

» SOCIOECONOMIC IMPACTS OF PLANTATION FORESTRY



Australian Government

Forest and Wood Products
Research and Development
Corporation

Bureau of Rural Sciences

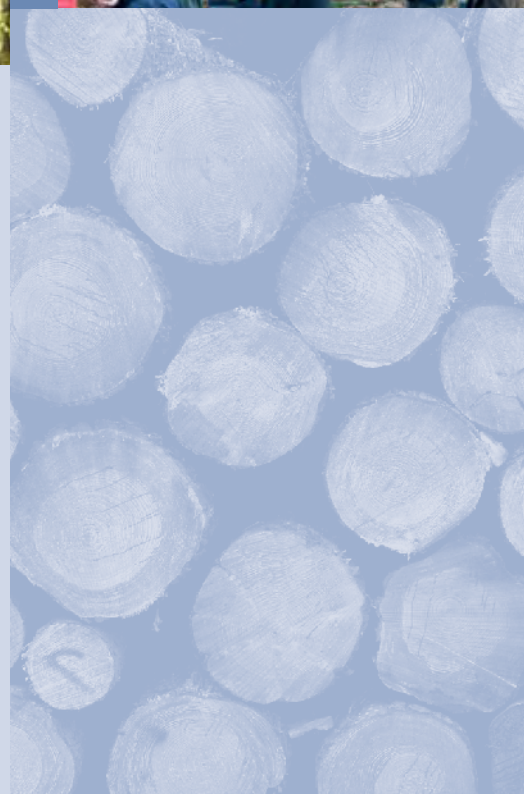


INTRODUCTION

This information booklet summarises the key findings of a recent study conducted by the Bureau of Rural Sciences, examining socioeconomic impacts of the plantation sector in the Great Southern region of Western Australia and the South West Slopes of New South Wales between 1991 and 2004. The study was funded by the Forest and Wood Products Research and Development Corporation.

The study identified key land uses and industries in the two case study regions and the history of plantation industry development. The level, type and location of employment and spending by the plantation sector over time were examined. The study then linked plantation sector expansion and changes in the socioeconomic characteristics of the population of different parts of the regions.

NOVEMBER 2005



» AUSTRALIA'S PLANTATION INDUSTRY

Australia's plantation sector is growing rapidly. Both the area of plantation estate and volumes of timber harvested have increased considerably over the past two decades.

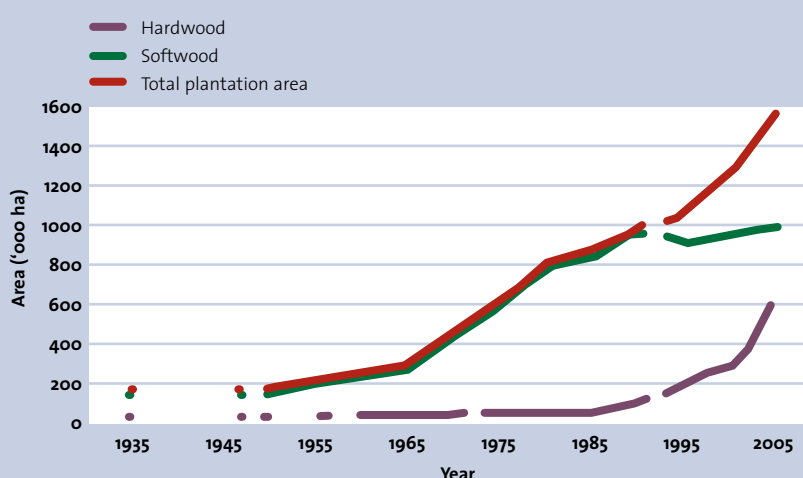
Since the early 1990s, the rate of plantation establishment in Australia has increased rapidly (Figure 1), as has the volume of timber processed from existing mature plantations.

Before the 1990s, most new plantations established in Australia were softwood plantations, grown on a rotation of 25–40 years to produce sawn timber and composite wood products. Since the 1990s, establishment of new softwood plantations has slowed, with a focus on harvesting and replanting the existing plantation estate on a rotational basis.

Most new plantings since 1990 have been of short-rotation hardwood plantations, many of which have been established to produce woodchips for export. In recent years, there have also been a number of proposals to establish domestic processing facilities to produce composite wood products or pulp and paper from hardwood plantations.

This study examined the socioeconomic impacts of the plantation sector in one region with a mature softwood plantation industry and in another with a rapidly expanding hardwood plantation estate.

Figure 1 Plantation area, by year and species group



South West Slopes (NSW) case study

The South West Slopes (SWS) of NSW contains a large, mature softwood plantation resource established since the 1920s and integrated processing facilities able to process sawlogs, pulp logs and residues. By 2004, 110,000 hectares of *Pinus radiata* had been established in the region (Figure 2).

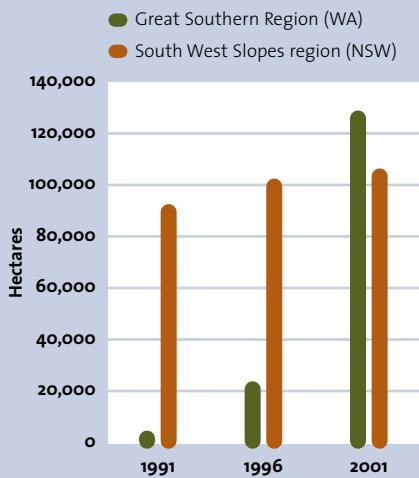
Since the 1950s, the volume of wood harvested in the region has grown steadily. Most is processed within the SWS at facilities in Tumut, Tumbarumba, Albury, Holbrook and Wagga Wagga.

Great Southern (WA) case study

The Great Southern region of Western Australia is an example of an area with a rapidly expanding hardwood plantation resource. From 1988 to 2001, just over 119,000 hectares of *Eucalyptus globulus* (blue gum) were established in the region, along with 8455 hectares of softwood plantations (predominantly *Pinus pinaster* and *P. radiata*), and a smaller area of sandalwood and oil mallee plantations (Figure 2). Plantations have been established on agricultural land leased or purchased from landholders.

The socioeconomic impacts of the plantation industry are different during the establishment phase (when new plantations are expanding but not yet ready for harvest), the transition phase (when harvesting and processing is being established), and the mature phase (when rotational harvesting and replanting of plantations is ongoing from the mature plantation estate).

Figure 2 Area of plantation established in the two study regions



Note: A further 19,000 hectares of softwood plantations are located adjacent to the SWS, in the Shelley region of Victoria.

Source: Bureau of Rural Sciences — National Forest Inventory; Forests NSW.

Harvesting of hardwood plantations began in 2001 and has since been expanding rapidly. A woodchip mill has been established in the region, while ‘mobile chippers’ are also used by some companies to process logs into woodchips at the harvest site. There are currently plans to establish a second woodchip mill, a biomass energy plant to process residues, and a composite wood products processing facility near Albany, the regional centre of the Great Southern.

Key phases of plantation sector development

There are three key phases in the development of a plantation industry, each of which may be associated with different socioeconomic impacts:

- **Phase 1:** Establishment of the plantation resource
- **Phase 2:** Transition in which some harvesting and processing of early plantings occurs, along with ongoing establishment of new plantations
- **Phase 3:** Maturity of the sector, in which the plantation resource is harvested on a rotational basis and a range of products are manufactured by processing facilities.

These phases are not mutually exclusive and often overlap. For example, 85% of the SWS plantation

estate had been established by 1991. Since that time, ongoing expansion of processing capacity has occurred in the region. This expansion has created an impetus for the establishment of more plantations to supply processors in the region.

Development of a mature plantation industry generally requires a large area of plantation resource to support the establishment of world-class processing facilities that can process a range of products from the plantation resource.

It is important to put the plantation area required into perspective. In the Great Southern, where the plantation area is large enough to support the development of processing facilities, plantations have been established on 10–22% of agricultural land in three local government areas (LGAs), with traditional agriculture continuing to operate on most land in those areas.



» KEY CHANGES IN AUSTRALIA'S RURAL REGIONS

Plantation sector expansion is only one of the changes occurring in rural regions of Australia. The socioeconomic impacts of the plantation sector need to be understood in the context of this broader socioeconomic change. Three key changes are discussed below.

Many rural regions of Australia have experienced major socio-economic and land use change in recent decades, including farm amalgamation, declining rural population and services, and shifts in employment opportunities.

Declining rural and farming populations

Across Australia, the number of farming families decreased by 22% between 1986 and 2001 (Figure 3).¹ This has been a result of change in agricultural markets and the introduction of new technologies, which has improved the efficiency of the sector. Rural populations have declined as farm families exit farming and their farms are bought by landholders who are expanding their farm enterprises (ABS 2003).

Decline in the numbers of farming families has contributed to population decline in many rural regions across Australia, and to the ageing of the farming workforce. The median age of farmers increased from 47 in 1986 to 51 in 2001 (ABS 2003).

Changing patterns of rural employment

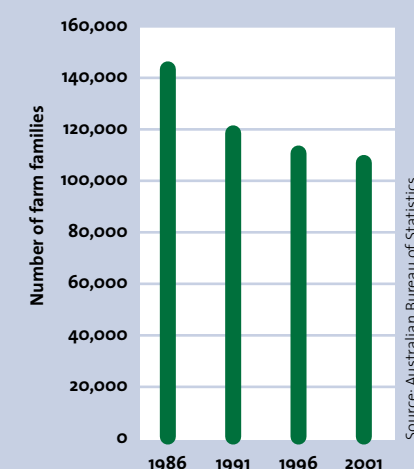
Availability of off-farm employment in nearby towns is one of the factors influencing decisions by farm families to remain on their farms or leave farming. Since 1989–90, off-farm income has provided around 65% of total household income on broadacre farms across Australia (Productivity Commission 2005). The plantation sector is one of the industries that may provide opportunities for off-farm employment in rural regions.

Influx of 'lifestyle' residents

In many rural areas, there has been an increase in the number of 'lifestyle farmers' owning small rural blocks of land.

This has occurred in both the Great Southern and the SWS. In the Great Southern, 'sea changers' have shifted to coastal areas as well as to inland areas of high natural beauty, such as the Porongurup Ranges. In the SWS, 'tree changers' have come to the area to live on small properties in the foothills of the Snowy Mountains.

Figure 3 Number of farm families in Australia, 1986 to 2001



Availability of services

Many rural regions have experienced a withdrawal of key services from small towns to regional centres. A well-publicised example has been the closing of bank branches in many small rural towns.

Many regions have looked to establish new industries to provide economic diversification and local employment, as a way of overcoming the challenges presented by declining farming population and levels of services in rural areas.

¹ Defined as the number of families with one or more members working as a farmer or farm manager.

Employment in the plantation sector

Most plantation sector employment is based in large regional towns, with less in small rural localities. The type and amount of employment generated by the sector grows as plantations mature and harvesting and processing of wood products takes place.

During the early years of the establishment phase, some plantation sector employment may be located outside the region. This changes over time as new businesses establish in the region to provide goods and services to the growing plantation sector.

Establishment phase

During the establishment phase, jobs are created in plantation management companies and in contracting businesses that provide services to the plantation sector, such as bulldozing contractors and businesses providing chemical and fertiliser application services. By 2001, the establishment and management of plantations in the Great Southern had led to creation of 263 of these types of jobs.

In the early stages of plantation expansion, it is common for some employment to be sourced outside the region where plantations are being established. This is because it is often difficult to source appropriately skilled labour in the local region. As the industry grows, locally based businesses establish to service the plantation sector, and an increasing proportion of the workforce is sourced locally.

In 1996–97, 57% of contracting firms undertaking work on Great Southern plantations were based outside the region. By 2003–04, only 36% were based outside the Great Southern, with several local firms establishing in the intervening years to service the plantation sector.

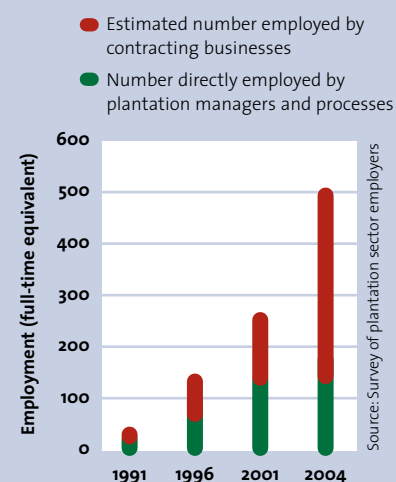
Transition phase

During the transition phase, increasing employment is generated in the harvesting and processing sectors, while expansion of the plantation estate continues. The total employment per unit of plantation increases rapidly during this phase.

For example, between 2001–02 and 2003–04, direct employment in plantations in the Great Southern rose from 263 to 500 people as the plantation industry of the region entered the transition phase (Figure 4).

In addition, large numbers of short-term jobs are often generated in the construction industry by the establishment and upgrading of processing facilities. For example, up to 900 workers were employed in the construction of the Visy Industries pulp and paper mill in the SWS during 1999 to 2001.

Figure 4 Direct employment in the plantation sector in the Great Southern





Mature phase

During the mature phase, most employment in the plantation sector is generated by the processing of plantation wood, while there is ongoing employment in plantation management, harvesting and haulage.

The majority of jobs generated by the plantation sector in the mature phase are in the processing sector, so the level of local employment generated by the industry is dependent on the location of processing facilities.

In 2003–04, 1.53 jobs were generated per 100 hectares of plantation in the SWS, with a total of 1680 full-time jobs. Of these, 0.50 were in plantation management, harvesting and haulage, and 1.03 were in processing.

The extent of regional benefit generated during the mature phase depends largely on the location of processing facilities, which are the largest employers in the plantation sector. In the SWS, the establishment of several processing facilities in the region has led to 92–94% of direct employment generated by the SWS plantations being based in the region.

Flow-on impacts

At all stages of plantation sector development, spending and employment by the sector has flow-on effects. For example, purchases of supplies by the sector generate employment and spending by suppliers, and spending of income by plantation sector employees generates flow-on employment and spending in the economy.

In the Great Southern towards the end of the establishment phase in 2001–02, every job in the plantation sector generated an estimated further 0.65 jobs within the region, as well as further flow-on employment outside the region. In the SWS in 2002–03, every plantation sector job generated an estimated further 0.8 to 1.3 jobs in the region, depending on the part of the plantation industry being examined. For example, plantation management generated flow-on employment of 0.8 jobs within the region, while pulp and paperboard processing generated 1.3 flow-on jobs (this flow-on figure includes some jobs in the plantation management sector).

Expenditure and value of output

Establishment phase

During the establishment phase, the dollar value of the sector can best be measured by the level of expenditure on establishing a plantation resource. As plantations are not yet mature, it is not possible to measure value of output or value-added.

During the establishment phase, most plantation sector expenditure is on establishment and management of plantations. This can generate considerable spending in regional economies.

For example, as the Great Southern reached the end of the establishment phase in 2001–02 (by which time the APEC woodchip mill was being established and the first harvests were beginning), plantation sector expenditure totalled an estimated \$35.8 million, of which approximately 69% was spent within the region.

Transition phase

During the transition phase, expenditure increases as harvesting and processing take place, creating a much wider range of activities related to the plantation resource than existed previously.

In 2003–04, expenditure by the plantation sector on plantations in the Great Southern totalled an estimated \$49.7 million — an increase of almost 40% compared to 2001–02, when harvesting had only just begun. While some of this increase reflected the larger area of new plantations established in 2003–04 compared to 2001–02, a large part of the growth was due to rapidly expanding harvesting and processing operations in the region. This growth will continue for several years until the plantation sector reaches maturity.

The level of expenditure from the plantation sector and the value of output generated per hectare increase as a greater proportion of the plantation estate reaches maturity and becomes part of an ongoing harvest rotation.

Mature phase

In the mature phase, it is possible to measure the dollar impacts of the plantation sector based on the value of output, as a similar area is being harvested and replanted each year.

In the SWS, the value of output rose from \$401.4 million in 1993–94 to \$574.5 million in 2002–03 (Table 1). This equated to \$5334 per hectare of plantation in the SWS in 2002–03.

Flow-on impacts

The proportion of flow-on impacts generated by direct expenditure from the plantation sector is relatively similar at all stages of plantation development. In the Great Southern, a total of \$1.76 output was generated for every dollar spent by the plantation industry in 2001–02, while in the SWS, between \$1.63 and \$1.83 of economic output was generated for every dollar spent in 2002–03.

However, the total magnitude of flow-on impact changes as the level of expenditure increases through the establishment, transition and mature phases. For example, the flow-on impacts of direct activity in the Great Southern were considerably higher in 2003–04 than in 2001–02, as a result of direct plantation sector expenditure increasing by 40% over this time.

Population change and the plantation sector

The impact of the plantation sector on regional populations differs during the establishment, transition and mature phases.

Areas of the Great Southern experiencing high rates of plantation expansion tended to experience either growth in rural population, or a lower decline than nearby areas. This growth was not a direct result of plantation establishment - areas where plantations were expanding also experienced higher growth in rural residential development and intensive agriculture than most other parts of the region, and these are likely to have led to rural population growth.

Table 1 Value of output from plantations grown in the SWS, 1993–04 and 2002–03

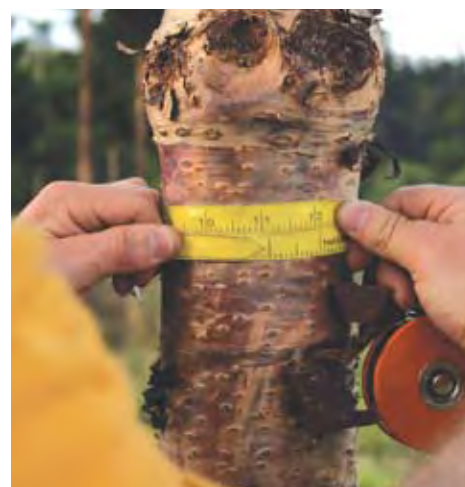
	1993–94 (\$ million)	2002–03 (\$ million)
Plantation management	28.3	45.7
Harvesting and haulage	21.6	32.1
Softwood processing	361.4	549.8
Total value of output (net)	401.4	574.5

Sources:

Margules Groome Poyry Pty Ltd (1995) — used for 1993–94 data (direct and indirect)

URS Forestry (2004) — used for 2002–03 data

Direct survey of plantation sector — used for both periods as appropriate to adjust data.





Establishment phase

During the establishment phase, plantations are usually established on cleared agricultural land that becomes available when landowners choose to sell or lease all or part of their properties.

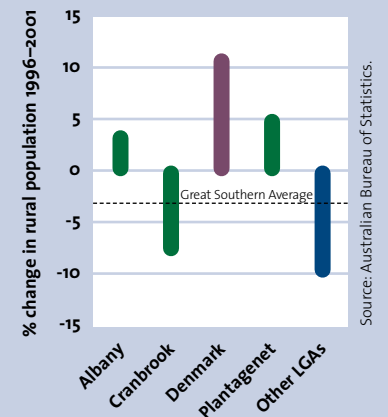
The overall impact of such a decision is the same whether the land is sold or leased to the plantation sector or to other farmers. In either case, the farming family often leaves the land. This results in a decline in the rural population (if no new residents come to live on the property), social change (as new residents rent or buy and move into the region), or both.

From 1996 to 2001, areas undergoing rapid plantation expansion in the Great Southern experienced either an increase in rural population or a slower rate of decline than the average for LGAs with few or no plantations and high dependence on the agricultural sector (Figure 5).²

This was the result of a number of factors. Establishment of intensive agricultural enterprises, primarily vineyards, increased rural population in some LGAs in which plantations have also been established, as did increasing numbers of ‘lifestyle’ rural residents. Additionally, the plantation sector has usually rented out houses on plantation properties in these LGAs.

This suggests that where plantation expansion occurs as part of a mix of land use changes, it does not lead to rural population decline.

Figure 5 Change in rural population in different parts of the Great Southern, 1996 to 2001



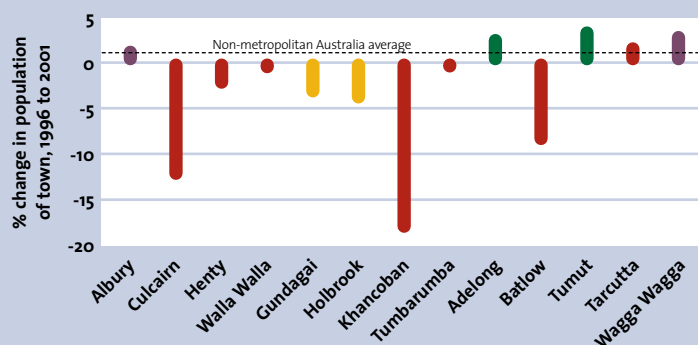
Note: The colour coding in this figure indicates the location and key land uses of different LGAs. Green LGAs contain large areas of plantation. Purple LGAs are on the coastline. Blue LGAs rely on broadacre agriculture as their dominant land use and have few or no plantations.

However, this result only applies at the LGA scale. Other trends may be occurring at smaller scales which could not be identified in this study.

Additionally, participants in focus groups held as part of the study — drawn from local government, rural communities and the plantation sector — suggested that plantation expansion could be better utilised to encourage rural population growth. The primary strategy suggested was to encourage further use of houses on plantation properties. This may occur through the rental of such houses, which already occurs in many cases, or alternatively through the subdivision of land into ‘homestead blocks’ that can be purchased. The latter course may encourage more long-term residents in rural areas.

² Rural population is defined as people living in localities with fewer than 200 residents, and on rural properties. The populations of towns with 200 or more residents are not included in rural population figures.

Figure 6 Change in population of different towns in the South West Slopes



Note: The colour coding in this figure indicates the location and key land uses of different LGAs. Yellow indicates towns near large areas of plantation estate, while green indicates towns near plantations that also contain processing facilities processing large volumes of plantation wood. Purple indicates towns not close to plantations but with plantation processing facilities. Red indicates towns with a high proportion of employment in the agricultural sector and little or no plantation sector activity.

Source: Australian Bureau of Statistics

Transition phase

During the transition phase, plantation processing facilities are constructed and increasing numbers of people are employed in harvesting and processing plantation wood.

This can lead to an increase in the population of towns with processing facilities. Often, there is also a temporary influx of population during construction of the facilities. The extent of impact depends on the scale of the processing facilities established.

Mature phase

Employment generated by a mature plantation sector can support population growth in rural and regional towns.

In the mature phase, the level of employment generated, particularly by the harvesting, transport and processing sectors, can lead to a noticeable positive impact on

populations of regional towns in which employment in the sector is based. For example, the towns of Tumut, Adelong and Tumbarumba in the SWS either experienced population growth or had stable population levels from 1996 to 2001, while populations of similarly sized towns in nearby areas often declined (Figure 6). Only the regional cities of the SWS (Albury and Wagga Wagga) experienced similar growth. The key difference between Tumut, Adelong and Tumbarumba and the other towns was the presence of a strong manufacturing sector processing plantation timber.

However, Holbrook, which has smaller scale plantation processing facilities than Tumut or Tumbarumba, experienced population decline, with its economy still largely dependent on agriculture despite the existence of plantation processing in the LGA.





Sociodemographic trends

The economic diversity of an area was the key factor associated with sociodemographic change in the population. In both case studies, regions with a more diverse economic base tended to experience higher growth in working age population (25 to 64 year olds) and more stable household income. These diverse economies included most plantation areas. In contrast, regions highly dependent on broadacre agriculture tended to experience higher growth in retirement age population (65 and over) and greater fluctuation in household income.

The presence of a mature plantation industry in the South West Slopes has been associated with higher than average growth in working age population and stable household income, both of which are good indicators for ongoing economic and population growth.

In the SWS, for example, the LGAs of Tumut and Tumbarumba have generally experienced higher growth in working age population and more stable growth in household income than nearby LGAs whose economies are more dependent on agriculture. The key difference between these two groups of LGAs was the presence in Tumut and Tumbarumba of plantation processing, providing a source of diversification of employment opportunities.

Provision of services

In recent decades, many rural areas of Australia have experienced ongoing withdrawal of services such as banks, schools and health services. This has been a result of factors including declining rural population, cost efficiency measures, and changing mechanisms for service delivery.

The study found that population changes were generally a good predictor of changes in service provision. If a region's population is declining, the region is likely to also be experiencing a decline in services; if the population is increasing, it is likely that the provision of key services will also increase.

However, for key types of services (such as community groups), the type of population as well as the size of the population influences service provision. In the Great Southern, short-term and temporary residents were commonly reported to have little involvement in local community activities, whereas long-term residents were reported to have more involvement.

Changes in the plantation sector were not generally associated with noticeably different patterns of change in the level of service provision. However, the available data allowed only the identification of broad trends, rather than exact measurement of the magnitude of change.

In some cases, services were found to have declined more rapidly in areas where plantations were established (particularly school enrolments and services provided to the agricultural sector). However, in these cases the decline in service provision was high before plantation expansion, suggesting that plantation establishment may have been a response to changes causing decline, rather than a direct cause of decline.

Land and property markets

Establishment phase

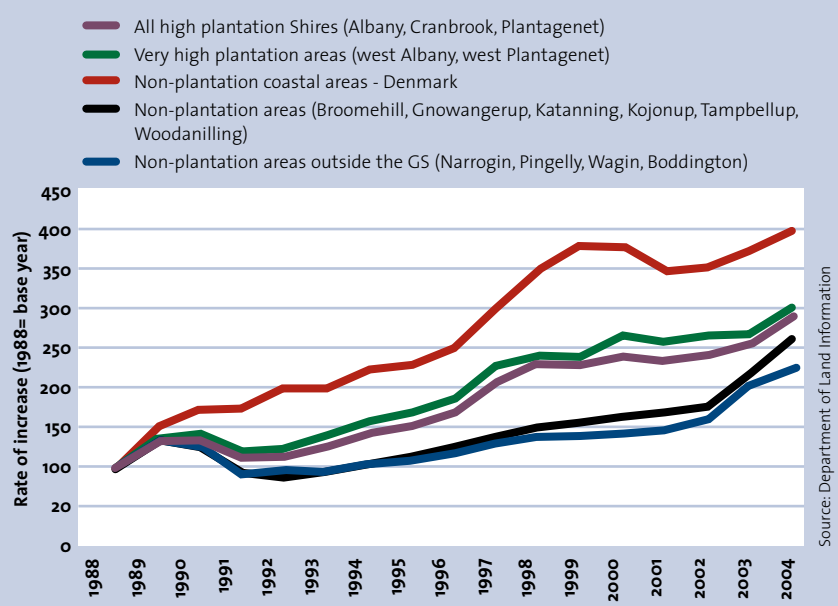
During the establishment phase, the plantation sector may have an impact on the rural land market. The extent of impact will depend on the amount of land acquired for establishment of plantations and the way it is acquired.

Demand for land from the plantation sector can lead to higher than average growth in the value of land suited to plantation establishment.

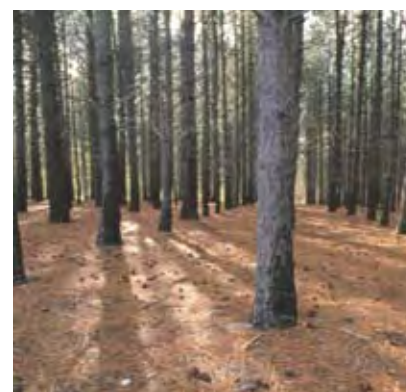
In the Great Southern, plantations have been established on land either leased from farmers or purchased by plantation companies. While purchase of land has the most direct impact on land markets, leasing may affect markets by reducing the area of land made available for sale.

During periods of rapid plantation expansion, rural land prices rose more rapidly in areas suitable for plantation establishment than in other areas of the Great Southern (Figure 7).

Figure 7 Rate of increase in average rural land prices in the Great Southern, for sales > 40 ha



However, when rates of plantation expansion were not as high, there was little to no observable impact on land markets. The exact threshold above which land purchase by the plantation sector has a measurable impact on the rural land market could not be calculated, but was most likely related to the proportion of the land market taken up by the plantation sector.



Transition and mature phases

During the transition and mature phases, any period of rapid expansion of the plantation estate is likely to lead to the changes in the rural land market described above.

During these phases, growing employment in harvesting, haulage and processing of plantation timber may also influence residential housing markets in plantation regions.



During establishment of processing facilities, the influx of labour needed for construction can place strain on rental markets, leading to low rental vacancy rates and difficulty obtaining local accommodation.

The higher volume of employment associated with expansion of the plantation industry can also result in increased demand for housing stock in towns where processing facilities are based.

Expansion of employment in the plantation industry may place strain on residential property markets in rural towns with limited or low-quality housing stock.

For some time, there has been a shortage of housing stock in many rural towns in the Great Southern and in the SWS. This can create challenges, with employees sometimes forced to live some distance from their place of employment, or in poor-quality housing, until improved housing stock becomes available.

Regional transport infrastructure

As harvesting and processing increase, increasing volumes of roundwood (logs) and processed wood products need to be transported from plantations to processing facilities, and from processing facilities to markets. This can place a strain on road networks often not designed to carry this type or volume of traffic.

Long-term planning for transport infrastructure needs is essential to ensure adequate maintenance and upgrading of road infrastructure, or the provision of alternative transport options such as railways.

In both case study regions, working groups have been established to plan for future transportation needs related to the plantation sector. These groups include representatives of local and state governments, the plantation sector and other road users.



» KEY CHALLENGES FOR THE PLANTATION SECTOR

Through the establishment, transition and mature phases, some key challenges arise for the plantation sector.

Rural population

Plantations are often established in rural areas experiencing population decline. Developing strategies to encourage residents to live on plantation properties may provide opportunities for the maintenance or growth of rural population. This often requires ongoing negotiation with authorities over the regulations governing subdivisions of small blocks of rural land from larger properties.

Labour shortages

Developing and maintaining a skilled labour force is an ongoing need through all phases of development. Shortages of skilled labour have the potential to slow expansion of the sector. Development of regional training resources for the plantation sector, such as accredited training through TAFE and other institutions, allows new and existing employees to rapidly gain skills in new technologies and processes as they are introduced.

It is important to plan ahead for the training, residential housing and transport needs of a growing plantation industry.

Residential accommodation

Planning for the housing needs of plantation sector employees is also an important challenge, particularly from the transition phase onwards. Lack of suitable accommodation can reduce willingness to shift to a plantation region for work, and can also affect other residents of towns where the plantation sector is expanding.

Transportation infrastructure

It is essential to plan for future transportation needs of the sector from the time of first establishment, to ensure that adequate infrastructure will be in place as plantation harvesting and processing expand.





Overall conclusions

The results of this study demonstrate that plantation sector expansion can contribute to stable economic growth in regional areas.

During the establishment phase, expansion of plantations on agricultural land generally has the same effects on rural populations as ongoing farm amalgamation processes. However, where there is interest in rural residential 'lifestyle' blocks, subdivision of 'homestead blocks' on plantation properties may provide opportunities for rural population growth.

Rapid establishment of large areas of plantation in a region can influence rural land prices by creating higher demand for rural land. This impact is most pronounced when plantation expansion occurs through direct land purchase by plantation companies, although leasing of land for plantations may reduce the number of properties being sold and hence also lead to a more competitive land market and rising prices.

During the transition and mature phases, employment in the plantation sector increases rapidly. A large proportion of this employment is generated in the harvesting, transport and processing of wood products. The presence of processing facilities in regional areas can help to reduce or prevent population decline by providing an alternative source of employment.

Most of the economic benefits of the plantation sector occur in the regions in which employment is based. In the plantation management and harvesting sector, employees are often located in regional centres closest to the plantation resource, but tend not to be based in smaller rural towns. In the processing sector, most employment is located in towns with processing facilities.



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Further information

The information in this booklet has been drawn from the results of the FWPRDC Project No. PNo4.4007 report 'Socioeconomic impacts of plantation forestry' project. Data analysis for the project was undertaken by the Bureau of Rural Sciences, with indirect economic impacts calculated using models provided by National Economics.

The full project reports can be downloaded from the websites of the Bureau of Rural Sciences (www.brs.gov.au) and the Forest and Wood Products Research and Development Corporation (www.fwprdc.org.au).

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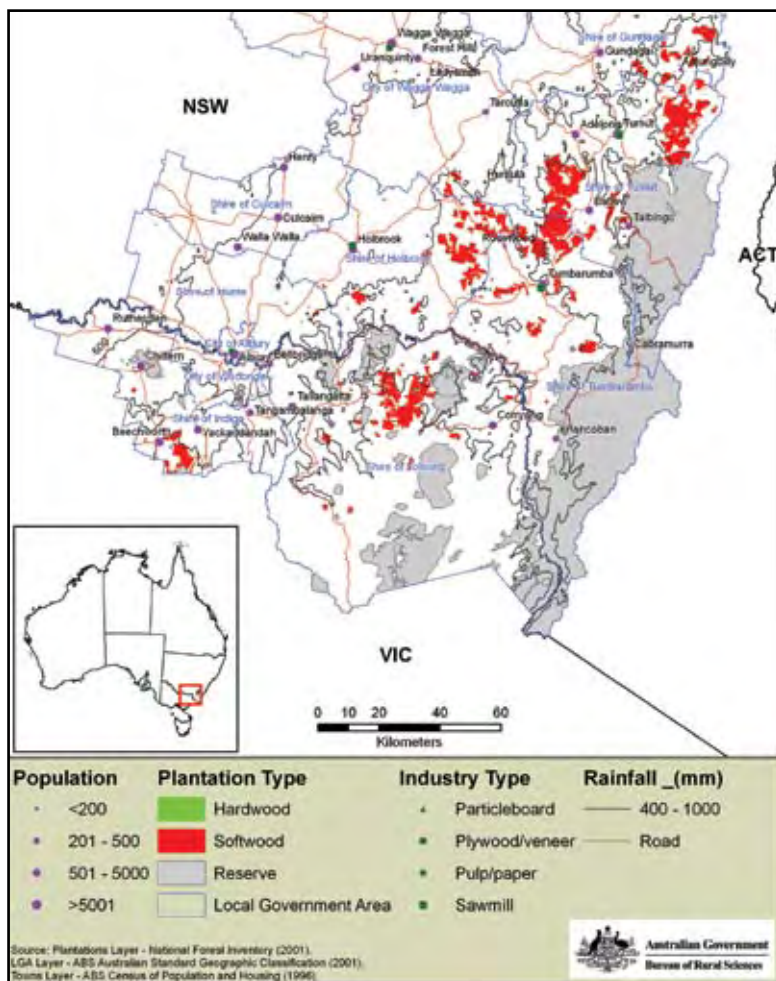
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» THE SOUTH WEST SLOPES REGION



» THE GREAT SOUTHERN REGION

These maps show the distribution of plantations in the two case study regions in September 2000. Please note that the area of plantations is not to scale, with small areas of plantation enlarged so they are visible on the maps.

