**Technical report 199**

# Socioeconomic impacts of the plantation industry on rural communities in Tasmania

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Public report

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## Executive summary

This report examines the socioeconomic impacts of the plantation industry in Tasmania. It analyses whether expansion of plantations, particularly the hardwood plantations established in the last two decades, leads to socioeconomic change in rural areas of Tasmania, and the types of impacts these changes may have for different people.

The research undertaken for this report was funded by the Cooperative Research Centre (CRC) for Forestry and undertaken by researchers at the Fenner School of Environment and Society of the Australian National University.

The area of plantations established in Tasmania has expanded rapidly in recent decades. Until the 1980s most of these plantations were softwood plantations, while from the 1990s onwards most new plantations have been hardwood plantations. By 2008 a total of approximately 77 200 hectares of softwood plantations and 217 000 hectares of hardwood plantations had been established across the State. In several local government areas (LGAs), more than 5% of agricultural land has been established to plantation.

Group interviews were held with local residents in eight locations in Tasmania in 2006, to identify key questions often asked by rural residents about the socioeconomic impacts of plantations. The interviews revealed a wide-ranging debate over the employment, population and community impacts of plantations. Much of this debate can be informed by research on the socioeconomic changes and impacts associated with plantation industry expansion. Each of the following questions was analysed to help inform debate about the impacts of plantations. While not enough evidence is currently available to answer some questions, many were able to be answered by analysing data on employment, population, land prices and other socioeconomic changes in Tasmania.

*How much employment is generated by plantations?* In 2006 an estimated 1995 people worked in the plantation industry in Tasmania, equating to approximately 1860 full-time equivalent jobs. Since that time, new jobs have been created in the hardwood plantation industry while the number of jobs in the softwood plantation industry has fallen, so that by the end of 2008 an estimated 1950 people worked in the plantation industry, of which 1350 worked in the softwood plantation sector and 600 in the hardwood plantation sector. Over 2006 to 2008, on average 0.33 jobs were generated per 100 hectares of hardwood plantation, and 1.8 jobs per 100 hectares of softwood plantation. In coming years hardwood plantations will generate more employment as a greater proportion of the estate reaches maturity and enters harvest and replanting, as a large proportion of Tasmania's hardwood plantations have been established in the last 10 years and not yet reached harvest age.

*How does the employment generated by plantations compare to other land uses?* The answer to this question depends on the point in the chain of production at which different land uses are compared, and the type of land use plantations are compared to. To the point of the 'farm gate'—at which goods such as logs, shorn wool, grain, or milk have been produced but not yet processed—hardwood plantations generate less employment than most other land uses except sheep grazing, while softwood

plantations generate slightly more employment than sheep or beef grazing or cropping, but less than dairy farming, horticulture or grape growing. However, when subsequent processing of goods is included (e.g. the employment generated in woodchipping and sawmills, wool scouring, abattoirs, and dairy factories), both hardwood and softwood plantations generate more employment than sheep grazing, beef grazing and cropping, but less than horticulture. Softwood plantations generate approximately the same amount of employment as dairy farming once downstream employment is included in the analysis of both industries, while hardwood plantations generate less employment than dairy farming.

*What types of jobs are generated by plantations?* The plantation industry generates a higher proportion of full-time jobs than the average for the workforce in Tasmania, and a similar proportion of full-time jobs as traditional agriculture.

*Where are plantation industry jobs located compared to other land uses?* Plantation industry workers are somewhat more likely to be located in large towns and regional cities than those working in sheep grazing, beef grazing, or horticulture (with the exception of grape growing) and less likely to be located in small towns or on rural land. Therefore a shift in land use from traditional agriculture to plantations is likely to be accompanied by some change in where job opportunities are located.

*How does plantation expansion affect local and regional rural economic activity?* Not enough evidence is currently available to adequately answer this question.

*How does plantation expansion affect rural population levels?* At the individual property scale, land use change from agriculture to plantations leads to different types of population change depending on how plantations are established. If land is sold to a plantation company there is a net loss of between 7% and 19% of population living on the properties, with 75% of previous residents shifting away but, within two years, new residents shifting back into housing on the property in approximately 80% of these cases. When land is leased to a plantation company, there is a net loss of approximately 5% of the population that used to live on these properties. When farmers establish their own farm forestry, there is no change in the number of people living on the properties involved. These changes are not necessarily higher than those that would occur in the absence of plantation expansion, with trends such as farm amalgamation having similar impacts on rural population in many areas; however, further analysis is needed to confirm this. At a larger scale, these population changes are not large enough to be observable in statistics on population change, with other factors such as distance to the coast and proximity to regional cities a better predictor of population change than the area of plantations established in a region.

*How does plantation expansion influence the type of people living in rural communities?* While there is a relatively small net loss of population associated with expansion of plantations, there is a high turnover of residents on rural properties that are sold to plantation companies at the time of sale. Three-quarters of previous residents shift off these properties when they are sold, and new residents then typically shift in, either renting houses or purchasing subdivided housing on the plantation property. This turnover can create rapid change in the people living in a rural community, but little is currently known about the characteristics of these new residents compared to those who shifted away from plantation properties.

*How does plantation expansion influence service provision and community groups in rural communities?* There is no relationship between change in the area of plantations and change in school enrolments in Tasmania. Landholders who lived on rural properties prior to their sale to plantation companies reported in a recent survey (undertaken in Victoria and South Australia) that they ceased or changed location of their membership of local fire brigades in 60% of cases, ceased membership of service groups such as Rotary in 32% of cases, and changed location or ceased membership of sporting groups in 55% of cases. Whether these changes have an adverse effect on overall membership of these groups depends largely on whether new residents shifting onto plantation properties join local groups.

*How does plantation expansion affect rural land prices?* Rapid expansion of plantations is associated with higher than average land price growth, although in recent years land prices have grown similarly rapidly for all types of rural land.

*How does plantation expansion affect traditional agricultural industries?* Areas experiencing high rates of plantation expansion have typically experienced a higher than average decline in sheep numbers, and in beef cattle numbers, compared to other regions. It does not appear that plantation expansion has affected the overall rate of change in dairy farming or horticulture (fruit growing, vegetable growing, or grape growing).

*Do different types of plantations have different socioeconomic impacts?* More work is needed to better answer this question. Currently the primary difference noted between softwood and hardwood plantations is that softwood plantations generate greater employment per 100 hectares than hardwood plantations. This is a result of the greater level of downstream processing of softwood plantation timber compared to hardwood plantations.

*How do the socioeconomic impacts of plantations vary in different circumstances?* The expansion of plantation estate, or of industry associated with it, can lead to a wide range of socioeconomic changes in rural areas, as can establishment of any new industry. The type of change experienced will vary depending on the size of the rural town being examined, the location of processing facilities associated with the plantation industry, the types of new residents who shift onto plantation properties, and the types of agriculture being replaced by plantations.

*What do all these changes suggest about the socioeconomic impacts of plantations?* Plantation industry expansion can clearly be associated with changes to employment availability, rural population, community groups and land prices. How these changes impact on people living in rural and regional communities where plantations are expanding will differ depending on individual circumstances. For example:

- If employment opportunities shift from small rural towns to larger regional centres as a result of the land use change, this may have negative impacts for some people living in the small town and positive impacts for some people living in the regional centres.
- If land prices rise due to demand from plantation companies, this will most likely have positive impacts for those who wish to sell land, but may reduce

opportunities for other farmers in the area to expand their farm enterprise through purchasing additional properties.

While the information presented in this report cannot answer all questions raised about socioeconomic impacts of plantations, it suggests these impacts differ in different situations. There is therefore opportunity to consider how to maximise the positive changes associated with plantation expansion, and minimise negative impacts.

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## Introduction

Debate about the socioeconomic impacts of plantations is common in Australian rural communities. Rapid expansion of hardwood (eucalypt) plantations in recent years has been accompanied by a range of differing perceptions about their impacts. Some people strongly believe plantations bring a range of benefits to rural regions, while others raise concerns about their impacts on rural communities.

This debate often takes place in the absence of sound information and evidence on the different issues being discussed. However, while not all questions about the socioeconomic impacts of plantation can currently be answered, a more comprehensive understanding of the socioeconomic impacts of plantations is emerging as a result of research undertaken in recent years.

To help inform debate over these issues, this report presents results of recent research that has explored key questions about the socioeconomic impacts of the plantation industry in Tasmania. It focuses in particular on the impacts of expansion of the hardwood plantation estate in recent years, but also refers to softwood plantations where relevant.

First, a number of common questions about the socioeconomic impacts of plantations are identified. Each of these topics is then discussed in turn, with a brief review of different points of view about the topic, consideration of the types of information needed to help answer the questions raised, and presentation of results of research undertaken in recent years (including research undertaken specifically for this report). Limitations and gaps in current research are also identified.

The report focuses on the socioeconomic impacts of plantations. It does not address biophysical issues related to plantations such as fire management, water, pesticide use, or biodiversity. These issues are important, and are being researched by other groups in Australia, with some reports available on these topics[1]. Impacts of changes to native forest management and access are not examined; this is an important area which also requires further research.

Where possible, evidence from Tasmania is used to answer the questions examined in this report. In some cases where no Tasmanian data was available, results of research undertaken in other Australian regions are drawn on. In those cases, the applicability of those results to Tasmania is discussed.

[1] See for example Keenan et al. (2004), Benyon and Doody (2005), Cawsey and Freudenberger (2005), Jenkin and Tomkins (2006). Links to some other scientific reports on environmental impacts of plantations are available at http://www.planningplantations.com.au

## How was this report funded, and what measures were used to ensure independence of analysis?

This report was funded by the Cooperative Research Centre (CRC) for Forestry, a research group that is funded by the Australian federal government, state government agencies involved in forestry, private forestry companies, research organisations and universities. A full list of the partners who fund the CRC for Forestry can be found at http://www.crcforestry.com.au.

The research was undertaken by researchers at the Australian National University's (ANU) Fenner School of Environment and Society. The ANU is one of the CRC for Forestry's research partners. Information about the Fenner School is available at http://fennerschool.anu.edu.au.

The CRC for Forestry's funders include partners who are actively involved in the forest industry, as well as several that are not. A number of measures have been taken to ensure the research undertaken for this report is independent and not biased due to some funding coming from those involved in the forest industry.

Firstly, it was important to ensure the right questions were being asked. This was done by holding group interviews with members of rural communities in Tasmania to ask them their views about plantations (described in the next section of this report, and Appendix 1), and reviewing past research and media reports to identify the different views expressed about plantations. In addition to providing independent data that aims to help inform the debate, both positive and negative views about the impacts of plantations are presented throughout this report, to ensure that all views are clearly communicated.

The data and methods used to answer common questions about plantations are described in detail throughout this report, and limitations of the data are discussed. By documenting where the information presented comes from and how it has been analysed, you can see how answers to each question have been reached, and decide whether you agree with the analysis presented.

We also asked local residents in plantation regions of Tasmania to help us interpret the statistical data collected for this report, by holding eight group interviews with residents who had in-depth knowledge of how land use and rural communities are changing in different parts of the state (described in Appendix 1). This helped weed out inaccurate data, enabled correction of any mistakes in the data, and most importantly ensured that the different interpretations were identified that people with differing views of plantations might make of the data.

The research reported here is in the process of being published as a set of peer-reviewed journal articles. This ensures that the data presented is thoroughly reviewed by experts who are independent of the project. Later versions of the report will include a list of peer-reviewed papers published from this research.

These measures have been taken to ensure that the research process is clearly documented and replicable, and reviewed by experts in the field who have no vested interest in the plantation industry, ensuring independence of the research.

## Plantation forestry in Tasmania

There is a long history of plantation forestry in Tasmania, beginning as early as the late 1800s with establishment of plantations by the State on areas of poor soil (Dargavel 1995).

The area of plantations established in Tasmania over time is shown in Figure 1, which separates softwood plantations (primarily *Pinus radiata*, which makes up over 99% of softwood plantations), and hardwood plantations (primarily *Eucalyptus nitens*, with 84.6% of hardwood plantations using this species and a further 11.8% planted with *Eucalyptus globulus*)[2].

Softwood plantations in Tasmania were established primarily from the 1950s onwards, with relatively few new plantings in recent years—some softwood plantations have in recent years been converted to hardwood plantations after harvest, and the softwood plantations established over the last 10–15 years are primarily second-rotation plantations established on sites that had already grown one rotation of softwood before being harvested and replanted.

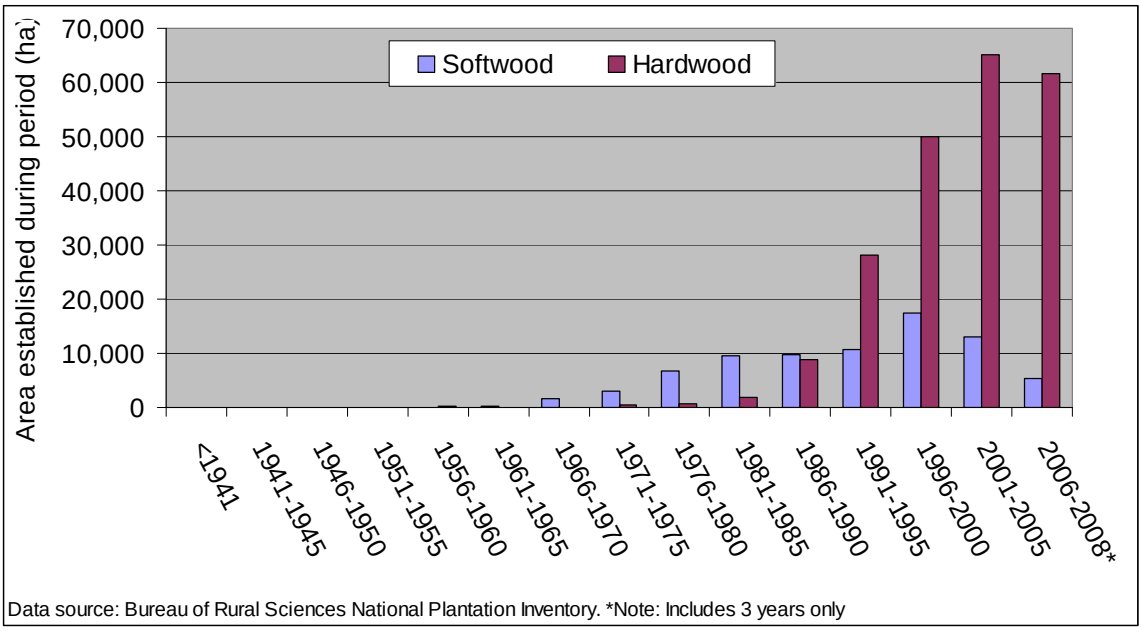


**Figure 1:** Area of Tasmania's current plantation estate, by year of planting or replanting

The period of softwood plantation establishment was followed by rapid expansion of hardwood plantations, beginning in the 1980s and increasing rapidly through the 1990s and particularly over the last 10 years. While hardwood plantations began to be established from the early 1980s, the large majority were established from the 1990s onwards. By 2008 a total of approximately 77 200 hectares of softwood plantations and

[2] The year of establishment reflects when the current trees in the plantation were established—in the case of softwood plantations, and to a lesser extent hardwood plantations, these may be second rotation plantations, meaning that the original plantations may have been established earlier than indicated in Figure 1.

217 000 hectares of hardwood plantations had been established across the State[3]. Of this 217 000 hectares of hardwood plantations, 97 000 hectares has been established as new plantations since 2002, representing substantial recent expansion of hardwood plantations[4].

Along with a shift in focus from establishment of softwood plantations to hardwood plantations, in the last two to three decades there has been a shift from public to private sector plantings. By 2005, almost 60% of Tasmania's total plantation estate consisted of privately owned trees established on privately owned land, predominantly as a result of establishment of privately owned hardwood plantations from the 1990s onwards, while another 27.5% involved trees established on public land either by a private entity, or through a private–public joint venture (Figure 2).

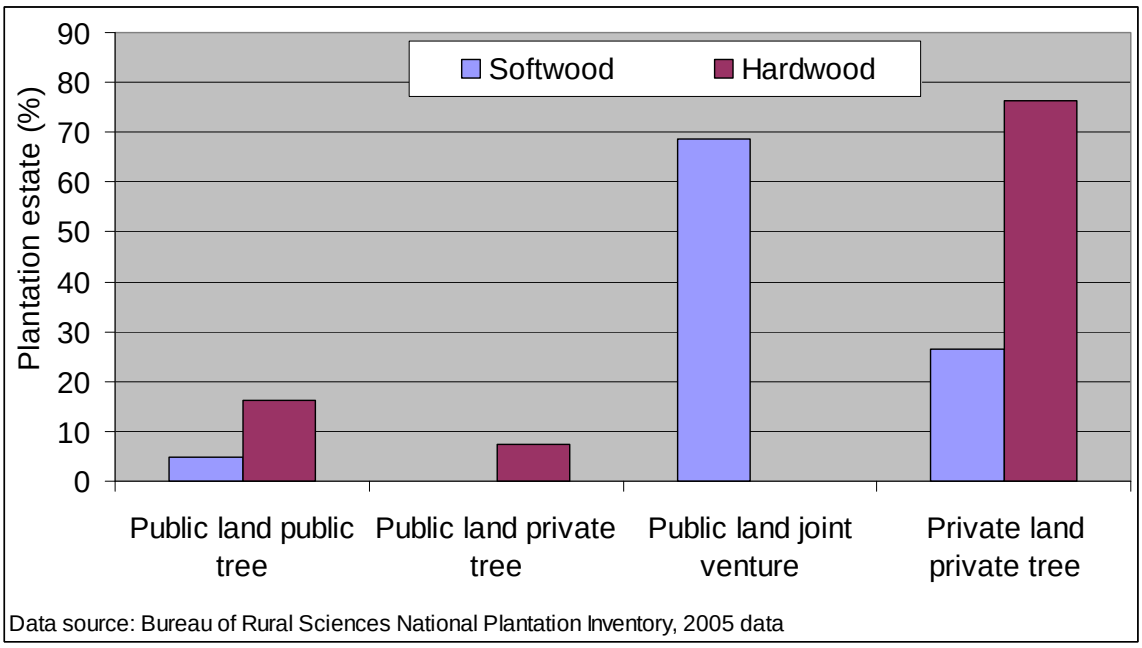


**Figure 2:** Ownership of plantations in Tasmania, 2005

Privately owned hardwood plantations have generally been established through either direct purchase of land by a plantation company, and less commonly lease of land by a plantation company. In 2006, of all privately owned plantations, 77.2% were established on land owned by the plantation manager, while 22.8% were established on land leased from the land owner (Private Forests Tasmania 2007).

Tasmanian plantations until recently have been permitted to be established on land which was cleared of native forest for the purpose of establishing the plantation. This practice is now largely phased out, with Forestry Tasmania and Gunns Ltd ceasing the practice and any remaining conversion on privately owned land to be phased out by 2015 under the provisions of the Tasmanian Community Forest Agreement (Commonwealth and Tasmanian governments 2008).

[3] Data source: Bureau of Rural Sciences (BRS) *National Plantation Inventory*. Data on the area of plantations in different Tasmanian localities can be downloaded from the BRS online Plantation Information Network at www.brs.gov.au/plantations/.

[4] Data source: Data on total area of hardwood plantations provided by the Bureau of Rural Sciences (BRS) *National Plantation Inventory*; Private Forests Tasmania; Forestry Tasmania.

Private Forests Tasmania (2007) identified that, of the total private plantation estate in 2006, 26.3% had been established on land converted from native forest, while 38.4% was established on land that had been previously cleared for use for agriculture, and 33.7% was plantation established as a second rotation on land previously used to grow plantation (some of this land was likely to have been converted from native forest at the time of establishment of the original plantation). Not enough was known about the other 1.6% of plantations to identify previous land use.

The area of hardwood plantations in each local government area (LGA) with more than 1000 hectares (ha) of hardwood plantation by 2009 is shown in Figure 3[5]. The LGAs with the greatest area of hardwood plantations are Waratah/Wynyard, Circular Head, Dorset, Break O'Day, Launceston, Burnie and Meander Valley, all of which had more than 15 000 hectares of hardwood plantations established by 2009, while Huon Valley, Kentish, Central Highlands, Central Coast and Southern Midlands all had between 8000 and 15 000 hectares of hardwood plantations established.

However, the total area of plantations is not necessarily a good indicator of the extent of change, as different LGAs vary considerably in size, and key concerns have been expressed in Tasmania about whether plantations established on previously cleared agricultural land have any negative impacts on rural communities. Ideally, the proportion of agricultural land established to plantation needs to be known. Figure 4 identifies the likely proportion of previously cleared agricultural land established to plantation in different Tasmanian LGAs in 2006, for all LGAs in which more than an estimated 2% of previously cleared agricultural land had been established to plantation by 2006, using Australian Bureau of Statistics estimates of the total area of agricultural land. This analysis is considered accurate to within only ±15%, as there is uncertainty about (a) the total area of agricultural land in different LGAs, and (b) the exact proportion of hardwood plantations that, in their first rotation, were established on land cleared of native forest[6].

The area of softwood plantations in each LGA with more than 1000 hectares (ha) of softwood plantation by 2009 is shown in Figure 5. In recent years, there has been a reduction in the total area of softwood plantations in Tasmania, with the total area decreasing from 77 025 hectares in 2001 to 73 770 hectares by 2006. The decrease is largely due to some areas of softwood plantation being converted to hardwood plantation after harvest.

[5] Only data to 2006 is shown as it was not possible to obtain detailed data on plantation location by LGA for the years 2007–2008.

[6] While Private Forests Tasmania (2007: 6) identified that 29% of hardwood plantations in 2006 had been established on land converted from native forest, another 30% had been established on areas replanted from earlier plantations—and some of those earlier plantations would also have been established on land converted of native forest. Plantation companies and agencies in Tasmania were asked to provide information on the proportion of their plantations established on ex-native forest and ex-agricultural land. Where data could not be provided for some earlier plantings, consultation with industry experts was used to estimate the areas established on ex-agricultural land.

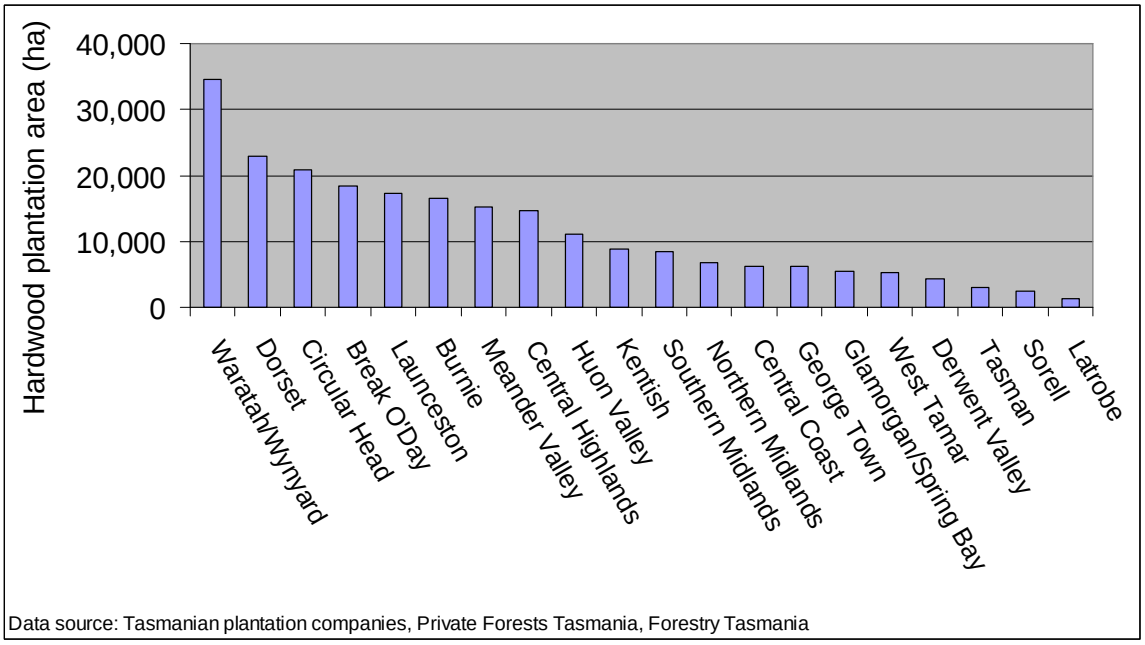


**Figure 3:** Area of hardwood plantations established in 2009, by LGA

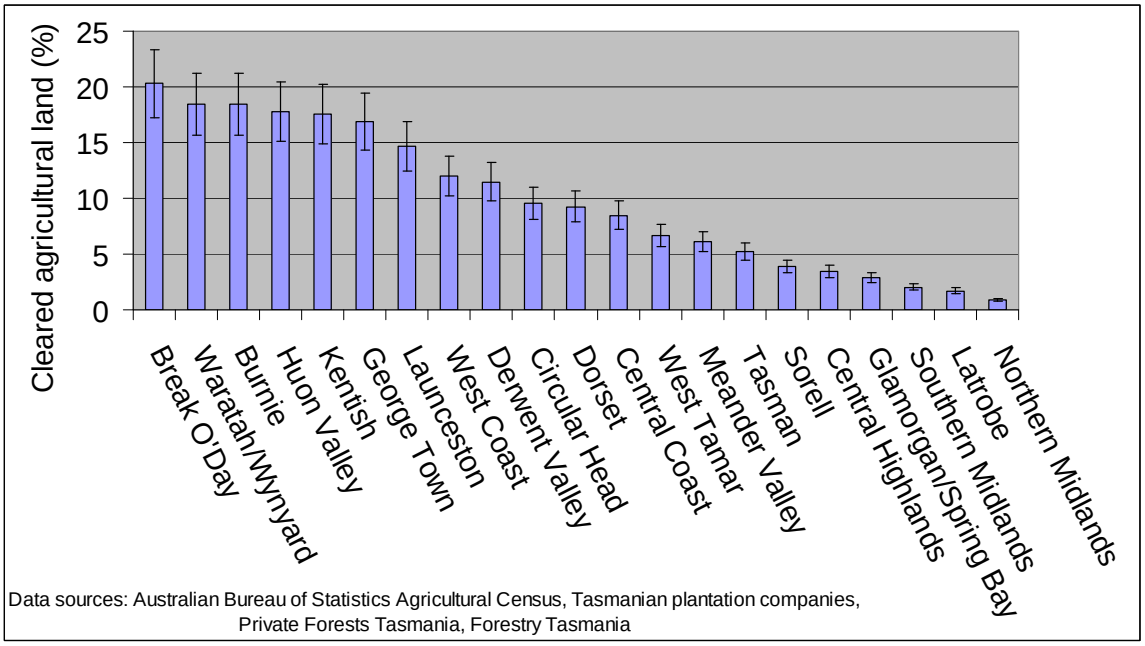


**Figure 4:** Proportion of agricultural land established to plantation by LGA, 2009

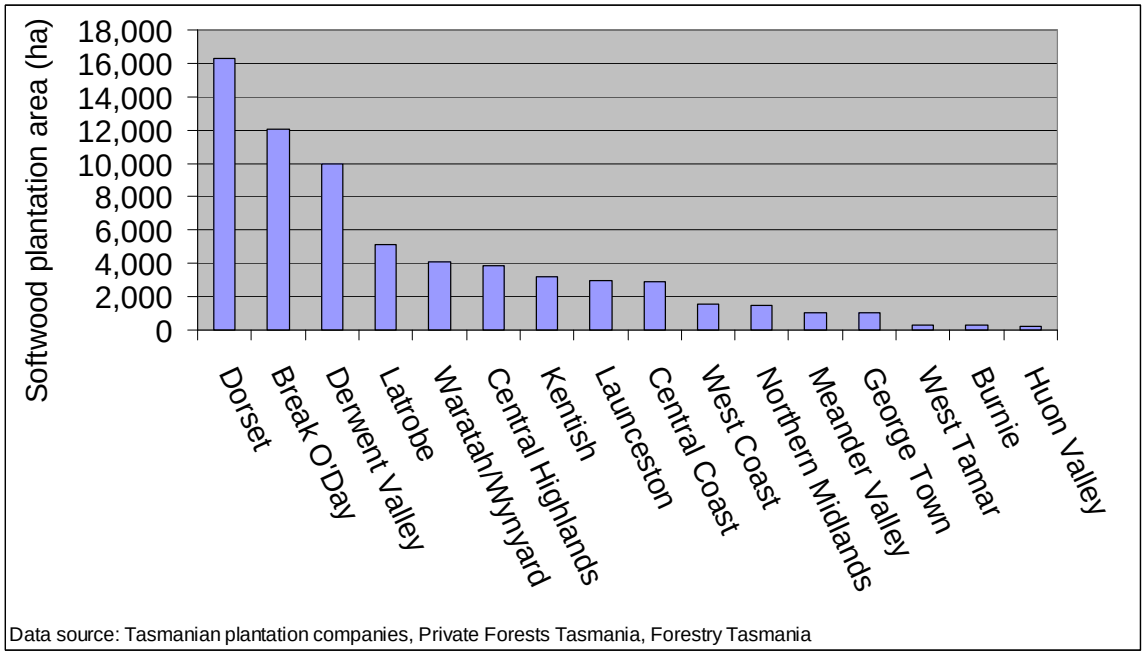


**Figure 5:** Area of softwood plantations established in 2009, by LGA

Different LGAs in Tasmania were classified as having low, medium or high areas of plantations relative to their total cleared agricultural land, and (for hardwood plantations), low medium or high plantation expansion in recent years. Table 1 lists the LGAs classified as having low, medium or high areas of softwood and hardwood plantation relative to their area of agricultural land and based on total area of plantations (if an area had less than a certain area of plantations, even if this area represented a high proportion of agricultural land it was not considered to be a 'high' plantation area; see Table 1 for detailed explanation of methods used). This classification is used to analyse socioeconomic impacts of plantations in this report.

**Table 1:** LGAs classified by their area of plantations relative to agricultural land

| Ranking | Hardwood plantations: area and rate of expansion | Softwood plantations: area of plantation |
|---|---|---|
| **High**[1] | Break O'Day, Burnie, Circular Head, George Town, Huon Valley, Kentish, Launceston, Waratah/Wynyard, West Tamar | Break O'Day, Derwent Valley, Latrobe, Waratah/Wynyard |
| **Medium**[2] | Central Coast, Derwent Valley, Dorset, Meander Valley, Tasman | Central Coast, Dorset, Kentish, Launceston |
| **Low**[3] | Central Highlands, Glamorgan/Spring Bay, Latrobe, Northern Midlands, Sorell, Southern Midlands | Burnie, Central Highlands, George Town, Huon Valley |
| **Negligible/none**[4] | All others, including the following rural/country LGAs (LGAs that consist predominantly of urban area have been excluded from the analysis):<br><br>Flinders, King Island, West Coast | All others, including the following rural/country LGAs (LGAs that consist predominantly of urban area have been excluded from the analysis):<br><br>Circular Head, Flinders, Glamorgan/Spring Bay, King Island, Meander Valley, Northern Midlands, Southern Midlands, Tasman, West Tamar |

[1]High = More than 10% of agricultural land established to plantations by 2006 AND more than 4500 ha of plantations established in total, assuming an average 40% of plantations were originally established on land converted from native forest. Note that some of these plantations have since been harvested and replanted, with 26.3% of the current rotation of plantations established on land converted from native forest; the 40% estimate is based on assuming that just under half of the 33.7% of plantations that are currently second rotation were established on land that had been cleared of native forest for the original plantation in addition to the 26.3% of plantations that are first rotation and established on land converted from native forest. The only exceptions are LGAs where a known high area of land was established to plantation that was never classified as agricultural, with Waratah-Wynyard and Burnie having a large area of land established to plantation on non-agricultural land. LGAs with more than 10% of agricultural land, but less than 1500 ha of plantations, were also excluded from being ranked as 'high plantation' as this reflects a small area of agricultural land (this was the case for the West Coast).

[2]Medium = More than 5% but less than 10% of agricultural land established to plantations, or less than 5% of land but more than 10 000 ha of plantations.

[3]Low = More than 1% but less than 5% of agricultural land had been established to plantations by 2006, and less than 10 000 ha of plantations had been established in total by this time.

[4]Negligible/none = Less than 1% of land, and usually less than 1000ha of plantation established by 2006.

## Key questions about socioeconomic impacts of plantations

The first step in examining the socioeconomic impacts of plantations was to identify the key questions often asked in rural communities about these impacts. These were identified by (a) holding a series of eight group interviews in the region in which participants were asked to discuss their views about the impacts of plantations[7], (b) reviewing previous studies to identify the views expressed and reported in these[8], and (c) identifying the differing perspectives reported in the media in recent years about plantations.

In 2008, Williams et al. (2009) undertook a quantitative survey of residents' attitudes towards plantations. The results of this helped improve understanding of common beliefs held about the socioeconomic impacts of plantations.

This resulted in identification of a large number of questions about the socioeconomic impacts of plantations. Debate over several of these issues can be usefully informed by independent evidence, particularly the following questions:

- How much employment is generated by plantations?
- How does the employment generated by plantations compare to other land uses?
- What types of jobs are generated by plantations?
- Where are jobs in the plantation industry located compared to traditional rural jobs?
- How does plantation expansion affect local and regional rural economic activity?
- How does plantation expansion affect rural population levels?
- How does plantation expansion influence the type of people living in rural areas?
- How does plantation expansion influence rural service provision and community groups?
- How does plantation expansion affect rural land prices?
- How does plantation expansion affect traditional agricultural industries?
- Do different types of plantations have different socioeconomic impacts?
- How do the socioeconomic impacts of plantations vary in different circumstances?

A lot of these questions are interrelated—the amount and location of employment generated by plantations will influence rural population levels, and this in turn is likely to influence local service provision and community groups.

[7] See Appendix 1 for a description of where group interviews were undertaken, the questions asked, and who took part.

[8] Previous studies undertaken in Tasmania that were reviewed include Schirmer (2002). In addition, studies undertaken in other regions were reviewed, particularly Kelly and Lymon (2000), Petheram et al. (2000), Schirmer (2002), Tonts et al. (2001), Schirmer et al. (2005a,b) and Schirmer et al. (2008a).

This list doesn't include some of the other important questions people often ask about plantations. In particular:

- Many people questioned whether managed investment schemes (MIS) give plantation companies an advantage over traditional farmers in accessing land or tax regimes. Answering this question requires specialist knowledge of the tax system which falls outside the expertise in socioeconomic impacts used to undertake this research[9].

- Concerns were commonly raised about the impact of plantation harvesting on local roads, with concerns roads are damaged by the transport of logs and woodchips. This issue is not examined further in this report as it requires specialist knowledge of road infrastructure and engineering. This type of analysis has been undertaken for local governments and the plantation industry in several regions in Australia, and several reports are available online on this issue[10].

- Some people expressed differing views about the visual impacts of plantations on rural landscapes. This issue requires further exploration using direct surveys of people's visual perceptions of plantations—something that was not possible for this report.

Questions about the environmental impacts of plantations were also raised. As our expertise is in the area of socioeconomic impacts, these questions are not addressed in this report. Sometimes these environmental impacts were related to social or health impacts; in particular, concerns were raised by four workshop participants about the impacts of use of pesticides on the health of nearby residents. This question requires specialist analysis by experts in epidemiology and health, an area outside the expertise of the researchers engaged on this project.

Each of the key questions identified that fell within the area of socioeconomic impacts was explored, and findings are presented in the following pages.

[9] You can find detailed information comparing current tax provisions available to farmers and tree growers, at http://www.plantations2020.com.au/assets/acrobat/ComparativeTaxTable%20Feb%2009.pdf. While produced by those who have an interest in the plantation industry, this provides some of the most detailed information on the context of tax provisions currently available. Details on the points of view of different organisations can be found in submissions to the Federal Government's 2005 review of plantation tax provisions at http://www.treasury.gov.au/, although this information is now out of date as some tax provisions have changed since this time.

[10] See http://www.planningplantations.com.au for further information. Reports on plantations and roads can be downloaded in the 'transport' section of this website.

## How much employment is generated by plantations?

A common question asked about plantations is 'how many jobs do they create?' This is then typically followed by questions about how this employment compares to that generated by alternative land uses, and the type and location of employment, discussed in the following sections of this report.

### *What are the different views?*

In interviews carried out in Tasmania with local residents in 2006, a wide range of views were expressed abut the amount of employment generated by plantations[11]:

> I'm just wondering with the plantations that we're going to see in our area, how much employment they'll create, I mean employment is not as great on the rural area now as it was 30 years ago will … [we] see less people in these rural communities?—*Interview participant, Campbell Town, 2006*[12]

> … all other things aside, it is a big industry in this state and it does employ quite a few people.—*Interview participant, Launceston, 2006*

In her survey of residents of Tasmania, Williams (2009) found that there was considerable diversity in views about whether an increase in plantations leads to an increase, decrease or little/no change in employment in the region. In the Southern NRM region, 31% of respondents felt it led to an increase and 22% felt it led to a decrease, while in the Northern NRM region 27% believed employment would grow and 24% that it would decline. In the Cradle Coast region 23% believed employment would increase while 30% believed it would decline. Other respondents either felt there would be little or no change to the quantity of jobs available, or indicated they didn't know what the likely impacts would be.

### *What evidence is needed to answer this question?*

Answering the question of how much employment is generated by plantations requires data on the number of jobs directly generated by the plantation industry. The different types of 'direct employment' generated by the plantation industry are generally considered to include jobs generated by:

- plantation growers, referring to businesses that own and manage plantations
- nursery workers, who grow plantation seedlings

[11] These quotes, together with the description of results of other studies below, represent the diversity of views presented about the employment generated by plantations. A key point to emphasise is that for most of the issues discussed in this report a great diversity of views exist so that no one perception can be described as 'typical' in most cases. Where possible, quantitative data on the proportion of people who hold particular views about plantations is presented based on Williams (2009); however, this type of data is not available for all the issues discussed in this report.

[12] Note that while the interview in which participants took part is identified, the exact participants are not, so that a label such as 'Interview participant, Campbell Town' may refer to any of those people who participated in the group interview undertaken in the location indicated. To ensure a diversity of views are reported, almost all quotes are from different interview participants, with only two interview participants quoted more than once (in both cases, two quotes are used from these participants as they expressed a view commonly discussed in the group interviews in a way that clearly summarised that particular point of view).

- silvicultural contractors, who undertake jobs such as preparing ground for tree planting, fertilisation, tree planting, thinning, coppicing, pesticide application and firebreak maintenance in plantations
- harvesters and hauliers who harvest and transport plantation timber
- processors, including all people employed in the processing of plantation timber into products such as woodchips, paper, sawn timber and composite wood products
- consultants, who provide expert advice on plantation-related issues
- researchers undertaking specialised research focused on plantations.

Other jobs generated by the industry are generally considered to be indirect or 'flow-on' jobs that result from the presence of the industry. Indirect jobs would include jobs that involve selling goods and services to the industry such as fuel or electricity, and the retail jobs generated indirectly by plantation industry workers spending their wages.

Currently there is no regular collection of data on plantation employment in Australia. The Australian Bureau of Statistics (ABS) produces data on forest industry employment, but does not separate this data into jobs based on native forests and those based on plantations.

However, several 'one-off' studies have estimated the employment generated by the plantation industry. The most recent of these was the *Forest Industry Survey* of native forest and plantation workers in Tasmania undertaken for this project (full results of this survey are reported in Schirmer 2008a). Data from the *Forest Industry Survey* is utilised here, and is also compared with other recent studies.

### *What does the evidence tell us?*

According to the Tasmanian *Forest Industry Survey*, in 2006 an estimated 1995 people worked in the plantation industry in Tasmania, in jobs including plantation management, silvicultural contracting, nurseries, harvest and haulage, processing and consulting. This compares to an estimated 4300 jobs reliant on native forest harvesting in Tasmania. Once the people who worked part-time or on a casual basis were taken into account, this equated to approximately 1700 full-time equivalent jobs in the plantation sector.

Since the time of the 2006 *Forest Industry Survey*, an estimated additional 105 jobs have been created in hardwood plantation processing, while softwood processing jobs have fallen by approximately 160 due to consolidation of the Auspine and Frenchpine facilities in Scottsdale and closure of one, and closure of the Carter Holt Harvey processing facilities in Bell Bay but expansion of softwood processing at other facilities[13]. This means that currently an estimated 1950 people work in the plantation industry.

Of these, approximately 1350 worked in the softwood plantation sector, and 600 in the hardwood plantation sector, although these figures should be considered accurate to within ±10%.

[13] Data on these changes will be published when the results of the next Tasmanian *Forest Industry Survey* are analysed and released, expected in late 2009.

Figure 6 breaks the employment generated into different sectors. In the softwood plantation industry, a higher proportion of workers are employed in processing compared to the hardwood plantation industry, reflecting the higher amount of downstream processing of softwood plantation timber compared to hardwood plantations.

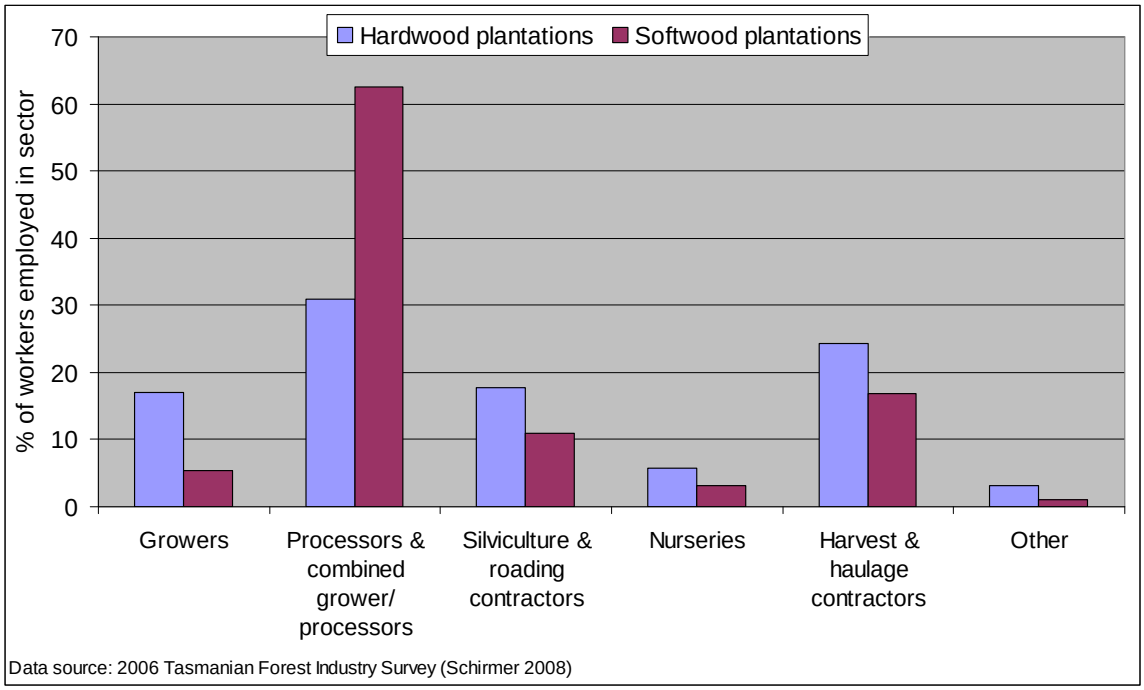


**Figure 6:** Percentage of workers employed in different sectors of the plantation industry

Over 2006 to 2008, this equated to generation of an average of:

- 0.33 jobs per 100 hectares of hardwood plantation
- 1.80 jobs per 100 hectares of softwood plantation.

There are two reasons for the large difference in the number of jobs generated per 100 hectares by hardwood versus softwood plantations.

Firstly, a large proportion of the hardwood plantation estate is yet to reach harvest age, and hence the full number of jobs that will be generated as plantations are harvested and regrown is yet to be reached. While there is harvesting of hardwood plantations, the large area of plantations established in recent years has not yet entered a cycle of harvesting and processing, meaning that total employment per 100 hectares of hardwood plantation is as yet quite low. In Western Australia (WA), in contrast, where a larger proportion of the hardwood plantations are being harvested, approximately 0.45 jobs are being generated per 100 hectares of hardwood plantation.

In contrast, the majority of the softwood plantation estate has reached harvest age and entered a full cycle of harvesting and replanting. Based on examining employment trends in the Great Southern region of WA, it is likely that once a 'steady state' of harvesting and coppicing/replanting is reached, and assuming that plantations continue to be harvested primarily for woodchip export, hardwood plantations will generate 0.5–0.65 jobs per 100 hectares. This figure will be higher if further value adding of hardwood plantation products occurs within Tasmania, for example an expansion of production of solid wood products such as the EcoAsh product produced by Forest Enterprises Australia.

Secondly, there is more downstream processing of softwood plantation timber within Tasmania than there is of hardwood plantation timber, much of which occurs at relatively old processing facilities that are more highly labour intensive than modern facilities which typically employ fewer people per unit output. The additional downstream processing means that softwood plantations in 2006 generated more jobs per hectare than hardwood plantations.

This situation is changing, with closure of some facilities that process softwood plantation in recent years, new softwood processing with higher labour efficiency established, and increasing processing of hardwood plantation timber into both woodchips and solid wood products (principally the EcoAsh product produced by Forest Enterprises Australia from plantation hardwood). As further downstream processing of hardwood plantation timber is established, the jobs generated per hectare by hardwood plantations will increase.

Data from the *Forest Industry Survey* is comparable to the limited number of other studies available, results of which are summarised in Table 2. Some studies examined only softwood plantations and some only hardwood plantations, while others produced data on both. As studies defined employment differently, the stage of production to which employment was measured is described, with some studies including the employment generated by plantation processing while others did not.

**Table 2:** Employment generated by plantation per 100 ha: comparing results of different studies

| Study and year of data collection | Hardwood plantations—employment per 100 ha | Softwood plantations—employment per 100 ha |
|---|---|---|
| *Forest Industry Survey,* Tas. (Schirmer 2008a) | 0.33 (harvesting occurring, but a large proportion of plantations in early stage of first rotation) | 1.84 (including processing, in 2006; this will have declined since then with closure of some processing facilities) |
| Schirmer (2008b), Western Australia | 0.45 (current)<br>0.5–0.65 (estimated employment once full harvest reached) | 1.44 |
| Schirmer et al. (2005a)<br>Great Southern region, WA 2003–04 | 0.36 (early harvest stage) [1] | — |
| Schirmer et al. (2005b)<br>South West Slopes, NSW, 1991–92; 1996–97; 2001–02; 2003–04 | — | 1991–92: 1.71<br>1996–97: 1.84<br>2001–02: 1.63<br>2003–04: 1.53<br>(including processing) |
| URS Forestry (2004)<br>South West Slopes NSW, 2002–03 | — | 1.50 (including processing) |
| URS Forestry (2003)<br>Central Victoria, 2001–02 | 0.38 (pre-harvest stage) [1] | 1.86 (including processing) |
| Prospect Consulting (2002)<br>North East Victoria, 2000–01 | 0.3 (pre-harvest stage) [1] | 2.07 (including processing) |
| CFPLM (1989)<br>North East Victoria, 1989 | — | 0.87 (excluding processing) |
| Petheram et al. (2000)<br>South-west Victoria, 1999 | 0.1 (pre-harvest) [1]<br>0.3 (estimated post-harvest) | 0.5 (excluding processing) |

[1]Data reflects employment generated when little or no harvesting and processing was yet occurring.

The *Forest Industry Survey* found a relatively similar amount of employment being generated by hardwood plantations to that identified in other recent studies, most of which have examined the employment generated when few or no hardwood plantations were being harvested and processed. Harvesting and processing add additional employment and hence increase employment per hectare, something most evident from Western Australian data indicating employment will increase when the entire hardwood plantation estate has reached a point of harvesting and replanting/coppicing.

The *Forest Industry Survey*'s estimates for softwood employment generated are slightly higher than for some other studies, but similar to estimates in Central Victoria where mills of a similar age are used to process softwood. Technology and the types of processing facilities located in a region affect the amount of employment generated, and the high employment generated in Tasmania likely reflects the age of processing facilities used to process softwood, with some older facilities requiring higher labour per unit output than the more modern facilities in place in other regions. As noted earlier, change in the nature of softwood processing in Tasmania in recent years means the employment generated per 100 hectares will change over time.

### *How do the impacts vary?*

The results presented above suggest that the plantation industry will generate different amounts of employment in different circumstances, depending on the type of plantation established and the downstream processing associated with it. The impacts of this employment on rural communities will vary depending on how it compares to the employment generated by previous land uses, the location of the employment, and accessibility of jobs, discussed in subsequent sections of this report.

### *What more do we need to know?*

We need to know more about how the number of jobs generated by plantations varies depending on the amount and type of downstream processing that is in place. In general, the greater the amount of downstream processing undertaken in a region, the greater the number of jobs generated. However, this depends to some extent on the type of downstream processing, with different types of processing generating differing levels of employment. More modern processing facilities typically employ fewer workers per unit of output produced, while older facilities are often less efficient and employ more people per unit of output.

It is likely that, as with other primary industries including agriculture and mining, the work generated per 100 hectares of plantation (once plantations have reached maturity) will decline over time as productivity and efficiency improves, but this needs to be confirmed through continued surveys of the industry over time.

## How does the employment generated by plantations compare to other land uses?

Many people want to know not just how many jobs are created by the plantation industry, but how the quantity of jobs compares to that generated by alternative land uses.

### *What are the different views?*

There is considerable debate about the amount of employment generated by plantations compared to other land uses. In group interviews, some participants argued that plantations provide less employment than other potential uses of the same land, referring primarily to hardwood plantations established in recent years, while others believed it would create employment in different locations:

> [agricultural properties established to plantation] are not producing anything any more, and I can take you to them one by one and say, you know, that farm is not producing any jobs any more …—*Interview participant, Meander Valley, 2008*

> … if instead of agriculture if the district was pines I mean you'd lose your Roberts [agricultural supplier] but on the other hand you're going to probably create more employment down at Bell Bay or [in] truck driving—*Interview participant, Campbell Town, 2008*

Others have argued that the employment required by many agricultural land uses is falling, indicating that this is a cause of loss of rural employment that needs to be considered when analysing the impacts of plantation expansion:

> … what we are seeing in dairying and that sort of thing is properties are getting bigger, and one of the advantages of having big properties is that you can cut your employment down … whereas you have three small farms and employs three people, when they put them together you only need six, not nine.—*Interview participant, Smithton, 2008*

Some believe that the employment generated by plantations is greater than that generated by alternative land uses, with some studies indicating this may be the case depending on what alternative land use plantations are being compared to (CPFLM 1989, Petheram et al. 2000).

### *What evidence is needed to answer this question?*

To answer this question requires gathering information on the amount of employment generated by different land uses. The amount of employment generated then needs to be compared for the same area of land at equivalent points in the chain of production, based on the average annual employment generated per annum over the entire life cycle of a land use. For example, a life cycle would be from ground preparation and planting to harvest and processing for plantations, and from ground preparing and sowing to harvest and processing for a grain crop. This approach ensures the employment generated by each land use is compared in equivalent ways.

It is also important to examine whether some of the employment is generated on a seasonal or casual basis—something discussed in the next part of this report.

A key issue is that the same land use (for example sheep farming) will generate differing levels of employment per unit area (for example, per 100 ha) depending on the productivity of the land being examined. For this reason, it is essential to compare the jobs generated by plantations to jobs generated by alternative land uses on land of similar productivity. This may still involve comparing employment on land with a relatively

wide range of productivity, and therefore there will be some variation in the amount of employment generated as land productivity varies.

### *What does the evidence tell us?*

Only a small number of studies have compared the employment generated by plantations to other land uses, and two of these were undertaken more than eight years ago. The results of these studies are summarised in Table 3, which compares employment to the farm gate only, without including jobs subsequently generated via the processing of the goods produced by the different land uses.

**Table 3:** Employment generated by different land uses to the 'farm gate'—results of different studies undertaken outside Tasmania[14]

| Land use | Average annual employment generated per 100ha to the 'farm gate', excluding processing | | |
|---|---|---|---|
| | CFPLM (1989)—NE Victoria | Petheram et al. (2000)—SW Victoria | Schirmer et al. (2005b)—NSW<br>Schirmer (2008b)—WA<br>Schirmer (2009 forthcoming)—SW Vic and SE SA[2] |
| **Wool and prime lambs** | 0.24–0.41[1] | 0.26 | 0.33 (range of 0.2–0.6)[1] |
| **Beef cattle/veal** | 0.21-0.33[1] | 0.14 | 0.22 (range of 0.1–0.5)[1] |
| **Dairy farming** | 0.88 | 1.22 | 1.4 (range of 0.9–1.7)[1] |
| **Cropping** | — | 0.14 | 0.23 (0.1–0.5)[1] |
| **Grape growing** | — | — | 7.7 (5.0–10.0)[1] |
| **Blue gum (pre-harvest)** | — | 0.1 | 0.2 (0.15–0.25)[1] |
| **Blue gum (post-harvest)** | — | 0.3 | — |
| **Softwood plantations (radiata pine)** | 0.87 | 0.5 | 0.5 |

[1]Variation reflects employment generated on land of differing productivity, and different farm enterprise labour structures

[2]These studies are shown in a single column as they all used the same methods to estimate employment

The estimates of employment generated vary across studies, as can be seen in Table 3. This partly reflects that the different studies were undertaken in different points in time—the CFPLM (1989) data reflect employment generated by different land uses almost 20 years ago, while the more recent Petheram et al. (2000) and Schirmer (2009 forthcoming) data is more likely to reflect current employment generated by different land uses.

The data in Table 3 suggests that hardwood plantations generate less employment to the 'farm gate' than many other land uses except cropping, while softwood plantations generate more employment than sheep or beef grazing or cropping, but less than dairy or viticulture.

Analysing employment generated to the farm gate provides only part of the answer to the question of how much employment different land uses generated. The majority of employment in the plantation industry—up to two thirds—is generated by the processing

[14] The studies compared in this table used similar, but not always identical, definitions of what constituted the 'farm gate'. The differences in definition may contribute to some differences in estimates of employment, although these are likely to be small.

of wood products. It is therefore important to compare, if possible, the total employment generated by different land uses when downstream processing is included in the analysis.

The employment generated by downstream processing is shown in Table 4 for several land uses. The data in Table 4 is sourced from several recent 'one-off' studies in specific regions, together with data from the Australian Bureau of Agriculture and Resource Economics (ABARE) *Farm Survey*, the Victorian Department of Primary Industries *Farm Monitor* project, and the ABS[15]. As with Table 3, the data has primarily been collected outside Tasmania.

**Table 4:** Employment generated by processing beyond the farm gate, based on studies undertaken outside Tasmania

| Land use | Employment per 100 ha, 2006–08, to farm gate | | Beyond farm gate in study region (jobs/100 ha) |
|---|---|---|---|
| | Median | Range | |
| **Beef** | **0.22** jobs/100 ha | **0.1–0.5** | **0.01–0.03** (abattoir/ transport) |
| **Blue gums** | **0.20** jobs/100 ha | **0.15–0.25** | **0.30–0.45** (woodchipping and export, based on WA data) |
| **Cropping** | **0.23** jobs/100 ha | **0.1–0.5** | **0.01–0.03** (storage, transport, sale) |
| **Dairy** | **1.4** jobs/100 ha | **0.9–1.7** | **0.2–0.3** (manufacturing) |
| **Grapes** | **7.7** jobs/100 ha | **5.0–10.0** | **6.5–7.0** (wine making) |
| **Sheep** | **0.33** jobs/100 ha | **0.2–0.6** | **0.01–0.03** (abattoirs, transport) |
| **Softwood plantations** | **0.5** jobs/100 ha | **0.5** | **1.0–1.6** (sawn wood, pulp, other wood products) |

**Data source:** Data gathered via a survey of primary producers and plantation companies, reported in Schirmer (2009 forthcoming); the South West Victoria Farm Monitor project; the ABS, ABARE; Schirmer et al. (2005a,b), URS Forestry (2003, 2004) and Schirmer (2008b).

To identify how applicable the studies summarised in tables 3 and 4 are likely to be to Tasmania, ABARE Farm Survey data for Tasmania was analysed to identify labour generated per hectare of activity, while Australian Bureau of Statistics (ABS) data was used to identify the employment generated both before and beyond the farm gate in different industries. This data was then combined with results from other studies, with results shown in Table 5, which also includes explanations of the sources of different data and assumptions made.

Table 5 indicates a fairly similar pattern to the data from studies outside Tasmania. Once employment beyond the farm gate is included, hardwood plantations generate slightly more employment than sheep farming, beef farming and cropping, and employ fewer people than dairy farming, vegetable and fruit growing and grape growing, all of which

[15]The data in Table 4 are reported in more detail in Schirmer (2009), who compared the downstream employment generated by different land uses in south-west Victoria and south-east South Australia, a region which has considerable processing of dairy, grapes, and timber products, as well as abattoirs processing meat products and a wool scouring facility. Table 4 also includes data from Schirmer (2005a,b), who gathered similar data for the hardwood plantation industry in the Great Southern region of WA and the softwood plantation industry in the south-west slopes of NSW as did URS Forestry (2003, 2004), while Schirmer (2008) generated this type of data for WA's forest industry. Analysis was also undertaken of data from the Australian Bureau of Agriculture and Resource Economics (ABARE) *Farm Survey*, the Victorian Department of Primary Industries *Farm Monitor* project, and from the ABS to identify whether the employment identified in these studies were typical for other parts of Australia.

are much more intensive land uses. Softwood plantations generate more employment than beef, sheep and dairy farming, and less than fruit, vegetable and grape growing. The data on cereal growing includes a mix of crops and are less reliable than the other data presented in Table 5.

**Table 5:** Estimated employment generated per 100 hectares by different land uses, Tasmanian data

| Data source/s | Land use | To farm gate | Beyond farm gate (within Tasmania) | Notes |
|---|---|---|---|---|
| *Forest Industry Survey* | Hardwood plantations—current | 0.18 | 0.15 | Includes contractor employment |
| *Forest Industry Survey* | Hardwood plantations once full rotation reached—estimated | 0.20 | 0.30–0.45 | Includes contractor employment |
| *Forest Industry Survey* | Softwood plantations | 0.4–0.5 | 1.0–1.5 | Includes contractor employment |
| ABS, ABARE | Sheep grazing | 0.15–0.18 | 0.07 | Figures have been adjusted to include direct farm employment plus shearing; contractors other than shearers are not included but typically represent a small proportion of employment. Sheep grazing data come primarily from the Midlands region, where land has lower carrying capacity, while beef cattle data includes land with higher rainfall and carrying capacity. |
| ABS, ABARE | Beef cattle grazing | 0.32–0.37 | 0.07 | |
| ABS | Grain growing (inc. poppies, cereal, oilseed) | 0.18–0.32 | 0.12 | Figures before farm gate are based on a relatively small sample and hence a wide range is given to reflect likely error range in the data. Does not include contractor employment (e.g. sowing, harvest contractors) so may underestimate employment |
| ABS, ABARE | Dairy farming | 1.07–1.26 | 0.61 | Contractor employment not included; all farmer and farmhand (e.g. milkers) employment included in employment to farm gate. Manufacturing employment includes tanker drivers. |
| ABS | Vegetable growing | 4.5–6.5 | 3.8–6.8 | Data based on relatively small sample and hence wide range given to reflect ABS estimate of relative standard error. |
| ABS | Fruit growing | 9.3–13.3 | 3.8–6.8 | Data based on relatively small sample and hence wide range given to reflect ABS estimate of relative standard error. |
| ABS | Grape growing (largely based on small-scale enterprises) | 14.3–20.3 | 20.2–26.2 | Data based on relatively small sample and hence wide range given to reflect ABS estimate of relative standard error. Grape growing is typically small-scale and highly intensive, serving a specialist market with niche products, hence is highly labour intensive. |

**Data analysis notes**: The area of land used for beef, sheep and dairy farming was estimated based on average stocking rate data from ABARE and estimates of total flocks from the ABS *Agricultural Census.* The area used for other agricultural land uses was based on ABS *Agricultural Census* data. ABS labour estimates are drawn from the ABS *Census of Population and Housing*, based on the number of people working in that industry using the Australia New Zealand Standard Industry Classification (ANZSIC). All ABS data is for 2006, while ABARE *Farm Survey* data was calculated based on the average for 2003-2008. While ABS labour data for agricultural support services was included in estimates, these likely underestimate total employment in agricultural contracting and hence several categories are noted as not including all contractor employment.

The answer to the question of how much employment plantations generate compared to other land uses therefore differs depending on what stages of production are included in the analysis, the type of land uses being compared, and how much downstream processing occurs in the region being examined.

### *How do the impacts vary?*

Land use change to plantations will results in varying types of change in employment depending on what purpose the land was used for prior to a plantation being established, and the amount of downstream processing associated with the different land uses being compared. Total regional employment may increase or decrease depending on the previous land use. The impacts of this change in employment will vary for different people. Even if more employment is generated by plantations, it is unlikely that those whose employment is displaced will be directly employed by the plantation industry. Therefore those who lose employment opportunities are likely to be impacted negatively if they are unable to find alternative employment, while those who gain employment in the plantation industry are likely to be impacted positively by this change.

Impacts on individual people therefore depend on whether their employment is affected, and who is able to take advantage of new opportunities provided by the plantation industry, for example by diversifying their business into providing services to the industry.

### *What more do we need to know?*

Further information is needed to gather more direct Tasmanian data which includes the employment generated in the contracting sector by different agricultural land uses, and to identify how the employment generated by different land uses differs depending on factors such as land productivity, and type of farm enterprise.

More data is also needed to identify how the employment generated by different land uses is changing over time in response to trends such as changes in productivity and intensification of land use.

## What types of jobs are generated by plantations?

As well as wanting to know how many jobs are generated by plantations, and how the amount of employment compares to that generated by other land uses, some people want to know more about the types of jobs generated by plantations. In particular, in group interviews participants asked about whether most work generated was full time, part time or casual, or generated only at certain stages of the plantation life cycle.

### *What are the different views?*

As with other questions about employment, a wide range of views were expressed on this issue. Some interview participants believed that plantations generate primarily temporary or casual jobs and little ongoing employment:

> … all work is being done by casuals employed to plant the [seedlings], and there are casuals employed to come and thin it and harvest it.—*Interview participant, St Marys, 2008*

Others, however, identified a shift to casual employment as having occurred in many industries in the Tasmanian economy in recent decades, rather than being specific to the plantation industry, or as being a common part of rural employment in Tasmanian industries such as horticulture.

### *What evidence is needed to answer this question?*

Identifying the types of jobs generated by the plantation industry requires accurate data on the proportion of employment that is full time, part time and casual in the plantation sector, and also whether jobs tend to be generated only at a particular point in the plantation life cycle. Ideally, the same information should be collected for other industries such as sheep and beef grazing, cropping, grape growing and dairy farming, so that the types of jobs generated by the plantation industry can be compared to those generated by alternative land uses.

Different types of work in the plantation industry may generate different types of employment, so it is also necessary to identify the types of jobs generated in plantation growing, nurseries, silvicultural contracting, harvest and haulage contracting, and by plantation processing.

### *What does the evidence tell us?*

Data from the 2006 Tasmanian *Forest Industry Survey* (Schirmer 2008a) is used here to examine the type of employment generated by the plantation industry. Information from the survey was compared with ABS *Census of Population and Housing* data. The proportion of full-time and part-time/casual employment in the plantation industry was compared to the labour force as a whole, and people working in agriculture, fishing and forestry, as shown in Figure 7[16]. Figure 7 is based on data for businesses that either undertake all their work in the plantation industry, or undertake some work in the plantation industry and some based on native forest harvesting. The latter are included as

[16] Data on employment in 'agriculture, fishing and forestry' refers to all those who work in these industries to the point of the 'farm gate'. In Tasmania in 2006, of a total 11 552 people who worked in agriculture, forestry and fishing, approximately 69.5% worked in agriculture, meaning that this data largely reflects the types of employed generated by the agricultural sector. However, it does also include the forestry workforce, which makes up 16% of the agriculture, fishing and forestry workforce, while commercial fishing (aquaculture and wild catch) makes up the remaining 14.5%.

there are a large number of businesses in Tasmania which undertake work in both the plantation and native forest sectors, and no significant differences were identified in the proportion of full-time and part-time employment across these different types of business. The plantation industry is split into several sectors to better identify which parts of the industry generate more full-time versus part-time work.

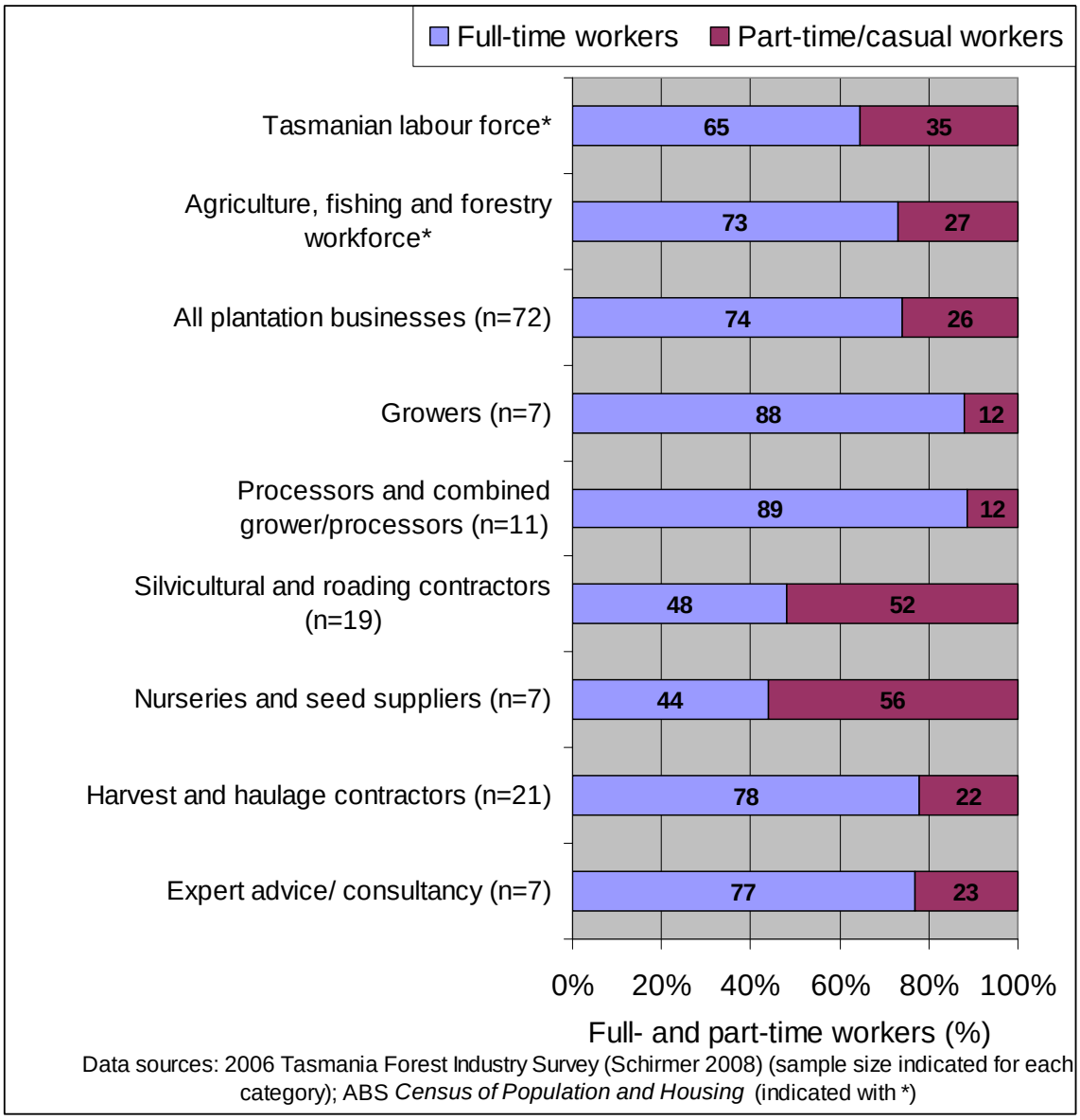


**Figure 7:** Proportion of workers in full-time and part-time/casual employment in the plantation industry, agriculture and the total labour force

Overall, the plantation industry has more full-time workers than the average for the labour force as a whole, and almost the same proportion as the agriculture, fishing and forestry sector as a whole—74% of plantation workers work full time, compared to just over 73% of all people working in agriculture, fishing and forestry[17].

[17] Note that Figure 7 shows data for all plantation workers and does not separate workers in hardwood and softwood plantations. This is for two reasons: to preserve confidentiality of individual businesses who provided data, and because no significant differences were found in the type of employment generated by hardwood versus softwood plantations in terms of the proportion of full- and part-time/casual workers.

When the plantation industry is broken down into individual sectors, it can be seen that some sectors of the industry generate a lot of part-time jobs, while in other parts of the industry jobs are usually full time. Nurseries and silvicultural contractors in particular have a high proportion of part-time/casual work, while most other parts of the industry largely employ full-time workers.

This suggests that the plantation industry is not significantly different from traditional agriculture in terms of the proportion of part-time/casual versus full-time jobs. This may seem surprising to some, as some work such as planting seedlings only occurs once in the lifetime of a plantation, which means it occurs once every 12–25 years for short-rotation hardwood plantations, and once every 25–35 years for softwood plantations or long rotation hardwood plantations. However, in most of Tasmania's plantation regions a large number of individual plantations of varying ages have been established. Because there are plantations of multiple ages in any locality, once plantations begin to reach harvest and replanting age, regular work is available for workers engaged in activities that only occur once in each full rotation of a plantation.

There is no evidence to suggest that the work generated by plantations is more casualised than for traditional agricultural workers, particularly given the trend in traditional agriculture towards increasing use of contractors, who may provide a specialised service at particular times of year based on seasonal labour needs (National Farmers Federation 2008).

### *How do the impacts vary?*

It does not appear that a land use change from agriculture to plantations leads to significant change in the amount of full-time versus part-time work available in rural areas. It is possible that some people find they leave one type of job for another as a result of this land use change, in which case the impact on that person may be positive or negative depending on the type of job they prefer, and whether the change helps them achieve their preferred type of employment.

### *What more do we need to know?*

More work is needed to compare the type of employment generated by plantations to specific agricultural industries such as sheep and beef grazing, which are the most common alternative land uses to plantations. It would also be useful to have better information on the level of 'wellbeing' of workers in the plantation industry compared to other land use industries. Wellbeing refers to a worker's level of satisfaction with their job, their workplace conditions, and health and safety risks presented by their employment. Gathering this type of information requires direct surveys of workers. While recent data from a survey of Tasmanian forest workers indicated 80% were satisfied or very satisfied with their work overall, this was based on a relatively small sample of 54 workers and requires further study (Schirmer et al. 2008c).

## Where are plantation industry jobs located compared to other land uses?

While plantations may generate the same amount of employment as some (but not all) alternative land uses, and more in some cases, these jobs may not be located in the same places as those generated by traditional agriculture. It is important to examine where plantation workers are typically located compared to workers from traditional agricultural industries, as this provides a better understanding of the likely social impacts of land use change to plantations. If land use change to plantations involves a shift in location of employment opportunities, this is likely to be associated with changes in where people live, spend their wages, use local services and join community groups.

### *What are the different views?*

In group interviews, many participants believed that plantation industry workers are more commonly located in large towns/regional centres compared to workers in traditional agricultural industries, and that the converse is also true, with plantation workers less likely to be located in small towns or living on rural properties than those who work in traditional agricultural industries. These perceptions sometimes differed for hardwood and softwood plantations, as well as differing depending on the extent of local processing established for the industry:

> … the forest industries now they tend to bring all their infrastructure with them and take it away with them, where years ago the local garage or mobile mechanic would get a heap of that work, or the hydraulic person would get a heap of that work, we don't see a lot of that now… [a hardwood plantation is] set by non locals, it's fertilised and harvested by non locals and then possibly carted by a transport company who doesn't live in this district … whereas the pine forest, at least we were getting employment and a roll-on effect from it, that's my interpretation anyway.—*Interview participant, Scottsdale, 2006*

> … the local area at home [had] several plantations that they did the mound ploughing and spraying for, the contracting group came from down near Port Arthur, came in, did the job and went. Two or three tractors, and just came and did it, and gone.—*Interview participant, Westbury, 2008*

Some agricultural industries were also described as generating less local employment over time, particularly by group interview participants in towns where processing facilities had shut down, indicating a more general concern about changes in the location of rural employment and a shift to longer distance transport of goods to manufacturing facilities:

> I mean our butter factories have gone, timber is all carted away, our potato factory disappeared 18 months ago and the rest … the big companies have bought them out and so they make the rules. If you want to supply them you send your product to where they want do the processing.—*Interview participant, Scottsdale, 2006*

### *What evidence is needed to answer this question?*

To answer this question requires identifying where plantation industry workers are located compared to (a) the general labour force, and (b) people who work in agriculture and food/meat manufacturing industries (the types of employment most likely to be generated by alternative land uses to plantations such as grazing, cropping, and less commonly dairy farming or grape growing).

Data from the 2006 ABS *Census of Population and Housing* was analysed to identify the percentage of workers in different industries who live on rural land and small towns versus larger sized towns. As ABS data does not separate employment generated as a

result of native forests versus plantations, only data for the region of Tasmania with the highest proportion of plantation-based employment was analysed—the Northern NRM region (including the LGAs of Break O'Day, Dorset, Georgetown, Launceston, Meander Valley, Northern Midlands and West Tamar). In the Northern region, an estimated 40.4% of forest industry workers were dependent on plantations while the remainder had jobs based primarily on native forest harvesting. In the Cradle Coast and Southern NRM regions, in contrast, the large majority of forest industry workers were dependent on native forest harvesting (Schirmer 2008a). While data for the Northern region still includes workers who work in native forest harvesting, it does provide the best information currently available on where plantation-based workers live.

### *What does the evidence tell us?*

People who work in the plantation industry are somewhat more likely to live in large towns, and less likely to live on rural land or in small towns, compared to agricultural workers. This can be seen in Figure 8, which compares where the following types of workers live:

- the labour force in general, indicating the distribution of the general labour force across different towns
- land managers and workers involved in the following industries: forestry and logging (which in the regions examined is over 40% based on plantations), sheep beef or grain farming, dairy farming, vegetable growing, fruit growing and grape growing
- manufacturing workers in the following industries: wood product manufacturing, meat manufacturing (including abattoirs), dairy manufacturing and wine manufacturing
- service industry workers who provide the following services: forestry support services, agriculture support services and shearing services.

As can be seen in Figure 8:

- Forestry and logging workers are more likely to live in large towns than those working in sheep, beef and grain growing, dairy farming and vegetation growing and less likely to live on rural land than these types of land managers. However, fruit and grape growers are just as likely to live in large towns as forestry and logging workers. Just over a quarter of forestry and logging workers live in Launceston, while a higher percentage (34.5%) live on rural properties or in small towns with a population of less than 200.
- Those working in wood manufacturing were more likely to live in small towns than those working in meat manufacturing, and a relatively large proportion of people working in all types of manufacturing were based in larger towns.
- Workers providing forestry support services (such as tree planting and plantation maintenance) were more likely to live in large towns and less likely to live on rural land or in small towns than those providing agricultural or shearing services.

These results suggest that those working in the plantation industry are somewhat more likely to be located in large regional cities and large towns than those working in agriculture, and less likely to live on rural properties or in small towns with less than 200

population, although the difference is not always large and depends on what types of agriculture forestry is compared to. This suggests that a shift in land use from agriculture to plantations is likely to be accompanied by some shift in where jobs are available, and hence where workers live.

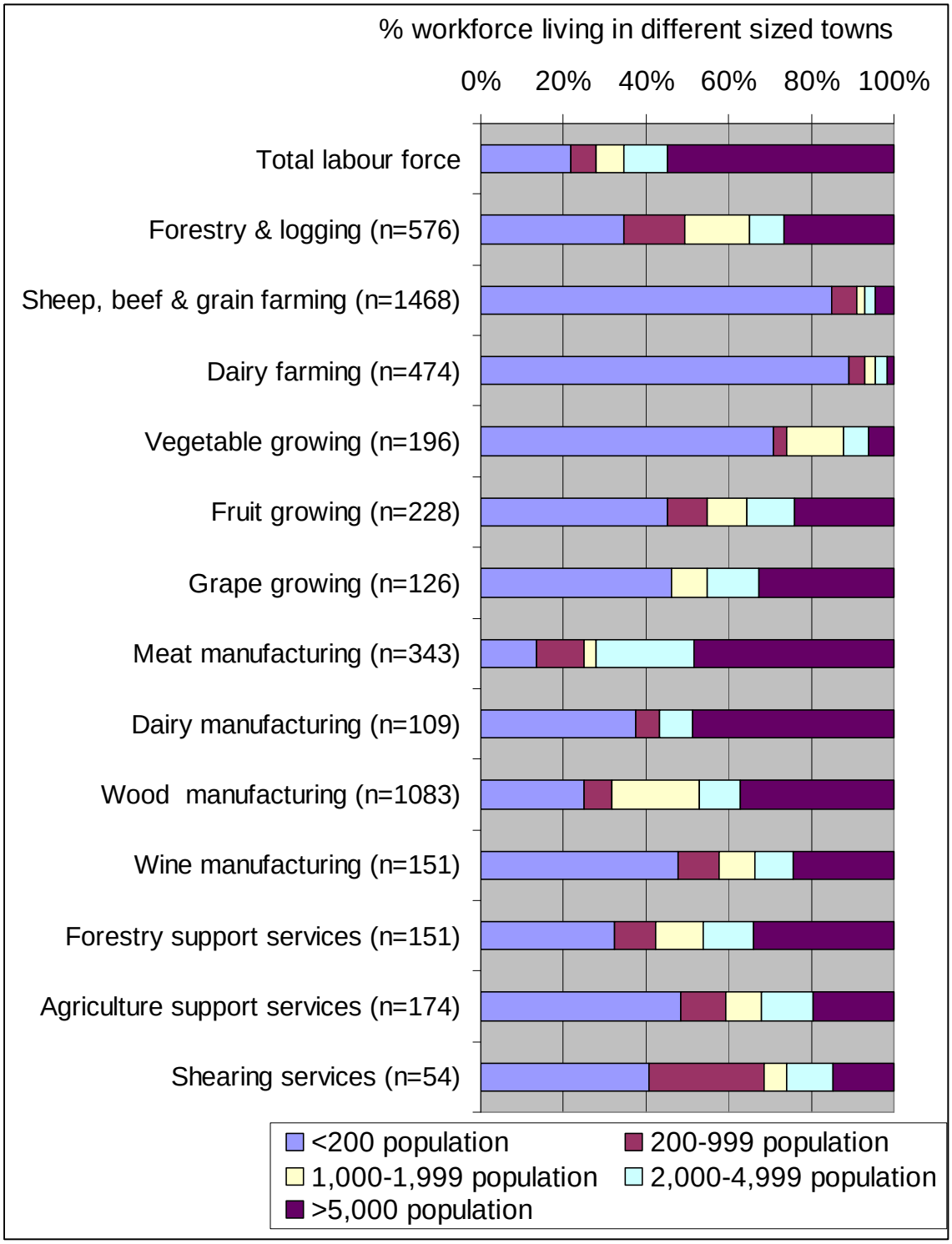


**Figure 8:** Residential location of workers in different industries (ABS *Census of Population and Housing*, 2006)

This result is consistent with results from other regions, with Schirmer (2009) finding that in Western Australia, a higher proportion of plantation workers were based in large towns and regional cities compared to traditional agricultural industries.

### *How do the impacts vary?*

Land use change to plantations is associated with some change in the location of employment. The jobs created by the plantation industry are more likely to be located in larger towns, with workers more often based in larger towns than in smaller towns or on rural land. The impacts of this change on people living in rural and regional areas will be varied. A net loss of employment in small towns can have negative consequences, with potential for associated population loss and rural decline. Employment growth in larger towns, meanwhile, can provide many benefits for these towns including increased spending of wages, economic activity, and participation in community and sporting groups. Shifts in land use from grazing or dairy farming to fruit or grape growing appear to involve similar changes, indicating land use change to plantations is not the only land use change that may be associated with some change in the location of workers. A large part of the impact depends on where wood processing facilities are located and where their workers live. In group interviews in Tasmania, participants suggested that many workers commute from small towns to work in manufacturing facilities, indicating that a chance in land use may influence commuting times more than residential location of workers, at least in the shorter term.

### *What more do we need to know?*

It would be useful to continue to compare the location of jobs in the plantation sector to those in other industries, to see if patterns change over time. More specific data identifying differences in the residential location of workers who work in the native forest versus plantation industries would also be useful, but is difficult to obtain for Tasmania where many people working in the forest industry undertake work in both the native forest and plantation sectors.

## How does plantation expansion affect local and regional economic activity?

Industries contribute to the economy not just directly through employing workers, but indirectly through their expenditure on things such as goods, services and wages that generate activity in the economy. The extent to which the plantation industry contributes to local and regional economic activity is commonly debated.

### *What are the different views?*

Critics of plantations argue that plantation companies do not spend as much money locally as the farming enterprises the plantations replaced. Advocates argue that plantations bring new types of spending into rural and regional economies, or provide benefits for farmers through the 'drought proofing' effect of receiving annual lease payments for plantations established on part of their property by plantation companies:

> … often landowners who are wool growers or whatever else, are able to sell blocks to timber, have an area chipped and converted or just put in the plantation or whatever, but that money that is from the forestry enterprise, mostly I would say, gets spent back on the farm again [on] capital improvement[s] … it is a long-term drought proofing, you notice that anyone that has got trees at the moment … it is income, where they are not going to get income from sheep or crops, and it is spent locally.—*Interview participant, Campbell Town, 2008*

> … farmers that do have this lease arrangement are quite thankful of the whole setup because it has really complemented the [farm] business in a sense … So the leasing thing is certainly helping businesses.—*Interview participant, Bothwell, 2006*

> I mean before you had apple farming, you've got cherries you've got some vineyards, … and now more people might be sort of going over to plantation forestry on land that used to be used for sheep and cattle, how is that impacting on businesses in town in terms of the diversity of business?—*Interview participant, Hobart, 2006*

> … that farm [that has been established to plantations] is not producing any jobs any more, it is not producing virtually anything for the economy any more, for all intents and purposes it just does not exist … that equates to about $6 million lost to the local economy per year.—*Interview participant, Westbury, 2008*

> … in the upper Ringarooma [region] where … some big properties or [a] big area in the district has gone from dairying to trees … you can see an effect on business because some big properties that used to [purchase a] couple of hundred thousand dollars worth of inputs, chemicals and whatever else, it is not there.—*Interview participant, Bothwell, 2006*

> [Managed investment schemes involving plantations] is the way that they have got people to invest into rural Australia, not only just Tasmania, but in rural Australia … and it is a positive sign because it has brought a lot of money into the communities.—*Interview participant, Wynyard, 2006*

This debate often centres on where funds for plantation establishment come from; whether those funds are spent in local areas as plantations are established, grown and harvested; and where profits go after harvest.

Williams (2009) asked the Tasmanian residents she surveyed whether they believed an increase in plantations led to an increase, little or no change or a decrease in business for local shops and businesses. Views were very mixed, with around 26% believing business would increase, a slightly higher proportion believing it would decrease, and the remainder believing there would be little or no change to local business, or indicating they were not sure how plantation expansion affected the local economy.

### *What evidence is needed to answer this question?*

To answer this question requires comparing the location and amount of expenditure by the plantation industry with that generated by alternative land uses such as broadacre grazing and dairy farming. Ideally, the location from which funding is sourced and to which profits are paid should also be examined. Unfortunately, relatively little research is currently available that adequately compares different industries to identify if and how plantations are different from other land uses.

### *What does the evidence tell us?*

The only data that can currently help answer this question comes from the 2006 Tasmanian *Forest Industry Survey* (Schirmer 2008a),which examined the proportion of spending by plantation businesses that took place locally (defined as in the LGAs in which the business's office was based and those adjacent), or non-locally. Only a small number of businesses provided this information in this survey, and further work is needed to identify if the figures reported here are typical for the industry.

- Plantation growers and processors, and businesses which managed both plantations and native forest for harvesting, spent an average of 34% of their expenditure in the LGA or LGAs in which their offices were located or in adjacent LGAs, and a further 43% in other LGAs located within Tasmania, and 23% of their expenditure outside Tasmania.
- Most contractors spent over 60%, and up to 80%, of their total expenditure in local and adjacent LGAs, and the remainder within Tasmania.

Overall, this indicates that in the plantation contracting sector, the majority of expenditure takes place in the LGAs in which the business is located, or those immediately adjacent. For growers and processors, most expenditure takes place within Tasmania but may be quite widely spread in Tasmania.

While these results indicate where spending occurred in relation to the office location of the businesses surveyed, they do not provide information on expenditure relative to the location of the plantations themselves. As a plantation company, processing facility, or silvicultural or harvest contractor may manage or utilise wood from plantations located some distance from their office (often up to 200 km), these results do not provide an adequate understanding of expenditure relative to the location of the plantation estate.

### *How do the impacts vary?*

Not enough is known about the changes to local and regional economic activity resulting from plantation expansion to identify the likely impacts of these changes, and how they may vary in different circumstances. Broadly speaking, any net loss of spending in local economies can impact negatively while an increase can impact positively. In reality it is likely that some types of spending increase, and some others decrease, as a result of land use change to plantations. Local businesses that provide services to the plantation industry will benefit from the land use change, while those who lose business are likely to be impacted negatively.

### *What more do we need to know?*

More specific studies which compare expenditure by the plantation industry with the expenditure generated by alternative land use industries are needed to adequately answer this question. These studies need to be carefully designed to ensure they have appropriate

definitions of what constitutes ‘local’ spending, that they identify how to compare spending across different industries, and they consider issues such as whether to measure spending relative to where a plantation business office is located, or relative to the actual plantation estate it manages, which may be spread over a large area.

## How does plantation expansion affect rural population levels?

There is considerable debate about the impact of plantation expansion on rural population levels. The seemingly simple question 'how does plantation expansion change rural population levels' can be surprisingly complex to answer, as is explained below. It is also important to consider how a mature plantation industry, as well as the establishment of new plantations, influences population levels.

### *What are the different views?*

Concerns have been raised in many rural communities that plantation expansion may be accompanied by rural population decline. This is typically believed to result from farmers shifting off properties when they are established to plantation, and from changes to availability of jobs resulting from the land use change. Others argue that population decline occurs for reasons other than plantation expansion, or that plantation expansion accelerates an existing trend to rural depopulation:

> … if you replace a farm family with a plantation you've got no-one living on that piece of land—*Interview participant, Scottsdale, 2006*

> Because family businesses … can't very often compete with the sort of prices which the land, which forestry companies are able to pay, and so that decreases the number of farming families in the community—*Interview participant, Bothwell, 2006*

On the other side of the argument, some argue that establishing a plantation industry will provide new industry and hence new employment opportunities, and may therefore help reduce rural population decline through diversifying rural economies:

> … when that mill [referring to the proposed Gunns pulp mill] goes ahead or if it goes ahead … that will increase the number of population that Tasmania needs, you were talking earlier on how we are losing all our young people and it really is a serious problem.—*Interview participant, Wynyard, 2006*

Williams (2009) found that in Tasmania the proportion of people who believed an increase in plantations would lead to an increase, decrease or no change in rural population differed for different regions. While between 43% and 47% of people believed plantation expansion would lead to little or no change in population:

- in the Cradle Coast region, only 6% of survey respondents believed there would be an increase in population while 41% felt there would be a decrease if the area of plantations grew
- in the Northern region, 8% felt population would increase while 35% believed it decreased when plantations increased
- in the Southern region, 10% believed population would increase and 21% believed it would decrease.

### *What evidence is needed to answer this question?*

Identifying the impact of plantation expansion on rural population levels requires assessing whether establishment of plantation estate and associated industry leads to changes in population that are different to those that would have occurred in the absence of plantation expansion.

This means it is necessary to identify the 'baseline', or typical, rate of population change that would be expected in a rural area in the absence of plantations. Many rural areas in

Tasmania with few or no plantations have experienced rural population decline in recent decades, and it is important to avoid assuming that population decline and plantation establishment are necessarily causally related if both occur at the same time, as other factors may be contributing to population decline.

A range of evidence may be needed to build an understanding of the impacts of the plantation industry on rural population, including examining:

- *people living on rural properties*: Does the number of people living on rural properties change as a result of plantation expansion, and is this change different to that which would have occurred if properties had not been established to plantation?
- *employment generation in rural regions*: Does the plantation industry generate different levels/types of employment compared to alternative land uses, which might lead to decline or growth in population on rural land or in towns?
- *population change in plantation versus non-plantation areas*: Do LGAs where rapid plantation expansion is occurring, or which have a mature plantation industry, experience different population trends to other regions?

Each of these three approaches provides a different 'angle' on the potential population impacts of plantations which, when combined, can provide a comprehensive understanding of these impacts.

### *What does the evidence tell us?*

Each of the three approaches described above is used in turn below to examine the impacts of plantation expansion on rural population.

#### *People living on rural properties*

In 2007, a survey was undertaken in south-west Victoria and south-east South Australia of 158 landholders who had either leased their property to a plantation company for hardwood plantation establishment, sold their property to a plantation company for hardwood plantation establishment, or established their own farm forestry. Data was also gathered from plantation companies in the region, providing information on a further 584 properties that had been sold or leased to plantation companies. Survey respondents were asked how many people lived on the property before land use change to plantations, whether existing residents shifted away as a result of the land use change and, if previous residents left, whether new people shifted onto the property (full results of the study are reported in Schirmer et al. 2008b).

The results, summarised in Table 6, indicate that the impacts of plantation expansion on the number of people living on the properties involved depend on how the plantation is established.

When landholders sell properties to plantation companies—the most common way that plantation expansion currently occurs in Tasmania—75% of previous residents shift away from the property. In south-west Victoria and south-east SA, where subdivision of housing from plantation properties is common, the majority of these properties are then reoccupied by new residents who shift into the housing. Once these new residents are taken into account, there is a net loss of population of between 7% and 19%.

These results apply to a situation where subdivision and sale of housing on plantation properties is common. Future studies should examine whether a higher or lower proportion of new residents are found in situations where houses on plantation properties are rented, rather than subdivided from the plantation block and sold.

When landholders lease part or all of their property to a plantation company, there is a small net loss of population (around 3%), as most landholders remain living on the property after it is leased.

When landholders establish their own farm forestry (through using their own labour and funds to establish a woodlot on their property), there is no change to the number of people living on the property.

These results show that there is a small net loss of people living on rural properties as a result of plantation expansion. The next question is, would a similar level of population loss have occurred in the absence of plantation expansion? Unfortunately there is little specific data available to help answer this question, limited to knowledge about the broader trends affecting rural population levels.

**Table 6:** Does plantation establishment change the number of people living on rural properties?

| | Landholders who established own farm forestry | Landholders who leased part/all of property to plantation company | Landholders who sold property to plantation company |
|---|---|---|---|
| What percentage of properties were inhabited before land use change? | 50–55%[1] | 60–70%[1] | 44–52%[1] |
| *If properties were inhabited:*<br>On what percentage of properties did residents shift away as a result of land use change? | 0% | 10% | 75% |
| *If people shifted away:*<br>On what percentage of properties did new people shift in?[2] | N/A | Short term: 45%<br>Long term: 55%[3] | Short term: 50%<br>Long term: 80%[3] |
| Net population impact | No change | –3% | –7% to –19% |

[1] The variation in these figures reflects differences in the data provided by landholders versus plantation companies, which are discussed in detail in Schirmer et al. (2008b).

[2] These results apply only to regions where subdivision of housing from plantation properties is common practice. Different results would be likely in regions where subdivision is not permitted.

[3]The variation between short-term and long-term figures reflects differences in the answer to this question based on the length of time considered. For properties sold to plantation companies, in the six months after the property is sold around 50% of properties will be reoccupied if previous residents left. In the longer term—one to two years after sale—around 80% were reoccupied.

**Data source**: Schirmer et al. (2008b) (see this report for a detailed description of the methodology used).

Hugo (2005: 63) has shown that rural areas within commuting distance of major cities and in high rainfall coastal areas of the south-west and east coast of Australia tend to be experiencing higher population growth than the Australian average. At the same time, '… in the heartland dryland farming and pastoral areas of rural and remote Australia absolute population decline is common …'.

Plantations in Tasmania are established in both high rainfall areas within commuting distance of major regional cities, and in rural areas with less proximity to large cities. This suggests that, in the absence of plantation expansion, some of the rural properties in

these regions would have lost population while others would not, or may even have experienced population growth where rural residential properties are popular.

*Employment generation in rural regions*

If the plantation industry generates a different amount or different types of employment compared to alternative land uses, this may lead to changes in the number of people living in rural regions, as people shift to where employment opportunities are available. Based on the employment data presented earlier in this report, land use change from traditional agriculture to plantations may be accompanied by:

- a shift of jobs from small towns and rural properties to larger regional towns and cities. This may be accompanied by a shift in population, although it depends on the extent to which workers change where they live in order to work in the plantation sector, versus commuting to take on a job in a new location
- growth, decline or relatively little change in the number of jobs generated, depending on (a) the previous land use, and (b) the extent to which downstream processing is established and the location of processing facilities. Softwood plantations generate more employment than many alternative land uses, with most of this employment in processing and hence most jobs located where processing facilities are located. Hardwood plantations generate less employment to the farm gate than most alternative land uses, but if harvesting and woodchipping activities are included, they generate more employment than sheep grazing, beef cattle grazing or cropping, but less than dairy farming, fruit and vegetable growing or grape growing.

In other words, the impacts on population depend on the type of plantation established, the previous land use, the extent to which downstream processing is established to produce wood and paper products, and where that downstream processing is located. If a dairy farm changes land use to hardwood plantation, and the nearest woodchipping facility is located 150 km away, then there will likely be a net decline of employment in the locality of that plantation and an increase in employment near the woodchipping facility. If a sheep farm is established to plantation, with a processing facility located within 10 km, employment opportunities in the local area will likely increase as a result of plantation establishment once the stage of harvest and replanting is reached.

*Comparing population change in plantation and non-plantation areas*

While a small net loss of population occurs at the individual property scale as a result of plantation establishment, this change in population is too small to be observable at a larger scale in Tasmania (Figure 9). To identify if the trends identified at the individual property level were 'visible' at larger scales, ABS data on rural population levels over time in different 'Statistical Local Areas' (SLAs) was analysed, and the rate of change in areas experiencing high rates of plantation expansion was compared to that in regions with few or no plantations. Each LGA in Tasmania is made up of between one and three SLAs, and they are useful to analyse as they typically separate city and urbanised areas from rural areas. Rural population—defined as people living on rural properties or in towns with a population of less than 200—was focused on, as concerns raised about plantations and population typically focus on whether rural population declines as a result of plantation expansion.

From Figure 9 it can be seen that there is no consistent relationship between the rate of plantation expansion and rural population change. Areas with high expansion of

plantations experienced greater population growth or lower decline than those with medium rates of plantation expansion over 1996 to 2006, the period when a large proportion of plantations were established, while those with low or no plantation expansion experienced greater growth in population than high plantation areas over 1996 to 2006, but greater population decline over 1991 to 1996 than regions with medium or high plantation expansion.

The lack of any consistent relationship between plantation expansion and rural population at the SLA scale suggests plantations have a much smaller influence on rural population trends than other factors affecting rural population.

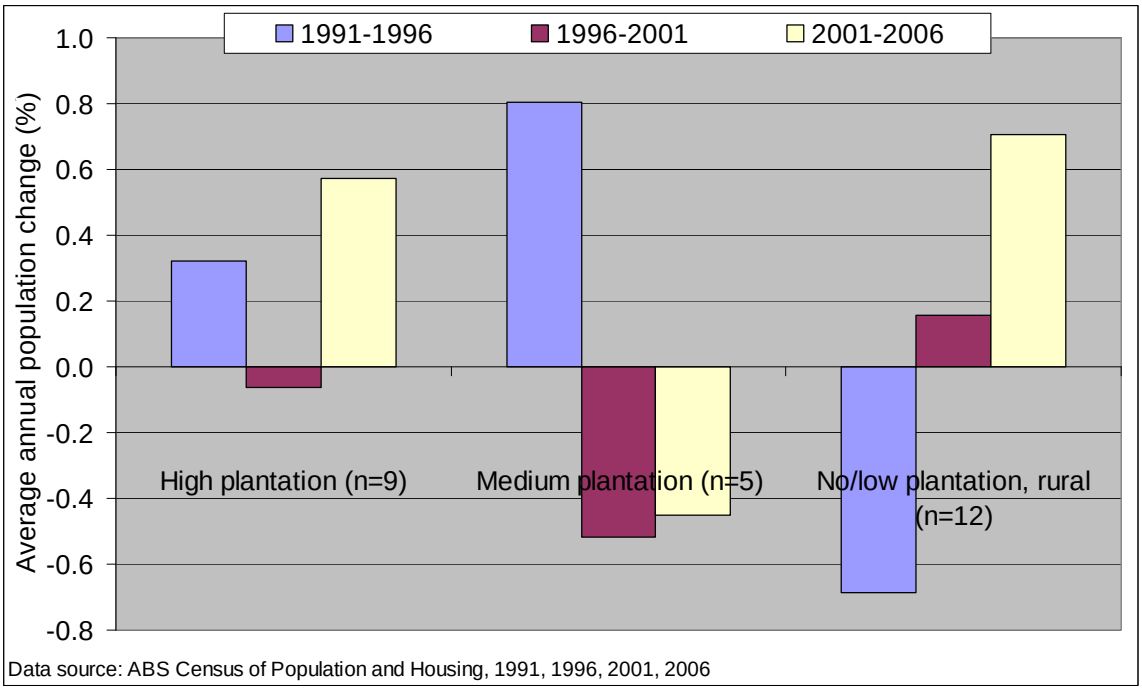


**Figure 9:** Rural population change in non-urban areas experiencing different amounts of hardwood plantation expansion, 1991–2006

When SLAs were classified according to the factors Hugo (2005) and others have identified as influencing population change—commuting distance to metropolitan areas and regional cities, and extent of 'seachange' population shifting onto rural properties—more consistent patterns can be seen (Figure 10). SLAs were classified based on whether they (a) included a large area (labelled 'city'), (b) were within commuting distance of a large urban area, (c) were predominantly rural with a low number of 'seachangers' moving onto rural properties, or (d) were rural but with reported high numbers of seachangers shifting onto properties in the region. The latter two were distinguished based on consultation with local government planners and data from group interviews held throughout Tasmania. Population growth has been consistently higher in regions that are close to cities and/or are experiencing growth in rural residential population ('seachangers'), while regions which are predominantly rural experienced rural population decline, and those near large urban areas had differing patterns over time, likely reflecting changes in definitions of which areas are considered to form part of the urban area and which are classified as rural.

These patterns suggests that factors such as distance to large urban areas and extent of rural residential immigration into an area have a greater impact on rural population levels than the rate of expansion of plantations.

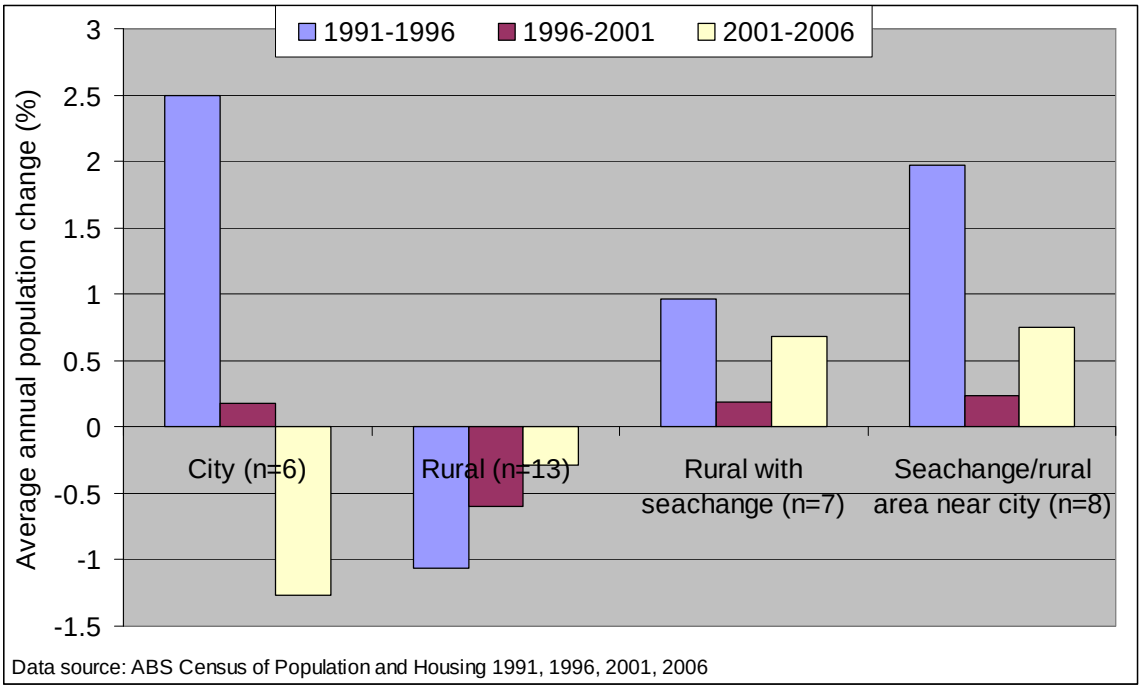


**Figure 10:** Rural population change based on proximity to cities, and extent of 'seachange'

In other studies, towns in which substantial plantation timber processing facilities have been established have been found to experience either less population decline than average for a town of their size, or greater population growth (Dwyer Leslie Pty Ltd and Powell 1995, Schirmer 2005a). This indicates that the establishment of substantial downstream processing of plantation timber may support regional population growth, which is centred on the towns where processing facilities are located. The converse is also true, that when processing facilities downsize their processing activities or close, this is likely to be associated with lower population growth, or higher than average population decline, in the town in which the facility is located.

*What does all the evidence mean?*

The information presented here suggests that expansion of plantations leads to a small net loss of rural population at the individual property level. This net loss is not necessarily greater than the loss of population already occurring as a result of trends such as amalgamation of farms and increasing farm productivity, which lead to fewer people being needed to work on farms and an associated loss of population. At larger scales, there is no consistent evidence of an association between plantation expansion and rural population decline. Conversely, plantation expansion is only associated with an increase in population in rural areas where substantial downstream processing is established.

## *How do the impacts vary?*

Plantation expansion leads to some change in population at the individual property level. The impacts of this change on those who shift away from properties they have sold or leased to plantation companies, or on others in their community, will differ depending on a range of factors. This includes things as simple as whether someone whose neighbour shifts off a property sold to a plantation company liked or disliked their neighbour—if they liked them, the change will most likely have negative impacts; if they had been involved in an ongoing dispute the change will more likely have positive impacts for both. The impacts also depend on how satisfied the landholders who shift away from a property sold to a plantation company are. Schirmer et al. (2008b) found that 73% of

landholders reported they were satisfied or very satisfied with their decision to sell their property to a plantation company, while only 10% were dissatisfied. This indicates that impacts have been largely positive for those who sold their land to a plantation company.

### *What more do we need to know?*

More work is needed to identify if these results apply in all situations. For example, in areas where subdivision of housing from plantation properties is not permitted there may be greater population loss than indicated here, as it may be more difficult to encourage new residents to shift into houses on plantation properties. It would also be useful to have more specific studies of changes to the population living in the small towns and rural areas located closest to large areas of plantations, as they may experience different trends to those shown here. Finally, more work is needed to identify if changes in the location of jobs associated with land use change to plantations lead to people shifting their place of residence—in some cases, people may simply commute to take these job opportunities, rather than shifting to live in the larger towns where plantation jobs are typically located.

## How does plantation expansion influence the type of people living in rural communities?

The previous section considered only how plantation expansion may affect the *number* of people living in rural communities. However, it is just as important to consider how it may influence *who* lives in rural communities.

### *What are the different views?*

Some participants in group interviews expressed concerns about the type of people shifting onto plantation properties, arguing that they did not always integrate well into the community or join local service and sporting groups or the volunteer fire brigade. Others described more positive experiences, describing new residents living on plantation properties or working in the plantation industry as having a positive influence and bringing benefits to their community:

> Probably the majority of people that moved into it [houses on plantation properties] would have been the on lower socioeconomic side, because it was cheap housing, and the other thing that it did allow, and that has probably only happened in the last 4 to 5 years, was mainland people coming over because they don't mind that travelling. — *Interview participant, Smithton, 2008*

What was perhaps common to these different points of view was that each person was describing plantation expansion as leading to a change in who lived in rural areas, with that change sometimes experienced positively and sometimes negatively.

### *What evidence is needed to answer this question?*

There are many ways to examine how plantation expansion influences the type of people living in rural communities. Firstly, it is important to measure the extent of population turnover associated with land use change to plantations—how often is establishment of plantations associated with a change in the people living in rural areas? Once this is known, the socio-demographic characteristics of new residents should ideally be compared with the characteristics of the people who lived in the region prior to plantation establishment. This might involve comparing their ages, professions, income, and membership of community and service groups.

It would also be useful to know whether the type of people shifting onto plantation properties differs depending on where the plantation is located, as plantation companies have reported some difficulty in finding residents to rent or purchase houses located on more remote plantation properties, while finding it easier to find tenants or purchasers for houses on plantation properties located nearer towns and cities.

### *What does the evidence tell us?*

Available information provides some understanding of the rate of turnover of population associated with plantation expansion, but very little about the socio-demographic characteristics of new residents living on plantation properties compared to previous residents.

Based on data from the previously discussed survey of landholders who had sold or leased properties to plantation companies in south-east South Australia and south-west Victoria, when a property is leased for plantation establishment there is up to a 5% turnover in population (with 10% of previous residents shifting away when the property is leased and new residents shifting onto the land in about 50% of those cases). When a property is sold to a plantation company, however, there is up to a 60% turnover in

population, with 75% of previous residents shifting away, and new residents shifting onto these properties in 80% of cases in the long term (Schirmer et al. 2008b).

Given that the majority of new plantations are currently established on land purchased by plantation companies, this means that many new people are shifting onto plantation properties. Unfortunately, no studies have identified the socio-demographic characteristics of these new people and whether and how they differ from the residents who previously lived in the same region.

### *How do the impacts vary?*

The impacts of a change in the type of people living in rural communities will depend on how well the new residents integrate into that community. If new residents are able to join local social networks, including community and sporting groups, and contribute to that community's sense of wellbeing, the change will likely be positive. If new residents remain isolated from others, both they and others residents may feel the change has been negative as they experience a lack of meaningful social networks.

### *What more do we need to know?*

A better understanding is needed of whether and how the new people shifting into housing on plantation properties, or employed in the plantation industry, differ from other residents in the rural communities they are shifting into. It would also be useful to know if different types of people shift into different types of plantation property housing—for example, do different types of people shift into plantation houses located in remote rural areas compared to houses on plantation properties located near rural towns and services; or into housing that is rented rather than subdivided and sold. Having this information would enable a better assessment of the social impacts of land use change to plantations.

## How does plantation expansion influence service provision and community groups in rural communities?

One question commonly raised about plantation expansion and population change is that of whether plantation expansion leads to a decrease in service provision and community group membership in rural areas. Groups and services such as community and sporting groups, local schools and volunteer fire brigades are often focal points which contribute greatly to people's sense of being part of a community. In recent decades, concern has been expressed about decline in membership of these types of groups in many parts of rural Australia (see for example Johnston et al. 2005).

### *What are the different views?*

Concerns have been raised that any loss or turnover of population associated with land use change to plantations may lead to a decline in membership of local community, sporting and volunteer groups, or declining enrolment in local schools. On the other side, some have argued that plantation expansion may provide a stable employment base that helps support growth in local services and community groups:

> … one of the things I see [as a consequence of plantation expansion] is the school bus operation … I know the numbers are dropping off dramatically, and of course one of the main reasons for that is the farms … now have not got anybody living on them, no children, the viability of the school and the school bus operations, is at this stage probably tenuous.—*Interview participant, Westbury, 2008*

> … [plantation expansion] decreases the number of farming families in the community. This is my perception. Yes, and that has a flow-on effect of course to the local businesses and community groups.—*Interview participant, Bothwell, 2006*

Williams (2009) found that in Tasmania just under 30% of survey respondents believed that growth in the area of plantations would lead to a decrease in involvement in local community groups, while around 10% believed there would be an increase in involvement, and the remainder felt there would be either little or no change, or weren't sure how plantation expansion would affect membership of community groups.

### *What evidence is needed to answer this question?*

Identifying the impacts of plantation expansion on local community groups and service provision requires comparing the rate of change in membership of community groups and provision of services in regions experiencing change in the plantation industry (either growth in area of plantations, or in activities associated with plantations such as harvesting and haulage and processing) with similar regions not experiencing change in the plantation industry. This enables identification of whether expansion of the plantation industry leads to different types of change in community groups and service provision compared to other changes affecting rural communities.

The types of community groups and services most commonly discussed in group interviews were:

- volunteer fire-fighting brigades
- local schools
- volunteer groups such as the Country Women's Association
- service groups such as the Lions Club, Rotary and Apex
- sporting groups of all types, but particularly football clubs.

Analysing the impacts of plantations on these groups and services requires data on the level of membership in these groups over time in individual towns or LGAs (or, in the case of schools, school enrolment data). This type of 'small area data' is needed as it is necessary to be able to compare membership/enrolment in areas with and without plantations. It is also necessary to ensure data is 'controlled' for other factors likely to influence changes in group membership or school enrolment. For example, enrolment in small schools in rural areas with relatively small populations in many cases has declined faster than enrolment in large rural towns or regional cities in recent decades, and the analysis needs to take this into account.

Another way to approach this question is to directly survey residents living on plantation properties before and after a land use change to plantations occurs, to compare levels of community group membership and use of services prior to and after plantation establishment. This approach is useful for exploring whether establishment of new plantation estate leads to a change in community group membership and use of local services, but doesn't take into account changes in employment and how these may also influence membership and utilisation of community groups and services.

### *What does the evidence tell us?*

Accurate data on membership of most community groups over time is not generally available for most rural areas. Sporting groups, service groups and rural fire brigades were contacted in Tasmania, and it was not possible to obtain the type of detailed data on membership over time needed to analyse the impacts of plantations for any of these groups.

It was, however, possible to obtain accurate data on school enrolment over time for each individual school in Tasmania, and to compare the rate of change in school enrolment in regions experiencing no/negligible, low, medium or high plantation expansion (Figure 11). When school enrolment change was analysed solely on the rate of plantation expansion, no clear pattern was observed. As can be seen in Figure 11, regions experiencing high rates of hardwood plantation expansion in recent years experienced greater decline in school enrolments than the cities of Hobart and Launceston and areas experiencing a medium rate of plantation expansion, but enrolments in rural areas with little or no plantation expansion fell at a much higher rate than those in which rapid plantation expansion was occurring. This suggests that other factors have a greater influence on school enrolments than the rate of plantation expansion in the region.

To test this, school enrolment trends were compared in areas with different population sizes, as it has been hypothesised in recent years that school enrolment is falling fastest in rural areas with small populations. As can be seen in Figure 12, population size is a much

better predictor of school enrolment change than the rate of plantation expansion. Areas with a smaller population experienced much more rapid decline in school enrolments than those with larger populations. As plantations have been established in regions of varying population size, from small to large, this may explain the lack of any consistent relationship between rate of plantation expansion and school enrolment.

To further explore whether school enrolment is different in regions experiencing more or less plantation expansion, regions were analysed based on both their total population and their rate of plantation expansion (Figure 13). This proved difficult as plantation expansion has taken place in a large proportion of all Tasmanian LGAs with a population of between 5000 and 20 000 people. To ensure more than one LGA was included in the analysis, large population ranges had to be examined. No consistent pattern was identified in which school enrolment change was noticeably or consistently related to the rate of plantation expansion, as can be seen in Figure 13.

When individual areas experiencing high rates of hardwood plantation expansion were examined, quite variable patterns were observed in terms of change in school enrolment (Figure 14). There is no consistent observable pattern in all these areas, again suggesting that the rate of plantation expansion has a smaller influence on school enrolment levels than other factors.

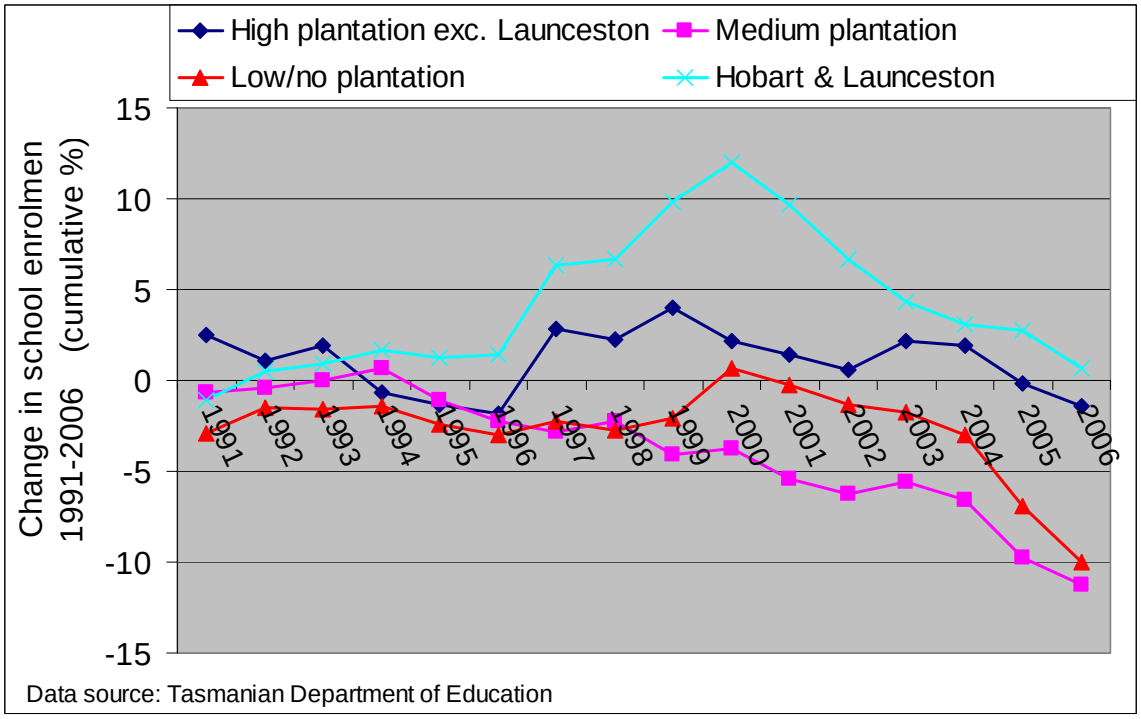


**Figure 11:** Cumulative rate of change in school enrolments, 1991–2006, in regions experiencing differing levels of plantation expansion

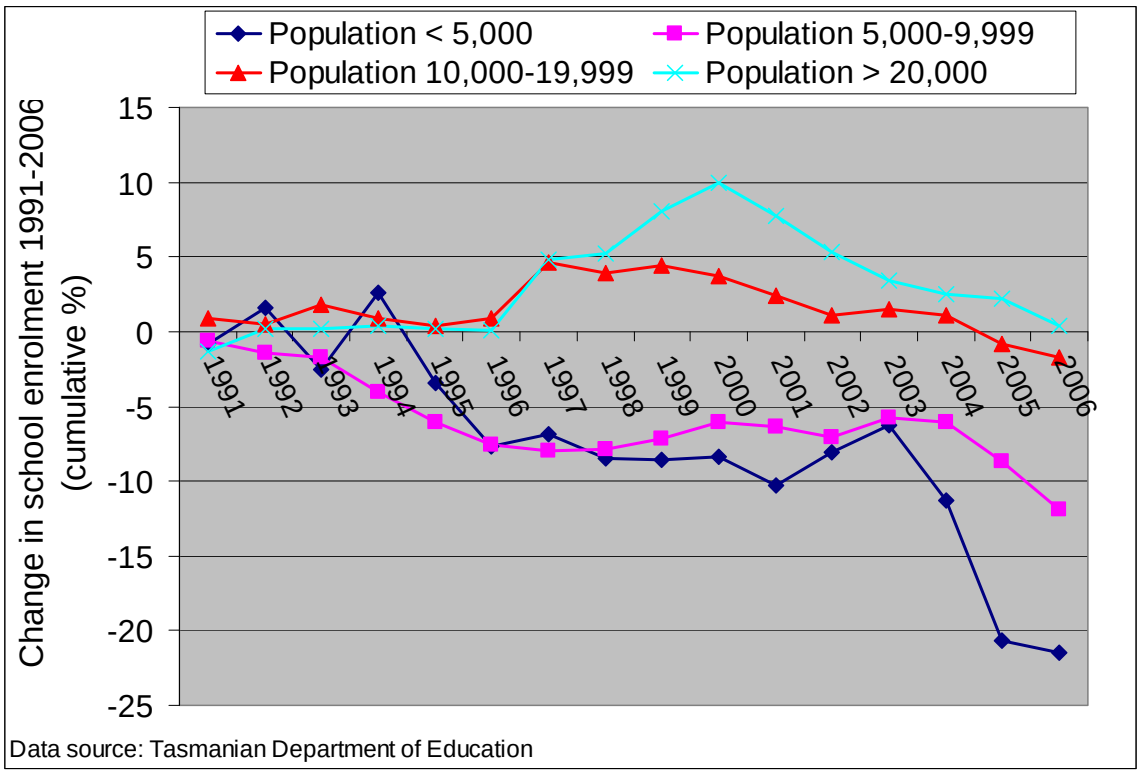


**Figure 12:** Change in school enrolments in Tasmanian LGAs with different total population, 1991–2006

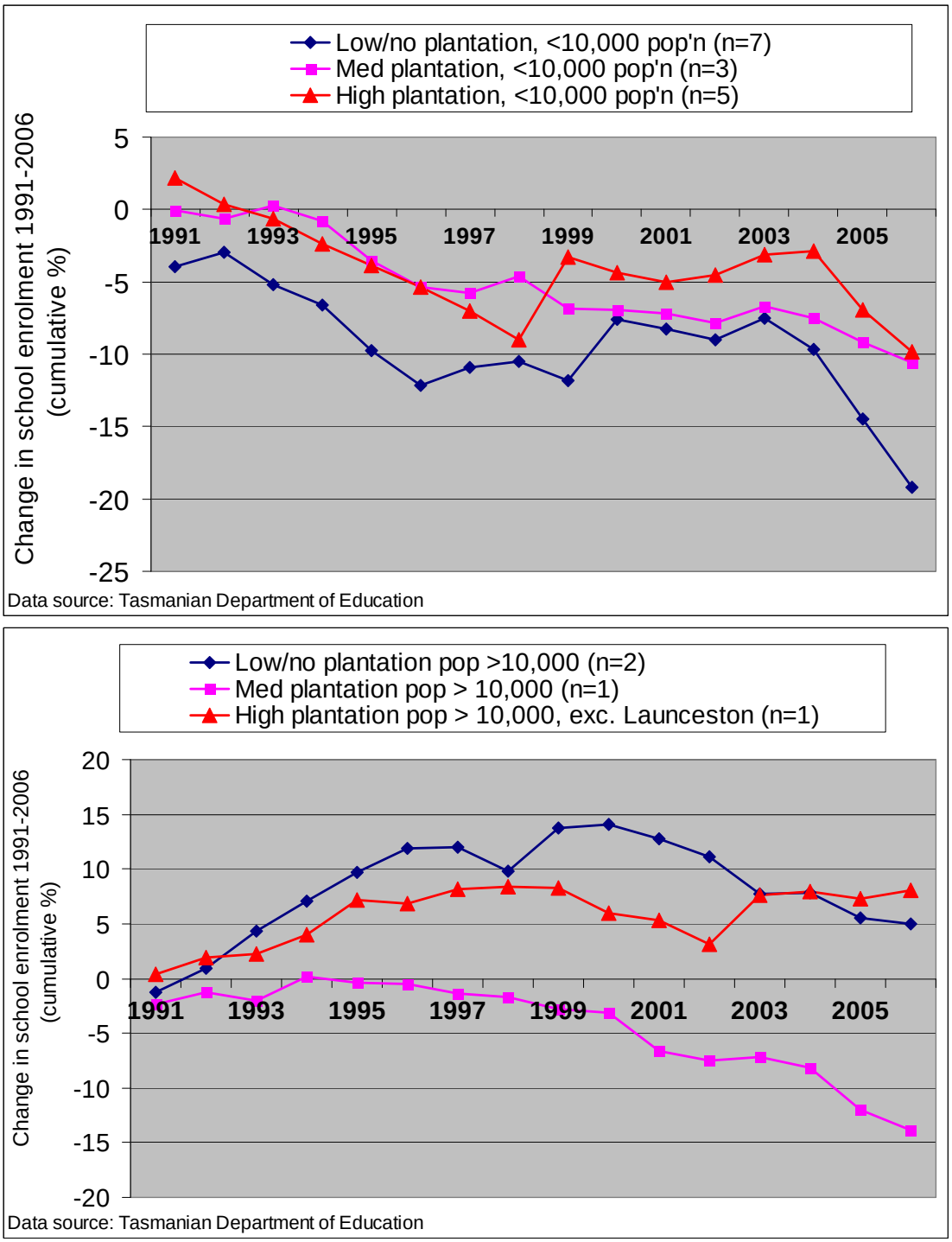


**Figure 13:** Change in school enrolments in LGAs experiencing differing levels of plantation expansion and with total population above or below 10 000 people

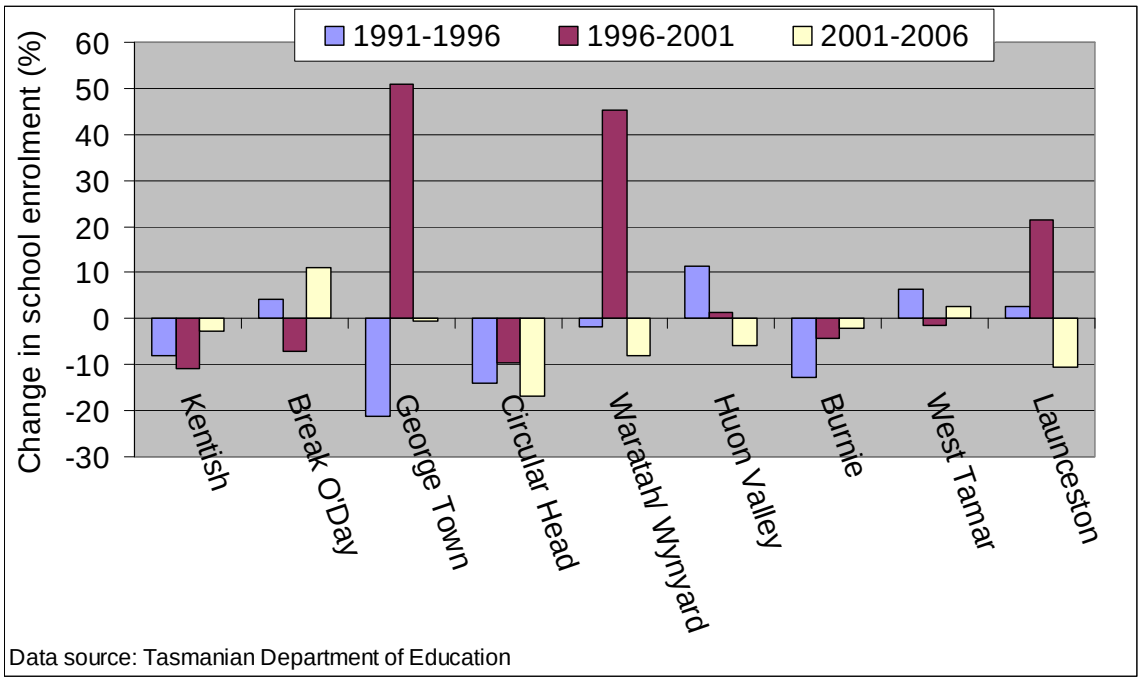


**Figure 14:** Change in school enrolment in Tasmanian LGAs experiencing high rates of plantation expansion, 1991–2006

These results suggest there is little observable relationship between plantation expansion and decline in school enrolments in Tasmania, with other factors having a greater influence on school enrolment levels than the rate of plantation expansion. This means that while plantation expansion may lead to some changes in school enrolment, these changes are smaller than those resulting from other ongoing trends such as ageing of the rural population and falling numbers of school-aged children in some areas.

Other than school enrolment data, the only other recent information comes from the survey of landholders who had changed land use to plantations undertaken by Schirmer et al. (2008b) in south-west Victoria and south-east South Australia. In that study, landholders who lived on rural properties prior to plantation establishment were asked if the land use change to plantations affected their membership of rural fire-fighting groups, service groups, sporting groups or other community groups.

Landholders who sold a property to a plantation company reported that they commonly changed their membership of these groups:

- While 40% of those who were members of volunteer fire brigades reported no change in membership, 30% changed the location of their membership, and 30% ceased membership as a result of selling their property to a plantation company.
- 68% of those who were members of service groups such as Rotary reported no change to their membership, while 32% ceased their membership when they sold their property to a plantation company.
- 45% of those who were members of sporting groups before the land use change to plantation reported no change in membership, while 33% changed the location of their membership and 22% ceased membership when they sold their property to a plantation company.

When a property was leased to a plantation company, few landholders reported any changes to membership of sporting and community groups, with generally less than 10% reporting any type of change. Most of those that did report a change had changed the location of their membership rather than ceased membership of a group.

This study was not able to identify the extent to which new residents shifting onto plantation properties joined local community groups, and so provides only a partial understanding of impacts.

### *How do the impacts vary?*

Expansion of plantations does appear to lead to some change in membership of local services and groups, primarily when properties are sold to plantation companies. How these changes impact rural communities will depend at least in part on whether new residents who shift into housing on plantation properties join community and sporting groups, something which is currently unknown. Anecdotally, group interview participants reported some cases where new residents did not join local sporting and community groups, and some where they did. Whether or not new residents join local groups, the establishment of plantations does appear to be associated with a period of change in which previous members leave or change the location of their membership which may be disruptive and difficult for local groups. Similar disruptions may result from rapid turnover of farming land or farm amalgamation not involving plantations.

### *What more do we need to know?*

More needs to be understood about how rural community groups and services are changing irrespective of plantation expansion, in order to identify if the changes that plantation expansion leads to are different to those caused by ongoing changes such as farm amalgamation in many rural communities. More data is also needed on the extent to which new residents who shift into housing on plantation properties join local groups and access local services.

## How does plantation expansion affect rural land prices?

A majority of new plantations established in recent years in Tasmania have been established on privately owned land purchased by plantation companies. The presence of plantation companies in the land market has led some to ask: what effect does this have on rural land prices?

### *What are the different views?*

A common view expressed in previous studies and in the group interviews undertaken for this project is that high demand for land from plantation companies may lead to higher than average growth in rural land prices.

Some people also discuss a potential 'domino' effect, arguing that land prices rise more than average in regions adjacent to plantation regions as landowners who have sold land at high prices to plantation companies then seek to purchase land in nearby regions where plantations are not being established (Schirmer 2005a).

Another perception less commonly expressed is that plantation establishment may affect land prices of neighbouring farming properties, with farmers more reluctant to purchase properties bordered by plantations:

> … yes well the dairy industry was in a slump, beef farming was not much better, and land prices had been fairly static for a long time, and so when they were given the opportunity of being offered anywhere from $1000 per acre to $1500 per acre [by plantation companies] it was like from heaven for them, and so they fell over themselves [to sell properties to the plantation industry] … Then it got to the stage where, one would sell and a couple more and suddenly the other guys would think we are going to miss out here or we are going to be blocked in by trees and our land will be worthless, so that created additional momentum. At the time it was the right decision for them to do it, it was good money for what they are used to …—*Interview participant, Smithton, 2008*

Other group interview participants pointed to other trends leading to growth in land prices in recent years:

> They [the plantation industry] put a floor in the market in the late 1990s, early 2000, that's about when it really sort of … took off [in the Cradle Coast region], became greater than it had been for some time … the actual real estate price now is being driven by Melbourne and Sydney house markets as much as anything else but the price of, you know when there is an upturn in the economy the dairy prices, beef prices, that has an impact on … the value of the land and we see the majority of land … sold of late has been to dairy farmers, neighbours—*Interview participant, Wynyard, 2006*

### *What evidence is needed to answer this question?*

To identify the impact of plantation expansion on rural land prices, we need to know if land prices rise at a higher than average rate in regions where there is high demand for land from plantation companies. Ideally, land prices in plantation expansion regions should be compared to land price change for land of similar productivity but on which plantations are not being established. This can be difficult, however, as plantations are being established in many if not most of the regions where there is suitable land.

If establishment of plantations leads to land price change, this would be indicated by:

- land prices rising more than average during periods when plantations were established (assuming demand from plantation companies does drive land prices up)
- land prices rising more than average in regions near plantation regions, during periods when plantations are established and just after (if the 'domino' theory is correct)
- land prices for properties adjacent to plantation properties being lower than that for similar agricultural properties not adjacent to plantation properties.

### *What does the evidence tell us?*

Examining land price trends in different regions of Tasmania suggests that regions experiencing high rates of hardwood plantation expansion have experienced a higher rate of land price growth than other regions through most of the last decade (the period when many properties were purchased for hardwood plantation establishment), although in the last three to four years land prices in other regions have grown rapidly to 'catch up' to the rate of increase in regions experiencing rapid plantation expansion.

The average price per hectares paid for rural properties larger than 30 hectares was examined for different LGAs in Tasmania[18]. Land price changes in LGAs with high, medium and low/no levels of plantation expansion were compared. The analysis focused on the period from 1988 onwards, during which the majority of Tasmania's current hardwood plantation estate was established.

Using 1988 as a base year, the rate of land price increase from 1988 to 2007 is shown in Figure 15 for regions with high, medium, low and no/negligible areas of hardwood plantations, while Figure 16 shows the median land price paid by year in each type of region. This analysis is based on analysing median land prices in each year; a similar pattern is seen when the mean land price is examined.

Regions in which medium and high plantation expansion have occurred typically have higher median land prices than other regions (Figure 16). This has been the case since the late 1980s, prior to rapid expansion of hardwood plantations, and as such likely relates more to land productivity than any influence of plantation expansion. When rates of land price growth are compared (Figure 15), it can be seen that although land prices per hectare have differed substantially across the different regions, the rate of land price growth has been relatively similar with the exception of the period 1999 to 2005, during which regions experiencing high rates of plantation expansion experienced higher rates of land price growth than other regions. The influence of prices paid for land purchased by plantation companies is likely to have contributed to this trend.

[18] Land sales over 30 hectares in size were examined as the large majority of plantations are established on land parcels of 40 hectares or larger, whereas land parcels smaller than this are often sold for rural residential purposes—a land use which has experienced very rapid land price rises in recent years. Irrigated and horticultural land were also excluded, as plantations are predominantly established on dryland areas, and prices for irrigated and horticultural land have typically been higher, and have followed different trends, to dryland prices over time.

During 2002 to 2007, it was possible to estimate the proportion of all land sales in Tasmania involving the plantation sector[19]. Over this period, sales of land to plantation companies made up anywhere from 6% to 36% of total sales of non-irrigated, non-horticultural land in Tasmania, and averaged 20.1% of land sales over the entire period.

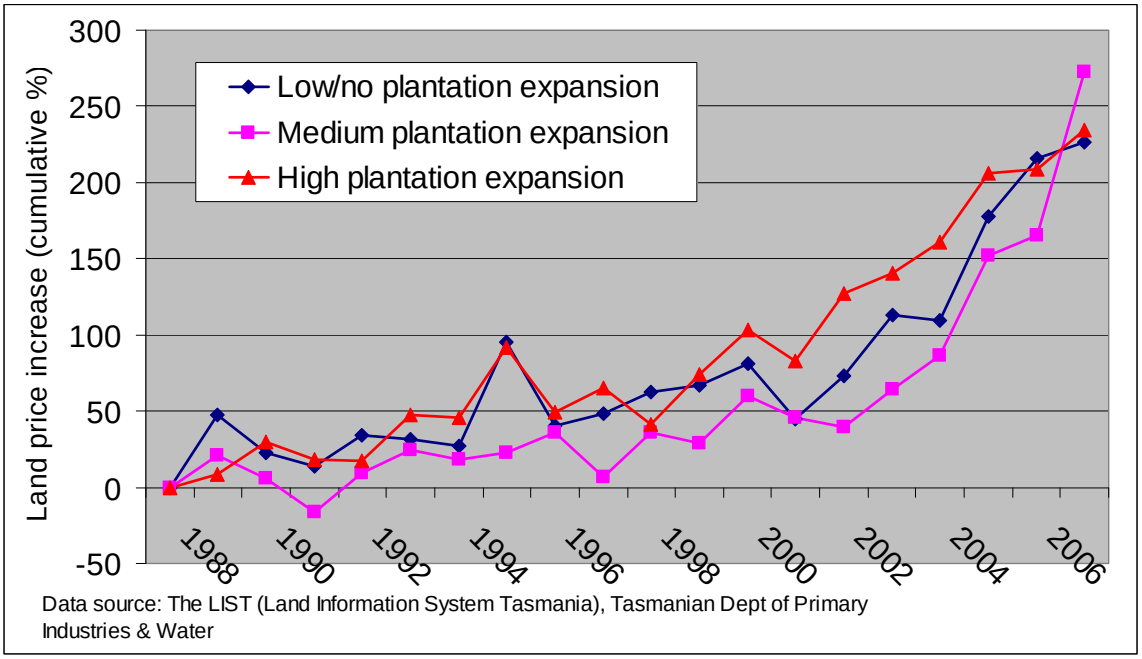


**Figure 15:** Rate of land price increase in Tasmanian regions experiencing differing levels of plantation expansion, 1988–2007

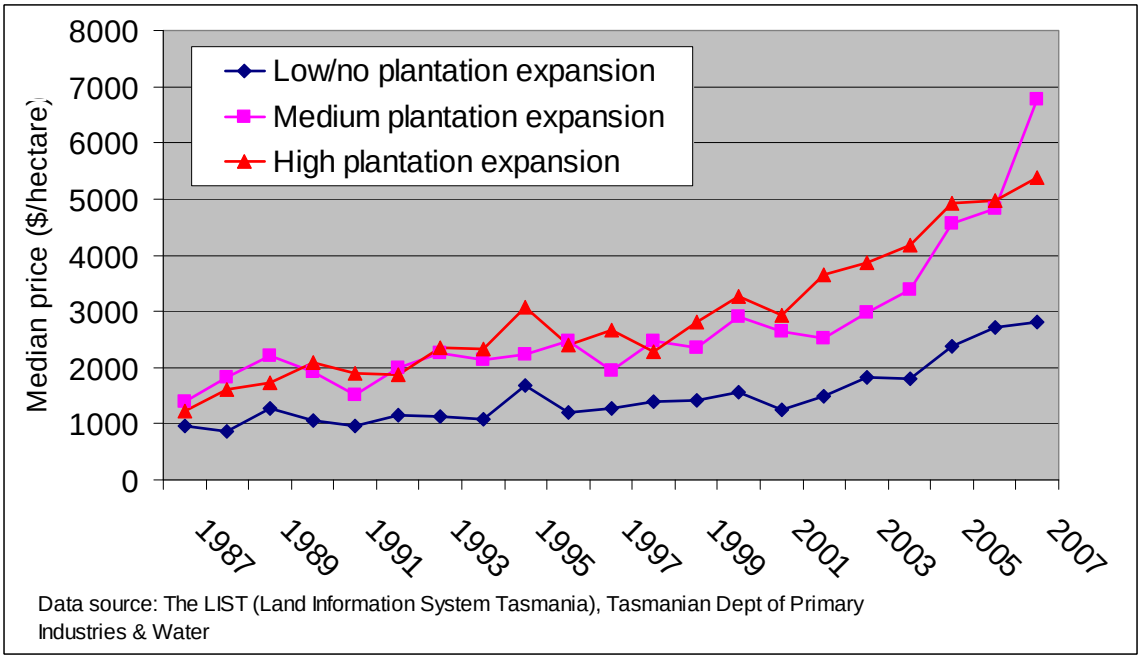


**Figure 16:** Median price paid per hectare in Tasmanian regions experiencing differing levels of plantation expansion, 1987–2007

[19] This analysis is based on data from the Bureau of Rural Sciences National Plantation Inventory annual updates, and data on total land sales sourced from the LIST (Land Information System Tasmania).

This analysis is limited in that it compares average prices for all rural land sales >30 hectares in the regions examined, rather than specifically comparing prices paid for land sold to plantation companies versus land not sold to plantation companies. It therefore provides an understanding of whether plantation expansion affected overall price trends in these regions, but does not indicate whether higher prices are paid when a property is sold to a plantation company versus when it is sold to other buyers.

It was not possible to identify and compare the prices paid for individual properties in Tasmania by plantation companies versus other land purchasers. Therefore the only data on this issue comes from other regions. Schirmer (2005a) examined prices paid for individual properties in the Western Australian LGAs of Albany, Cranbrook and Plantagenet over 1994 to 2004, comparing the price paid for land sold to plantation companies to the price paid in other land sales. This analysis identified that plantation companies typically paid anywhere from 20% to 65% more per hectare than other land purchasers during this period, which included some years of rapid plantation expansion in which up to 60% of property transactions in these LGAs involved sale of land to a plantation company.

However, the higher prices recorded were only paid for properties suitable for plantation establishment. Not all land in any given region is suitable for plantations, with factors such as soils, distance to port and rainfall influencing suitability. The extent to which the high prices paid for land suited to plantations leads to price growth on other types of land in the same region is not known. It is not possible to identify how applicable these results would be to Tasmania, where land price trends have differed somewhat to Western Australia, but does suggest that in at least some circumstances plantation companies pay higher than average prices for land suited to plantation establishment.

### *How do the impacts vary?*

A change in land prices, such as the increase in land prices identified here, will have different impacts depending on the current interests and needs of landholders in the region. A land price increase is likely to have positive impacts for landholders wishing to sell land in a plantation region; it may, however, make it more difficult for landholders who wish to purchase land for purposes such as expanding their farm enterprise, as they have to pay higher prices for land and the cost of the finance required may prevent some from being able to purchase properties in plantation regions.

### *What more do we need to know?*

Further work is needed to identify if properties bordering a plantation, which are sold to a buyer other than a plantation company, attract a different average price per hectare compared to properties not bordering plantations. The extent to which the premium paid for land suitable for plantations leads to an increase in prices of nearby land not suitable for plantation establishment also needs further exploration. Finally, further analysis is needed to identify whether a premium is always paid for plantation properties or, if in years of lower demand by the plantation industry, the price paid for land is closer to the market average.

## How does plantation expansion affect traditional agricultural industries?

New plantations are established on cleared land previously used for traditional agriculture. This raises the question of what impact plantation expansion has on the agricultural industries that previously utilised the land on which plantations have been established.

### *What are the different views?*

A wide range of views are expressed on this subject. Some people feel the area of plantations is too small a percentage of total agricultural land to have an impact on production of traditional agricultural commodities. Others argue that in some local regions plantation establishment may lead to a fall in production of some commodities, and this may have flow-on effects for viability of industries dependent on these commodities:

> I think putting plantations on agricultural land is, good agricultural land, is an absolute shame and we need to fight that with everything we have got I reckon. But not only for reasons of keeping our diversity of agriculture but keeping the diversity of lifestyle because it's diversity of agriculture that generates a lot of supporting industries that put people into different employment.—*Interview participant, Hobart, 2006*

> It's just I suppose really just a changing trend in agriculture that has seen not only a lot of our traditional agricultural land now being used for what might be regarded as less traditional farming practices, new types of crops and vines and olives and essential oils, but also into that equation the amount of farmland being used for forestry. I guess the concern that might go with it [is] that we are taking very good land for plantations.—*Interview participant, Launceston, 2006*

### *What evidence is needed to answer this question?*

Identifying the impacts of plantation expansion on agricultural production requires firstly specifying the scale at which the question should be answered. Is the question whether plantation establishment is affecting production of agricultural commodities at the national or state scale, or at a more localised scale? Once the issue of scale is resolved, answering this question requires data on:

- the products produced on the land prior to plantation establishment—what types of agricultural production are potentially displaced by establishment of plantations?
- what proportion of local, state or national production this displacement represents
- the other trends affecting production of that commodity—for example, across Australia sheep flocks have fallen substantially since 1991. While plantations have been established on some of the land which used to be used for sheep farming, there has also been a shift from sheep grazing to cropping, and beef grazing in many areas of Australia
- the downstream processing dependent on that commodity, and the 'threshold' changes at which viability of processing in a local area may be threatened. This is important in order to identify whether any changes in commodity production resulting from plantation expansion lead to flow-on impacts down the processing chain.

### *What does the evidence tell us?*

There is currently very little exploration of this question beyond speculation. Some work has examined the proportion of Australia's agricultural land on which plantations have been established. This type of data, however, is often of limited use as in regions such as Tasmania plantations are often established on high rainfall land which is more productive for some particular types of agriculture than lower rainfall areas. Ideally, data is needed that examines the proportion of different types of land established to plantation, based on land productivity classes.

In Tasmania, this type of work has been done. Private Forests Tasmania (2007) analysed the proportion of agricultural land on which privately owned plantations had been established, by land productivity class. They found that, statewide, by the end of 2006 plantations had been established on:

- 4.9% of the State's most productive land (classes 1 to 3), with a total of 5290 hectares or 3.6% of Tasmania's private plantations established on this type of land
- 5.9% of Class 4 land, which is less productive than classes 1–3, with a total of 35 095 hectares, or 23.3% of Tasmania's private plantations established on this type of land
- The remaining 73.1% of private plantations were established on land classed as lower productivity than classes 1–4.

This indicates that plantations currently make up a fairly small proportion of the area of high productivity land in Tasmania.

To explore this further, changes in agricultural production over 1991 to 2006 were examined in medium and high plantation expansion regions in Tasmania, and compared to low/no plantation expansion regions to see if there is a noticeable difference in trends in these plantation regions compared to other areas.

Firstly, the land uses occurring prior to plantation establishment were identified. Schirmer et al. (2008b) found that in south-east South Australia and south-west Victoria, where a large area of hardwood plantations has been established, land was predominantly used for sheep or beef grazing before plantation establishment, with some land used for grain and oilseed growing. Less commonly, land was used for dairy farming or viticulture, but this made up a very small percentage of the land established to plantation.

Group interview participants in Tasmania similarly reported that much of the land established to plantations had previously been used for sheep or beef grazing, but also discussed dairy farms, and sometimes land that had been used for horticulture, being established to plantation.

Therefore the rate of change in sheep and lamb numbers, beef cattle numbers, area cropped, grapes, fruit and vegetables grown was examined, and change in the extent of each land use compared over time for areas experiencing differing levels of plantation expansion (Figure 17).

Over 1991 to 2006, LGAs experiencing high rates of plantation expansion experienced a higher than average decline in numbers of sheep and lambs and beef cattle compared to regions with low/no or medium plantation expansion. No consistent differences could be

identified for change in dairy cow numbers, or area of fruit, vegetable or grapes, although the area of vegetable growing did decline more than average in high plantation areas (while increasing in medium plantation expansion areas), suggesting a possible—but not consistent—relationship, and the area of grapes grew more slowly in high plantation areas, but from a larger original base, meaning the percentage change is not necessarily reflective of total area established (as can be seen in Table 7). The latter sometimes grew more slowly in regions experiencing medium or high plantation expansion, but often from a larger existing base, meaning that the rate of percentage change would be expected to be lower.

This suggests that plantation expansion may be associated with greater than average decline in sheep and lamb numbers and beef cattle farming, but does not appear to have affected expansion of horticulture, dairy or viticulture.

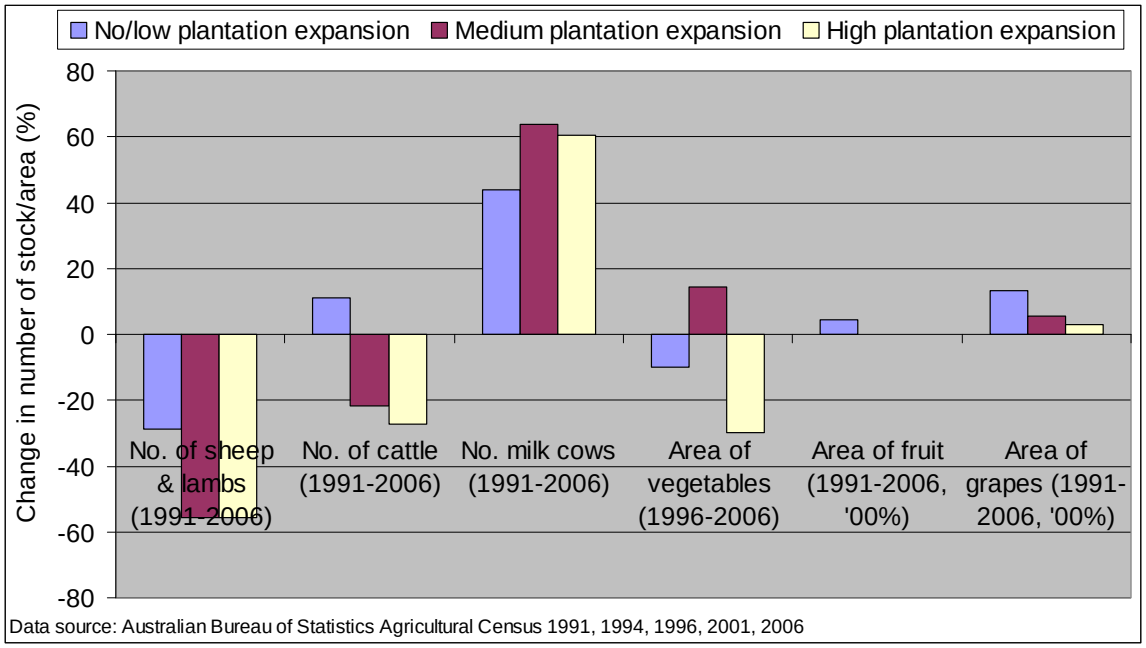


**Figure 17:** Change in agricultural production in high, medium and low/no plantation areas

**Table 7:** Total change in stock/area, and total stock/area in 2006, for different agricultural commodities

| | Low/no plantation expansion | Medium plantation expansion | High plantation expansion |
|---|---|---|---|
| | *First number shows change over indicated period; bracketed number indicates total stock/area as at 2006* | | |
| **Change in number of sheep & lambs, 1991–2006** | –934 000 sheep (2 295 000 in 2006) | –407 100 sheep (324 800 in 2006) | –223 000 sheep (178 900 in 2006) |
| **Change in number of cattle, 1991–2006** | +21 900 cattle (216 600 in 2006) | –33 300 cattle (118 500 in 2006) | –50 400 cattle (133 300 in 2006) |
| **Change in number of milk cows, 1991–2006** | +3870 dairy cows (12 700 in 2006) | +19 400 dairy cows (49 900 in 2006) | +28 450 dairy cows (75 500 in 2006) |
| **Change in area of vegetables, 1996–2006 (ha)** | –620ha (5680 ha in 2006) | +617ha (4890 ha in 2006) | –970ha (2280 ha in 2006) |
| **Change in area of fruit, 1991–2006 (ha)** | +394 ha (480 ha in 2006) | +7 ha (350 ha in 2006) | –148 ha (1600 ha in 2006) |
| **Change in area of grapes, 1991–2006 (ha)** | +239ha (260 ha in 2006) | +44ha (50 ha in 2006) | +251 ha (340 ha in 2006) |
| **Change in area cropped, 1991–2006 (ha)** | +3570 ha (17 450 ha in 2006) | –377 ha (2570 ha in 2006) | –660 ha (900 ha in 2006) |

Overall, these results suggest that plantations are predominantly established on land used for sheep and beef grazing, and that where a high area of plantations is established production of sheep, lambs and cattle may fall in the local region. The flow-on effects of this require further examination.

### *How do the impacts vary?*

The expansion of plantations can lead to a change in production of agricultural produce from the land, as that production is replaced by timber and fibre production from the plantation. What are the impacts of this change in agricultural production? As usual, this depends on a range of factors. Firstly, it depends on whether the drop in agricultural production in a plantation region is matched by an increase elsewhere, as farmers who sold a property shift to farm elsewhere. If this is the case, the impact may be a change in where employment opportunities relating to that agricultural industry are located. If there is a net reduction in agricultural production, the impacts will depend on whether the reduction is high enough to affect employment at downstream processing facilities or in industries supplying services such as shearing or veterinary services. If the change is large enough to impact these, there is likely to be a negative impact for those whose business is reduced, while conversely those who are able to take advantage of new business opportunities provided by the plantation industry are likely to benefit.

### *What more do we need to know?*

Further work is needed to examine at what point establishment of plantations may reduce local agricultural production to an extent that downstream processing facilities are affected. More analysis of the trends affecting agricultural production in general is also needed, so that we can better understand to what extent plantation establishment versus other influences affect agricultural production.

## Do different types of plantations have different socioeconomic impacts?

A number of types of plantations are currently being established in Australia. Several different species are established, and the end-products also vary, with hardwood plantations most often producing woodchips for paper production (although some are grown to produce other products), while softwood plantations are processed into products such as sawn timber, composite wood products, and others. A question sometimes asked is whether these different types of plantations have different socioeconomic impacts.

### *What are the different views?*

There are a range of views on this issue. When comparing the acceptability of different land uses as part of a survey of residents of Western Australia and Tasmania, Williams (2009) found that eucalypt plantations established for pulp and paper production were on average ranked as less acceptable than pine plantations, while pine plantations in turn were ranked less acceptable than eucalypt plantations established for timber production. This suggests a strong perception that these different types of plantations may have different impacts.

### *What evidence is needed to answer this question?*

Answering this question requires comparing the likely impacts of different types of plantations on the range of socioeconomic issues discussed in this report. This can help identify where they are likely to have different impacts, and why.

### *What does the evidence tell us?*

Table 8 compares the impacts of the two types of plantations studies have focused on—eucalypt plantations established for pulp and paper production, and pine plantations which are utilised for sawn timber and a range of related products, as well as pulp and paper production. As no work has examined the impacts of eucalypt plantations grown for timber, they are not included in Table 8.

### *What more do we need to know?*

More work is needed which explicitly compares the socioeconomic impacts of different types of plantations, to identify whether and when they differ.

**Table 8:** Comparison of socioeconomic changes associated with hardwood and softwood plantations

| | Changes associated with hardwood versus softwood plantations |
|---|---|
| **Quantity of employment** | Softwood plantations currently generate more employment per 100 hectares than hardwood plantations, largely due to differences in the amount and type of downstream processing associated with each type of plantation. |
| **Types of jobs** | Both types of plantations generate similar levels of full-time, part-time and casual employment. |
| **Location of jobs** | Both types of plantation generate more jobs in regional centres and large towns than in rural areas, with the majority of jobs often clustered near processing facilities. |
| **Local and regional rural economic activity** | Not enough data is currently available to adequately compare the impacts of the two types of plantations. |
| **Rural population levels** | Expansion of either type of plantation is likely to lead to similar changes in rural population. The way in which plantations are established will, however, make a difference, with sale of land to a plantation company associated with greater loss of population than lease of land or farmers establishing their own farm forestry. |
| **Type of people living in rural communities** | Not enough data is currently available to adequately compare the impacts of the two types of plantations. |
| **Service provision and community groups** | Not enough data is currently available to adequately compare the impacts of the two types of plantations. |
| **Rural land prices** | Not enough data is currently available to adequately compare the impacts of the two types of plantations, as most plantation expansion in the last two decades has been of hardwood plantations. |
| **Traditional agricultural industries** | The two types of plantations are likely to have similar impacts. |

## Conclusions

Plantation industry expansion is associated with changes to employment, rural population, community groups and land prices. How these changes impact on people living in rural and regional communities where plantations are expanding will differ depending on individual circumstances. For example:

- If employment opportunities shift from small rural towns to larger regional centres as a result of the land use change, this may have negative impacts for some people living in the small towns and positive impacts for some people living in the regional centres.
- If land prices rise due to demand from plantation companies, this will most likely have positive impacts for those who wish to sell land, but may reduce opportunities for other farmers in the area to expand their farm enterprise through purchasing additional properties.
- If sale of properties to plantation companies results in an influx of new residents and loss of previous residents, the impact will depend on how well new residents integrate into the community compared to the previous residents.

While the information presented in this report cannot answer all questions raised about socioeconomic impacts of plantations, it suggests these impacts differ in different situations. There is therefore opportunity to consider how to maximise the positive changes associated with plantation expansion, and minimise negative impacts, through developing strategies that can assist people to adapt to the changes associated with plantation expansion. This may involve strategies that help rural businesses identify new business opportunities they can take advantage of; strategies to assist new residents to build a place in the rural communities they have shifted into; or assisting local residents to develop skills that enable them to seek employment in the plantation industry. Training programs that help develop skills in plantation industry work have already been put in place for several years in some plantation regions in Tasmania.

A key issue to consider when developing strategies to minimise the negative and maximise the positive impacts of plantations is whether the types of change associated with plantations are also likely to occur as a result of other changes, such as ongoing loss of rural population that is happening in many rural areas, or 'seachangers' shifting into rural communities, another common trend in Tasmania. Where plantations are only one of the factors contributing to a particular socioeconomic change, an integrated approach is needed to assist communities to adapt to that change, which focuses not only on the impacts of plantations, but also on the broader changes that are leading to things such as shifting employment opportunities, changes in who lives in rural communities, and changing levels of participation in local community groups.

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## Appendix 1: Group interview methods

### *Initial group interviews—identifying the issues*

During 2006 group interviews were conducted with a wide range of residents and stakeholders in eight locations in Tasmania. The interviews were conducted to explore the variety of views people have about the different types of commercial forestry occurring in their regions. The information collected contributed to this report, as well as to other work undertaken by the Communities project of the CRC for Forestry. For this report, the group interviews were utilised to identify the views people have about the socioeconomic impacts of different types of plantations, and then to use this as the basis for identifying what types of plantations and socioeconomic change to analyse.

Eight formal group interviews were conducted. Sites of interviews were determined by researchers in consultation with individual advisory group members, and chosen to represent a wide range of geographical location, agro-ecological zones and forestry types. Locations were Launceston, Scottsdale, Wynyard, Campbelltown, Bothwell, Hobart, Huonville, and Nubeena.

Potential participants were identified through community and professional organisations. Around forty groups were contacted, with participation by one or more members of their group invited. In each area we selected organisations with a range of interests, for example, agriculture, forestry, community development, local government, tourism, commerce, Indigenous interests, rural fire brigade and conservation interest groups. Groups were provided with information about the project and the interview. Follow-up phone calls were made to encourage and confirm participation.

A total of 42 people participated in group interviews in Tasmania. Group sizes ranged from two to nine. While each group necessarily included a limited range of perspectives, overall participants came from a wide range of backgrounds, as can be seen in Table A1.

**Table A1:** Types of participants in group interviews

| Location | Number of participants | Primary affiliations |
|---|---|---|
| Hobart | 4 | forestry-farming, forest industry, local government, parks/wildlife interest |
| Huonville | 3 | community development, special timber, farming |
| Campbelltown | 2 | farming, farming-forestry |
| Bothwell | 5 | farming, revegetation, farming-forestry, forest industry, farming |
| Nubeena | 7 | real estate, local government, agricultural contractor, farming, community development, education |
| Scottsdale | 8 | farming-forestry, commerce, fire brigade, local government, farming, health professional, animal professional |
| Launceston | 8 | commerce, conservation, ecotourism, farming-forestry, private forestry, local government, community development |
| Wynyard | 5 | community development, local government, farming, farming-forestry |

Interviews took approximately two hours. Participants were invited to discuss:

- changes they had observed occurring in their region over time, focusing on land use change
- the different types of forestry occurring in their local area
- the impacts they believed resulted from different types of forestry, including positive, negative and neutral impacts
- their hopes for future management of the region
- what they value about living in the region.

Participants were encouraged to discuss and debate issues, to ensure the full diversity of views about land use change and forestry were identified.

Interviews were fully transcribed for analysis, and identifying information removed. Transcripts were read for different types of analysis by at least two and often three researchers. Recurring ideas or themes were noted. Researchers discussed and refined these themes for further analysis.

### *Second round of group interviews—interpreting the data*

In 2008, a further eight group interviews were undertaken in Tasmania, in which participants were asked to review and discuss the early analysis of data which was subsequently re-analysed to produce this report. The goal of these interviews was to ask local residents with in-depth knowledge of their region to assist in interpreting data for their local area, including identifying potential errors in statistical data, and discussing potential explanations and relationships in the statistical data presented. This provided a range of theories on the potential links (or lack of links) between socioeconomic change and plantation expansion in Tasmania, which were subsequently explored further, and have formed the basis for the analysis presented in this report.

Interviews were held in Burnie, Launceston, Oatlands, Scottsdale, Smithton, St Marys, Westbury and Woodbridge, with a total of 56 participants across the eight groups. These participants came from a variety of backgrounds including the forest industry, local government, local business/commerce, natural resource management, agriculture, farm forestry, and state government departments.