industry employment is located in towns with less than 1,999 population and on rural land compared to the labour force overall. This is different to forestry workers in other regions; in the Green Triangle, forestry workers are much more urbanised than in north east Tasmania. Forest industry employment is much more urbanised than employment in the agricultural industry. This indicates that any shift from traditional agriculture to forest-industry based employment is likely to be accompanied by some urbanisation of employment opportunities in the region.

Areas experiencing plantation expansion were analysed to identify whether the plantation expansion has affected rural population levels. At the SLA scale, there was no evidence that areas experiencing plantation expansion had experienced a greater loss of rural population than those experiencing no or little plantation expansion. This means that any population decline resulting from plantation expansion is too small to be distinguished from other factors causing rural population decline; in addition, many areas in the region experienced growth of rural population over 1996 to 2006 whether or not plantation expansion occurred. At more localised scales it is possible other trends would be evident, but these scales could not be examined for this study.

Perceptions held about forestry by members of communities living in north east Tasmania were not examined in this case study, due to a lack of time and resources. Understanding the social impacts of forestry requires understanding perceptions, as they inform how people understand, experience and respond to forestry in the region.

A range of characteristics of the forestry workforce were examined, to help identify the impacts the industry has in the people who work for it. Key findings were that:

- Forest industry workers in north east Tasmania were more likely to earn \$600-999 and less likely to earn over \$1,000 per week than other members of the labour force;
- The forest industry across Australia has a higher rate of occupational disease and injury requiring compensation than all other industries, and this rate is declining at a slower rate than for other industries, indicating ongoing high injury and disease rates compared to other industries;
- A majority of Tasmanian forestry workers indicated they were satisfied with their life in general, the local area they live in, and the health of their family; a smaller majority were satisfied with their own health and their financial situation;

- Forestry workers in Tasmania are satisfied many aspects of their work in the industry, including the level of challenge, income, interactions with colleagues, and sense of accomplishment, but a higher proportion are dissatisfied with the support received from those outside the industry, the rules set by government on how forestry can operate, and the fairness of decisions made about the forest industry;
- Forestry workers are predominantly male, with around 10% of north east Tasmanian forest workers female in 2006, less than the average for Tasmania or Australia. Female participation in the forestry workforce has declined over time in Tasmania and north-east Tasmania, while it grew in Australia, indicating the ‘gender gap’ between the forest industry and overall labour force is growing in Tasmania and north east Tasmania;
- Forestry workers in north east Tasmania are slightly younger on average when compared to forestry workers in Tasmania and Australia; while the forestry workforce has a slightly younger age profile than the labour force in general. However, the forestry workforce aged more rapidly than the labour force as a whole over 1996 to 2006, indicating that this difference is likely to narrow;
- Tasmanian forestry workers have more attachment to the place they live in compared to forestry workers living elsewhere in Australia, and are more likely to believe they will be living in the same area in five years time, indicating a higher ‘attachment to place’ than for forestry workers in other regions;
- Tasmanian forestry workers were more likely than other forestry workers to have spent most or all of their working life in the forest industry. Just under 30% of forestry workers have more than one member of their household working in the industry, while just over 30% have a family history of work in the industry extending beyond one generation. Many workers have reasonably strong social networks within the forest industry, although few indicated that ‘most or all’ of their friends worked in the industry, indicating good social links outside the industry;
- Forestry workers in north east Tasmania, Tasmania and Australia are more likely to work full-time hours than those in the general labour force; and
- Forestry workers in north east Tasmania, Tasmania and Australia are more likely to have a post-school qualification than average for the total population aged over 15.

The Tasmanian forest industry has a higher than average proportion of Indigenous workers in its labour force. Tasmania has a higher proportion of Indigenous workers than the Australian average in the forest industry. North east Tasmania has a lower percentage of Indigenous workers than Tasmania as a whole, although it is still higher than the Australian average. However Indigenous employment has grown at a slower rate than average in the forest industry in recent years, indicating this gap may be closing. Indigenous workers are most likely to work as machinery operators/drivers and labourers, and less likely to work as managers, technicians, trades workers, and in clerical and administrative work, compared to the rest of the forestry workforce.

The indicators reported in this document provide a broad overview of the key social and economic characteristics of forestry and forestry workers, and of the communities that are dependent on forestry, in north east Tasmania. The indicators can be used to identify how these characteristics are changing over time, and hence to examine social and economic change related to the forest industry. These social and economic changes may have many impacts on different people. However, the indicators can provide only a limited understanding of impacts, and should be accompanied by in-

depth studies which provide a more complete understanding of the social and economic impacts of forestry. These studies include studies of downstream economic impacts, of the ways people experience the changes identified in the indicators and what these changes mean for their lives, and of perceptions about forestry, amongst others.

Contents

Executive Summary	i
1.0 Introduction.....	1
2.0 Case study and methods.....	3
2.1 Case study: North East Tasmania	3
2.2 Methods	4
2.2.1 Data from existing sources.....	5
2.2.2 Data from survey of forestry workers.....	5
3.0 Results of the case study.....	7
3.1 Characteristics of the forest industry.....	7
3.1.1 Employment in the forest industry	7
3.1.2 Estimated value of forest industry production.....	15
3.1.3 Estimated volume of forest industry production	17
3.1.4 Efficiency of production (labour productivity)	19
3.1.5 Consumption of wood and paper products.....	20
3.2 Impacts of the forest industry on the broader community	22
3.2.1 Dependence on the forest industry (% employment).....	23
3.2.2 Social characteristics of forestry-dependent regions	26
3.2.3 Location of forest industry employment	30
3.2.4 Impact of forest industry on rural population	32
3.2.5 Values, uses and perceptions of forestry activities	34
3.3 Impacts of the forest industry on its workforce	35
3.3.1 Income earned by forestry workers	36
3.3.2 Physical health – reported injury rates.....	40
3.3.3 Self-rated health (physical and mental)	42
3.3.4 Self-rated wellbeing	45
3.3.5 Demographic characteristics – age	48
3.3.6 Demographic characteristics - gender.....	50
3.3.7 Attachment to place.....	52
3.3.8 Cultural and family attachment to forestry	54
3.3.9 Hours worked.....	56
3.3.10 Educational qualifications.....	59
3.4 Impacts of the forest industry on Indigenous people.....	61
3.4.1 Indigenous employment in the forest industry – quantity	62
3.4.2 Indigenous employment in the forest industry – type	64
3.4.3 Area of forest owned or accessed by Indigenous people	65
4.0 Conclusions.....	66
5.0 References	67
Appendix 1: Characteristics of forestry workforce by SLA	I

Figures

Figure 1: Map of the north east Tasmania case study region.....	3
Figure 2: Occupation of forestry workers responding to survey	6
Figure 3: Employment in forest industry, total all sectors, 1996, 2001, 2006.....	9
Figure 4: Rate of change in employment in forest industry, total all sectors, 1996, 2001, 2006.....	9
Figure 5: Employment in forestry and logging sector, 1996, 2001, 2006.....	11
Figure 6: Rate of change in employment in forestry and logging sector, 1996, 2001, 2006.....	11
Figure 7: Employment in wood and paper product manufacturing sector, 1996, 2001, 2006.....	12
Figure 8: Rate of change in employment in wood and paper product manufacturing sector, 1996, 2001, 2006	12
Figure 9: Proportion of employment in native forestry and plantation sectors by LGA, 2006	14
Figure 10: Estimated value of forest industry production – gross roundwood equivalent, 2000-01 to 2006-07	16
Figure 11: Average annual change in value of forest industry production – gross roundwood equivalent, 2000-01 to 2003-04 and 2003-04 to 2006-07.....	16
Figure 12: Estimated volume of forest industry production – gross roundwood equivalent, 2000-01 to 2006-07	18
Figure 13: Average annual change in volume of forest industry production – gross roundwood equivalent, 2000-01 to 2003-04 and 2003-04 to 2006-07.....	18
Figure 14: Consumption of wood and paper products per 1,000 people, 1995-95 to 2006-07	21

Figure 15: Average annual change in consumption of wood and paper products per 1,000 people, 1995-95 to 2006-07.....	21
Figure 16: Dependence on the forest industry, measured as proportion of labour force employed, 1996, 2001 and 2006.....	24
Figure 17: Average annual change in dependence on the forest industry, measured as proportion of labour force employed, 1996-2001 and 2001-2006.....	24
Figure 18: Dependence on the plantation and native forest sectors by LGA, 2006.....	25
Figure 19: Proportion of forestry, agricultural and total employment in localities of different sizes, 2006.....	31
Figure 20: Area of plantation establishment and average annual rate of change in rural population, 1996-2006.....	33
Figure 21: Distribution of forestry worker income, 2006 – Australia, Tasmania and north east Tasmania.....	37
Figure 22: Average annual rate of change in percentage of forestry workers in different income categories, 2001-2006 – Australia, Tasmania and north east Tasmania.....	37
Figure 23: Comparison of forest worker income and average income of total workforce, 2006.....	38
Figure 24: Comparison of forest worker income and average income of total workforce for those earning more than \$400 per week, 2006.....	38
Figure 25: Distribution of forestry worker income, 2006, by SLA.....	39
Figure 26: Compensated occupational disease and injury rate per 1,000 workers, compared across industries, 1997-98 to 2005-06.....	41
Figure 27: Compensated occupational disease and injury rate per 1,000 workers, compared over time, 1997-98 to 2005-06.....	41
Figure 28: Health problems experienced by forest worker survey respondents.....	43
Figure 29: Workplace risks identified by survey respondents.....	44
Figure 30: Forest workers' satisfaction with life – survey responses.....	45
Figure 31: Forest workers' satisfaction with their work – all survey respondents.....	46
Figure 32: Forest workers' satisfaction with their work – Tasmania.....	46
Figure 33: Importance of different aspects of work in the forest industry – survey responses.....	47
Figure 34: Proportion of labour force in different age groups – forest industry and total labour force, 2006.....	49
Figure 35: Average annual rate of change in proportion of labour force in different age groups – forest industry and total labour force, 2006.....	49
Figure 36: Percentage of male and female workers in forest industry and overall labour force, 2006.....	51
Figure 37: Average annual change in proportion of males and females in the workforce, 2001-06.....	51
Figure 38: Strength of attachment to local community – survey respondents.....	52
Figure 39: Rating of local community as a place to live – survey respondents.....	53
Figure 40: Responses to question 'Do you expect to be living in the same place five years from now?.....	53
Figure 41: Proportion of working life survey respondents had spent in the forest industry.....	54
Figure 42: Do other members of your household work in the forest industry? – survey responses.....	55
Figure 43: Proportion of family and friends working in forest industry – survey responses.....	55
Figure 45: Average annual rate of change in working hours by category, 2001-2006 – Australia.....	58
Figure 46: Average annual rate of change in working hours by category, 2001-2006 – Tasmania.....	58
Figure 47: Average annual rate of change in working hours by category, 2001-2006 – north east Tasmania.....	58
Figure 48: Proportion of population with different types of educational qualification – forest industry and total population aged over 15, 2006.....	60
Figure 49: Average annual rate of change in proportion of population with different types of educational qualification, 2001-2006.....	60
Figure 50: Percentage of Indigenous workers and non-response rate – forest industry and total labour force, 2006.....	63
Figure 51: Average annual rate of change, 2001-2006, in Indigenous and non-Indigenous employment.....	63
Figure 52: Proportion of workers with different occupations – Indigenous and total forestry workforce, 2006.....	64
Figure A: Proportion of population with different types of educational qualification – forest industry and total population aged over 15 – Statistical Local Areas, 2006.....	IV

Tables

Table 1: Statistical Local Areas located in each Local Government Area.....	4
Table 2: Classification of regions by level of dependence on the forest industry	26
Table 3: Social characteristics of north east Tasmania.....	28
Table 4: Percentage of workforce working different hours, 2006.....	57
Table 5: Forest land owned and accessed by Indigenous people, 2007.....	65
Table A1: Percentage of labour force in different age groups, forest industry and total labour force - 2006	I
Table A2: Gender of workforce – comparison of forest industry and labour force, 2006 and 2001	II
Table A3: Percentage of workforce working different hours by Statistical Local Area, 2006.....	III

1.0 Introduction

In April 2008, the Forest Industries Branch of the Department of Agriculture, Fisheries and Forestry (DAFF) engaged the Fenner School of Environment and Society to identify a set of indicators to describe and quantify the social and economic impact of forestry in Australia over time.

The indicators developed need to:

- Be cost effective, to enable regular monitoring;
- Be valid – measure what they are intended to measure;
- Be replicable over time – requiring a consistent, replicable and cost effective methodology;
- Be applicable across both native forest and plantation sectors;
- Be applicable at local, regional and national scale where possible; and
- Provide information on the most relevant social and economic impacts.

A key priority was to identify indicators that can be readily and cost effectively measured over time using available sources of data, as well as identify where further information is needed, but not as easily accessible.

Indicators were developed by reviewing the types of information needed about social and economic impacts of forestry, followed by identifying methods that can be utilised to measure these impacts. Information needs were identified by reviewing current forest policies, media reports on forestry, recent research recording public perceptions about forestry, and reports produced by stakeholders with an interest in forestry in Australia. Methods for measuring indicators were identified by reviewing the data currently produced on forestry by different organisations such as the Australian Bureau of Statistics, and reviewing methods used in recent research studies to measure the impacts of forestry.

The initial indicators identified were discussed at a workshop of forestry stakeholders, and an initial set of recommended indicators developed based on these discussions. The following types of indicators were recommended for monitoring the social and economic impacts of forestry in Australia:

- Indicators which measure characteristics of the forest industry:
 - Direct employment in the forest industry;
 - Proportion of land utilised by the forest industry;
 - Estimated value and volume of production;
 - Efficiency of production, measured as labour productivity; and
 - Consumption of wood and paper products.
- Impacts of the forest industry on the broader community:
 - Dependence on the forest industry, measured as the proportion of the employed labour force working in the forest industry;
 - Social characteristics of forestry-dependent communities;
 - Location of forest industry employment;
 - Impact of plantation forestry on rural population; and
 - Values, uses and perceptions of forestry activities.
- Impacts of the forest industry on its workforce:
 - Income earned by forestry workers;
 - Physical and mental health of forestry workers;
 - Self-rated wellbeing of forestry workers;
 - Age and gender of forestry workers;

- Forestry workers' attachment to place;
- Forestry workers' cultural and family attachment to forestry;
- Hours worked by forestry workers; and
- Education qualifications of forestry workers.
- Impacts of the forest industry on Indigenous people:
 - Quantity of Indigenous employment in the forest industry;
 - Types of Indigenous employment in the forest industry; and
 - Area of forest owned or accessed by Indigenous people.

These recommended indicators were then tested in two case study regions: north east Tasmania, and the Green Triangle region of south-west Victoria and south-east South Australia. These two regions were chosen as they have a considerable amount of forest industry activity. In the Green Triangle region, this activity is based almost completely on plantation forestry, including both hardwood and softwood plantations, while in Tasmania the industry is based on native forests and plantations.

This document reports the results of testing indicators in the north east Tasmania case study region. Results for each of the recommended indicators are presented, and trends in the north east Tasmanian forest industry compared to trends in Australia overall. Not all of the recommended indicators could be tested in the case study region, due to time and resource constraints. Where an indicator could not be tested, it is not presented in this report; details of methods for measuring these indicators can be found in Schirmer *et al.* (2008a).

The results of the analysis presented in this report were used to refine the indicators recommended by the consultancy; the final recommended indicators are documented in Schirmer *et al.* (2008a). Results of the Green Triangle case study are documented in Schirmer *et al.* (2008b).

2.0 Case study and methods

This section describes the case study region, and provides a brief overview of the methods used to measure the different indicators measured for this report.

2.1 Case study: North East Tasmania

This section reports results of testing indicators in north east Tasmania. This region was chosen to test indicators because it contains a large proportion of total forest industry activity for the state.

Figure 1 below shows the local government areas (LGAs) included in the north east Tasmanian study region. They include all the LGAs in Tasmania's northern NRM region¹.

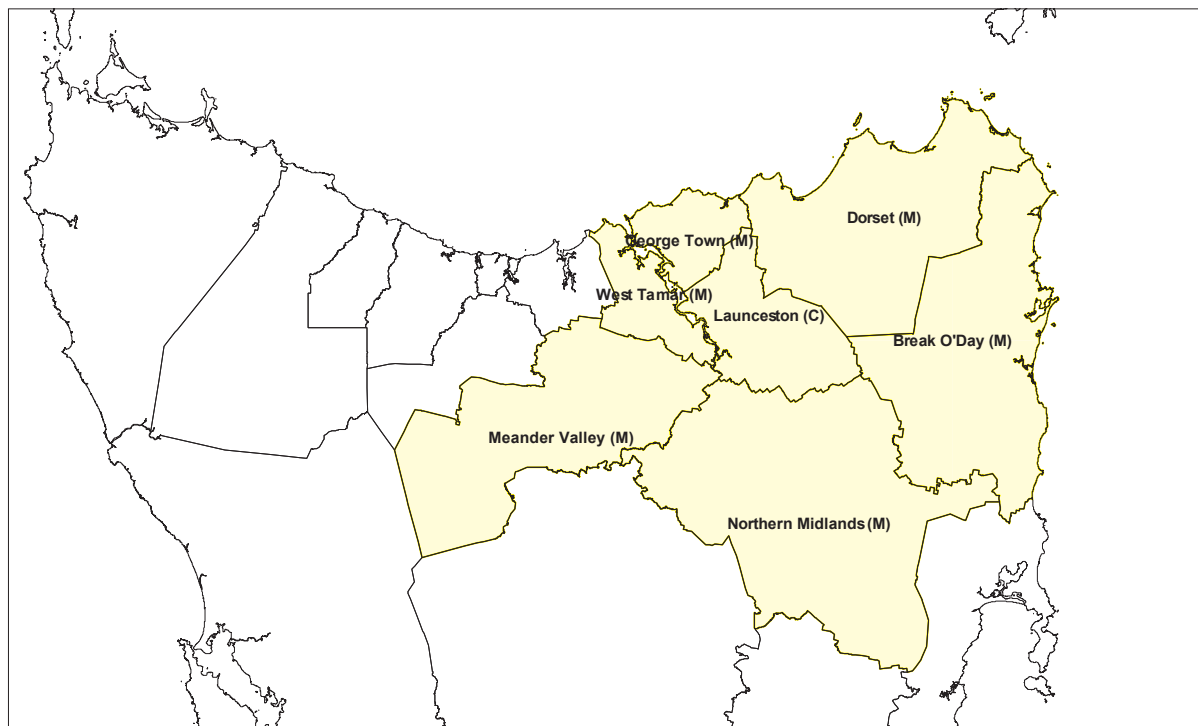


Figure 1: Map of the north east Tasmania case study region²

Where possible, indicator data for this case study are presented for different 'Statistical Local Areas' in the study region (described below), for the 'Northern Statistical Division', also described below, for the state of Tasmania, and for Australia as a whole. This enables comparison of trends in individual local areas within the region, as well as comparison of the region as a whole to state and national averages.

Statistical Local Areas (SLAs) are geographic regions measured by the ABS which are either the same size as, or smaller than, local government areas. Within the study region, each LGA is made up of between one and three SLAs, as shown in Table 1. SLAs are often either equivalent to the boundaries of previous LGAs which were amalgamated, or separate the city and rural areas of an LGA.

¹ Throughout this report, this region is referred to as 'north east Tasmania'. It is equivalent to the 'Northern' statistical division as classified by the Australian Bureau of Statistics except that it excludes the LGA of Flinders (Flinders Island); Flinders was excluded as it does not have forestry activity.

² Local government areas included in the study are shown in yellow. The letters in brackets after each name refer to the type of local government, where 'C' refers to 'City', and 'M' to 'Municipality'.

Table 1: Statistical Local Areas located in each Local Government Area

LGA	SLA/s in LGA	Description of SLAs
Break O'Day (M)	Break O'Day (M)	SLA is the same as LGA
Dorset (M)	Dorset (M)	SLA is the same as LGA
George Town (M)	George Town (M) - Pt A George Town (M) - Pt B	LGA has been split into two SLAs. Part A covers the west of the municipality along the Tamar River, while Part B covers the rest of the LGA.
Launceston (C)	Launceston (C) - Inner Launceston (C) - Pt B Launceston (C) - Pt C	LGA has been split into three SLAs, in which 'Inner' is equivalent to the city of Launceston, 'Part B' is in the west of the LGA along the Tamar river, and 'Part C' covers the east of the LGA, including much of the rural land.
Meander Valley (M)	Meander Valley (M) - Pt A Meander Valley (M) - Pt B	LGA has been split into two SLAs, where Part A is urbanised and effectively forms part of the city of Launceston, and Part B covers the large majority of the area of the municipality.
Northern Midlands (M)	Northern Midlands (M) - Pt A Northern Midlands (M) - Pt B	LGA has been split into two SLAs, where Part A is more urbanised and closer to the city of Launceston, and Part B covers the large majority of the area of the municipality.
West Tamar (M)	West Tamar (M) - Pt A West Tamar (M) - Pt B	LGA has been split into two SLAs, where Part A is located along the Tamar River in the east of the municipality, and Part B covers the remainder of the municipality.

Statistical Divisions (SDs) refer to groupings of LGAs which are considered to have some geographic and economic linkages that mean they form a coherent group. The case study region LGAs all form part of the 'Northern' Statistical Division, which also includes the LGA of Flinders (Flinders Island). Flinders was not included in the case study as it does not have forest industry activities. Data are presented for the Northern Statistical Division throughout this report; this region is referred to as 'Northern SD' to ensure it is recognised as the ABS defined Northern Statistical Division.

For some indicators, it was not possible to gather data to the LGA scale, with only larger scale data available. This is identified as each indicator is presented and discussed.

2.2 Methods

The data sources and methods used to measure each indicator are explained briefly as each is presented in Section 3.0. A more detailed discussion of the methods used to calculate each indicator can be found in Schirmer *et al.* (2008a).

This section describes the types of data used to measure indicators, with all indicators presented in this report measured using one of two types of data:

- Data from existing sources such as the Australian Bureau of Statistics (ABS); or
- Data from a small survey of Australian forestry workers undertaken for this consultancy.

2.2.1 Data from existing sources

Where data from existing sources have been used to calculate indicators, the data source and methods used are briefly described when the indicator is reported. More detailed information on the methods used to calculate each indicator can be found in the methods used to calculate each indicator can be found in Schirmer *et al.* (2008a).

2.2.2 Data from survey of forestry workers

Some indicators could not be measured using existing data as no data are currently available for them. Where this was the case, data were gathered via an online survey which was sent to forestry companies operating in the case study regions examined for this consultancy³.

The survey included a range of questions on forest workers' health, wellbeing, and attachment to place and to the forestry industry, including:

- Health – the types and severity of health problems experienced;
- Workplace health risks – a rating of the extent to which the work the respondent undertakes is believed to present a health risk (e.g. hours worked, stress, exposure to noise, exposure to physical risk);
- Satisfaction with different aspects of life (family, finance, overall level of satisfaction);
- Satisfaction with different aspects of work in the forest industry (e.g. the amount of challenge their work presents);
- Level of attachment to the local community the respondents lives in; and
- Level of cultural and family attachment to forestry.

Valid survey responses were received from 132 respondents. Of these, 54 were based in Tasmania, 19 in the Green Triangle, and 56 in other regions. This means the responses from Tasmania can be compared to responses from workers in the other regions included in the survey⁴.

Responses to the survey are likely to have been biased. Respondents were predominantly involved in managing plantations and native forests, with a smaller proportion involved in silvicultural activities, and very few employed in processing. The responses are therefore biased towards those involved in forest management and administrative positions, and away from field-based workers and workers in manufacturing jobs (Figure 2).

³ Ethics approval was gained from the Australian National University Human Research Ethics Committee ('the Committee') prior to the release of the survey.

⁴ Many forestry businesses operate across multiple regions; while the survey was sent principally to those operating in the Green Triangle and Tasmania – the regions examined for this consultancy – companies were encouraged to send the survey to all their workers so responses from these regions could be compared to the broader sample of forestry workers achieved. Some Tasmanian respondents lived in regions other than north east Tasmania, but a large proportion were based within north east Tasmania. North east Tasmania respondents are not separated from others when reporting results, as this would reduce sample size substantially, and no significant differences were identified in responses from different parts of Tasmania.

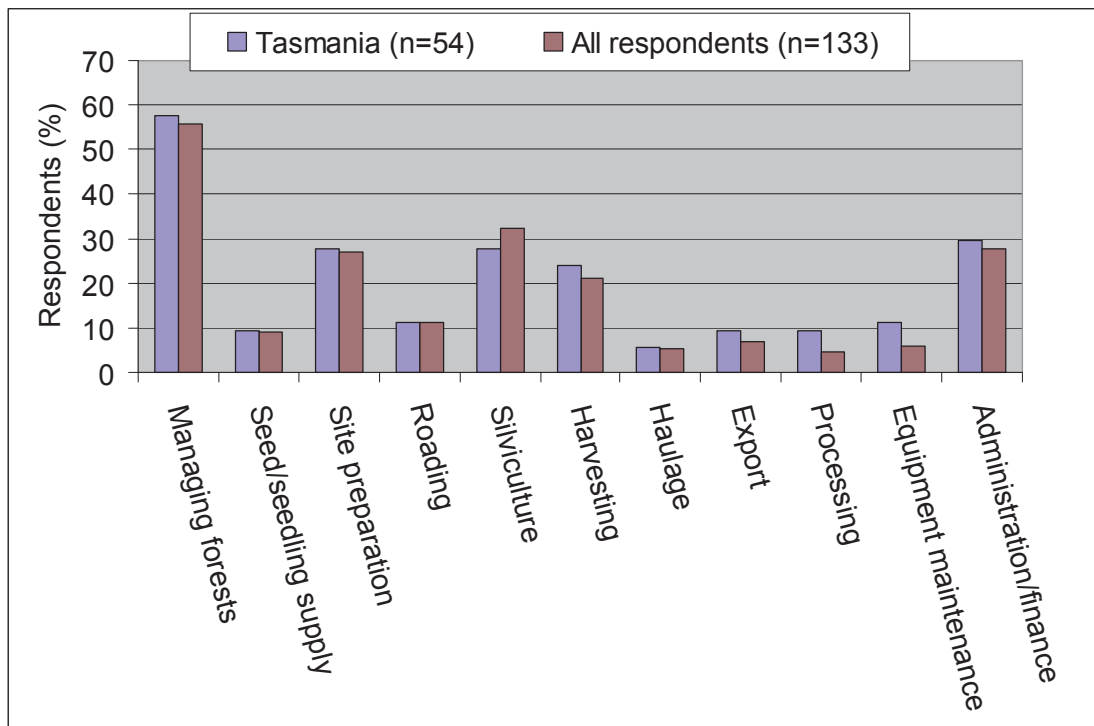


Figure 2: Occupation of forestry workers responding to survey

General characteristics of respondents were as follows:

- Gender: 78% male and 22% female for Tasmania, while for overall respondents 70% were male and 30% female;
- Average age: 39.5 years for Tasmanian respondents and 39 years for all respondents;
- Average length of time working in the industry: 17.7 years for Tasmanian respondents, and 13.3 years for all respondents; and
- Respondents worked in all sectors of the forest industry, including both the native forest and plantation sectors.

While the survey was reasonably small, the responses received enable testing of some key recommended indicators; the results are discussed as individual indicators are reported. They should be considered biased towards people working in particular jobs in the industry, and not representative of all types of forest industry workers.

3.0 Results of the case study

This section presents results for each of the indicators tested in this case study. The key uses and limitations of each indicator are explained, and conclusions are drawn as to its usefulness of the indicator for monitoring of changes in the forest industry.

The indicators are presented in four sections:

- Characteristics of the forest industry;
- Impacts of the forest industry on the broader community;
- Impacts of the forest industry on its workforce; and
- Impacts of the forest industry on Indigenous people.

3.1 Characteristics of the forest industry

The indicators in this section provide information on the following characteristics of the forest industry:

- Direct employment in the forest industry;
- Estimated value of forest industry production;
- Estimated volume of forest industry production;
- Efficiency of production (labour productivity); and
- Consumption of wood and paper products.

These characteristics provide a useful basis for analysing how the forest industry is changing in terms of employment, production and consumption. These characteristics are important to track over time, as changes in characteristics of the industry are likely to be associated with changes in the social and economic impacts of the industry on its workers, and on local and regional communities.

3.1.1 Employment in the forest industry

Direct employment in the forest industry in north east Tasmania was measured in three ways, in which total employment and change in employment over time was measured for:

- The forest industry as a whole;
- The ‘forestry and logging’, and ‘wood and paper product manufacturing sectors’ of the industry; and
- The plantation and native forestry sectors.

Each measure is useful as it provides an understanding of not just how many jobs there are, but where jobs are located within the industry.

The data presented are all based on ABS *Census of Population and Housing* data. These data are likely to exclude some contractors working in the forest industry, particularly silvicultural and transport workers. Based on Schirmer (2008), ABS estimates undercount direct reliance on forest industry employment by approximately 13% in Tasmania, as they exclude many silvicultural contractors and do not include contractors transporting timber to mills⁵.

Data on employment in the native forest and plantation sectors were based on a brief telephone survey of forestry firms in the region. All the data are based on where

⁵ The data from Schirmer (2008) were not utilised for this report as this report focuses on identifying the usefulness of data collected regularly over time, and the *Forest Industry Survey* on which Schirmer (2008) is based has to date only been undertaken once, with a repeat survey planned for late 2008.

forestry workers live, rather than where they work as it draws on 'place of usual residence' data from the ABS⁶.

Employment in the forest industry as a whole

A total of 1,852 people were employed in the forest industry in north east Tasmania in 2006⁷. Employment in different parts of the region is shown in Figure 3, and the rate of change over time in Figure 4. Of the people employed in forestry in north east Tasmania, 37.4% (691 people) were based on Launceston, and 24.2% in Dorset (449 people). Other municipalities had fewer forestry workers, although Meander Valley, West Tamar and Break O'Day all had over 100 forest industry workers in 2006.

Total employment in the forest industry in north east Tasmania shows different patterns to the Tasmanian average, with slight growth over 1996 to 2001 followed by decline over 2001 to 2006, while in Tasmania as a whole, employment declined over both periods. In Australia forestry employment grew over 1996-2001 and subsequently declined over 2001-2006.

Individual localities within north east Tasmania have shown a range of patterns, however in most areas employment in forestry grew slightly (in terms of numbers and, where high numbers are employed, rate of growth) over 1996-2001 and fell over 2001-2006⁸.

⁶ This differs to some other reports – for example, Schirmer (2008) reports employment by place of work. Place of usual residence is a useful measure as it gives an indicator of where forest industry workers live and hence are likely to interact with others in their community, spend a large proportion of their income, and develop a range of social and economic networks.

⁷ The forest industry is defined as those employed in forestry and logging and wood and paper product manufacturing.

⁸ Areas which show a higher rate of change typically had fewer forestry workers, with the high rate of change representing a small change in the total number of forestry workers in these municipalities.

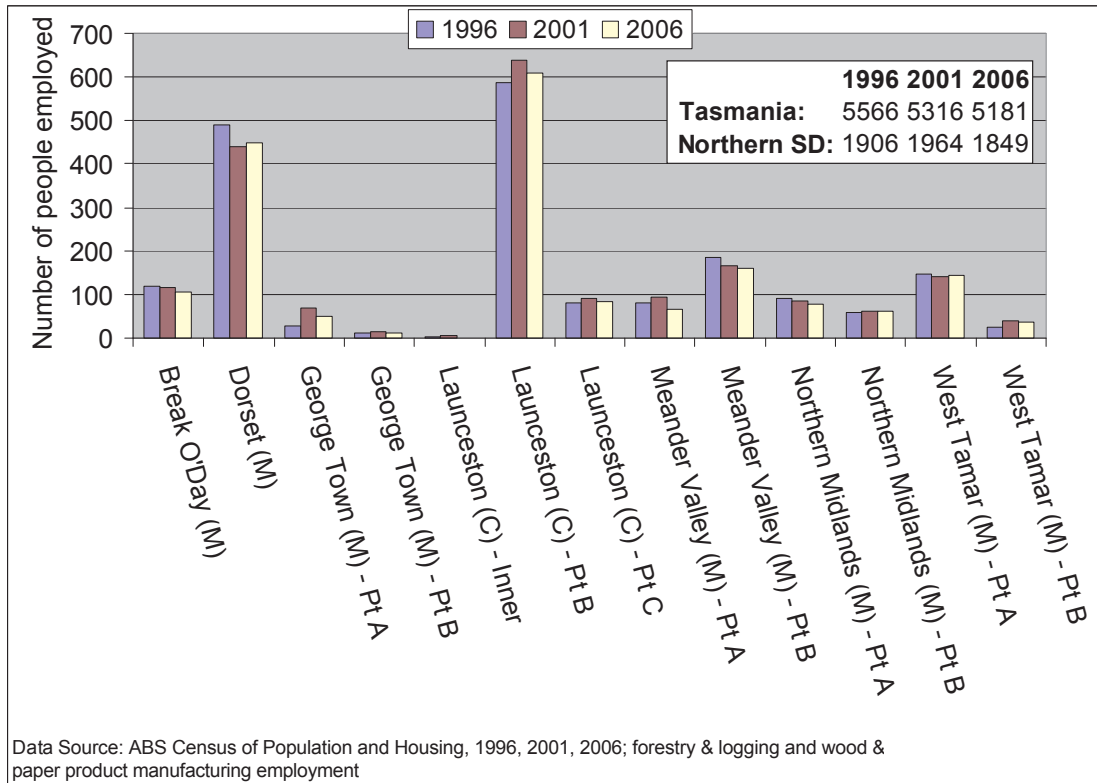


Figure 3: Employment in forest industry, total all sectors, 1996, 2001, 2006

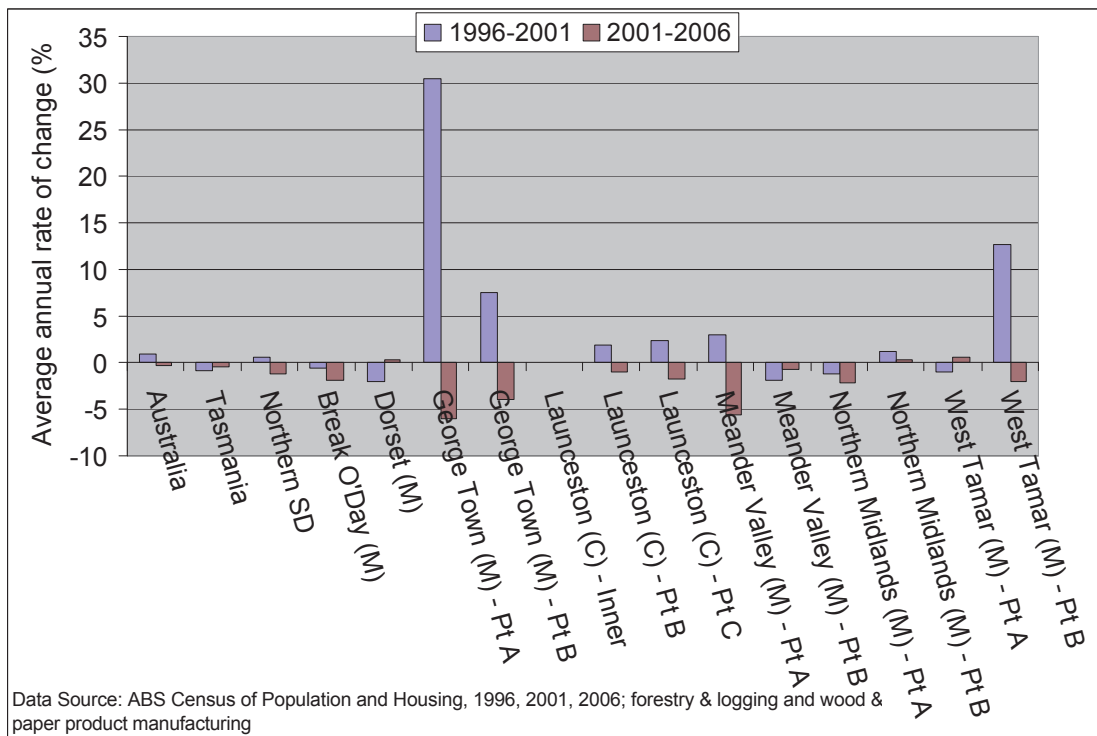


Figure 4: Rate of change in employment in forest industry, total all sectors, 1996, 2001, 2006⁹

⁹ Note: Where an area had < 20 employees in all time periods, rate of change is not shown, as randomisation of data by the ABS together with small numbers of people employed make the rate of change data potentially meaningless for areas with small numbers of forest industry workers.

Employment in the forestry and logging, and wood and paper product manufacturing, sectors

Total employment in the ‘forestry and logging’ and ‘wood and paper product manufacturing’ sectors is shown in Figures 5 to 8. Forestry and logging is defined as the activities of growing and managing forests, and harvesting trees. Wood and paper product manufacturing involves processing wood and paper products, and includes people who work in woodchip mills, sawmills, wood-based panel production, and pulp and paper production.

Overall, 65.7% of people who worked in the north east Tasmania forest industry in 2008 worked in wood and paper product manufacturing, while 34.3% were employed in forestry and logging activities. The latter figure is likely to undercount the true level of activity that occurs prior to processing, with Schirmer (2008) finding that ABS data do not include many silvicultural contractors who work in activities such as ground and soil preparation, tree planting, fertilising and pest and weed control while plantations are growing. However, it is evident that the manufacturing sector supports the majority of employment in the forest industry in north east Tasmania.

The proportion of workers employed in each sector is similar in north east Tasmania and Tasmania as a whole (in Tasmania as a whole, 65.7% of forestry workers are employed in wood and paper product manufacturing and 34.3% in forestry and logging). Both north east Tasmania and Tasmania differ considerably from the Australian average, however, with 87.3% of forestry workers across Australia working in wood and paper product manufacturing and 12.7% in forestry and logging. This indicates there is a lower level of processing/value adding of wood products relative to the volume of timber logged in Tasmania compared to the Australian average.

In many parts of north east Tasmania, forestry and logging employment grew over 1996 to 2001, and subsequently declined. The exceptions were Break O’Day, Meander Valley – Pt B, where there was consistent decline; and Launceston – Pt B where there has been continuing growth in forestry and logging employment¹⁰. When trends in Australia are compared to trends in Tasmania for forestry and logging, Tasmania experienced greater growth in employment over 1996-2001 than the Australian average and a slightly lower decline in employment over 2001-2006.

Employment in wood and paper product manufacturing showed more consistent decline over 1996-2001 and 2001-2006 than employment in forestry and logging, with almost all north east Tasmanian regions experiencing decline. Areas which did not experience decline typically had relatively low numbers of employees, meaning that an increase involved a small number of people. While north east Tasmania experienced decline in wood and paper product manufacturing employment over both periods, in Tasmania there was growth in employment in wood and paper product manufacturing over 2001-2006. Tasmania as a whole shows different trends to the Australian average – across Australia over 1996-2001, employment in wood and paper product manufacturing increased, while in Tasmania it declined, while the opposite occurred over 2001-2006.

¹⁰ Note that rate of change is not shown for areas with < 20 employees as these data are likely to be influenced by randomisation of data by the ABS.

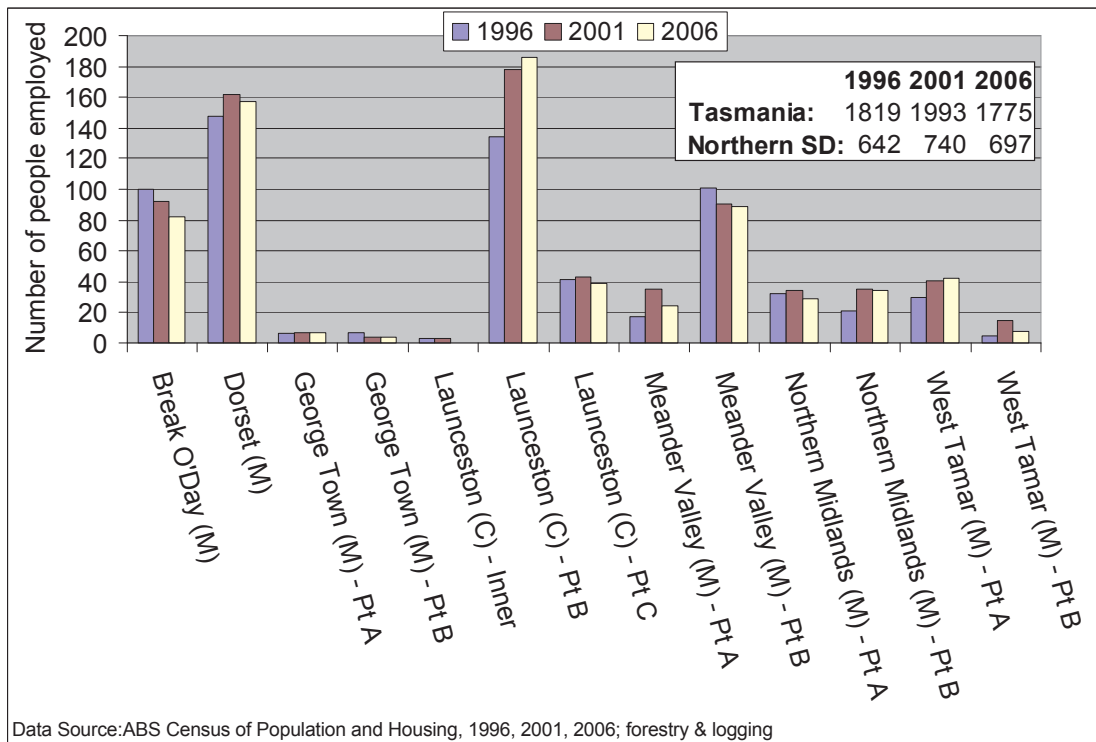


Figure 5: Employment in forestry and logging sector, 1996, 2001, 2006

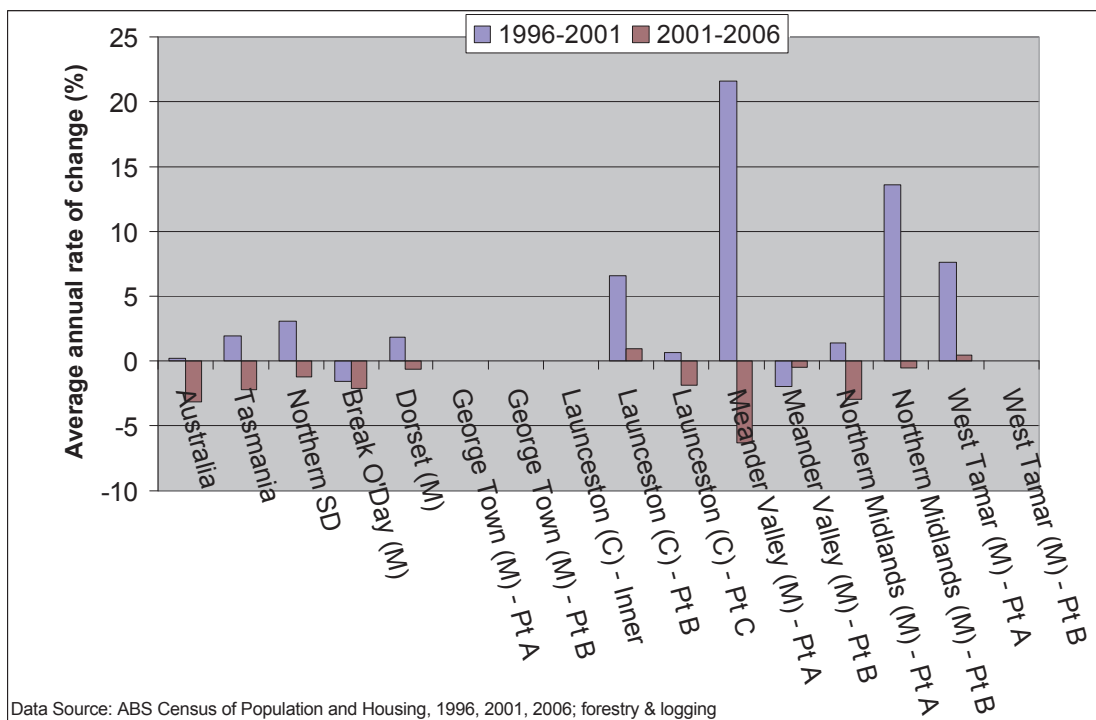


Figure 6: Rate of change in employment in forestry and logging sector, 1996, 2001, 2006

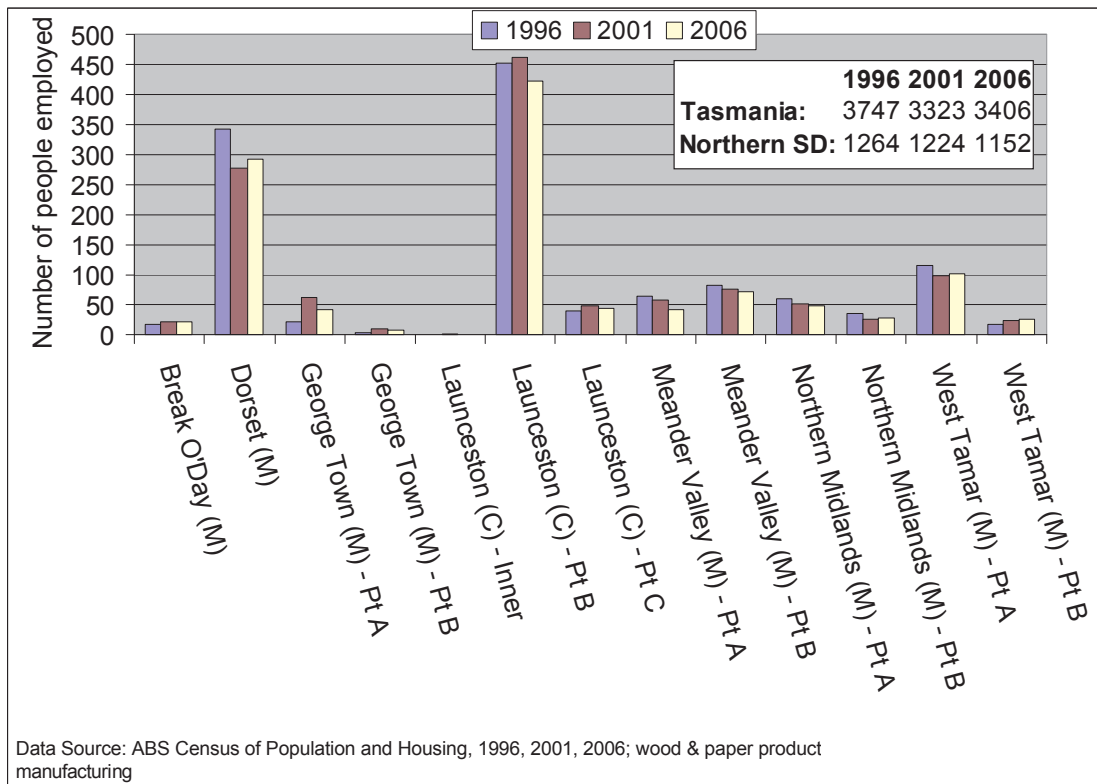


Figure 7: Employment in wood and paper product manufacturing sector, 1996, 2001, 2006

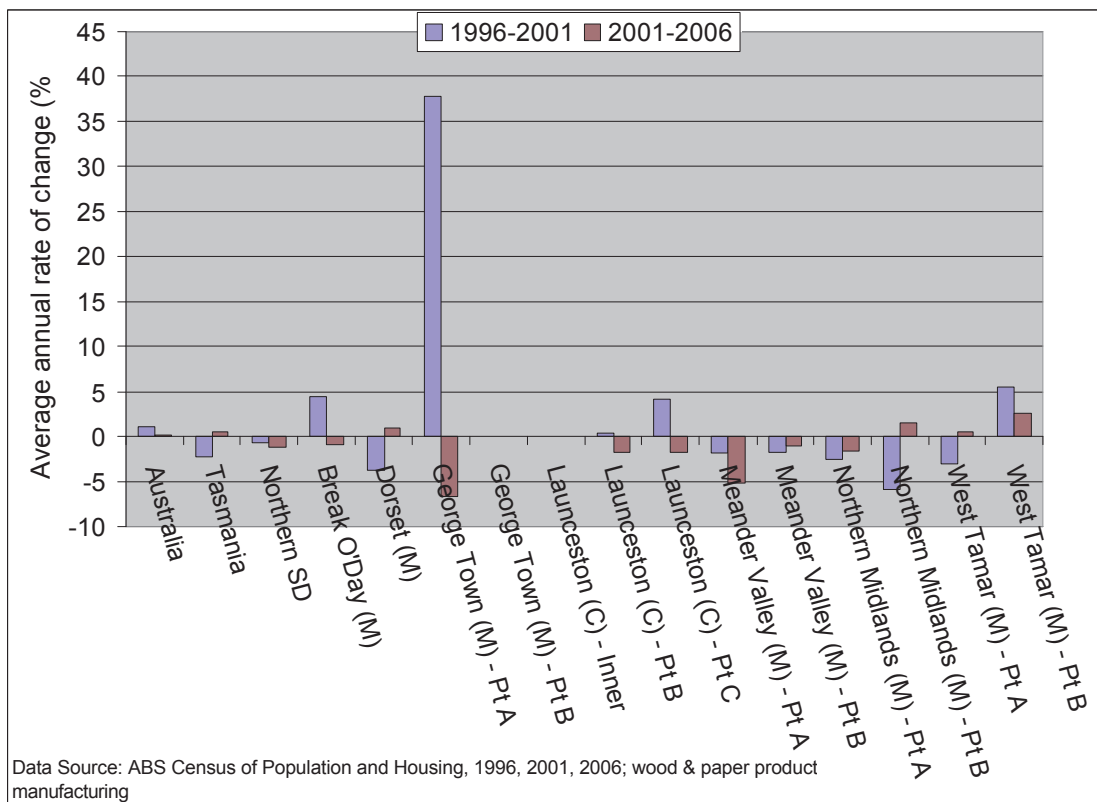


Figure 8: Rate of change in employment in wood and paper product manufacturing sector, 1996, 2001, 2006

Employment in the native forest and plantation sectors

North east Tasmania has a greater reliance on plantation employment than Tasmania as a whole, as can be seen in Figure 9¹¹. In total, approximately 40% of north east Tasmanian forest industry workers work in the plantation sector, and 60% in native forestry. Plantation sector employment is largely based in Dorset, where there are softwood processing facilities; however, since 2006 when these data were produced, there have been significant job losses due to closure of some softwood milling operations in Dorset. Other local areas within north east Tasmania have similar levels of dependence on plantation forestry to the Tasmanian average, with the exception of Break O'Day and West Tamar where it is estimated more employment is based in the native forestry sector (although Break O'Day does have large areas of plantations, the majority of employment in the municipality was generated in the native forest sector).

These data do not include many silvicultural contractors, and it is likely that once contracting employment is included, employment in hardwood plantations would be higher, as much of the work currently generated in this sector is undertaken by silvicultural contracting firms.

It was not possible to specifically identify the proportion of employment in softwood and hardwood plantations at the local scale, but at the State scale, Schirmer (2008) estimated that of the 31.7% of employment dependent on plantations, 24% was based on softwood plantations and 7.7% on hardwood plantations.

An attempt was made to identify what proportion of plantation-based employment was based in the Managed Investment Scheme (MIS) sector. This was problematic to identify, as:

- The only businesses which specifically identify as being MIS are those which manage plantations on behalf of investors. It is not possible to identify MIS derived wood at the wood and paper product manufacturing stage, and so it is only possible to examine MIS-based employment in the forestry and logging sector;
- Within the forestry and logging sector, a considerable proportion of employment is generated in contracting firms, such as silvicultural contractors. However, it was not possible to identify what proportion of silvicultural contractor employment is dependent on the MIS sector based on the limited phone survey of forestry growers undertaken; and
- Some forestry businesses which manage plantations manage both MIS and non-MIS plantations, and it is very difficult to identify what proportion of their employment is dependent on the MIS and non-MIS parts of their business activities.

¹¹ Data on employment in the plantation and native forest sectors were gathered by asking forestry businesses what proportion of their activities occurred in each sector. Where a business did not provide information, local industry experts were asked their knowledge of (a) which sector a business operated in and (b) the broad size of its overall operations in terms of number of employees. This information was gathered based on the location of the forestry business. ABS data on forest industry employment by place of residence then had to be adjusted to estimate the proportion of employment in each sector. This requires making an estimate based on knowledge of where forest industry workers typically live in relation to the location of their place of employment. Based on Schirmer (2008), it was assumed that a large majority of forestry workers live in the same local government area (LGA) as their place of work, or in a neighbouring LGA, and that relatively few live more than one LGA away from their place of employment. The data in Figure 9 are also based on the wood source used by a business, whether or not that wood was sourced from within the region. Some processors source timber from some distance away, or import a wood-derived product and process it to a further stage. The data should be taken as a broad indication of location of plantation and native forestry employment, rather than a precise estimate.

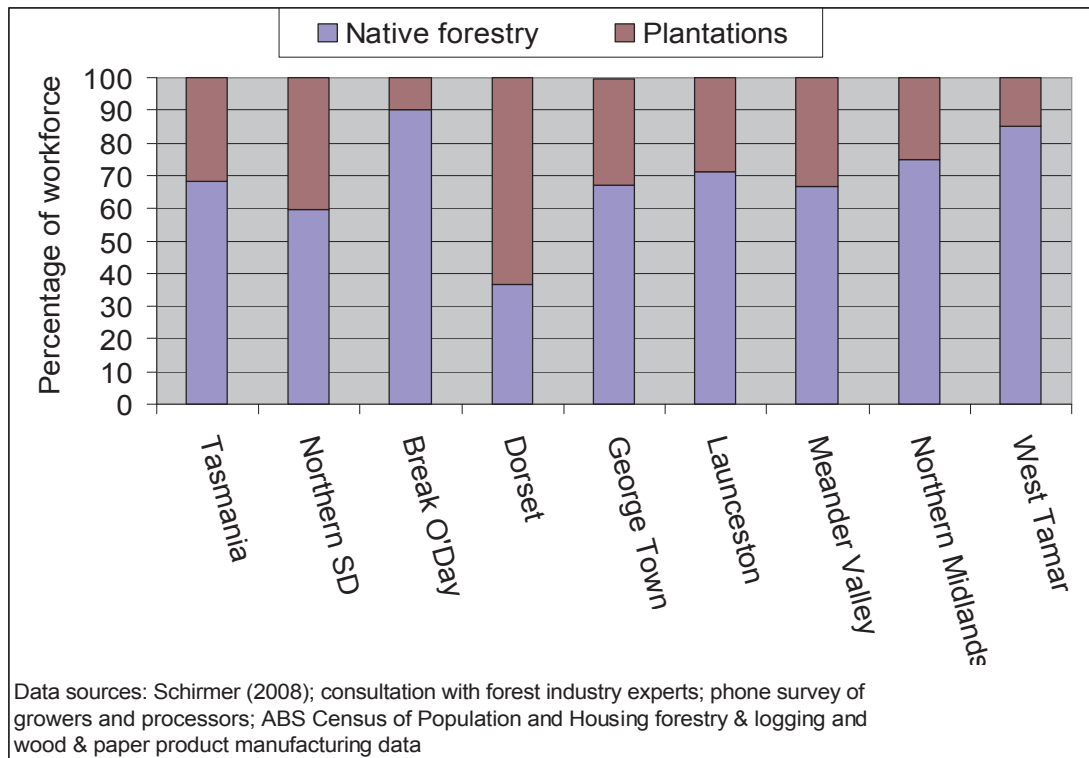


Figure 9: Proportion of employment in native forestry and plantation sectors by LGA, 2006

Within the limited part of the forestry and logging sector where it was possible to distinguish MIS and non-MIS activities based on publicly available data on the nature of company activities, and data collected via phone contact with forestry businesses and consultation with forest industry experts:

- Approximately 60% of employment by forest growers across all of Tasmania was in the non-MIS sector; and
- Approximately 40% of employment by forest growers across all of Tasmania was in the MIS sector.

It is not possible to identify if the same percentages would apply to employment in the forestry and logging part of the plantation sector overall, as it is not known whether the MIS and non-MIS sectors engage similar proportions of silvicultural and harvest contractors.

3.1.2 Estimated value of forest industry production

The value of production of an industry provides important information about its economic impact on the region in which it operates, as the value of production is a useful indicator of the economic activity generated by the industry.

The estimated value of production of the forest industry can be measured at several points in the chain of production:

- Gross value of log production (roundwood);
- Gross value of sawnwood;
- Gross value of wood based panels; and
- Gross value of paper and paperboard.

There has been more rapid growth in the value of log production in Australia as a whole compared to Tasmania (Figure 10). From 2000-01 to 2003-04, growth in the value of log production was more rapid in Tasmania than for Australia as a whole, while over 2003-04 to 2006-07, the value of log production fell in Tasmania, while it grew in Australia (Figure 11).

North east Tasmania contains a large proportion of Tasmania's wood production, but it is not possible to identify whether it experienced the same trends as the state in the value of production of the forest industry. Information on value of production was only obtained at national and state level, with specific data on north east Tasmania not able to be obtained¹². While forestry processors in the region were asked to provide information on their production, most declined to provide this information for confidentiality reasons, and also because the data can be complex to provide – many wood and paper manufacturers produce a wide variety of products with differing values. In addition, confidentiality concerns mean that it is often not possible to report value of production for local regions, as there are often less than three businesses producing particular products in an SLA or SD, and the business may be individually identifiable if data were presented at these scales.

¹² Data from the Australian Bureau of Agricultural and Resource Economics (ABARE) *Forest and Wood Products Statistics* series were used to estimate value of forestry production over time, comparing trends in Australia and Tasmania.

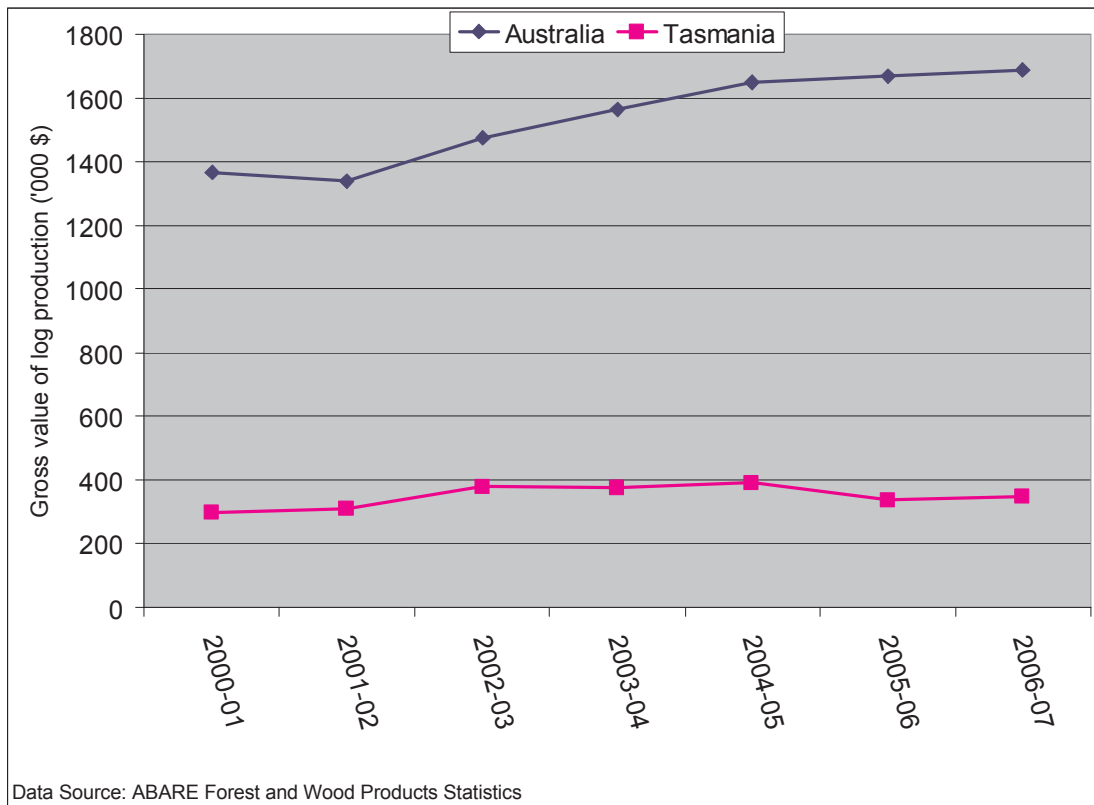


Figure 10: Estimated value of forest industry production – gross roundwood equivalent, 2000-01 to 2006-07

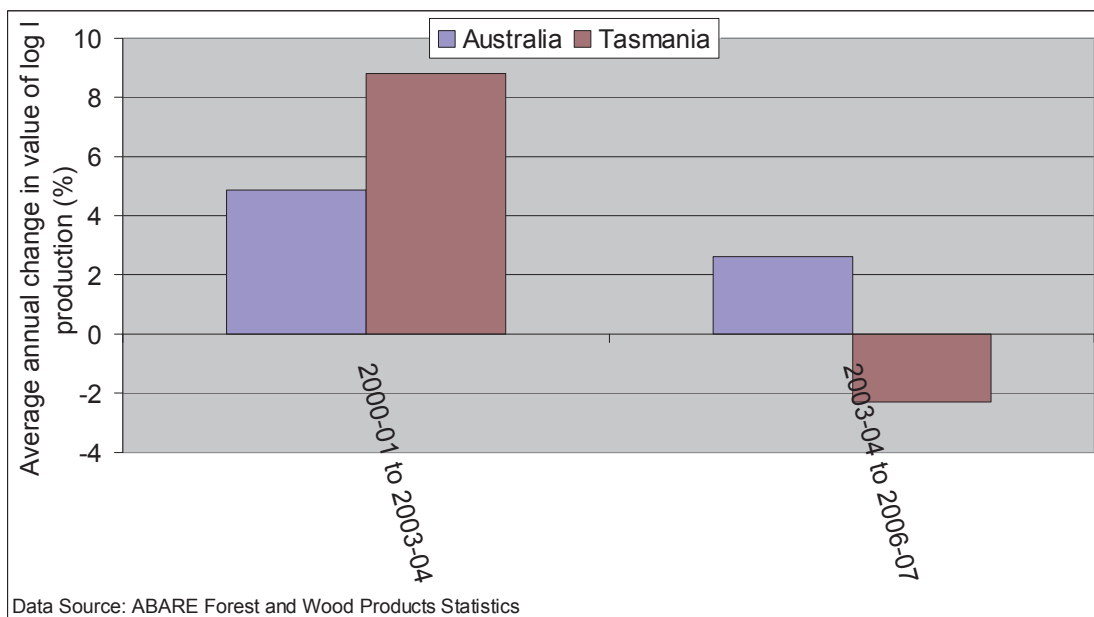


Figure 11: Average annual change in value of forest industry production – gross roundwood equivalent, 2000-01 to 2003-04 and 2003-04 to 2006-07

3.1.3 Estimated volume of forest industry production

The volume of production of an industry provides important information about its economic impact on the region in which it operates, as the volume of production is a useful indicator of the economic activity generated by the industry. When combined with information on value, it can provide useful data on trends in the industry.

The estimated volume of production of the forest industry can be measured at the following points in the chain of production as initial products such as roundwood are value added to produce products such as paper, sawnwood and wood based panels:

- Volume of roundwood;
- Volume of sawnwood;
- Volume of wood based panels; and
- Volume of paper and paperboard.

Volume of production, and change over time in volume of logs produced is shown in Figures 12 and 13. From 2000-01 to 2003-04, growth in the volume of log production was more rapid in Tasmania than for Australia as a whole, while over 2003-04 to 2006-07, the volume of log production fell in Tasmania, while it grew in Australia.

It is not possible to identify if north east Tasmania experienced the same trends as the state overall. Information on volume of production was only obtained at national and state level, with specific data on north east Tasmania not able to be obtained¹³. While forestry processors in the region were asked to provide information on their production, most declined to provide this information for confidentiality reasons, and also because the data can be complex to provide – many wood and paper manufacturers produce a wide variety of products. In addition, confidentiality concerns mean that it is often not possible to report value of production for local regions, as there are often less than three businesses producing particular products in an SLA or SD, and the business may be individually identifiable if data were presented at these scales.

¹³ While data were obtained from some wood and paper product manufacturers within north east Tasmania, almost half did not provide information on volume produced. Because of this, data from the Australian Bureau of Agricultural and Resource Economics (ABARE) *Forest and Wood Products Statistics* series were used to estimate volume of forestry production over time, comparing trends in Australia and Tasmania.

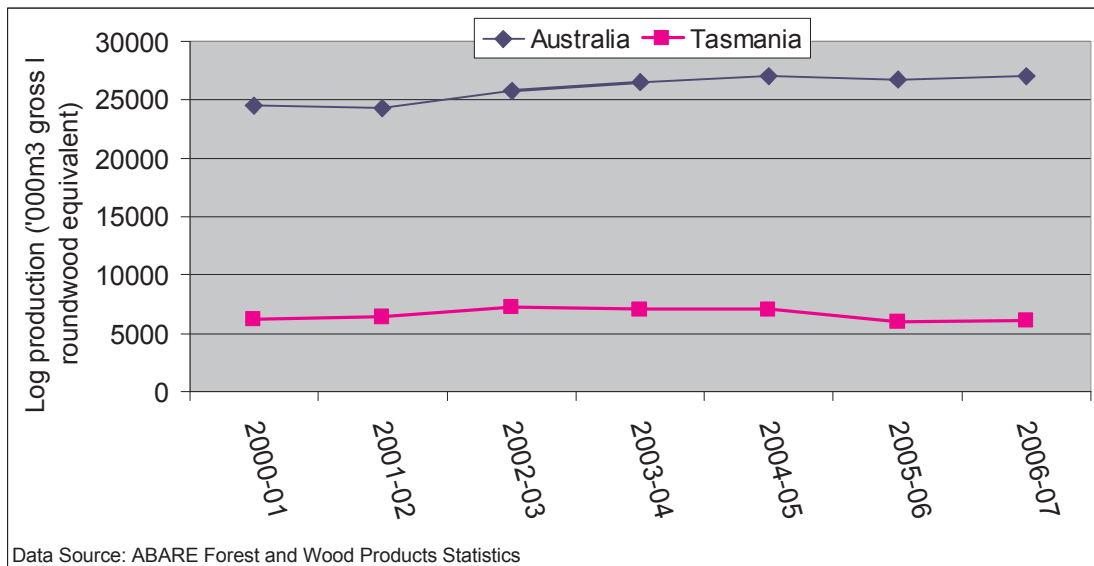


Figure 12: Estimated volume of forest industry production – gross roundwood equivalent, 2000-01 to 2006-07

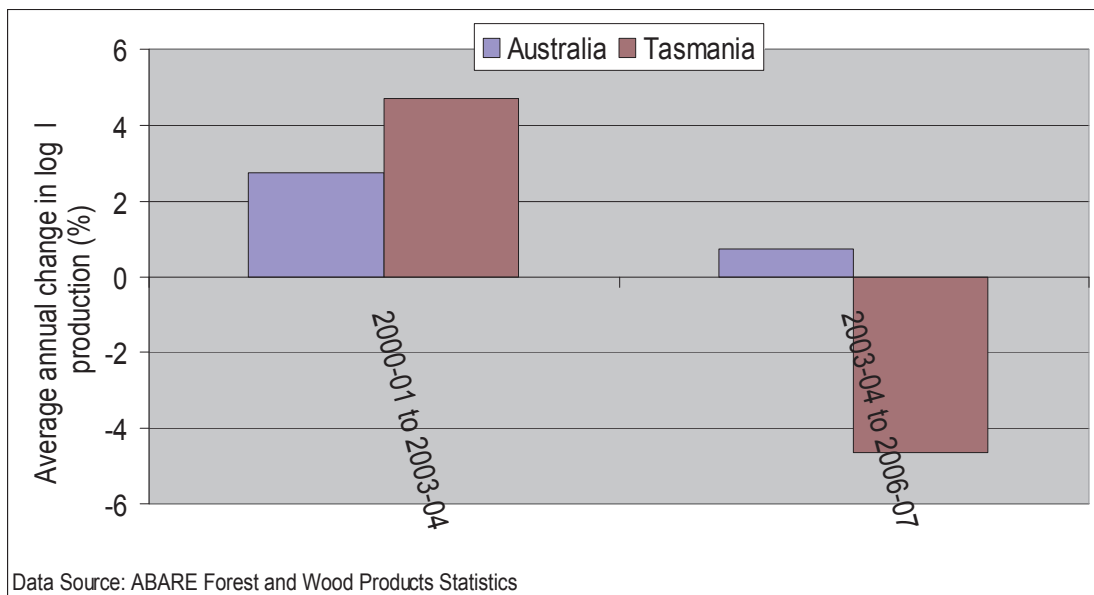


Figure 13: Average annual change in volume of forest industry production – gross roundwood equivalent, 2000-01 to 2003-04 and 2003-04 to 2006-07

3.1.4 Efficiency of production (labour productivity)

The efficiency of production of an industry is a key measure of economic efficiency, with increases in productivity often indicating increased investment in technology and skills that enable higher production per labour unit, and hence improved competitiveness in the marketplace. From a social viewpoint, changes in efficiency of production may have implications for the number of jobs available in an industry, or the skills required of workers.

This indicator is measured by dividing the volume of output produced by the units of labour required to produce it.

An attempt was made to measure this indicator using data from ABARE's *Forest and Wood Product Statistics*, in which the employment required per unit of gross roundwood equivalent produced was calculated. However, the productivity estimates varied widely, most likely because each region produces different types of wood and paper products, and differing amounts of labour are required to produce different products. For example, based on gross roundwood equivalent (GRWE) and total employment in the forest industry, in 2006-07 (*ABARE Forest and Wood Product Statistics*):

- 370 cubic metres of GWRE were produced per forestry worker in Australia;
- 345 cubic metres of GWRE were produced per forestry worker in South Australia;
- 326 cubic metre of GWRE were produced per forestry worker in Victoria; and
- 1170 cubic metres of GWRE were produced per forestry worker in Tasmania.

The productivity measure will be most useful if measured separately for different types of wood and paper products, rather than as a generic measure based on gross roundwood equivalent.

It is therefore recommended that efficiency of production be measured using data from direct survey of forestry businesses, and:

- Be specifically calculated for different types of wood and paper products; and
- Be calculated separately for the native forest and plantation sectors.

This means this indicator may not be feasible to monitor regularly, and may instead need to be measured based on occasional studies.

It also means it was not possible to identify labour productivity for north east Tasmania forest industry based on currently available data.

3.1.5 Consumption of wood and paper products

Consumption of wood and paper products is a key indicator of demand for these products, and hence of likely trends in forest industry production. Changes in consumption may indicate shifts in social impacts of the forest industry.

The rate of consumption of wood and paper products per capita can only be measured at national scale in Australia, as consumption data are not available at smaller scales.

National consumption per capita is shown in Figure 14 for sawnwood, wood based panels, and paper and paperboard, per 1,000 people, for Australia. It can be seen that:

- After growing for most of the period of 1995-2003, sawnwood consumption fell over 2004-2007;
- Consumption of paper and paperboard has grown overall, but not steadily over time, with some decreases in consumption at some points in time; and
- Consumption of wood based panels has grown over time, with some variation in trends in individual years.

The average annual rate of change in consumption for the periods 1994-95 to 1999-00, and 2000-01 to 2006-07, are shown in Figure 15. Growth in consumption of wood based panels and paper and paperboard was relatively similar across these two periods, while growth in the rate of sawnwood consumption fell considerably in the latter period.

National wood and paper consumption data provide useful information relevant to north east Tasmania. Some of the wood and paper products produced in north east Tasmania are sold into national (as well as international) markets, and forest industry production in the region is likely to be influenced by domestic consumption trends. More detailed study is needed to identify how domestic consumption affects demand, however, as forest industry products produced in north east Tasmania are sold into a range of national and international markets, and the relative influence of changes in different types of demand for wood products domestically and internationally needs further examination.

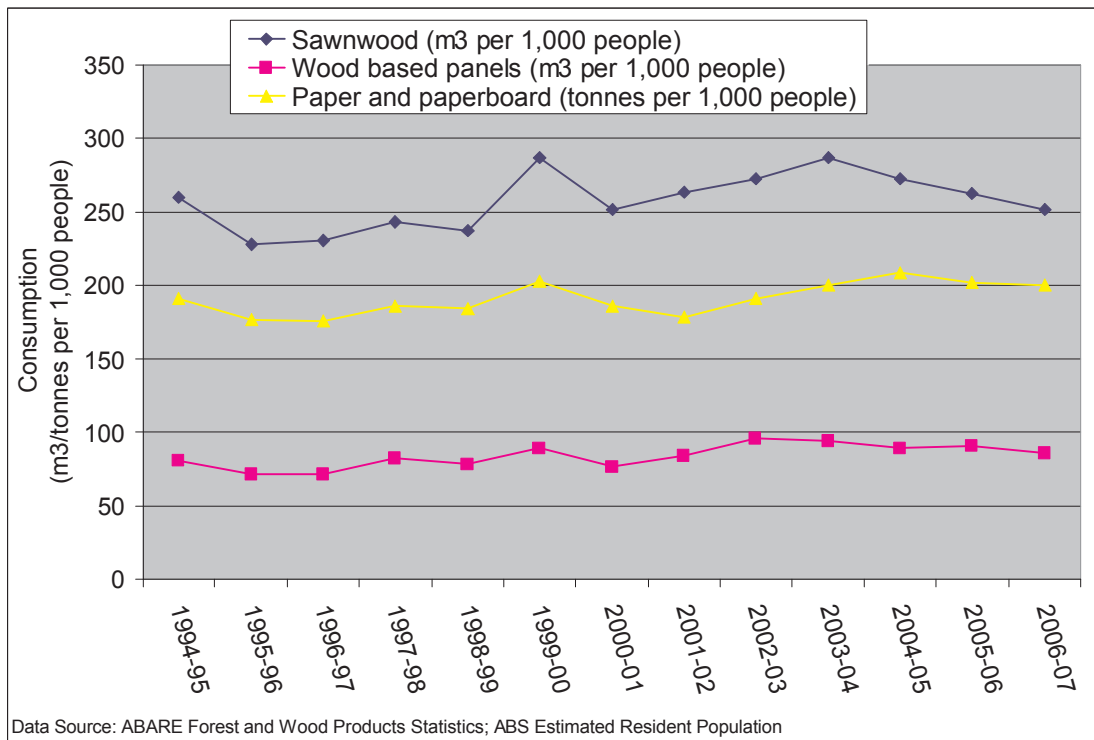


Figure 14: Consumption of wood and paper products per 1,000 people, 1995-95 to 2006-07

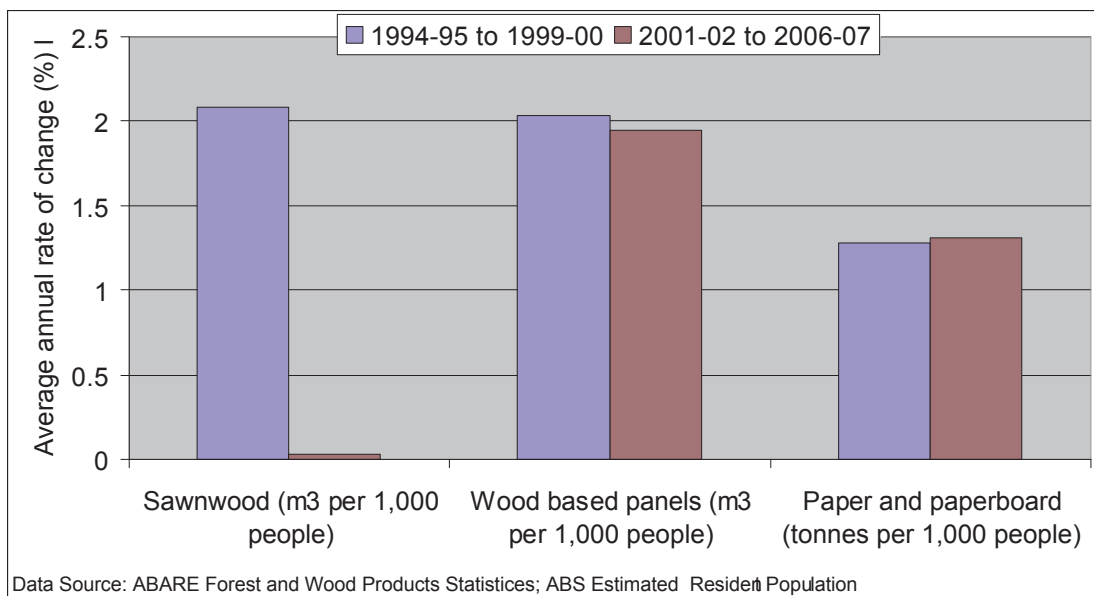


Figure 15: Average annual change in consumption of wood and paper products per 1,000 people, 1995-95 to 2006-07

3.2 Impacts of the forest industry on the broader community

The following indicators provide information that can assist in monitoring the social and economic impacts of the forest industry on the communities in which it is situated:

- Dependence on the forest industry (% employment);
- Social characteristics of forestry dependent regions;
- Location of forest industry employment;
- Impact of forest industry on rural population; and
- Values, uses and perceptions of forestry activities.

These indicators provide a picture of how dependence of different communities on the forest industry is changing over time, and also how forestry-dependent communities are changing in terms of their key socio-demographic and economic characteristics.

Change in social characteristics may be an indicator both of impacts of the forest industry on a community, and provide important understanding of how characteristics of the communities in which the industry operates may influence the industry. For example, if forestry-dependent communities have low levels of unemployment this may partly reflect job creation in the forest industry, but may also be a result of changes to employment in a range of industries. Low levels of unemployment may indicate the forest industry will have difficulty recruiting workers to fill new jobs, constraining its capacity to expand.

The indicators in this category provided a limited but useful understanding of key characteristics of forestry-dependent communities. They should be accompanied by in-depth studies which examine how people experience and interact with the forest industry, and the impacts of changes to the forest industry.

3.2.1 Dependence on the forest industry (% employment)

A first step in understanding the social and economic impacts of the forest industry is to identify the extent to which different regions depend on the forest industry. This indicator measures dependence by identifying the percentage of the workforce in a given area who depend directly on the forest industry for their employment¹⁴.

Within north east Tasmania, the highest dependence on the forest industry for employment occurs in Dorset, where in 2006 almost 16% of the employed workforce worked in the industry. While Dorset had considerably higher dependence on forestry than other parts of north east Tasmania, all local regions in north east Tasmania had higher dependence on the forest industry than the Australian average (Figure 16). North east Tasmania has a higher dependence on the forest industry (3.24%) than the Tasmanian average (2.53%), while the Australian average is lower than that of north east Tasmania or Tasmania as a whole, at 0.80%¹⁵. The high dependence on forestry in Dorset in particular, but also more generally throughout north east Tasmania, indicates these regions are likely to experience greater impacts if changes occur to the forest industry than other regions with lower dependence on the forest industry as a source of employment.

Overall dependence on the forest industry has fallen over time in Australia and Tasmania, as can be seen in Figure 17. In north east Tasmania, dependence on forestry employment grew between 1996 and 2001, and subsequently fell. Many local regions within the north east Tasmania followed a similar pattern, although Break O’Day, Meander Valley, Northern Midlands – Part A, and West Tamar – Part A all experienced a decline in dependence over both 1996-2001 and 2001-2006. This indicates that these local regions are becoming less dependent on forestry over time relative to other parts of north east Tasmania. This may be a result of a number of trends, including a shift of forestry workers to be based in other regions; overall decline in number of forestry workers as was seen in Figure 3 for most of these regions; and growth in the overall labour force, such that the forestry workforce represents a smaller part of the total. All three factors are likely to have contributed, with a fall in the total number of forestry workers in many regions, as well as some growth in the labour force. Further work is needed to identify the extent to which shifts in the location of forest industry employment may also have contributed.

Dependence on plantations and native forestry could only be measured for 2006 (Figure 18). Dorset has a much higher dependence on plantation forestry than other areas.

¹⁴ The indicator is measured by calculating the proportion of the working labour force employed in the forest industry. The data used were sourced from the ABS *Census of Population and Housing*, based on place of usual residence data. Note that it would also be possible to measure dependence using ‘place of employment’ data, as was done by Schirmer (2008). Dependence was measured based on a person’s place of usual residence here because this reflects where people live, and hence where they are likely to spend a large proportion of their income.

¹⁵ If all contractors were included in ABS forestry data, the total dependence on forestry would be higher; For example, ABS data indicate that in Tasmania as a whole, 2.53% of the workforce are employed in forestry, whereas Schirmer (2008) estimated the figure to be 3.08% once all contractors were included in estimates. That said, ABS data are likely to accurately reflect changes over time in forestry employment as data have been measured the same way over time.

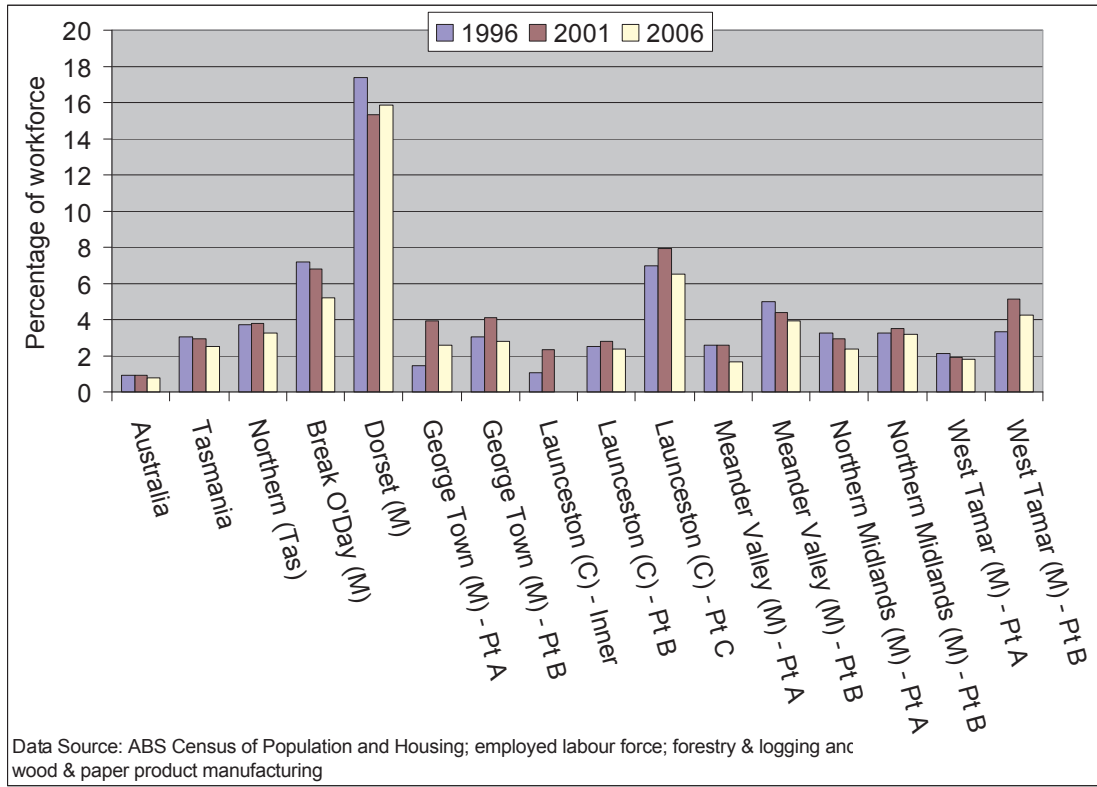


Figure 16: Dependence on the forest industry, measured as proportion of labour force employed, 1996, 2001 and 2006

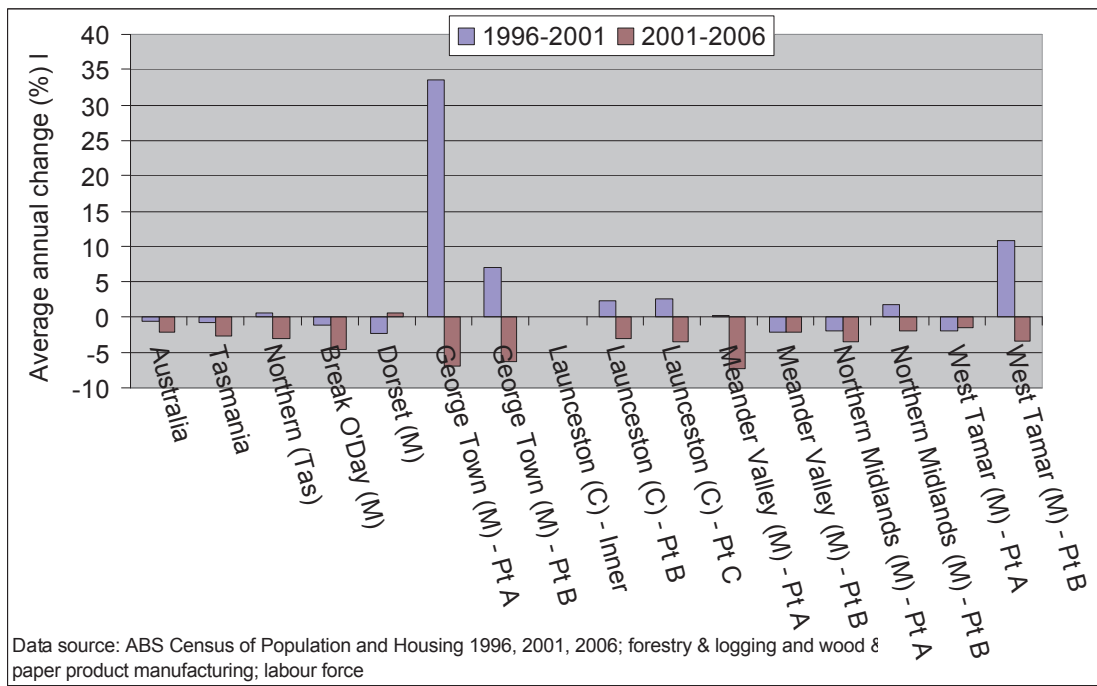


Figure 17: Average annual change in dependence on the forest industry, measured as proportion of labour force employed, 1996-2001 and 2001-2006

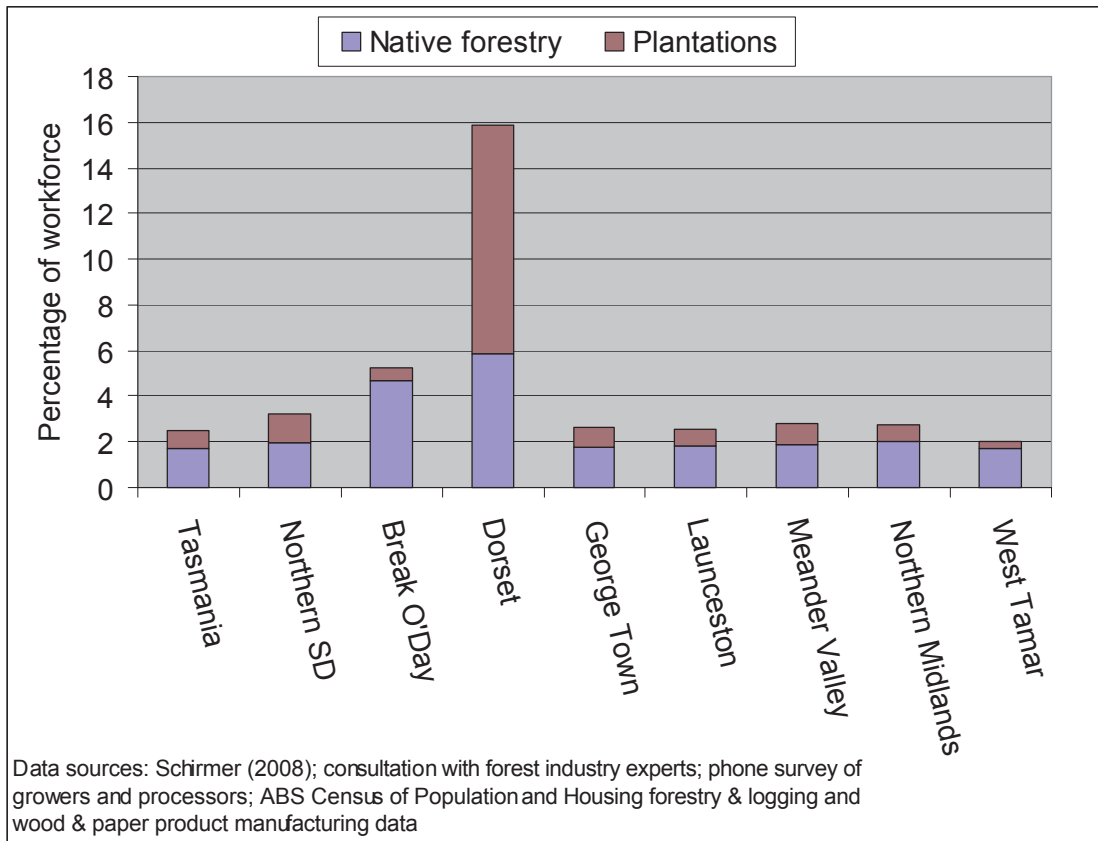


Figure 18: Dependence on the plantation and native forest sectors by LGA, 2006

3.2.2 Social characteristics of forestry-dependent regions

It is possible that forestry-dependent communities have different social characteristics to other communities. These differences may or may not be a result of forest industry activities; either way, they are important to understand as they may influence the ability of a community to adapt to changes in the forest industry.

To better understand whether this is the case, this indicator measures key characteristics believed to be related to a region's ability to adapt to change, namely whether the total amount, and change, in the following differ for regions with higher and lower dependence on forestry:

- Total population;
- Unemployment rate;
- Educational qualifications (proportion of over 15 population with (a) no post-school qualifications, (b) certificate/diploma, (c) bachelor degree or higher);
- Median age;
- Median household income;
- Dependency ratio, which shows the ratio of population age <15 years and >65 years to the working age population aged 25-64 years; and
- Economic diversity (measured as proportion of total employed labour force working in the top three employing industries).

Areas within north east Tasmania were classified as having low, medium and high dependence on forestry based on the proportion of the labour force employed in forestry, with:

- Low = <2% of labour force employed in forestry;
- Medium = 2% to 5% of labour force employed in forestry;
- High = 5% to 10% of labour force employed in forestry; and
- Very high = >10% of labour force employed in forestry.

Based on this classification, the classification shown in Table 2 was identified.

Table 2: Classification of regions by level of dependence on the forest industry

Level of dependence	Region/s
Low dependence	Large scale: Australia SLAs: Launceston (C) ¹⁶ – Inner, Meander Valley (M) – Pt A, West Tamar (M) – Part A
Medium dependence	Large scale: Tasmania Regional scale: Northern SD SLAs: Meander Valley (M) – Pt B, Northern Midlands (M) – Pt A and Pt B, West Tamar (M) – Pt B, Launceston (C) – Pt B, George Town (M) – Pt A and Pt B
High dependence	SLAs: Break O'Day (M), Launceston (C) – Pt C
Very high dependence	SLAs: Dorset

Information on social characteristics of each region are presented in Table 3. For each, two figures are presented: the level in 2006, and rate of change over 1996-2006. This enables identification of whether regions with higher dependence on forestry have different characteristics (e.g. higher/lower unemployment rate) than other regions, and whether they have been changing in the same ways as other regions.

¹⁶ As previously, the postfix letter 'C' refers to 'city' while 'M' refers to 'municipality'.

When characteristics of low, medium and high dependence forestry regions were compared for north east Tasmania, only two differences were observed between areas with differing levels of dependence:

- In areas with medium or high dependence on forestry, a slightly higher proportion of the adult population had no post-school qualifications, and slightly lower proportion had a bachelor degree or higher qualification, than in areas with low dependence on forestry; and
- Median household income was slightly lower in areas with medium and high dependence on forestry than other areas.

In both cases, it is entirely possible these differences are due to factors unrelated to the forest industry. The size of difference is relatively small, and it is not possible to identify to what extent the forest industry may either contribute to or be affected by these differences.

No other consistent differences were observed between areas with different levels of dependence on the forest industry, indicating that areas with high dependence on the forest industry have few differences in social characteristics compared to those with less dependence located nearby. For example, of the three areas with high or very high dependence on forestry, one (Break O'Day) had a higher than average unemployment rate, while the other two (Dorset and Launceston – Pt C had unemployment rates below the Tasmanian average.

While areas with high dependence on forestry were rarely different to others, it is useful to identify whether north east Tasmania as a whole has different characteristics to the Tasmanian or Australian average. When examining the data in Table 3, it is apparent that:

- Most north east Tasmanian regions, and Tasmania as a whole, experienced either negative population growth or slower growth than the national average, with the exception of Meander Valley – Pt A, which experienced rapid population growth over 1996 to 2006. Meander Valley – Pt A effectively forms part of Launceston, and has had suburban development during this period;
- The overall unemployment rate in Tasmania is higher than the Australian unemployment rate in 2006, but this varies in individual SLAs, with some having a much higher unemployment rate than the Tasmanian average and others having a lower rate than the average;
- Unemployment rates fell in all regions examined over 1996-2006;
- The proportion of the population age over 15 with no post-school qualifications fell in all regions over 1996 to 2006, while the proportion of the population with a bachelor degree or other postgraduate qualification grew;
- Median age grew in all areas; Break O'Day has a particularly high median age compared to all other regions;
- Median household income was highest in urban centres and large regional centres, and lower in rural areas. Break O'Day had a considerably lower average household income than all other regions in 2006; and
- While the overall dependency ratio – the proportion of the population aged under 15 and over 65 compared to those aged 25-64 – grew in Australia over 1996-2006, in most Tasmanian regions it either fell, or grew more slowly than the Australian average. Where the dependency ratio is falling, this indicates a growing number of working age people compared to 'dependent' aged population (whether child or retirement age); slow growth indicates that the proportion of children and elderly are increasing as a proportion of the population.

Table 3: Social characteristics of north east Tasmania

Forestry dependence	Region	2006 - Total population	Change in population 1996-2006	2006 - Unemployment rate	Change in unemployment rate 1996-2006	2006 - % population with no post-school quals
Low	Australia	19,855,288	1.18%	5.24%	-4.29%	60.58%
Low	Launceston (C) - Inner	407	-0.49%	3.20%	-6.47%	50.00%
Low	Meander Valley (M) - Pt A	8176	2.06%	3.70%	-4.27%	64.39%
Low	West Tamar (M) - Pt A	18414	0.76%	5.45%	-4.37%	59.54%
Med	Tasmania	476,480	0.26%	6.58%	-4.03%	64.43%
Med	Northern SD	133,932	0.23%	6.39%	-4.32%	65.64%
Med	George Town (M) - Pt A	5459	-0.34%	11.32%	-3.49%	72.86%
Med	George Town (M) - Pt B	1002	0.03%	7.21%	-4.50%	69.66%
Med	Launceston (C) - Pt B	59277	0.02%	7.14%	-3.98%	64.80%
Med	Meander Valley (M) - Pt B	9889	-0.10%	6.36%	-4.97%	69.32%
Med	Northern Midlands (M) - Pt A	7376	0.79%	4.46%	-4.87%	67.58%
Med	Northern Midlands (M) - Pt B	4436	-0.22%	5.99%	-4.58%	70.67%
Med	West Tamar (M) - Pt B	1827	0.35%	5.02%	-5.44%	65.46%
High	Break O'Day (M)	6017	0.66%	9.02%	-5.60%	69.13%
High	Launceston (C) - Pt C	2729	-0.34%	5.58%	-5.22%	64.12%
V. high	Dorset (M)	6819	-0.39%	5.67%	-1.98%	71.56%

Data source: ABS *Census of Population and Housing*, 1996, 2001, 2006

Table 3: Social characteristics of north east Tasmania (cont.)

Forestry dependence	Region	Change in population with no post-school quals, 1996-2006	2006 - % population with bachelor degree or higher	Change in % population with bachelor degree+ 1996-2006	2006 - Median age (years)	Change in median age 1996-2006
Low	Australia	-1.34%	15.59%	4.96%	37	0.88%
Low	Launceston (C) - Inner	-2.09%	25.94%	3.47%	38	1.18%
Low	Meander Valley (M) - Pt A	-1.16%	8.89%	4.94%	37	2.33%
Low	West Tamar (M) - Pt A	-1.31%	13.48%	4.55%	40	1.43%
Med	Tasmania	-1.26%	11.90%	4.78%	38	1.18%
Med	Northern SD	-1.26%	10.50%	4.91%	38	1.18%
Med	George Town (M) - Pt A	-0.89%	5.06%	5.25%	38	1.88%
Med	George Town (M) - Pt B	-1.24%	5.82%	8.91%	42	2.00%
Med	Launceston (C) - Pt B	-1.29%	12.25%	4.73%	36	0.91%
Med	Meander Valley (M) - Pt B	-1.27%	8.18%	5.23%	42	1.67%
Med	Northern Midlands (M) - Pt A	-1.24%	7.95%	5.27%	39	1.47%
Med	Northern Midlands (M) - Pt B	-1.35%	7.59%	11.84%	40	1.11%
Med	West Tamar (M) - Pt B	-0.95%	8.14%	3.70%	38	1.52%
High	Break O'Day (M)	-1.27%	7.22%	5.20%	46	2.11%
High	Launceston (C) - Pt C	-1.32%	10.00%	4.32%	39	1.82%
V. high	Dorset (M)	-1.19%	6.07%	4.02%	41	1.71%

Data source: ABS *Census of Population and Housing*, 1996, 2001, 2006

Table 3: Social characteristics of north east Tasmania (cont.)

Forestry dependence	Region	2006 - Median house-hold income	Change in median household income 1996-2006	2006 – Dependency ratio	Change in dependency ratio 1996-2006
Low	Australia	\$1027	6.59%	0.50	2.41%
Low	Launceston (C) - Inner	\$877	9.62%	0.59	-0.26%
Low	Meander Valley (M) - Pt A	\$1011	5.32%	0.45	-1.44%
Low	West Tamar (M) - Pt A	\$904	5.61%	0.12	0.55%
Med	Tasmania	\$800	5.44%	0.53	-0.27%
Med	Northern SD	\$759	5.43%	0.54	-0.17%
Med	George Town (M) - Pt A	\$636	3.50%	0.51	-0.81%
Med	George Town (M) - Pt B	\$825	7.63%	0.51	-0.26%
Med	Launceston (C) - Pt B	\$752	5.47%	0.61	-0.37%
Med	Meander Valley (M) - Pt B	\$693	5.26%	0.53	0.40%
Med	Northern Midlands (M) - Pt A	\$842	5.31%	0.46	-0.99%
Med	Northern Midlands (M) - Pt B	\$710	5.71%	0.56	-0.38%
Med	West Tamar (M) - Pt B	\$972	6.70%	0.60	0.46%
High	Break O'Day (M)	\$558	4.16%	0.53	0.03%
High	Launceston (C) - Pt C	\$871	5.89%	0.46	-0.62%
V. high	Dorset (M)	\$652	3.81%	0.56	-0.12%

Data source: ABS *Census of Population and Housing*, 1996, 2001, 2006

3.2.3 Location of forest industry employment

The location of jobs can provide important information on their social impact, and on what types of towns will be most impacted by a change in employment in an industry. Recent studies have indicated that many people believe the majority of jobs in the forest industry are located in larger towns and regional centres, and fewer in small towns and villages (see for example Schirmer *et al.* 2008c). Identifying where forest industry employment is located can help identify whether these perceptions are correct, and also whether the location of forest industry jobs is changing over time.

This indicator compares the proportion of forestry employment located in different sized towns versus the proportion of (a) employment in the agricultural sector, and (b) overall employment. Town size was classified into groups of rural areas towns with:

- Rural land and localities with < 200 population;
- 200-499 population;
- 5,00-999 population;
- 1,000-1,999 population;
- 2,000-2,999 population;
- 3,000-4,999 population;
- 5,000-9,999 population; and
- > 10,000 population.

This range of town sizes was selected as many of the towns in the areas being studied had a population of less than 5,000, and so it was considered useful to ensure several categories of town size were included. Only one city with > 10,000 population – Launceston - was included in the study region, and all others than a population of less than 5,000, so that there are no data for the 5,000 to 9,999 population category.

Overall, the distribution of forest industry employment in north east Tasmania is relatively similar to the distribution of the total labour force across differently sized towns (Figure 19)¹⁷. The key difference is that a moderately higher proportion of forest industry employment is located in towns with less than 1,999 population and on rural land compared to the distribution of the labour force overall.

Forest industry employment is much more urbanised than the location of agricultural employment. This indicates that any shift from traditional agriculture to forest industry-based employment is likely to be accompanied by some shift of employment to regional centres, although 55.9% of forest industry employees in north east Tasmania live in towns or rural areas with populations of less than 2,000.

¹⁷ It was only possible to measure these data for 2006, as data for earlier years were not able to be accessed from the ABS within the timeframe of the consultancy. The indicator compares areas with differing populations within north east Tasmania, as it was not possible to source comparative data for all of Tasmania or Australia (this would have required obtaining forestry employment data for the entire country).

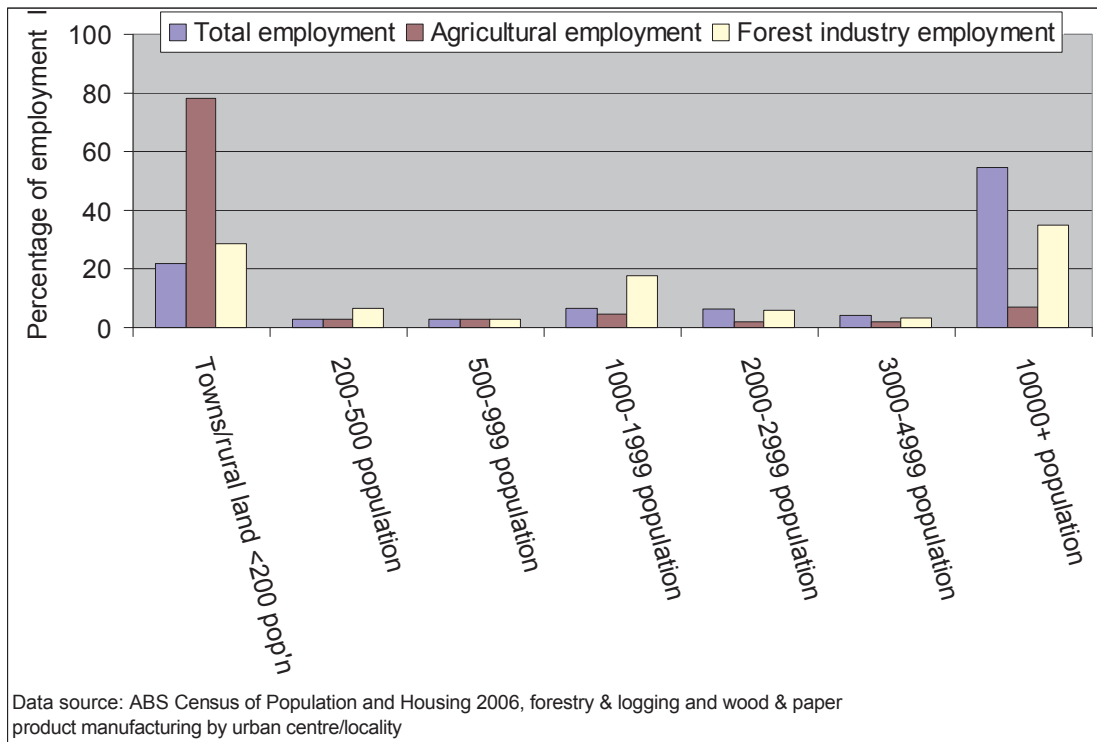


Figure 19: Proportion of forestry, agricultural and total employment in localities of different sizes, 2006

3.2.4 Impact of forest industry on rural population

In recent years, concerns have been expressed that expansion of plantations may lead to change in the population of small rural towns and on rural land. This indicator compares rural population change in areas experiencing different rates of plantation expansion, to identify if there are identifiable differences in rural population change in areas experiencing rapid rates of plantation expansion compared to the average rate of change in rural population. Rural population is defined as the population living on rural properties and in localities (small towns and settlements) with less than 200 residents. This social indicator relates to plantation forestry only, as these concerns have been expressed exclusively about plantation expansion and do not relate to native forestry.

Change in the total area of plantations¹⁸ and average annual rate of change in rural population over 1996 to 2006 are shown in Figure 20. When the rate of plantation expansion is compared to change in rural population, no apparent pattern is seen – areas with higher rates of plantation expansion did not experience higher rates of population decline, and vice versa. Rural population declined somewhat in most regions, irrespective of whether they were experiencing plantation expansion, and rates of rural population decline were not higher in areas experiencing the most plantation expansion.

This indicates that, at the SLA scale, the expansion of plantations in recent years in north east Tasmania has not had an impact on overall rural population levels that is able to be distinguished from other factors influencing rural population.

It is possible that at more localised scales, plantation expansion has been associated with loss of rural population, as the SLA scale is still reasonably large – a single SLA may include a large number of rural properties, only a small number of which will have been established to plantation over a given period.

¹⁸ Initially, average annual change in plantation area was calculated. However, this proved to be a poor indicator of rate of change, as some areas which experienced expansion of plantations of only a few hectares over this period experienced a much higher rate of change in plantation area than those which experienced a greater expansion of plantations. It is therefore more appropriate to use the area of expansion of plantations, rather than the average annual rate of change, as a measure of plantation expansion. This indicator can only be measured meaningfully at local scale, so includes only SLAs and not larger regions.

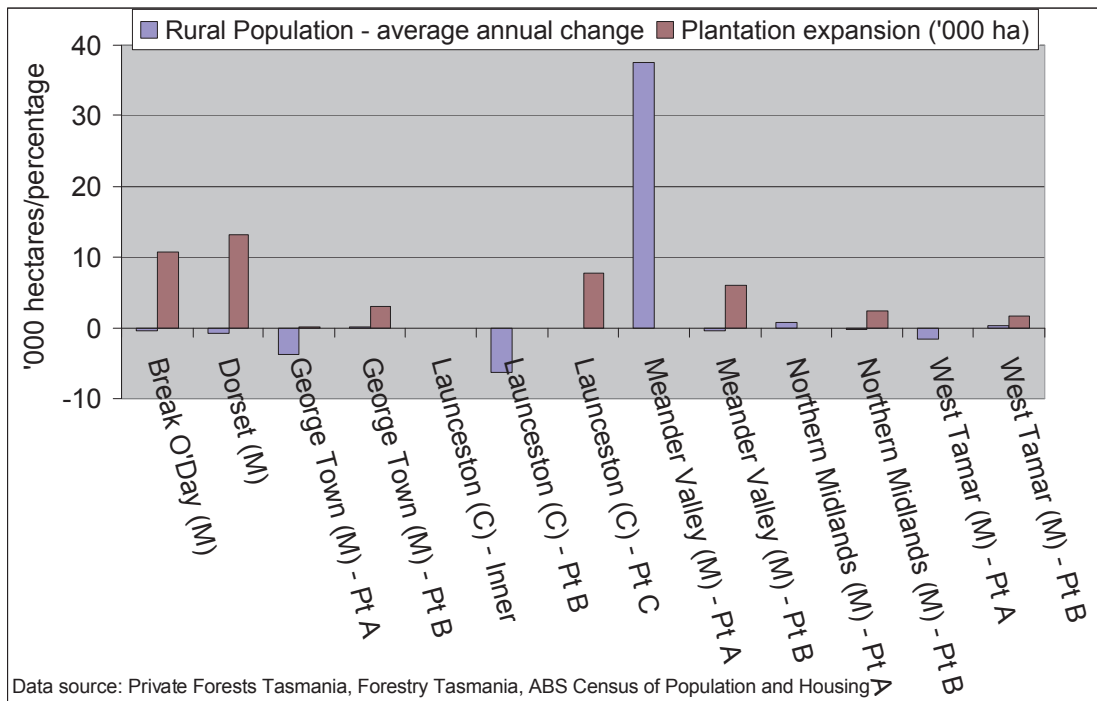


Figure 20: Area of plantation establishment and average annual rate of change in rural population, 1996-2006

3.2.5 Values, uses and perceptions of forestry activities

Perceptions of the north east Tasmanian population about forestry were not identified for this study, as this would require a survey of the communities within the region, and this type of survey was not possible for this consultancy. It is important to understand how the following are changing over time:

- Attitudes and values held about different types of forestry - what overall values and attitudes do people hold regarding forestry in general, and acceptability of different forestry practices? How do these differ between people with different characteristics and living in different regions?;
- Uses of forests – are different people changing the ways they use the forest, for example the types of recreational activities undertaken and access for uses such as firewood collection? Is frequency of use changing? Are the types of people using forests changing over time?; and
- Perceptions of forestry activities – what are the differing perceptions of forest industry activities and how are these changing over time? This may include examining access to information sources and how these influence perceptions.

3.3 Impacts of the forest industry on its workforce

The following indicators provide information that can assist in monitoring the social and economic impacts of the forest industry on the people who depend on forestry for their livelihood, by analysing change in the following characteristics of forestry workers over time:

- Income earned;
- Work injury rates;
- Self-rated physical and mental health;
- Self-rated well-being;
- Age;
- Gender;
- Attachment to place;
- Cultural and family attachment to forestry;
- Hours worked; and
- Educational qualifications.

These indicators provide a picture of key characteristics of forestry workers compared to the overall labour force, how their well-being is changing over time, and their relationship to the industry that employs them.

They provide a useful understanding of some key characteristics, but should be accompanied by more in-depth study which identifies what changes in the different characteristics mean – if the forestry workforce is ageing, is this an indicator of potential future skills shortages? How does working long (or short) hours affect people in the industry?

3.3.1 Income earned by forestry workers

The income earned by forestry workers is a key indicator of their wellbeing, although with limitations. Higher income does not always indicate higher wellbeing, although it is argued to have at least some impact on wellbeing by a number of theorists, and many studies have demonstrated some link between the two.

The average income earned by forestry workers in 2006 is shown in Figure 21, while change in income over 2001-2006 is shown in Figure 22. The distribution of forestry workers income is compared to that of the overall labour force in Figure 23¹⁹.

It can be seen that:

- Tasmanian forestry workers have a similar income distribution to Australian forestry workers; however in north east Tasmania in 2006 a higher proportion of workers earned \$600-999 and fewer earned \$1000-1599 than the Tasmanian average;
- North east Tasmanian forestry workers have experienced slower growth in the \$1600+ income bracket than the Tasmanian or Australian average; and
- When compared to average income across all workers, fewer forestry workers earn less than \$400/week, and more earn between \$400-\$1599 than the average across the total workforce. A similar percentage of forestry workers and workers in general earn above \$1600 per week.

Therefore forestry workers on average – in Australia, Tasmania and the north east of Tasmania - earn a higher income than the Australian average across most income categories. This is partly because forestry worker income is measured for those employed in forestry, whereas income across the whole labour force includes income earned by those on social security benefits, which tends to reduce income.

However, there is still a difference when low income earners are removed; Figure 24 shows distribution of income amongst workers earning more than \$400/week, which would exclude most social security payments. A greater percentage of forestry workers earn \$600-999 than the average for all workers, while fewer earn \$400-599. Income distribution of forestry workers and the general workforce is similar for other income categories.

Figure 25 provides data by SLA; it can be seen that there is variation within SLAs, however the small numbers of people employed in some SLAs means it is not

¹⁹ Data for this indicator were calculated using ABS statistics. While the survey of forestry workers undertaken for this case study also asked for information on income, the sample achieved does not provide a robust analysis of distribution of income within the forestry labour force and was not high enough to analyse differences between forestry sectors. Key limitations of the ABS data include that:

- The ABS changed their income categories substantially between the 2001 and 2006 Census of Population and Housing. This means there is limited comparability of data across these two periods, although some comparison is possible. As a result, the income categories are unevenly distributed as they have been grouped into categories that are possible to compare across the two periods; and
- ABS data can only be realistically presented for regions which had >50 forestry workers. This is because in areas where there are few forestry workers, randomisation of data by the ABS to preserve confidentiality may mean the data do not accurately represent average forestry income, and because the small sample involved means it is not possible to identify whether variation in income distribution is a natural function of the variation expected in a small sample, or reflects actual differences in income between regions.

possible to evaluate if the distribution of income reflects differences in income paid across regions, or simply reflects variation that would be expected when comparing small samples.

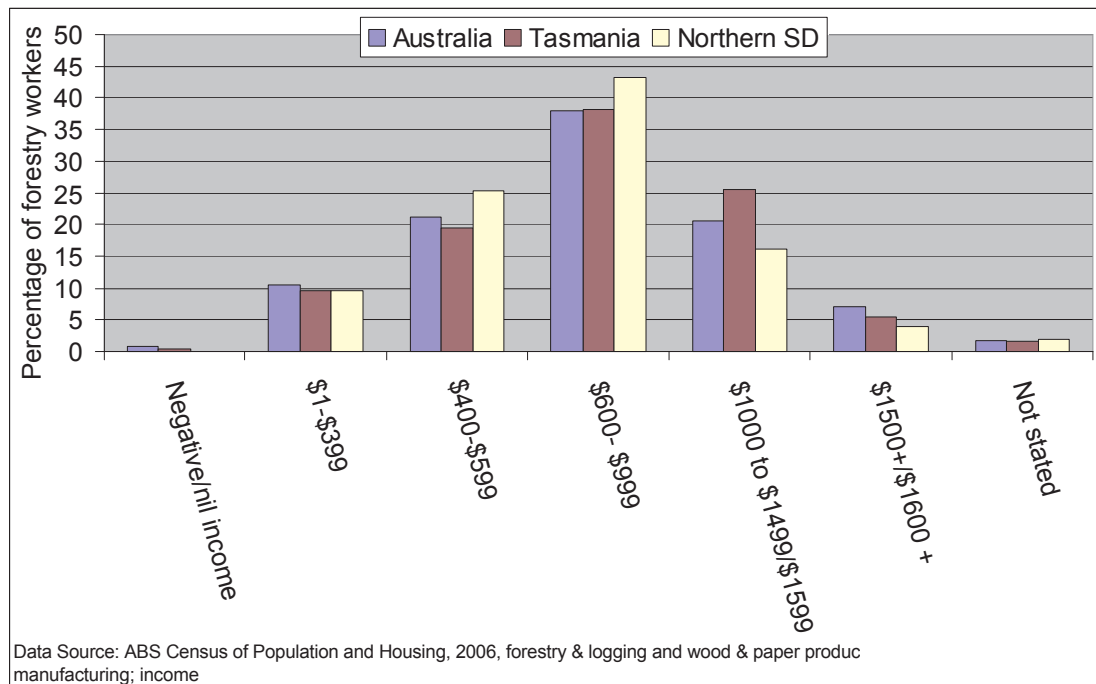


Figure 21: Distribution of forestry worker income, 2006 – Australia, Tasmania and north east Tasmania²⁰



Figure 22: Average annual rate of change in percentage of forestry workers in different income categories, 2001-2006 – Australia, Tasmania and north east Tasmania

²⁰ The '\$1,000 to \$1499/1599' category has two ranges as the ABS changed the income ranges for which they collect data over time. Before 2006, income was measured up to \$1,499; after 2006, income was measured up to \$1,599.

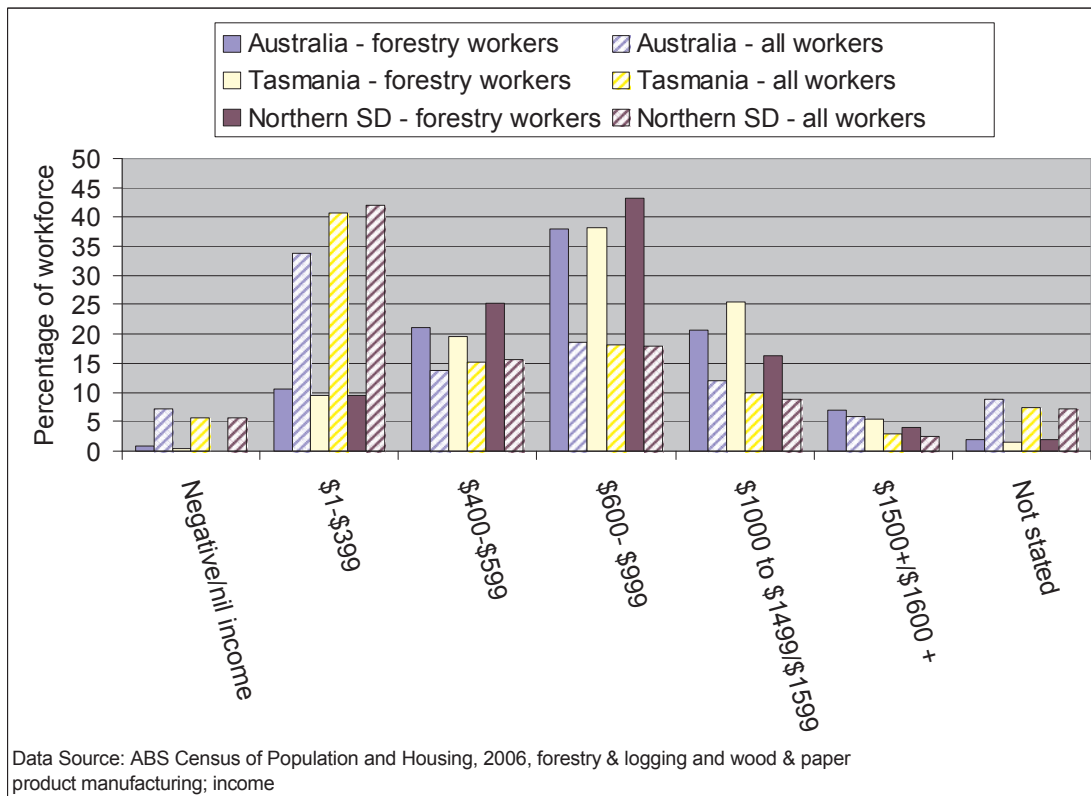


Figure 23: Comparison of forest worker income and average income of total workforce, 2006

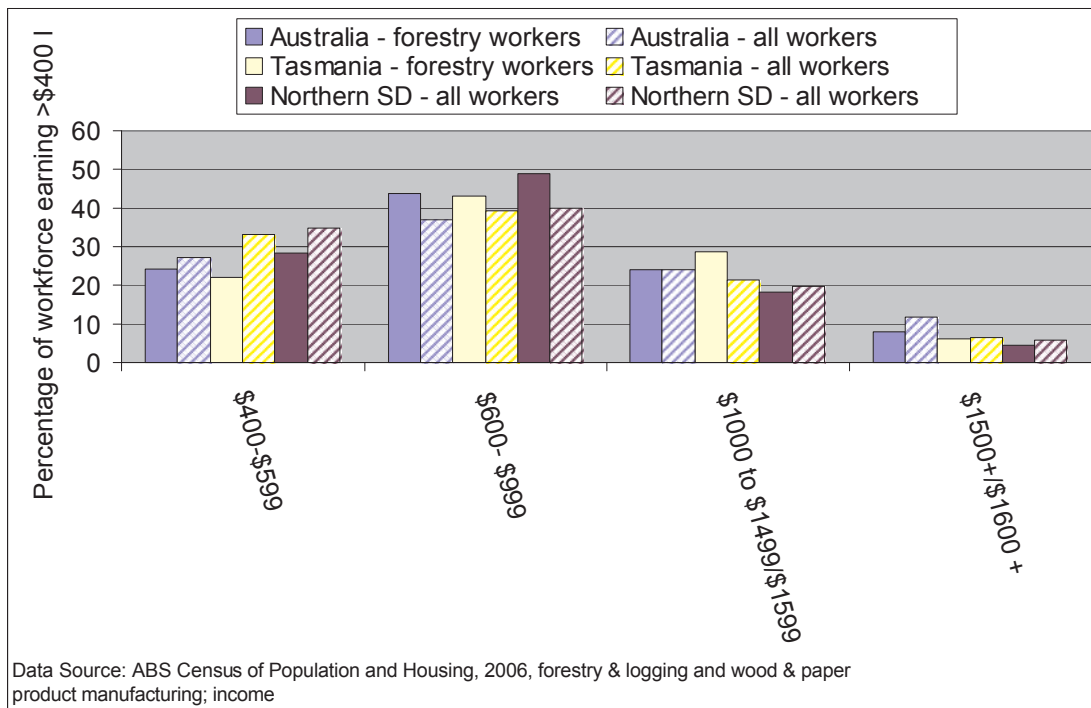


Figure 24: Comparison of forest worker income and average income of total workforce for those earning more than \$400 per week, 2006

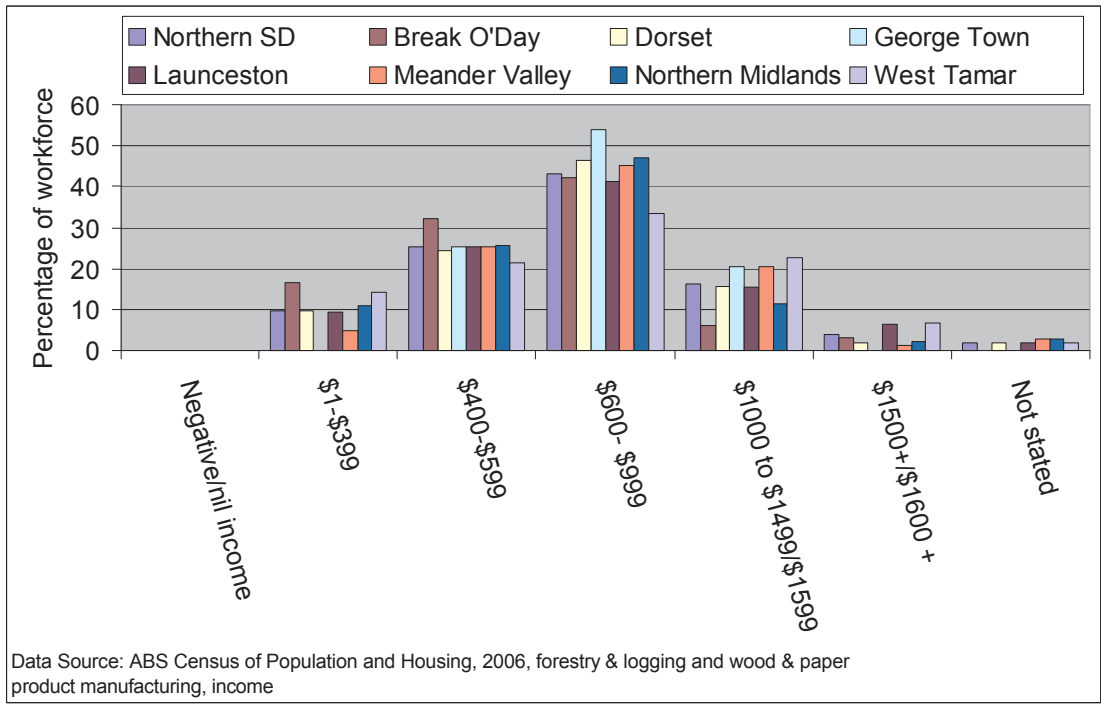


Figure 25: Distribution of forestry worker income, 2006, by SLA

3.3.2 Physical health – reported injury rates

The physical health of forestry workers has a significant influence on their wellbeing. The most direct way to measure how working in the industry impacts on wellbeing of workers is to identify the rate of workplace injuries experienced by forestry workers.

This social indicator reports rates of workplace injuries per 1,000 forest industry workers over a financial year. The information in injuries is drawn from the National Data Set for Compensation-based Statistics (NDS). The NDS records all occupational diseases and injuries for which a work-based compensation payment has occurred, including diseases and injuries causing death, permanent incapacity, or temporary incapacity. It does not include incidence of occupation-related diseases or injuries for which no compensation payment has been made, so represents only a subset of the total occupational diseases and injuries. It is a useful dataset because it allows comparison across industries, so that even with only compensated diseases and injuries included it enables identification of whether the forest industry has higher occupational disease and injury rates than other industries.

When examining data over 1997-98 to 2005-06 (Figures 26 and 27²¹), it can be seen that:

- There is a higher rate of occupational disease and injury in the forestry and logging sector compared to the average across all industries, and compared to the ‘agriculture, forestry & fishing’ and ‘agriculture’ industries;
- There is a higher rate of occupational disease and injury in the wood and paper product manufacturing sector compared to the manufacturing sector as a whole, and compared to the average across all industries;
- Occupational disease and injury rates are consistently higher in the wood and paper product manufacturing sector compared to the forestry and logging sector;
- Occupational disease and injury rates in the forestry and logging sector have varied widely. While there has been a slight fall in the rate of forestry and logging incidence of injury and disease over time, this fall has been less than that experienced in either of the comparison categories; and
- Occupational disease and injury rates in the wood and paper product manufacturing sector have fallen over time, but not at the same rate as they have fallen in the manufacturing sector as a whole, or across all Australian industries.

Overall, the forest industry experiences a higher rate of occupational disease and injury than other industries, particularly in the manufacturing sector, and rates of occupational disease and injury are falling more slowly than for other industries. The higher risk of disease and injury in the forest industry compared to others is an indicator of reduced wellbeing in the industry.

While these data do not specifically cover north east Tasmania, they indicate that it is likely that the forest industry there has relatively high levels of occupational disease and injury. It would be useful to have data for native forest and plantation sectors separately, as different technologies and practices are used for both and this may be associated with differing rates of injury and disease. Unfortunately, these data are not currently available.

²¹ The data is presented two ways: in Figure 26, change in reported injury rates over time for each industry can be compared; in Figure 27, the rate of injuries for a defined period of time can be compared across different industries.

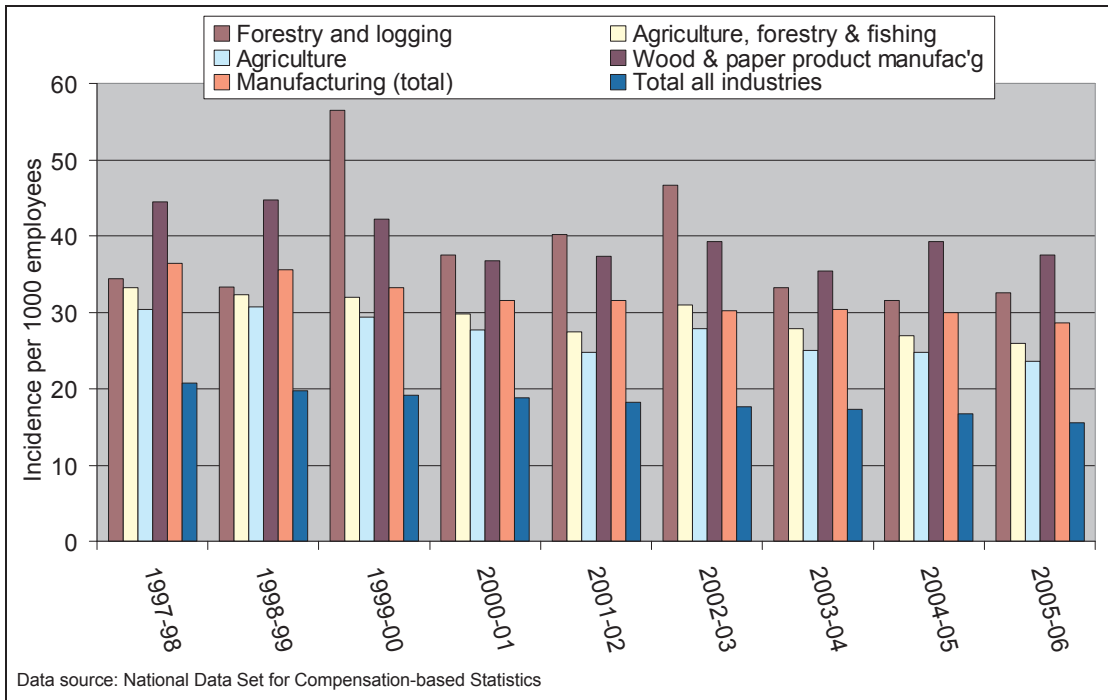


Figure 26: Compensated occupational disease and injury rate per 1,000 workers, compared across industries, 1997-98 to 2005-06

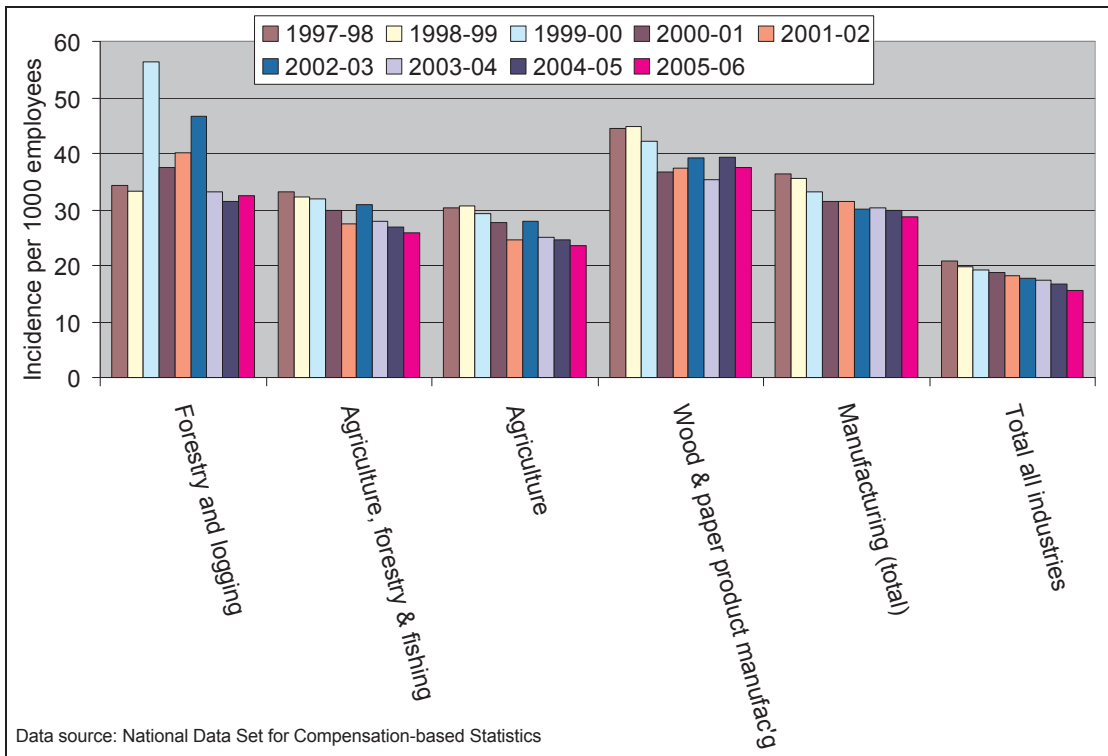


Figure 27: Compensated occupational disease and injury rate per 1,000 workers, compared over time, 1997-98 to 2005-06

3.3.3 Self-rated health (physical and mental)

While data on compensated disease and injury are useful, they provide information on a subset of health issues that may be of relevance. This social indicator reports the physical and mental health of forestry workers, based on their self-reported health.

Data were gathered via a survey of forestry workers in which they were asked to self-identify the extent to which they had experienced symptoms such as difficulty sleeping, depression, stress or anxiety, and physical injury while working, as well as the level of work-related risk they perceived was present in their workplace as a result of the physical conditions, hours worked, equipment, noise, and stress. As described in the 'Methods' section, survey responses may be biased towards office-based industry workers.

The proportion of respondents who had experienced a symptom of ill-health is identified in Figure 28, which compares forestry workers in north east Tasmania to all survey respondents. Survey respondents were also asked whether they had seen a medical professional; between 2% and 7% of Tasmanian respondents had seen a medical professional about the symptoms they experienced.

Tasmanian respondents reported slightly fewer health problems compared to the average across all respondents to the survey.

Across all workers, difficulty sleeping was the most common health problem reported, with 57% of Tasmanian and 67% of all respondents experiencing the symptom, and 8% of all respondents (7% of Tasmanians) seeing a health care professional about it. The least common health problem was physical injury incurred at work, with 11% of Tasmanians and 12% of all respondents experiencing the symptom and 6% of both Tasmanian and all other respondents seeing a health care professional about the injury. The low level of physical injury reported is likely to be influenced by the high number of respondents who were employed in forestry jobs that do not involve physical labour.

Forty four per cent of Tasmanians and 46% of all respondents experienced back pain, and 6% of Tasmanians and 10% of all respondents had seen a health care professional about it. Forty seven per cent of Tasmanians (compared to 57% of all respondents) reported being affected by stress, anxiety or depression, with 6% of Tasmanians and 8% of all respondents visiting a health care professional because of these symptoms. Headaches and excessive fatigue also affected just under half of those surveyed.

Further work is needed to identify if these results are unusual for people of working age who are employed, or whether trends for forestry workers are different to other workers. Repeating this survey over time would enable identification of whether forest industry workers are experiencing changes in levels of health problems over time.

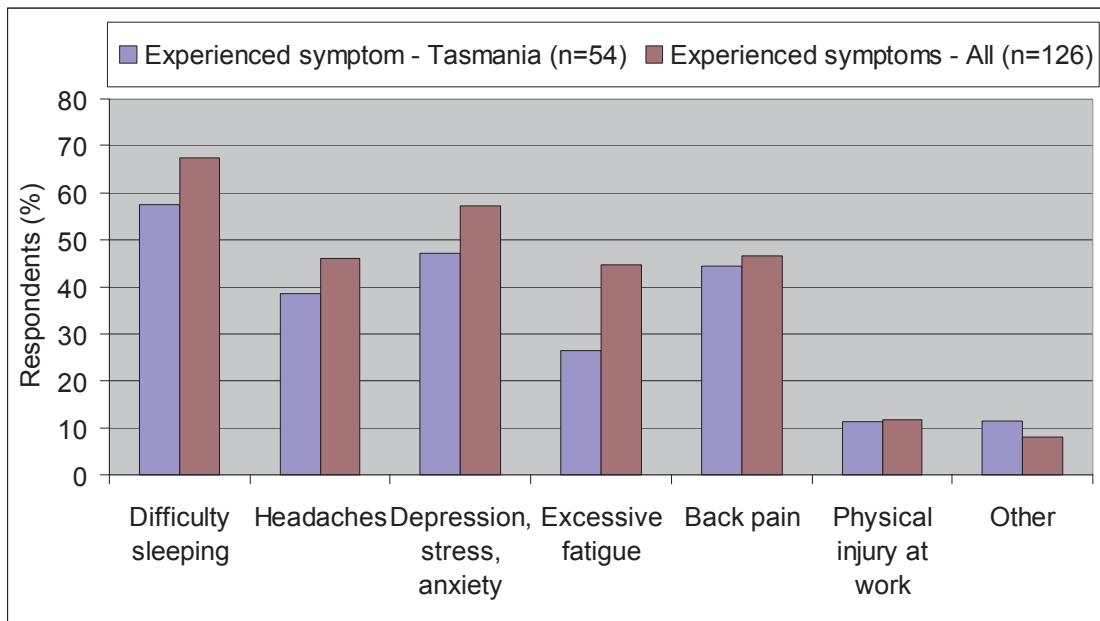


Figure 28: Health problems experienced by forest worker survey respondents

As well as asking about health problems experienced, the survey asked worker's perceptions of the level of risk their work presented to their wellbeing. Responses are shown in Figure 29.

The level of noise experienced at work was perceived to be the smallest risk to forest industry employees. Physical elements of working in the forest industry, and the equipment used were usually considered to present no or little risk. This is likely to reflect the bias in survey responses towards those who are primarily office-based employees.

Aspects of working in the forest industry which led to the largest perceived level of risk were stress and the numbers of hours worked, with 62% and 38% of all respondents respectively rating these as medium to very high risks.

Forestry workers located in Tasmania were very similar to all other respondents to the survey, with the same trends reported in terms of work risk. The small differences evident are likely to be the result of the small sample involved, and cannot be confidently identified as indicating differences between workers in Tasmania and elsewhere.

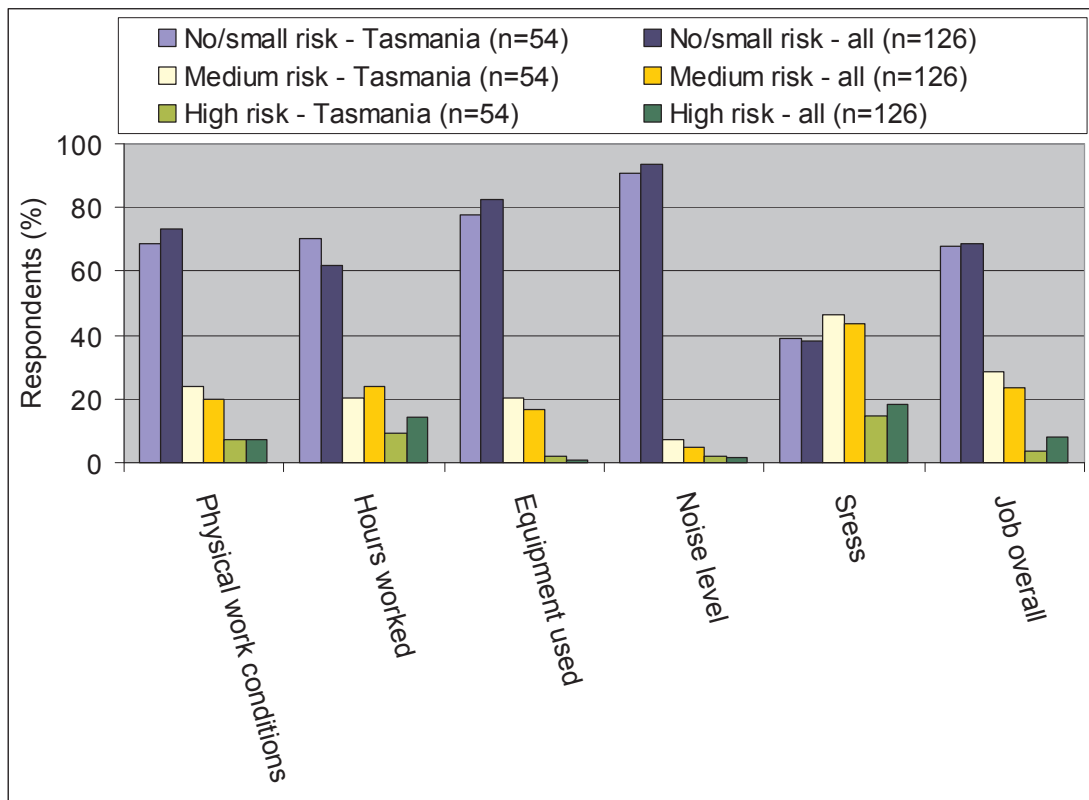


Figure 29: Workplace risks identified by survey respondents

Overall, the responses indicate that the survey approach can provide useful information on worker health. However, it is not possible to identify the extent to which health problems were linked to the workplace for many of the health issues identified; and the small sample means it is not possible to identify how representative these responses are of workers in the forest industry as a whole. While this survey provided useful data for forest industry workers as a whole, it was less useful in identifying any regional differences in forest worker health. Use of a survey to identify these issues should be carefully designed and resourced to enable a large sample of workers to be surveyed, if different regions are to be adequately compared.

3.3.4 Self-rated wellbeing

The survey sent to forestry workers asked them to rate their level of satisfaction with a range of issues related to their life, work, family and income (see Figures 30, 31 and 32). The survey responses to questions about satisfaction with their own lives and financial situation (Figure 30) suggest that forest industry workers are generally happy with most aspects of their life, particularly life in general and the area in which they live, although their level of satisfaction of their financial situation and health was slightly lower than for other aspects of their lives. Tasmanian respondents were very similar to other workers in all aspects. As previously, the small differences evident between workers in Tasmania and other workers are likely to reflect the small sample size achieved from Tasmania rather than actual differences in level of satisfaction.

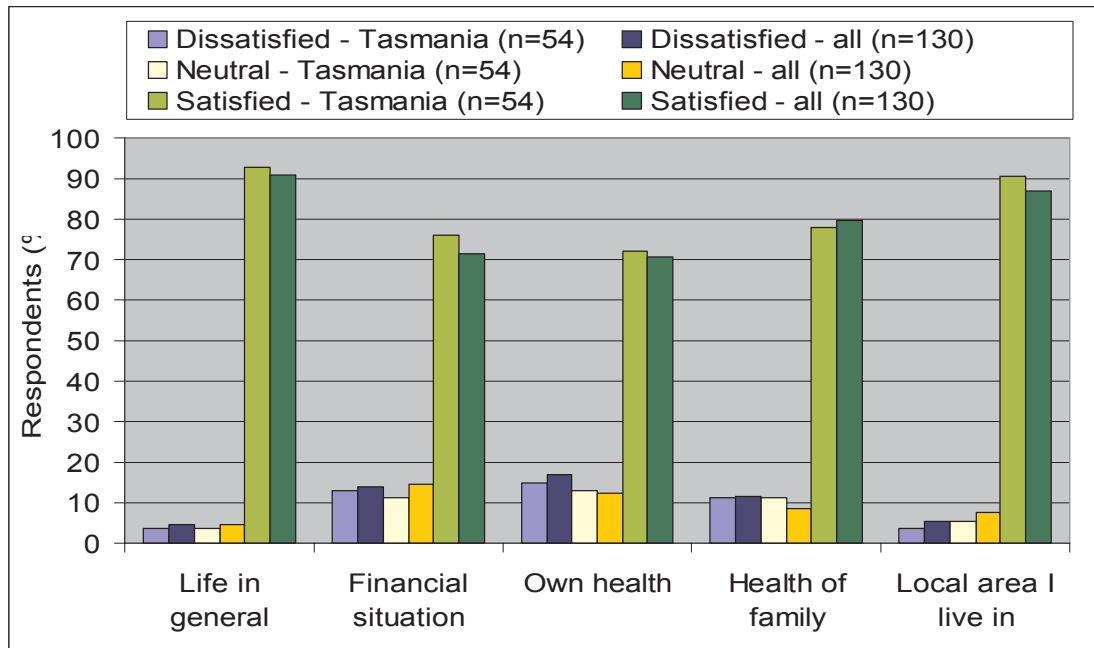


Figure 30: Forest workers' satisfaction with life – survey responses

Forestry workers satisfaction with different aspects of their work varied more widely. Workers who responded to the survey were asked their level of satisfaction with the challenge in their work, control and independence, job security, balance, workmates and other people, and with their job overall (Figures 31 and 32). Responses to this question from Tasmanian respondents were similar to the average for all respondents, indicating that the issues raised by Tasmanian respondents, such as dissatisfaction with support received from organisations outside the industry, are common across the industry nationally rather than being region-specific.

Forestry workers were in general less satisfied with the following compared to other aspects of their work:

- the level of support received from groups outside the forest industry such as local government and other community bodies;
- the rules set by government on how the forest industry can operate; and
- the fairness of decisions about management of the forest industry.

All these issues relate to the views and decisions of people outside the industry about the industry, and indicate these external influences are a key factor influencing wellbeing and work satisfaction. There was also less satisfaction with long-term viability of the industry than other aspects of work for many respondents.

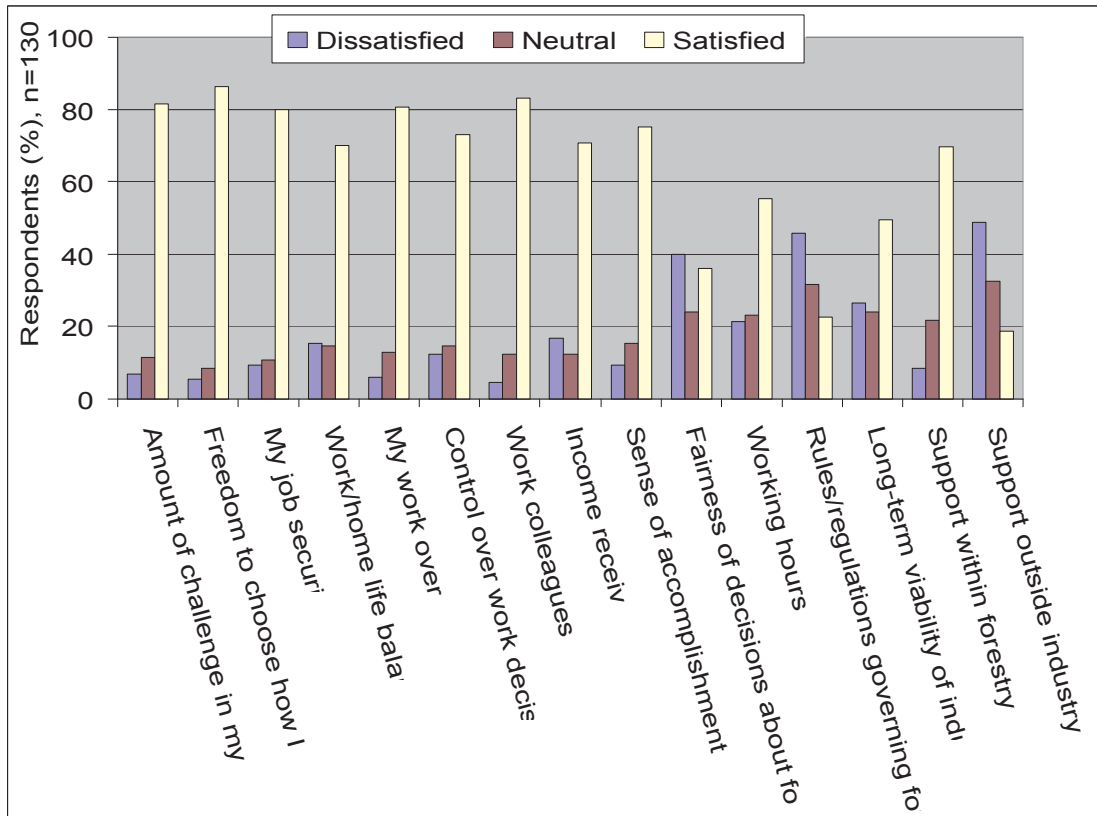


Figure 31: Forest workers' satisfaction with their work – all survey respondents

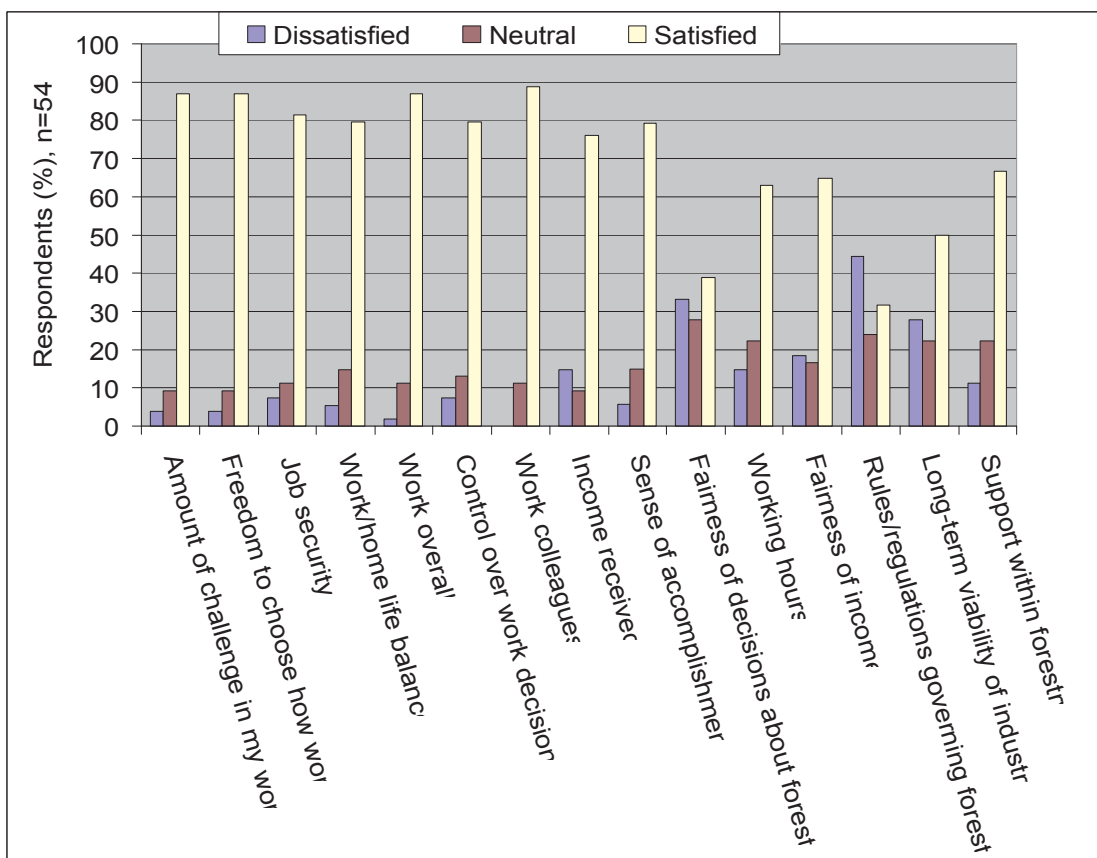


Figure 32: Forest workers' satisfaction with their work – Tasmania

A third set of questions asked forest industry workers about the level of importance of a range of factors related to their work (Figure 33). Most aspects were considered

highly important, with the following rated as highly important by the greatest number of respondents:

- a sense of worthwhile accomplishment;
- having independent control over work done;
- fair and consistent management;
- stimulating and challenging work; and
- a good work-life balance.

Of slightly less importance were aspects such as income and job security. The factor considered by the most number of people to be of lowest importance was interactions with the public forming part of their work.

Responses to these questions may assist in the understanding of levels of satisfaction with life and work as indicated by factors illustrated in Figure 30 to 32.

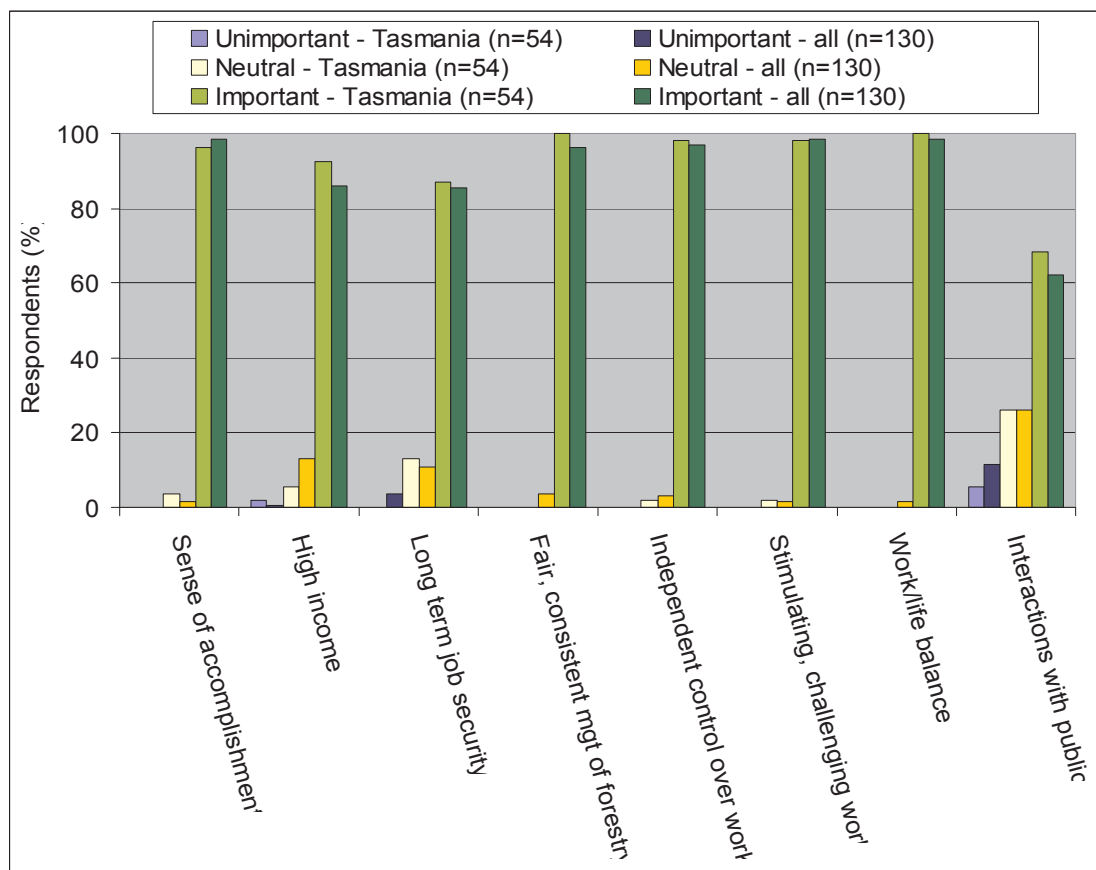


Figure 33: Importance of different aspects of work in the forest industry – survey responses

3.3.5 Demographic characteristics – age

Changes in the age composition of the forestry workforce may have a range of consequences for the industry, and may also reflect impacts forestry has on its workforce. For example, if the investment in terms of skills training or, in the case of some contractors, funds to purchase equipment needed to enter the industry are high, this may prevent many younger people from entering the industry. Higher than average ageing of the labour force can indicate issues such as difficulty recruiting new workers into the workforce, and likely future skills and labour shortages if older workers retire without new workers in a younger age demographic replacing them.

The proportion of forestry workers falling into different age groups are compared to the total labour force in 2006 for north east Tasmania, Tasmania and Australia in Figure 34²². Appendix 1 provides the same data for each SLA in the case study region²³. In north east Tasmania, Tasmania and Australia:

- There are fewer forest industry workers aged 15-24 than the average for the total labour force;
- There are more forest industry workers aged 25-34 and 35-44 than the labour force average;
- In the 45-54 age groups, forest industry workers and the labour force are similar, with a similar percentage of the workforce falling into this age groups;
- In the 55-64 and 65 and older age groups, there is a lower proportion of forest industry workers compared to the total labour force; and
- While Tasmanian forestry workers are typically older than the average Australian forestry workers, in north east Tasmania, they are younger than the Tasmanian and Australian average.

Overall, forestry workers have a slightly younger age profile than the labour force in general, with the exception of 15-24 year olds.

The average annual rate of change in the proportion of forestry workers and the labour force falling into different age groups is shown in Figure 35. It can be seen that:

- The forest industry in north east Tasmania, Tasmania and Australia has experienced a greater drop in the proportion of the workforce aged 15-24 than the total labour force, and a slightly higher drop in the 25-34 age group;
- The forest industry in all three regions has experienced a slightly lower drop in the 35-44 year age group than the overall labour force;
- The forest industry has experienced greater growth in the 45-54 age groups, and in the 55-64 age group in Tasmania and Australia, but not north east Tasmania, where there was greater growth in the 45-54 age group and slower growth in the 55-64 age group; and

²² The data presented are based on ABS statistics; while the survey of forestry workers asked for information on age, the sample received was not high enough to use as an analysis of age distribution within the workforce.

²³ Age distribution of the workforce varied considerably by SLA, as can be seen in Appendix 1. As with previous indicators, the small numbers of workers in some SLAs mean that fairly wide variation would be expected to result simply from chance, and so it is not possible to identify if patterns seen in any individual SLA are the result of specific workforce issues – for example, changes in the forest industry leading to an ageing of the workforce, or new and younger workers being attracted into a region by establishment of new forestry activity – or if they simply reflect the wide distribution expected when small numbers are involved.

- North east Tasmania, and the Tasmanian forestry industry overall, experienced much higher growth in workers aged 65 and over than the overall labour force and than the Australian forest industry average.

This indicates that the forestry workforce, while still having an overall slightly younger age profile than that of the total labour force, is ageing more rapidly than the total labour force, particularly in Tasmania and, for the over 65 workforce, very rapidly in north east Tasmania.

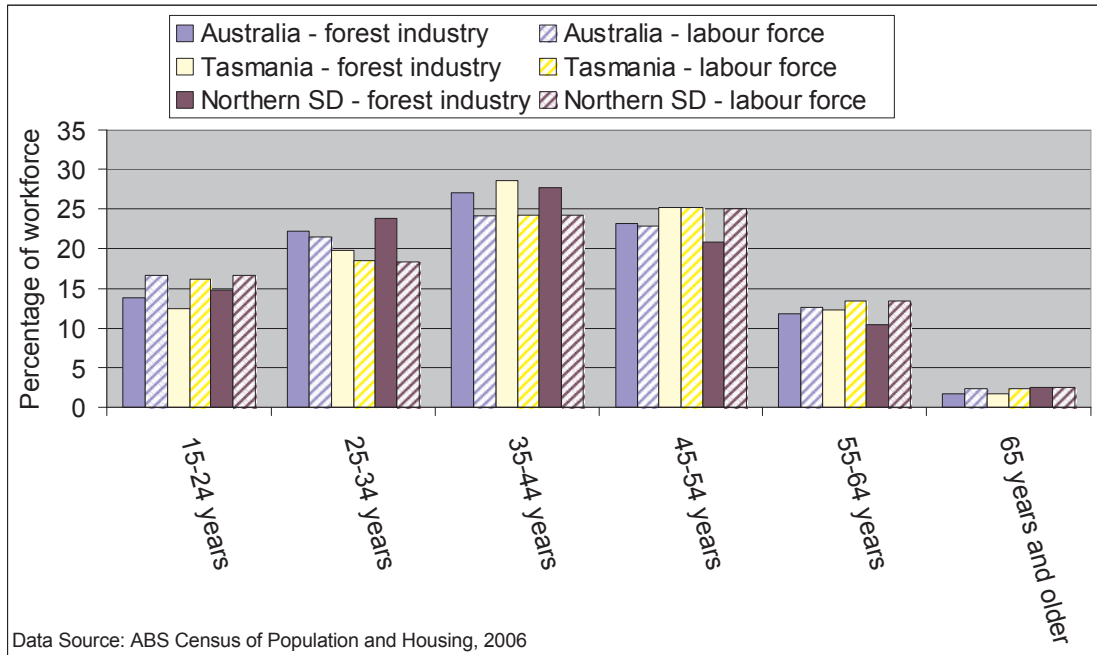


Figure 34: Proportion of labour force in different age groups – forest industry and total labour force, 2006

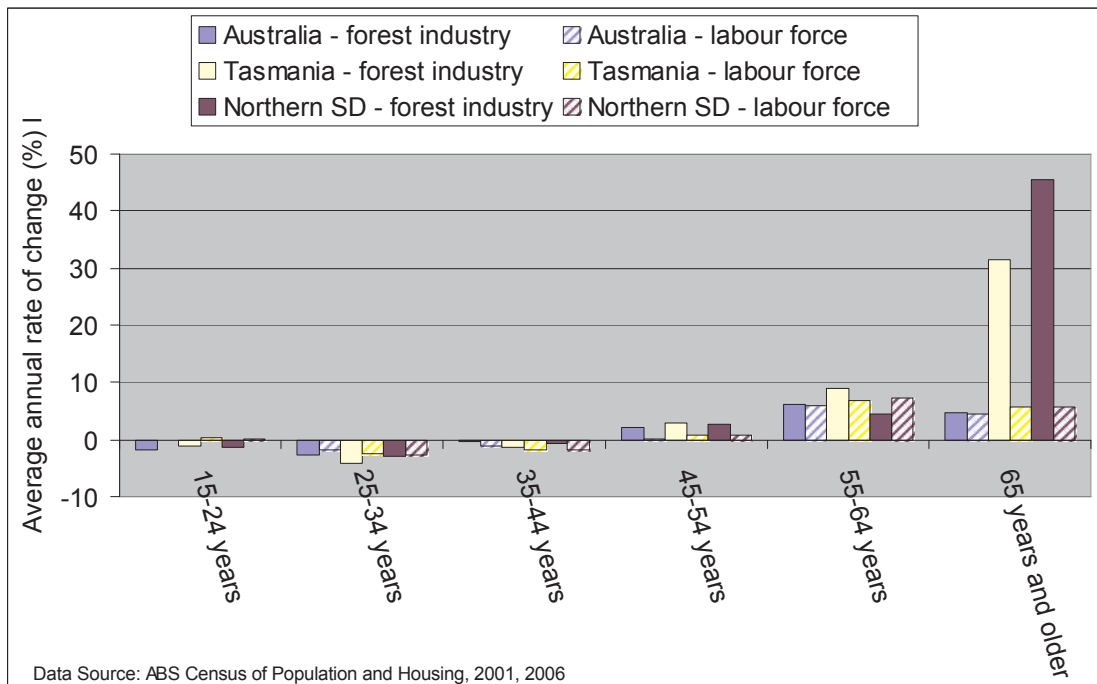


Figure 35: Average annual rate of change in proportion of labour force in different age groups – forest industry and total labour force, 2006

3.3.6 Demographic characteristics - gender

The proportion of male and female workers in the forest industry provides useful information on gender issues and access to the industry by men and women. This indicator identifies the proportion of the forestry workforce that is male and female, and compares this to employment in the general labour force.

The gender of workers in the forestry workforce in 2006 is compared to the gender of those working in the labour force as a whole in Figure 36. It can be seen that²⁴:

- The forest industry has a much higher proportion of male workers than the average for the labour force, and a lower proportion of female workers; and
- This pattern holds across all regions, and also at SLA scale (see Appendix 1 for data at SLA scale)²⁵.

Around 10% of north east Tasmanian forest workers were female in 2006, less than the average for Tasmania or Australia. Female participation in the forestry workforce has declined over time in Tasmania and north-east Tasmania, while it grew in Australia, indicating the 'gender gap' between the forest industry and overall labour force is growing in Tasmania and north east Tasmania

The average annual rate of change in the proportion of the workforce who are male and female is shown in Figure 37, comparing the forest industry and overall labour force. In Australia, growth in female participation in the forestry workforce was higher than the average for the labour force as a whole, while in Tasmania and north east Tasmania, female participation in the forestry workforce declined over 2001-2006, compared to growth in female participation in the overall labour force.

In Tasmania it therefore appears there has been an increase in male workers measured as a proportion of the workforce over 1996 to 2006, and a decline in female workers. This indicates that the dominance of the forest industry by male workers is likely to continue in Tasmania.

²⁴ This indicator is presented based on ABS statistics; while the survey of forestry workers asked for information on gender, the sample received was not high enough to provide a robust analysis of distribution of age within the forestry labour force and was not high enough to analyse differences between forestry sectors.

²⁵ The proportion of male and female workers varies more widely at SLA scale, likely a result of small numbers of workers in some SLAs which is usually associated with wider variability in characteristics when expressed as a percentage than for larger numbers.

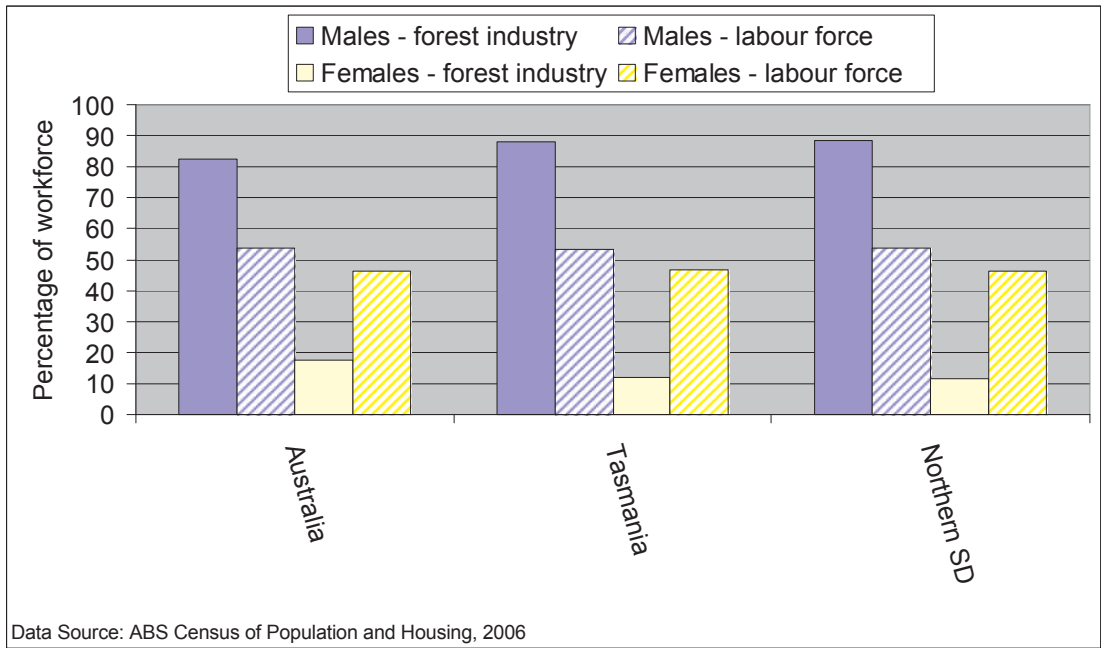


Figure 36: Percentage of male and female workers in forest industry and overall labour force, 2006

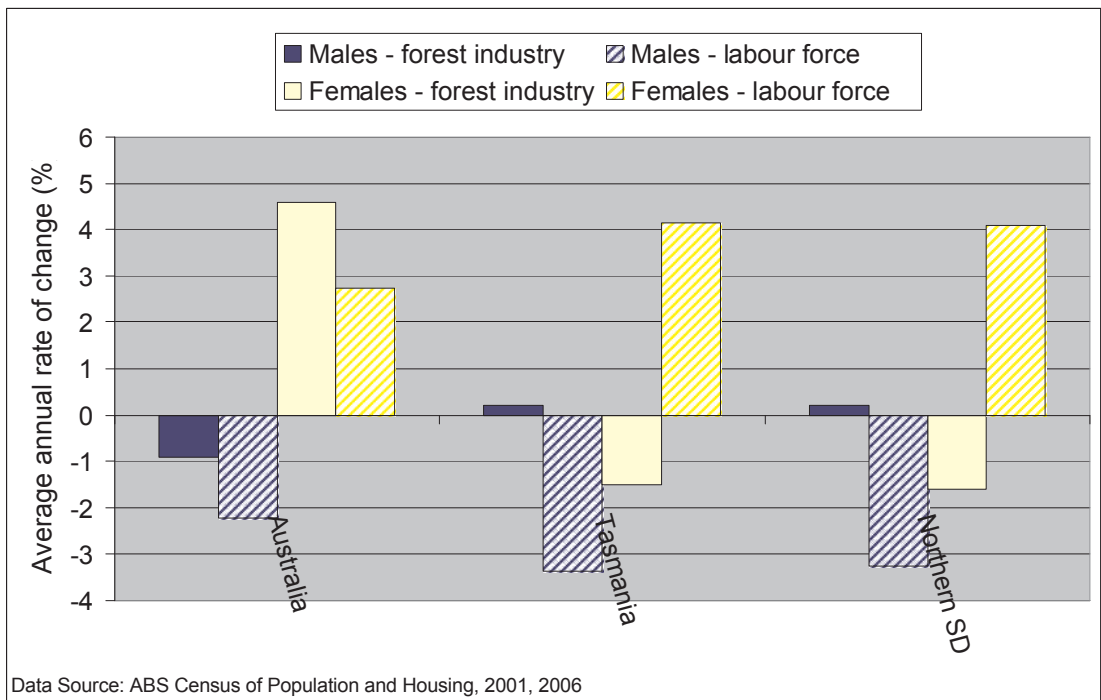


Figure 37: Average annual change in proportion of males and females in the workforce, 2001-06

3.3.7 Attachment to place

A forest industry worker's attachment to the place they live and/or work in can be an important indicator of how they are affected by changes in the industry. Having a high level of attachment to place may mean workers rely on the forest industry for employment that allows them to maintain their attachment to place, and will be unwilling to change the location of their employment if a change happens in the industry.

Information on attachment to place was gathered by asking questions in the survey of forestry workers undertaken for this consultancy. Attachment was identified by asking questions about the length of time, they and their family have lived in the local area, and their desire to continue living and working in the area.

Most respondents are somewhat or strongly attached to the local community they live in (Figure 38), with Tasmanian respondents less likely to describe themselves as having no or little attachment compared to the average across all respondents. Tasmanian forestry workers were more likely to rate their local community as a 'good' rather than 'excellent' place to live compared to the average across all respondents (Figure 39).

Tasmanian forestry workers are more likely to expect to be living in the same place five years from now compared to other respondents (Figure 40).

The length of time forestry workers had lived in their current locality ranged from less than one year to more than 50 years. The average was higher for Tasmanian forestry workers (18.7 years) and all respondents (15.2 years). More than 80% of respondents indicated that they were the first generation to live in the area, with similar results for respondents based in Tasmania versus other regions.

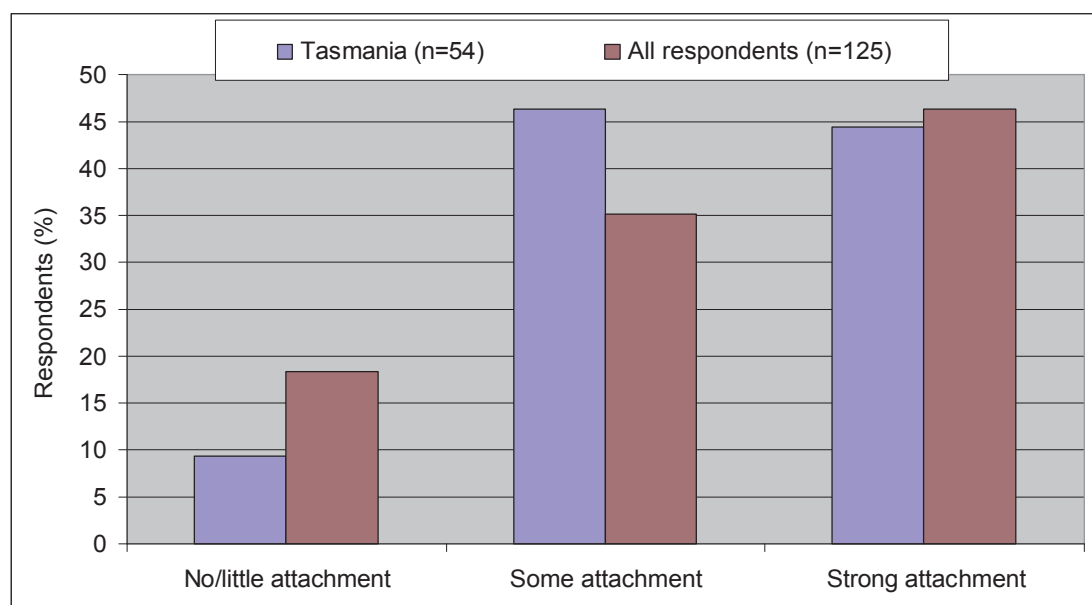


Figure 38: Strength of attachment to local community – survey respondents

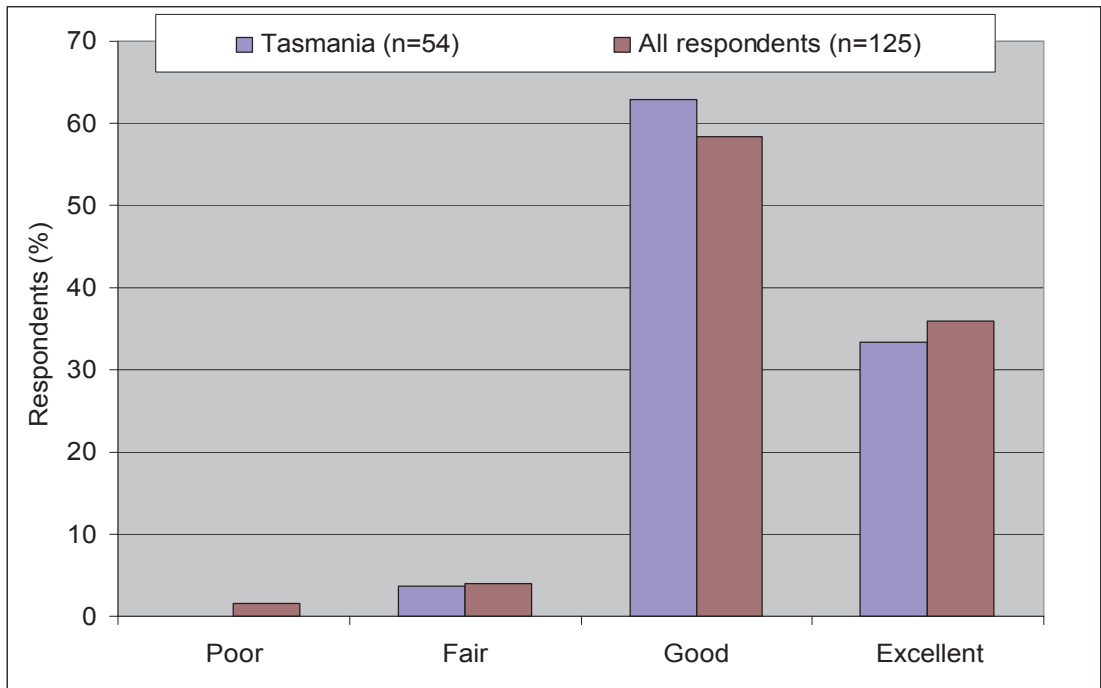


Figure 39: Rating of local community as a place to live – survey respondents

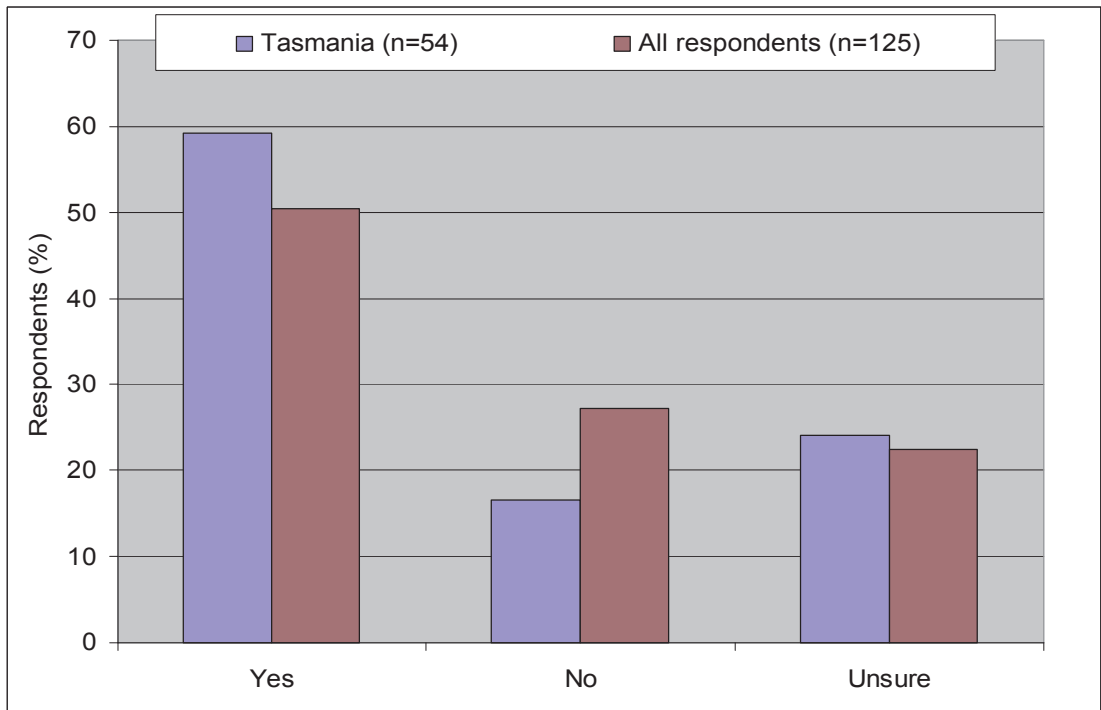


Figure 40: Responses to question ‘Do you expect to be living in the same place five years from now?’

Overall, forestry workers have a reasonably strong attachment to place, although most do not have long-standing family attachments to the region they live in. Tasmanian respondents to the survey had a somewhat stronger attachment to the localities they live in than the average across all respondents, with a higher proportion expecting to be living in the same location in five years time, and fewer reporting having no/little attachment to the place they live in.

3.3.8 Cultural and family attachment to forestry

Similarly to being attached to the local area in which they live and work, forestry workers may have a social or family attachment to the forest industry which affects how they cope with changes to the industry. People with a strong social or family attachment to forestry – assessed by identifying the extent to which their family members and friends work in the industry, their involvement in forest industry organisations, and length of time spent working in the industry – may find it more difficult to adjust to some types of changes in the industry.

Data for this indicator were collected via the survey of forestry workers.

Tasmanian forestry workers had worked in the industry for an average of 17.7 years (n=54) compared to 14.9 years for all respondents (n=120). Tasmanian forest workers had also spent a greater proportion of their working lives working in the forest industry compared to the average across all (Figure 41). Overall, Tasmanian forestry workers have stronger cultural attachment to the forest industry compared to the average across all survey respondents, being more likely to have family working in the industry, to report a multiple generation family history of working in the industry, and to have spent most or all of their working life in the forest industry.

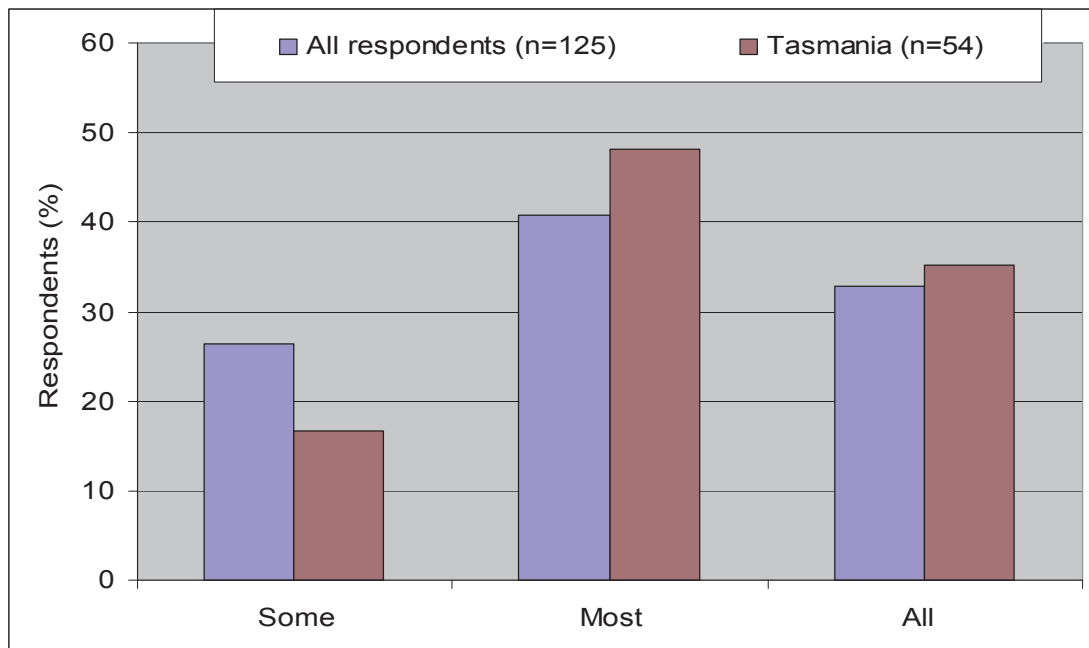


Figure 41: Proportion of working life survey respondents had spent in the forest industry

Just under 30% respondents indicated that other members of their household have jobs within the forest industry (see Figure 42), while the large majority did not have others in their household working in the industry. Less than 15% of respondents had at least one other member of their immediate and extended family working in the forest industry or forest related jobs, while a larger number who had friends who were also forest industry employees (see Figure 43). Tasmanian respondents were more likely to report having few/half their family working in the industry than other respondents, indicating somewhat stronger family attachment to forestry than in other regions. Just over thirty per cent of Tasmanian respondents indicated that more than one generation of their family had worked in the industry, compared to 22% of all respondents. Respondents also tended to speak to other forest workers not living with them more than they spoke to family and friends not living with them; this higher rate is most likely due to daily contact with work colleagues (see Figure 44).

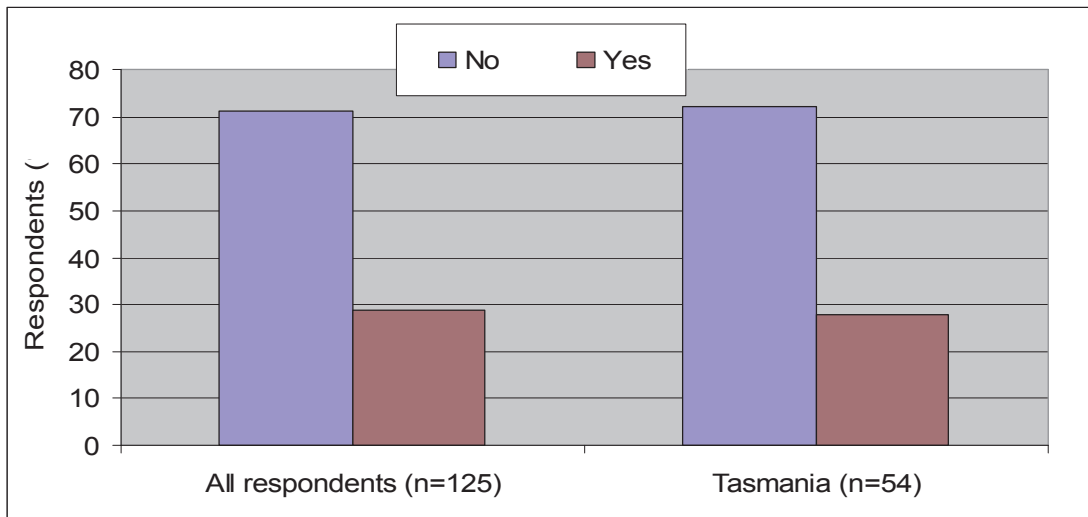


Figure 42: Do other members of your household work in the forest industry? – survey responses

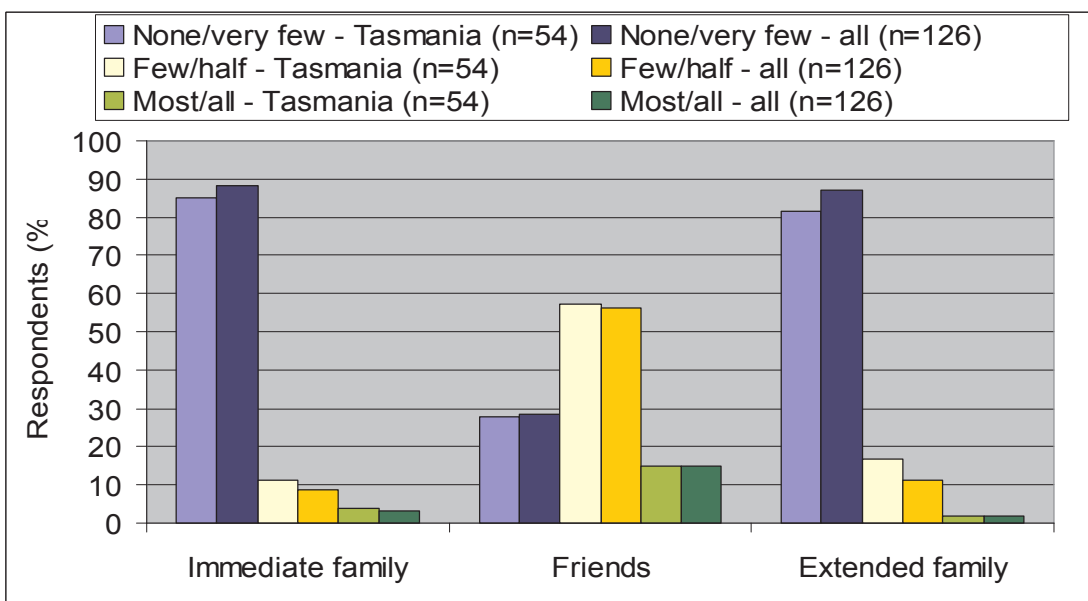


Figure 43: Proportion of family and friends working in forest industry – survey responses

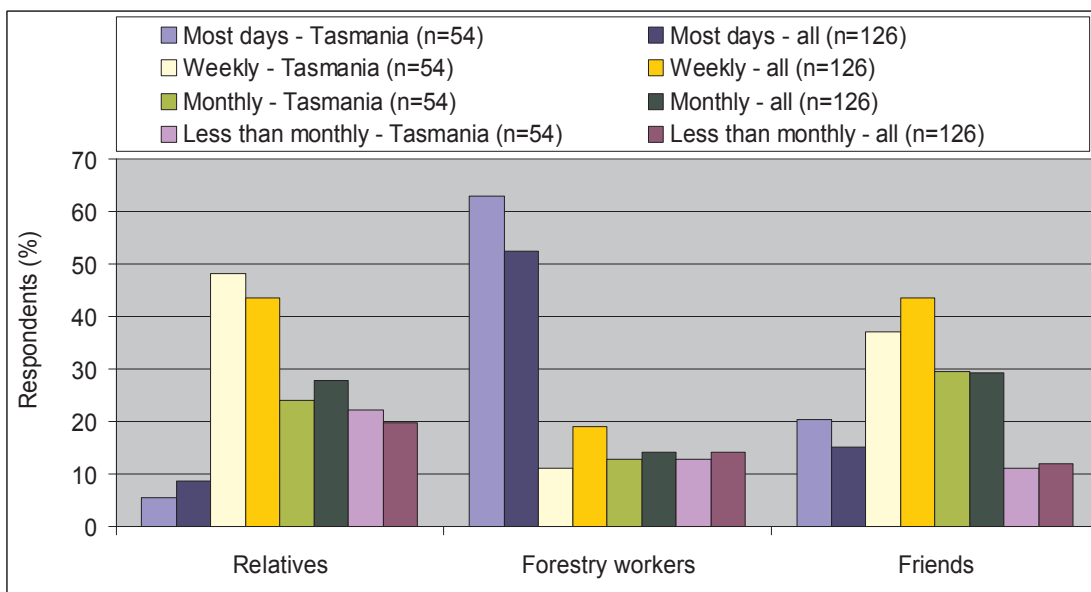


Figure 44: Frequency with which survey respondents spoke or met with relatives, friends, and other forest workers

3.3.9 Hours worked

The number of hours a person works has the potential to influence their wellbeing. Excessively high work hours may contribute to stress and a poor work/life balance; working less hours than desired may also reduce wellbeing. For this reason, monitoring trends in work hours can be a useful way of identifying wellbeing of forestry workers.

Forestry workers are less likely to work under 34 hours, and more likely to work 35 hours or more per week, than the average for the labour force, as can be seen in Table 4 for the regions of Australia, Tasmania and north east Tasmania. These patterns hold across the three regions shown, with similar patterns for Australia, Tasmania, and north east Tasmania.

The average annual rate of change over 2001 to 2006 in number of hours worked, for each category of working hours, is shown in Figures 45 to 47. Over this period, there was greater decline in the proportion of forestry workers who worked 24 hours or less, compared to the labour force as a whole, but less decline in the proportion of the forestry workforce working 25 hours or more compared to the labour force overall

This indicates that the forest industry in north east Tasmania, as well as more generally, is maintaining a higher proportion of full-time work compared to the labour force overall. This is different to the trend for the workforce as a whole; a common trend noted across Australia in recent years has been increasing levels of part-time work. This trend is not as evident in the forest industry, with the forest industry on average maintaining, or in some areas increasing, average hours worked per person.

The proportion of forestry workers who work more than 40 hours per week has been growing across Australia, Tasmania and north east Tasmania, at a higher rate than the average for the whole labour force. This indicates that those who work in forestry are working an increasing number of hours, and this growth is greater than is typical for the labour force in the different regions examined.

Data for individual SLAs is shown in Appendix 1. The high variability and small sample size means that it is more appropriate to present and analyse at the regional, rather than the local, level for this indicator²⁶.

²⁶ At the Statistical Local Area scale, small numbers of workers in some SLAs mean that there is wide variation in the proportion of workers who worked different hours per week. This can be seen in the tables shown in Appendix 1. It is therefore recommended that this indicator be examined at the regional, rather than the local scale, so that high enough numbers of forestry workers are included to ensure trends represented are meaningful trends rather than reflecting random variation resulting from only having a small sample of workers.

Table 4: Percentage of workforce working different hours, 2006

Percent of workforce working different hours – 2006	Australia	Tasmania	Northern SD
Labour force - None	3.7%	4.4%	4.3%
Forestry - None	2.9%	4.4%	3.7%
Labour force - 1-15 hours	10.8%	12.0%	12.4%
Forestry - 1-15 hours	3.7%	3.7%	3.8%
Labour force - 16-24 hours	8.9%	9.9%	9.9%
Forestry - 16-24 hours	3.9%	3.3%	4.0%
Labour force - 25-34 hours	9.8%	11.0%	10.6%
Forestry - 25-34 hours	5.0%	5.0%	5.5%
Labour force - 35-39 hours	16.8%	18.2%	17.5%
Forestry - 35-39 hours	24.3%	21.5%	23.8%
Labour force - 40 hours	18.3%	17.0%	17.0%
Forestry - 40 hours	20.8%	21.9%	19.6%
Labour force - 41-48 hours	11.1%	10.3%	10.3%
Forestry - 41-48 hours	16.8%	19.1%	15.2%
Labour force - 49 hours and over	17.7%	14.5%	15.4%
Forestry - 49 hours and over	20.4%	18.0%	20.9%
Labour force - Not stated	2.8%	2.7%	2.6%
Forestry - Not stated	2.2%	3.2%	3.7%

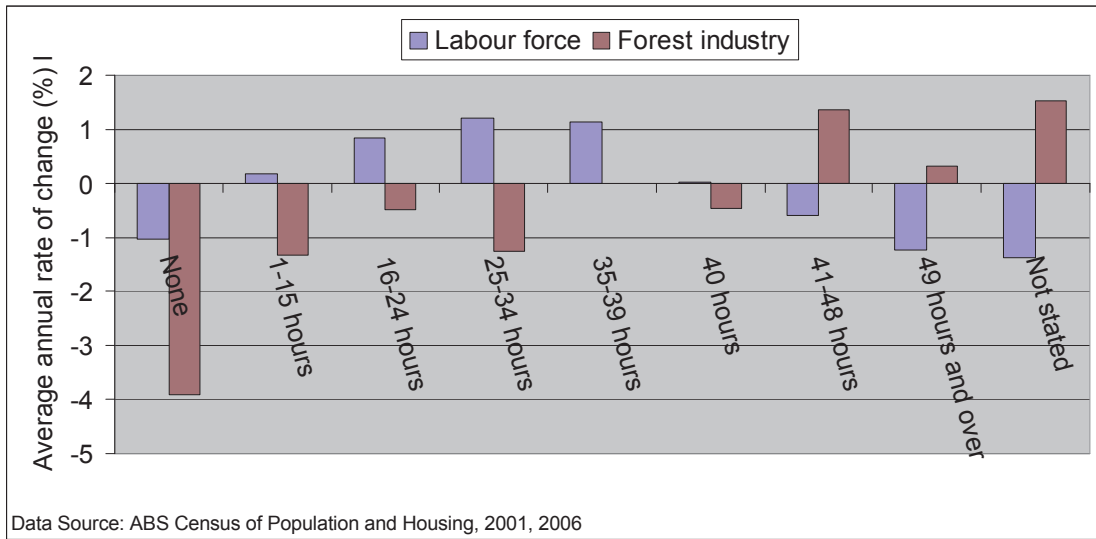


Figure 45: Average annual rate of change in working hours by category, 2001-2006 – Australia

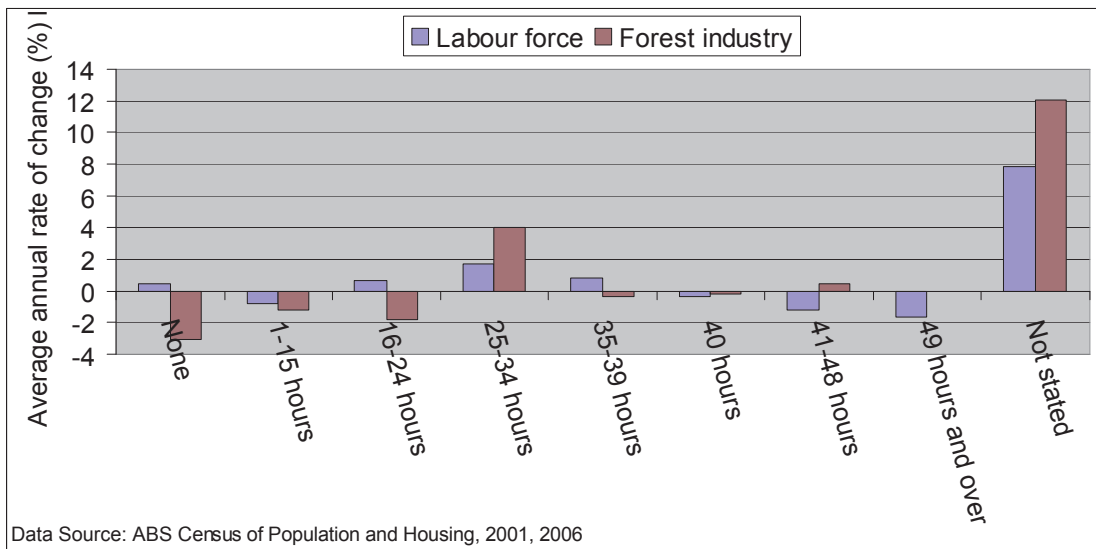


Figure 46: Average annual rate of change in working hours by category, 2001-2006 – Tasmania

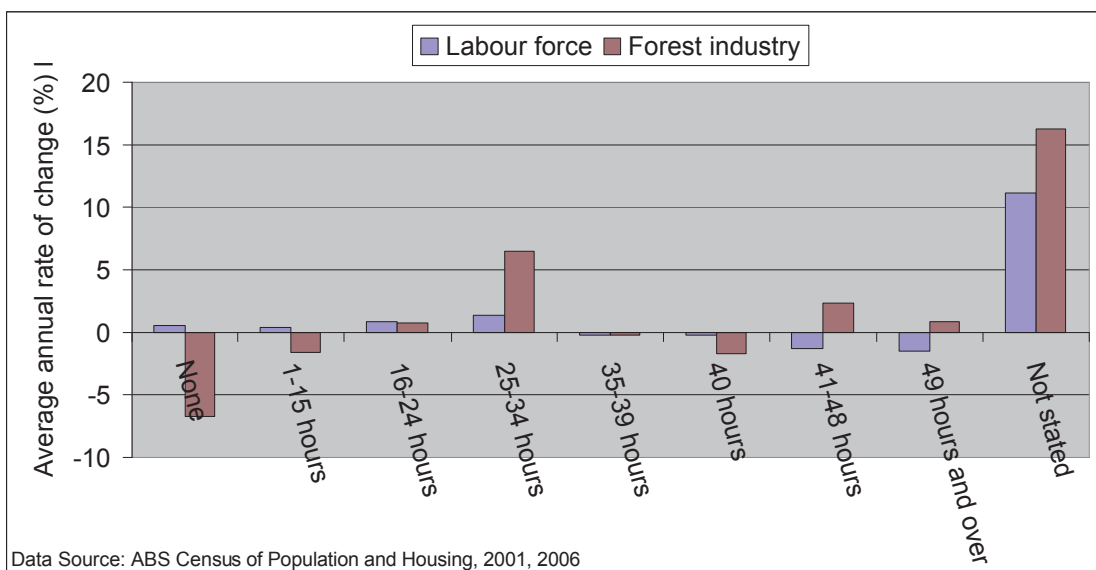


Figure 47: Average annual rate of change in working hours by category, 2001-2006 – north east Tasmania

3.3.10 Educational qualifications

The level of formal qualifications a person has achieved is a good predictor of their employment and income earning capacity. Higher levels of education may assist workers in adapting to change in the forest industry, particularly technological change. A high level of education is therefore often viewed as indicative of highly skilled workers who are likely to earn a good income and be adaptable to changing needs within an industry. Low education levels may indicate lower adaptability, although it is important not to over-estimate the influence of education – other factors also influence people’s ability to adapt to change.

This indicator identifies the proportion of forest industry workers with different levels of formal educational qualifications, and compares it to the average across the whole labour force.

In general (Figure 48):

- Forest industry workers are more likely to have a post-school qualifications than average for the total population aged over 15²⁷;
- Forest industry workers are more likely to have a certificate or diploma than average for the whole population; and
- Forest industry workers are less likely to have a bachelor degree or postgraduate qualification than average for the whole population.

North east Tasmanian forestry workers are very similar to those in Australia and Tasmania.

Overall the forest industry has experienced a slower rate of decline in the proportion of workers with no post-school qualifications compared to the average for the whole population aged over 15 (Figure 49), and slower growth in the proportion of workers with a certificate/diploma, or a bachelor degree or postgraduate qualification. This means that while forest industry workers are currently more likely than average to have a post-school qualification or hold a certificate or diploma, this gap may lessen over time based on the trends over 2001 to 2006.

These patterns hold for most but not all Statistical Local Areas, as can be seen in Appendix 1²⁸.

²⁷ Formal qualifications are only measured for the population aged over 15 years, to avoid bias in estimating the proportion of the population with qualifications, which would occur if children still attending school were included.

²⁸ A key issue with this indicator is that at the Statistical Local Area scale, small numbers of workers in some SLAs mean that there is wide variation in the educational qualifications. It is not possible to tell if variation in individual SLAs is the result of the random distribution expected when small numbers are involved, or of significant differences in educational qualifications of forest industry workers across different locations. With small numbers of workers, it is not possible to identify where trends are significant, and hence it is recommended that this indicator is best analysed at the regional, rather than the local, level.

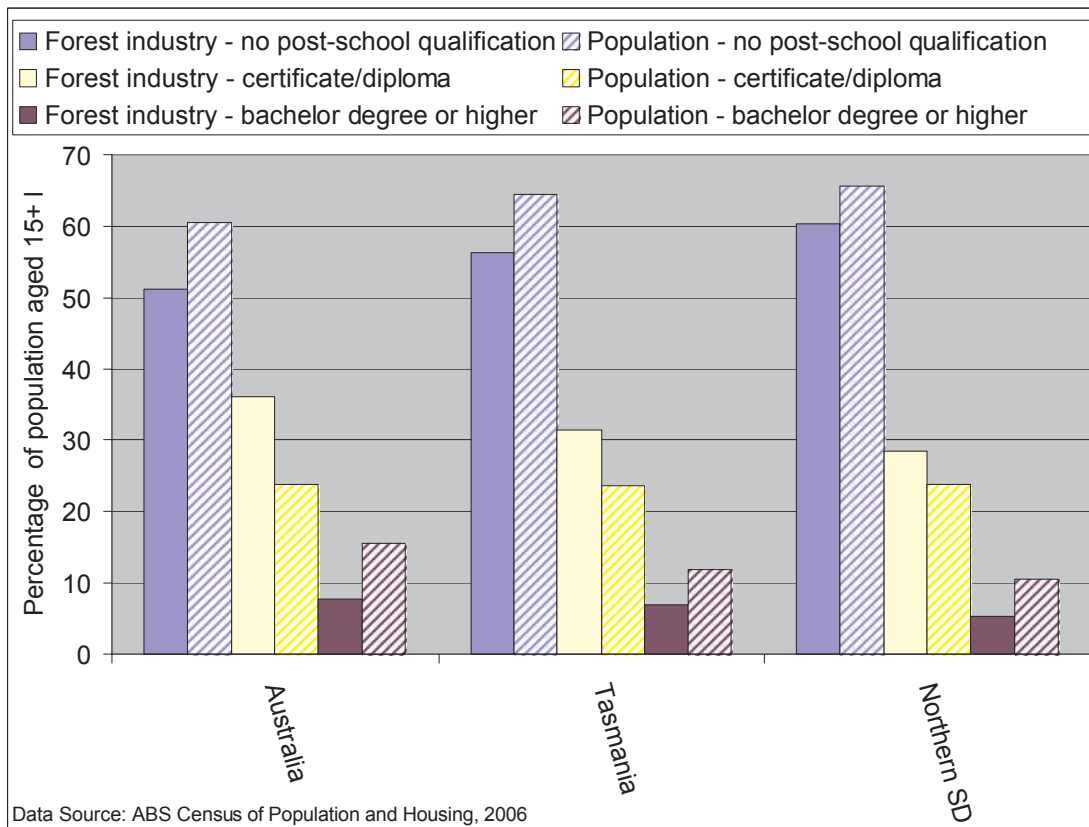


Figure 48: Proportion of population with different types of educational qualification – forest industry and total population aged over 15, 2006

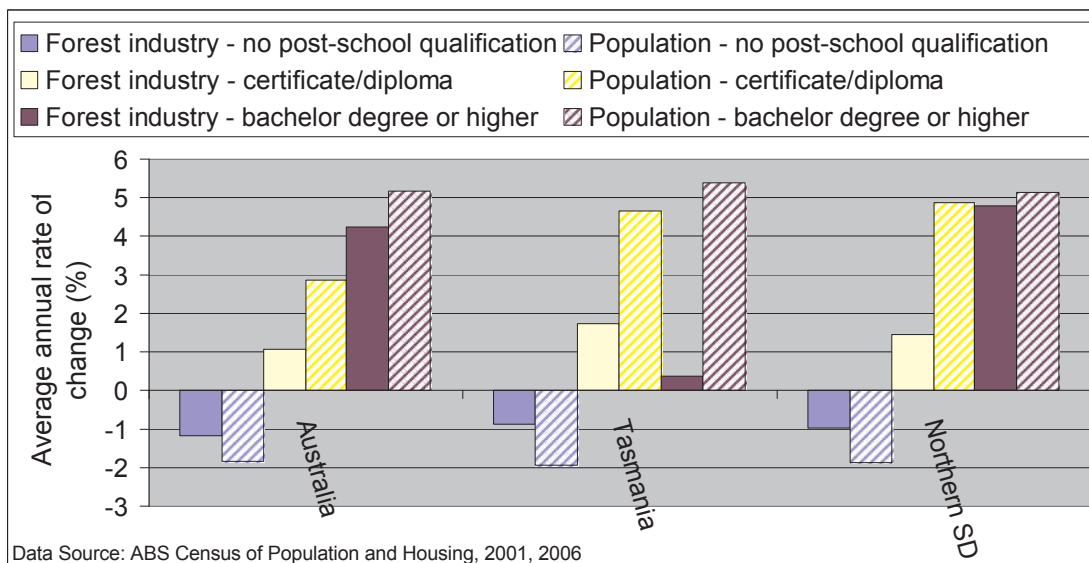


Figure 49: Average annual rate of change in proportion of population with different types of educational qualification, 2001-2006

3.4 Impacts of the forest industry on Indigenous people

The following indicators provide information that can assist in monitoring the social and economic impacts of the forest industry on Aboriginal and Torres Strait Islanders, through monitoring:

- The proportion of forest industry workers who are Indigenous people;
- The type of employment Indigenous people have in the forest industry; and
- The area of forest owned or accessed by Indigenous people.

These indicators provide a picture of some aspects of Indigenous involvement in the forest industry. They represent only a small subset of issues around forestry and Indigenous people, however, and must be accompanied by in-depth studies which examine the values and importance of forests for different Indigenous groups, and capacity building and skills needed by both the forest industry and Indigenous people to improve engagement between the industry and Aboriginal and Torres Strait Islanders.

3.4.1 Indigenous employment in the forest industry – quantity

The proportion of Indigenous workers in the forestry workers, and how this is changing over time, is one measure of Indigenous participation in forestry in Australia. Change over time in the proportion of Indigenous workers may indicate that barriers to Indigenous people working in the industry, such as issues related to skills and resources needed to access work in the industry, are changing.

As very few people employed in the forest industry identify themselves as Indigenous, this indicator can only be reported to the statistical division scale, with data not able to be reported for individual SLAs.

Both north east Tasmania and Tasmania as a whole have a higher than average proportion of Indigenous workers in the forestry workforce compared to the total labour force. The proportion of workers in the forest industry and the overall labour force who self-identified as indigenous in 2006 is shown in Figure 50, as is the ‘non-response’ rate, meaning the percentage of people who did not indicate whether they were indigenous or non-indigenous²⁹.

Tasmania has a higher proportion of Indigenous workers than the Australian average, in both the forest industry and the total labour force. North east Tasmania has a lower percentage of Indigenous workers than Tasmania as a whole, although it also has a higher proportion of non-responses (‘not stated’ refers to people who did not indicate if they were Indigenous on their Census form).

Whereas in Australia the proportion of Indigenous workers is slightly higher in the overall labour force compared to the forest industry, in Tasmania and north east Tasmania, the proportion of Indigenous workers is higher in the forest industry than in the overall labour force. Therefore the Tasmanian forest industry has a higher than average proportion of Indigenous workers in its labour force.

While Indigenous employment as a proportion of the workforce is higher in Tasmania than the Australian average, it is growing more slowly, so may shift over time to being similar to the rest of the workforce. The average annual rate of change in the proportion of Indigenous and non-Indigenous workers, shown in Figure 51, indicates that growth in Indigenous employment in forestry was lower than growth in Indigenous employment in the overall labour force, over 2001 to 2006.

²⁹ The proportion of people who were non-indigenous is not shown, as it is over 95% in all cases and reduces the ability to compare indigenous status across the forest industry and the total labour force.

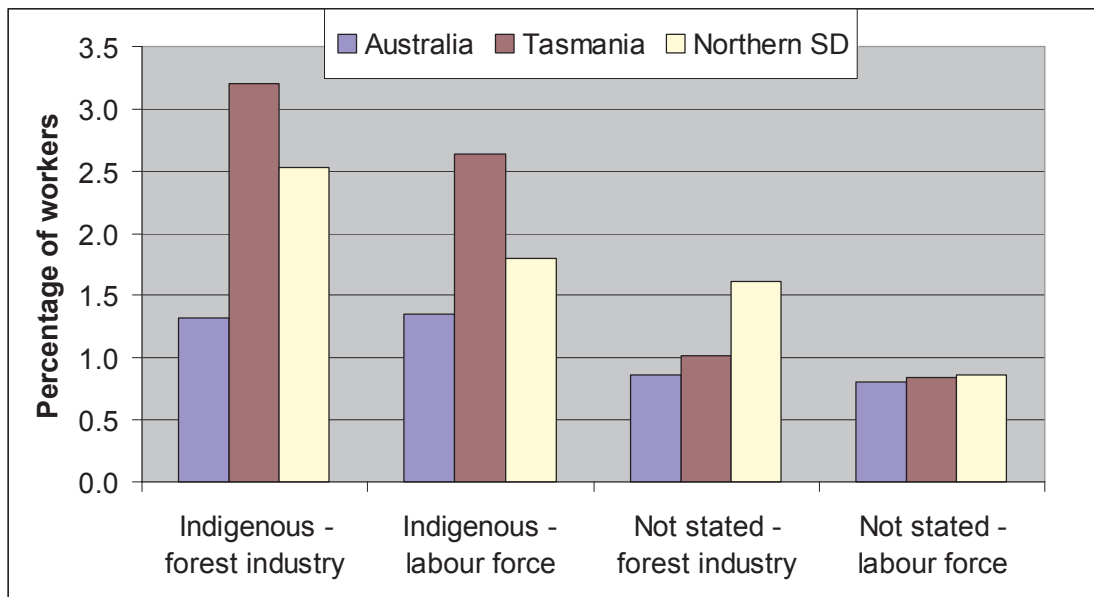
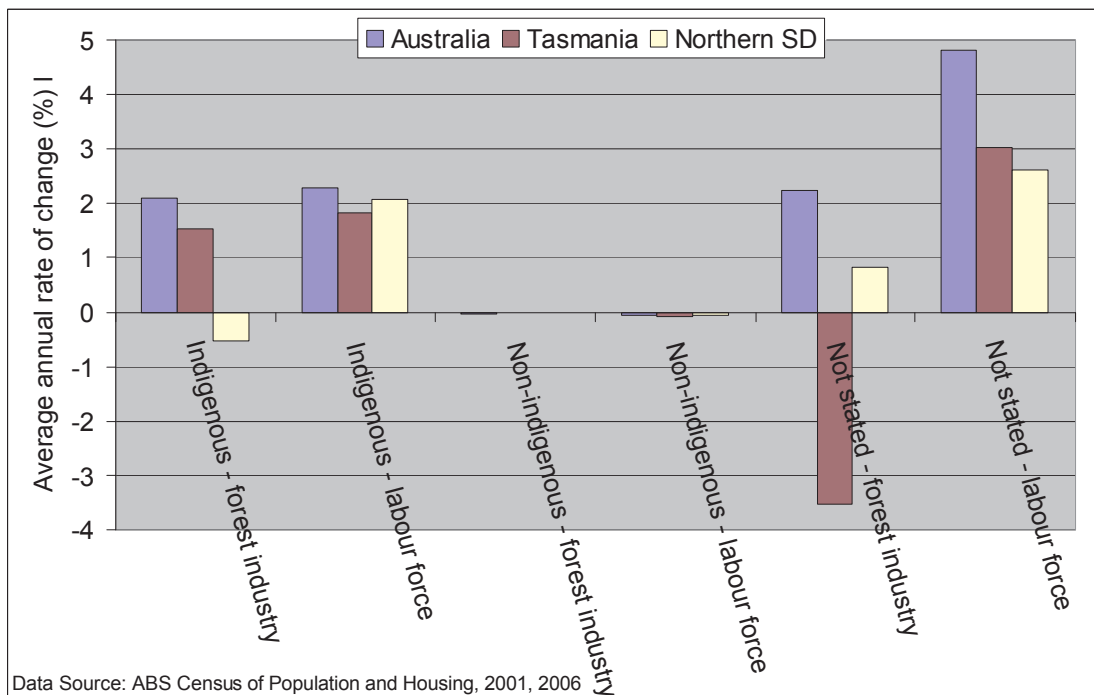


Figure 50: Percentage of Indigenous workers and non-response rate – forest industry and total labour force, 2006



Data Source: ABS Census of Population and Housing, 2001, 2006

Figure 51: Average annual rate of change, 2001-2006, in Indigenous and non-Indigenous employment

3.4.2 Indigenous employment in the forest industry – type

As well as knowing how many Indigenous people work in the forest industry, it is important to identify what types of jobs they work in. A high rate of employment does not necessarily indicate that Indigenous people are able to access all types of work in the industry including management positions. This social indicator identifies the proportion of indigenous employees who have different types of occupation within the forest industry, such as field worker, manager or administrator.

Similarly to the previous indicator, the low rate of Indigenous employment means this indicator can only be meaningfully reported at large scale – in this case, at national and state scale only.

The proportion of Indigenous forestry workers is compared to the proportion of all forest workers who have different types of occupation in Figure 52. It can be seen that in both Australia and Tasmania:

- Indigenous forestry workers are less likely to be managers, professionals, technicians and trades workers, clerical and administrative workers, or sales workers, compared to the forestry workforce as a whole; and
- Indigenous forestry workers are more likely to be working as machinery operators and drivers, and labourers, compared to the overall forestry workforce.

These results are highly likely to be representative of the north east Tasmania region.

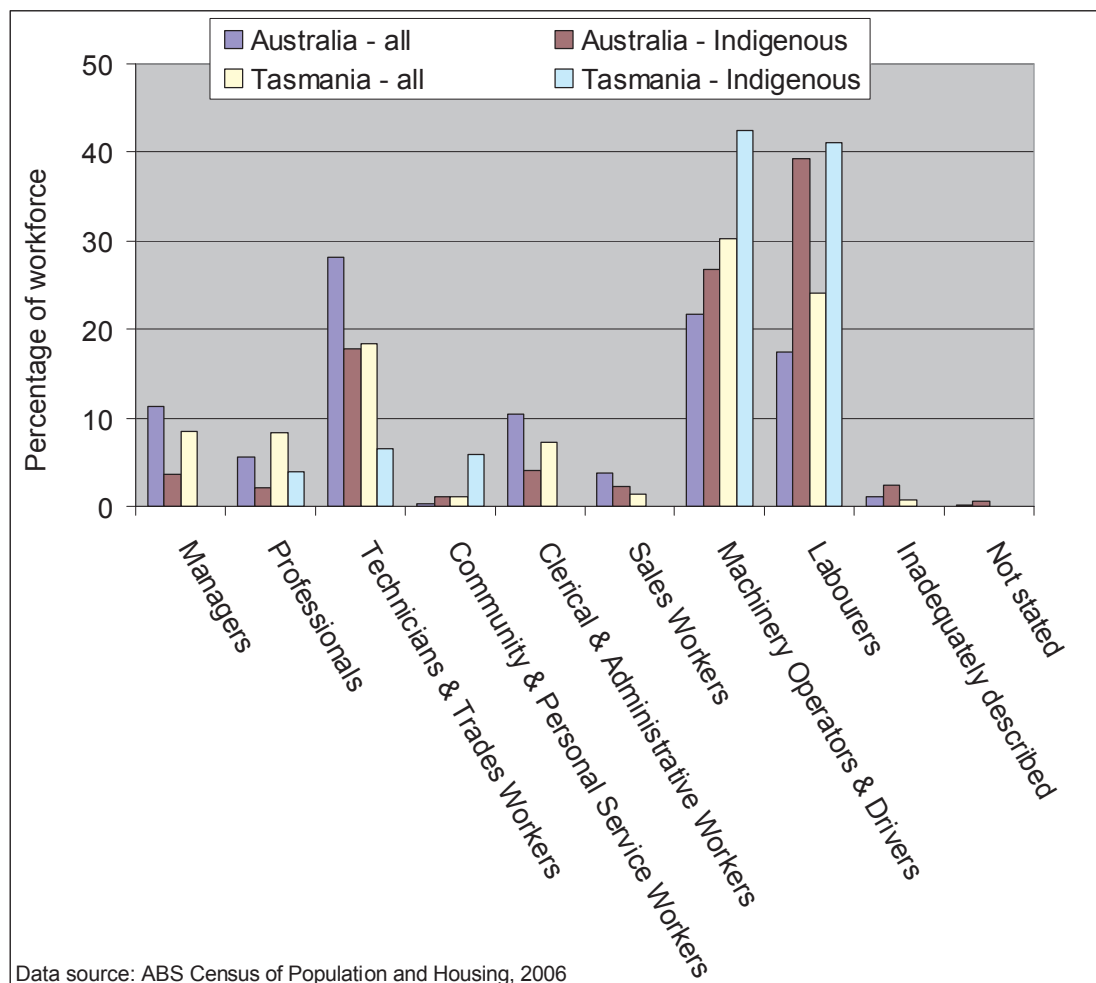


Figure 52: Proportion of workers with different occupations – Indigenous and total forestry workforce, 2006

3.4.3 Area of forest owned or accessed by Indigenous people

The cultural and social importance of forests to Indigenous people goes well beyond being a source of employment. Access to forests can be highly important for many Aboriginal and Torres Strait Islanders, and this social indicator identifies the total area owned or accessed by Indigenous people, using data on the location of Native Title determinations and appeals, and areas containing Indigenous Land Use Agreements.

Table 5 identifies the total area of forest land owned by Indigenous people in different states and territories, and the area of forest on the Register of the National Estate for Indigenous values.

It can be seen that there is a relatively small area of Indigenous-owned forest in Tasmania compared to most other States except Victoria. Tasmania also has a relatively small area of native forest listed on the Register of the National Estate for Indigenous Values. It is not possible to identify what proportion of the forest area listed in the table is located in north east Tasmania.

The data on which this indicator is based are a fairly limited representation of the extent to which Indigenous people may access and utilise forest resources in Australia, or of the spiritual and cultural significance of forests to different Indigenous people. It may be best to undertake more in-depth work to better understand how to monitor access to forests and how this is changing over time.

Table 5: Forest land owned and accessed by Indigenous people, 2007

	Native forest owned by Indigenous people (hectares)	Plantation owned by Indigenous people (hectares)	Native forest on Register of the National Estate for Indigenous values (hectares)
New South Wales	197,000	0	96,000
Northern Territory	15,342,000	15,000	790,000
Queensland	3,374,000	2,000	458,000
Western Australia	1,645,000	1,000	4,000
South Australia	283,000	0	51,000
Tasmania	4,000	0	2,000
Victoria	4,000	0	173,000
Australia	20,848,000	19,000	1,574,000
Data source: Bureau of Rural Sciences National Forest Inventory as reported in Australia's <i>State of the Forests</i> report			

4.0 Conclusions

The indicators reported in this document provide a broad overview of the key social and economic characteristics of forestry and forestry workers, and of the communities that are dependent on forestry, in north east Tasmania. The indicators can be used to identify how these characteristics are changing over time, and hence to examine social and economic change related to the forest industry. These social and economic changes may have many impacts on different people. It is important to undertake further work to improve the extent to which the social and economic changes shown in the different indicators can be understood in terms of their impacts on different individuals and groups. More in-depth studies are needed to identify downstream economic impacts, of the ways people experience the changes identified in the indicators and what these changes mean for their lives, and of perceptions about forestry, amongst others.

The results of analysing the indicators suggest that the forest industry in Australia and north east Tasmania have some important differences. These differences suggest a range of potential issues if the forest industry experiences change in the future.

In particular, some parts of north east Tasmania are highly dependent on the forest industry, indicating a high vulnerability to experiencing impacts of changes to the industry. North east Tasmanian forest workers have a relatively high attachment to the localities they live in and to the forest industry, indicating higher vulnerability to experiencing social impacts if their employment in forestry changes. Social characteristics of forestry dependent regions are fairly similar to non-forestry dependent regions in north east Tasmania; this is not unexpected given that even in highly forestry dependent regions more than 80% of the labour force work in industries other than forestry.

Occupational disease and injury rates are high in the forest industry, although most forestry workers indicate high levels of satisfaction with their jobs and lives overall. The major source of dissatisfaction with their work comes from external decisions made about the industry, rather than from internal conditions within the industry, for most workers. Workers earn slightly higher than average incomes, and are more likely to have post-school qualifications than is average for the labour force.

Indigenous participation in the Tasmanian forest industry labour force is currently higher than average for Australia, but growing more slowly than the average. Further work is needed to identify how best to encourage and facilitate Indigenous participation in the industry.

It would be useful to undertake studies which enable improved interpretation of the meaning of the social and economic characteristics and changes identified here, in order to better utilise the indicators tested in this case study. While this report has attempted to interpret what the data measured in indicators means in terms of social and economic impacts of the industry, further study is needed to be able to make better use of this data. While this report has identified social changes associated with the forest industry, and social and economic characteristics of the industry, it is difficult to identify what these indicators mean in terms of impacts on communities and forestry workers in the regions. These further studies would enable improved utilisation of the recommended indicators.

5.0 References

- Schirmer, J. (2008). Forestry, jobs and spending: Forest industry employment and expenditure in Tasmania, 2005-06. Technical Report No. 184. Cooperative Research Centre for Forestry, Hobart. URL: www.crcforestry.com.au
- Schirmer, J., Loxton, E. and Campbell-Wilson, A. 2008a. *Monitoring the social and economic impacts of forestry: Recommended indicators for monitoring social and economic impacts of forestry over time in Australia*. Report prepared for the Department of Agriculture, Fisheries and Forestry by the Fenner School of Environment and Society, June 2008, Canberra.
- Schirmer, J., Loxton, E. and Campbell-Wilson, A. 2008b. *Monitoring the social and economic impacts of forestry: A case study of the Green Triangle*. Report prepared for the Department of Agriculture, Fisheries and Forestry by the Fenner School of Environment and Society, June 2008, Canberra.

Appendix 1: Characteristics of forestry workforce by SLA

Table A1: Percentage of labour force in different age groups, forest industry and total labour force - 2006

	Forest industry 15-24 years	Total labour force 15-24 years	Forest industry 25-34 years	Total labour force 25-34 years	Forest industry 35-44 years	Total labour force 35-44 years	Forest industry 45-54 years	Total labour force 45-54 years	Forest industry 55-64 years	Total labour force 55-64 years	Forest industry 65 years and older	Total labour force 65 years and older
Australia	13.9%	16.7%	22.3%	21.4%	27.1%	24.0%	23.1%	22.8%	11.8%	12.7%	1.7%	2.4%
Tasmania	12.5%	16.1%	19.7%	18.6%	28.7%	24.3%	25.2%	25.3%	12.4%	13.4%	1.7%	2.3%
Northern SD	14.9%	16.6%	23.7%	18.3%	27.6%	24.2%	20.8%	25.0%	10.5%	13.4%	2.5%	2.5%
Break O'Day (M)	15.7%	15.0%	22.5%	16.4%	18.6%	25.0%	27.5%	26.9%	9.8%	14.0%	5.9%	2.7%
Dorset (M)	18.0%	16.0%	25.1%	24.2%	25.5%	23.0%	21.2%	20.9%	8.2%	10.7%	1.9%	5.3%
George Town (M) - Pt A	19.1%	19.9%	29.8%	20.6%	25.5%	22.5%	6.4%	23.0%	12.8%	12.2%	6.4%	1.9%
George Town (M) - Pt B	0.0%	15.9%	0.0%	20.4%	53.8%	29.1%	0.0%	23.8%	46.2%	9.8%	0.0%	1.1%
Launceston (C) – Inner*		13.4%		16.4%		27.5%		26.5%		13.5%		2.8%
Launceston (C) - Pt B	15.8%	15.4%	24.7%	15.8%	27.4%	24.8%	20.9%	26.8%	10.5%	14.9%	0.7%	2.3%
Launceston (C) - Pt C	8.9%	10.5%	21.5%	12.1%	38.0%	24.8%	22.8%	32.9%	5.1%	14.0%	3.8%	5.6%
Meander Valley (M) - Pt A	14.1%	12.3%	25.0%	15.2%	35.9%	27.2%	20.3%	27.6%	4.7%	14.5%	0.0%	3.1%
Meander Valley (M) - Pt B	14.0%	13.1%	23.4%	14.9%	23.4%	24.1%	19.9%	27.3%	15.8%	16.5%	3.5%	4.1%
Northern Midlands (M) - Pt A	7.6%	12.5%	24.1%	17.1%	34.2%	23.7%	26.6%	26.4%	3.8%	15.4%	3.8%	5.0%
Northern Midlands (M) - Pt B	6.7%	11.9%	23.3%	13.0%	33.3%	30.2%	20.0%	28.2%	11.7%	15.0%	5.0%	1.7%
West Tamar (M) - Pt A	11.9%	9.5%	15.4%	15.6%	32.2%	26.2%	21.7%	29.6%	14.7%	16.1%	4.2%	2.9%
West Tamar (M) - Pt B	16.2%	14.0%	32.4%	16.8%	18.9%	24.3%	8.1%	26.6%	16.2%	14.2%	8.1%	4.1%

Table A2: Gender of workforce – comparison of forest industry and labour force, 2006 and 2001

	2006				2001			
	Males - forest industry	Males - labour force	Females - forest industry	Females - labour force	Males – forest industry	Males – labour force	Females – forest industry	Females – labour force
Australia	82.5%	53.9%	17.6%	46.1%	83.2%	55.2%	16.8%	44.9%
Tasmania	87.9%	53.3%	12.1%	46.7%	87.8%	55.2%	12.3%	44.8%
Northern SD	88.4%	53.9%	11.6%	46.2%	88.2%	55.7%	11.8%	44.4%
Break O'Day (M)	93.3%	54.8%	6.7%	45.2%	90.4%	58.2%	9.6%	41.8%
Dorset (M)	87.8%	57.8%	12.3%	42.2%	87.5%	59.2%	12.5%	40.8%
George Town (M) - Pt A	79.6%	58.4%	20.4%	41.6%	82.9%	60.7%	17.1%	39.3%
George Town (M) - Pt B	100.0%	60.3%	0.0%	39.7%	86.7%	64.9%	20.0%	35.1%
Launceston (C) - Inner	0.0%	59.6%	0.0%	40.4%	100.0%	61.4%	0.0%	38.6%
Launceston (C) - Pt B	90.0%	52.3%	10.0%	47.7%	88.3%	54.0%	11.7%	46.0%
Launceston (C) - Pt C	89.2%	55.3%	10.8%	44.7%	92.3%	57.5%	7.7%	42.6%
Meander Valley (M) - Pt A	85.1%	52.5%	14.9%	47.5%	90.3%	53.7%	9.7%	46.3%
Meander Valley (M) - Pt B	89.4%	56.2%	10.6%	43.9%	92.2%	58.1%	7.8%	41.9%
Northern Midlands (M) - Pt A	96.1%	53.9%	3.9%	46.1%	83.7%	55.6%	16.3%	44.4%
Northern Midlands (M) - Pt B	77.4%	57.9%	22.6%	42.1%	86.9%	60.2%	13.1%	39.8%
West Tamar (M) - Pt A	83.3%	53.3%	16.7%	46.7%	87.1%	55.1%	12.9%	44.9%
West Tamar (M) - Pt B	85.7%	56.5%	14.3%	43.5%	82.1%	57.0%	20.5%	43.0%

Table A3: Percentage of workforce working different hours by Statistical Local Area, 2006

Percent of workforce working different hours – 2006 (%)	George Town (M) - Pt A	Launceston (C) - Inner	Launceston (C) - Pt B	Meander Valley (M) - Pt A	Northern Midlands (M) - Pt A	West Tamar (M) - Pt A	George Town (M) - Pt B	Launceston (C) - Pt C	Meander Valley (M) - Pt B	Northern Midlands (M) - Pt B	West Tamar (M) - Pt B	Break O'Day (M)	Dorset (M)
Labour force - None	4.8%	4.6%	4.3%	3.5%	3.9%	4.6%	3.6%	4.6%	4.3%	4.6%	3.9%	4.7%	4.1%
Forestry - None	3.1%	2.2%	15.6%	0.0%	0%	4.2%	0.0%	4.6%	6.5%	0.0%	0.0%	4.2%	8.1%
Labour force - 1-15 hours	13.0%	13.2%	12.4%	10.5%	11.2%	13.1%	11.6%	11.1%	12.6%	9.9%	9.9%	16.8%	13.0%
Forestry - 1-15 hours	0.0%	4.3%	6.7%	16.7%	0%	2.9%	7.8%	0.0%	0.0%	7.1%	9.2%	4.2%	8.1%
Labour force - 16-24 hours	11.2%	9.2%	9.8%	9.5%	9.9%	10.3%	9.8%	9.9%	9.4%	9.3%	9.2%	12.1%	9.4%
Forestry - 16-24 hours	6.1%	4.8%	0.0%	0.0%	0%	4.2%	0.0%	4.6%	5.3%	0.0%	9.2%	2.1%	0.0%
Labour force - 25-34 hours	8.8%	9.2%	11.0%	10.6%	12.3%	10.4%	8.3%	10.0%	10.3%	9.8%	11.0%	11.0%	9.1%
Forestry - 25-34 hours	9.2%	4.8%	0.0%	0.0%	0%	6.3%	0.0%	0.0%	7.1%	7.1%	4.6%	8.4%	0.0%
Labour force - 35-39 hours	15.6%	19.1%	19.2%	19.1%	17.0%	17.2%	13.2%	17.9%	13.6%	12.6%	15.9%	14.0%	15.9%
Forestry - 35-39 hours	30.6%	31.0%	20.0%	16.7%	0%	24.8%	16.9%	16.9%	18.9%	14.3%	21.5%	17.5%	8.1%
Labour force - 40 hours	17.8%	12.5%	16.9%	18.8%	18.4%	17.0%	19.0%	17.9%	16.2%	18.4%	19.5%	12.0%	14.6%
Forestry - 40 hours	17.3%	20.8%	13.3%	33.3%	0%	19.7%	15.6%	23.1%	17.2%	26.2%	13.8%	17.5%	24.3%
Labour force - 41-48 hours	12.0%	9.2%	10.5%	11.1%	9.9%	10.5%	10.0%	10.0%	10.1%	8.7%	10.3%	8.5%	9.1%
Forestry - 41-48 hours	6.1%	13.0%	17.8%	16.7%	0%	17.0%	18.2%	18.5%	14.8%	17.9%	18.5%	16.1%	8.1%
Labour force - 49 hours +	13.5%	19.7%	13.4%	14.4%	14.8%	14.4%	20.8%	15.5%	20.3%	23.1%	17.5%	18.1%	22.0%
Forestry - 49 hours +	24.5%	16.1%	20.0%	16.7%	0%	18.7%	37.7%	23.1%	23.7%	23.8%	23.1%	23.8%	35.1%
Labour force - Not stated	3.3%	3.3%	2.4%	2.3%	2.7%	2.4%	3.8%	3.0%	3.2%	3.5%	2.9%	2.8%	2.7%
Forestry - Not stated	3.1%	3.0%	6.7%	0.0%	0%	2.2%	3.9%	9.2%	6.5%	3.6%	0.0%	6.3%	8.1%

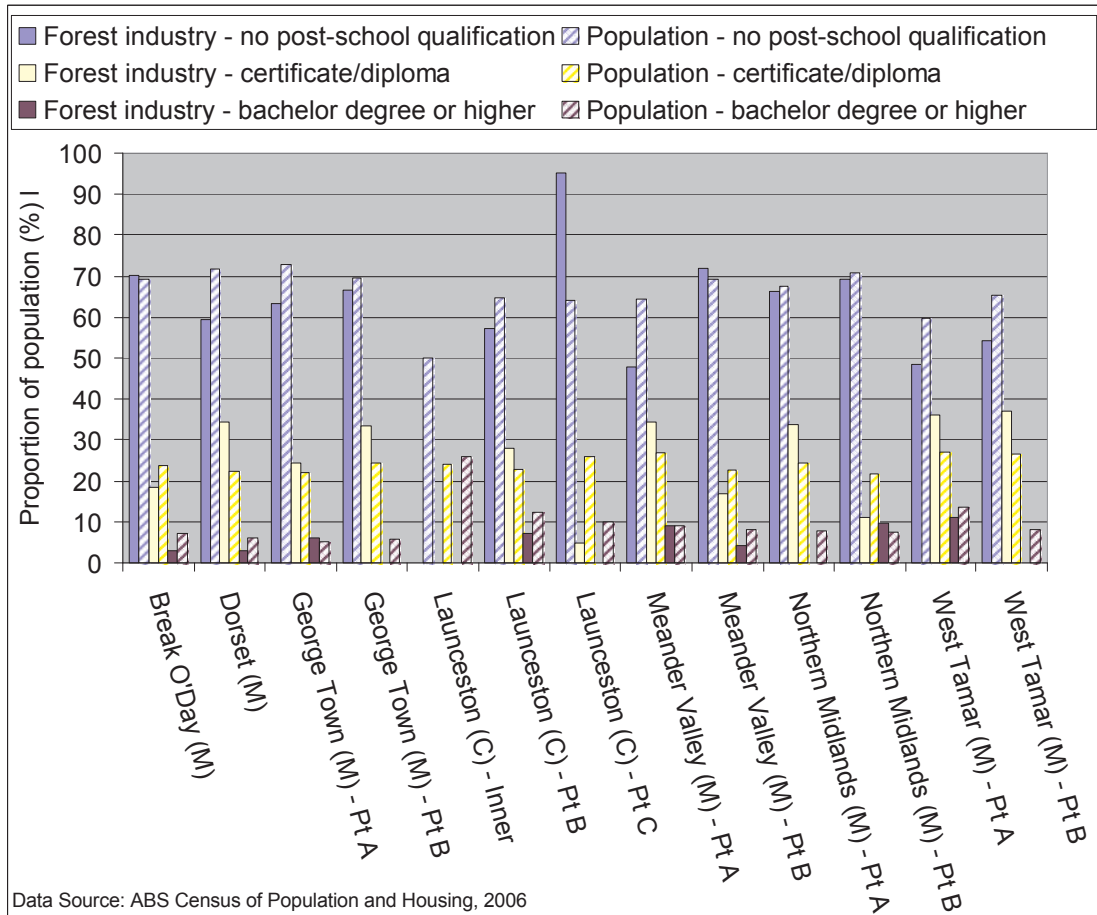


Figure A1: Proportion of population with different types of educational qualification - forest industry and total population aged over 15 – Statistical Local Areas, 2006