Community impacts of the Guide to the proposed Murray-Darling Basin Plan

Volume 9. Regional Analysis – South Australia

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Report prepared for the Murray-Darling Basin Authority

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Community impacts of the proposed Murray-Darling Basin Plan

Preface

This report is Volume 9 in a suite of documents that has been prepared by the EBC consortium on the potential community impacts of the proposals in the Guide to the proposed Murray-Darling Basin Plan.

The MDBA commissioned the consortium to assess the potential community impacts of the proposals in the Guide. The primary objective was to understand the impacts on local, small-scale, human issues and costs during the short and medium term. A key aim was to consult with communities to understand how they would be impacted by proposals in the Guide.

A round of interviews with key informants was conducted from January to April 2011, covering 48 social catchments, 80 local government areas and 119 towns and regional centres. The discussions involved nearly 700 people from across the full range of sectors and employment groups. Additional economic analysis was undertaken to supplement and inform the outcomes of the community interviews.

The outcome of the project is reported in nine volumes:

- Volume 1: An Executive Summary - provides an overview and condensed report on the core outcomes of the project;
- Volume 2: Methodology - sets out the framework and analytical methodology for the study;
- Volume 3: Community Impact - provides a comprehensive report on the breadth of the issues raised in the community impact assessment. This includes the identification of a number of significant issues which are material for the roll-out of the draft Basin Plan;
- Volume 4: Informing choices - takes the key issues from Volume 3 and provides further analysis and assessment of the issues to provide information to optimise decisions on the development and implementation of the draft plan at least cost to the community;
- Volume 5: Regional analysis: Southern Connected Basin Overview;
- Volume 6: Regional analysis Queensland - provides detailed reports on the key findings from the community engagement process at a regional scale. These regional analyses focus on the short to medium term impacts of the proposals in the Guide on industries and communities at the local level;
- Volume 7: Regional analysis New South Wales;
- Volume 8: Regional analysis Victoria; and
- Volume 9: Regional analysis South Australia.
Introduction

About this study

This study was commissioned by the Murray-Darling Basin Authority to assess the potential impacts of the proposals in the *Guide to the proposed Basin Plan* on local, small-scale, human issues and costs during the short and medium term.

The project was delivered using a suite of tools including community interviews, data analysis and economic modelling. These complementary approaches provided a robust basis for the assessment.

The community impact assessment was targeted at ‘social catchments’. This is a level of social grouping that reflects community identity and local economic interaction and enabled the study to capture impacts that occurred at a small scale. Around 50 such social catchments were selected across the Basin, mostly centred on towns that are at the heart of regional communities.

A comprehensive interview program was undertaken throughout the Basin early in 2011, with almost 700 interviews with key informants in nearly 50 social catchments. These semi-structured interviews obtained and assessed the potential impact of the *Guide* on farmers, businesses and communities within each social catchment. The impact assessment was structured to take account of the wider factors impacting on regional communities to identify the additional impacts that the Guide would have, over and above an agreed baseline.

The interviews used lines of enquiry that explored the current context, responses to the *Guide*, the baseline (a dynamic baseline, if there were no Basin Plan), the impacts of buyback and irrigation modernisation to date, and the impacts of future buyback and/or modernisation to meet the scenarios set out in the Guide. There were four groups of interviewees, with four tailored lines of enquiry, so that impacts could be traced from farmers, through the farm value chain (including processors), and into the community with a focus on businesses and services (Figure 1–1).
The relative impact of the Guide at a local level depended on the scale of the proposed change, the mechanisms by which compensated environmental water recovery occurred, and the inherent capacity of the communities in social catchment to adjust. The capacity of communities to adapt to compensated environmental water recovery depended on two attributes: ‘size’, with a threshold at a figure around 10,000 people; and ‘dependency on irrigated agriculture’, with a threshold at around 15% of total employment in agricultural related sectors.

Figure 1–2. Vulnerability matrix.

Using these two criteria allows the multiple social catchments across the Basin to be analysed within four major categories (Figure 1–2):

**Category 1:** Small to medium towns that are highly dependent on irrigated agriculture and are often geographically isolated. These smaller communities are often subject to larger forces that are driving a decline in their size and
vitality. In many of these communities the Basin Plan could increase the speed and extent of these changes;

**Category 2:** small to medium sized, diverse locations that combine high-value irrigation with tourism and other sectors. They are generally less exposed to impacts;

**Category 3:** Medium to large towns that are highly dependent on irrigated agriculture. These centres are robust with current diversion limits but would be highly exposed to any proposed changes in irrigated agriculture in the region; and

**Category 4:** Large, diverse growing regional centres that have a breadth of activity and employment. These are generally relatively insulated from changes in irrigated agriculture in the region.

The relative vulnerability of towns across the Basin as a whole is shown in Figure 1–3.

It is very important to recognise that relative vulnerability does not necessarily mean that towns will be more negatively impacted by the forthcoming Basin Plan. Other factors are also important; in particular, the relative exposure of towns to the proposed changes is critical. Not all vulnerable towns will necessarily face significant reductions in irrigation activity under the Basin Plan. A number of factors, in turn, affect exposure – these include the extent of the change from the current to the proposed sustainable diversion limit; the types of water entitlement sought by the Commonwealth; the mode of procurement (e.g. buy-back vs. modernisation); etc. Some of these key policy settings that affect exposure are discussed in Volume 4 of this study.
Figure 1–3. Social catchments in the Murray-Darling Basin, showing relative vulnerability of towns to reduced irrigation.
About these regional reports

These regional reports set out in detail the analysis and findings of this study for each Basin region, by State.

This report presents the EBC consortium’s findings for the South Australian regions – the Riverland and the Lower Murray. The findings set out in this report should be construed as the consortium’s professional judgment, except for where the context makes it clear that it is not our judgment (e.g. in some cases, anecdote that could not be substantiated is clearly expressed as being the opinion of those who communicated it). Our judgment is based upon interviews with community members, economic modelling, published literature and our professional experience.

The days allocated to regional interviews, and to analysis and report preparation, for each region differed depending on the expected exposure of each region to potential irrigation impacts of the Basin Plan. Accordingly, the number of people interviewed and the time spent in report writing was greater for the Riverland than the Lower Murray.

These regional reports do not present the results, or our detailed analysis of, the additional ABARES modelling commissioned for this study; for that material the interested reader is referred to Volume 4. The Volumes of this study are set out on page 4.

The interview program and analysis for each region in this study was undertaken by a two-person team that comprised a Team Leader and Number Two. The Team Leaders (and, in many cases, the Number Twos) have many years’ experience working and, for some, living in their regions. This expertise was combined with extensive professional experience in water and/or agriculture and meant that the Team Leaders were able to test and thoroughly analyse the material gained through our program. The consortium’s findings across the Basin as a whole then were collectively analysed and synthesised.

The Team Leaders were the lead authors of these regional profiles, which were then reviewed by the consortium and MDBA.

The Team Leader for South Australia was Julian Morison of EconSearch, assisted by Heather Bailey of EconSearch (Riverland) and Matthew Ferris of EconSearch (Lower Murray).

‘Bridging the Gap in the Murray-Darling Basin’

The Australian Government has made a commitment that farmers' water rights will not be affected by the Basin Plan. It will ensure this by "bridging the gap" between current diversions and any final sustainable diversion limits in the Murray-Darling Basin Plan through water savings generated by infrastructure investments and
voluntary water purchase. An annual average of over 700 GL of water had already been recovered for the environment through these measures.¹

The major elements of the Commonwealth's ten-year Water for the Future program commence in 2008 are:²

$3.1 billion for purchase of water entitlements for the environment (Restoring the Balance in the Murray-Darling Basin Program); and

$5.8 billion for infrastructure improvements to improve water use efficiency (Sustainable Rural Water Use and Infrastructure Program), some of which is not within the Basin.

Under the Sustainable Rural Water Use and Infrastructure program, the Australian Government has agreed in principle to provide close to $3.2 billion for significant state-based water infrastructure and reform projects in South Australia, New South Wales, Victoria, Queensland and the ACT, subject to a due diligence assessment of the social, economic, environmental, financial and technical aspects of the projects.³

Other elements of the Sustainable Rural Water Use and Infrastructure program include investment in the Menindee Lakes, and the Private Irrigation Infrastructure Operators Program (PIIOP) in New South Wales. The PIIOP aims to acquire water entitlements resulting from water savings generated by the implementation of eligible projects to improve the efficiency and productivity of water use and management, both off and on-farm, by private irrigation infrastructure operators, and which also secure a sustainable future for irrigation communities.

As regards water buyback, the $3.1 billion Restoring the Balance in the Basin program aims to acquire water entitlements from willing sellers that represents value for money, and use the water allocated to them for the environment. This water will be used to improve the health of the Basin's rivers, wetlands and floodplains.

Up to February 2010, expenditure on the buyback component was $1,079 million, and expenditure on water infrastructure for irrigation and other primary industry purposes was $465 million.⁴ This means that significant investment remains to be made under these two programs, contributing towards the ‘bridging the gap’ commitment. Budgeted expenditure is set out in Table 1–1.

The extent of any additional necessary investment in these or other programs to meet the requirements of the Basin Plan is not yet clear.

Table 1–1. Budgeted expenditure for Australian Government buyback and modernisation (at 2010).\(^5\)

<table>
<thead>
<tr>
<th>Financial year</th>
<th>Buyback (Restoring the Balance budgeted expenditure revised ($ million))</th>
<th>Modernisation (SRWUI, as shown in 2010–11 Budget ($ million))</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007-08</td>
<td>45.5</td>
<td>-</td>
</tr>
<tr>
<td>2008-09</td>
<td>432.5</td>
<td>-</td>
</tr>
<tr>
<td>2009-10</td>
<td>1,237.8</td>
<td>230</td>
</tr>
<tr>
<td>2010-11</td>
<td>254.4</td>
<td>706</td>
</tr>
<tr>
<td>2011-12</td>
<td>249.5</td>
<td>868</td>
</tr>
<tr>
<td>2012-13</td>
<td>510.5</td>
<td>900</td>
</tr>
<tr>
<td>2013-14</td>
<td>n/a</td>
<td>732</td>
</tr>
<tr>
<td>2013-14 to 2016-17</td>
<td>369.8</td>
<td>-</td>
</tr>
</tbody>
</table>

Riverland

Summary Overview

This section summarises the subsequent sections of the Riverland report. For explanation of conclusions summarised in this overview, please refer to the appropriate subsequent section of this report. Please note that this report is not a regional profile, but rather, is a report on the base case and potential impacts of proposed reductions in irrigation water availability. It draws on previously-published regional profiles to which the interested reader is referred. 

This report presents the EBC consortium’s findings for the Riverland region. For the purposes of this report the Riverland region extends from the SA/Victoria border westwards along the SA Murray to Morgan (above Lock 1 at Blanchetown). The Riverland region forms one social catchment.

Social Catchments 

The Riverland social catchment has a number of small, highly water dependent communities which are vulnerable to changes in water availability and quality.

<table>
<thead>
<tr>
<th>Social catchment</th>
<th>City/town name</th>
<th>Population, 2006</th>
<th>Vulnerability category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riverland</td>
<td>Paringa</td>
<td>946</td>
<td>1</td>
<td>Highly dependent on irrigated permanent horticulture</td>
</tr>
<tr>
<td></td>
<td>Renmark</td>
<td>4,339</td>
<td>1</td>
<td>Highly dependent on irrigated permanent horticulture</td>
</tr>
<tr>
<td></td>
<td>Berri</td>
<td>4,008</td>
<td>1</td>
<td>Highly dependent on irrigated permanent horticulture, regional centre for health services</td>
</tr>
<tr>
<td></td>
<td>Barmera</td>
<td>1,928</td>
<td>1</td>
<td>Highly dependent on irrigated permanent horticulture</td>
</tr>
<tr>
<td></td>
<td>Loxton</td>
<td>3,431</td>
<td>1</td>
<td>Highly dependent on irrigated permanent horticulture</td>
</tr>
<tr>
<td></td>
<td>Cobdogla</td>
<td>232</td>
<td>1</td>
<td>Highly dependent on irrigated permanent horticulture</td>
</tr>
<tr>
<td></td>
<td>Waikerie</td>
<td>1,744</td>
<td>1</td>
<td>Highly dependent on irrigated permanent horticulture</td>
</tr>
<tr>
<td></td>
<td>Cadell</td>
<td>460</td>
<td>1</td>
<td>Highly dependent on irrigated permanent horticulture</td>
</tr>
<tr>
<td></td>
<td>Morgan</td>
<td>426</td>
<td>1</td>
<td>Highly dependent on irrigated permanent horticulture</td>
</tr>
</tbody>
</table>

Primary Irrigated production 

The Riverland is Australia’s largest wine producing region, growing in excess of 50% of South Australia’s wine grapes. The region is also well known for its production and processing of citrus, stone fruit, almonds and vegetables. The regional economy of around $2.2 billion has a high dependence on irrigation, with wineries, packing sheds and other food processing reliant on a consistent supply of irrigated crops. There are

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7 Please refer to section 2.2.1 for more information and explanation  
8 Please refer to section 2.2.1 and 2.2.2 for more information and explanation
an estimated 3,000 growers. It is important to note that the contribution to regional economic activity in 2006/07 by irrigated agriculture was influenced by drought conditions and restricted water allocations in that year. Notwithstanding those conditions, it was estimated that River Murray based irrigated agriculture contributed approximately 18 per cent of jobs in the region and almost 15 per cent of GRP.

**Drought**

The Riverland region developed with the expectation of 100% reliable water. Since 2006-07 the Riverland has suffered a series of low allocations, being finishing allocations of 60%, 32% and 18% and starting allocations of only a few %, which makes planning very difficult. Low water allocations have led to high debt from annual water purchases e.g. in 2007-08 interstate temporary trade into SA was around 150 GL.

Low water allocations combined with low prices have resulted in 6,780 ha of perennial plantings being dried off (17% of perennial irrigated horticulture).

**Baseline**

The Riverland has sustainable comparative advantages for high value irrigated horticulture. These include soils, climate, (hitherto) reliable water supply, best practice water supply systems and efficient on-farm systems, ability to grow a diversity of (irrigated) crops, fruit fly free status, proximity to markets and good infrastructure (transport and power).

These positive attributes are offset by a range of issues that contribute to the low level of resilience and the current vulnerability of the region.

The regional economy is not diversified - “The engine of the Riverland is horticulture. Tourism is important but it relies on the regional assets and infrastructure provided by the horticultural industries. The region is not like a Wagga Wagga; there is no university, no defence, no significant regional offices of government”.

There is no scope for farm transformation to dryland agriculture as irrigation property sizes are too small and rainfall is relatively low and unreliable.

Achieving scale economies (through property amalgamation) is generally more difficult in permanent horticulture (compared with annual irrigated crops and dryland agriculture) where orchards/vineyards and irrigation systems are challenging and expensive to integrate.

The capital necessary for investment (on-farm and elsewhere) is not available within the community and banks are expected to be reluctant to lend.

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9 Please refer to section 2.3.3 for more information and explanation

10 Please refer to section 2.4 for more information and explanation
The community has a low propensity to change enterprises.

There is substantial capital sunk in perennial irrigated crops that makes changing to alternative enterprises/land uses costly and therefore unattractive. Another aspect is that there is a tradition or ‘proud history’ of horticulture and that there is a psychological barrier to change.

**Impact of reduced water availability**

The Riverland wine grape industry currently is very sensitive to water reduction due to recent low profitability. Other perennial horticulture may be able to survive by buying water. This will be dependent on commodity prices and water prices.

The response to any permanent and material reduction in SDLs is uncertain and will depend upon long-term horticultural profitability. At the moment profitability is low, especially for wine grapes and could result in a likely reduction in horticultural area, no replanting of dried-off areas, and people abandoning properties. This would lead to reduced employment in an area where unemployment is already above State averages. However, if horticulture profitability returns then the Riverland will be able to purchase water from other areas and expand production, as it has over the last fifteen years. Some growers see an opportunity in being able to buy or being supplied water from the environment water holder in dry years and selling or supplying water to it in wet years.

Water security is essential to industry confidence and investment. If the SDL provided a reduction in the frequency of low allocation years, then it would assist.

**Minimising Impacts**

The following suggestions towards minimising the impacts of the Plan have come from the Riverland community.

The Basin Plan should recognise South Australia’s historically responsible behaviour in restraining from issuing new water entitlements. South Australia has achieved increased economic activity from Murray Darling Basin water resources through efficient management of its limited water resource, whereas in other states, growth has been greatly enhanced through increased water allocations.

Communities suggested the Basin Plan should target water saving measures in those areas of the Murray Darling Basin where inefficient delivery systems still exist and ‘socialise’ the water savings across the entire MDB (i.e. the concept of a ‘Basin without Borders’).

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11 Please refer to section 2.6 for more information and explanation. In addition, the potential social and economic impacts of different policy settings including buyback policy, modernization policy, etc. is discussed in Volume 2 of this study – accordingly it is not repeated here, but the interested reader is referred to that volume for detailed discussion of conclusions that are summarized in this regional report.

12 Please refer to section 2.8 for more information and explanation.
Some growers propose and support a scheme where surplus irrigation water (i.e. water surplus to requirements in a 100% allocation year) is bought for the environment at a price reflecting the on-farm investment that has been made to achieve these water savings.

Communities suggested the Basin Plan should determine critical human needs collectively (across all states), prior to determining individual states SDLs. This would ensure that the SDL impacts to irrigation water users across the Basin are directly comparable.

Informants argued the Basin Plan should move away from a deterministic target towards a precautionary, graduated approach to achieve the new diversion limits, recognising the high levels of uncertainty surrounding the science, the biological responses and the social and economic consequences.

A number of suggestions were made where government could provide a facilitating role in regional development. These include assisting farm amalgamation, assisting transition into new crops/enterprises, development of non-agricultural based industries which might include tourism, education, food and beverage manufacturing, and retirement and immigration facilities and services.

Communities suggested the Government should allow growers to sell water in the buyback program under the condition they can lease back from ‘the environment’ in dry years.

Related to this, communities suggested there should be greater transparency about the way in which environmental water will be managed and accounted for will improve confidence in the Basin Plan and, ultimately, the likelihood of its acceptance by the MDB community.

**Background**

**Social catchments and regional profile**

The Riverland region extends from the SA/Victoria border westwards along the SA Murray to Morgan (above Lock 1 at Blanchetown). The Riverland region forms one social catchment (see Figure 2–1).

**Riverland social catchment**

The regional centres of the Riverland social catchment are Renmark, Loxton, Barmera, Berri and Waikerie. The population is around 33,455 and is relatively evenly spread, with 34% in Berri Barmera LGA, 36% in Loxton Waikerie LGA and 29% in Renmark Paringa LGA. The Riverland area has above average proportions of children and people aged 45 years and older. There have been below average
population increases over recent years, and the population is projected to decline in the future\textsuperscript{13}.

The regional economy of around $2.2 billion\textsuperscript{14} has a high dependence on irrigation, with wineries, packing sheds and other food processing reliant on a consistent supply of irrigated crops. There are an estimated 3,000 growers\textsuperscript{15}. It also has manufacturing industry and is a strategic location for transport between Adelaide, Mildura and Sydney.

The Riverland is Australia’s largest wine producing region, growing in excess of 50% of South Australia’s wine grapes. The region is also well known for its production and processing of citrus, stone fruit, almonds and vegetables. The Riverland is also a producer of cherries and olives. The location of high horticultural quality soils adjacent to the Murray is a key advantage for the region.

Recreation and tourism are important contributors to the regional economy with tourist accommodation (including the houseboat industry) generating significant employment and income for the regional economy.

**Towns by vulnerability category**

A listing of major towns by social catchment and vulnerability category is provided in Table 2–1. The Riverland social catchment has a number of small, highly water dependent communities which are vulnerable to changes in water availability and quality.

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<td>Highly dependent on irrigated permanent horticulture</td>
</tr>
<tr>
<td></td>
<td>Waikerie</td>
<td>1,744</td>
<td>1</td>
<td>Highly dependent on irrigated permanent horticulture</td>
</tr>
<tr>
<td></td>
<td>Cadell</td>
<td>460</td>
<td>1</td>
<td>Highly dependent on irrigated permanent horticulture</td>
</tr>
<tr>
<td></td>
<td>Morgan</td>
<td>426</td>
<td>1</td>
<td>Highly dependent on irrigated permanent horticulture</td>
</tr>
</tbody>
</table>

\textsuperscript{13} http://www.workforceinfoservice.sa.gov.au/workforceinfo/regionalprofiles/riverland

\textsuperscript{14} EconSearch. 2009 for PIRSA, Economic Profile of the Riverland Region of South Australia 2006/7

\textsuperscript{15} Estimated 1,300 CIT plus RIT and private irrigators approximately 3,000 growers

\textsuperscript{16} ABS (2007), 2006 Census QuickStats by Location, Cat No.1216.0.
In addition to the towns listed in Table 2–1, the Riverland social catchment includes a number of other smaller, highly vulnerable towns such as Lyrup, Glossop, Monash, Loveday, Winkie, Moorook, Ramco and Kingston-on-Murray.
Figure 2–1. Riverland social catchment in the SA Murray, showing relative vulnerability of towns to reduced irrigation.
Regional profile

EconSearch (2011)\textsuperscript{17} has prepared a broad regional profile of the Riverland region for 2006/07 for Primary Industries and Resources South Australia. The profile presented below relates to a region bounded by the following Statistical Local Areas.

Renmark Paringa (DC) – Paringa
Renmark Paringa (DC) – Renmark
Berri Barmera (DC) - Berri
Berri Barmera (DC) - Barmera
Loxton Waikerie (DC) – East
Loxton Waikerie (DC) – West
Unincorporated Riverland

Economic activity in the River Murray region in 2006/07 is presented in terms of the following indicators:

- employment;
- output;
- household income;
- other value added; and
- gross regional product (GRP).

**Employment** is a measure of the number of working proprietors, managers, directors and other employees, in terms of the number of full-time equivalents and total (i.e. full-time and part-time) jobs. Employment is measured by place of remuneration rather than place of residence.

**Output** is a measure of the gross revenue of goods and services produced by commercial organisations (e.g. farm-gate value of production) and gross expenditure by government agencies. Total output needs to be used with care as it includes elements of double counting (e.g. the value of winery output includes the farm-gate value of grapes) and overstates the real contribution to economic activity.

\textsuperscript{17} EconSearch (2011), *Economic Profile of the River Murray Region of South Australia, 2006/07*, report prepared for PIRSA.
Household income is a component of GRP and is a measure of wages and salaries paid in cash and in kind, drawings by owner operators and other payments to labour including overtime payments, employer’s superannuation contributions and income tax, but excluding payroll tax.

Other value added is another component of GRP and includes gross operating surplus (excluding the drawings of working proprietors) and all taxes, less subsidies.

Gross regional product (GRP) is a measure of the net contribution of an activity to the regional economy. Gross regional product is measured as value of output less the cost of goods and services (including imports) used in producing the output. In other words, it can be measured as household income plus other value added (gross operating surplus and all taxes, less subsidies). It represents payments to the primary inputs of production (labour, capital and land).

A breakdown of employment and value of output by sector for the Riverland region in 2006/07 is provided in Table 2–2 and a breakdown of gross regional product (GRP) is summarised in Table 2–3.

The Riverland region has a mix of primary (mainly irrigated permanent horticulture) and manufacturing activity (particularly wine and food products) and also has a significant urban population with associated housing stock and service sectors.

It is important to note that the contribution to regional economic activity in 2006/07 by both broadacre and irrigated agriculture was influenced by drought conditions and restricted water allocations in that year. Notwithstanding those conditions, it was estimated that River Murray based irrigated agriculture contributed approximately 18 per cent of jobs in the region and almost 15 per cent of GRP.

Based on recent modelling work undertaken by EconSearch, it was estimated that expenditure by tourists directly and indirectly contributed over 6 per cent of jobs (FTE and total) in the region and 4 per cent of GRP in 2006/07.
## Table 2–2. Employment and output, Riverland region, 2006/07

<table>
<thead>
<tr>
<th>Sector</th>
<th>Total Employment</th>
<th>Employment</th>
<th>Value of Output</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no. of jobs</td>
<td>%</td>
<td>fte</td>
</tr>
<tr>
<td>Agriculture, forestry and fishing</td>
<td>3,270</td>
<td>20.8%</td>
<td>3,323</td>
</tr>
<tr>
<td>River Murray irrigated agriculture</td>
<td>2,756</td>
<td>17.5%</td>
<td>2,763</td>
</tr>
<tr>
<td>Mining</td>
<td>5</td>
<td>0.0%</td>
<td>6</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>1,981</td>
<td>12.6%</td>
<td>2,018</td>
</tr>
<tr>
<td>Electricity, gas and water</td>
<td>171</td>
<td>1.1%</td>
<td>183</td>
</tr>
<tr>
<td>Building and construction</td>
<td>610</td>
<td>3.9%</td>
<td>629</td>
</tr>
<tr>
<td>Wholesale trade</td>
<td>1,287</td>
<td>8.2%</td>
<td>1,320</td>
</tr>
<tr>
<td>Retail trade</td>
<td>2,269</td>
<td>14.4%</td>
<td>1,950</td>
</tr>
<tr>
<td>Accommodation, cafes &amp; restaurants</td>
<td>725</td>
<td>4.6%</td>
<td>555</td>
</tr>
<tr>
<td>Transport and storage</td>
<td>564</td>
<td>3.6%</td>
<td>614</td>
</tr>
<tr>
<td>Communication services</td>
<td>78</td>
<td>0.5%</td>
<td>66</td>
</tr>
<tr>
<td>Finance and insurance</td>
<td>241</td>
<td>1.5%</td>
<td>211</td>
</tr>
<tr>
<td>Ownership of dwellings</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Property and business services</td>
<td>688</td>
<td>4.4%</td>
<td>601</td>
</tr>
<tr>
<td>Public administration and defence</td>
<td>445</td>
<td>2.8%</td>
<td>419</td>
</tr>
<tr>
<td>Education</td>
<td>1,036</td>
<td>6.6%</td>
<td>993</td>
</tr>
<tr>
<td>Health and community services</td>
<td>1,776</td>
<td>11.3%</td>
<td>1,422</td>
</tr>
<tr>
<td>Cultural and recreational services</td>
<td>121</td>
<td>0.8%</td>
<td>98</td>
</tr>
<tr>
<td>Personal services</td>
<td>476</td>
<td>3.0%</td>
<td>439</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>15,744</td>
<td>100.0%</td>
<td>14,847</td>
</tr>
</tbody>
</table>

Value of output estimates for River Murray based irrigated agricultural production were supplied by PIRSA (pers. comm.). Associated employment estimates were calculated using employment to output ratios for the component industries which were, in turn, derived from the modelling undertaken by EconSearch.

The ownership of dwellings sector is a notional sector designed to impute a return to the region’s housing stock. Total value of output in this sector is an estimate of rent earned on leased dwellings and imputed rent on the balance of owner-occupied dwellings.

Table 2–3. Contribution to gross regional product, Riverland region, 2006/07\(^a\)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Household Income</th>
<th>Other Value Added</th>
<th>Gross Regional Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, forestry and fishing</td>
<td>$79.9 (13.1)%</td>
<td>$142.3 (28.9)%</td>
<td>$222.3 (18.6)%</td>
</tr>
<tr>
<td>(\text{River Murray irrigated agriculture} (^b))</td>
<td>$64.3 (10.6)%</td>
<td>$112.4 (22.8)%</td>
<td>$176.8 (14.8)%</td>
</tr>
<tr>
<td>Mining</td>
<td>0.2 (0.0)%</td>
<td>0.6 (0.1)%</td>
<td>0.8 (0.1)%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>105.0 (17.3)%</td>
<td>78.5 (15.9)%</td>
<td>183.6 (15.3)%</td>
</tr>
<tr>
<td>Electricity, gas and water</td>
<td>14.8 (2.4)%</td>
<td>23.7 (4.8)%</td>
<td>38.5 (3.2)%</td>
</tr>
<tr>
<td>Building and construction</td>
<td>31.4 (5.2)%</td>
<td>14.8 (3.0)%</td>
<td>46.2 (3.9)%</td>
</tr>
<tr>
<td>Wholesale trade</td>
<td>60.4 (9.9)%</td>
<td>32.2 (6.5)%</td>
<td>92.6 (7.7)%</td>
</tr>
<tr>
<td>Retail trade</td>
<td>51.5 (8.5)%</td>
<td>19.8 (4.0)%</td>
<td>71.3 (6.0)%</td>
</tr>
<tr>
<td>Accommodation, cafes &amp; restaurants</td>
<td>16.6 (2.7)%</td>
<td>11.0 (2.2)%</td>
<td>27.6 (2.3)%</td>
</tr>
<tr>
<td>Transport and storage</td>
<td>27.6 (4.5)%</td>
<td>16.0 (3.2)%</td>
<td>43.6 (3.6)%</td>
</tr>
<tr>
<td>Communication services</td>
<td>3.9 (0.6)%</td>
<td>4.4 (0.9)%</td>
<td>8.2 (0.7)%</td>
</tr>
<tr>
<td>Finance and insurance</td>
<td>15.2 (2.5)%</td>
<td>14.6 (3.0)%</td>
<td>29.7 (2.5)%</td>
</tr>
<tr>
<td>Ownership of dwellings</td>
<td>0.0 (0.0)%</td>
<td>96.4 (19.6)%</td>
<td>96.4 (8.0)%</td>
</tr>
<tr>
<td>Property and business services</td>
<td>38.0 (6.2)%</td>
<td>20.1 (4.1)%</td>
<td>58.1 (4.9)%</td>
</tr>
<tr>
<td>Public administration and defence</td>
<td>19.0 (3.1)%</td>
<td>3.1 (0.6)%</td>
<td>22.2 (1.9)%</td>
</tr>
<tr>
<td>Education</td>
<td>47.6 (7.8)%</td>
<td>2.9 (0.6)%</td>
<td>50.5 (4.2)%</td>
</tr>
<tr>
<td>Health and community services</td>
<td>72.9 (12.0)%</td>
<td>7.7 (1.6)%</td>
<td>80.6 (6.7)%</td>
</tr>
<tr>
<td>Cultural and recreational services</td>
<td>5.7 (0.9)%</td>
<td>2.9 (0.6)%</td>
<td>8.6 (0.7)%</td>
</tr>
<tr>
<td>Personal services</td>
<td>18.7 (3.1)%</td>
<td>1.7 (0.4)%</td>
<td>20.4 (1.7)%</td>
</tr>
<tr>
<td>Intermediate total</td>
<td>608.4 (100.0)%</td>
<td>492.8 (100.0)%</td>
<td>1,101.2 (92.0)%</td>
</tr>
</tbody>
</table>

\(^{a}\) Using the income method to derive gross regional product (GRP) enables GRP to be estimated on a sector-by-sector basis (household income and other value added are the two components of GRP).

\(^{b}\) Household income and other value added estimates for River Murray based irrigated agricultural production were calculated using value of output estimates supplied by PIRSA (pers. comm.) and household income per job and other value added to output ratios for the component industries. These ratios were derived from the modelling undertaken by EconSearch.

\(^{c}\) Includes net taxes (i.e. indirect taxes less subsidies) paid by households and other components of final demand.


**Irrigation in the region**

The current surface water diversion limit for the irrigation valleys of the Basin is shown in...
The first district to be established in the Riverland region was Renmark in 1887 by the Chaffey Brothers, who also established the Mildura Irrigation District in the neighbouring upstream region of Sunraysia. Other settlements followed in the 1890s at Holder, Kingston, Lyrup, Moorook, Murtoa, New Era, New Renmark, Pyap, Ramco and Waikerie. Some of these schemes were developed as a government response to the economic depression of the 1890s, where the aim was to keep energy, talent and capital from leaving South Australia using Village Settlement Schemes.

In 1901 a Royal Commission recommended that the settlements be subdivided and leased to individual settlers instead of village associations and over time most of these areas became government irrigation areas. Soldier settlement schemes were later allotted for returned servicemen at Berri, Chaffey, Cadell and Cobdogla from 1917, with Loxton and Cooltong from 1946. In 1956 and 1961 the privately developed Sunlands/Golden Heights schemes were established.

As pumping technology became more affordable and efficient more recent development occurred through private irrigation, where irrigators operate their own pumping infrastructure from the River. Water trade enabled further growth in these properties from the early 1990s with the Riverland purchasing water from pasture users in upstream states or from the downstream lower Murray region to expand the wine grape and almond industries. Some of this development was funded through

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managed investment schemes. Now the majority of irrigation is from private infrastructure. The Central Irrigation Trust manages most of the community supplied districts with a total of 13,000 ha. There is also the Renmark Irrigation Trust, which supplies water to 4,700 ha. All the water is supplied from the River Murray.

The change in area of perennial horticultural crops in response to drought over the last three years is shown in Table 2–4. There also are approximately 1,000 ha of vegetables grown and the area laid out for irrigation (including vacant seasonal and perennial area) is around 48,000 ha. The main trend in citrus has been a shift away from valencias (from 150 kt to 50 kt) for juicing to more navels for fresh fruit and export to the USA. In wine grapes there has been a large expansion followed by a reverse in the last few years. Almonds have also grown in area in recent years. There are also significant areas of stone fruit and pome fruit. This area reduced during the wine grape boom when people replaced older trees with wine grapes. In recent times people are considering a move back to these and other crops such as dates and vegetables. The area has a history of changing crop type to suit the market.

Most properties hold a water entitlement that was calculated based on crop area and crop requirement. Licensing conditions require annual reporting of water use versus crop requirement. Water use has been relatively steady in the decade prior to the drought, which was an outcome of water entitlements being sufficient for the development, and usage had been capped by State legislation.

Irrigators believe that legislation provided 100% reliability and that being a small, highly efficient and high value user of the total resource, that this should be recognised. Expansion in irrigated area occurred through water trade, but this has reduced since 2007 because of drought and low commodity prices.

Table 2–4. Perennial Horticulture

<table>
<thead>
<tr>
<th>Commodity Area (ha)</th>
<th>2007</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grapevines</td>
<td>24,400</td>
<td>20,094</td>
</tr>
<tr>
<td>Citrus</td>
<td>7,768</td>
<td>6,212</td>
</tr>
<tr>
<td>Nut crops</td>
<td>4,263</td>
<td>4,264</td>
</tr>
<tr>
<td>Stone fruit</td>
<td>1,523</td>
<td>851</td>
</tr>
<tr>
<td>Pome fruit</td>
<td>294</td>
<td>212</td>
</tr>
<tr>
<td>Olives</td>
<td>716</td>
<td>617</td>
</tr>
<tr>
<td>Other horticultural tree crops</td>
<td>209</td>
<td>143</td>
</tr>
<tr>
<td>Total a</td>
<td>39,173</td>
<td>32,393</td>
</tr>
</tbody>
</table>

\[\text{a Includes SA border to the barrages but excludes Langhome Creek as it is not contained in or managed within the SAMDBNRM database.}\]
Water management, government purchases and drought

Water management

Access to River Murray water is managed through the River Murray Water Allocation Plan.\textsuperscript{20} The Plan covers the River Murray from the border with Victoria to the Coorong, including Lakes Alexandrina and Albert, and portions of Currency Creek and the Rivers Finniss, Angas and Bremer.

Amendments have been made to the River Murray Allocation Plan to unbundle water rights into separate instruments from 1 July 2009. Prior to this date, water rights and approvals were reflected on a single water licence. Before 1 July 2009, the permanent water right has been reflected as a volumetric water allocation on a licence.

In the current system, the permanent right is expressed as unit shares of water available to be allocated to a class of water access entitlement. Each year, water licensees obtain a share of the available water as a water allocation. The share entitlement is a permanent right, whereas the water allocation received depends on prevailing conditions. The maximum volume that can be assigned to a share is one kilolitre.

Table 2–5 provides a summary of SA River Murray water entitlements.

\textbf{Table 2–5. SA River Murray water entitlements}\textsuperscript{21}

<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
<th>Total Shares</th>
<th>Allocation in 100% allocation year (GL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Domestic and/or stock watering</td>
<td>8,704,910</td>
<td>8.7</td>
</tr>
<tr>
<td>2</td>
<td>Country towns public water supply</td>
<td>50,000,000</td>
<td>50.0</td>
</tr>
<tr>
<td>3a</td>
<td>Irrigation and Holding</td>
<td>544,018,767</td>
<td>544.0</td>
</tr>
<tr>
<td>3b</td>
<td>Irrigation Qualco-Sunlands Groundwater Control Trust area</td>
<td>21,038,369</td>
<td>21.0</td>
</tr>
<tr>
<td>4</td>
<td>Recreation</td>
<td>4,423,526</td>
<td>4.4</td>
</tr>
<tr>
<td>5</td>
<td>Industrial and Industrial Dairy</td>
<td>5,519,841</td>
<td>5.5</td>
</tr>
<tr>
<td>6</td>
<td>Metro Adelaide reticulated public water supply a</td>
<td>130,000,000</td>
<td>130.0</td>
</tr>
<tr>
<td>7</td>
<td>Environment</td>
<td>38,366,550</td>
<td>38.4</td>
</tr>
<tr>
<td>8</td>
<td>Environmental Land Management</td>
<td>22,200,000</td>
<td>22.2</td>
</tr>
<tr>
<td>9</td>
<td>Wetland Management</td>
<td>200,000,000</td>
<td>200.0</td>
</tr>
</tbody>
</table>

\textsuperscript{a} 650,000,000 shares over a 5-year rolling average.


Water recovery

The Australian Government, through the Water for the Future Program, has bought 62.6 GL of water entitlements from the SA Murray\(^\text{22}\). The water rights acquired by the Commonwealth under Water for the Future become part of the Commonwealth environmental water holdings. These holdings are managed by the Commonwealth Environmental Water Holder (see Table 2–6). The purchases have primarily involved voluntary selling by individual irrigation businesses. Individual sales have been spread across the SA Murray. In the Riverland it would appear that irrigators within the Irrigation Trust areas, rather than private diverters, have been more likely to sell to the Australian Government. Water recovery via the Private Irrigation Infrastructure Program for SA (PIIP) scheme has been minimal\(^\text{23}\). The PIIP funds projects that demonstrate high merit in improving the efficiency and productivity of irrigation water use and management in the South Australian Murray-Darling Basin. Water savings generated through the program are shared between irrigators and the Commonwealth Environmental Water Holder.

<table>
<thead>
<tr>
<th>Catchment</th>
<th>Entitlement Type</th>
<th>Secured purchases (GL)</th>
<th>Expected average annual volume of water available for the environment (GL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA Murray</td>
<td>SA High security</td>
<td>62.584</td>
<td>56.326</td>
</tr>
</tbody>
</table>

Table 2–6. Australian Government water purchases in the SA Murray River catchment.\(^\text{24}\)

Drought

Over the last five years there has been substantial purchase of temporary water from upstream states to assist with low water allocations, especially in 2008-09 when a finishing allocation of only 18% was available. This followed the 2006-07 season allocations of 60% and the 2007-08 season allocation of 32%.

The SA government implemented carryover as a temporary, drought-specific policy introduced in South Australia in 2007\(^\text{25}\). It enabled River Murray water users to manage inter-seasonal risks by carrying over to the following year a proportion of their unused annual

\(^{22}\) [http://www.environment.gov.au/water/policy-programs/entitlement-purchasing/2008-09.html](http://www.environment.gov.au/water/policy-programs/entitlement-purchasing/2008-09.html), accessed 3/5/2011. Note that this figure is higher than that cited in Table 2–7 because more purchases have been made since the time that table was assembled. The figure in Table 2–7 was used in the EBC interview program.


allocation. Carryover was enabled because the State Government negotiated the capacity to temporarily retain some water in upstream storages for delivery the following year. This temporary storage arrangement has now ceased. Current allocations are at 67% to account for the carryover into the 2010-11 season.

South Australia is currently negotiating the arrangements to allow for implementation of long-term water storage rights under the Murray-Darling Basin Agreement.

Drought and other issues identified by respondents are discussed in the following sections.

**Irrigators**

Commodity prices have been the first order issue in recent years, particularly for wine grapes which account for more than 60% of irrigated area in the Riverland. Low wine grape prices have been a problem for the past 4 or 5 years and continue to be the most significant issue in the region. The average wine grape price in the Riverland was approximately $265/tonne for the 2010 vintage and is expected to be similar or slightly higher for 2011 vintage (perhaps around $280/tonne). Cost of production averages around $330-$350/tonne. It is expected that the excess supply problem, nationally and internationally, will continue in the medium term and, as a result, wine grape prices are unlikely to recover significantly during that time. Production in the Riverland may be down slightly in 2011 because of wet summer related disease problems (widespread Downy and Powdery Mildew). This is likely, however, to provide only short-term relief to the oversupply problem.

Linked to the low commodity prices is the general concern about water security, the future of water entitlements and the uncertainty about the consequences of the Basin Plan. There are, as a result, high levels of stress in the farming community that are exacerbated by falling asset values and declining equity in farm businesses.

In some areas, particularly in the larger irrigation trusts (Central Irrigation Trust (CIT) and Renmark Irrigation Trust (RIT)), there has been a noticeable uptake of exit grants by irrigators (Small Block Irrigator Exit Grants), which has left a patchwork of vacant land within the trust areas. Some of these blocks are being poorly maintained which has created pest and disease issues for neighbouring properties.

In addition to the direct uptake of the exit grant schemes, the low prices combined with low water allocations and risks of high temporary water prices have resulted in an estimated 6,700 ha of perennial plantings being taken out of production (39,000 ha down to 32,300 ha26). Some can be accounted for by participants in the water buyback schemes whilst a portion of the area has been taken out by larger irrigators with an eye to replanting when market conditions and water security improve.

Some growers are achieving reasonable returns and are optimistic about the future. This is the case for almonds, stone fruit and, to a lesser extent, citrus. The $20 million

26 See Table 2–4.
provided by Government for the Riverland Futures Taskforce to enable diversification of the economy is seen by some growers as an opportunity for R&D funding for intensive horticulture and product marketing.

It is estimated that 500 to 1,000 irrigators (of a regional total of approximately 3,000) are on some form of Centrelink support. Local farmers are described as “very fragile”. When exceptional circumstances (EC) payments end there are expected to be some inevitable social consequences.

Statistics on domestic violence show a steady increase over the last 10 years, referrals have reportedly doubled in the last year, from the previous year. There have been 3 suicides amongst farmers locally.

**Value Chain**

That part of the value chain concerned with processing (i.e. wineries, fruit juice manufacturers and packing sheds) are generally concerned about securing raw product volume at suitable quality. The drought and low water allocations has meant that fruit packing sheds, in particular, have been very competitive in securing fruit and a number of smaller packing sheds have ceased operating. For wineries, securing volume has not been a problem. As part of a rationalisation, Berri Fruits (juice manufacturer) left the region during the drought causing a loss of 450 jobs, which had a flow-on effect to transport company, Fletchers, which closed down (loss of 150 jobs). However, there has been a new juice manufacturing entrant that is expanding and the other two juice manufacturers are stable. During the drought, winemakers in the Riverland did not compensate growers for the increased costs incurred in securing water supplies, despite knowing that growers were struggling financially and their viability was under or likely to be under threat. According to one interviewee, this is a reflection of the wine industry’s “complete inability to set up appropriate market structures” and a failure of “corporate social responsibility”.

For the water supply businesses (irrigation trusts), the combination of irrigators participating in exit grant schemes, participation in the buyback program and reduced allocations has meant significantly reduced volume of water pumped which has had a significant impact on revenue in recent years. The reduced allocations portion of the overall reduction is likely to be an intermittent problem into the future but that portion resulting from participation in the buyback program and exit grant schemes could pose a more serious issue.

The business model employed by irrigation trusts has, however, been called into question. It has been suggested that irrigation trusts have very high overheads and rely on a large number of geographically dispersed irrigators drawing from their systems. There is little flexibility built into their business model to account for growers choosing to leave the industry or to not irrigate. It has been suggested that the number of irrigation trusts and their management structures needs to be rationalised.
Input supply firms have suffered as a result of the poor financial position of irrigators in recent years. Machinery dealers in particular have been badly affected with several firms consolidating their operations to just one location in the Riverland. Palate and bin manufacturers, for example, have left the region.

Service firms too have been adversely affected. Finance for equipment purchasers has been greatly reduced which has affected the business of banks and other financiers. Reducing property values has affected commissions for agents and the reduced number of transactions has affected revenue for conveyancing services provided by solicitors. All sectors along the value chain have been impacted by the regional economic downturn in the irrigation industry.

**Community**

Issues for the community are directly related to the issues in the irrigation and other water-related sectors. The reduction in spending by irrigators and businesses in the value chain flows on to the whole community. An increase in behavioural problems reported at schools has, in part, been attributed to financial problems and related pressures in irrigator families.

Population is steady or declining throughout the region. This has a number of impacts. With the downturn in the economy and general lack of inward investment and declining population, houses are difficult to sell for those looking to leave the region and, as a result, house prices are declining (as one respondent explained “I came to the Riverland 7 years ago and I couldn’t buy a house so I had to build one. Now I can’t sell it!”). This increases housing affordability and has attracted some people to move to the region, although generally from lower socio-economic groups who are generally not able to contribute significantly to local economic activity.

The closure of two primary schools is likely, triggered by falling student numbers in smaller communities. Once the school closes, the sports clubs close too and the fabric of the community disintegrates. These small communities have been described as being at a tipping point.

The Riverland councils report that the very significant drop in value of farming properties has made these properties difficult to rate and is having a significant impact on council revenue. Councils are now operating break even budgets and reducing expenditure on road works and non-essential services. They are also shifting the burden of rating onto commercial properties and, to a lesser extent, residential properties.

**Baseline – the Future without Policy Change**

The ‘baseline’ is a description of the expected future for the towns and social catchments over the coming decade, if the current diversion limit for irrigation water were left unchanged. The baseline is dynamic, not static; that is, there would continue
to be variability in factors such as rainfall and commodity prices. Underlying trends would continue.

From a positive perspective the region has sustainable comparative advantages for high value irrigated horticulture. These include:

Soils
Climate
(hitherto) reliable water supply
best practice water supply systems and efficient on-farm systems
ability to grow a diversity of (irrigated) crops
fruit fly free status
proximity to markets
good infrastructure – transport and power

These positive attributes are offset by a range of issues that contribute to the low level of resilience and the current vulnerability of the region:

the regional economy is not diversified - “The engine of the Riverland is horticulture. Tourism is important but it relies on the regional assets and infrastructure provided by the horticultural industries. The region is not like a Wagga Wagga; there is no university, no defence, no significant regional offices of government”;

there is no scope for farm transformation to dryland agriculture as irrigation property sizes are too small and rainfall is relatively low and unreliable;

achieving scale economies (through property amalgamation) is generally more difficult in permanent horticulture (compared with annual irrigated crops and dryland agriculture) where orchards/vineyards and irrigation systems are challenging and expensive to integrate;

the capital necessary for investment (on-farm and elsewhere) is not available within the community and banks are reluctant to lend; and

the community has a low propensity to change enterprises – there is substantial capital sunk in perennial irrigated crops that makes changing to alternative enterprises/land uses costly and therefore unattractive. Another aspect is that there is a tradition or ‘proud history’ of horticulture and that there is a psychological barrier to change.
Response to Basin Plan process

A number of respondents indicated that this consultation exercise was appreciated as it provided an opportunity for the Riverland community to have input into the Basin Plan process. They felt that there had been inadequate consultation during the development of the Guide. As one respondent put it “the community wasn’t engaged, it was barely consulted”. As a result the Guide did not pick up on the importance of regional differences and their socio-economic consequences.

The timing of the release of the Guide has been recognised as unfortunate occurring at a time when there is a crisis in the wine industry, low commodity prices generally and on-going impacts of state water policy (i.e. on-going water restrictions and the cessation of carry-over of water allocations). The community’s emotional response to the Guide can be seen as inevitable. As one respondent put it “the Plan has created a ‘venting’ vehicle for a lot of other issues”.

Many respondents raised the point that the Basin States’ water policies (and politics) are as much a determinant for River-dependent communities as the Basin Plan itself. There is much suspicion surrounding Basin States’ water policies and politics, with phrases like “policy on the run” and “state-based politics are derailing the process” used. As one irrigator highlighted, the biggest risk to his business is government policy – both federal and state. He can’t manage the risk because he does not know in which direction water policy is going, “it’s smoke and mirrors in the water industry”. A repeated aspiration was a “Basin without borders” and one irrigator went as far as to suggest that the Murray-Darling Basin and MDBA be run like the Reserve Bank i.e. with no borders and independent of Government.

Several respondents said that the case for the environment was not well articulated during the community presentations, leading to scepticism amongst some about whether cuts of 3000-4000 GL magnitude were justified. Similarly, concerns about the Environmental Watering Plan lacking detail were raised e.g. environmental watering objectives are not clear and how is the water being used going to be metered? Greater transparency about the way in which environmental water will be managed and accounted for will improve confidence in the Basin Plan and, ultimately, the likelihood of its acceptance by the MDB community.

Many respondents highlighted that the science around environmental water is not well understood, citing examples from their local area of ‘dead’ red gums coming back to life after 10 years of dormancy, frogs returning after a 15 year absence, the Basin rehydrating with above average rainfall in 6 months and not in 3 to 4 years as the MDBA predicted. Given the uncertain science, many have urged that the Basin Plan should be implemented incrementally, evaluating the environmental response and the Basin Plan’s contribution to this periodically. As one respondent put it implementing the Basin Plan should be approached “like eating an elephant – one bite at a time”. Fixed reductions to be achieved over a 5 year transition period was found to be very confronting. As one respondent indicated the Guide has been “unnecessarily scary” and suggests that whilst – in his view - the same reduction
figures need to be put forward, they could be presented differently e.g. “the environment needs 7000 GL, the community can sustain a maximum of 4500 GL, there is a plan to get 3000 GL in the mid-term, and 1500 GL has already been saved”.

Whilst the majority of people interviewed have been critical of the Guide, many have underlined that having no Basin Plan is the worst outcome of all, and urge that the process must not lose momentum.

Impacts of Reduced Water Availability

Water Procurement by Government

The 4000 GL and 3000 GL scenarios outlined in the Guide translate to the Australian Government procuring approximately 54% and 40% (993 GL) of the total water entitlements respectively held by the irrigation industry in the SA Murray 2007 (Table 2–7). There has been approximately 54 GL purchased by the Australian Government in the SA Murray to date, almost all being High Security irrigation only water. It is assumed there will be a mix of both High and General Security water entitlements procured across the Basin by Government in order to meet environmental requirements across the range of high and low rainfall years.

Table 2–7. Current diversion limit and ‘Guide’ proposals.

<table>
<thead>
<tr>
<th>Region</th>
<th>Scenario</th>
<th>Current Diversion Limit (CDL)</th>
<th>Guide reduction from CDL to SDL (^{27}) (average)</th>
<th>Guide reduction in entitlements before modernisation &amp; before buy back (^{28})</th>
<th>Modernisation ‘bridging the gap’ on and off farm, to 2010 (^{29})</th>
<th>Buy-back to date (^{30})</th>
<th>REMAINING CHANGE</th>
<th>Guide reduction in remaining entitlements after modernisation and after existing purchases (^{31})</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA Murray</td>
<td>4000</td>
<td>665</td>
<td>232</td>
<td>35%</td>
<td>277</td>
<td>54%</td>
<td>9</td>
<td>54 (^{32})</td>
</tr>
<tr>
<td>SA Murray</td>
<td>3000</td>
<td>665</td>
<td>173</td>
<td>26%</td>
<td>206</td>
<td>40%</td>
<td>9</td>
<td>54</td>
</tr>
</tbody>
</table>


\(^{28}\) Yield-unweighted entitlements, pro-rata based on use

\(^{29}\) Yield-unweighted entitlements. Source: MJA 2010


\(^{31}\) Yield-unweighted entitlements. Note this ‘gap’ may also be partially met through on and off-farm irrigation modernisation.

\(^{32}\) not always the same across entitlement type, even if pro rata as other Government purchases have reduced 2010 entitlement

\(^{33}\) Note that this figure is higher than that used in section 2.3.2 because more purchases have been made since the time this table was assembled. The figure in Table 2–7 was used in the EBC interview program.
Irrigators

The response to the proposed reductions in Sustainable Diversion Limits (SDLs) will depend upon:

- the prevailing profitability of horticulture/viticulture enterprises; and
- the price offered for water in the buyback programs.

Profitability is currently low/negative, particularly in the wine grape industry. The equity of many grape growers is declining and is likely to deteriorate further following the current (2011) vintage, as the expected average price is well below the operating cost of production. To make matters worse, production costs will be higher in 2010/11 because of adverse seasonal conditions. In these circumstances banks will encourage irrigators to reduce their debt levels by whatever means are available to them. In most cases the only option available will be through the sale of permanent water entitlements.

Irrigators in this position are widely regarded as “distressed sellers”. Most interviewees were contemptuous of government’s reference to “willing sellers” (in their policy of only buying from willing sellers). Sellers in these circumstances will have two broad options:

- remain irrigating by buying temporary water on a year-to-year basis; or
- cease irrigating.

Some irrigators have already adopted the first option, although it is widely recognised as a higher risk option, given the variability of temporary water prices and uncertainty surrounding government policy and the way in which it may affect the water market in the future.

For those who choose the second option, this would increase the already high unemployment level of the region and have a negative impact on regional economic activity (reduced business expenditures, etc.).

Most interviewees felt that the actual impacts will vary according to the circumstances of the individuals participating in the buyback. For those who are near retirement age they would be likely to stay in the region and perhaps look for part-time work. This has been the case with many participants in the exit grant schemes. For those who are younger, it is much more likely that they would leave the Riverland looking for full-time work. There has been a trend for some people to look for work in the mining regions (fly-in fly-out), particularly at Olympic Dam, and this trend is likely to continue.

Many growers feel that they have already achieved very high water use efficiency on farm and there is limited scope for further water savings. Some of these growers indicated a willingness to participate in a buyback program (to the extent that they have water entitlements in excess of their requirements in a year of 100% allocation).
if the price reflected the investment they had made to achieve their water savings. A buyback under these conditions (essentially a retrospective payment for demonstrated and verifiable on-farm investment in improvements to water use efficiency) is unlikely to have any negative impact on regional production and economic activity and indeed would be likely to provide a stimulus to the local economy.

**Value chain**

For the value chain and community discussions it was explained that the SDLs in the Guide were expressed as 26-35% of total SA diversions but, when converted to reduction in entitlements (before modernisation and buyback to date), it implied a range of 40% to 54%. When modernisation and buyback to date were accounted for it became a range of 31% to 47%. In this context we explained it could be up to 50% of remaining entitlements in the region (and that CIT believe it could be as high as 60%). Due to trading (and the fact that many irrigators hold an entitlement greater than their requirements in a 100% allocation year), the reduction in actual water use would be likely to be much less given the high value nature of irrigation in the region.

There are a range of views about the likely impacts along the value chain:

some could see a direct, proportional relationship between changes in water entitlements/availability/use and regional production and therefore the impacts on regional processing. For example, there is likely to be some further consolidation of regional citrus packing sheds (4 large ones remain) if volume was to decrease from current levels;

there is already underutilised winemaking capacity in the region (e.g. one of the largest wineries in Australia, at Loxton, with a capacity to crush 90,000 tonnes/year is currently idle). Further closures would be likely if regional wine grape production was to fall further. Most wineries, like most processing enterprises, need to operate at or near capacity to remain viable;

some see that even if production is largely maintained, the structural adjustment that would be likely to occur through farm build up, cooperative farming and farm amalgamation pressures, would see a rationalisation of input requirements at an industry level which may have significant impacts for suppliers of those services and equipment (i.e. less tractors, less spray units, less farms requiring taxation advice, etc.); and

those irrigation water supply businesses, such as CIT and RIT, who supply a large number of small irrigation blocks and are already grappling with the loss of irrigation customers via the Small Block Irrigators Exit Package, will be put under further financial pressure and ultimately their viability will be in question. The loss of blocks via water buyback leads to a ‘Swiss cheese’ effect where small, randomly dispersed blocks are taken offline but the water supply assets need to be maintained to deliver water to the remaining customers. For
example RiT services 5000ha of which 4500 ha is currently irrigated. The Trust indicates that it can sustain a 10% loss of water delivered to irrigators, beyond which it will not be able to raise rates sufficiently with the remaining growers to fund the replacement of infrastructure, and will be “sitting on a time bomb”.34

Other businesses

The implications for community businesses are obvious. Irrigated agriculture is seen as the driving force for the regional economy. Even tourism, which is sometimes viewed as a separate driver of regional economic activity, is itself highly dependent on the horticulture industry:

while the river is the main tourist attraction in the region, the wineries and food producers are a growing part of the region’s attractions;

some of the larger farms have farm-stay accommodation; and

around 47% of visitors35 to the region are in the ‘visiting friends and relatives’ category. If the region’s population were to decline, then it is highly likely that the ‘attraction’ of the region for almost half the current visitors would decline correspondingly.

Most other community businesses, particularly those involved in retail, are directly and proportionally dependent on the community’s population. If that declines then business is affected accordingly.

Service providers

Community impacts are anticipated to be significant and varied but consistent with a region that is facing reduced income levels and declining population:

a reduction in contribution to volunteering. Related to this is a loss to the religious community when families leave. As population declines the financial and in-kind support for these groups also declines;

increased workload for groups/individuals such as rural counsellors, pastoral groups, Relationships Australia;

reduced attendance at school – some children will be kept at home helping on farms or local businesses when parents can’t afford to pay workers;

the move of some city families to the region to access affordable housing in isolated areas (a current trend that could well continue) can bring issues in the form of a relatively high proportion of children with special needs, families unable to contribute due to financial pressures, staff at schools providing breakfasts, etc.;

34 The ‘Swiss cheese’ effect, termination fees, and related policy issues are discussed in further detail in Volume 4 of this study, and the interested reader is referred to that Volume.
35 Riverland Tourism Authority, pers. Comm.
as people decide to leave their blocks there can be extended periods of family separation (e.g. wife and children move to Adelaide while husband stays in the region to “hold the fort” until the block sells);

for families trapped in low income/poverty - the feelings of hopelessness are manifest in belligerent behaviour of the children, which is mostly very out of character; and

the identity of smaller communities is lost with closure of primary schools and sporting clubs.

Community Resilience and Adaptive Capacity

The region is highly vulnerable to a reduction in available water. Perennial plantings have no capacity to vary planted area with changed water availability. The economy is built on a high dependence of water for agriculture. The historic high security of water combined with suitable soils and climate has led to long-term investment in capital-intensive perennial horticulture and a high level of value adding in processing, packing and distribution industries. The full impacts of low water allocations have yet to flow through to the official statistics.

The capacity to transform to different commodities is:

low for dryland agriculture. Existing farms are 0.5% to 1% of the area required for dryland farms and rainfall is insufficient or marginal for dryland farms;

medium for high value intensive irrigation horticulture. The region does have comparative advantages for this. Farms do not have access to capital for this transformation, but do have access to skills;

low for succession. The region has two groups the on-goers and the out-goers. The out-goers have already reached retirement age and are looking for a way to exit. The on-goers are committed to stay and wish to take opportunities, particularly those posed by low land values and low entry costs at the moment;

high for the commitment to diversify the economy through the $20 million Murray Futures fund plus leverage and individual grower commitment; and

medium to high capacity for innovation and adaption in the regions and sustainable competitive advantages in soil, climate, infrastructure and proximity to Adelaide markets.

Scope to strengthen irrigation management:

on-farm: Already at a very high level due to drought impacts and other factors such as pumping cost and adoption of technology to achieve labour savings. There is some concern that leaching has resulted in higher soil salinities than is
sustainable. Accordingly, there is a little scope to save water from farm technology;

delivery system: the supply system is already piped and there is no capacity to strengthen this component other than improved metering and telemetry/ control systems; and

freeing up of water trade rules: Generally water trading rules are unrestricted. There has been frustration in changing trading rules from upstream states such as the ballot in the Murrumbidgee valley.

Minimisation of Impacts

An interesting divergence of views emerged regarding mitigation options. At a general level some mitigation options related as much to the general malaise of the regional economy as to the specific issues that might arise from the Basin Plan.

On the one hand there was a view that on-going and substantial government support for irrigators and others in the community, of the sort provided through the EC-related programs, was essential for the survival of the region.

An alternative view, relating particularly to the wine industry, was that there are fundamental structural problems with the industry that have been caused by or at least can be characterised by a failure to develop professional relationships between growers and winemakers in the region (and more widely). This has been compounded by too many part-time growers and too many small, family owned enterprises, the latter of which do not generally have any alternative source of income. These struggling growers have little or no disposable income and their failure is contributing to the reduced robustness of the regional economy. EC assistance (in this alternative view) has exacerbated the regions’ problems. In essence the industry is suffering from profound structural problems and ongoing assistance of the type provided under EC is likely to make things worse, not better.

Generally there was a desire that South Australia’s historically responsible behaviour in restraining from issuing new water entitlements be recognised. South Australia has achieved increased economic activity from Murray Darling Basin water resources through efficient management of its limited water resource, whereas in other states, growth has been greatly enhanced through increased water allocations.

An almost universal response was that a high priority should be placed on significant, targeted water saving measures in those areas of the Murray Darling Basin where open channel delivery systems still exist (investment via the Commonwealth Government’s Water for the Future program). The savings from this type of investment should then be ‘socialised’ across the entire MDB (i.e. the concept of a ‘Basin without Borders’).

Some growers indicated a willingness to participate in a buyback program (to the extent that they have water entitlements in excess of their requirements in a year of
100% allocation) if the price reflected the investment they had made to achieve their water savings. A buyback under these conditions (essentially a retrospective payment for demonstrated and verifiable on-farm investment in improvements to water use efficiency) is unlikely to have any negative impact on regional production and economic activity and indeed would be likely to provide a stimulus to the local economy.

There was almost uniform criticism of the way in which the relative reductions (the SDLs) for each state had been calculated and presented in the Guide. A large part of the problem was the way in which critical human needs were included in the calculations. It was suggested that to ensure that the SDL impacts to irrigation water users are directly comparable, these critical human needs should be determined collectively (across all states), and prior to determining individual states SDLs.

Several interviewees could not see the logic in having a deterministic target for the SDLs when there are such high levels of uncertainty about the science, the biological responses and the social and economic consequences. A more precautionary approach (longer time frame) to the new diversion limits was suggested.

A number of suggestions were made where government could provide a facilitating role in regional development:

- Assisting farm amalgamation;
- Assisting transition into new crops/enterprises;
- Development of non-agricultural based industries which might include:
  - tourism;
  - education;
  - food and beverage manufacturing; and
  - retirement and immigration facilities and services.

Many interviewees believe the way in which environmental water is managed will have a large effect on the impact the buyback program will have on regional economies. Some growers see an opportunity in selling water in the buyback program under the condition they could lease back from ‘the environment’ in dry years. These types of arrangements have considerable scope for reducing/mitigating the regional and local community impacts of the SDLs.

Related to this, greater transparency about the way in which environmental water will be managed and accounted for will improve confidence in the Basin Plan and, ultimately, the likelihood of its acceptance by the MDB community.
Lower Murray

Overview

This section summarises the subsequent sections of the Lower Murray report. For explanation of conclusions summarised in this overview, please refer to the appropriate subsequent section of this report. Please note that this report is not a regional profile, but rather, is a report on the base case and potential impacts of proposed reductions in irrigation water availability. It draws on previously-published regional profiles to which the interested reader is referred.36

This report presents the EBC consortium’s findings for the Lower Murray region. For the purposes of this report the Lower Murray region extends from Lock 1 at Blanchetown in SA to the Murray Mouth and includes the Lower Lakes, Alexandrina and Albert. There are two social catchments within the region; Murray Bridge and Goolwa.

Social Catchments37

Murray Bridge

Centred on the relatively large and economically diverse regional centre of Murray Bridge, this social catchment extends from Lock 1 to the Lower Lakes. The region includes a number of smaller regional centres that are highly dependent upon irrigated agriculture (e.g. Swan Reach and Blanchetown – horticulture) and other water-dependent activities such as tourism (e.g. Mannum) and commercial fishing (e.g. Meningie).

Goolwa

A geographically small social catchment based around the regional centres of Goolwa and Strathalbyn. Both of these towns are relatively economically diverse and service a significant numbers of retirees, commuters (particularly Strathalbyn) and holiday makers (particularly Goolwa). Neither is significantly dependent upon irrigated agriculture but Goolwa is highly dependent upon boating-related tourism activity which is, in turn, a function of water levels in the Lower Lakes. The region also includes some smaller regional centres that are highly dependent upon irrigated agriculture (e.g. Langhorne Creek – wine grapes) and other water-dependent activities such as tourism and commercial fishing (e.g. Milang and Clayton).


37 Please refer to section 3.2.1 for more information and explanation
Primary Irrigated production

Murray Bridge

There is a diverse range of irrigated agricultural activity in the region, primarily dairying and vegetable growing, with small plantings of permanent horticultural crops such as stone fruit, almonds and wine grapes. There are significant dairy and vegetable processing facilities located within the region.

Goolwa

Irrigation in the region is dominated by the wine industry centred on Langhorne Creek. This is a large wine grape growing region by area but it has a relatively small processing capacity. Most of the product is transported elsewhere for processing.

Drought

The drought and associated extreme low levels of water in the Lower Lakes impacted upon local communities profoundly.

In 2009 precipitated by extremely low levels of water in the Lower Lakes, two pipelines were built to deliver water from the River Murray further upstream. The first supplies irrigation water to irrigators at Langhorne Creek and Currency Creek. The second provides potable water to households and properties at Langhorne Creek, and Lower Lakes communities.

Irrigated agriculture in the Lower Murray has experienced profound change and contraction over the past 10 years, due to drought and other adjustment pressures (e.g. the SA government funded Lower Murray Swamps Rehabilitation Scheme).

For fishing businesses (Lakes and Coorong commercial fishery) the uncertainty associated with low flows has led to missed marketing and value-adding opportunities, particularly in terms of being able to reliably supply high value niche markets.

The drought also resulted in profound change in the boating sector (hire boats, boat construction and boat maintenance) in the region. Two impacts are highlighted:

- the number of ‘boating’ and other ‘water based’ visitor expenditures went down by an estimated $200 million annually; and
- despite recent investment of millions of dollars on dredging, extending and rebuilding facilities most marinas, slips and ramps became unserviceable during the drought.

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38 Please refer to section 3.1.2 for more information and explanation
39 Please refer to section 3.3.3 for more information and explanation
Other drought related costs incurred by businesses and individuals in the region, as well as by state and local governments, included the following:

the cost of building pipelines to secure access to potable and irrigation water (a mix of private and government funded schemes);

the cost of rehabilitating and securing collapsing river banks (private and government expenditure);

the cost of ensuring access to irrigation water, marinas and boating berths (lowering pumps, excavation, new infrastructure, etc.) – largely private expenditure; and

costs incurred by the SA Department of Transport in keeping the ferries operational during the period when water levels were low.

Baseline

A ‘business as usual’ scenario would lead to considerable uncertainty and would not provide a basis for irrigators or processors to invest with confidence in their businesses. The region’s irrigated agriculture sector is therefore unlikely to grow or change significantly, particularly permanent plantings (i.e. orchards and vineyards) and the dairy industry. Vegetable growers will largely maintain production levels in order to ensure continuity of supply and to secure valuable markets. Some irrigators in the region, particularly those on the Narrung Peninsula, have made a successful transition to dryland agriculture and would be unlikely to undertake anything more than opportunistic irrigation without the Basin Plan.

The Lakes and Coorong fishery would be able to survive a short term adjustment, such as that experienced during the drought, but fishing patterns would become opportunistic rather than being a sustainably managed multi-species fishery. Variability of flows (high and low) would jeopardise boating business viability. Towns such as Mannum, which are highly dependent upon river and boating related tourism expenditure, would also suffer the consequences of this variability.

Environmental problems will continue and tools like regulators will continue to be implemented by government. The construction of the Clayton regulator and Narrung Bund, for example, divided the Lower Lakes community and these types of conflicts between different sections of the community are likely to become more frequent and more intense without the successful implementation of the Basin Plan.

40 Please refer to section 3.4 for more information and explanation
Impact of reduced water availability\textsuperscript{41}

The initial response to the Guide amongst irrigators ranged from quite positive, particularly from those on the Lower Lakes who have been badly impacted by low flows and poor water quality during the drought, to negative from those who regard the proposed reduction in diversion limits as too onerous.

In general, there was some agreement that the Basin Plan would reduce uncertainty and provide irrigators and farm-dependent businesses with the ability to plan ahead and invest with more confidence.

There is significant doubt whether there are enough ‘willing sellers’ in the region to meet the Guide’s proposed reductions in irrigation diversions.

If sufficient buybacks occur so as to reduce regional irrigated agricultural production by more than 10 per cent, then the cost of operating and maintaining pipeline assets and similar infrastructure will increase significantly. It is apparent that the very small irrigation-based communities (e.g. Caloote and Mypolonga) seem unlikely to survive if large numbers of irrigators cease production. Tipping points in these communities are expected to be reached.

Farm input suppliers and other farm-dependent businesses, particularly those in smaller regional centres, have been adversely impacted by the drought and would be likely to suffer similar losses if irrigated agricultural production falls in response to the proposals in the Guide.

It is apparent that the drought has had little or no major impact on the processors of irrigated agricultural products in the region, primarily milk, wine grape and onion processing. Security of supply for raw product would be unlikely to be jeopardised by the Basin Plan and it may indeed provide more certainty for investment in expansion of these types of businesses.

Guaranteed flows under the 3,000 or 4,000 GL scenarios are likely to provide tourism and fishing businesses in the region with confidence to invest and grow.

If the 3,000 or 4,000 GL scenarios result in a large number of irrigators leaving the region, the viability of small towns, in particular, will be jeopardised. This needs to be balanced against the positive impact on business confidence provided by the Basin Plan and the commercial and residential development that this reduced uncertainty is likely to lead to. There is a sense that ‘the return of water and guaranteed future flows will result in stronger, more resilient communities in the region”.

\textsuperscript{41} Please refer to section 3.6 for more information and explanation. In addition, the potential social and economic impacts of different policy settings including buyback policy, modernization policy, etc. is discussed in Volume 2 of this study – accordingly it is not repeated here, but the interested reader is referred to that volume for detailed discussion of conclusions that are summarized in this regional report.
Minimising Impacts

A number of other suggestions were made for mitigating the impacts of the proposed Plan on the Lower Murray region. These included that:

- the Federal Government should allocate substantial funds to assist communities and irrigators to adjust to the social and economic consequences of the introduction of Sustainable Diversion Limits (SDLs) across the Basin. Such programs need to be developed concurrently with the development of the Basin Plan;

- all users i.e. towns-domestic/commercial, water suppliers (e.g. SA Water) and irrigators should contribute to environmental water, not just irrigators;

- SDLs should take into account long-term averages of water use and over-allocations beyond the Cap (otherwise SA is penalised for past good management practices);

- under the Commonwealth's infrastructure improvement programs – all water saved should go to the environment (not 50 per cent as currently negotiated) and all water savings made in water delivery should be shared proportionately between states;

- governments keep to timelines in committing to a Basin Plan so that communities have confidence in planning for the future. The uncertainty regarding the Basin Plan and other related government policies is the most significant problem for many businesses. Not knowing what the rules are and not having confidence that the rules won’t change are significant constraints to business investment; and

- the restoration of the Murray Darling Basin system has great potential as a demonstration site and a unique tourist location where communities have recognised their interdependence with a healthy river system. New tourism products are needed and the opportunities exist for investment in infrastructure and employment. Government can assist by facilitating investment, encouraging and supporting relevant training and education programs and assisting in developing coordinated and targeted marketing campaigns.

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Background

Social catchments and regional profile

The Lower Murray region extends from Lock 1 at Blanchetown in SA to the Murray Mouth and includes the Lower Lakes, Alexandrina and Albert. There are two social catchments within the region, Murray Bridge and Goolwa (see Figure 3–1).
Murray Bridge social catchment

Centred on the relatively large and economically diverse regional centre of Murray Bridge, this social catchment extends from Lock 1 to the Lower Lakes (see Figure 3–1). The region includes a number of smaller regional centres that are highly dependent upon irrigated agriculture (e.g. Swan Reach and Blanchetown – horticulture) and other water-dependent activities such as tourism (e.g. Mannum) and commercial fishing (e.g. Meningie). There is a diverse range of irrigated agricultural activity in the region, primarily dairying and vegetable growing, with small plantings of permanent horticultural crops such as stone fruit, almonds and wine grapes. There are significant dairy and vegetable processing facilities located within the region.
Figure 3–1. Murray Bridge and Goolwa social catchments in the SA Murray, showing relative vulnerability of towns to reduced irrigation.
Goolwa social catchment

A geographically small social catchment based around the regional centres of Goolwa and Strathalbyn (see Figure 3–1). Both of these towns are relatively economically diverse and service a significant numbers of retirees, commuters (particularly Strathalbyn) and holiday makers (particularly Goolwa). Neither is significantly dependent upon irrigated agriculture but Goolwa is highly dependent upon boating-related tourism activity which is, in turn, a function of water levels in the Lower Lakes. The region also includes some smaller regional centres that are highly dependent upon irrigated agriculture (e.g. Langhorne Creek – wine grapes) and other water-dependent activities such as tourism and commercial fishing (e.g. Milang and Clayton). Irrigation in the region is dominated by the wine industry centred on Langhorne Creek. This is a large wine grape growing region by area but it has a relatively small processing capacity. Most of the product is transported elsewhere for processing.

Towns by vulnerability category

A listing of major towns in the Lower Murray by social catchment and vulnerability category is provided in Table 3–1. Each social catchment has a number of small, highly water-dependent communities which are vulnerable to changes in water availability and quality.

Unlike many other regions upstream, this vulnerability is also attributable to industries other than irrigated agriculture, including tourism and commercial fishing. In other words, whilst some category 1 towns in the Lower Murray region could be vulnerable to reduced availability of irrigation water (e.g. Swan Reach and Blanchetown), as proposed in the Guide, others could be vulnerable if the Basin Plan is not introduced (e.g. Mannum and Meningie). These towns are vulnerable to a failure to increase environmental flows.

In addition to the towns listed in Table 3–1, the Murray Bridge social catchment includes a number of other smaller, highly vulnerable towns such as Caloote (horticulture), Mypolonga (horticulture) and Jervois (dairy). Likewise, in the Goolwa social catchment, other highly vulnerable towns include Langhorne Creek (wine grapes) and Clayton (tourism and commercial fishing).
Table 3–1. Major towns by social catchment and vulnerability category

<table>
<thead>
<tr>
<th>Social catchment</th>
<th>City/town name</th>
<th>Population, 2006</th>
<th>Vulnerability category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Murray Bridge</td>
<td>Murray Bridge</td>
<td>14,048</td>
<td>4</td>
<td>Economically diverse regional centre</td>
</tr>
<tr>
<td></td>
<td>Mannum</td>
<td>2,042</td>
<td>1</td>
<td>Highly dependent upon boating and river related tourism</td>
</tr>
<tr>
<td></td>
<td>Tailem Bend</td>
<td>1,457</td>
<td>2</td>
<td>Some dependence on irrigated agriculture (dairy and onions)</td>
</tr>
<tr>
<td></td>
<td>Meningie</td>
<td>940</td>
<td>1</td>
<td>Highly dependent upon commercial fishing and both dryland and irrigated agriculture (dairy)</td>
</tr>
<tr>
<td></td>
<td>Swan Reach</td>
<td>235</td>
<td>1</td>
<td>Highly dependent upon irrigated agriculture (annual and permanent horticulture)</td>
</tr>
<tr>
<td></td>
<td>Blanchetown</td>
<td>231</td>
<td>1</td>
<td>Highly dependent upon irrigated agriculture (annual and permanent horticulture)</td>
</tr>
<tr>
<td>Goolwa</td>
<td>Goolwa</td>
<td>5,882</td>
<td>1</td>
<td>Although a relatively large centre by regional standards, it is highly dependent upon boating related tourism and, to a lesser extent, commercial fishing</td>
</tr>
<tr>
<td></td>
<td>Strathalbyn</td>
<td>3,894</td>
<td>2</td>
<td>Some dependence on irrigated agriculture (winegrapes)</td>
</tr>
<tr>
<td></td>
<td>Milang</td>
<td>512</td>
<td>1</td>
<td>Highly dependent upon boating related tourism</td>
</tr>
</tbody>
</table>

Regional profile

EconSearch (2011) has prepared a broad regional profile of the Lower Murray region for 2006/07 for Primary Industries and Resources South Australia (PIRSA). The profile presented below relates to a region bounded by the following Statistical Local Areas.

Mid Murray (DC)
Karoonda East Murray (DC)
Murray Bridge (RC)
The Coorong (DC)
Alexandrina (DC) - Coastal
Alexandrina (DC) - Strathalbyn

Economic activity in the River Murray region in 2006/07 is presented in terms of the following indicators:

- employment;
- output;
- household income;

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43 ABS (2007), 2006 Census QuickStats by Location, Cat No.1216.0.
other value added; and

gross regional product (GRP).

**Employment** is a measure of the number of working proprietors, managers, directors and other employees, in terms of the number of full-time equivalents and total (i.e. full-time and part-time) jobs. Employment is measured by place of remuneration rather than place of residence.

**(Value of) Output** is a measure of the gross revenue of goods and services produced by commercial organisations (e.g. farm-gate value of production) and gross expenditure by government agencies. Total output needs to be used with care as it includes elements of double counting (e.g. the value of winery output includes the farm-gate value of grapes) and overstates the real contribution to economic activity.

**Household income** is a component of gross regional product (GRP) and is a measure of wages and salaries paid in cash and in kind, drawings by owner operators and other payments to labour including overtime payments, employer’s superannuation contributions and income tax, but excluding payroll tax.

**Other value added** is another component of GRP and includes gross operating surplus (excluding the drawings of working proprietors) and all taxes, less subsidies.

**Gross regional product (GRP)** is a measure of the net contribution of an activity to the regional economy. Gross regional product is measured as value of output less the cost of goods and services (including imports) used in producing the output. In other words, it can be measured as household income plus other value added. It represents payments to the primary inputs of production (labour, capital and land).

A breakdown of employment and value of output by sector for the Lower Murray region in 2006/07 is provided in Table 3–2 and a breakdown of GRP is summarised in Table 3–3.

The Lower Murray region has a mix of primary industries activity (both broadacre and irrigated agriculture) and manufacturing activity (particularly food products and machinery and equipment) and also has a significant urban population with associated housing stock and service sectors.

It is important to note that the contribution to regional economic activity in 2006/07 by both broadacre and irrigated agriculture was influenced by drought conditions and restricted water allocations in that year. Notwithstanding those conditions, it was estimated that River Murray-based irrigated agriculture directly contributed approximately 8 to 9 per cent of jobs in the region and almost 6 per cent of GRP in 2006/07.

Based on recent modelling work undertaken by EconSearch, it was estimated that expenditure by tourists directly and indirectly contributed over 9 per cent of fte jobs
(10 per cent of total employment) in the region and almost 6 per cent of GRP in 2006/07.

Table 3–2. Employment and output, Lower Murray region, 2006/07

<table>
<thead>
<tr>
<th>Sector</th>
<th>Total Employment</th>
<th>Employment</th>
<th>Value of Output</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no. of jobs</td>
<td>%</td>
<td>fte</td>
</tr>
<tr>
<td>Agriculture, forestry and fishing</td>
<td>4,016</td>
<td>19.1%</td>
<td>4,352</td>
</tr>
<tr>
<td>River Murray irrigated agriculture</td>
<td>1,702</td>
<td>8.1%</td>
<td>1,771</td>
</tr>
<tr>
<td>Mining</td>
<td>92</td>
<td>0.4%</td>
<td>104</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>2,751</td>
<td>13.1%</td>
<td>2,727</td>
</tr>
<tr>
<td>Electricity, gas and water</td>
<td>180</td>
<td>0.9%</td>
<td>184</td>
</tr>
<tr>
<td>Building and construction</td>
<td>1,056</td>
<td>5.0%</td>
<td>1,022</td>
</tr>
<tr>
<td>Wholesale trade</td>
<td>814</td>
<td>3.9%</td>
<td>830</td>
</tr>
<tr>
<td>Retail trade</td>
<td>3,262</td>
<td>15.5%</td>
<td>2,692</td>
</tr>
<tr>
<td>Accommodation, cafes &amp; restaurants</td>
<td>1,043</td>
<td>5.0%</td>
<td>773</td>
</tr>
<tr>
<td>Transport and storage</td>
<td>835</td>
<td>4.0%</td>
<td>848</td>
</tr>
<tr>
<td>Communication services</td>
<td>178</td>
<td>0.8%</td>
<td>156</td>
</tr>
<tr>
<td>Finance and insurance</td>
<td>289</td>
<td>1.4%</td>
<td>247</td>
</tr>
<tr>
<td>Ownership of dwellings</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Property and business services</td>
<td>997</td>
<td>4.7%</td>
<td>843</td>
</tr>
<tr>
<td>Public administration and defence</td>
<td>893</td>
<td>4.3%</td>
<td>835</td>
</tr>
<tr>
<td>Education</td>
<td>1,479</td>
<td>7.0%</td>
<td>1,361</td>
</tr>
<tr>
<td>Health and community services</td>
<td>2,049</td>
<td>9.7%</td>
<td>1,548</td>
</tr>
<tr>
<td>Cultural and recreational services</td>
<td>358</td>
<td>1.7%</td>
<td>317</td>
</tr>
<tr>
<td>Personal services</td>
<td>719</td>
<td>3.4%</td>
<td>625</td>
</tr>
<tr>
<td>Total</td>
<td>21,012</td>
<td>100.0%</td>
<td>19,463</td>
</tr>
</tbody>
</table>

a Value of output estimates for River Murray based irrigated agricultural production were supplied by PIRSA (pers. comm.). Associated employment estimates were calculated using employment to output ratios for the component industries which were, in turn, derived from the modelling undertaken by EconSearch.

b The ownership of dwellings sector is a notional sector designed to impute a return to the region’s housing stock. Total value of output in this sector is an estimate of rent earned on leased dwellings and imputed rent on the balance of owner-occupied dwellings.

Table 3–3. Contribution to gross regional product, Lower Murray region, 2006/07a

<table>
<thead>
<tr>
<th>Sector</th>
<th>Household Income $m</th>
<th>%</th>
<th>Other Value Added $m</th>
<th>%</th>
<th>Gross Regional Product $m</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, forestry and fishing</td>
<td>113.2</td>
<td>14.1%</td>
<td>126.9</td>
<td>21.5%</td>
<td>240.1</td>
<td>15.6%</td>
</tr>
<tr>
<td>River Murray irrigated agriculture</td>
<td>44.7</td>
<td>5.6%</td>
<td>45.5</td>
<td>7.7%</td>
<td>90.3</td>
<td>5.9%</td>
</tr>
<tr>
<td>Mining</td>
<td>4.7</td>
<td>0.6%</td>
<td>14.0</td>
<td>2.4%</td>
<td>18.8</td>
<td>1.2%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>138.3</td>
<td>17.3%</td>
<td>58.0</td>
<td>9.8%</td>
<td>196.2</td>
<td>12.8%</td>
</tr>
<tr>
<td>Electricity, gas and water</td>
<td>14.8</td>
<td>1.8%</td>
<td>23.9</td>
<td>4.1%</td>
<td>38.7</td>
<td>2.5%</td>
</tr>
<tr>
<td>Building and construction</td>
<td>50.2</td>
<td>6.3%</td>
<td>22.6</td>
<td>3.8%</td>
<td>72.7</td>
<td>4.7%</td>
</tr>
<tr>
<td>Wholesale trade</td>
<td>38.3</td>
<td>4.8%</td>
<td>20.3</td>
<td>3.4%</td>
<td>58.6</td>
<td>3.8%</td>
</tr>
<tr>
<td>Retail trade</td>
<td>71.7</td>
<td>8.9%</td>
<td>27.4</td>
<td>4.6%</td>
<td>99.1</td>
<td>6.4%</td>
</tr>
<tr>
<td>Accommodation, cafes &amp; restaurants</td>
<td>23.6</td>
<td>2.9%</td>
<td>15.7</td>
<td>2.7%</td>
<td>39.3</td>
<td>2.6%</td>
</tr>
<tr>
<td>Transport and storage</td>
<td>39.4</td>
<td>4.9%</td>
<td>30.4</td>
<td>5.2%</td>
<td>69.8</td>
<td>4.5%</td>
</tr>
<tr>
<td>Communication services</td>
<td>9.3</td>
<td>1.2%</td>
<td>10.4</td>
<td>1.8%</td>
<td>19.7</td>
<td>1.3%</td>
</tr>
<tr>
<td>Finance and insurance</td>
<td>19.6</td>
<td>2.4%</td>
<td>15.3</td>
<td>2.6%</td>
<td>34.8</td>
<td>2.3%</td>
</tr>
<tr>
<td>Ownership of dwellings</td>
<td>0.0</td>
<td>0.0%</td>
<td>162.7</td>
<td>27.6%</td>
<td>162.7</td>
<td>10.6%</td>
</tr>
<tr>
<td>Property and business services</td>
<td>53.6</td>
<td>6.7%</td>
<td>34.2</td>
<td>5.8%</td>
<td>87.7</td>
<td>5.7%</td>
</tr>
<tr>
<td>Public administration and defence</td>
<td>38.2</td>
<td>4.8%</td>
<td>6.2</td>
<td>1.1%</td>
<td>44.4</td>
<td>2.9%</td>
</tr>
<tr>
<td>Education</td>
<td>66.0</td>
<td>8.2%</td>
<td>4.1</td>
<td>0.7%</td>
<td>70.1</td>
<td>4.6%</td>
</tr>
<tr>
<td>Health and community services</td>
<td>72.2</td>
<td>9.0%</td>
<td>8.0</td>
<td>1.4%</td>
<td>80.2</td>
<td>5.2%</td>
</tr>
<tr>
<td>Cultural and recreational services</td>
<td>17.5</td>
<td>2.2%</td>
<td>6.6</td>
<td>1.1%</td>
<td>24.1</td>
<td>1.6%</td>
</tr>
<tr>
<td>Personal services</td>
<td>31.3</td>
<td>3.9%</td>
<td>3.1</td>
<td>0.5%</td>
<td>34.3</td>
<td>2.2%</td>
</tr>
<tr>
<td>Intermediate total</td>
<td>801.7</td>
<td>100.0%</td>
<td>589.8</td>
<td>100.0%</td>
<td>1,391.5</td>
<td>90.4%</td>
</tr>
<tr>
<td>Net Taxes in Final Demand</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>147.3</td>
<td>9.6%</td>
</tr>
<tr>
<td>Total</td>
<td>801.7</td>
<td>100.0%</td>
<td>589.8</td>
<td>100.0%</td>
<td>1,538.8</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

a Using the income method to derive gross regional product (GRP) enables GRP to be estimated on a sector-by-sector basis (household income and other value added are the two components of GRP).

b Household income and other value added estimates for River Murray based irrigated agricultural production were calculated using value of output estimates supplied by PIRSA (pers. comm.) and household income per job and other value added to output ratios for the component industries. These ratios were derived from the modelling undertaken by EconSearch.

c Includes net taxes (i.e. indirect taxes less subsidies) paid by households and other components of final demand.


Irrigation in the region

The current surface water diversion limit for the irrigation valleys of the Basin is shown in Figure 3–2.
Figure 3–2. Current diversion limits. The SA Murray is the sixth largest diverter in the Basin.44

Water management, government purchases and drought

Water management

Access to River Murray water is managed through the River Murray Water Allocation Plan45. The Plan covers the River Murray from the border with Victoria to the Coorong, including Lakes Alexandrina and Albert, and portions of Currency Creek and the Rivers Finiss, Angas and Bremer. Amendments have been made to the River Murray Allocation Plan to unbundle water rights into separate instruments from 1 July 2009. Prior to this date, water rights and approvals were reflected on a single water licence. Before 1 July 2009, the permanent water right has been reflected as a volumetric water allocation on a licence. In the current system, the permanent right is expressed as unit shares of water available to be allocated to a class of water access entitlement. Each year, water licensees obtain a share of the available water as a water allocation. The share entitlement is a permanent right, whereas the water allocation received depends on prevailing conditions. The maximum volume that can be assigned to a share is one kilolitre.

Table 3–4 provides a summary of SA River Murray water entitlements.

---

Table 3–4. SA River Murray water entitlements\textsuperscript{46}

<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
<th>Total Shares</th>
<th>Allocation in 100% allocation year (GL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Domestic and/or stock watering</td>
<td>8,704,910</td>
<td>8.7</td>
</tr>
<tr>
<td>2</td>
<td>Country towns public water supply</td>
<td>50,000,000</td>
<td>50.0</td>
</tr>
<tr>
<td>3a</td>
<td>Irrigation and Holding</td>
<td>544,018,767</td>
<td>544.0</td>
</tr>
<tr>
<td>3b</td>
<td>Irrigation Qualco-Sunlands Groundwater Control Trust area</td>
<td>21,038,369</td>
<td>21.0</td>
</tr>
<tr>
<td>4</td>
<td>Recreation</td>
<td>4,423,526</td>
<td>4.4</td>
</tr>
<tr>
<td>5</td>
<td>Industrial and Industrial Dairy</td>
<td>5,519,841</td>
<td>5.5</td>
</tr>
<tr>
<td>6</td>
<td>Metro Adelaide reticulated public water supply\textsuperscript{a}</td>
<td>130,000,000</td>
<td>130.0</td>
</tr>
<tr>
<td>7</td>
<td>Environment</td>
<td>38,366,550</td>
<td>38.4</td>
</tr>
<tr>
<td>8</td>
<td>Environmental Land Management</td>
<td>22,200,000</td>
<td>22.2</td>
</tr>
<tr>
<td>9</td>
<td>Wetland Management</td>
<td>200,000,000</td>
<td>200.0</td>
</tr>
</tbody>
</table>

\textsuperscript{a} 650,000,000 shares over a 5-year rolling average.

**Water recovery**

The Australian Government, through the *Water for the Future* Program, has bought 62.6 GL of water entitlements from the SA Murray\textsuperscript{47}. The water rights acquired by the Commonwealth under *Water for the Future* become part of the Commonwealth environmental water holdings. These holdings are managed by the Commonwealth Environmental Water Holder (see Table 3–5). The purchases have primarily involved voluntary selling by individual irrigation businesses. Individual sales have been spread across the SA Murray. Water procurement via the Private Irrigation Infrastructure Program for SA (PIIP) scheme has been minimal\textsuperscript{48}. The PIIP funds projects that demonstrate high merit in improving the efficiency and environmental benefits of irrigation water use and management in the South Australian Murray-Darling Basin. In exchange irrigators transfer water entitlements to the Commonwealth Environmental Water Holder to use for environmental water purposes.


\textsuperscript{47} http://www.environment.gov.au/water/policy-programs/entitlement-purchasing/2008-09.html, accessed 3/5/2011. Note that this figure is higher than that cited in Table 3–6 because more purchases have been made since the time that table was assembled. The figure in Table 3–6 was used in the EBC interview program.

Drought

Over the last five years there has been substantial purchase of temporary water from upstream states to assist with low water allocations, especially in 2008-09 when a finishing allocation of only 18% was available. This followed the 2006-07 season allocations of 60% and the 2007-08 season allocation of 32%.

The SA government implemented carryover as a temporary measure during the drought. Carryover is a temporary, drought-specific policy introduced in South Australia in 2007. It enabled River Murray water users to manage inter-seasonal risks by carrying over to the following year a proportion of their unused annual allocation. Carryover was enabled because the State Government negotiated the capacity to temporarily retain some water in upstream storages for delivery the following year. This temporary storage arrangement has now ceased. Current allocations are at 67% to account for the carryover into the 2010-11 season.

South Australia is currently negotiating the arrangements to allow for implementation of long-term water storage rights under the Murray-Darling Basin Agreement.

In 2009, with Federal Government and irrigator investment, the Lower Lakes pipeline was built to provide a more reliable, both in terms of quantity and quality, water supply to irrigators at Langhorne Creek and Currency Creek who used to extract Murray water from Lake Alexandrina and Lake Albert. Another pipeline was built to provide potable water to households and properties at Langhorne Creek, the Raukkan Aboriginal Community and the Narrung and Poltalloch Peninsulas.

Drought and other issues identified by respondents are discussed in the following sections.

Irrigators

Irrigated agriculture in the Lower Murray has experienced profound change over the past 10 years, much of it as a consequence of the long-term upstream drought in other areas of SE Australia over this period but also in response to local drought and other adjustment pressures (e.g. the SA government funded Lower Murray Swamps Rehabilitation Scheme).

Table 3–5. Australian Government water purchases in the SA Murray River catchment.49

<table>
<thead>
<tr>
<th>Catchment</th>
<th>Entitlement Type</th>
<th>Secured purchases (GL)</th>
<th>Expected average annual volume of water available for the environment (GL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA Murray</td>
<td>SA High security</td>
<td>62.584</td>
<td>56.326</td>
</tr>
</tbody>
</table>

Drought

Over the last five years there has been substantial purchase of temporary water from upstream states to assist with low water allocations, especially in 2008-09 when a finishing allocation of only 18% was available. This followed the 2006-07 season allocations of 60% and the 2007-08 season allocation of 32%.

The SA government implemented carryover as a temporary measure during the drought. Carryover is a temporary, drought-specific policy introduced in South Australia in 2007. It enabled River Murray water users to manage inter-seasonal risks by carrying over to the following year a proportion of their unused annual allocation. Carryover was enabled because the State Government negotiated the capacity to temporarily retain some water in upstream storages for delivery the following year. This temporary storage arrangement has now ceased. Current allocations are at 67% to account for the carryover into the 2010-11 season.

South Australia is currently negotiating the arrangements to allow for implementation of long-term water storage rights under the Murray-Darling Basin Agreement.

In 2009, with Federal Government and irrigator investment, the Lower Lakes pipeline was built to provide a more reliable, both in terms of quantity and quality, water supply to irrigators at Langhorne Creek and Currency Creek who used to extract Murray water from Lake Alexandrina and Lake Albert. Another pipeline was built to provide potable water to households and properties at Langhorne Creek, the Raukkan Aboriginal Community and the Narrung and Poltalloch Peninsulas.

Drought and other issues identified by respondents are discussed in the following sections.

Irrigators

Irrigated agriculture in the Lower Murray has experienced profound change over the past 10 years, much of it as a consequence of the long-term upstream drought in other areas of SE Australia over this period but also in response to local drought and other adjustment pressures (e.g. the SA government funded Lower Murray Swamps Rehabilitation Scheme).

Of all irrigated agricultural industries in the region, the dairy industry has probably undergone the most significant change. As a consequence of their inability to access water from Lake Albert and the poor quality (i.e. high salinity level) of this water, irrigated agriculture on the Narrung Peninsula (NW of Meningie) has ceased entirely. Whilst it was a diverse irrigation district (pasture, fodder, vegetables) it was primarily devoted to milk production. The number of dairies has fallen from over 20 in 2003 to only 3 currently. Those dairies that remain run dryland feedlotting operations. Similarly, the Lower Murray Swamps Rehabilitation Scheme (i.e. laser levelling of flood irrigated paddocks and improved infrastructure for dealing with run-off) resulted in a large reduction in the number of dairy farms in the Lower Murray swamps region (i.e. Mannum to Wellington) with a consequent impact on the broader local community. The dairy farmers that have remained in these districts have done so by diversifying their feeding regimes away from a primarily irrigated pasture base to include a feedlotting component. However, large unwatered areas of the Lower Murray swamps subsequently have suffered from extensive damage to irrigation infrastructure and soils from soil movement and cracking.

A similar rationalisation in the number of vegetable growing farms has occurred as a consequence of the drought and high cost of temporary water purchases. Larger vegetable growers have survived by leasing water and/or moving their operations to regions with a more secure supply of irrigation water (e.g. the Murray Mallee and SE SA).

The Langhorne Creek wine grape growing region is the third largest wine grape growing region in South Australia after the Riverland and Barossa regions. However, only around 15 per cent of grapes are crushed locally with the majority going to the Barossa Valley. Poor wine grape prices have had a significant impact on the local economy in recent years. There has been less disposable income, owners and family members are working longer hours (laid off casual labour) and there is reduced generational handover of farms and, consequently, an ageing population among growers.

Farmers in the region, both dryland and irrigated, have experienced significant mental health issues (stress, anxiety, anger and depression) as a consequence of the drought and compounding debt levels. Provision of mental health services appears to have been adequate over this period (government funded services were available in Murray Bridge) and the stigma associated with discussing and accessing these services has, apparently, declined.

The farming population is an ageing one and the drought has provided little incentive for the next generation to take over the businesses. Many irrigation farmers appear to have either ‘lost interest in’ or are too ‘time poor’ to participate in community activities and volunteering and much of this activity has been undertaken by ‘wives and partners’.
Fishing

For fishing businesses (Lakes and Coorong commercial fishery) the uncertainty associated with low flows has led to missed marketing and value-adding opportunities, particularly in terms of being able to reliably supply high value niche markets.

River-based tourism

The drought also resulted in profound change in the boating sector (hire boats, boat construction and boat maintenance) in the region. Several businesses have closed down (some temporarily, others permanently) whilst others significantly reduced employment levels. For a town such as Mannum, which is heavily dependent upon tourism expenditure, there were adverse flow-on effects to other businesses and the broader community.

The drought and changing river levels and water flows have created a dire situation for tourism operators below Blanchetown through to the Murray Mouth. The Boating Industry of South Australia in their December 2010 ‘Submission to the Guide’ has highlighted the following impacts:

- in the Blanchetown through to the Murray Mouth stretch of the River Murray the forward houseboat and charter bookings have never been worse;
- the fleet is presently operating at less than 50% of normal capacity;
- the use of the (privately) owned houseboat and cruising fleets is also down by at least 50%;
- holidays and leisure visitation has seriously declined on the Murray in the Lakes and in the Coorong as people have anticipated ‘no water at all or unsafe conditions due to navigation hazards and bank slumping and the like within the River and Lakes and Coorong’;
- with these conditions and with perceptions of ‘nowhere to go', boats have been relocated from inland waters of the Lakes and Lower Murray to ‘more reliable’ marinas upstream and to coastal moorings;
- more than 1,000 large (non-trailerable) cruising craft which offer overnight accommodation and/or galley services have gone from Lakes Albert and Alexandrina;
- the economic loss to rural communities, incorporating aspects of boat servicing/fuelling/provisioning, is estimated to be in the order of $5 million annually and the loss of revenues derived from rentals of moorings and berthing in marinas and at informal moorings is estimated to be in the order of $2 million annually;
the number of ‘boating’ and other ‘water based’ day trippers and holiday makers is way down with visitor expenditures down by an estimated $200 million annually; despite the recent investment of millions of dollars on dredging, extending and rebuilding facilities most marinas, slips and ramps became unserviceable during the drought; and so far as the tourism, recreation and leisure sectors (incorporating boat sales/boat repair, boat service/boat hire and charter operators) are concerned, things had never been worse.

Community

Other drought related costs incurred by businesses and individuals in the region, as well as by state and local governments, include the following:

the cost of building pipelines to secure access to potable and irrigation water (a mix of private and government funded schemes);

the cost of rehabilitating and securing collapsing river banks (private and government expenditure);

the cost of ensuring access to irrigation water, marinas and boating berths (lowering pumps, excavation, new infrastructure, etc.) – largely private expenditure; and

costs incurred by the SA Department of Transport in keeping the ferries operational during the period when water levels were low.

Some respondents in this region have suggested that the health and sustainability of the Murray Darling Basin system must be improved as a matter of urgency and this can best be achieved by increasing the flow of water down the River to the Murray Mouth. The health of the River must be achieved by ensuring a sustainable and healthy ecosystem in Lakes Alexandrina and Albert, in the Coorong and at the Murray Mouth.

The South Australian Government introduced the SA Cap in 1968. It was further reduced in 1995 when the other States finally adopted a Cap. Between 1970 and 2000, the total diversion from the Basin increased from 7,500 GL to 12,500 GL, an increase of 5,000 GL or 67 per cent, while SA maintained and then slightly reduced its Cap. There is widespread frustration in SA that the Guide gives no recognition to South Australia for such restraint.

Baseline – the Future without Policy Change

The ‘baseline’ is a description of the expected future for the towns and social catchments over the coming decade, if the current diversion limit for irrigation water were left unchanged. The baseline is dynamic, not static; that is, there would continue
to be variability in factors such as rainfall and commodity prices. Underlying trends would continue.

Whilst the City of Murray Bridge has a quite diverse and resilient economy, the river and Lower Lakes dependent, medium to small regional centres in the social catchment such as Meningie and Mannum are vulnerable to adjustment pressures such as those resulting from the drought. However, much of the adjustment has already taken place and the businesses that remain are more efficient and adaptable.

A ‘business as usual’ scenario would lead to considerable uncertainty and would not provide a basis for irrigators or processors to invest with confidence in their businesses. The region’s irrigated agriculture sector is therefore unlikely to grow or change significantly, particularly permanent plantings (i.e. orchards and vineyards) and the dairy industry. Vegetable growers have largely maintained production levels in order to ensure continuity of supply and to secure valuable markets. This has, however, come at some cost to them financially. Some irrigators in the region, particularly those on the Narrung Peninsula, have made a successful transition to dryland agriculture and would be unlikely to undertake anything more than opportunistic irrigation without the Basin Plan.

Without the Basin Plan, the Lakes and Coorong fishery would be able to survive a short term adjustment, such as that experienced during the drought, but fishing patterns would become opportunistic rather than being a sustainably managed multi-species fishery. Variability of flows (high and low) would jeopardise boating business viability. Towns such as Mannum, which are highly dependent upon river and boating related tourism expenditure, would also suffer the consequences of this variability.

Environmental problems will continue and tools like regulators are expected to continue to be implemented by government. The construction of the Clayton regulator and Narrung Bund, for example, divided the Lower Lakes community and these types of conflicts between different sections of the community are likely to become more frequent and more intense without the successful implementation of the Basin Plan.

**Response to Basin Plan process**

Having witnessed the emotional response to the release of the *Guide*, many Lower Murray respondents (who are generally in favour of the *Guide*) fear political derailing of the process, for example one respondent said that “the Lower Lakes communities are really fearful of the Plan failing”. There were offers “to be involved in a rational dialogue in finalising the Plan”, calls for “leadership from our politicians” and requests for the MDBA to “keep to timelines” and that the “MDB Plan must be acted on”.

One respondent raised the point that the MDBA doesn’t appear to have commissioned enough work on the “do nothing scenario” and highlighted what the social, economic and environmental impacts of business as usual would be.
Impacts of Reduced Water Availability

Water Procurement by Government

The 4000 GL and 3000 GL scenarios outlined in the Guide translate to the Australian Government procuring approximately 54% and 40% (993 GL) of the total water entitlements respectively held by the irrigation industry in the SA Murray 2007 (Table 3–6). There has been approximately 54 GL purchased by the Australian Government in the SA Murray to date, almost all being High Security irrigation only water. It is assumed there will be a mix of both High and General Security water entitlements procured across the Basin by Government in order to meet environmental requirements across the range of high and low rainfall years.

Table 3–6. Current diversion limit and ‘Guide’ proposals.

<table>
<thead>
<tr>
<th>Region</th>
<th>Scenario</th>
<th>Current Diversion Limit (CDL)</th>
<th>Guide reduction from CDL to SDL50 (average)</th>
<th>Guide reduction in entitlements before modernisation &amp; before buy back51</th>
<th>Modernisation ‘bridging the gap’ on and off farm, to 201052</th>
<th>Buy-back to date53</th>
<th>Guide reduction in remaining entitlements after modernisation and after existing purchases54</th>
</tr>
</thead>
<tbody>
<tr>
<td>GL</td>
<td>GL</td>
<td>%</td>
<td>Entitlement type</td>
<td>GL</td>
<td>%</td>
<td>GL</td>
<td>GL</td>
</tr>
<tr>
<td>SA Murray</td>
<td>4000</td>
<td>665</td>
<td>232 35% High security Irrigation only</td>
<td>277 54%</td>
<td>9</td>
<td>54 214</td>
<td>48%</td>
</tr>
<tr>
<td>SA Murray</td>
<td>3000</td>
<td>665</td>
<td>173 26% High security Irrigation only</td>
<td>206 40%</td>
<td>9</td>
<td>54 144</td>
<td>32%</td>
</tr>
</tbody>
</table>

Irrigators

The initial response to the Basin Plan amongst irrigators ranged from quite positive, particularly from those on the Lower Lakes who have been badly impacted by low flows and poor water quality during the drought, to negative from those who regard the proposed reductions as too onerous. There is a widely held belief in this latter group that buybacks and infrastructure improvements need to be targeted at upstream regions (particularly interstate) and that the Guide fails to recognise the water efficiency improvements from past infrastructure upgrades in SA. There was also a view expressed that the Guide fails to recognise the importance that irrigators

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51 Yield-unweighted entitlements, pro-rata based on use.
52 Yield-unweighted entitlements. Source: MJA 2010
54 Yield-unweighted entitlements. Note this ‘gap’ may also be partially met through on and off-farm irrigation modernisation.
55 N.B. not always the same across entitlement type, even if pro rata as other Government purchases have reduced 2010 entitlement.
56 Note that this figure is higher than that used in section 3.3.2 because more purchases have been made since the time this table was assembled. The figure in Table 3–6 was used in the EBC interview program.
attach to their role as food producers and to their lifestyle. In general, there was some agreement that the Basin Plan would reduce uncertainty and provide irrigators and farm-dependent businesses with the ability to plan ahead and invest with more confidence.

For either the 4,000 GL or 3,000 GL scenario there is significant doubt whether there are enough ‘willing sellers’ in the region to meet the Guide’s proposed reductions in irrigation diversions. Key informants consider that most of those who are willing to sell have either taken advantage of recent buybacks and/or have left the industry already in response to the drought. Those growers that remain in the region want to continue in the business of irrigation and regard themselves as efficient users of water. They have adapted to survive on low allocations. It is likely to be those in financial stress (tempted by the cash flow) and those seeking a superannuation package that are the most likely to participate in future buy backs.

There is however some sensitivity to the price of water offered in the proposed buybacks. Key informants consider that a price of approximately $2,400/ML or higher is likely to see a reasonable volume of water offered for sale, primarily from those with permanent plantings but also from dairy farmers with latent entitlement and other irrigators needing to reduce debt levels or finance diversification of their businesses. Commodity prices and input prices (particularly electricity) are also important determinants in water sales decisions.

If sufficient buybacks occur so as to reduce regional irrigated agricultural production by more than 10 per cent, then the cost of operating and maintaining pipeline assets and similar infrastructure will increase significantly. The very small irrigation-based communities (e.g. Caloote and Mypolonga) seem likely not to be able to survive if large numbers of irrigators cease production. Tipping points in these communities are expected to be reached.

**Value chain**

Farm input suppliers and other farm-dependent businesses, particularly those in smaller regional centres, have been adversely impacted by the drought and would be likely to suffer similar losses if irrigated agricultural production falls in response to the Basin Plan.

It is apparent that the drought has had little or no major impact on the processors of irrigated agricultural products in the region, primarily milk, wine grape and onion processing. With the vast majority of local wine grapes exported from the region, local winemakers have not had issues sourcing sufficient product. For milk and onions processing, raw product has been sourced from elsewhere, at some extra cost in some cases, but supply has been secured and key markets maintained. Security of supply for raw product would be unlikely to be jeopardised by the Basin Plan and it may indeed provide more certainty for investment in expansion of these types of businesses.
National Foods have recently conducted a review of their cheese making operations throughout Southern Australia with a view to rationalising the number of factories. They have recently announced that both factories in the Lower Murray region (i.e. Jervois and Murray Bridge) will be sold. This decision making process was unrelated to the Basin Plan or drought but relates more to issues of excess capacity (i.e. too many factories too close together) factory age, technology, capital requirements, etc. The potential buyer’s intentions (e.g. maintain production, cuts costs, change product mix) are not apparent at this stage.

Other water-dependent businesses

Guaranteed flows under the 3,000 or 4,000 GL scenarios are likely to provide tourism and fishing businesses in the region with confidence to invest and grow. For less resilient towns in the region, which are highly dependent upon these businesses for expenditure, employment, volunteers, etc. (e.g. Mannum and Meningie), the Basin Plan should have significant positive flow-ons in terms of amenity, employment, population growth and service provision.

Some in the community regard the 3,000 GL scenario as inadequate. Diversions of anything less than 4,000 GL will see SA’s catchment (River, Lakes and Coorong) continue to be in poor health. The area will continue to lose industries and communities because water levels will be unreliable and water, particularly in the Lower Lakes, will continue to be unusable and/or inaccessible for irrigation and dangerous for human health.

Service providers

Local Councils in the region, particularly the Mid Murray Council and Coorong District Council, have a narrow rate paying base. A large number of rate payers in the former are non-resident (e.g. river shack owners) whilst the latter is overwhelming rural in nature. Property valuations in both council regions have been affected by low business turnover and high vacancy rates (commercial and residential) during the drought. This has, in turn, provided challenges for service provision.

During the drought Alexandrina Council experienced a 50 per cent reduction in lease payments for council-owned properties and facilities. Values of rural and residential properties declined and the loss of approximately 1,000 boats from the area affected all businesses, including the council. These revenue reductions have, in turn, provided challenges for service provision by council. The implementation of the Basin Plan is seen as critical to diminish the likelihood of such protracted low-flow events in the future.

If the 3,000 or 4,000 GL scenarios result in a large number of irrigators leaving the region, the viability of small towns, in particular, will be jeopardised. This needs to be balanced against the positive impact on business confidence provided by the Basin Plan and the commercial and residential development that this reduced uncertainty is
likely to lead to. There is a sense that ‘the return of water and guaranteed future flows will result in stronger, more resilient communities in the region’.

Local sports clubs, CFS, Meals on Wheels, etc. have a strong historical base of volunteers. However, they have experienced an increase in demand for services without a concomitant increase in volunteering in recent years. This pressure is likely to be alleviated by the successful implementation of the Basin Plan.

**Community Resilience and Adaptive Capacity**

The City of Murray Bridge has a quite diverse and resilient economy. Conversely, the river and Lower Lakes dependent, medium to small regional centres in the social catchment such as Meningie and Mannum are vulnerable to adjustment pressures. However, businesses in the social catchment have in the past and could in the future adapt to low allocations and limited or no access to water (see section 3.8 for further details).

**Minimisation of Impacts**

Businesses in the social catchment have in the past and could in the future adapt to low allocations and limited or no access to water in the following ways.

**Irrigators**

Many have sold permanent water entitlements and have purchased water on the temporary market. This has, in the case of those who wish to continue their businesses, allowed for debt reduction and financial survival.

In the Lower Lakes region a mild climate, reliable annual rainfall and reasonable soil types provide for viable dryland agriculture. Several irrigation farmers have successfully converted their businesses to dryland enterprises, funded primarily through sales of permanent water entitlements. Likewise, dairy farmers on the Lower Murray Swamps have converted part or all of their feeding to a feedlot base rather than irrigated pasture.

Vegetable growers (particularly onions) have leased and/or purchased land and water in more reliable production zones (i.e. the Murray Mallee and SE SA).

**Value chain**

Milk processors in the region have adapted to restricted supplies of raw product in the region by sourcing product from elsewhere in SE Australia. Whilst transport costs may be higher, the total landed cost to the processor has, in many cases, been revenue neutral due to the use of ‘milk swaps’ between factories.

Onion and other vegetable processors have maintained or increased production in order to ensure continuity of supply and to maintain access to valuable markets. This
has necessitated growers purchasing temporary water and/or moving their production to areas with greater water security.

**Other water-dependent businesses**

The Lakes and Coorong commercial fishery is a highly adaptable multi-species sector, able to withstand downturns up to 4-5 years in duration. The primary mitigation option to low flows, poor water quality and reduced lake levels is a reduction in capital expenditure, through repair of existing gear and equipment.

For the boating sector, attempts are being made to secure funding for construction of a dry dock at Mannum Marine (for big boats). This, in turn, would ensure big boat visitation to the region with associated expenditure by visitors and the tour businesses (labour, purchase of supplies, etc.).

The Murray River could be promoted as a ‘single tourism region’ and a ‘natural asset of Australia like the Great Barrier Reef’. Tourists could be encouraged to start at the river’s source and work their way to the mouth with interpretive trails and attractions along the way, including indigenous sites and history.

**Service providers**

In terms of the provision of Local Government services, councils have had to reduce expectations (particularly in terms of R&M of roads) and ratepayers have been encouraged to volunteer their time to assist with the survival of small towns, in particular.

**General**

A number of other suggestions were made for mitigating the impacts of the proposed Plan on the Lower Murray region:

the Federal Government should allocate substantial funds to assist communities and irrigators to adjust to the social and economic consequences of the introduction of Sustainable Diversion Limits (SDLs) across the Basin. Such programs need to be developed concurrently with the development of the Basin Plan;

all users i.e. towns-domestic/commercial, water suppliers (e.g. SA Water) and irrigators should contribute to environmental water, not just irrigators;

SDLs should take into account long-term averages of water use and over-allocations beyond the Cap (otherwise SA is penalised for past good management practices);

under the Commonwealth’s infrastructure improvement programs – all water saved should go to the environment (not 50 per cent as currently negotiated) and all
water savings made in water delivery should be shared proportionately between states;

keep to timelines in committing to a Basin Plan so that communities have confidence in planning for the future. The uncertainty regarding the Basin Plan and other related government policies is the most significant problem for many businesses. Not knowing what the rules are and not having confidence that the rules won’t change are significant constraints to business investment; and

eco- and environmental tourism are emerging industries. International tourists are increasingly interested in real experiences and direct contact with the natural world. The restoration of the Murray Darling Basin system has great potential as a demonstration site and a unique tourist location where communities have recognised their interdependence with a healthy river system. New tourism products are needed and the opportunities exist for investment in infrastructure and employment. Government can assist by facilitating investment, encouraging and supporting relevant training and education programs and assisting in developing coordinated and targeted marketing campaigns.