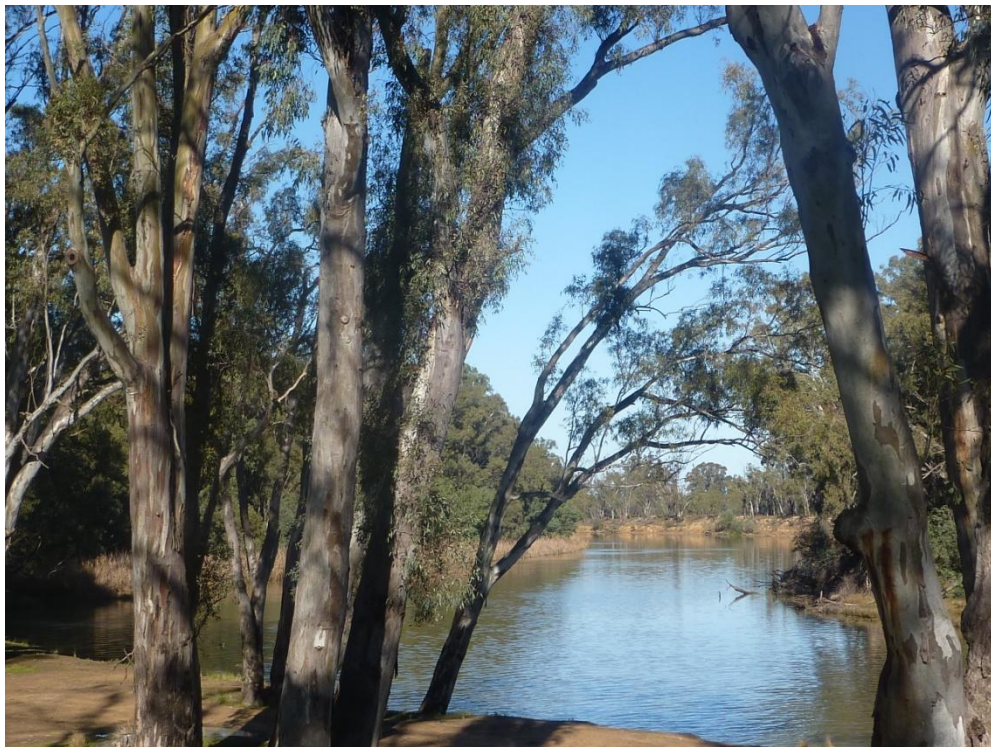


Central Murray Cluster Group of Councils Strengthening irrigation communities



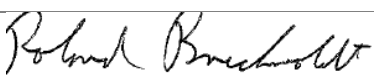
SYNTHESIS REPORT – STAGE 1: WHERE ARE WE AT NOW?



Central Murray Cluster Group of Councils

Strengthening irrigation communities

SYNTHESIS REPORT – STAGE 1: WHERE ARE WE AT NOW?

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Community Engagement and Workshop Summary Report – Stage 1

1 Introduction

1.1 Project background

Berrigan Shire Council, Jerilderie Shire Council, Conargo Shire Council, Deniliquin Council, Murray Shire Council and Wakool Shire Council, which form the Central Murray Cluster Group of Councils, obtained funding under the Commonwealth Government's *Strengthening Basin Communities Program* to conduct a study into how they could adapt to a future with less water. The Central Murray cluster is one of four council cluster groups within the Riverina and Murray River Organisation of Councils (RAMROC) that were funded under the Program.

The Councils developed a brief for the project, the *Central Murray Strengthening Basin Community Project* that will help them and Councils manage under a future with less water. Rather than suffer the effects of an uncertain future as it unfolds, the Councils are proactive and want a plan. They want to see their communities prepared, adaptable and resilient to a changing environment.

This Strengthening Basin Community project is being completed in three distinct stages, as shown in Figure 1.

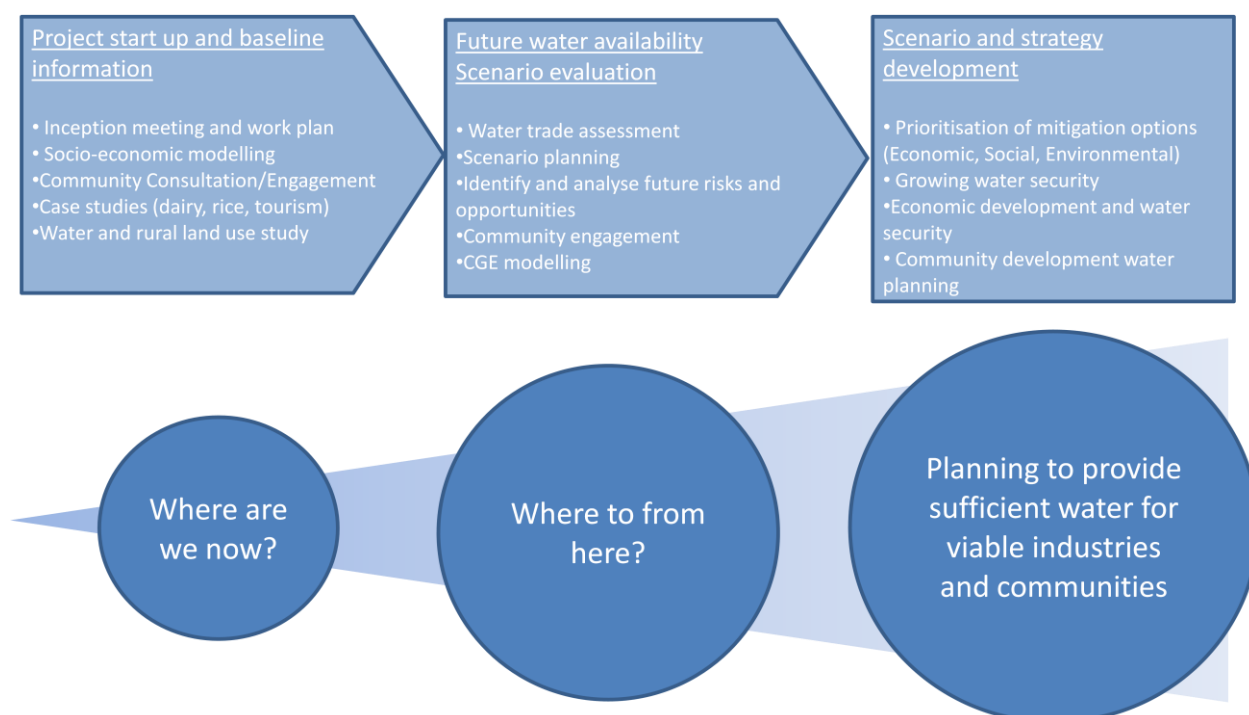


Figure 1: Overall project approach

An outline of the scope for each of three stages is provided below:

Stage 1: Where are we at now?

Involves an assessment of the current status of the Region and how it has been shaped by changes in water availability and water policy since 2002. This information provides a baseline for Stage 2.

Stage 2: Where to from here?

This stage is a test of assumptions regardless water and describe and assesses the implications of some plausible alternative futures. It involves socio-economic modelling and scenario planning to understand impacts posed by different water security scenarios (e.g. sustainable diversion limits posed under the *Guide to Basin Plan*)

Stage 3: Planning to provide sufficient water for viable industries and communities

The final stage addresses the question of how to provide sufficient water from two perspectives: growing the supply of water for industries and communities; and adapting the demand from industries and communities to match expected supply.

1.2 Purpose of this report

The purpose of this report is to provide a synthesis of the findings for Stage 1 assessment findings for the Central Murray cluster group of councils. Findings are presented according to three discrete data collation activities, which include socio-economic modelling, community stakeholder engagement and case studies on the Central Murray rice, dairy and tourism industries.

1.3 Structure of this report

This report is structured according to the following:

- Section 2 outlines the approach for each of the Stage 1 data collation activities
- Section3 presents the key findings for the Stage 1 assessment
- Section 3 identifies key messages which can be drawn from the assessment to date, knowledge gaps and next steps involved in project delivery.

2 Stage 1 approach

The first stage of the *Central Murray Strengthening Basin Community Project* comprises an assessment of the current status of the region – its people, economy, land uses, industry, water resources and local governments - and how the region has been shaped in response to reduced water availability.

To facilitate the Stage 1 assessment a number of discrete data compilation tasks were undertaken, as illustrated in Figure 2.



Figure 2: Stage 1 modules and outputs to inform Stages 2 and 3

Case Studies

Case studies of the rice and dairy industries have been completed. These industries make an important contribution to the Central Murray regional economy and are highly dependent on water. The objectives of the case studies are:

- Understand the value of water and its management
- Determine adaptation strategies in responding to less water
- Assess the vulnerability and viability of these industries in a future with less water.

The case studies were compiled from background data sources and face-to-face interviews. A total of 23 interviews were undertaken.

A separate study was made on the tourism industry. It contributes a significant proportion of regional gross domestic product (GDP), but the actual amount is difficult to ascribe to any one source because the benefits are widely spread. Development of tourism is often suggested as an alternative economic base for regional communities. It is therefore necessary to have a comprehensive understanding of its present role and future capacity in Central Murray.

Socio-economic modelling

The socio-economic modelling component of Stage 1 involved the following:

- *Regional socio-economic database* - development of socio-economic profiles for each of the Central Murray Clustercouncils, and for the region as a whole based on existing data (e.g. ABARE, ABS). This database was used to inform an assessment of the current socio-economic status of the region in absolute terms. The region has been assessed in comparison to relevant regions ("the rest of Murray Statistical Division", Murrumbidgee, Goulburn, Southern MDB, non metro NSW, etc)
- *Regional water and land use model* – development of an model based on data on detailed production volumes, values of what water, people?, water use and employment data have been where water is an input into production in the region, and part of the broader production function for each industry in the region. This model will be used to determine the first round (direct) effects on production due to changes in water availability (Stage 2). This analysis will be undertaken at the level of the Statistical Local Area.
- *Computerised General Equilibrium (CGE) Model* – the outputs from the regional socio-economic database and regional water and land use model were used to develop the CGE model for the Central Murray Region as well as the 'rest of South MDB', 'North MDB' and 'rest of Australia. The model includes 11 categories of agricultural landuses, most relevant to the water use and landuse in the MDB. Final model structure will be refined over coming months, and as the Stage 2 scenarios are modelled.

A detailed breakdown of each task undertaken as part of the socio-economic profiling activities undertaken in Stage 1 is documented in Table 1.

Table 1: Development status of the economic model

STAGE 1 TASK	STATUS	COMMENT
Regional Database Development	Complete	Data from the region collected into a spreadsheet database. Data held by Local Governments, or data not otherwise in the public domain is yet to be included
Current Socio-economic Status	Complete	The status of the Central Murray has been assessed in absolute form. It has also been assessed in comparison to relevant regions ("the rest of Murray Statistical Division", Murrumbidgee, Goulburn, Southern MDB, non metro NSW, etc)
Rural Land Use	Complete	Detailed production volumes, values, water use and employment data have been collected. This is being used in the water use modelling.
Time Series Economic Profile	Complete	Data has been obtained and has been aggregated. Most data is available only back to 1996.
Building land and water use model	Stage 1 completed Continuing for Stage 2	Basic model structure in place. Required data from the public domain has been collected. Data voids will be filled with further research and consultations over coming months. Fine tuning this model will occur progressively over the next 6 months, during Stage 2.
Building Central Murray into Access CGE model	Complete	The region is now in the Model, along with 'rest of Sth MDB', 'Nth MDB' and 'rest of Australia. There are 11 categories of agricultural landuses in the model, most relevant to the water use and landuse in the MDB. Final model structure will be refined over coming months, and as the Stage 2 scenarios are modelled.

Community engagement

The community engagement component aimed to provide the following:

- a means for stakeholders to be informed of the project in order to respond to their own interests
- an opportunity for stakeholders to express their preferred interests on behalf of their constituency
- avenues for Council to articulate the likely benefits and details of the project
- an opportunity for councils to understand the opinions and concerns of stakeholders.

Several community engagement activities were undertaken as part of Stage 1, as detailed below.

General Interviews

July 2010-August 2010

A key feature of the community engagement plan for Stage 1 involved face-to-face meetings with a diverse range of community and business interest groups.

A total of 41 separate interviews were completed. Most involved a single respondent, however some involved up to three people thereby increasing the actual number of people beyond the 41 interviews.

Public Meetings23rd – 26th August 2010

Five public meetings were undertaken in Jerrilderie, Deniliquin, Finley, Wakool and Moama. The purpose of these meetings was to inform community members about the project, identify issues currently impacting on regional viability (particularly water security) and identify possible causal factors and management actions.

An estimate of 154 attendees attended the five public meetings.

Conargo and Deniliquin Shire Council Workshops. 14th and 15th July 2010

Two community information sessions undertaken to build upon information obtained from community survey, literature review and field based condition assessment.

3 Key findings

Key findings for the Stage 1 assessment of the current status of the Central Murray are presented below for the socio-economic modelling, case studies, community engagement and water usage of the Region.

3.1 Socio-economic modelling

The Stage 1 socio-economic analysis serves two main objectives of the overall project. Firstly, it provides a profile of the Central Murray region and its component Local Government Areas, including the distinguishing features and characteristics that determine their reliance on water and the viability of different ways to plan for a future with less water. Secondly, and most importantly, it builds the modelling capacity required in the impact analysis and scenario planning of Stage 2 of the project, involving both a regional water use model, and the development of the Central Murray area as a region into a global computerised general equilibrium (CGE) model.

The two main tasks are related. The regionally detailed models are data intensive and much of the data collected in the Stage 1 profiling is used to build the models. The models themselves will be used in Stage 2 of the project and results of this will be presented in the Stage 2 reports. What is presented in this Stage 1 report is a snapshot of the key data that has been collected and analysed, either as a distinguishing feature of the region potentially relevant to the scenario planning, or as a key model input.

3.1.1 Snapshot of the Central Murray

A socio-economic snapshot of the Central Murray was developed, including the current status and trends based on variables such as regional demographics, labour force, land use, water use, production volumes, production values, industry profiles, occupational profiles and business activity. This profile is based on the findings of the socio-economic assessment and rural landuse and water use modelling. Time series data of many of these variables have also been compiled.

The following is a snapshot of the key data used in the modelling, or most relevant to developing plans for a regional future with less water:

- The economy of the Central Murray region is highly specialised, concentrating on agricultural production and supporting industries. Total agricultural production is worth approximately \$600 million per annum, predominantly from rice, other cereals and livestock. Compared to Australia as a whole, secondary and tertiary economy sectors are underrepresented in the region's industry mix.
- The region's agriculture, and hence overall economy, depends heavily on irrigation. The Central Murray region consumes approximately 12% of Australia's surface water used for irrigated agriculture, and 17% of the total used in the Murray-Darling Basin.
- Agricultural productivity from irrigated land is much higher than it is from dryland production. Irrigated land represents a small component of overall land use, but a major component of the value of agricultural production. For example, although irrigated rice only accounts for 2% of the land area it accounts for over 20% of the value of all agricultural production from the region.
- The Central Murray produces approximately 50% of Australia's rice on a long term basis, most notably from Conargo and Jerilderie. Other commodities that distinguish this region from others in the Basin and Australia include cereal crops such as wheat, dairy and meat

livestock, with particular niche industries in grapefruit, tomatoes, potatoes and nectarines. Some 70% of the agricultural land in the region is used for grazing.

- The population is ageing, with the 20 to 34 age group being particularly underrepresented. Compared to surrounding areas of the Murray-Darling Basin and to Australia as a whole, the Central Murray has lower per capita income and an older labour force and population.
- The region has an unemployment rate lower than surrounding areas and the rest of Australia. However, this is likely to reflect younger members of the working age population leaving the region to find work elsewhere, rather than being indicative of a vibrant and growing economy.
- As in the surrounding regions much of the population is Australian-born. However, there is a relatively smaller Indigenous population than in some other parts of the Murray-Darling Basin.
- Compared to the Basin as a whole, the region has historically used proportionally more of its water to irrigate rice, and to a lesser extent other cereals, with proportionately less of its water used to produce grapes, fruits and vegetables. The water uses of the Central Murray are distinguished from other water uses as being annual crops, part of global markets, and where more of the costs of production are more variable rather than fixed.
- This has important implications for water availability in the region; it means that there is more flexibility in the land and water use patterns from year to year than other regions. Irrigated agricultural production will vary more from year to year here, as will the apparent overall economics of water use in this region.
- After a decade of low water, there has been little change in the region's population. Since 2000, the population has remained around 31,000, with a growth of only 0.1% over the decade. This is significantly less than the average growth of most neighbouring regions and the rest of the Murray-Darling Basin. This average represents growth in some LGAs (Berrigan and Murray) and declines in others (Conargo, Deniliquin, Jerilderie and Wakool).
- Population in the Central Murray region is closely linked to water availability, that is, patterns in population density appear to be related to the location of the irrigation areas. Not only are the rural areas of a significantly higher population density within the irrigation areas, the larger towns and cities of the region are typically in close proximity to the irrigation area (see Figure 3).
- By way of quantifying this apparent trend, GIS calculations indicate that the population density of the Central Murray region that is within 10 km of an irrigation area is 1.6 persons per square kilometre, compared to only 0.22 beyond 10 kilometres from an irrigation area.

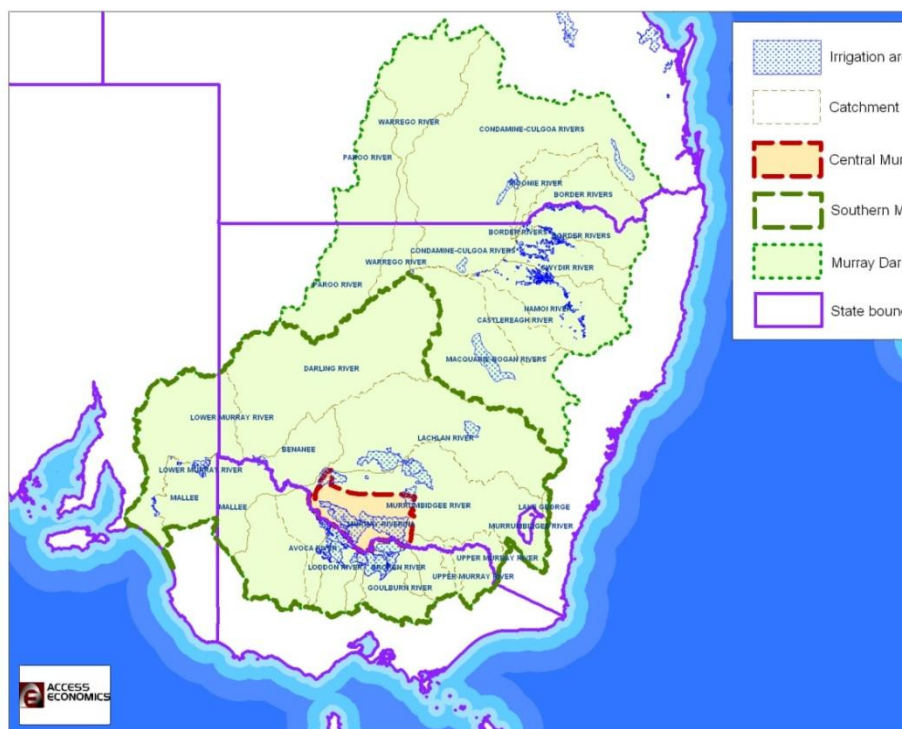


Figure 4: Regions accounted for by the CGE model

The CGE model will be utilised in Stage 2 of the project to assess the impact of different water availability scenarios of the Central Murray regional economy.

3.2 Community engagement

Inclusion of stakeholders and the wider community early in the planning process is essential to reach an understanding and appreciation of the issues facing the Central Murray communities. Community engagement was undertaken with a commitment to:

- Understanding the region and its people
- Understanding the changes that have already taken place and the responses to them
- Showing the drivers of those changes
- What enterprises and enterprise mixes people have already chosen in response to change
- The role Local, State and Commonwealth Government policy has had in the Central Murray, and how this may shape the future
- Gaining a complete understanding and appreciation of the impact of change on these communities and what resilience there is to further change
- Providing case studies on the rice and dairy industries
- Engaging with the tourism industry as part of the study into the opportunities in this sector.

Solutions cannot be developed and delivered without the engagement and support of those involved and affected. To ensure maximum involvement the community engagement plan for Stage 1 involved a combination of general face to face interviews, industry specific interviews, targeted workshops and public meetings.

A number of common priority issues were identified in the Stage 1 community consultation process. They are:

- The recent drought has accelerated the process of structural adjustment in the Central Murray region. People are leaving agriculture and farms are getting bigger. There is a benefit to those who achieve economies of scale. However, there is a disadvantage to the towns as there are fewer people.
- There are high levels of uncertainty regarding water management and this is likely to continue until the Basin Plan is finalised. This combined with the impacts of drought has impacted significantly on community morale.
- No new industries or agricultural enterprises have emerged. There is major adjustment within them but there is a distinct lack of alternatives of new industries. . .
- Increased tourism was frequently mentioned as an economic activity that could assist the region. However, given the importance of irrigated agriculture to the region regarding its contribution to Gross Regional Productivity tourism will not be the silver bullet to offset water losses projected in the *Guide to the Basin Plan*.
- Central Murray communities have faced major changes that have increased uncertainty and vulnerability. The impending (at the time of the interviews) Basin Plan and the water buyback are examples of uncertainty.
- There has been a loss of government services combined with trade of resources out of the region to meet the demands of urban interests. The recent restrictions on logging the Red Gum forests are given as an example.
- People feel disempowered because the major influences on their lives are outside their control. They feel resentful towards the New South Wales Government. They believe that this Government ignores them because they have such close links with Victoria.
- Respondents were less critical of the Commonwealth Government. They see more opportunities for regional development with the Commonwealth Government. Although the subsequent release of the Guide to the proposed Basin Plan may have changed this.
- No new industries or agricultural enterprises have emerged during the drought. Although it was noted that there are better and more efficient ways of managing the current range of enterprises.
- Increased tourism was frequently mentioned as an economic activity that could assist the region.
- There is a very low level of resilience among many individuals and particular towns as a whole.
- The main positive aspect to arise in the interviews was that people realise how important it is to cooperate and address change with a unified voice.

3.3 Case studies

3.3.1 Tourism

The Central Murray is a popular region for water-based recreation with the Murray River and other water systems providing an attractive setting for these activities. This is shown by the 387,000 tourists who visited the Central Murray in 2009. These tourists spent a total of 1.4 million nights in the region (Tourism Research Australia, 2010). Access to National Parks and forests with iconic Australian flora and fauna are also popular features of the Central Murray.

Tourism provides economic, social and environmental benefits to the Central Murray community. Economically it is an important industry with 5.5% of the region's total workforce employed within a tourism capacity in 2004/05 (TTF, 2006).

However, visitation trends for regional tourism are not promising. Across both NSW and Victoria the domestic tourism sector remains flat, with limited net growth recorded over the last 10 years (Tourism Victoria, 2009). National visitation data also shows a progressive decline in domestic leisure travel for virtually all tourism categories since 2000. People have been taking fewer trips, spending fewer nights away and spending less per trip in regional Australia. According to Tourism Victoria (2009) driving this trend is increased competition from overseas destinations, changing consumer expenditure patterns and growth in low cost airlines.

The growth of tourism in regional areas has not been uniform and Tourism Victoria (2009) identified a correlation between the tourism growth of destinations and their proximity to Melbourne. Tourism Victoria (2009) states that surrounding regions to Melbourne had experienced an increased in tourism over the last five years. However, more distant regions from Melbourne had experienced a decline in tourism over the same period. The majority of visitors to the Central Murray come from Victoria, particularly Melbourne, placing it at a geographical disadvantage to the more accessible surrounding regions of Melbourne.

A report by Tourism Research Australia (2010) on the impact of the drought on tourism in the River Murray region also reinforced the belief amongst tourism operators in the Central Murray that the real or perceived impacts of the drought have significantly reduced tourism demand in the region.

Respondents to the tourism survey provided a variety of responses to the question about the impact of drought on visitation to the Central Murray. Many believed that the recent drought had contributed to a decline in overnight visitation to the Central Murray over the last decade. However, recent growth in tourism expenditure and visitation in the Central Murray from 2008 to 2009 provides a degree of optimism for the local tourism industry.

Overall the general conditions facing the tourism industry in the Central Murray are challenging. However, the Central Murray has an opportunity to expand and grow its tourism industry. The potential of the Central Murray tourism industry and the scope of its opportunities will be explored in Stage 2 'Where to from here' of the *Strengthening Basin Communities Project*.

3.3.2 Rice industry

There were 590 registered rice growers in the Central Murray in 2005/06. During that year it produced approximately 50 % of Australia's rice production with a gross value of \$137.5 million. This accounted for 21% of Central Murray gross value of production. Approximately 44% of employment in the Central Murray depends on the rice industry. Rice was planted on 2.3% of the Central Murray rural farmed land and 17% of the its irrigated land, It used 628 GL, or just less than 50% of the water used in Central Murray during 2005/06.

The 13 rice growers interviewed were asked about the major changes to the rice growing industry in Central Murray over the last 10 years. The most common response was reduced water. This is not surprising considering the direct effect water availability has had on rice production. Four growers noted the development of more suitable rice varieties as being a major change. Interestingly, a range of social changes, including population decline, declining community morale, labour scarcity and loss of businesses and community services ranked highly as being a change in the rice industry. This downturn in production has in turn triggered substantial flow on effects in Central Murray for processing industries as shown by the closure of the Deniliquin rice mill in 2006. There has been decline in support services such as transport and agricultural contracting and the farm input supply chain such as fertiliser, agricultural chemicals, fuel and machinery.

Rice growers in the Central Murray have implemented adaptation strategies in response to reduced water availability. These include:

- *Water trading* – the price of water is high (and/or crop profitability is lower, rice farmers may sell their water on the temporary market.
- *Water use efficiency improvements* – strategies include laser levelling, shorter season growing varieties, water recycling, drainage reticulation and storage systems and alternative sowing methods such as combine or direct drill.
- *On-farm and off-farm diversification* to create alternative income streams additional to rice.

Growers surveyed were optimistic about the long-term viability of the rice industry, particularly given the improved outlook regarding water availability. However, many respondents noted that long-term reliability of water supply is critical and will govern long term industry performance. Although, the Central Murray rice industry has made significant advances in promoting on-farm water use efficiency, the uncertainty around government policy and its impact on access to water under general security allocation regimes is a major issue impacting on rice growers.

3.3.3 The dairy industry

The Central Murray dairy industry continues to be a significant contributor to the local economy, with a local production value of \$87 million in 2005/06. This is 2.63% of Australia's total dairy production. In 2005/06 the Central Murray dairy industry supported a workforce of 412 people, 1.9% of Australia's total dairy workforce (Access Economics, 2010).

Over the last decade the industry has undergone significant changes, largely in response to low water allocations and an extended period of drought. An international market downturn and its impact on milk prices has also forced many dairy farmers to reassess their situation and make difficult decisions on whether to continue farming, relocate or exit the industry (Dairy Australia, 2009).

Dairy farmers in the Central Murray have undertaken a number of adaptations and modifications to adjust to circumstances of the last decade. Some of these include:

- Increasing reliance on purchased feed
- Shifting from perennial to annual cropping
- Water trading
- Increasing farm operating flexibility
- Improved water use efficiency
- Increasing herd sizes.

Whilst these adaptations have enabled some dairy farmers to sustain operations during the drought, they have also eroded the profitability of many dairy farms. ABARE estimate that in 2008/09 whilst the average farm cash income was \$31,900, the average farm incurred a business loss of \$43,000 (Beale *et al.*, 2009).

Of the 10 dairy farmers surveyed six were receiving the exceptional circumstances Interest Rate Subsidy. These dairy farmers commented that the Interest Rate Subsidy provided significant support to their financial position. Overall, eight out of the 10 also believed that the Central Murray dairy industry is viable. The other two respondents stated that without water the Central Murray dairy industry was not viable. The surveyed dairy farmers all identified water uncertainty

as a major challenge. Surprisingly many of the respondents commented that water uncertainty, rather than reduced water allocations, was impacting their business most significantly.

Dairy Australia (2010) forecast that improved milk prices and generally favourable seasonal conditions will see southern dairy farmers enjoying the best production conditions for several years. However, this optimistic forecast needs to be tempered by the great uncertainty over water allocations in Central Murray.

3.4 Water use

3.4.1 Water trade assessment - overview

The examination of water trade in Central Murray has focused on entitlement trade (sometimes referred to as permanent trade) and allocation trade (temporary trade) as these are the main mechanisms for trade. Although other arrangements are possible, such as leasing, it is not envisioned that this comprises a significant part of water trade in the Central Murray.

Allocation trade is the trade of water between entitlement holders in an irrigation season. The long-term right to receive allocation water provided through the entitlement is not traded. As it is a 'one off' trade of water it has commonly been referred to as temporary trade. Allocation trade normally consists of larger volumes and this is the case in Central Murray. It can occur relatively quickly (a transaction can take days or weeks) and therefore provides quick access to water as it is needed.

Entitlement trade is the trade of the entitlement that gives the right to water obtain water allocated provided through the entitlement. This is regarded as 'permanent' as this provides a continuing right to water. It can take months to successfully conclude an entitlement trade and is therefore normally used to provide greater surety of water into the future, rather than as a response to a quick term need for water.

Trade can occur within and outside Central Murray. Therefore, the net change in water entitlement and or use depends on how much water is traded out of the area, into the area, and within the area. Summaries and key points from the data analysis are:

- Between 10-20% of total allocation trade could be leaving Central Murray each year.
- Trade of allocated water into Central Murray from 2004 onwards has declined whilst trade out has remained steady.
- Trades out of Central Murray are characterised by a low number of trades but for higher volumes. For example, in 2008-09 there were only two trades out of Murray Irrigation Ltd but the total volume was 7,509 ML. This is most likely Commonwealth buybacks.
- Price fluctuations do not exhibit an overall trend and follow normal supply/demand issues.
- A spike in price in early 2008 was due to the NSW trade embargo.
- Entitlement trade values show a steady increase in value. This indicates that the asset value of the water is increasing.
- Permanent trade within Central Murray went through a flat period during 2005 to mid 2007 with a sharp increase after that. Those trades are characterised by a high number of trades dealing with small amounts of water.
- The volume of shares traded in the 2008-2010 period shows that this can be variable.

- The overall trend to greater permanent trade is supported by the Water Markets Reports which show that the number of Water Access Licence Trades increased from 34 to 138 from 2007-08 to 2008-09.

3.4.2 Water usage in the Central Murray

0 5 shows water use on irrigated crops in Central Murray and across the entire Murray Darling Basin. Rice was planted on 2.3% of Central Murray's rural farmed land, covered 17% of the region's irrigated land, accounted for 21% of the region's gross value of production and used 628 GL, or just less than 50%, of Central Murray's water in 2005-06. Rice accounts for 18% of total irrigated water use in the Murray Darling Basin.

Central Murray also uses a high proportion of irrigation water on pasture for grazing, with 375 GL used in 2005-06 across 135,000 hectares of irrigated land. Some 30% of the region's total irrigated water was used on pasture for grazing in 2005-06, similar to 29% of the Murray Darling's irrigated water use on pasture for grazing.

Cereal crops for grain or seed and pasture for hay and silage are also relatively large users of irrigated water in Central Murray and across the whole Murray Darling Basin. In 2005-06, 1,235 GL of water was also withdrawn from the Murray Darling Basin for cotton production, although no cotton was grown in Central Murray.

In total, Central Murray used 1,259 GL of irrigated water across 310,000 hectares of irrigated land, while the whole of the Murray Darling Basin used 6,613 GL of irrigated water across 1.6 million hectares of irrigated land in 2005-06.

Figure 5: Irrigated land use, Central Murray, 2005-06

Irrigated land use	Central Murray		Murray Darling Basin	
	Irrigated area ('000 ha)	Volume (GL of water)	Irrigated area ('000 ha)	Volume (GL of water)
Cereal crops cut for hay	13	20	45	97
Cereal crops for grain or seed	70	116	251	507
Cereal crops not for grain or seed	5	7	14	23
Cotton	0	-	242	1,235
Fruit trees, nut trees, plantation or berry fruits	1	5	67	367
Grapevines	1	4	95	494
Other broadacre crops	6	15	33	80
Other crops	1	1	2	9
Pasture for grazing	135	375	545	1,937
Pasture for hay and silage	22	73	142	506
Pasture for seed production	1	3	5	14
Rice	53	628	101	1,211
Sugar cane	0	-	-	-

Irrigated land use	Central Murray		Murray Darling Basin	
	Irrigated area ('000 ha)	Volume (GL of water)	Irrigated area ('000 ha)	Volume (GL of water)
Vegetables for human consumption	2	11	24	122
Vegetables for seed	0	-	-	3
Total all irrigation	310	1,259	1,566	6,613

Source: ABS 4618.0, Water Use on Australian Farms, 2005-06.

As with the agricultural production data, there is no annual water use data specific to the Central Murray, and data at the level of the Murray Statistical Division must be used for statistics revealing trends over the recent years of the drought.

Figure 6: Murray NRM region – water use and value of irrigated agricultural production

Commodity group	2005-06	2006-07	2007-08	2005-06	2006-07	2007-08
	GL	GL	GL	\$ mill	\$ mill	\$ mill
Cereals for grain and seed	121	73	0	42	26	0
Total hay production	101	64	22	22	31	7
Rice	533	38	7	118	10	2
Other broadacre crops	20	5	0	5	2	0
Fruit and nuts	10	11	7	29	30	9
Grapes	7	5	4	12	8	15
Vegetables for human consumption and seed	13	11	6	24	19	35
Nurseries, cut flowers and cultivated turf	1	1	0	6	5	4
Dairy production	117	74	52	89	94	113
Production from meat cattle	104	37	16	60	41	7
Production from sheep and other livestock	160	38	15	32	21	9
Total volume applied	1193	366	152	439	286	205

Note: Many of these estimates have large standard errors, and data should be interpreted with caution

Source: ABS, Murray-Darling Basin - Gross Value of Irrigated Agricultural Production, 2000-01 to 2007-08

Figure 6 shows the water use and value of irrigated agricultural production in the Murray NRM region. Key differences in the water use and the value of irrigated agricultural production in the dry years of 2006-07 and 2007-08 compared to the year of 2005-06 where rainfall and allocations were closer to average are:

- Much less water used on rice, other broadacre crops, and for sheep and meat cattle production.
- More stable water use from vegetables, fruit and dairy.
- Despite slightly lower water use in the drier years in dairy and vegetables, the value of production was higher due to higher commodity prices.
- Volumes of irrigated water use drop proportionally more in drier years compared to the value of irrigated agricultural production.

Figure 7 shows the water use in the Murray Irrigation Area from 1992/3 to 2009/10. It highlights the reduced water usage during the period of the drought, especially in 2007/8 to 2009/10. It also identifies the high variability in water usage by the rice industry compared to more stable water usage for stock and domestic (S & D) purposes. Annual pasture, perennial pasture and winter crops have also significantly declined during the period of the drought. Only 29,401 ML of water was used in 2007/08 across the entire Murray Irrigation Area. This is compared to the long-term average annual water usage of 829,974 ML in the Murray Irrigation Area.

Figure 7: Water usage (ML) in the Murray Irrigation Area, 1992/3 to 2009/10

Year	Rice	Annual Pasture	Perennial Pasture	Winter Crops	Other	S & D	Total	% Allocation
1992/93	521,356	357,082	97,273	21,359	16,394	6,468	1,019,932	
1993/94	614,327	409,382	145,390	16,522	61,452	9,978	1,257,051	
1994/95	622,888	378,541	171,092	54,179	63,105	8,710	1,298,515	
1995/96	714,499	320,527	151,741	39,481	52,580	12,353	1,291,181	87%
1996/97	786,792	335,924	192,126	80,622	60,696	15,750	1,471,910	93%
1997/98	561,259	212,758	150,739	58,208	47,799	14,895	1,045,658	68%
1998/99	626,156	264,167	157,596	51,030	52,921	15,905	1,167,775	77%
1999/00	378,691	128,572	77,555	23,521	52,302	14,514	675,155	29%
2000/01	768,118	241,809	142,584	94,579	35,661	12,686	1,295,437	78%
2001/02	646,265	263,436	148,702	136,032	29,622	15,479	1,239,536	86%
2002/03	10,410	155,422	68,350	125,622	24,489	15,447	399,740	8%
2003/04	244,144	197,635	92,793	84,962	24,561	14,513	658,608	45%
2004/05	180,017	220,671	82,677	127,227	25,430	12,048	651,212	42%
2005/06	471,569	248,400	117,961	98,863	25,465	13,950	985,001	56%
2006/07	10,277	69,452	42,136	67,838	18,512	14,442	222,685	0%
2007/08	108	11,963	2,876	2,694	1,834	9,461	29,401	0%
2008/09	2,781	31,280	5,787	11,569	6,306	11,238	69,279	9%
2009/10	41,831	56,729	11,352	25,836	11,943	8,675	161,454	34%
Average	400,083	216,875	103,263	62,230	33,948	12,584	829,974	47%

Source: Murray Irrigation Limited, 2010.

Figure 8 shows the percentage of irrigation water used from different sources. Central Murray used 19.1% of the Murray Darling Basin's surface water and 13.9% of Australia's surface water in 2005-06.

The region used 7.5% of the Murray Darling Basin's groundwater, 17.3% of the Basin's total irrigation water supplies and 11.5% of Australia's total irrigated water.

Figure 8: Source of irrigation water, Central Murray Region, 2005-06

Water source	Central Murray Region (GL)	% of Murray Darling Basin total	% of Australia total
Groundwater	67	7.5%	3.1%
Surface water	1,188	19.1%	13.9%
Total	1,255	17.3%	11.5%

Source: ABS 4618.0, Water Use on Australian Farms, 2005-06.

3.4.3 Water use for residential and commercial purposes

The table below shows the commercial and residential water use for each Council in the Central Murray in 2009/10. Some statistics for the Conargo Shire were not available.

	Berrigan		Conargo		Deniliquin		Jerilderie		Murray		Wakool	
Urban Water Use												
Total residential water use	3250ML		n.a.		2950ML		370ML		2702ML		1092ML	
Residential water use (per household)	260kL		183kL		395kL		890kL		260kL		152kL	
Total commercial water use	420ML		n.a.		468ML		93ML		n.a.		368ML	
Commercial water use per business	864kL		544kL		563kL		1900kL		257kL		373kL	
Top commercial users	Tocumwal Golf Club	5ML	Conargo Hotel	1.2ML	Deniliquin Hospital	11.8ML	Barthers Chickens	7.1ML	Rich Rover Golf Club	11.7ML	Murray Downs Golf Club	14.7ML
	Tocumwal Bowls Club	4.2ML	Conargo School	0.2ML	Navarina Nursing Home	7.8ML	Billabong Produce	2.7ML	Maidens Inn Caravan Park	10.4ML	Tooleybuc Sporting	3.2ML
	Barooga Sports Club	9.1ML			RSL (main)	7.4ML	Jerilderie Swimming Pool	2.1ML	Merool Inn Caravan Park	9.7ML	Federal Hotel	3.2ML
	Tattersall's Hotel	2.6ML			Coach House Hotel	6.5ML	Royal Mail Hotel	1.9ML	Cottonwood Caravan Park	8.9ML	Barham Golf Club	2.5ML
	Brolgaroo Caravan Park	2.5ML			Purtills Depot and Car Wash	6.3ML	Colony Inn Motel	1.4ML	Moama Bowling Club	8.3ML	Barham Retirement	2.1ML
	Barooga Nurseries	2.5ML			McLeans Beach Caravan Park	5.7ML	Jerilderie Caravan Park	1.2ML	Moama Holiday Resort	8ML	All Seasons Motel	2ML

	Berrigan		Conargo		Deniliquin		Jerilderie		Murray		Wakool	
	Tocumwal Hotel	2.3ML			Deniliquin High School	4.5ML	Caltex Service Station	0.9ML	Madison Spa Motel	6.6ML	Moulamein Bowling Club	1.5ML
	Golf Motor Inn	2.2ML			Deniliquin Bowling Club	4.5ML	Prasad Accommodation	0.9ML	Mathoura Bowling Club	5.8ML	Barham Service’s Club	1.9ML
					RSL (sports club)	3.6ML			Moama Primary School	5.8ML	Wamba Wamba Aboriginal Co-Op	1.4ML
					Southern Cross Homes	3.3ML			Moama Motor Inn	5.1ML		
Waste Water												
Inflows to treatment plant	431ML		n.a.		480ML		200ML		580ML		270ML	
Volumes of reclaimed water sold/used	155ML		n.a.		0		13ML		128ML		50ML	
Inventory of water infrastructure												
Water main	230km		n.a.		148km		44km		137km		175km	
Sewer main	107km		n.a.		93km		12km		89.1km		55km	
Water treatment plant	4		n.a.		1		1		2		6	
Sewer treatment plant	4		n.a.		1		1		2		4	
Stormwater drains	69km		n.a.		53km		n.a.		n.a.		12km	
Water tanks	10		n.a.		0		2		n.a		8	
Storage dams	5		n.a		0		0		0		2	

	Berrigan	Conargo	Deniliquin	Jerilderie	Murray	Wakool
Water saving case studies						
Council initiatives	<ul style="list-style-type: none"> ▪ Electronic water, ▪ Metering, ▪ Water loss program, ▪ Recycled storm water, ▪ Recycled effluent. 		<ul style="list-style-type: none"> ▪ Water loss management program, ▪ Integrated water cycle management plan, ▪ Effluent reuse scheme, ▪ Save water alliance programs. 	<ul style="list-style-type: none"> ▪ Water metering, ▪ Effluent recycling 	<ul style="list-style-type: none"> ▪ Stormwater harvesting, ▪ Water loss program. 	<ul style="list-style-type: none"> ▪ Stormwater harvesting, ▪ Water reuse scheme.

Source: Local Council water use statistics, Rowan Perkins, 2010.

3.4.4 Role and importance of water in the region:

Water provides a means to increase the productivity of land use in the Central Murray through irrigation. This contributed to developing the infrastructure of its communities. The MDBA (2010) stated that drought significantly affected the gross value of irrigated agricultural production for the NSW Central Murray. This is a region defined by the MDBA extending from Corowa to Wakool Shire. In 2006 the gross value of irrigated agricultural production in this region was \$320 million. This was 80% of the NSW Central Murray's gross value of agricultural production. This compares to pre-drought \$550 million in 2000. (MDBA, NSW Central Murray Profile, 2010).

Value adding of agricultural production is limited to rice processing, bulk transport of grain and milk, tomato processing and cereal straw processing. There is also a small stock stud industry for meat and wool sheep and dairy cattle in the region.

Irrigated agriculture is a major economic driver within the region and the importance of water was resonated throughout surveys conducted with community members during the community consultation process. The surveys identified that the Central Murray community believe that water availability is a vital for sustaining the region. Comments such as *"we have nothing without water"*, *'without water we don't have an industry'*, and *'water is the only thing that keeps us here'* highlight typical sentiments observed during the consultation process regarding community member's views on the importance of water to the region.

However, the recent drought has shown that through adaptations and innovations some industries are able to evolve to reduce their dependence on irrigation. The relationship between water availability and industries will be explored in greater detail during Stage 2 of the project through the land use and CGE model. These models predict the outcomes from changes in water availability within the region.

The outcomes of the CGE model will be reported in Stage 2 and Stage 3 and will highlight the role and importance of water in the region.

3.4.5 Water efficiency

Reduced availability of water and an increased price of water created greater incentive for on-farm water use efficiency. The rice and dairy case studies outlined a number of ways these industries had adjusted the production process to increase water-use efficiency.

Water savings from improved efficiency have been used to improve farm production levels. Approximately 10% of farm businesses have recently submitted expressions of interest to trade water entitlements with the Government in exchange for funding for improved water use technologies (MDBA, 2010). The MDBA (2010) believes that there is significant scope to improve on farm water use efficiency. They believe gains in excess of 10% in the short to medium term are achievable.

The MDBA (2010) expects that this will involve further adoption of sub surface irrigation for hill or row cropping, overhead irrigation for broad acre crops and pastures, micro irrigation for horticulture crops and improvements to surface irrigation such as laser levelling and water applications methodology. Improvements in water use efficiency are also likely to require ongoing investment in research and technology.

3.4.6 Water trading

A review of water trade data in the RAMROC area has been conducted. This has used publicly available information from the NSW water register (<http://www.wma.dnr.nsw.gov.au/wma>) supplemented by information contained within the National Water Commissions Australian Water Markets Reports for 2007 – 2008 and 2008-2009. This provides an overview of what is happening with water use and trade within the area and will also assist in the economic modelling to be completed.

The examination of water trade has focused on entitlement trade (sometimes referred to as permanent trade) and allocation trade (temporary trade) as these are the main products. Although other arrangements are possible, such as leasing, it is not regarded as significant. Allocation trade can occur relatively quickly and therefore provides quick access to water as it is needed.

Entitlement trade is the trade of the entitlement that gives the right to obtain water allocated through the entitlement. This is regarded as 'permanent' as this provides a continuing right to water. It can take months to successfully conclude an entitlement trade and is therefore normally used to provide greater surety of water into the future, rather than as a response to a quick term need for water.

Trade can occur within and outside Central Murray. Therefore, the net change in water entitlement/use depends on how much water is traded out of the area, into the area, and within the area. Raw trade figures do not show the real picture in terms of change in water use/entitlement within the region.

Summaries and key points from the data analysis are provided in Figure 9.

Figure 9: Volume of water assignment traded per month ('allocation' trade)



Figure 9 shows a steady increase in allocation trade from 2004 and may indicate the increase in actual water leaving Central Murray. The 2007-2008 Water Markets Report indicates that for all of NSW, the proportion of allocation trade that was internal, trade in and trade out was:

- Internal trade: 528 283 ML (74%)
- Trade out: 171 174 ML (24%)
- Trade in: 14 544 ML (2%)
- Net change: -156 630 ML (-22%)

A similar ratio for Murray Irrigation Limited is presented in the same report:

- Internal trade: 40 767 ML (74%)
- Trade out: 13 560 ML (25%)
- Trade in: 936 ML (2%)
- Net change: -12 624 (-23%)

However, the figures change for 2008-09:

- Internal trade: 90 127 ML (86%)
- Trade out: 13 955 ML (13%)
- Trade in: 1 183 ML (1%)
- Net change: -12624 (-12%)

These reports therefore indicate that between 10-20% of total allocation trade could be leaving Central Murray per year. However, the Murray Irrigation was a net importer of water into the region for all years prior to 2007/8. This water was traded in to the region from the NSW Lower Murray, Lower Darling, Murrumbidgee and SA Riverland. However, in the past three years Murray Irrigation has been a net exporter of water both on the temporary and permanent water markets (Murray Irrigation Ltd.2010).

Figure 10: Water assignment trade ('allocation' trade in and out)

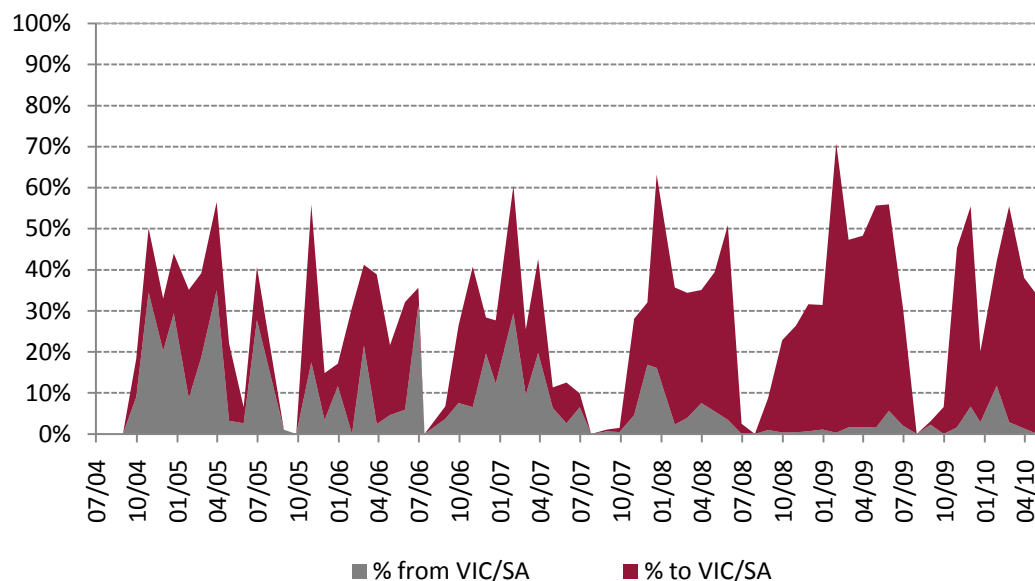


Figure 10 shows that trade of allocated water into Central Murray from 2004 onwards has declined whilst trade out has remained steady or slightly increased.

In 2008-09 entitlement trades within irrigation corporations totalled 163 285 ML. Figure 11 shows that of the regulated water licence transfers, 27 (totalling 113 959 ML) were for the transfer of entitlement out of irrigation districts. Figure 10 shows the unprecedented transfers of entitlement out of irrigation districts during 2008–09, including almost 104 GL from Murrumbidgee Irrigation Ltd. During the same period 7.5 GL of water entitlements was traded out of the region by Murray Irrigation Ltd.

Figure 11: Transfers of entitlement out of irrigation districts, 2007-08 and 2008-09 (NWC, 2010)

Irrigation Corporation	2007-08		2008-09	
	Number	Volume (ML)	Number	Volume (ML)
Murray Irrigation Ltd	1	166	2	7506
Murrumbidgee Irrigation Ltd	n.a	18	17	103624
Coleambally Irrigation Corporation Ltd	n.a	1596	1	1775
Jemalong Irrigation Ltd	n.a	497	1	794
Western Murray Irrigation Ltd	0	0	6	260
Total	n.a	2277	27	113959

Figure 12: Price of water assignment trade ('allocation' trade)

WAA Average Price
[\$/ML] (Daily)

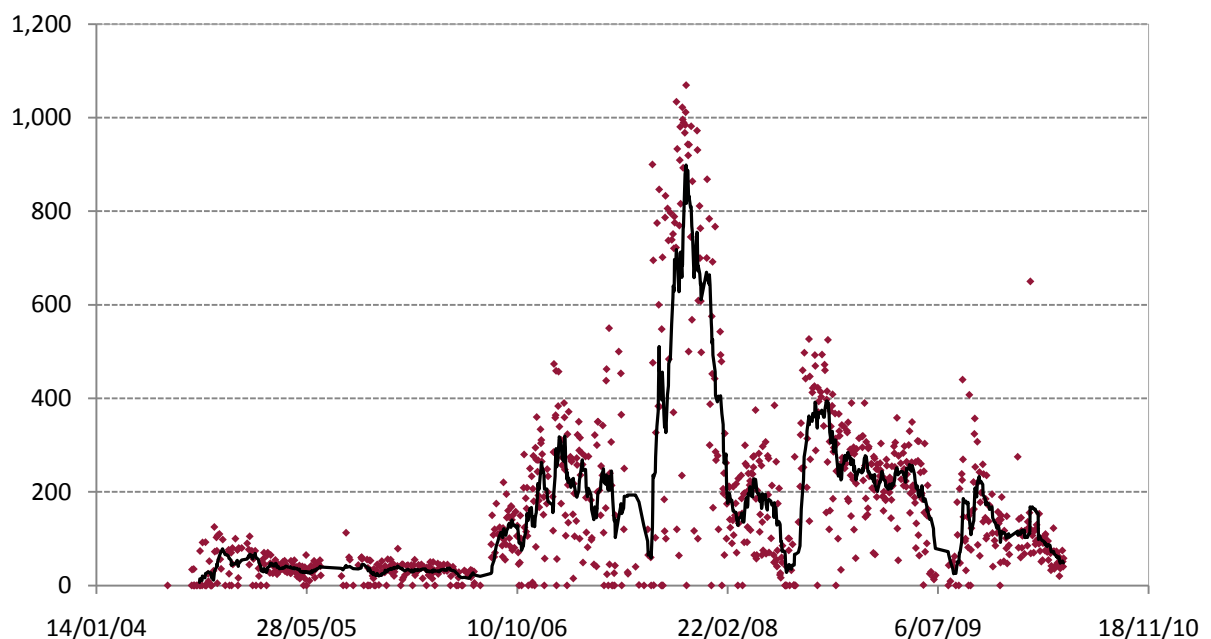
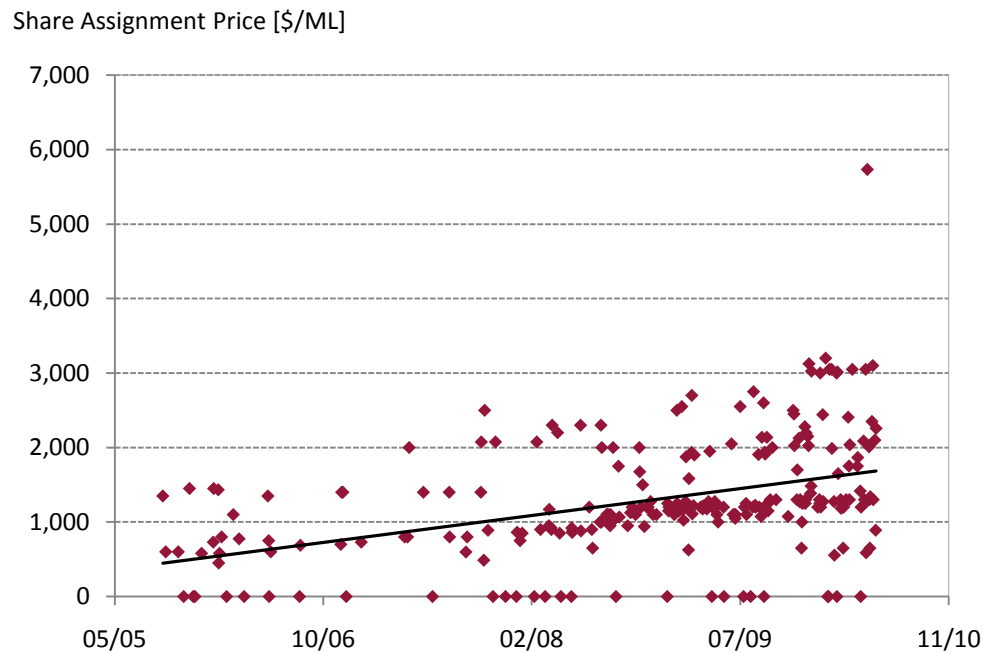


Figure 12 shows that price fluctuation do not exhibit an overall trend and would be following normal supply/demand issues. Feedback from Murray Irrigation Ltd indicates that the spike in early 2008 was due to the NSW trade embargo.

Figure 13: Price achieved for share assignment (permanent trade)



Entitlement trade values show a steady increase in value. This indicates that the asset value of the water is increasing. The recent rains and higher storage volumes may effect this overall trend.

Figure 14: Permanent trade volume per month

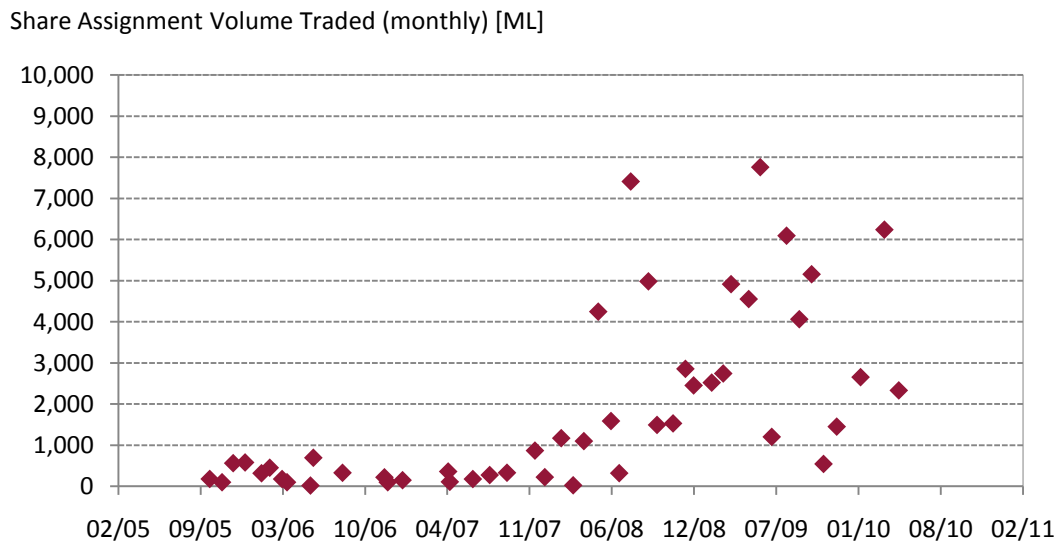


Figure 14 shows the amount of permanent trade occurring in Central Murray, indicating a flat (and low) period during 2005 to mid 2007 with a sharp increase after that. It also shows that the volume of shares traded in the 2008-2010 period can be variable.

The overall trend to greater permanent trade is supported by the Water Markets Reports which show that the number of Water Access Licence Trades increased from 34 to 138 from 2007-08 to 2008-09.

Figure 15: Permanent trade within irrigation companies (NWC, 2010)

Irrigation Corporation	2007-08		2008-09	
	Number	Volume (ML)	Number	Volume (ML)
Murray Irrigation Ltd	n.a	49413	126	69327
Murrumbidgee Irrigation Ltd	169	38003	113	72 314
Coleambally Irrigation Corporation Ltd	n.a	30192	50	10 292

Figure 15 shows the volume of trade within irrigation companies in 2007-08 and 2008-09. It shows an increase in trade by Murray Irrigation Limited from 2007-08 to 2008-09.

Buy backs:

Government buybacks have resulted in the purchase of approximately 200 GL of NSW General Security entitlements in the NSW Central Murray region (MDBA, 2010). Over 16% of the Murray Irrigation General Security water entitlements have been sold or committed to the NSW and Commonwealth Governments over the past three years as part of the Restoring the Balance, Living Murray and Water for Rivers programs (MDBA, 2010).

Figure 16 shows more specific data on the Australian Government's water purchases in the NSW Murray River catchment by volume, entitlement type and average price paid per trade \$/ML. It shows the high proportion of water that has been purchased as general security above the choke (156 GL).

Figure 16: Australian Government water purchases in the NSW Murray River catchment (DEWHA, 2010)

Catchment	Entitlement type	Secured purchases (ML)	Expected Average annual volume of water available for environment (ML)	Average price paid per trade (\$/ML)
Murray	NSW general security – above the choke	156,572	126,823	\$1,283
	NSW general security – below the choke	35,157	28,477	\$1,197
	NSW high security – below the choke	386	367	\$2,248
TOTAL		192,115	155,667	-

Source: Department of Environment, Water, Heritage and the Arts, 2010

3.4.7 Survey of water brokers

A survey of water brokers was conducted to identify patterns in water trading in the Central Murray over the last 10 years. The survey provided insights into the water trade data compiled from Commonwealth, State and private sources. The brokers were asked to comment on what they believed were the forces behind the trends in water trading in the Central Murray.

Whilst the water brokers had a range of views on water trading in the region they all agreed that the Murray Irrigation Area had transformed from a net importer to a net exporter of temporary water market in the final years of the drought. They commented that a high proportion of farmers had sold their allocations to meet financial obligations.

They also commented that the low allocations of some years were not of sufficient volume for cropping on a viable scale at the farm level. Because of the eroded capital base of farmers due to prolonged drought the farmers were not in a position to buy additional water required to crop at a viable scale. Under these conditions farmers tended to sell water.

According to the water brokers other farmers in stronger financial positions were still able to purchase additional water to successfully crop during the period. This is reflected in the Murray Irrigation Limited's trading data that shows that except for in 2007 the rice and dairy industries were net buyers of temporary water over the last five years. The high price paid by Sunrice during the drought was also mentioned as a factor that influenced some rice farmers to purchase water and grow rice during the period.

Generally, the brokers agreed that most farmers in the region looked to purchase water when its price in the temporary market was less than \$50/ML. At \$80-\$100/ML they mentioned that farmers were hesitant about buying water and at \$200/ML most farmers sold their water. At \$200/ML one broker commented that it was a '*no brainer*' for farmers to sell their water.

Many of the water brokers also commented that there was some speculation in the water trading market from individuals or groups who were taking a position on the future price of water. This speculation may have caused temporary fluctuations in the price and availability of water.

3.5 Changes in the region since 2001

There have been significant changes in the Central Murray from 2001 to 2010. Many of these changes have been directly in response to the recent drought and subsequent reductions in water allocations. The seven year average allocation for NSW Murray general entitlements for the period 2002/03 to 2008/09 was 26% (MDBA, 2010).

Over the last three years the Murray Irrigation Area has changed from being a net importer of water on the temporary water market to a net exporter of water on the temporary water market. The region has also become a net seller of water entitlements during this period.

According to the MDBA (2010) the pattern of water entitlement trade within the Murray Irrigation Area indicates that the initial impact of the drought may have been felt more severely in the western and central areas of the region. However, more recent expressions of interest to sell water are more evenly spread across the Murray Irrigation Area (MDBA, 2010).

Reduced water allocations have impacted on the gross value of irrigated agricultural production in the Central Murray. According to the MBDA (2010) the gross value of irrigated agricultural production in the NSW Central Murray region was \$320 million in 2006. This is compared to pre-drought gross value of production of \$550 million in 2000. In particular the rice industry has been affected by a reduction in water allocations over the last five years.

Along with the drought changes to Government water policy have also impacted the region. The MDBA (2010) report that over the last 15 years irrigated farm businesses have adjusted to changing Government water policy, including the MDBC Cap on Diversions, the NSW Water Sharing Plan, the ACCC Water Change Rules, and NSW IPART Water Price Determinations. This adjustment has resulted in significant restructuring with less than 1,200 farm businesses owning the 2,400 irrigation landholdings previously established within the Murray Irrigation Area (MDBA, 2010).

The drought has also caused significant financial stress to many farmers in the Central Murray. Most farm incomes have substantially reduced as a result of the recent drought. The survey of rice and dairy farmers in the region identified that many farmers have been reliant on Exceptional Circumstances payments to meet increasing debt levels. Many farm businesses have sold water to the government to meet increasing debt levels and business needs.

According to the MDBA (2010) one major bank has reported an across the board decline in farm equity within the region. An erosion of the capital base of most farm businesses in the region is also expected to slow the transformation of farm business in restructuring their operations around reduced water allocations (MDBA, 2010) i.e. with reduced equity many farm businesses are not in the position to invest in restructuring their businesses.

Other farmers in the Central Murray have resorted to off-farm income to meet their financial commitments. Much of this income is generated within the regional service centres from activities such as shop assistants, teachers, nurses and blue collar workers. However, the MDBA (2010) reports that many people have also left the region to find work in the mines, truck driving and skilled labour positions. In a phone survey conducted for the MDBA's Guide to the Proposed Basin Plan 38% of broadacre farmers in the NSW Central Murray had off-farm income (MDBA, 2010).

After a decade of low water allocations there has been little change to population. Since 2000, the population of the Central Murray has hovered around 31,000, with a growth rate of only 0.1%. This is significantly less than the average growth of the rest of the Murray Darling Basin (Access Economics, 2010). In particular many young people have left the region to obtain employment.

The rice and dairy industries in the region have been particularly impacted by the circumstances in the last 10 years. In the five years to 2001-02 the region produced over 600,000 tonnes of rice annually. In the five years to 2008-09, less than 132,000 tonnes of rice were produced annually with almost no production in 2007-08 and 2008-09 (MDBA, 2010).

During the drought, many rice based farms did not produce rice and transformed into mixed farms. Many dairy farmers transformed their operation from pasture based grazing to a feedlot based fodder system. Some dairy farmers also exited the industry and according to the MDBA (2010) the number of dairy farm businesses in the eastern portion of the NSW Central Murray has reduced from 100 to 80 over the last five years.

More general transformation over the past decade has involved farm businesses becoming larger, a reduced reliance on irrigation water and greater capacity to use irrigation water on a more opportunistic basis effectively on the most suitable land and the best developed irrigation layouts (MDBA, 2010).

In 2006 the region was first granted Exceptional Circumstances provisions. This was initially for the dairy industry, but later applied for all industries. The MDBA (2010) also report that over 30% of farm businesses currently use the Rural Counselling service and an average of 663 applications has been made for Interest Rate Subsidies to the NSW Rural Assistance Authority in each year between 2007 and 2009.

Over 16% of the Murray Irrigation General Security water entitlements have been sold or committed to the NSW and Commonwealth Governments over the past three years as part of the Restoring the Balance, Living Murray and Water for Rivers programs (MDBA, 2010).

According to the MDBA (2010) the sale of water entitlements from farm businesses will reduce the productive capacity of the region and place a greater reliance on dryland agriculture. This will make the region more dependent on annual rainfall (MDBA, 2010). It is also expected to have a flow on effect on the service community.

The major economic driver for each urban area is the provision of services to the irrigated agricultural sector and reduced water availability has also significantly impacted these industries. Berrigan, Finley,

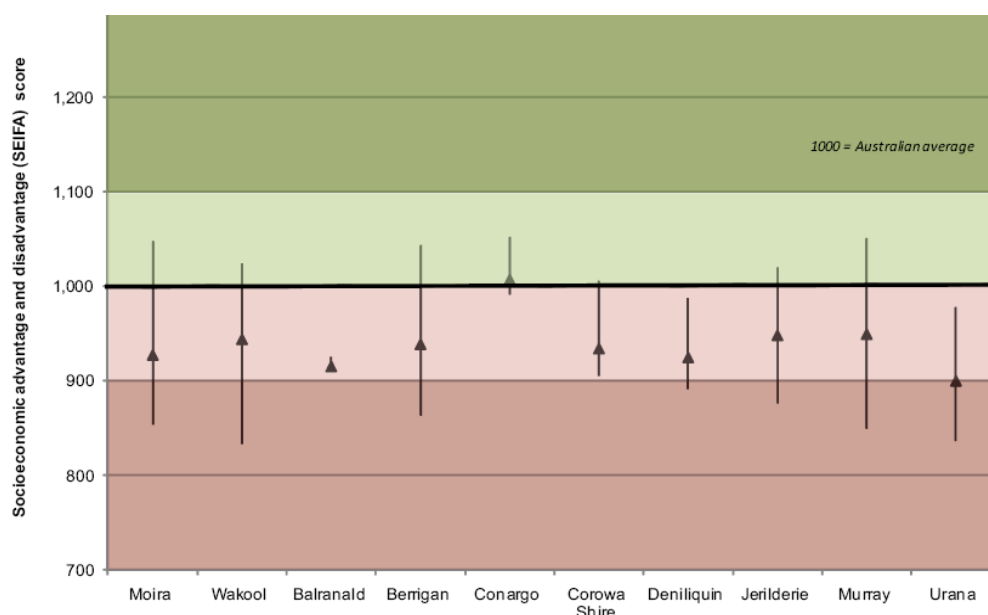
Deniliquin and Barham are considered to be the areas that are most directly influenced by the irrigated farm economy (MDBA, 2010).

Over the last decade a number of small businesses in these towns have closed and many of the remaining businesses are carrying large portfolios of unpaid accounts for works and services provided to irrigation farmers (MDBA, 2010). The Deniliquin rice mill also closed temporarily during the drought and whilst the transport sector continued to operate the majority of its business was conducted outside of the region during the drought (MDBA, 2010). The Deniliquin abattoir also closed due to low stock numbers.

The service centres of Deniliquin, Finley, Jerilderie and Berrigan have been assessed by local government as the centres most exposed to the agricultural economy (MDBA, 2010). Barham and Deniliquin are also vulnerable to the recent decision made to reduce future saw-milling of River Red Gum. According to the MDBA (2010) the river towns of Barooga, Toomswal and Barham are to some extent buffered from the impacts on irrigated agriculture due in part to contributions to the economy from other industries such as tourism.

Figure 17 shows the SEIFA Index of socio-economic disadvantage of the LGA's in the Central Murray. It shows that the region is relatively vulnerable compared to the Australian average. Conargo is the only LGA in the Central Murray with a level of socio-economic disadvantage less than the Australian average.

Figure 17: Index of relative socio-economic advantage and disadvantage (2006)



Source: MDBA, NSW Central Murray Profile, 2010

3.6 Changing Government policies

The greatest impact of changing government policies has been the creation of uncertainty across a broad cross section of Central Murray communities. The most controversial of these is the SDL suggested under the MDBA Basin Plan. This has created uncertainty that will continue for some time as the Commonwealth Government determines what SDL will be set and how it will achieve it. Statements by the Commonwealth Government that it will achieve the SDL by continuing buybacks raises the issue of whether entitlement holders will sell sufficient water to meet the Basin Plan SDL when it is set.

A number of studies have now been completed on the impact of the Commonwealth Government buybacks and other buyback programs such as NSW Government RiverBank. Marsden Jacob Associates (2010) provide a comprehensive review of the social and economic impact of the water buybacks. A summary of their finding is that:

- The water buybacks have increased the cost of water by up to 42%,
- The water buybacks have increased trade in water,
- The sale of water to governments has been high during the recent drought but may drop off with a return to higher allocations,
- The sale of water to governments has not had a detrimental economic impact because the income from the sales is transferred to other uses, including debt reduction,
- There is no evidence of any impact on the broader community,
- There is no evidence yet of any negative impact caused by stranded assets,
- It is possible that in some situations the sale of water devalues the land.

Many of these conclusions about the impact of the water buybacks are not shared by the wider community which sees it as another transfer of productive regional resources to non-productive uses such as environmental water. One reason for this view is that people in the regions see themselves as the victims of government policies that limit resource use rather than seeing themselves as being the agents or drivers of change. They believe that things are happening to them rather than for them.

The interviews with a broad range of participants conducted in the community engagement plan and discussed in the Appendix shows the impact that changing government policies have on community resilience. People continually point to the withdrawal of government services occurring in parallel to an increase in government regulations. The most recent of these from their perspective is the decisions by the NSW Government on the forest industry and the closure of mills and loss of employment. These changes in government policy are very apparent and are widely reported in the media. The cumulative impact is to create uncertainty and a lack of resilience.

On the other hand, other government interventions such as Exceptional Circumstances payments to farmers during the recent drought have had a positive impact in the region. This policy is discussed in greater detail in the rice and dairy case studies. There is clearly a change in the way governments relate to Central Murray communities. Direct services have been cut as government agencies are closed and there is increased regulation that results in a transfer of resources out of the region. However, centralised government agencies put money back into Central Murray through other targeted programs. The balance sheet has yet to be reconciled and this will be taken up in Stage 2.

4 Key messages and next steps

4.1 Key messages

Key messages drawn from Stage 1 assessment of the Central Murray region are:

- The economy of the Central Murray Region is highly specialised, concentrating on agricultural production and supporting industries. Compared to Australia as a whole, the secondary and tertiary sectors of the economy are underrepresented in the region's industry mix.
- Central Murray depends heavily on irrigation. It uses approximately 12% of Australian surface water (17% of the Murray-Darling Basin total) used for irrigated agriculture.
- The recent drought has accelerated the process of structural adjustment in the Central Murray. People are leaving agriculture and farms are getting bigger. There is a benefit to those who achieve economies of scale. However, there is a disadvantage to the towns as there are fewer people.
- There are high levels of uncertainty regarding water management.
- Rice and dairy farmers are optimistic about the long-term viability of their industries particularly given the improved outlook regarding water availability. However, many respondents noted that long term reliability of water supply is critical and will govern long term industry performance. Whilst the Central Murray rice and dairy industries have made significant advances in promoting on-farm water use efficiency, the uncertainty around government policy and its impact on access to water under general security allocation regimes is a major issue impacting these industries.
- Increased tourism was frequently mentioned as an economic activity that could assist the region in adapting to less water availability in the future. Overall the conditions facing the tourism industry in the Central Murray are challenging. However, the Central Murray has an opportunity to expand and grow its tourism industry.

4.2 Next steps

Stage 2 of the *Central Murray Strengthening Basins Project* will include a number of discrete work packages, each of which will be informed from the findings from Stage 1 (see Figure 16). This stage of the proposed project will test assumptions linked to reduced future water availability, develop and describe some plausible alternative futures and assess their implications for the individual councils and the Cluster Group as a whole.

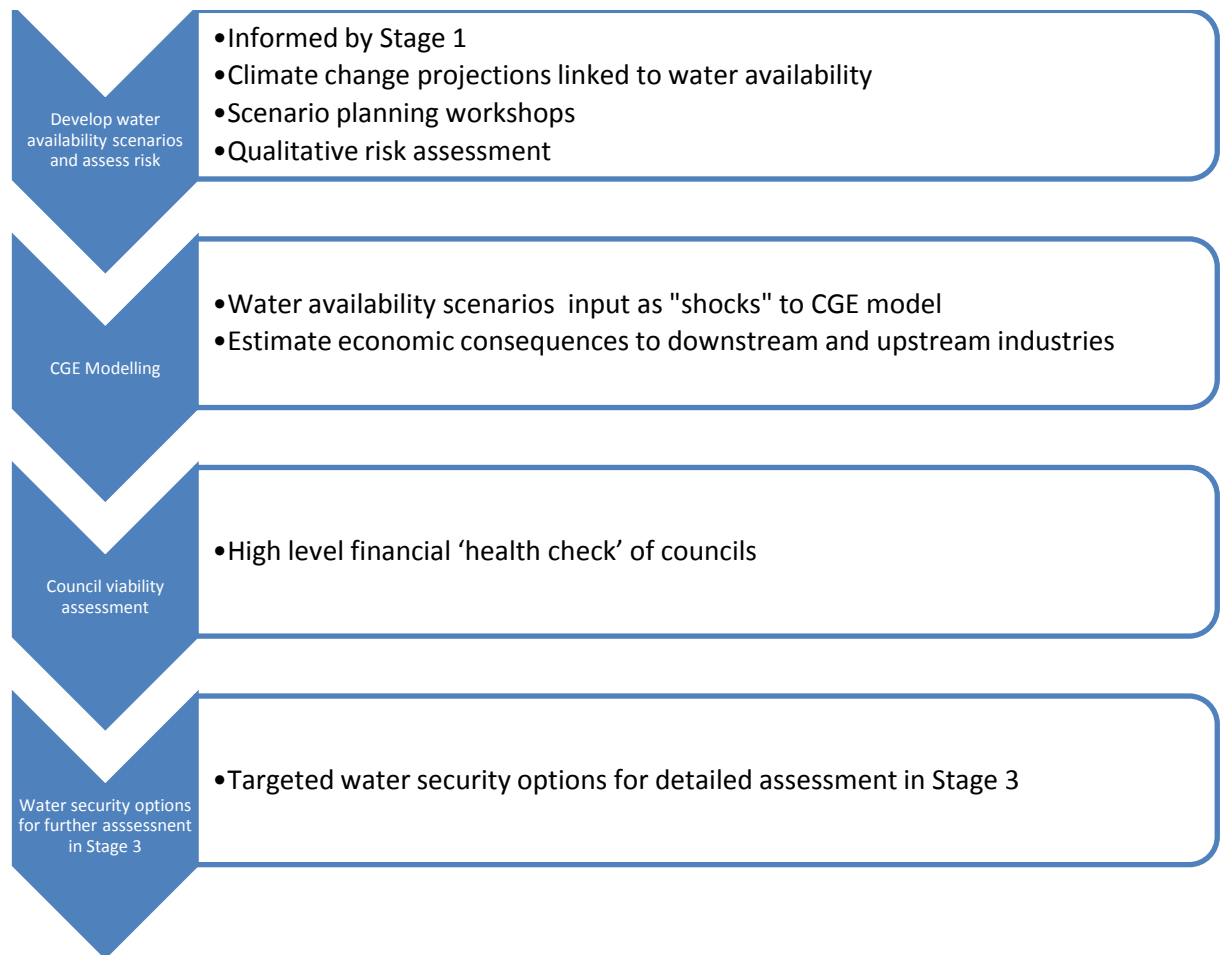


Figure 18: Key work packages to be completed as part of Stage 2 Central Murray Cluster SBC project

Data collated in Stage 1 will be used to examine the key drivers of change in the region, and explore the impacts on the region under a range of different future scenarios. From that, planning for those future scenarios (Stage 3) will follow.

The key drivers of change and future scenarios to be considered relate primarily to water availability and irrigated agricultural production, but will also consider the role of other unknown uncertainties, particularly those that are most relevant to irrigation based agricultural economies such as the Central Murray region. These other variables include exchange rates, commodity prices, agricultural input prices (such as fuel and fertilisers) and government policy (such as the proposed Carbon Pollution Reduction Scheme). Consideration of these other variables is crucial because the effect of changes to water availability will vary as these other variables vary. A thorough understanding of the likely future for the region therefore requires that this wider range of variables is considered, notwithstanding that the primary focus of the project is on water availability.

This assessment will link the socio-economic regional and water land use model with the wider general equilibrium modelling and will provide quantitative assessments of the economic impacts of water availability on:

- consumptive uses
- long term security and reliability of irrigated agricultural production, and other alternative landuses
- flow-on effects to regional economies (e.g. service and food processing industries)
- non-consumptive uses of water, such as fishing, recreation, etc

- effects of other market, policy or environmental factors on irrigated farming and Basin economies.

Overviews of key tasks which will be undertaken in Stage 2 include:

Develop water availability scenarios and assess risk

Water availability scenarios will be developed from a combination of the outputs of Stage 1, a review of climate change projection data applicable to the Central Murray region and scenario planning workshops. Climate change projections will be collated and synthesised to inform future water availability/security scenarios. These will be incorporated into the modelling via the water use model. This will enable changes in stress/resilience for different water user entities to be determined for informing strategies to address water scarcity.

Scenario planning workshops will also be undertaken to inform the development and short listing of water availability scenarios and likely responses in the Central Murray region posed by these.

In order to assess the risks associated with each scenario a risk assessment method based on the process defined in the Australian Standard *AS/NZS ISO 31000:2009, Risk management - Principles and guidelines* (shown in the figure below). A matrix or score card will be developed so that each scenario plan can be assessed against the same criteria. This will also enable the risks to be prioritised based on the level of risk posed and the feasibility of options to mitigate or treat risks.

CGE Modelling

The Computable General Equilibrium (CGE) model developed in Stage 1 will be applied to estimate the economy-wide impacts of changes in water supply in the Central Murray Region. The water availability scenarios

In years between the Agricultural Census, the data is based on an Agricultural Survey (where fewer terms of spatial resolution), where the smallest spatial resolution is the Statistical Division or the Natural Resource Management Region (e.g. Murray), and where the commodities themselves are aggregated into approximately 50 categories (although the commodity detail has varied from year to year).

For modelling purposes and across all years, Access has aggregated the commodity detail up into 11 consistent categories, as follows:

- Rice
- Other cereals (excluding rice)
- Cotton
- Other non cereal broadacre
- Hay sales
- Livestock – dairy
- Livestock – other
- Vegetables
- Grapes
- Fruits, nuts, berries (excluding grapes)
- Other (Nurseries, cut flowers and cultivated turf)
- All agriculture

The main benefit of the CGE modelling approach is the ability to incorporate the direct changes from the water use model in terms of agricultural production, and estimate the broader economic consequences to upstream and downstream industries and factor markets (notably labour).

Council Viability Assessment

A high level financial 'health check' of council's will be undertaken, including their water businesses. This process will assess changes in revenue and asset bases considering operating expenses, capital requirements and service provisions.

This assessment will involve the following seven step process:

- 1 Review the current financial position of the each constituent council and compare to similar councils and assess against relevant benchmarks produced by third parties such as the Auditor General and Strategy Plus.
- 2 Review councils long term financial plan, with a particular focus on financial sustainability, debt levels and serviceability, capital works programs and infrastructure gaps.
- 3 Review and assess critical financial key performance indicators (KPIs) and assess against relevant sustainability benchmarks.
- 4 Assess the reasonableness of the assumptions underpinning the financial forecasts.
- 5 Review the integrity and accuracy of the financial model.
- 6 Review and assess any contingent liabilities.
- 7 Discuss critical risks associated with each council's long term financial position and current financial position with council management.

Water Security Options for Further Assessment in Stage 3

Many of the issues facing the social and economic future of this Cluster Group will have emerged by this time. The economic modelling, the case studies, the scenario planning and community engagement will have provided a comprehensive view of water availability. The risk analysis will have shown what impediments might occur for certain plans.

A select list of water security options applicable to the Central Murray region as a whole as well as for each of the six cluster councils will be identified for further assessment in Stage 3.

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Appendix A

Central Murray Socioeconomic Profile

Strengthening Central Murray Irrigation Communities Stage 1 Studies: Socioeconomic Profile of Central Murray

December 2010

Stage 1 Report by Access Economics Pty Limited for
RAMROC's Central Murray Cluster Group

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Glossary

ABS	Australian Bureau of Statistics
LGA	Local government area
RAMROC	Riverina and Murray Regional Organisation of Councils
SD	Statistical division

1 Socioeconomic analysis of Central Murray

1.1 Key points

The information presented in this chapter is a socioeconomic snapshot of Central Murray, including its current status and trends over time. The data are drawn from a more detailed regional profiling database that has been developed to inform the socioeconomic modelling and scenario planning around a future with less water that will be undertaken in Stage 2.

Key findings of the socioeconomic analysis are summarised below:

- The Central Murray economy is highly specialised, concentrating on agricultural production and supporting industries. Total agricultural production is worth approximately \$600 million per annum, predominantly from rice, other cereals and livestock. Compared to Australia as a whole, the secondary and tertiary sectors of the economy are under-represented in the region's industry mix.
- The region's agriculture, and hence overall economy, depends heavily on irrigation. Central Murray consumes approximately 12% of Australian surface water used for irrigated agriculture (17% of the Murray Darling Basin total).
- Agricultural productivity from irrigated lands is much higher than from the drylands. Irrigated lands are a small component of overall land use, but a major component of the value of agricultural production. For example, although irrigated rice only accounts for 2% of the land area, it accounts for over 20% of the value of all agricultural production from the region.
- Central Murray produces approximately 50% of Australia's rice on a long term basis, most notably from Conargo and Jerilderie. Other notable commodities that distinguish this region from others in the Basin and Australia include other cereal crops such as wheat, dairy and meat livestock, with particular niche industries in grapefruit, tomatoes, potatoes and nectarines. Some 70% of the agricultural land in the region is used for grazing.
- After a decade of low water, there has been little change in the population. Since 2000, the population has hovered around 31,000, with growth of only 0.1% over the decade. This is significantly less than the average growth of most neighbouring regions and the rest of the Murray Darling Basin. However, this stagnant population growth hides differing trends within the region – some LGA areas are growing (Berrigan and Murray) and others are declining (Conargo, Deniliquin, Jerilderie and Wakool).
- Similar trends are observed with data on the value of building activity per capita, a key indicator of the health of regional economies. Overall levels for the Central Murray are low on a per capita basis compared to all of New South Wales, and have especially fallen in the period since 2007. Berrigan and Murray have consistently outperformed the other LGAs in the Central Murray over the past decade, with levels in those two regions consistent with that of all of New South Wales, and higher than it in the case of Murray.
- The mix and value of agricultural production has changed in the broader Murray Statistical Division since the drought began in 2002, with large impacts upon both dryland and irrigated agricultural production. Notable changes in the years of both low rainfall and low allocations were a large shift away from irrigated rice and other irrigated

broadacres crops. Rice production in 2007-08 was less than 1 percent of what it was in 2000-01. There is far more stable production from irrigated vegetables and dairy. Although areas of production of dryland crops stayed similar in the drier years, the volume of production from that area dropped considerably, as many crops failed and were used as hay. Areas of land used for hay production are notably higher in drier times.

- Across the whole Murray Statistical Division, the value of irrigated production in 2007/08 – a year of low rainfall and allocations – was less than half of what it was in 2005/06 where rainfall and allocations were closer to, though still lower than, long term averages.
- The population is ageing, and the 20 to 34 years age group is particularly under-represented. Compared to surrounding areas of the Murray Darling Basin and to Australia as a whole, Central Murray has lower per capita income and an older labour force and population.
- The region has an unemployment rate lower than surrounding areas and the rest of Australia. However, this is likely to reflect younger members of the working age population leaving the region to find work elsewhere, rather than being indicative of a vibrant and growing economy.
- Much of the population is Australian-born, like the surrounding regions. However, there is a relatively smaller Indigenous population than in some other parts of the Murray Darling Basin.
- Compared to the Basin as a whole, the region has historically used proportionally more of its water to irrigate rice, and to a lesser extent other cereals, with proportionately less of its water used to produce grapes, fruits and vegetables. The distinguishing characteristics of Central Murray's water uses are that it is typically for annual crops that are part of global markets, and where costs of production tend to be more variable rather than fixed.
- This has important implications for water availability in the region; it means that there is more flexibility in the land and water use patterns from year to year in this region than other regions. Irrigated agricultural production will vary more from year to year here, as will the apparent overall economics of water use in this region.

1.2 Background

The Stage 1 socioeconomic analysis serves two main objectives of the overall project. Firstly, and most importantly, it profiles Central Murray and its LGAs, including the distinguishing features and characteristics that determine reliance on water and the viability of different ways to plan for a future with less water. Secondly, it builds the scenario planning and modelling capacity required in Stage 2 of the project. In particular, data collected as part of the socioeconomic analysis has been used to develop a regional water use model and has also enabled the development of Central Murray as a distinct region in a global computerised general equilibrium (CGE) model. Modelling results will be presented in the Stage 2 report.

This Stage 1 report therefore presents a snapshot of the key data that have been collected and analysed, either as a distinguishing feature of the region potentially relevant to the scenario planning or as a key model input.

Data are presented in absolute forms for each region, but are mostly analysed on a comparative basis i.e. how this particular region differs from others for each key characteristic. In addition, the data presented are only a snapshot of thousands of data items that have been collected during Stage 1.

Principally, data have been assembled for variables such as regional demographics, labour force, land use, water use, production volumes, production values, industry profile, occupational profiles and business activity. Time series data for many of these variables have also been assembled.

As noted above, much of the data are relevant to the Stage 2 economic modelling. For example, water use and agricultural production data will be used in the water and land use modelling, and labour force, taxation and employment data have been used to develop Central Murray as a region in the CGE model. A detailed input-output table of Central Murray has also been constructed as part of the CGE model development, detailing what the region produces, imports, exports and how the industries of the region interact with each other.

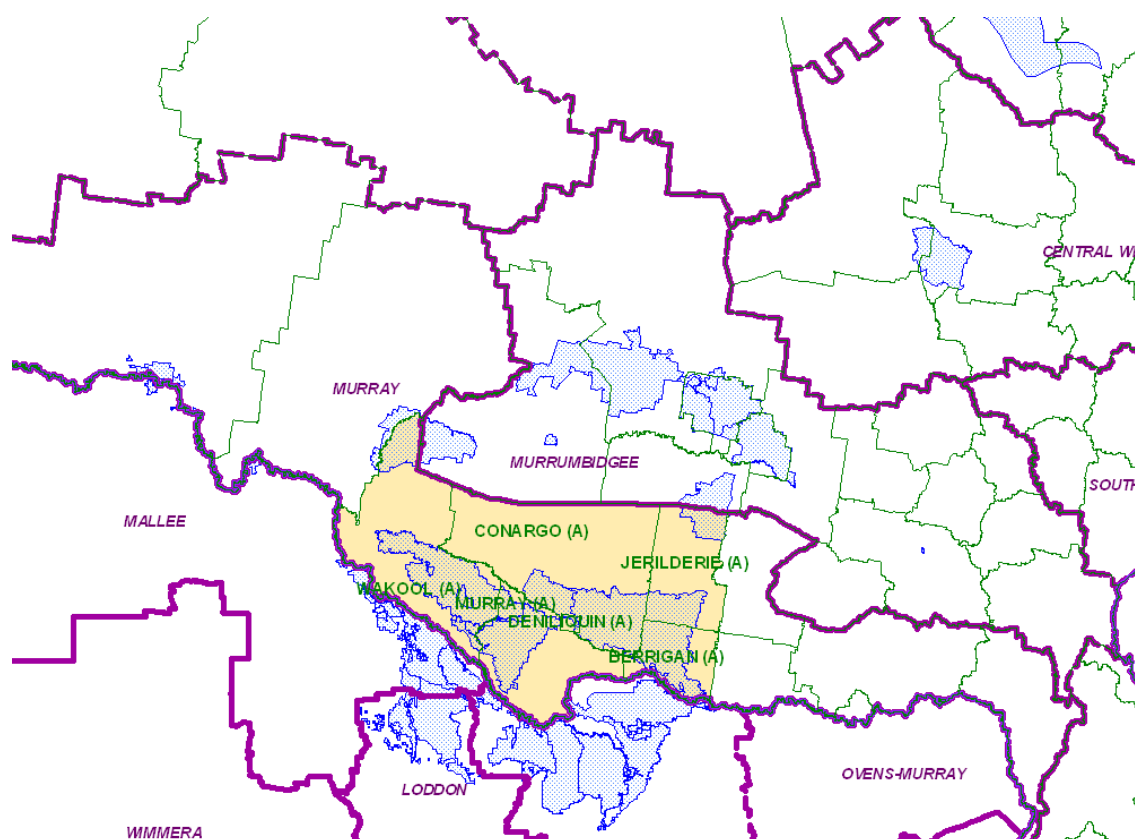
Understanding Central Murray's economic structure in this way is critical to modelling not just the direct impacts of less water use on the water users, but also the impacts of water use across the whole regional economy.

1.3 Central Murray and comparative areas

This project undertakes an economic analysis of Central Murray. The region is located in the Murray statistical division in southern New South Wales and accounts for approximately 26% of the population of the Murray statistical division. Statistical divisions and local government areas are based on the Australian Standard Geographical Classifications published by the Australian Bureau of Statistics (ABS).

Central Murray incorporates six LGAs situated in the Central Murray irrigation area, consisting of the Shire of Berrigan, Shire of Conargo, Municipality of Deniliquin, Shire of Jerilderie, Shire of Murray and Shire of Wakool. The consortium is one of four Council cluster groups of the Riverina and Murray Regional Organisation of Councils (RAMROC).

Central Murray forms the central part of the Murray Statistical Division. Figure 1.1 shows a map of Central Murray and surrounding statistical divisions. These surrounding statistical divisions are used as comparative areas for the social and demographic profiling that follows.

Figure 1.1: Location of the Central Murray Region

The Goulburn and Mallee statistical divisions in Victoria border the Murray statistical division to the south. The Murrumbidgee statistical division in NSW borders the region to the north-east. The Goulburn, Mallee, Murrumbidgee statistical divisions and the rest of Murray statistical division are referred to as ‘surrounding statistical divisions’ in the reporting that follows.

1.4 Socioeconomic snapshot

Table 1.1 provides a brief summary of the current socioeconomic indicators for Central Murray.

Table 1.1: Central Murray at a glance

Indicator	Date	Outcome
Area	2009	26,184km ²
Population	2009	31,323 persons
Population density	2009	1.20 persons per km ²
Total taxable income (ex losses)	2007-08	\$520.06 million
Number of taxpayers	2007-08	17,044 persons
Average taxable income	2007-08	\$30,682
Labour force	Q2 2010	15,631 persons
Employed population	Q2 2010	14,876 persons
Unemployed population	Q2 2010	755 persons

Main industry (1 digit) ¹	2006	A Agriculture, Forestry and Fishing
Main industry (2 digit)	2006	01 Agriculture
Main industry (3 digit)	2006	014 Sheep, Beef Cattle and Grain Farming
Main industry (4 digit)	2006	0149 Other Grain Growing
Defining industry (1 Digit) ²	2006	A Agriculture, Forestry and Fishing
Defining Industry (2 Digit)	2006	39 Motor Vehicle and Motor Vehicle Parts Retailing
Defining industry (3 digit)	2006	050 Agriculture, Forestry and Fishing Support Services
Defining industry (4 digit)	2006	0146 Rice Growing
Industrial diversity ³	2006	0.35
Total offences	2009	6,812
Total gross value agricultural production	2005-06	\$625.3 million

Source: Various

Note: Tourism is not an Australian New Zealand Standard Industrial Classification (ANZSIC) industry as used above – where industries are defined on the basis of the goods and services which they mainly produce. Tourism does not fit as an industry under this standard classification because the tourism industry is defined according to the status of the consumer – i.e. it a demand side concept.

Table 1.2 compares the socioeconomic conditions of Central Murray with the aggregate of surrounding statistical divisions – the Murrumbidgee, Mallee, Goulburn and rest of Murray statistical division - and the whole of Australia.

Table 1.2: Comparative socioeconomic snapshot

Indicator	Year	Central Murray	Surrounding Statistical Divisions	Australia
Population	2009	31,323	550,660	21,955,256
Population density	2009	1.2	2.8	2.9
Median Age	2006	43	37	37
Median weekly household income	2006	\$754	\$826	\$1,025
Mean weekly individual income	2006	\$398	\$412	\$466
Labour force participation rate	2006	59.5%	60.7%	60.4%
Unemployment rate	2010	4.8%	5.5%	5.6%
Australian born (% of population)	2006	88.2%	85.7%	70.9%
Bachelor degree or higher (% of population)	2006	6.5%	7.8%	13.6%

¹ 'Main industry' defined by that industry where the employment is greatest.

² 'Defining industry' determined by the industry with the highest representation in the economy (industry employment divided by total employment) *relative to the Australian average*. The defining industry is therefore a relative concept, highlighting what is distinguishing about this economy relative to others.

³ 'Industrial diversity' determined through location quotients and the Hachman Index. A result of '1' indicates an industrial structure perfectly aligned with the entire Australian economy. The closer the result to '0' the more specialised the economy.

Indigenous population (% of population)	2006	2.2%	3.3%	2.3%
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Source: Various

Table 1.3 presents a more detailed socioeconomic analysis of the towns in Central Murray with populations greater than 200 people, based on ABS defined urban locality boundaries. Deniliquin is the largest town with a population of 7,430 persons in 2009. Moama and Finley also have large populations of 3,330 and 2,053 persons respectively. The three towns all have an average of 2.3 persons per household. Tocumwal has the highest median age, of 54 years, while median household income and median individual income are highest in Barooga.

Table 1.3: Urban centres of Central Murray, 2006

NAME	LGA	Total persons	Indigenous population	Median age	Median individual income per week	Median household income per week	Average household size (persons)
Deniliquin	Deniliquin (C)	7,430	210	41	\$404	\$755	2.3
Moama	Murray (A)	3,330	91	45	\$391	\$760	2.3
Finley	Berrigan (A)	2,053	49	44	\$397	\$716	2.3
Tocumwal	Berrigan (A)	1,861	15	54	\$349	\$625	2.1
Barooga	Berrigan (A)	1,453	14	40	\$418	\$892	2.5
Barham	Wakool (A)	1,134	24	50	\$359	\$636	2.2
Berrigan (L)	Berrigan (A)	898	18	50	\$357	\$624	2.1
Jerilderie (L)	Jerilderie (A)	769	17	48	\$363	\$632	2.2
Mathoura (L)	Murray (A)	654	13	48	\$311	\$552	2.1
Moulamein (L)	Wakool (A)	349	5	44	\$341	\$629	2.2
Wakool (L)	Wakool (A)	213	8	42	\$351	\$741	2.7

Source: ABS Census of Population and Housing, 2006, Basic Community Profile

Greg Murdoch of Murray Shire has advised (pers. comm., 2010) that the councils officially recognised figure for Moama is 4481. This higher figure than identified above comes because council includes two additional collector districts in the Moama population that are not included in the official ABS urban locality boundaries.

1.4.2 Population

The population of Central Murray was 31,323 persons in 2009, or 26% of the overall Murray statistical division. Figure 1.2 illustrates that most of the region is sparsely populated, with population density highest in and around Deniliquin, and in the towns of the south east including Tocumwal, Berrigan, Finley and Barooga.

Patterns in population density appear to be related to the location of the irrigation areas. Not only are the rural areas of a significantly higher population density within the irrigation areas, the larger towns and cities of the region are also typically in close proximity to the irrigation area. By way of quantifying this apparent trend, Access Economics Geographical Information Systems (GIS) calculations indicate that the population density of Central Murray that is within 10 km of an irrigation area is 1.6 persons per square kilometre, compared to only 0.22 beyond 10 kilometres from an irrigation area.

Figure 1.2: Central Murray population density

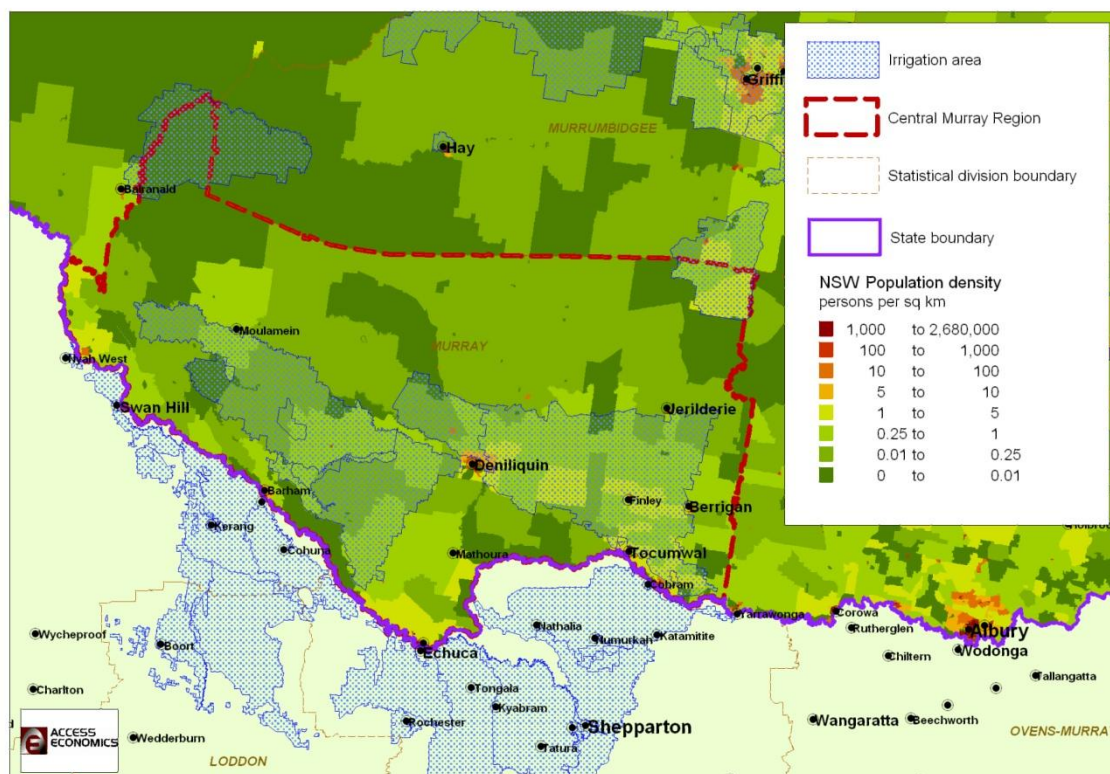


Table 1.4 shows that the whole of Murray statistical division had a population of 118,540 in 2009, less than the population of the Goulburn statistical division, but greater than the Mallee

and Murrumbidgee statistical divisions. Central Murray accounts for approximately 26% of the population of the Murray statistical division.

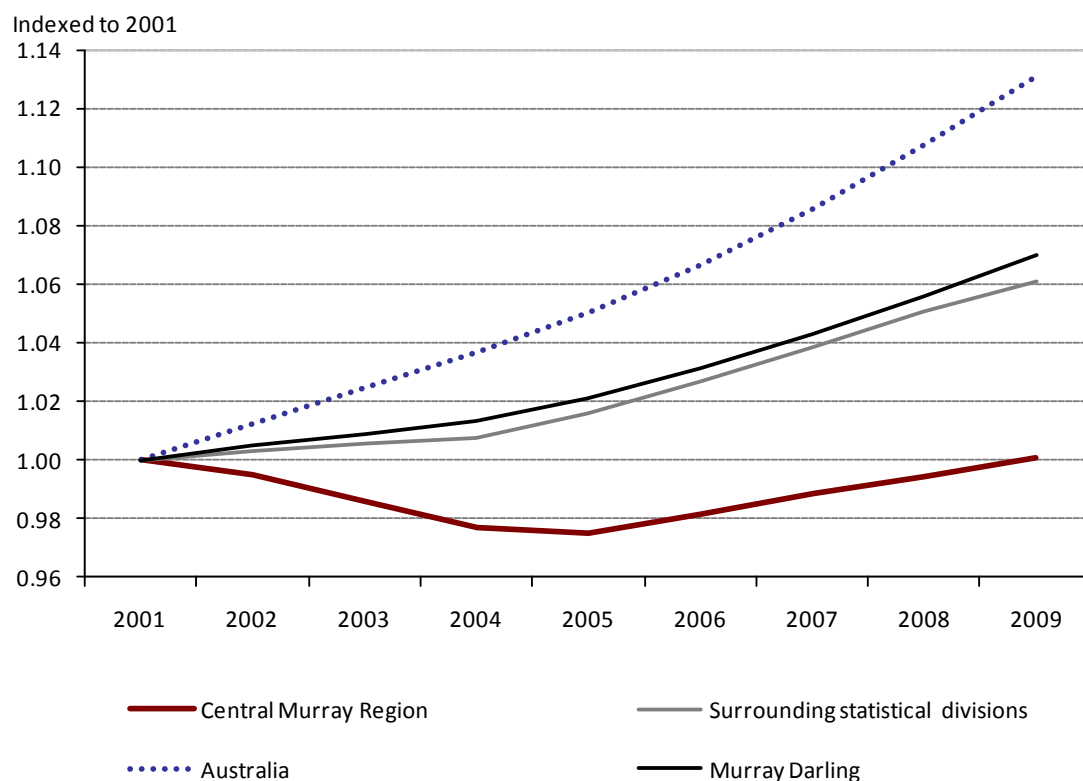
Table 1.4: Population by region, 2007-09

Region	2007	2008	2009
Central Murray NSW	30,948	31,122	31,323
Rest of Murray NSW SD	85,629	86,501	87,217
Murrumbidgee NSW SD	154,935	156,552	158,593
Goulburn Vic SD	205,295	208,197	210,114
Mallee Vic SD	92,896	93,800	94,736
Murray NSW SD	116,577	117,623	118,540
NSW	6,904,942	7,014,887	7,134,421

Source: ABS: 3218.0 Regional Population Growth Estimates by statistical local area and local government area, 2001-2009.

The population in Central Murray decreased by 1.2% over the five year period between 1996 and 2001, and a further decline of 1.5% occurred between 2001 and 2006. Conversely the rest of the Murray statistical division experienced population growth of 3.5% between 2001 and 2006.

However Chart 1.1 shows that Central Murray has experienced steady growth of an average 0.6% per year since 2006. The rest of the Murray statistical division and the surrounding statistical divisions have also experienced population growth since 2007. Population growth in Central Murray remains significantly lower than Australia's average growth of approximately 2% per year since 2007. Despite recent growth, overall growth in Central Murray over the eight year period to 2009 is 0%.

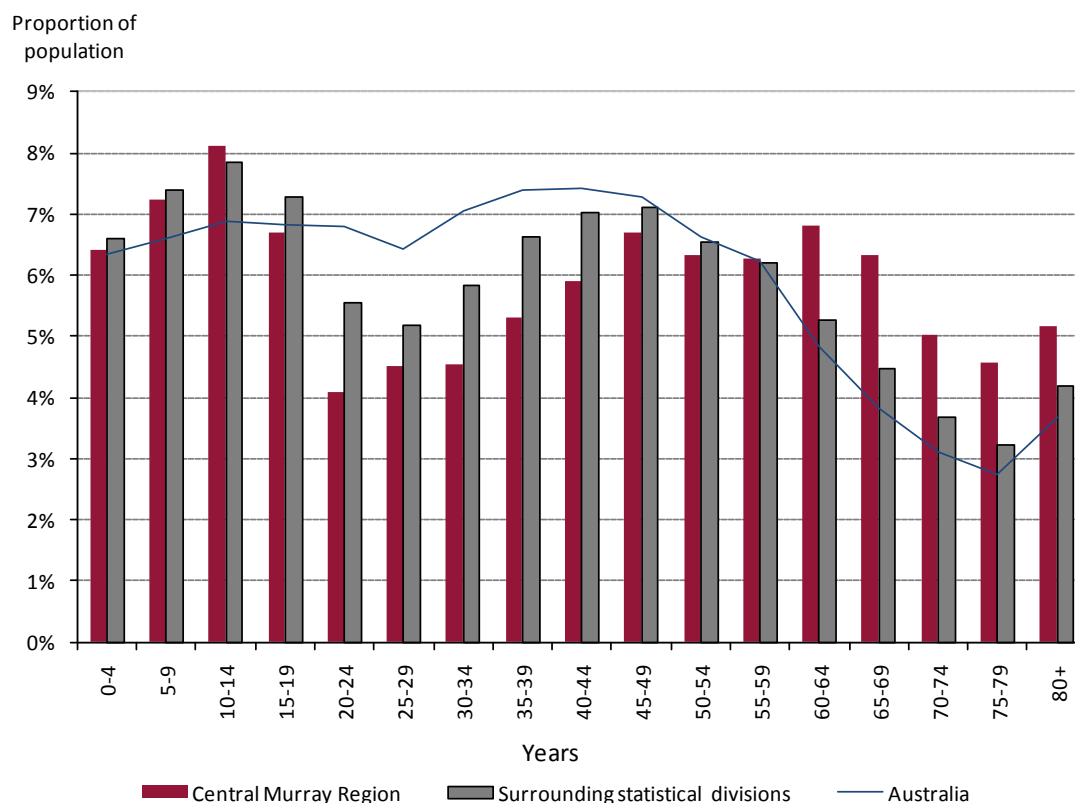
Chart 1.1: Population growth by region, 2001-09

Source: ABS: 3218.0 Regional Population Growth Estimates by statistical local area and local government area, 2001-2009.

1.4.3 Age

The age composition of Central Murray is shown in Chart 1.2. Only 13.1% of the population are aged between 20 and 35 years in Central Murray, reflecting the trend of young adults leaving the area temporarily in pursuit of education or exiting the region altogether. However 28.5% of the population are under 20 years of age. The high proportion of the population aged under 20 years lessens the risk of future population decline in the region.

The chart also shows the age distribution of Central Murray in comparison to the rest of Murray statistical division, surrounding statistical divisions and the whole of Australia. Central Murray has a lower proportion of its population aged 15 to 45 years and a higher proportion of its population aged over 50 years.

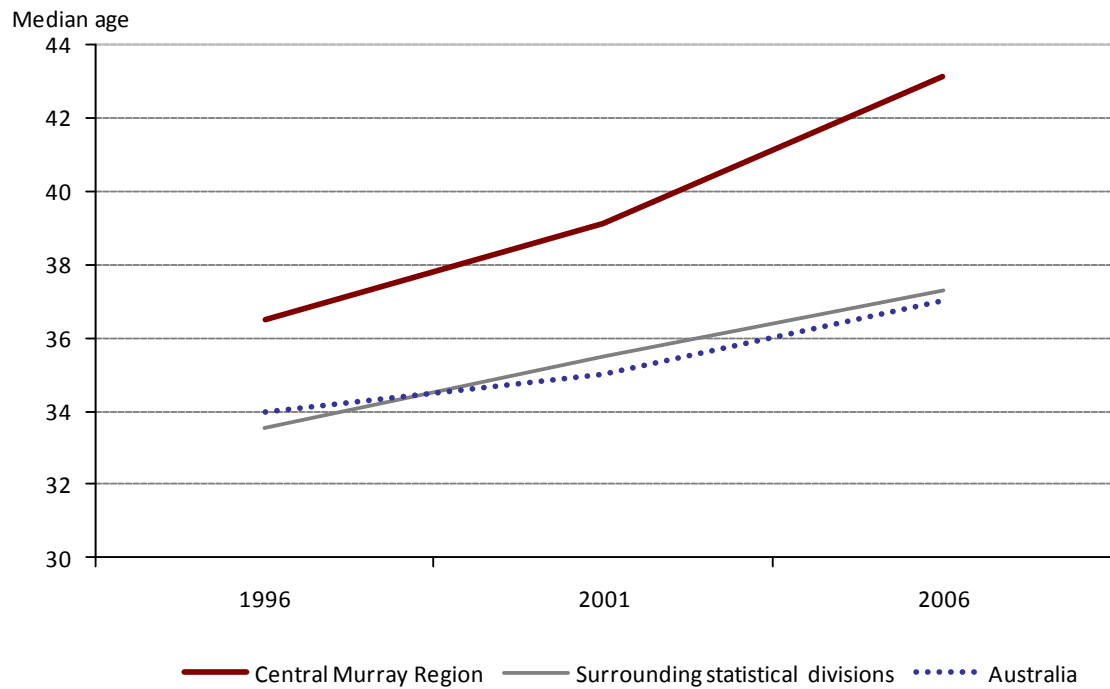
Chart 1.2: Age composition by region, 2006

Source: ABS 2001.0, Census of Population and Housing, 2006, Basic Community Profile.

As a result of having a greater proportion of the population aged over 50 years, the median age in Central Murray was considerably higher than the median ages of the surrounding statistical divisions and the whole of Australia between 1996 and 2006. The median age has increased in Central Murray from just over 36 years in 1996 to over 43 years in 2006, as shown in Chart 1.3.

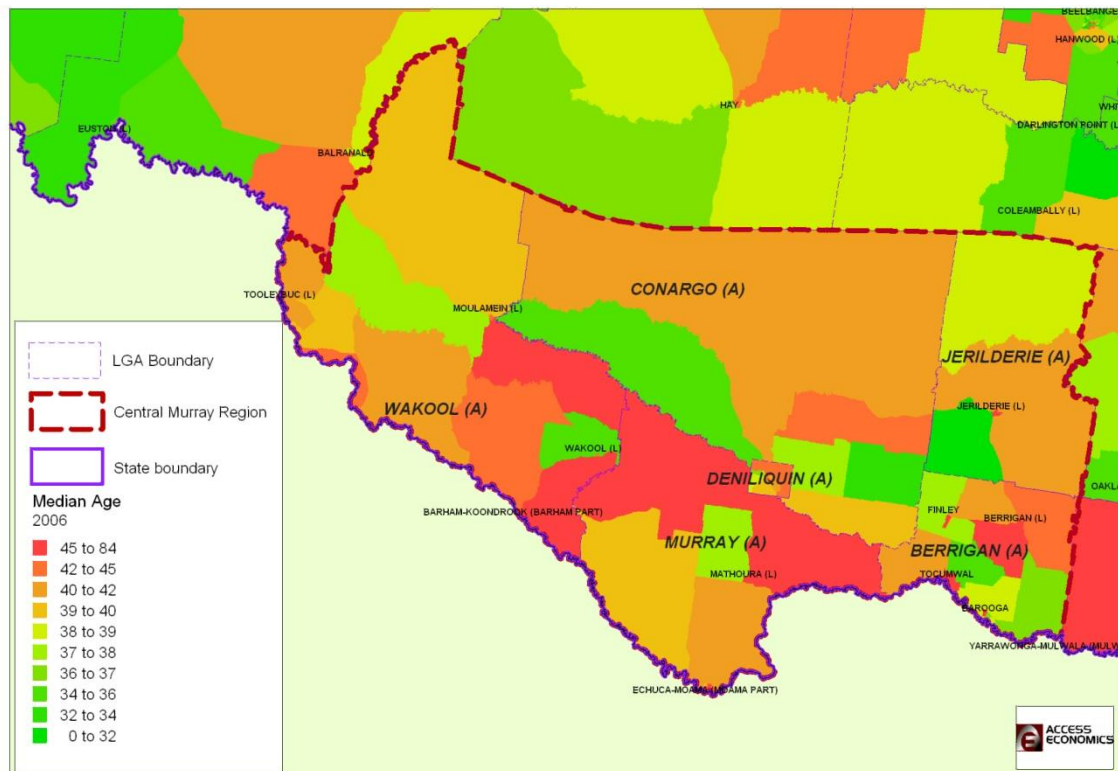
Figure 1.3 shows that within Central Murray, the median age is highest in the Murray and Wakool LGAs.

Chart 1.3: Median age by region, 1996-2006



Source: ABS: 2003.0, Census of Population and Housing, 2006, Time Series Profile.

Figure 1.3: Median age within Central Murray

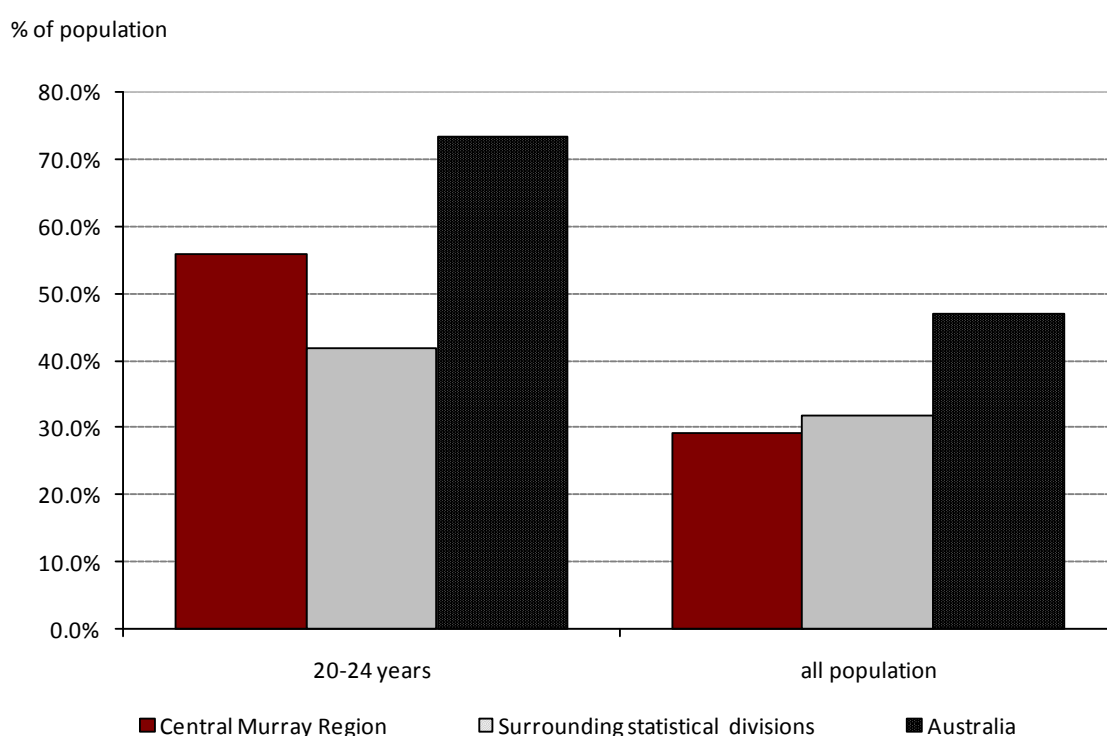


1.4.4 Education

Chart 1.4 shows that the population of Central Murray has relatively low educational attainment in comparison to the rest of Murray statistical division, surrounding statistical areas and all of Australia.

The chart shows that in all regions a greater proportion of the 20-24 year old population completed Year 12 than that of the total population. This depicts the trend towards higher educational attainment in the younger generation. In 2006, Central Murray had a greater proportion of its population aged 20-24 years complete Year 12 than the surrounding statistical divisions, although it had a lower rate of high school completion than the rest of Murray statistical division and the Australia-wide population.

Chart 1.4: Population with Year 12 or equivalent education, 2006



Source: ABS 2001.0, Census of Population and Housing, 2006, Basic Community Profile.

Table 1.5 shows the highest level of educational attainment in Central Murray. Some 5.4% of the population had a Bachelor degree in 2006, with 0.4% having obtained a postgraduate degree. The rest of Murray statistical division and surrounding statistical divisions had a higher proportion of the population with a degree. The proportion of the population with degrees was significantly higher Australia-wide.

Table 1.5: Highest level of education attainment in Central Murray, 2006

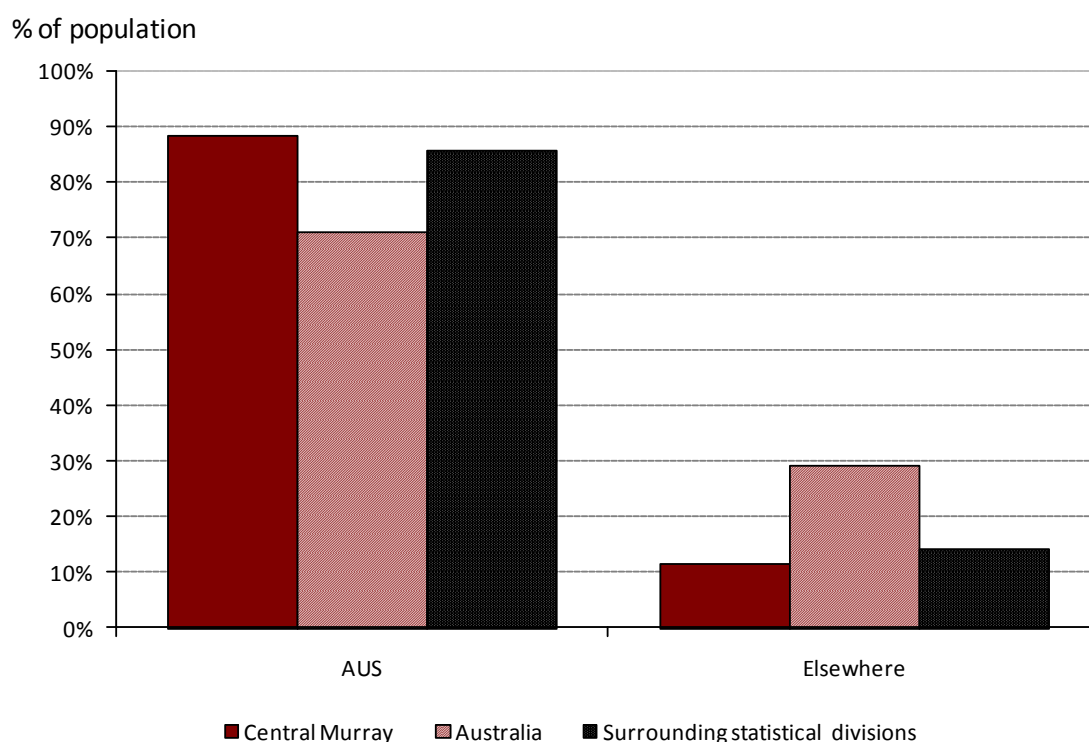
	Central Murray	Surrounding statistical divisions	Australia
Bachelor degree	5.4%	6.0%	10.1%
Postgraduate Degree	0.4%	0.8%	2.3%
Total higher degrees	28.8%	29.4%	35.8%

Source: ABS 2001.0, Census of Population and Housing, 2006, Basic Community Profile.

1.4.5 Ethnicity

Chart 1.5 shows that 88.2% of Central Murray's population in 2006 was born in Australia.

The surrounding statistical divisions - Mallee, Goulburn, Murrumbidgee and the rest of Murray statistical division – all have similar rates of ethnicity to that of Central Murray. Australia-wide data shows a much lower proportion of the population born in Australia (70.9%), as the capital cities in Australia attract more immigrants than the regional areas of NSW.

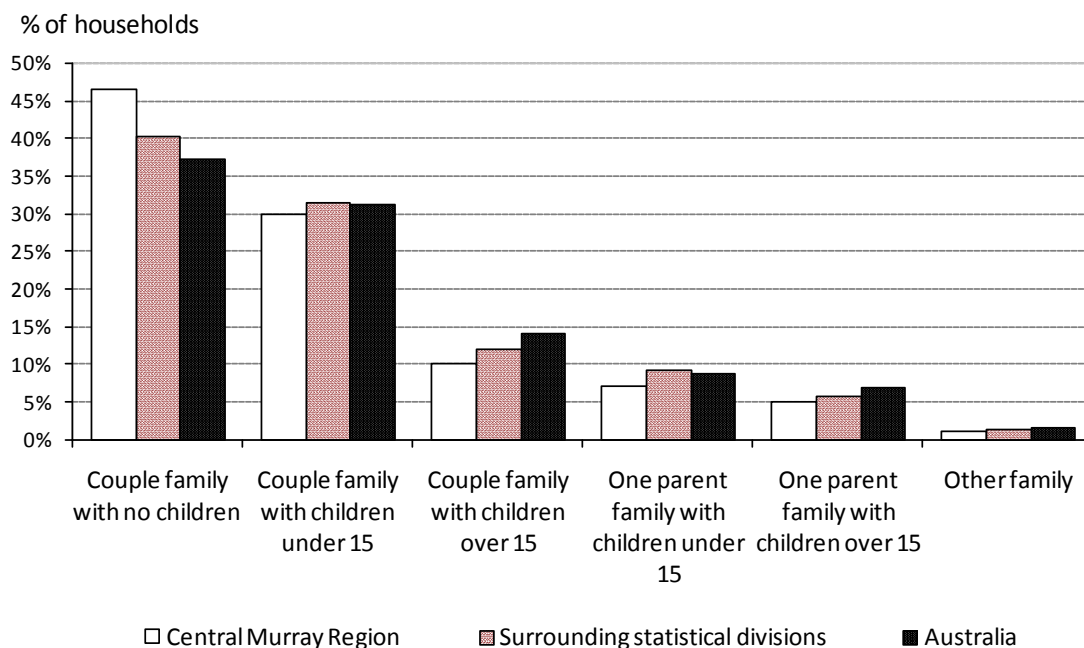
Chart 1.5: Share of population born in Australia, 2006

Source: ABS 2001.0, Census of Population and Housing, 2006, Basic Community Profile.

Of the overseas born in the 2006 Central Murray population, most were born in the United Kingdom (679), New Zealand (239), Italy (109) and Netherlands (106).

1.4.6 Household size and composition

Chart 1.6 shows that Central Murray has a higher proportion of couples with no children than other regions.

Chart 1.6: Household composition by region, 2006

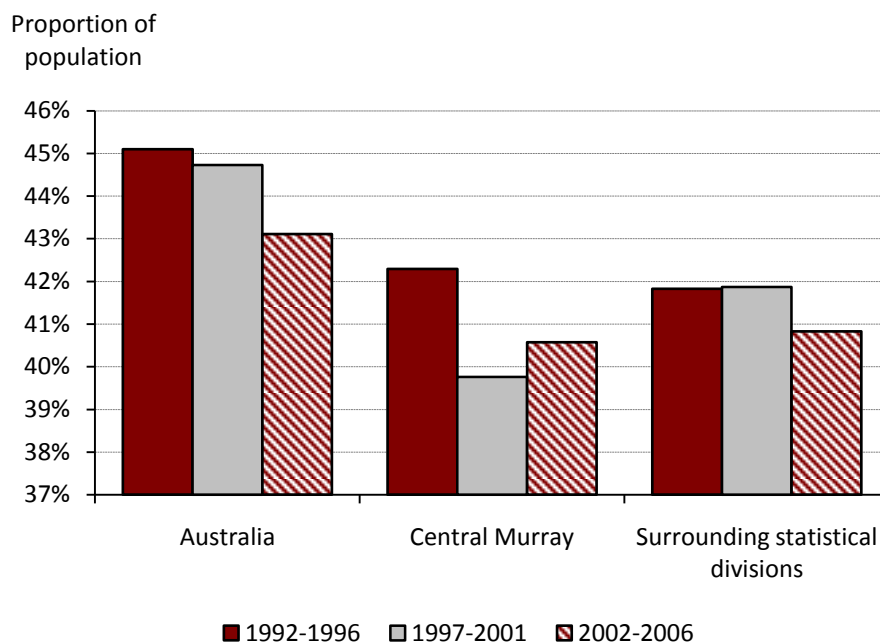
Source: ABS 2001.0, Census of Population and Housing, 2006, Basic Community Profile.

The average household size decreased in Central Murray and surrounding areas between 1996 and 2006. Across Australia the average household size decreased between 1996 and 2001, but remained constant between 2001 and 2006. Central Murray has a comparatively lower average household size of 2.4 persons in 2006, compared to the Australian average of 2.6 persons.

1.4.7 Migration

Chart 1.7 shows the proportion of people who have moved houses in the period between 1992 and 2006. Over this period, including in the 2002 to 2006 period, Central Murray has had a slightly less migratory population than the whole of Australia, but very similar to that of the surrounding Statistical Divisions. In Australia 43% of the population moved houses in the five years between 2001 and 2006. The Central Murray Region and surrounding statistical divisions experienced a smaller movement of just less than 41% of the population over the same period.

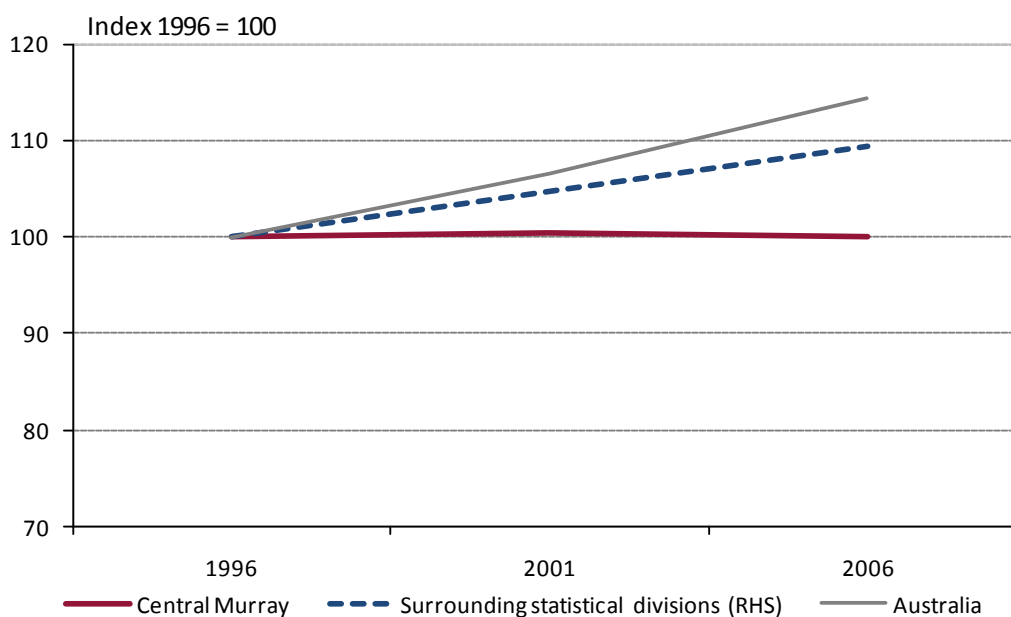
In Australia and the statistical divisions surrounding Central Murray Region, the proportion of people who have moved has declined for each five year period between 1992 and 2006. However in Central Murray the proportion of people that moved decreased between 1992 to 2001, but then increased between 2002 and 2006. The increase in the number of movements in the Region may be due to the drought in 2002.

Chart 1.7: Proportion of people who changed their address (five year period)

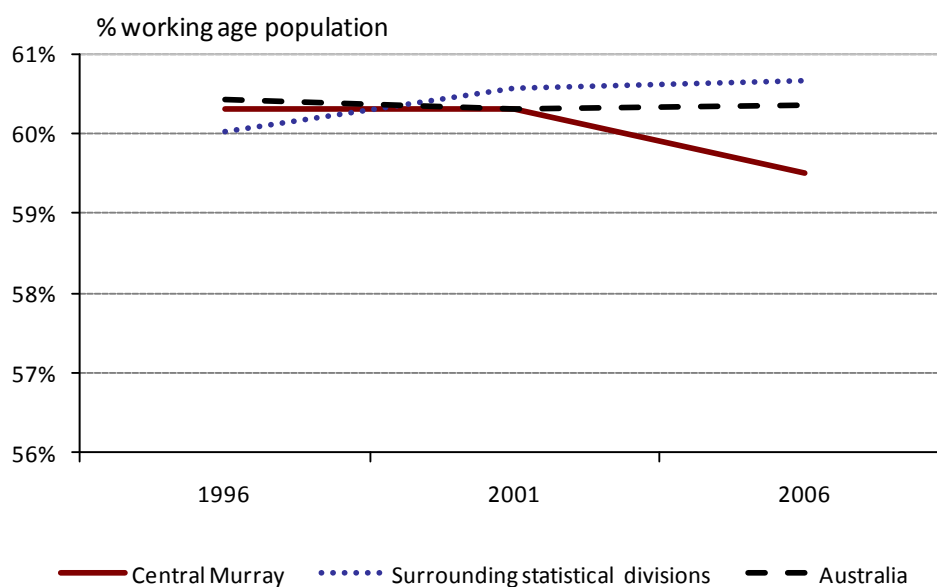
Source: ABS: 2003.0, Census of Population and Housing, 2006, Time Series Profile.

1.4.8 Labour force

The labour force of Central Murray currently comprises 15,631 persons. Chart 1.8 shows that the size of the labour force in Central Murray remained stable between 1996 and 2006. The surrounding areas experienced relatively modest growth in the size of the labour force, but not as fast as growth across Australia overall.

Chart 1.8: Size of labour force by region, 1996-2006

Source: ABS: 2003.0, Census of Population and Housing, 2006, Time Series Profile, and

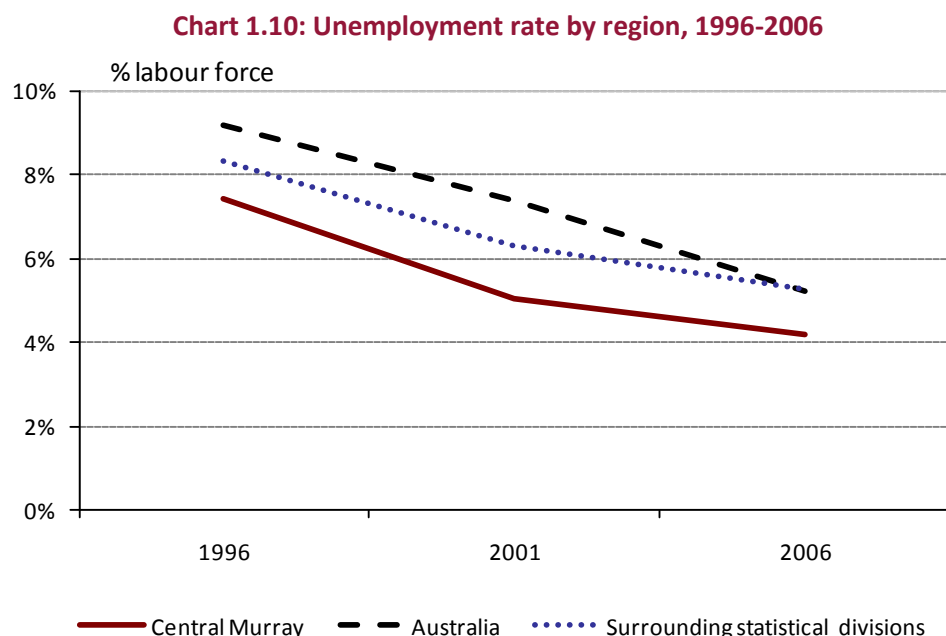
Chart 1.9: Labour force participation by region, 1996-2006

Source: ABS: 2003.0, Census of Population and Housing, 2006, Time Series Profile.

Chart 1.9 (above) shows that labour force participation in Central Murray remained stable between 1996 and 2001, before dropping in 2006 to 59.1%. Labour force participation in the surrounding statistical divisions and Australia-wide remained stable between 2001 and 2006. In 2006 labour force participation was comparatively lower in Central Murray than in all surrounding regions.

1.4.9 Employment and unemployment

Some 14,876 people are employed in Central Murray as of June 2010, and 755 are unemployed, giving an unemployment rate of 4.8%. Central Murray has a significantly lower unemployment rate than the surrounding regional areas (5.5 %), and Australia at large (5.6%). This trend of lower unemployment in Central Murray has existed for many years, as shown in Chart 1.10. Over the ten years to 2006, unemployment dropped in all regions.



Source: ABS: 2003.0, Census of Population and Housing, 2006, Time Series Profile.

Unemployment levels rose in all regions following the global financial crisis in 2008, though the trend over the past year has once again been downwards.

1.4.10 Income

Median weekly household income within Central Murray in 2006 averaged \$754, less than the median of \$826 for the surrounding statistical divisions and \$1,025 for all of Australia. Within Central Murray, median household incomes are lowest in Conargo, and highest in parts of the Wakool, Murray Berrigan, Deniliquin and Jerilderie LGAs (Figure 1.4).

Chart 1.11 shows that the median individual income of Central Murray is much lower than the Australian average. This is because regional areas typically have lower individual incomes, with farming as a predominant livelihood. The median income of the rest of Murray statistical division and surrounding statistical divisions are similar to that of Central Murray, although between 2001 and 2006 growth in median income was comparably slower in Central Murray. Between 1996 and 2006, median individual income in Central Murray has grown from \$258 per week to \$398 per week.

Figure 1.4: Median household income throughout Central Murray

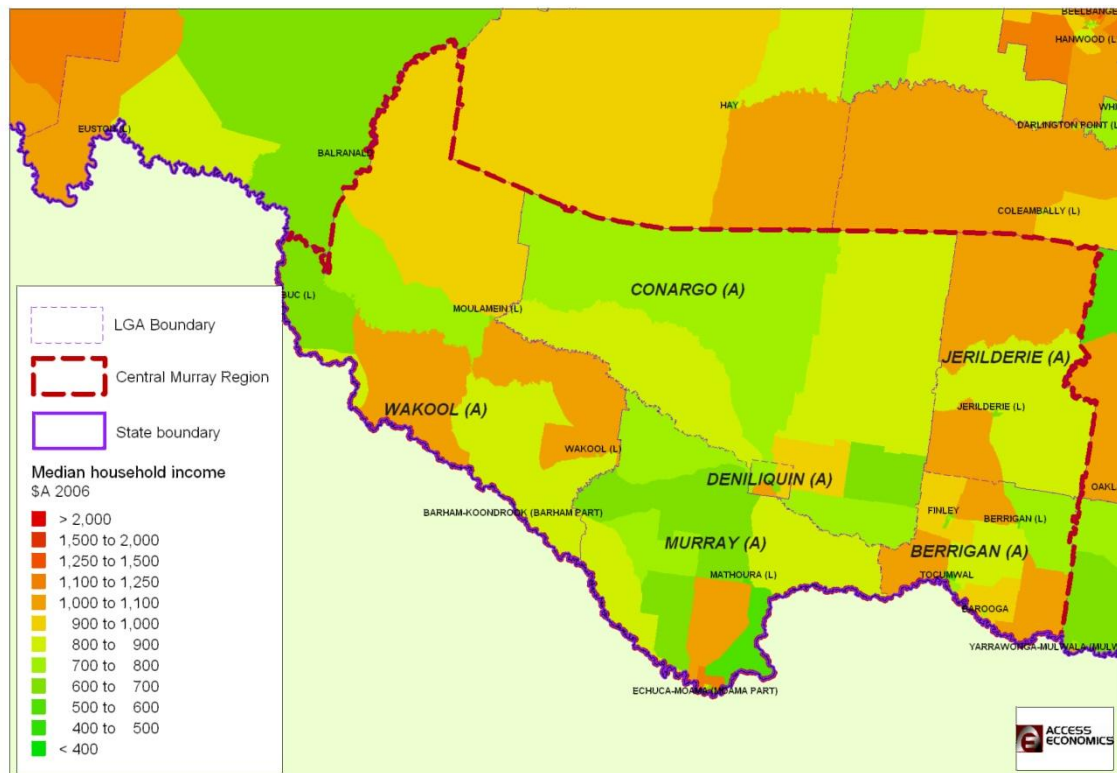
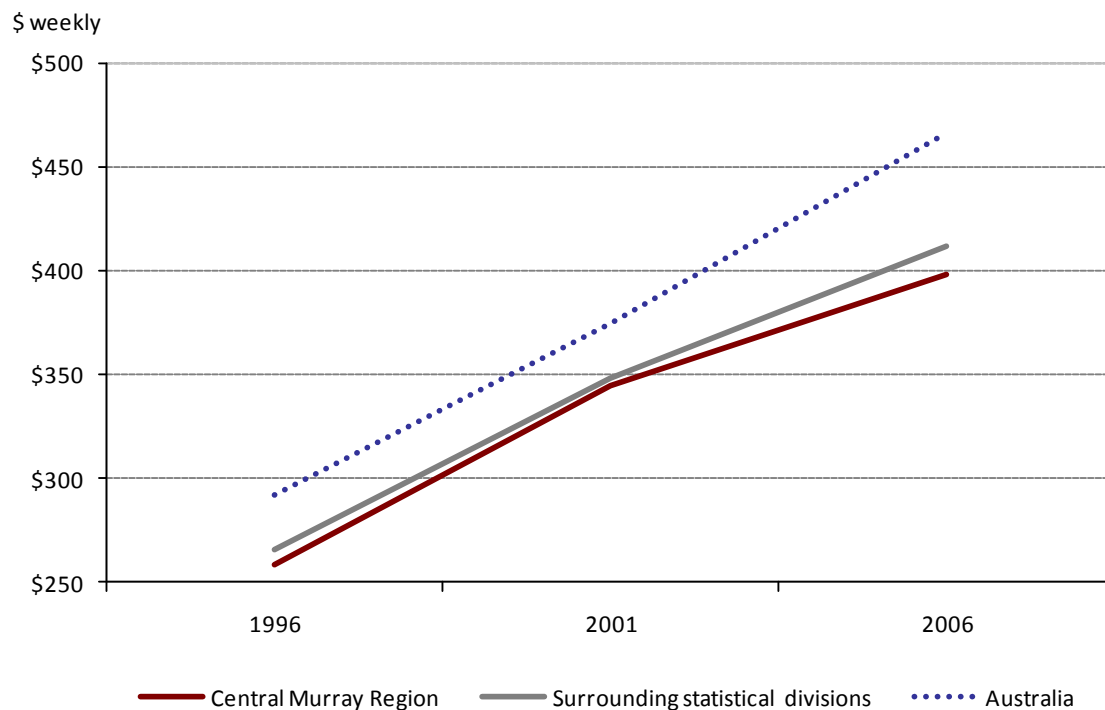


Chart 1.11: Median individual income by region, 1996-2006



Source: ABS: 2003.0, Census of Population and Housing, 2006, Time Series Profile.

1.4.11 Building activity

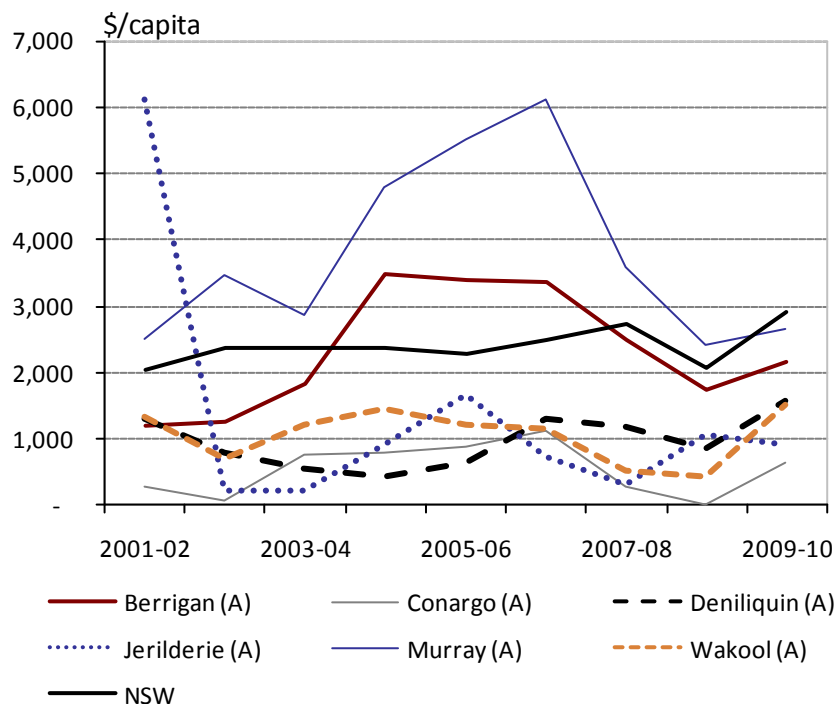
Table 1.6 provides the value of total building activity for 2001-02 to 2009-10, where total building activity comprises residential and non-residential dwellings. While the Murray statistical division recorded growth of 121% over the nine year period, the Central Murray sub-statistical division only saw growth of 8% in the value of total building activity; the rest of the Murray statistical division recorded rapid growth of 185% between 2001-02 and 2009-10.

Table 1.6: Value of total building activity

\$'000	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
NSW	13,390,939	15,731,501	15,783,135	15,842,973	15,288,723	16,939,392	18,848,304	14,531,774	20,724,973
Non-metro NSW	4,101,908	4,537,331	5,270,717	5,300,871	5,638,288	5,905,829	5,673,073	4,562,839	7,227,481
Sydney SD	9,289,031	11,194,170	10,512,418	10,542,102	9,650,435	11,033,563	13,175,231	9,968,936	13,497,491
Murray SD	152,869	205,633	242,519	255,970	285,436	297,347	254,648	233,333	338,230
Central Murray	54,734	42,105	44,881	71,670	78,085	86,976	58,301	42,157	58,949
Rest of Murray SD	98,135	163,528	197,638	184,300	207,351	210,372	196,347	191,176	279,281
Berrigan	9,795	10,172	14,774	27,854	27,433	27,863	20,992	14,843	18,483
Conargo	503	110	1,342	1,360	1,523	1,916	459	-	1,057
Deniliquin	10,740	6,524	4,502	3,476	5,084	9,909	9,162	6,627	12,025
Jerilderie	11,765	386	367	1,597	2,870	1,242	513	1,721	1,487
Murray	15,367	21,575	18,067	30,569	35,620	40,813	24,856	17,041	19,190
Wakool	6,564	3,338	5,829	6,814	5,555	5,234	2,321	1,925	6,707

Source: ABS cat no 8731.0

The value of total building activity on a per capita basis - a more meaningful indicator of the health of the regional economy over time than absolute figures - is provided in Chart 1.12. Overall, building activity per capita in Central Murray has been less than the State average, a function of two LGAs with higher than State average results and four with lower. The Berrigan and Murray LGAs saw the level of the value of building per capita higher than that of NSW as a whole (up until the last couple of years under question). However, Conargo, Jerilderie, Deniliquin and Wakool have hovered around \$1,000 of activity per capita, well below the average of \$2,500 across the state. Value of building activity per capita peaked in the Central Murray between 2005 and 2007.

Chart 1.12: Value of total building activity per capita

Source: ABS cat no 8731.0

1.4.12 Industry profile

Chart 1.13 shows that Central Murray has a much greater proportion of employees working in the agriculture, forestry and fisheries industry than the rest of Murray statistical division, surrounding statistical divisions and the whole of Australia. Some 24.8% of employees in Central Murray worked in the agriculture, forestry and fishery sector in 2006. About 16.9% are employed in the manufacturing, construction and utilities sector.

The rest of the Murray statistical division relies significantly less on the agriculture sector for employment, with a higher proportion of employment in manufacturing, construction and utilities. The surrounding Mallee, Murrumbidgee and Goulburn statistical divisions also had a lower proportion of workers employed in the agriculture, forestry and fishery sector (19.5%, 13.3% and 12.3% of total employees respectively) in 2006.

Chart 1.13: Share of people employed by industry, 2006 (a)

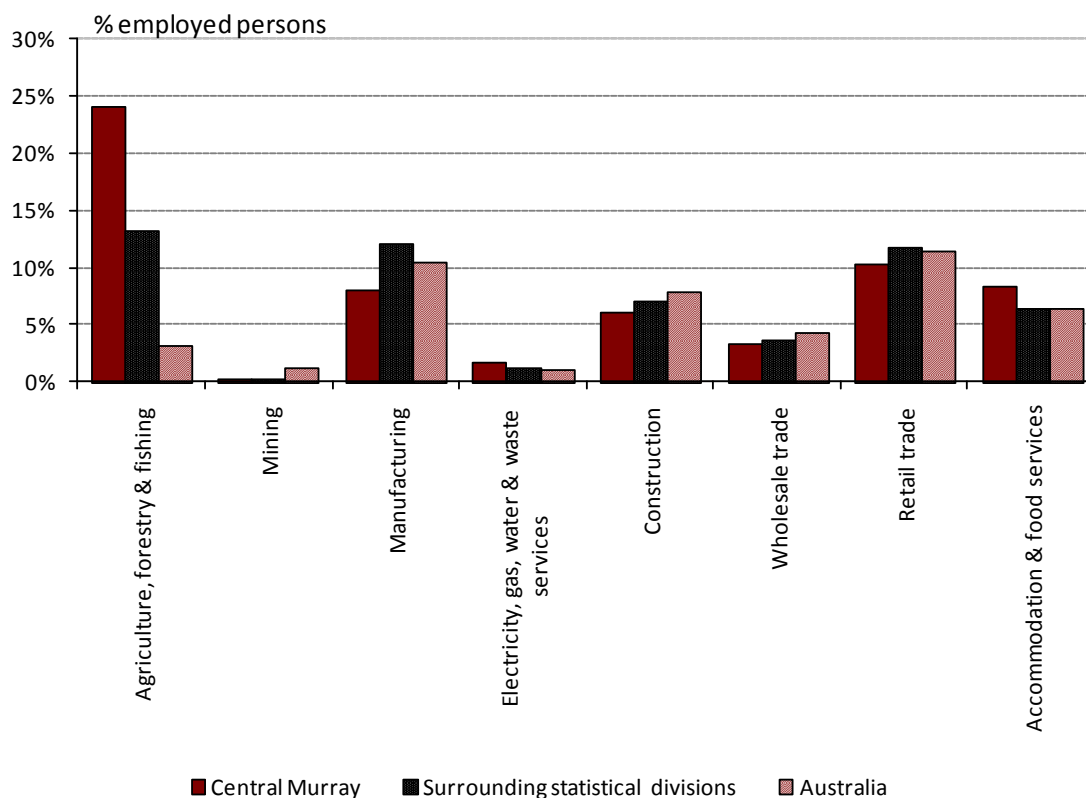


Chart 1.14: Share of people employed by industry, 2006 (b)

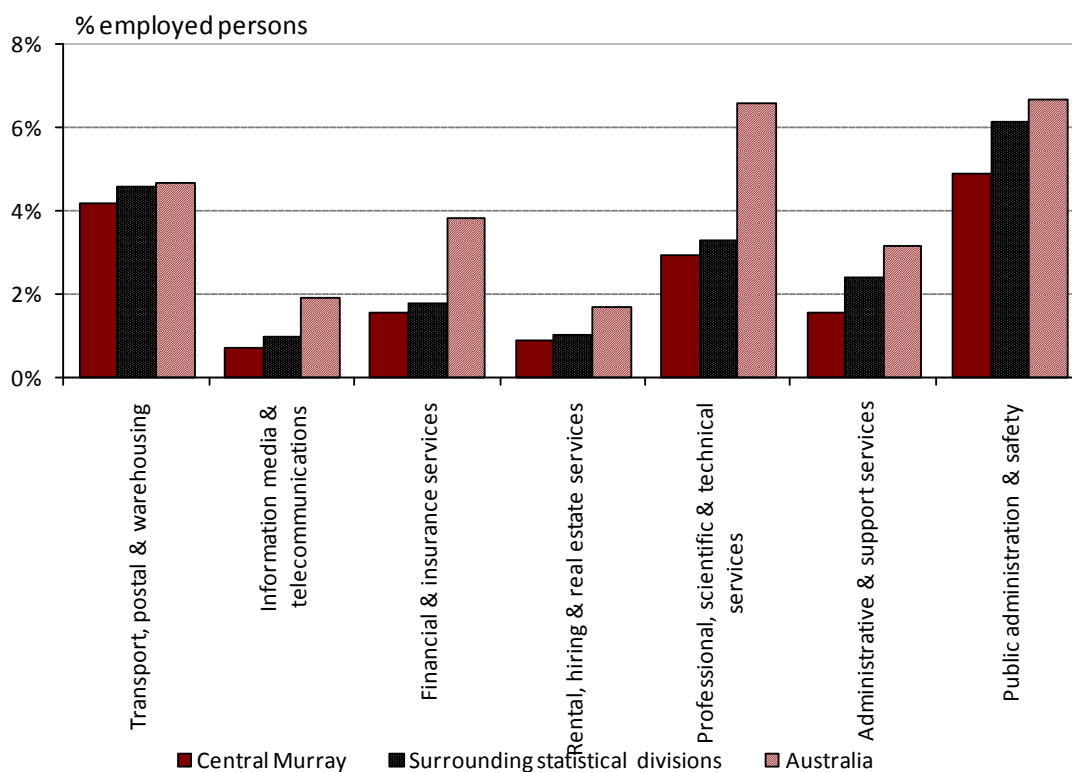
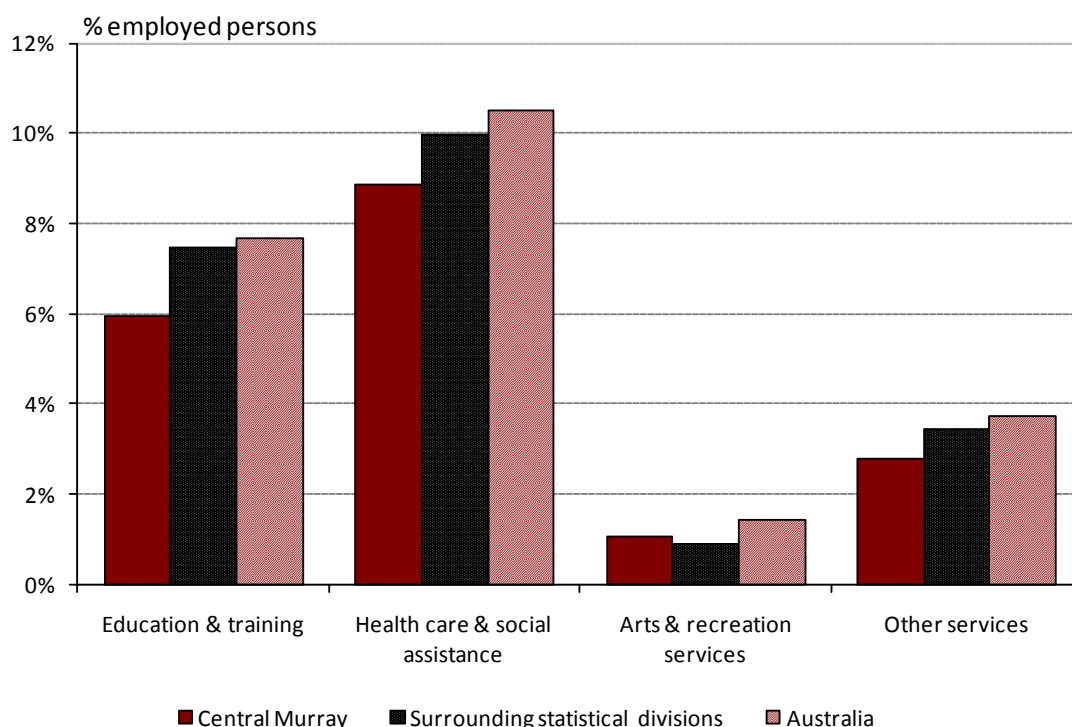


Chart 1.15: Share of people employed by industry, 2006 (c)

Source: ABS: 2003.0, Census of Population and Housing, 2006, Time Series Profile.

Since 1996, the manufacturing, construction and utilities, the retail and wholesale trade and accommodation, and the education and health service sectors have all grown in Central Murray. However between 1996 and 2006 the agriculture, forestry and fishing sector experienced a decline from 3,955 employees to 3,206 employed persons (Table 1.7). This is a 19% decline in employees in that decade. The majority of this reduction occurred between 2001 and 2006, indicating that the drought, which started in 2002, may have significantly influenced employment numbers in that sector in particular.

As a percentage of the employed population in the Central Murray Region, the agricultural, forestry and fisheries sector also experienced a decline. Some 31.7% of the Region's workers were employed in the sector in 1996, and by 2006 an estimated 24.8% of the employed population remained working in the sector.

Despite the decline in agricultural employment, other industries have grown such that the total employed population has remained steady between 2001 and 2006. The main growth industries in Central Murray between 2001 and 2006 have been health care and social assistance, construction, retail trade, public administration and education.

Table 1.7: Employment by industry, Central Murray Region, 1996-2006

Industry sector	Number of employed persons			Per cent of employed population		
	1996	2001	2006	1996	2001	2006
Mining	9	9	18	0.1%	0.1%	0.1%
Manufacturing, construction and utilities	1,703	1,890	2,102	13.7%	14.6%	16.2%
Retail and wholesale trade and accommodation	2,631	2,885	2,902	21.1%	22.3%	22.4%
Transport, postal & warehousing	530	547	558	4.3%	4.2%	4.3%
Other services	2,004	2,011	2,189	16.1%	15.5%	16.9%
Education and health services	1,632	1,707	1,973	13.1%	13.2%	15.2%
Agriculture, forestry & fishing	3,955	3,914	3,206	31.7%	30.2%	24.8%
Total employed population	12,464	12,963	12,948	100.0%	100.0%	100.0%

Source: ABS: 2003.0, Census of Population and Housing, 2006, Time Series Profile.

Table 1.8 shows the number of employed persons by industry in the statistical divisions surrounding the Central Murray Region. The number of employed persons in the agriculture, forestry and fisheries sector increased marginally between 1996 and 2001 before the drought in 2002. Between 2001 and 2006 there was a 15% loss of employees in the agriculture, forestry and fisheries sector in surrounding statistical divisions. The number of employed persons by industry in Australia is shown on Table 1.9. Similarly to the surrounding statistical divisions, the number of employed persons in the agriculture, forestry and fisheries sector increased by 2% between 1996 and 2001 before the drought in 2002. Between 2001 and 2006, employment in the sector declined by 15%, slightly less than the decline in Central Murray.

Table 1.8: Employment by industry, surrounding statistical divisions, 1996-2006

Industry sector	Number of employed persons			Per cent of employed population		
	1996	2001	2006	1996	2001	2006
Mining	385	421	503	0.2%	0.2%	0.2%
Manufacturing, construction and utilities	36,339	42,206	46,832	18.4%	19.9%	20.9%
Retail and wholesale trade and accommodation	44,723	48,924	50,044	22.7%	23.0%	22.3%
Transport, postal & warehousing	8,525	9,450	10,598	4.3%	4.4%	4.7%
Other services	40,017	40,760	45,927	20.3%	19.2%	20.5%
Education and health services	31,696	34,949	40,057	16.1%	16.4%	17.8%
Agriculture, forestry & fishing	35,648	35,888	30,453	18.1%	16.9%	13.6%
Total employed population	197,333	212,598	224,414	100.0%	100.0%	100.0%

Source: ABS: 2003.0, Census of Population and Housing, 2006, Time Series Profile.

Total persons employed in Australia across all sectors increased over the time period, and as such, employment in the agriculture, forestry and fisheries sector declined as a percent of the total employed population over the decade.

Table 1.9: Employment by industry, Australia, 1996-2006

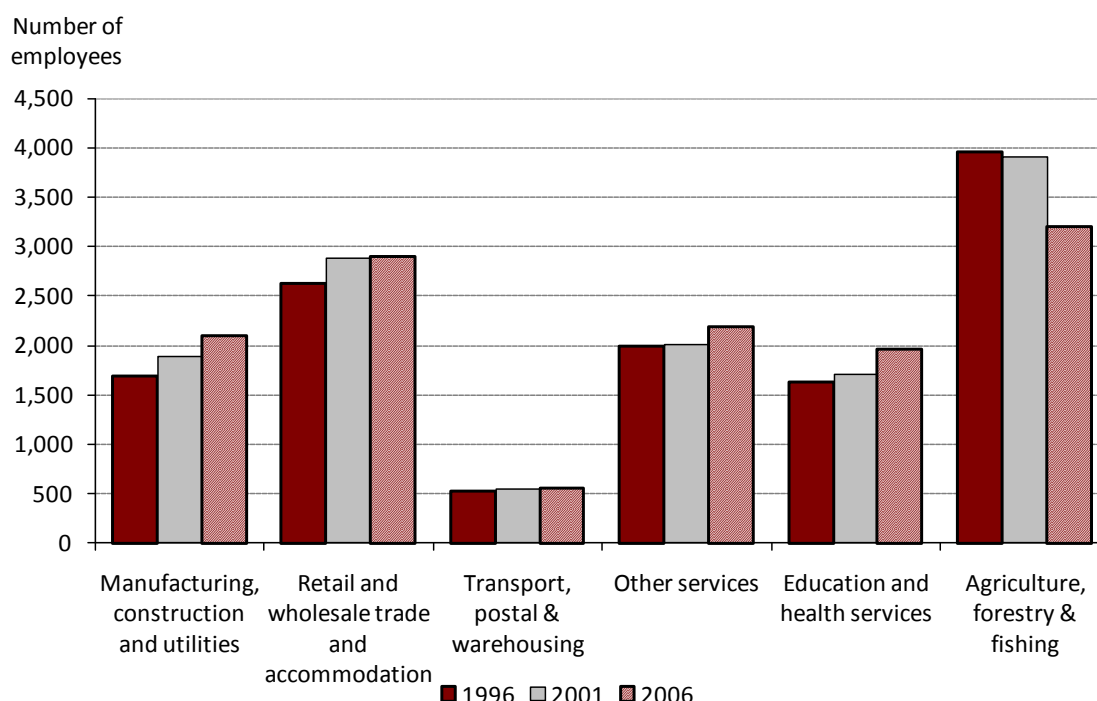
Industry sector	Number of employed persons			Per cent of employed population		
	1996	2001	2006	1996	2001	2006
Mining	86,261	75,178	106,894	1.2%	0.9%	1.2%

Manufacturing, construction and utilities	1,463,475	1,601,219	1,751,309	19.8%	19.8%	19.7%
Retail and wholesale trade and accommodation	1,677,360	1,881,176	2,004,670	22.7%	23.2%	22.6%
Transport, postal & warehousing	359,157	385,270	427,789	4.9%	4.8%	4.8%
Other services	2,195,480	2,412,105	2,642,168	29.7%	29.8%	29.8%
Education and health services	1,275,375	1,420,357	1,653,949	17.3%	17.5%	18.7%
Agriculture, forestry & fishing	324,330	330,782	280,918	4.4%	4.1%	3.2%
Total employed population	7,381,438	8,106,087	8,867,697	100.0%	100.0%	100.0%

Source: ABS: 2003.0, Census of Population and Housing, 2006, Time Series Profile.

Chart 1.16 shows the employed persons by industry in the Central Murray Region between 1996 and 2006. It highlights the decline in employed persons in the agriculture, forestry and fisheries sector over the decade, while employment in every other sector has increased. As discussed, the net result of this has been largely stable employment overall.

Chart 1.16: Employed persons, Central Murray Region, 1996-2006



Source: ABS: 2003.0, Census of Population and Housing, 2006, Time Series Profile.

1.4.13 Business counts

The number of businesses in the major industries is provided in Table 1.10, with further disaggregation by the number of employees. Across the Central Murray sub-statistical division, agriculture, forestry and fishing was the industry with the most number of businesses in 2007. Almost 60% of businesses engaged in agricultural pursuits were non-employing (that is, the businesses did not employ external staff), whereas only three businesses employed more than 200 staff (all three businesses were located in the Wakool LGA). Property and business services had the second largest number of businesses across the Central Murray, with construction businesses representing the third largest industry.

Table 1.10: Central Murray - business counts (by number of employees), 2007

	Non employing	1-19 persons	20-199 persons	200+ persons	Total persons
Agriculture forestry and fishing	1,062	669	45	3	1,779
Mining	0	0	0	0	0
Manufacturing	54	78	9	0	141
Electricity gas and water supply	9	6	0	0	15
Construction	198	129	3	0	330
Wholesale trade	33	42	9	0	84
Retail trade	93	123	12	0	228
Accommodation cafes and restaurants	63	105	21	0	189
Transport and storage	87	81	15	0	183
Communication services	6	18	0	0	24
Finance and insurance	114	15	0	0	129
Property and business services	360	78	3	0	441
Education	6	6	3	0	15
Health and community services	33	39	6	0	78
Cultural and recreational services	18	15	3	0	36
Personal and other services	30	30	0	0	60

Source: ABS cat no 8165.0

1.4.14 Occupational profile

Chart 1.17 shows the occupational distribution in Central Murray compared with surrounding areas and Australia. Central Murray has a much larger proportion of managers and lower proportion of professionals than the other areas.

Chart 1.17: Occupational distribution, 2006 (a)

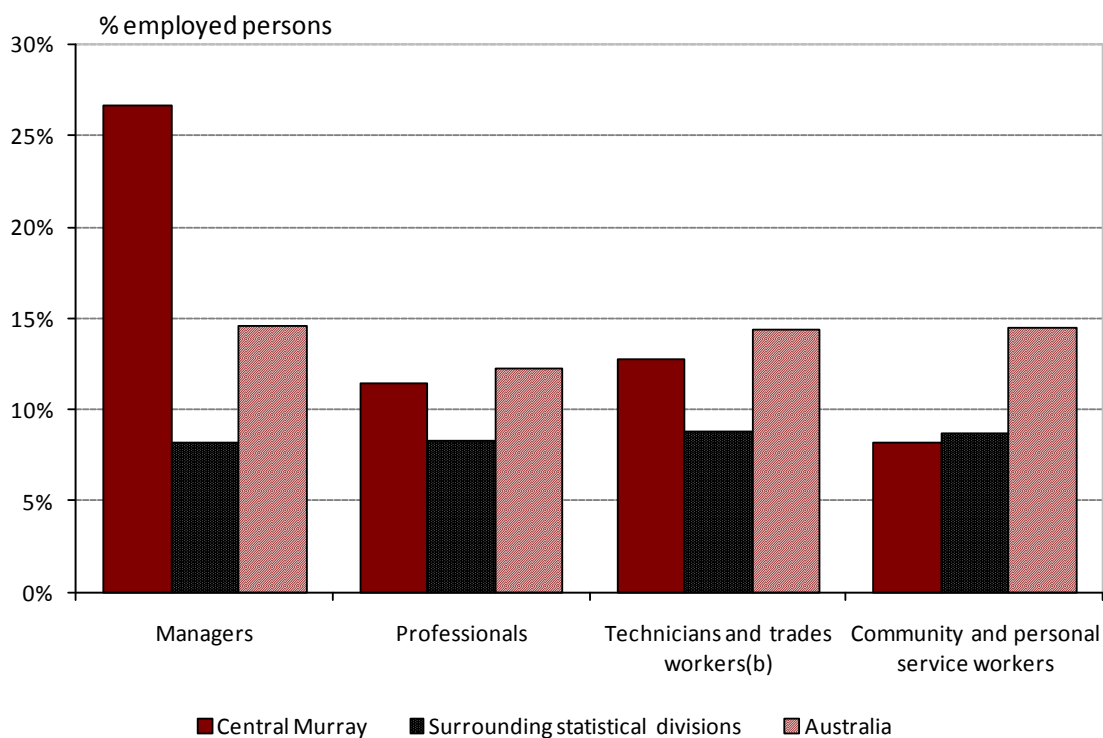


Chart 1.18: Occupational distribution, 2006 (b)

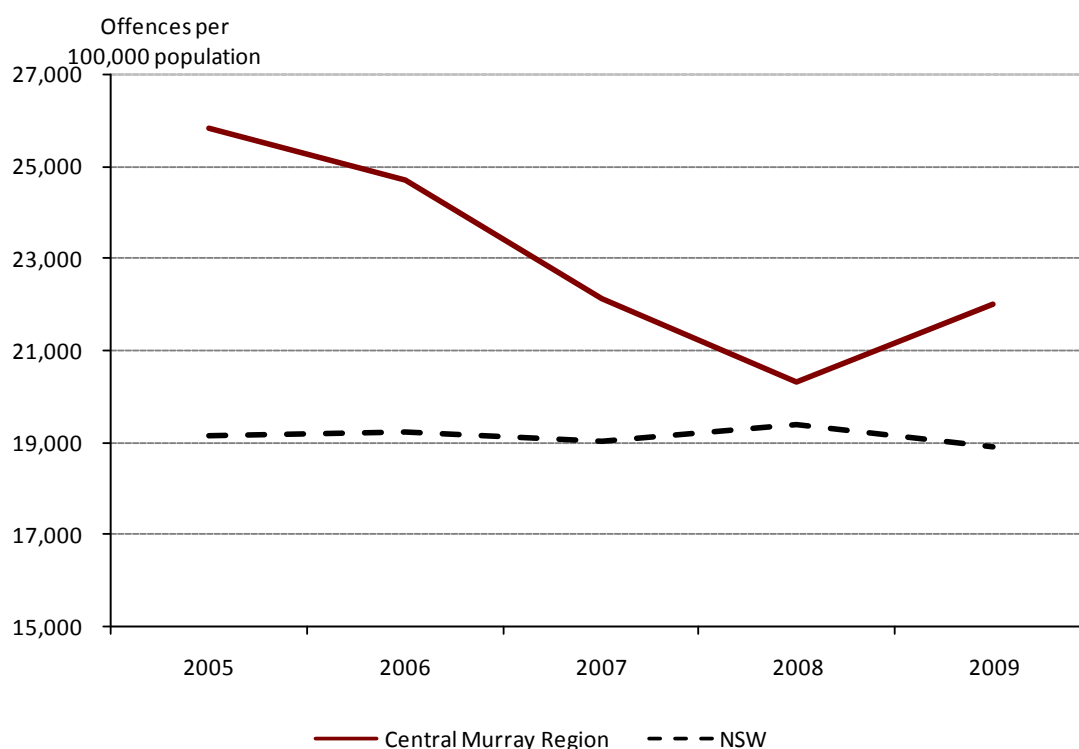


Source: ABS: 2003.0, Census of Population and Housing, 2006, Time Series Profile.

1.4.15 Crime

Central Murray experienced 6,812 criminal offences in 2009. Chart 1.19 shows that the rate of offences per 100,000 population has been falling in Central Murray, and is significantly lower than the rest of Murray statistical division and the Murrumbidgee statistical division. However, the rate of offences is lower for all years in the Sydney statistical division and across the whole of NSW.

Chart 1.19: Crime rate



Source: NSW Government Lawlink, Bureau of Crime Statistics and Research, 2009.

Note: Data for rest of Murray Region, aggregate statistical regions and Australia was not available.

1.4.16 Indigenous profile

In 2006, Central Murray had 645 Indigenous persons, accounting for 2.2% of the population. This proportion is less than the rest of Murray statistical division and surrounding statistical divisions, although more than the proportion of Indigenous people across Australia's population (Table 1.11).

Table 1.11: Indigenous population by region, 2006

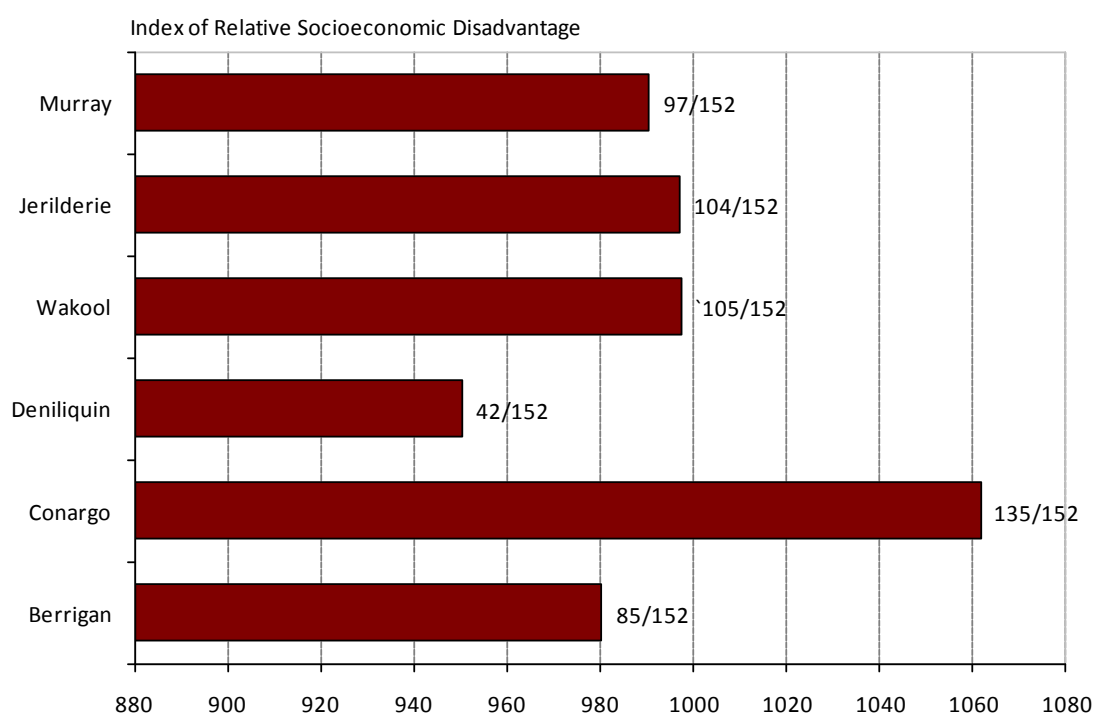
Indicator	Central Murray Region	Rest of Murray SD	Surrounding Statistical Divisions	Australia
% Indigenous population	2.2%	2.7%	3.3%	2.3%

Source: ABS 2001.0, Census of Population and Housing, 2006, Basic Community Profile.

1.4.17 SEIFA level of disadvantage

Chart 1.20 shows that the Deniliquin LGA has the highest level of socioeconomic disadvantage in Central Murray, according to the Socio-Economic Indexes for Areas (SEIFA) Index of socioeconomic disadvantage⁴ from the ABS. This index combines indicators of disadvantage such as low income, high unemployment and low levels of education into one metric to indicate the overall level of regional socioeconomic disadvantage. Socioeconomic disadvantage varies widely across the LGAs within Central Murray, ranking from the 42nd to the 135th most socioeconomically disadvantaged of the 152 LGAs in NSW. Conargo is the only LGA in Central Murray with a level of socioeconomic disadvantage less than the Australian average.

Chart 1.20: SEIFA Index of Socio-economic disadvantage, 2006



Source: 2033.0.55.001 2006 Census of Population and Housing: Socio-Economic Indexes for Areas, Australia.

⁴ The ABS constructs Socio-Economic Indexes for Areas (SEIFA) from the 2006 Census of Population and Housing data. The indexes enable comparison of social and economic data. Scores for LGAs (based on 2006 boundaries) are population-weighted means of the scores of their constituent census collector districts. Australian scores are the reference point and are set to 1,000 for each index.

The Index of Relative Socioeconomic Disadvantage (IRSD) is shown on Chart 1.20. IRSD combines indicators of disadvantage such as low income, high unemployment and low levels of education. A high IRSD shows that the region has a lower percentage of low income families, less people working in unskilled jobs, and fewer untrained people. Thus a high index shows a region is comparably better off.

The SEIFA level of disadvantage is not calculated for statistical divisions, and as such data from the 6 LGAs within the Central Murray Region is utilised.

1.5 Agricultural production

Table 1.12 shows the gross value of agricultural commodities grown in Central Murray, at the time of the latest Agricultural Census of 2005/06. In 2005-06, non-dairy livestock was the region's highest value commodity with a gross value of production of \$158.2 million. The region grows 2.9% of the Murray Darling Basin's non-dairy livestock.

The table shows that Central Murray grows a high proportion of Australia's rice and other cereal production, hay sales and dairy livestock. In these commodities, Central Murray's share of the national total is higher than the 1.6% share for all agriculture.

The region produces 50.3% of the Murray Darling Basin's rice and 50.2% of Australia's rice, with a gross value of production in rice of \$137.5 million in 2005-06. Other cereals generated \$144.1 million in gross value.

Total gross value of agricultural production in Central Murray in 2005-06 was \$625.3 million. Central Murray grows 4.0% of the Murray Darling Basin's total agricultural production and 1.6% of Australia's total agricultural production.

Table 1.12: Agricultural production, Central Murray, 2005-06

Commodity	Gross Value of Production (\$m)	% of Murray Darling Basin total	% of Australia total
Rice	\$137.5	50.3%	50.2%
Other cereals (ex rice)	\$144.1	4.2%	2.0%
Other non-cereal broadacre	\$34.7	1.9%	0.6%
Hay sales	\$37.8	5.4%	2.6%
Livestock -dairy	\$87.9	8.4%	2.6%
Livestock - other	\$158.2	2.9%	1.1%
Vegetables	\$22.0	3.7%	0.8%
Grapes	\$9.3	0.9%	0.7%
Fruits, nuts, berries (ex grapes)	\$25.9	2.4%	1.0%
Other (nurseries, cut flowers and cultivated turf)	\$5.7	2.4%	0.4%
All agriculture	\$625.3	4.0%	1.6%

Source: ABS 7503.0, Value of Agricultural Commodities Produced, Australia 2005-06.

Table 1.13 shows the agricultural commodities grown in Central Murray disaggregated into types of crop. Central Murray grows 50.2% of Australia's rice and 26.6% of Australia's grapefruit.

Table 1.13: Major commodities of Central Murray, 2005-06

Top commodity	Central Murray	Central Murray as % of national production
Cereal crops - Rice for grain - production (t)	503,556	50.2%
Orchard fruit - Grapefruit - production (kg)	3,968,768	26.6%
Orchard fruit - Grapefruit - trees 6 years and over - number	39,758	25.1%
Trees & shrubs - seed sown - nature conservation - quantity (kg)	657	19.3%
Vegetables for human consumption - Tomatoes (processing) - production (t)	38,029	13.8%
Orchard fruit - Grapefruit - total trees - number	51,832	11.2%
Vegetables for human consumption - Tomatoes - total production (t)	38,029	8.4%
Trees & shrubs - seed sown - enhanced production - quantity (kg)	343	7.2%
Vegetables for human consumption - Potatoes (processing) - production (t)	44,219	6.1%
Cereal crops - Maize for grain- production (t)	21,433	5.9%
Tree and shrub seed sown - purposes other than timber and wood pulp - quantity (kg)	1,193	5.6%
Trees & shrubs - seed sown - total - quantity (kg)	1,223	5.1%
Non-cereal broadacre crops - Soybeans - production (t)	2,446	4.9%
Trees & shrubs - seedlings planted for purposes n.e.c. - number	85,153	4.8%
Disposals of meat cattle and calves excluding bulls 1 year and over intended for breeding - feedlot (owned by others) - number	35,287	4.8%
Orchard fruit - Nectarines - trees under 6 years - number	65,838	4.5%
Disposals of dairy cattle and calves excluding bulls 1 year and over intended for breeding - owned by others - number	3,659	4.5%

Source: ABS 7125.0, Agricultural Commodities: Small Area Data (reissue), 2005-06.

In terms of livestock numbers, the Central Murray supported approximately 1.75 million head of sheep and 275,000 head of cattle as of the 2005/06 agricultural census, with the latter comprising of approximately 72,000 dairy and 203,000 beef cattle. Compared to the earlier census of 2000/01, these key livestock numbers had increased slightly, despite the drier conditions prevailing by the middle of the decade.

Table 1.14: Key livestock numbers

Area	Sheep 00/01	Sheep 05/06	Dairy cattle 00/01	Dairy cattle 05/06	Meat cattle 00/01	Meat cattle 05/06
Berrigan	191,705	157,334	23,673	30,202	30,933	52,841
Conargo	305,179	525,517	20,212	23,137	28,382	45,929
Deniliquin	26,303	4,965	2,154	1,033	1,892	939
Jerilderie	278,686	249,465	2,470	1,255	15,311	14,568
Murray	350,129	320,251	6,086	5,544	34,173	42,168
Wakool	525,319	490,505	14,974	11,315	47,726	46,255
Cent Murray						
Total	1,677,321	1,748,037	69,569	72,486	158,417	202,700

1.5.2 Rural land use

0 shows how agricultural land in Central Murray was utilised in 2005-06. Overall, 1.6 million hectares of the land (70.0%) was used as grazing land. A further 441,327 hectares, or 19.3% of land, was used for crops. Some 2.3% of the land was used for rice and 15.0% was for other cereals.

Total rural land use in Central Murray was just less than 2.29 million hectares in 2005-06.

Table 1.15: Rural land use, Central Murray, 2005-06

Land use	Area (ha)	% of Central Murray total
Rice	52,750	2.3%
Other Cereals (ex rice)	343,433	15.0%
Non cereal broadacre	33,773	1.5%
Total land under crop	441,327	19.3%
Grazing land (incl pastures and rangelands)	1,600,597	70.0%
Houses sheds and other agriculturally unproductive land	25,887	1.1%
Land under commercial forestry plantations	24,750	1.1%
Land under fallow	104,538	4.6%
Land use - land use n.e.c.	8,878	0.4%
Other environmentally sensitive areas fenced out of production	7,872	0.3%
Remnant vegetation and woodland not suitable for grazing	54,102	2.4%
Land use - wetlands or swamps not suitable for grazing	5,268	0.2%
Land use total	2,285,234	100.0%

Source: ABS 7125.0, Agricultural Commodities: Small Area Data (reissue), 2005-06.

In terms of changes to rural land use since the previous agricultural census in 2000-2001, some of the key changes have been:

- A decrease in the area of grazing land, from 1,781,917 hectares in 2000/2001 to 1,600,597 in 2005/06.
- A decrease in the area of rice production, from 86,850 hectares for the 2001 harvest to 52,750 for the 2006 harvest. Over the same period, the volume of rice production fell from 798,774 tonnes to 503,555 tonnes, though neither of these years were the worst of the drought.
- A slight increase in the area of other (non rice) cereals, from 338,418 in 2000/01 to 342,433 in 2005/06. Over the same period, the volume of production (for grain) of other cereals increased from 873,111 tonnes to 893,716 in 2005/06.

Note that these landuse areas and production figures between the agricultural censuses do not indicate long term changes. Rather, they are snapshots at two points in time only, where both years were of similar rainfall. Hence, it is important to note here that the impacts of the drought on agriculture cannot be reliably seen in the small area (i.e. LGA level) agricultural statistics, because the years that the Agricultural Census has been most recently held - they being 2000/01 and 2005/06 – *were not the worst of the drought years*. Neither of years represented worst years of the drought, such as 2002/03, 2006/07 or 2007/09.

A more stark illustration of the impact of the drought on landuse and production comes from the broader agricultural survey (as distinct from census) data, which is now provided on an annual basis but not at a level fine enough to estimate results specific for the Central Murray. Nevertheless, a view of some of the key land use and production changes statistics for the whole of Murray Statistical Division in years of average rainfall (2000-01) and years of low rainfall (2007-08 and 2008-09).

Table 1.16: Murray SD landuse and production over time

	2000-01 area (ha)	2001-01 volume (tonnes)	2007-08 area (ha)	2007-08 volume (tonnes)	2008-09 area (ha)	2008-09 volume (tonnes)
Rice	93,585	863,451	1,003	7,605	1,562	12,665
Other cereals (ex rice)	764,417	1,357,783	710,187	372,172	812,059	651,792
Other non-cereal broadacre	183,920	273,175	124,402	13,211*	184,584	72,810
Hay	13,688	64,612	200,996	219,084	63,471	137,515
Vegetables	3,813	116,124	1,545	57,847	1,234	34,898
Grapes	8,717	118,869	9,505	162,170	1,412	12,244
Fruits, nuts, berries (ex grapes)	5,238	71,812	-	42,160	4,214	40,129
Other (nurseries, cut flowers and cultivated turf)	179	-	71	-	68	-

Source: ABS cat no 7121.0, ABS cat no 7125.0

Notes: Cotton volume is measured in kilograms; Nurseries, cut flowers and cultivated turf not measured in volume terms; * ABS categories of other non-cereal broadacre were expanded in the 2008-09 survey – based on previous categories, 2008-09 area was 83,021 ha and volume was 34,773 tonnes.

Key trends in the drier years in the Murray region are:

- Area of land planted to rice drops notably, as does the volume of production. Landuse productivity (tonnes per hectare) stay much the same. In dry times of low allocations, farmers cut back on the area of land planted to rice.
- Area of land planted to other broadacre crops stays much the same, but production falls. As such, landuse productivity fall dramatically.
- Volume of hay sales is higher in the driest of years, as failing cereal and other broadacre crops are used for hay production rather than original purpose such as grain. Areas of land for hay production are also notably higher.

1.5.3 Water use

Water use data and statistics are provided within the synthesis report. Information on the value of irrigation and the trends in water use within the Central Murray are included. Statistics on water trading within the region are also included.

Appendix A: Notes on data

The ABS 2006 Census of Population and Housing is the prime source of social and demographic data used in the report. The ABS Census Community Profile, the Working Population Profile and the Time Series Profile are utilised.

Basic Community Profile data are based on the place of usual residence of a person, whereas time series profiles are based on the place of enumeration, i.e. the place where a person spent Census Night, which may not be where he/she usually lives. The reasoning for this is because previous years' Census data was collated only by place of enumeration, and so for a consistent time-series approach enumeration data is still utilised. Data in the Working Population Profile are based on a person's place of work and are only applicable to employed persons aged 15 years and over.

Due to the different methods used to calculate the data in the three Census Profiles, the data in this report may differ slightly between time series analysis and one year data.

Central Murray Tourism Report



Tourism Assessment Central Murray Irrigation Communities

Stage one: Where are we now?

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1 Introduction

Could tourism be a saviour to retain employment, income and sustain the community in the Central Murray? This report is an assessment of tourism for the *Strengthening Basin Communities* project. It will help determine the role tourism could play in the viability of the Central Murray in a 'future with less water'. The report will also recommend what role Council should take within the local tourism industry.

Tourism in Central Murray is analysed together with regional, state and national tourism trends. The report examines those trends as well as their impacts. The relationship between tourism and water is also specifically examined.

Information from the public domain, privately produced reports as well as first-hand research has been used to complete this report. Interviews were conducted with 28 tourism operators in Central Murray. Additional interviews were conducted with other tourism stakeholders outside the region. The interview and survey schedule is contained in Appendix A.

2 Tourism snapshot

The Central Murray includes the Local Governments of Wakool, Murray, Berrigan, Jerilderie, Deniliquin and Conargo. The region they cover offers a range of tourism experiences, with water-based recreation and nature-based tourism being the most widely spread tourism activities across the region. Golf and sporting activities are also popular with tourists, along with history and heritage experiences. The Deniliquin Ute Muster and Southern 80 are major events hosted in the region each year.

A major driver of tourism in the region is the twin-town of Echuca-Moama, and more specifically the Port of Echuca precinct. According to the Murray Shire Echuca-Moama's proximity to Melbourne and its unique cultural heritage attracts more than one million visitors each year.

Echuca-Moama and District Tourism believe the success of tourism in Echuca-Moama is largely due to the strong synergies between its cultural heritage experiences and value-added tourism and recreational enterprises such as the retail sector, food and wine industry, river cruise industry, houseboat industry, festivals and events and leisure sector.

The Murray River is another iconic tourist attraction in the Central Murray. It also plays a significant role in the attractiveness towns situated on the River. Its high natural and cultural value provides an ideal environment for recreational activities. Other significant natural assets in the Central Murray include the world's largest red gum forest and scenic wetlands.

2.1 Tourism assets

A summary of tourist activities in the Central Murray are included in Figure 2-2. Water-based recreation is a primary tourist activity in each Local Government with the exception of Jerilderie.

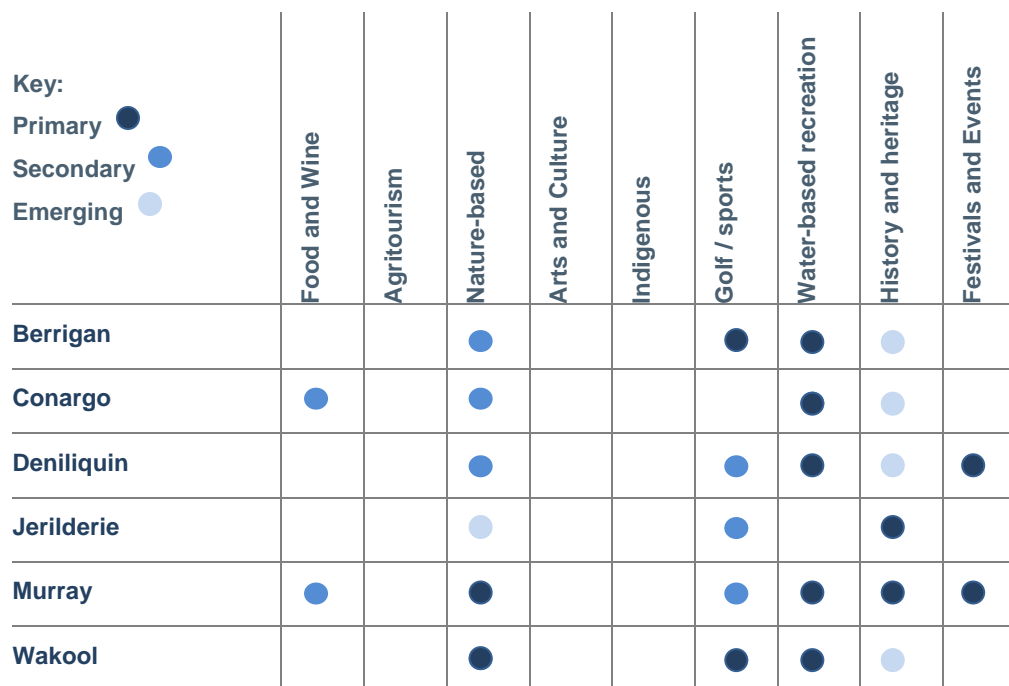


Figure 2-1 Summary of tourist activities in the Central Murray

3 Regional tourism overview

3.1 The broad picture

Tourism is a significant contributor and vital source of employment for many regional economies in NSW. In 2009 regional NSW received nearly 16.3 million domestic overnight visitors, who spent \$7.7 billion across regional NSW (Tourism NSW, 2010). In addition to its influence on the economy, tourism also contributes towards the long-term social and environmental sustainability of many regional areas.

However, tourism in regional NSW and regional Victoria is facing some significant challenges. Tourism Victoria (2009) has identified that visitor growth has remained stagnant in recent years due to a flat domestic tourism sector and national visitation data shows a progressive decline in domestic leisure travel for virtually all tourism categories since 2000. People have been taking fewer trips, spending fewer nights away and spending less per trip in regional Australia (Tourism Victoria, 2009).

According to Tourism Victoria (2009) driving this trend is increased competition from overseas destinations, changing consumer expenditure patterns and growth in low cost airlines. The decline in domestic visitation to regional areas is also a phenomenon occurring nationally, as well as in most other western countries.

Tourism Victoria (2009) also believes that an increase in outbound travel has contributed to reduced domestic visitation in Australia. Last year, Australian outbound departures continued to grow strongly as a consequence of favourable exchange rates, increasing air seat capacity particularly from low cost carriers in the Asia region and the stronger than expected recovery of the Australian economy. Despite the Global Financial Crisis negatively affecting Australian consumer discretionary spending, the number of Australian outbound trips increased strongly in 2009, up 8.2% to a record high 6.3 million trips (Tourism Forecasting Committee, 2010).

The growth of low cost air carriers has made air travel more accessible to a broader range of consumers. It may also be particularly disadvantaging for regional centres, such as the Central Murray, that are not in close proximity to major airports.

According to Tourism Victoria (2009) changing consumption patterns have also impacted domestic tourism. Domestic tourism's share of household consumption has declined, with a shift towards other categories entertainment and home renovation. Tourism Victoria (2009) believes that households are servicing higher levels of debt and putting pressure on discretionary spending. High fuel costs may also be suppressing demand for regional tourism and the touring experiences of the Central Murray.

Attracting tourism investment in regional areas also continues to be a challenge. Similarly a shortage of qualified customer service personnel and tourism professionals in regional areas remains a barrier to regional tourism development (Tourism Victoria, 2009).

The rise of new technologies and media fragmentation is another significant regional tourism trend. The emergence of new media and increased access to information has provided tourists with more options in selecting destinations and booking travel. Tourists have become harder to influence via traditional marketing methods and markets can now be reached without the need for large marketing budgets formerly required under traditional marketing approaches (Tourism Victoria, 2009).

3.2 Trends in regional tourism

This section of the report looks at the tourism trends of the Central Murray. Data on tourist visitation in the Central Murray over the last 10 years has been analysed. However, there is a limited amount of data available for the Central Murray compared to the data that is available for

the 'Murray Region'. Data for the Murray Region is believed to reflect similar trends to what would be expected in the Central Murray. Data for the Murray Region is more readily available and has been included with the analysis of tourism trends. The Murray Region represents the most closely aligned Regional Tourism Organisation to the Cluster Group. It includes the Shires of Berrigan, Wakool, Jerilderie and Murray in addition to Albury, Corowa, Greater Hume and Urana. It does not include Conargo and Deniliquin.

3.2.1 Visitation

An estimated 387,000 domestic visitors stayed overnight in the Central Murray in 2009. This was an increase from 2008 and reversed a long-term trend of an average annual 1% decline in overnight visitation since 1999. In 2009 there was also a record 1.4 million visitor nights spent in the Central Murray. Over the last 10 years visitor nights spent in the Central Murray has increased at an average annual rate of 2% (Tourism Research Australia, 2010).

Figure 3-3 shows that the decline in overnight visitation has been greater in the total Murray Region in comparison to the Central Murray (figure 3-2). It highlights that whilst overnight visitation in the Central Murray has declined at a rate of 1% per year for the last 10 years, it has declined at a lesser rate than the total Murray Region (1.6% per year).

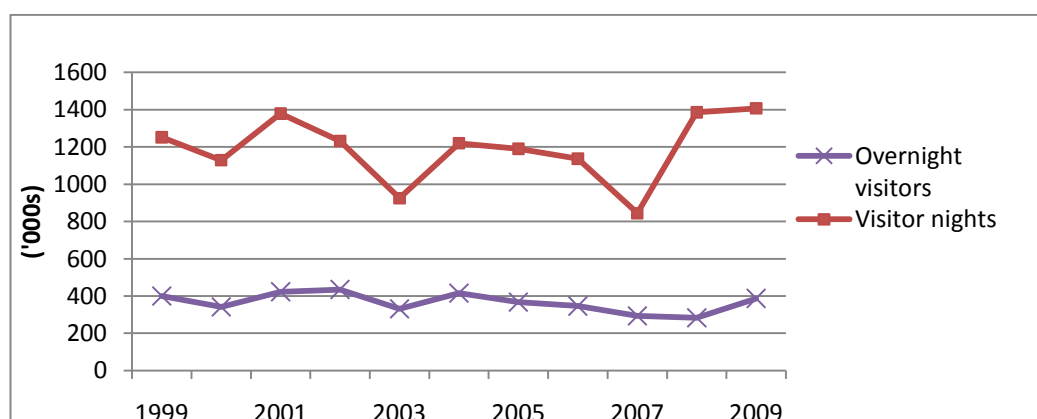


Figure 3-2 Domestic overnight visitation and visitor nights in the Central Murray (Tourism Research Australia, 2010)

- Visitor nights of domestic tourists have increased since 2007, to a record of 1.4 million nights in 2009.
- An increase in domestic overnight visitor numbers in 2008 reversed a downward trend, with a 37% increase in overnight visitation in 2009.

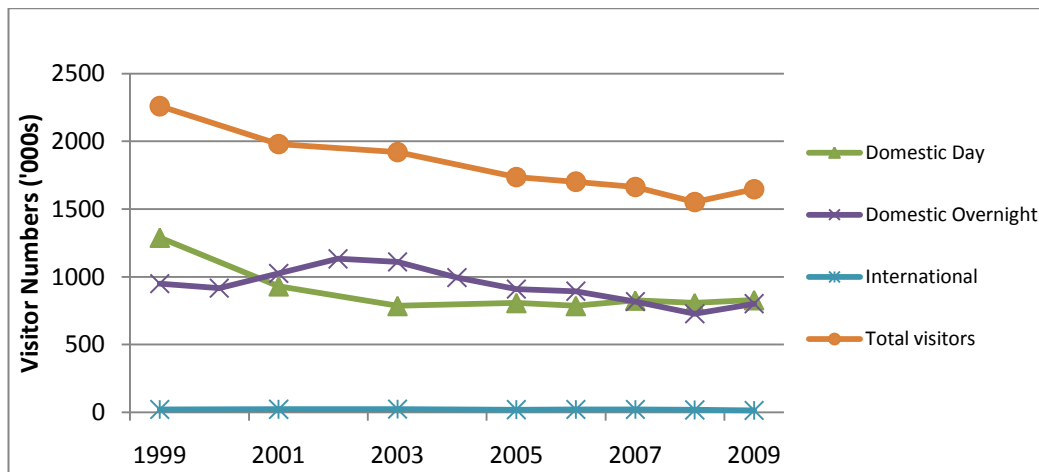


Figure 3-3 Total visitation to the Murray Region (Tourism NSW, 2010)

- The Murray Region represents 4.9% of total regional NSW visitation (Tourism NSW, 2010).
- 1.6 million tourists visited the Murray Region in 2009.
- Approximately half of these tourists were domestic day visitors and the other half were domestic overnight visitors.
- International visitors are less than 1% of total visitation.
- Total visitation to the Murray Region has consistently decreased over the last 10 years at an annual rate of 3%. However, a growth rate of 6% was recorded for the period of 2008 to 2009.
- Domestic day visitation has declined at an average rate of 4.4% per year over the last 10 years. However, the rate of decline has slowed in more recent years.
- Domestic overnight visitation has noticeably fluctuated over the last 10 years.
- In 2009 there was an increase of 75,000 domestic overnight visitors in the region.

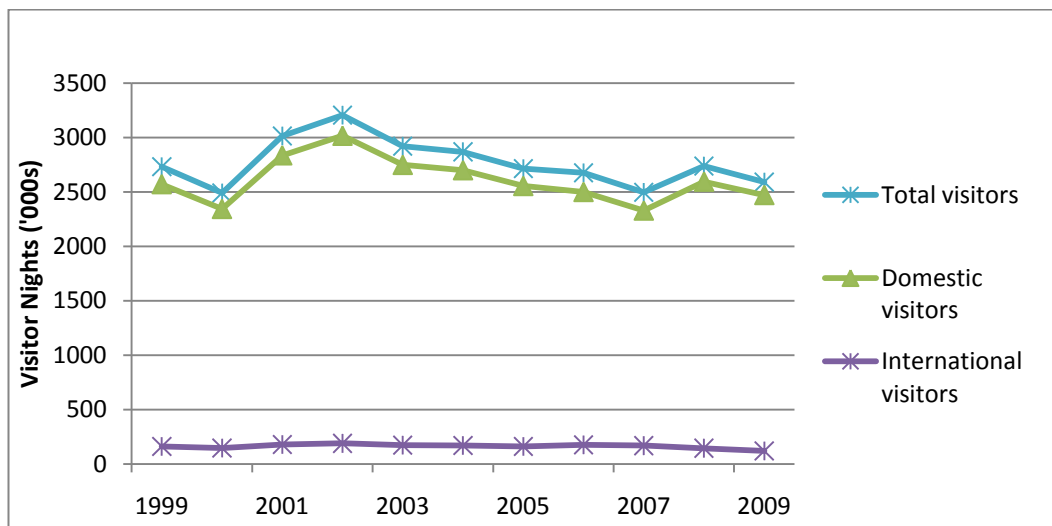


Figure 3-4 Visitor nights spent in the Murray Region (Tourism NSW, 2010)

- Unlike in the Central Murray (figure 3-2) the Murray Region's visitor nights continue to decline.

- Despite an increase in total visitation from 2008 to 2009 (as shown in figure 3-3) visitor nights still declined during the period. This was due to a reduction in the average length of stay of tourists in the Murray Region. This trend is contrary to the Central Murray where the average length of stay is increasing.

3.2.2 Expenditure

Total expenditure by tourists in the Murray Region in 2009 was \$444 million. Statistics concerning the expenditure of tourists in the Central Murray are not available from Tourism NSW or Tourism Research Australia. Only data on expenditure from domestic overnight tourists is available for the Central Murray. Figure 3-5 shows that nominal tourist expenditure in the Murray Region has increased by an average of 2.4% each year since 1999. This is despite a significant decline in total visitation illustrated in figure 3-3.

However, when an average inflation rate of 3.2% for the last 10 years is considered it shows that real expenditure has actually declined at an average rate of 0.8% during the period i.e when inflation is considered the real level of expenditure has decreased at 0.8% per year over the last decade.

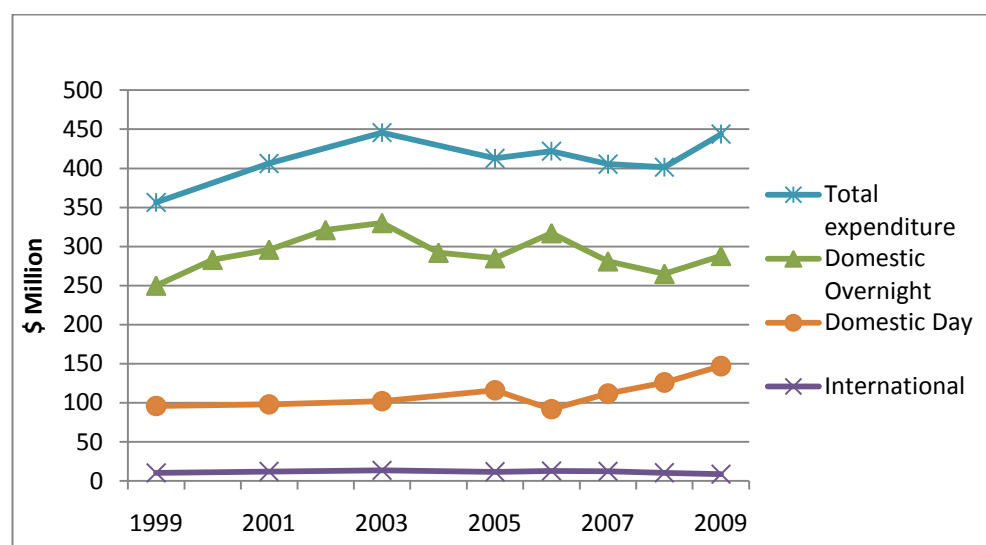


Figure 3-5 Tourist expenditure in the Murray Region (Tourism NSW, 2010)

- Total expenditure by tourists in the Murray Region in 2009 was \$444 million.
- Nominal expenditure increased from 2008 to 2009 to reverse a downward trend of the previous 4 years.
- There has been a steady 17% increase in nominal expenditure by domestic day travellers since 2006.
- Expenditure per person for domestic day tourists is \$177.
- Expenditure per person for domestic overnight tourists is \$359, or \$117 per day.
- Expenditure per person for international visitors is \$588, or \$74 per day.

3.2.3 Tourist experiences and activities

Nationally there has been a shift away from mass tourism. Alternative tourism experiences such as nature-based tourism have become increasingly popular. A shift towards 'eco-friendly' activities and increased environmental awareness are also observable at a national level.

Limited information is available to identify trends in tourists' preferences for choosing to visit the Central Murray. Whilst data from the National Visitor Survey (2008) provides information on what activities were undertaken by tourists in the Central Murray, there is no supporting information available to quantify the importance of these activities in influencing the decision of tourists to visit the region i.e. the data is only useful to show which activities were undertaken by tourists and is not a good indicator to show which of these activities motivated tourists to travel to the region. As such it is difficult to identify trends and opportunities concerning experiences and activities in the Central Murray from the data.

The activities undertaken by tourists are illustrated in Figure 3-6.

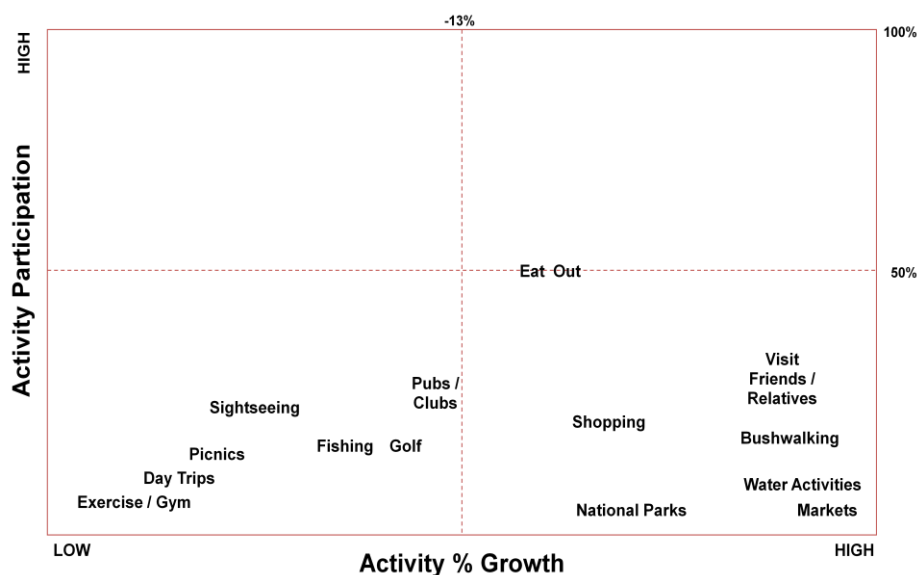


Figure 3-6 Participation and growth rate of tourist activities in the Central Murray (Tourism NSW, 2010)

- No activities had higher than 50% participation amongst visitors.
- The 'popular' activities (those which recorded $>-13\%$ growth) still had low participation rates.
- 'Water activities', 'bushwalking' and 'markets' have the highest growth rates.

3.2.4 Accommodation

Private camping and caravanning are popular accommodation options for tourists in the Central Murray. Figure 3-7 shows that there has been a significant increase in the proportion of visitors in the Central Murray who 'caravan or camp near roads or on private property' from 2000-2004 to 2005-2009. (Tourism NSW, 2010). The number of commercial camping sites in the Murray Region has dropped from 40 establishments in 2005 to 35 in 2010 (ABS, 2010).

A reduction in overnight stay at 'friends and relatives properties' and 'hotel, resort, motel or motor inn' has also occurred during the period from 2000-2004 to 2005-2009. These trends are illustrated in Figure 3-7.

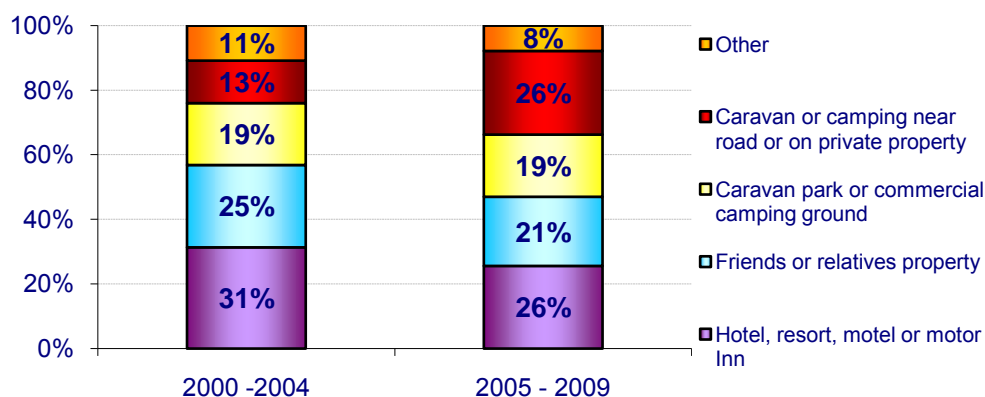


Figure 3-7 Accommodation trends in the Central Murray (Tourism NSW, 2010)

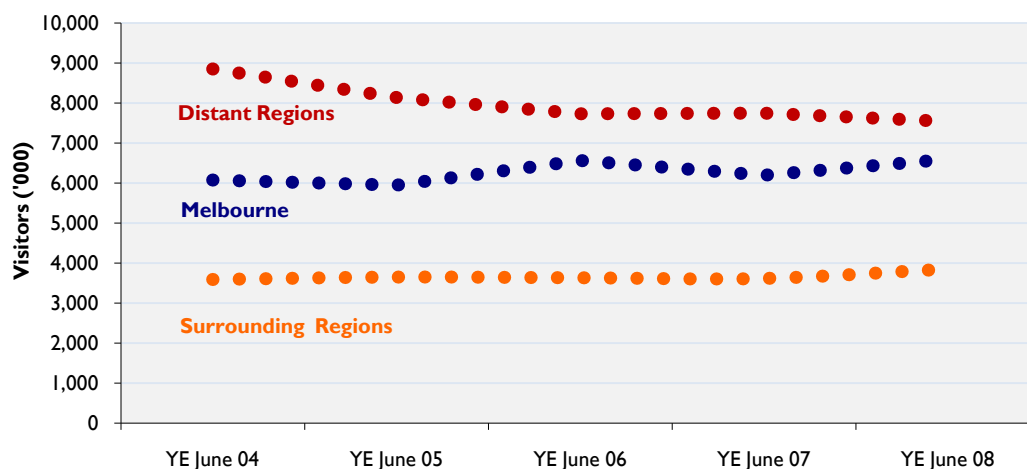
3.2.5 Visitor dispersal in Victoria

Tourism in regional Victoria has some similar characteristics to that of the Murray Region. Visitation to the Murray Region is also predominantly by Victorians. In 2009 56.5% of visitors to the Murray Region came from Victoria (Tourism NSW, 2009).

It is particularly insightful to compare visitor dispersal across Victoria. Figure 3-8 illustrates the visitation of Melbourne with its Surrounding Regions and Distant Regions. It highlights the decline in visitation of Distant Regions in comparison to Melbourne, where visitation has grown. Visitation to the Surrounding Regions of Melbourne has also remained steady during that same period (Tourism Victoria, 2009).

The implications of this trend are not promising for the Central Murray which is located further away from the key market of Melbourne than the Distant Regions category in figure 3-8.

Figure 3-8 Total domestic overnight visitor dispersal in Victoria (Tourism Victoria, 2009)



- Domestic visitation to the Surrounding Regions of Melbourne has been positive over the period 2004 – 2008 with an annual growth rate of 1.8%.
- Distant Regions experienced a decline in domestic visitation, down 3.9% per annum over the same period.

3.3 Interpreting the trends

The visitation trends for regional tourism are not promising. Across both NSW and Victoria the domestic tourism sector remains flat, with limited net growth recorded over the last 10 years (Tourism Victoria, 2009).

The growth of tourism in regional areas has not been uniform and figure 3-8 illustrates the relationship between tourism growth of destinations and their proximity to Melbourne. The majority of visitors to the Central Murray come from Victoria, particularly Melbourne, placing the region at a geographical disadvantage to the more accessible surrounding regions of Melbourne. These regions have not been subject to the same decline in visitation as the 'Distant Regions' from Melbourne shown in figure 3-8.

However, growth in tourism expenditure and visitation in the Central Murray in 2009 provides a degree of optimism for the local tourism industry. This growth has reversed a gradual decline in visitation and real tourist expenditure over the last decade in the Central Murray.

3.4 Issues for regional tourism

Tourism Victoria (2009) identified the major issues that are confronting regional tourism. These are listed below.

- Low awareness, visitation and yield,
- Lack of integrated, holistic and sustainable destination development and poor integration of tourism into regional development initiatives,

- C.** Lack of community awareness of tourism,
- D.** Lack of product development for international markets,
- E.** Product supply gaps in accommodation, services, attractions and restaurants,
- F.** Variable delivery of quality products and services,
- G.** Variable levels of support from local government,
- H.** Currency of regional tourism development plans,
- I.** Variable strength of industry leadership and appropriate structures,
- J.** Predominance of small business limits the ability to maximise co-operative marketing.

4 Destination Assessment

4.1 Political (Government):

Many respondents to the tourism survey commented that there is a lack of recognition and support for the region by the State and Commonwealth Governments. The tourism survey showed that the confidence of some members of the local community in government has eroded due to recent policy decisions such as the water-buy-back scheme and the Barmah-Millewa National Park decision.

National policy changes that impact the region can create uncertainty in the short-term. Uncertainty can cause hesitation with investment and discourage business activity, which is an unfavourable environment for the tourism industry

4.2 Economic:

Reduced agricultural incomes

The drought has impacted the financial position of the Central Murray. Agriculture, the backbone of the economy, has been impacted by low water allocations. Many tourism services such as restaurants, clubs and sports facilities do not cater entirely for the tourism market and are also reliant on local trade to sustain their viability. Respondents from the tourism survey commented that reduced income from the agricultural sector has reduced spending in the region, impacting on the financial position of many tourism services shared with the community.

Global Financial Crisis:

Tourism Victoria (2009) believes that a slowdown in jobs growth and the global economy has heightened consumer uncertainty. They expect that there will be a reduction in discretionary spending on tourism and leisure until confidence returns. Tourism Victoria (2009) state that the decline in confidence is also having flow-on effects to investment, which may also have a negative impact on the tourism sector.

Stagnant domestic tourism sector:

National visitation data shows a progressive decline in domestic leisure travel for virtually all travel categories since 2000 (Tourism Victoria, 2009). This is especially concerning for the Central Murray as domestic leisure travel is the region's primary source of tourism. Across regional Victoria people have been taking fewer trips, spending less time away, and are also spending less per trip (TRA, 2007).

Australians on the contrary have increased their spending on international travel. Many consumers perceive International travel to be more prestigious and offer better value for money than domestic travel (Tourism Victoria, 2009).

Exchange rate volatility:

After averaging US\$0.91 in the first four months of 2010, the \$A depreciated to around US\$0.85 in early June 2010. While some appreciation is likely in the short term, the Tourism Forecasting Committee (2010) assumes the \$A will depreciate to around US\$0.81 in 2019. The exchange rate impacts the attractiveness of international destinations in comparison to domestic destinations. A strong \$A makes Australia less competitive on an International scale and makes International travel more affordable for Australians.

Changing consumption patterns:

Domestic tourism's share of household income has declined, with a shift towards spending on other categories such as entertainment systems. Households are also servicing higher levels of debt, which is putting pressure on discretionary expenditure such as tourism (Tourism Victoria, 2009).

Growth in low cost carriers

Tourism Victoria recognise that the growth of low cost carriers and route networks has increased capacity between tourism destinations and made air travel more accessible to a broader range of consumers (Tourism Victoria, 2009). This shift presents a challenge for regional centres like the Central Murray that are not in close proximity to major airports.

4.3 Social

Labour market shifts

According to Tourism Victoria (2009) longer working hours and the stockpiling of annual leave have impacted the domestic tourism sector. With more time dedicated to work consumers have less time for travel. Less time for travel may benefit destinations that are feasible as 'weekend getaways' and reduce the attractiveness of long-haul destinations.

Demographic shifts

Tourism Victoria (2009) also believes that shifts in the demographics of the Australian population have altered demand for tourism experiences. A key factor is Australia's ageing, driven by the Baby Boomer generation entering retirement. This may create greater demand for appropriate travel experiences to suit the Baby Boomer market.

The Generation Y and Generation Z segments will also influence the future of the tourism sector. Tourism Victoria recognise that although these segments value holidays highly, they are also more discerning and typically seek very unique travel experiences (Tourism Victoria, 2009).

4.4 Technological

Rise of new technologies and media fragmentation

Consumers are increasingly using the internet and new technologies to research their travel options. An increase in information available has also increased consumer awareness of real value for money propositions. New technologies provide an opportunity for regional destinations to reach their market without the expense associated with traditional marketing approaches (Tourism Victoria, 2009).

4.5 Environmental

Sustainability

According to Tourism Victoria (2009) tourists are becoming increasingly environmentally aware and are placing higher importance on tourism products and experiences that are environmentally sustainable. Environmental considerations are increasingly influencing tourists' destination choice. This trend has driven the creation of environmentally focused tourism experiences as well influencing the brand identity conveyed by many destinations.

In particular consumers supporting the theory of climate change have increased their awareness of environmental issues and may alter their behaviour to minimise impacts to the environment. This could include reducing long-haul air travel and increasing preferences for more environmentally compatible business practices. This perception has contributed towards the popularity of 'eco-friendly' travel initiatives and experiences.

Nature-based tourism

Nature-based tourism is tourism that relies on experiences directly related to natural attractions. Tourism Victoria (2009) have identified that nature-based tourism is growing world-wide at a rate of 10 – 30% per annum. Tourism Victoria has recognised nature-based tourism as a growth opportunity and has developed a nature-based tourism strategy. The strategy identifies ecotourism, adventure tourism, extractive tourism (e.g. fishing), wildlife tourism and nature retreats as potential nature-based tourism opportunities. The Central Murray has the potential to leverage off an increase in nature-based tourism.

4.6 Legal

Some legal requirements can act as barriers for entrepreneurs to establish unique tourism experiences. Government policy changes can also impact the tourism industry. An example is the recent decision to recognise the Barmah-Millewa red gum forest as a National Park. As a National Park there may be additional restrictions for camping in the area and dogs may also be prohibited. This can impact the demand for visitation to the area. However, on the contrary the National Park may also provide 'free' marketing of its assets.

The NSW Department of Planning is also advocating for a 100 metre setback for tourism development on the major water courses in rural zoned areas. This could also limit tourism development opportunities.

5 Conforming with regional strategies of Tourism VIC and NSW

Tourism NSW and Tourism Victoria are in discussions to create a new regional tourism board for the Murray Region in co-operation with local stakeholders (pers.com.O'Dwyer 2010). A regional tourism board would be in a position to provide leadership and break down traditional borders to facilitate greater cohesion across state boundaries. Hyder Consulting believe that a collective approach is fundamental to the advancement of the Central Murray's tourism industry. The proposed tourism board is outlined in greater detail in Section 5.1.

Tourism Victoria's Regional Tourism Action Plan (2009-12) outlined its planned activities which included the recognition for the need to disperse visitors geographically and seasonally from the Melbourne gateway. The Central Murray needs to streamline its tourism activities with that of Tourism NSW, Tourism Victoria as well as with other tourism organisations operating in the region.

5.1 Proposed Murray Regional Tourism Board

The establishment of a Murray Regional Tourism Board (MRTB) is being considered by Tourism NSW and Tourism Victoria. The Board would operate across borders to promote and manage the 'Murray' destination as a whole. Both organisations have received a proposal and MOU for the establishment of the Board, but as at 17 August 2010 no further actions have been taken to establish the Board. The new Board would supersede the Murray Campaign Committee.

A list of the Councils invited to join the MRTB are included in figure 5-9.

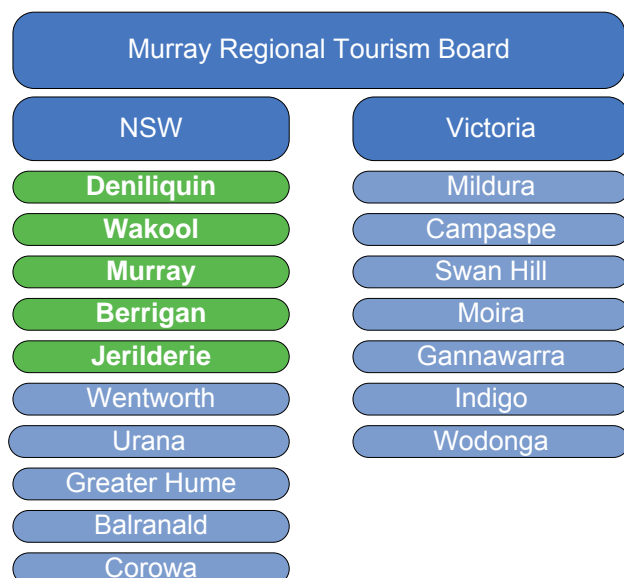


Figure 5-9 Councils invited to join the proposed MRTB (MRTB, 2010)

The proposed MRTB would be responsible for holistic tourism development and advocacy for the region. Its functions would include:

- Industry development,

- Product development,
- Regional marketing,
- Skills training,
- Mentoring,
- Networking,
- Identifying investment priorities and managing sustainability (MRTB, 2010).

The proposed tourism board will be in a position to provide a positive pathway to developing tourism in the Central Murray and present a unified voice on all issues relating to tourism in the region. The MRTB would also provide an avenue for local Councils to work closer together in partnership. The structure of the new MRTB is outlined in Figure 5-10.

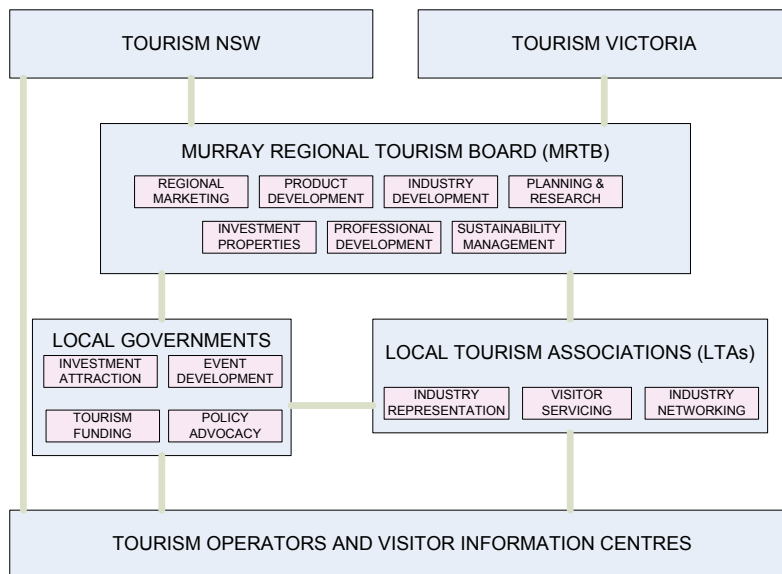


Figure 5-10 The proposed new regional structure (MRTB, 2010)

6 Water and tourism

The tourism industry uses water in three ways:

- 1) Non-consumptive water use,
- 2) Consumptive water use – fixed,
- 3) Consumptive water use – variable.

Figure 6-11 highlights the relationship between consumptive and non-consumptive water use. Consumptive water use removes water from the local supply, compared to non-consumptive water use that does not. Consumptive water use can be fixed or variable. Fixed water use is not dependant on the number of tourists, whereas variable water use directly correlates to the number of tourists.

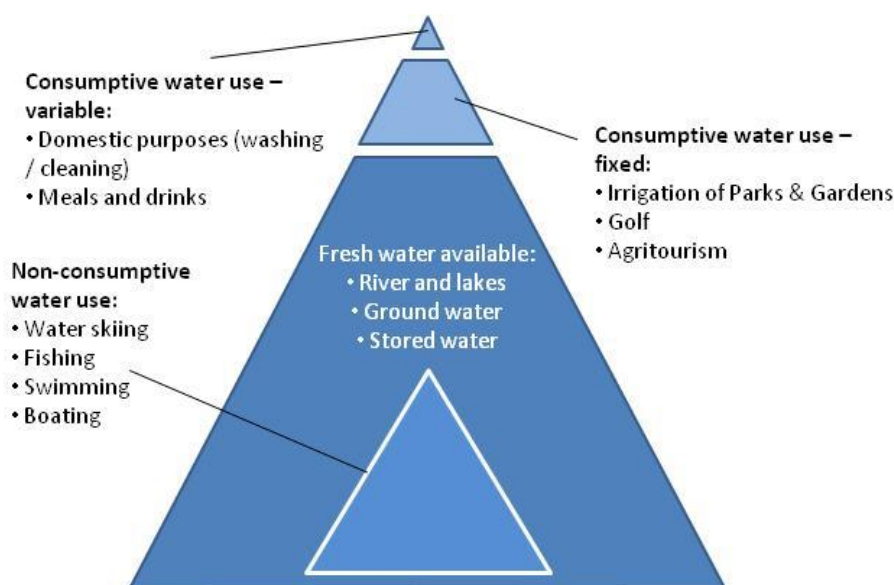


Figure 6-11 Water usage by the Central Murray tourism industry

The Central Murray tourism industry is primarily focused on water-based recreational activities. These activities are reliant on water. However, unlike other industries, such as agriculture, tourism is not a large consumer of water. Key activities such as fishing, water skiing and canoeing all require water, but whilst they use water they don't consume it i.e. are non-consumptive.

Other recreational tourism activities in the Central Murray, such as golf, consume water. Water consumption is also required to maintain the attractiveness of a destination for tourists. Parks and gardens that make for popular picnic stops and enhance the overall attractiveness of a destination need to be irrigated. The amount of water used for these purposes is fixed and is not dependant on the number of tourists visiting a region i.e. tourism demand and visitation does not influence the volume of water consumed for these purposes.

However, the volume of water used by tourists for domestic purposes is related to the number of visitors in the region. For domestic purposes it is estimated that tourists can use up to twice the amount of water than local residents. However, even considering tourists' greater per capita water consumption, water used for domestic purposes by tourists is not substantial.

Total water consumption in the Central Murray by tourists for domestic purposes is estimated to be 425ML each year.¹ A 20% increase in tourism (an additional 154,000 visitors) in the Central Murray would only require an additional 84ML of water to service the needs of the increased demand.²

6.1 Importance of water

Water availability is critical to sustaining the tourism industry in the Central Murray. A survey of tourism operators and stakeholders reinforced this understanding with 19 out of the 28 respondents selecting the option of 'critical' when questioned about the importance of water to the tourism industry. Eight respondents selected 'highly important' as their option and one respondent selected 'moderately important'.

Tourism requires water for a range of purposes and a reduction in water availability or quality can have a significant impact on tourism. Section 6.1.1 examines the impacts of the recent drought on the tourism industry and highlights the importance of water to the industry.

Tourism in the Central Murray is also interlinked with the local economy and community. The industry is reliant on the local population to help sustain many of the services required to cater for tourists. This includes pubs, parks and cafes. Agriculture is a significant contributor to local incomes and can be particularly vulnerable to water availability. Without sufficient water the local economy may suffer and shared facilities that the tourism industry uses may be compromised.

6.1.1 Impacts of the drought to tourism

A report by Tourism Research Australia (2010) on the impact of the drought on tourism in the Murray River region highlighted a belief amongst tourism operators that the real or perceived impacts of the drought have significantly reduced tourism in the region.

According to Tourism Research Australia (2010) the drought had adversely effected overnight visitation to the Murray region. It showed that overnight visitation to the Murray River region had declined on average by 2.19% per annum from 1999-2008, compared with an average decline of 1.25% for comparator regions less affected by the drought. This is illustrated in Figure 6-12.

Other key findings of the Tourism Research Australia (2010) report were that:

- 20% of respondents who had visited the Murray River region indicated that the drought had affected their travel behaviour,
- As a result of the drought 9% of respondents who had visited the region previously now visited less often, 5% reduced their duration of stay and 2% no longer visited,

¹ Calculations made on the assumption that overnight tourists consume 277 litres of water a day, and day tourists consume 100 litres a day (average daily consumption of water by Melbourne residents is 277 litres – Melbourne Water)

² Calculations made on the assumption that overnight tourists consume 277 litres of water a day, and day tourists consume 100 litres a day (average daily consumption of water by Melbourne residents is 277 litres – Melbourne Water)

- 22% of surveyed respondents who had never visited the Murray indicated that the drought is one of the factors contributing to their lack of interest in visiting the Murray River region.

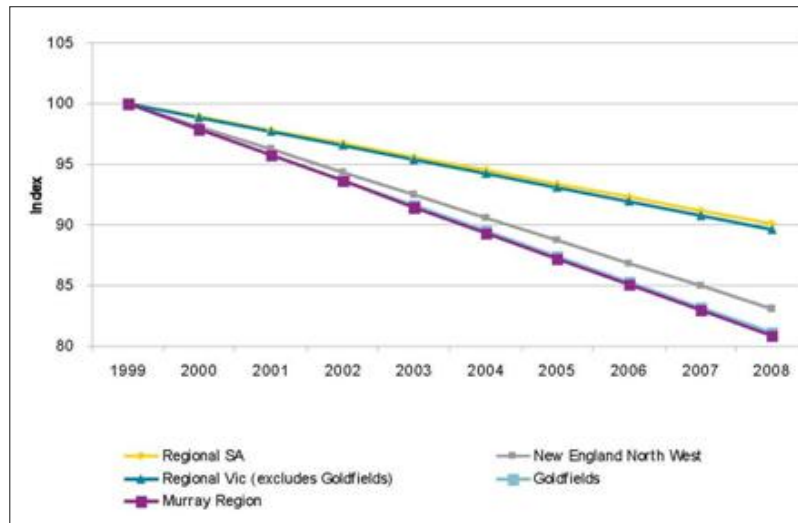


Figure 6-12 Overnight visitation – Murray and comparator regions (TRA, 2010)

The tourism survey also reflected similar findings to that of Tourism Research Australia’s report. For example, one accommodation provider in Deniliquin stated that 45% of summer holiday bookings were cancelled during 2007/8 when the water level in the Edward River was particularly low.

The drought has impacted water-based recreation, as many of these activities are dependent on the health and levels of the river systems. This includes swimming, fishing, canoeing and boating. The constraints on these activities has reduced the attractiveness of the destination for some tourists and reduced tourism demand in some areas (TRA, 2010).

The linkages between environmental conditions and recreational activities in the Central Murray are outlined in Figure 6-13.

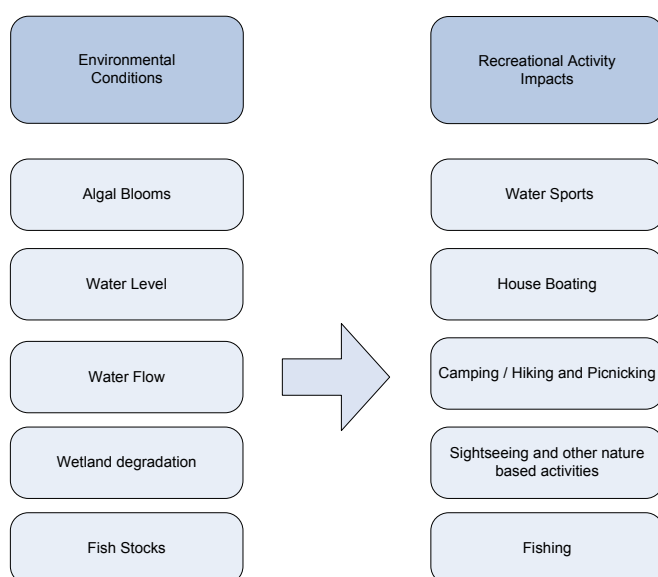


Figure 6-13 Linkages between environmental conditions and recreational activities in the Murray region (TRA, 2010)

The impact of the drought on tourism vary across the region. Some impacts are counter-intuitive with unexpected consequences. For example the prolonged drought has reduced the water level in many of Victoria's lakes, reducing their attractiveness for water-sport activities. Echuca-Moama and District Tourism believe that this has made other destinations with a more secure water level, such as Echuca-Moama, more appealing for these water-based activities.

A secondary impact of the drought is related to perceptions , rather than actual environmental consequences. A study by Tourism Research Australia (2010) showed that people have been avoiding the Murray Region altogether because of their perceptions of how the drought has impacted the range of activities that could still be undertaken. These perceptions may not be accurate, but nonetheless have impacted tourism demand within the region.

This understanding is consistent with anecdotal information gathered from the tourism survey. An example includes the publication of a miss-represented photo of the Edward River in the Herald Sun and the Advertiser on 20 April 2007 (figure 6-14) claiming the Edward River was dry near Deniliquin. This was not the case with the river height at 1.75m (ABC, 2007). A tourism operator in Deniliquin stated that the tourism demand was reduced during this period due to the photos creating a perception that the Edward River was low. This illustrates the influence people's perceptions of water availability / levels can have on tourism demand.

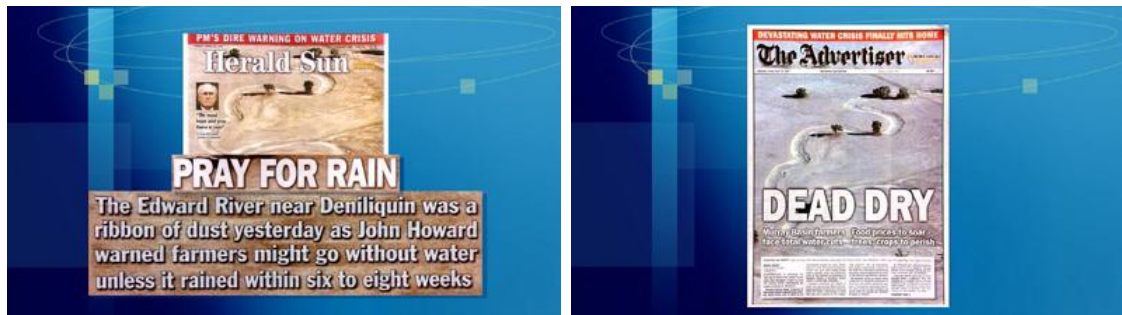


Figure 6-14 Front pages of the Herald Sun and Advertiser, 20th April 2007 (ABC, 2007)

The Central Murray is a popular region for water-based recreation with the Murray River and other water systems providing an attractive setting for these activities. This is shown by the 387,000 tourists who visited the Central Murray in 2009. These tourists spent a total of 1.4 million nights in the region (TRA, 2010). Access to National Parks and forests with iconic Australian flora and fauna are also popular features of the Central Murray.

However, visitation trends for regional tourism are not promising. Across both NSW and Victoria the domestic tourism sector remains flat, with limited net growth recorded over the last 10 years (Tourism Victoria, 2009). National visitation data also shows a progressive decline in domestic leisure travel for virtually all tourism categories since 2000. People have been taking fewer trips, spending fewer nights away and spending less per trip in regional Australia. According to Tourism Victoria (2009) driving this trend is increased competition from overseas destinations, changing consumer expenditure patterns and growth in low cost airlines.

The growth of tourism in regional areas has not been uniform and Tourism Victoria (2009) identified a correlation between the tourism growth of destinations and their proximity to Melbourne. Tourism Victoria (2009) states that surrounding regions to Melbourne had experienced an increased in tourism over the last five years. However, more distant regions from Melbourne had experienced a decline in tourism over the same period. The majority of visitors to the Central Murray come from Victoria, particularly Melbourne, placing it at a geographical disadvantage to the more accessible surrounding regions of Melbourne.

A report by Tourism Research Australia (2010) on the impact of the drought on tourism in the Murray River region also reinforced the belief amongst tourism operators in the Central Murray that the real or perceived impacts of the drought have significantly reduced tourism demand in the region.

Respondents to the tourism survey provided a variety of responses to the question about the impact of drought on visitation to the Central Murray. Many believed that the recent drought had contributed to a decline in overnight visitation to the Central Murray over the last decade. However, recent growth in tourism expenditure and visitation in the Central Murray from 2008 to 2009 provides a degree of optimism for the local tourism industry.

Overall the conditions facing the tourism industry in the Central Murray are challenging. However, the Central Murray has an opportunity to expand and grow its tourism industry. The potential of the Central Murray tourism industry and the scope of its opportunities will be explored in Stage 2 'Where to from here' of the *Strengthening Basin Communities* project.

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9 Appendix A:

9.1 Interview schedule

REGION	# SURVEYS CONDUCTED
Berrigan	4
Deniliquin	3 (4)
Conargo	2
Jerilderie	3 (4)
Murray	8 (9)
Wakool	5 (7)
General Central Murray	2
TOTAL	28 (33)

Figure 9-15 Interview schedule

Note: figures in brackets include multiple respondents

9.2 People consulted

Hyder Consulting would like to recognise and thank the following people for their support in developing this report:

PERSON	ORGANISATION
Denise Ulbrick	Tourism Victoria
Amanda Coghlan	Tourism NSW
Margaret O'Dwyer	Industry and Development NSW
Tina Jones	Riverina Tourism Organisation
Natasha Singerova	Department of Industry and Innovation
Priscilla Holmes	Tourism Research Australia
Ali McClean	Long Paddock Touring Route

Figure 9-16 Consultation table