

Case Study: City of Murray Bridge, SA



**Exploring the relationship between community
resilience & irrigated agriculture in the Murray
Darling Basin**

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This report has been prepared for



Cotton Catchment Communities CRC

by

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1. Key Findings

1.1. Background

The primary driver for long-term reductions in water availability for irrigation communities in the Murray Darling Basin will be government policy, including the purchase of water entitlements under *Water for the Future* and the setting of new Sustainable Diversion Limits under the forthcoming *Basin Plan*. Climate change is also projected to have an impact on reduced water availability by 2030. Whilst there are likely to be benefits from increased water for the environment, reduced water for irrigation will result in a range of social and economic impacts on agriculturally dependant communities across the Basin. It is important in this regard to distinguish between short-term stressors such as rainfall variation and fluctuating commodities prices, to which agricultural communities have been adapting over many years, and more permanent impacts from a long-term policy-driven and climatic reduction of water for consumptive uses.

In the face of possible permanent reductions in water availability and the associated impacts, this part of the study aims to answer the question, ‘how resilient are communities likely to be to change?’ A number of factors were found to predict changes in indicators of wellbeing and resilience in earlier stages of this study¹ including changes in employment and population. Our findings for the MDB were generally in line with other research on rural and regional communities, with key indicators that predict wellbeing and resilience including degree of remoteness, degree of urbanisation (population size), proportion of Indigenous people particularly remote populations, and age of the population.² Degree of economic diversity and opportunities to diversify were also relevant factors identified in the literature,³ though our findings indicate that these factors are largely a function of other more endogenous factors like remoteness, proximity to a large urban centre or to other economic resources like extractive industries. Though things like community leadership and collaborative initiatives are important, it can be difficult for communities to respond to major stressors where they have characteristics that work against their ability to adapt to change.

To explore the likely social and economic impacts and degree of resilience to more permanent changes in water at different geographic scales, JSA has researched eight case studies across the

¹ JSA (2010) Report 2: *Quantifying the impacts of cotton production on employment within cotton growing areas in the MDB and in Southern Queensland*, Cotton Catchment Communities Co-Operative Research Centre, Narrabri; and JSA (2010) Report 3: *Quantifying the impacts of cotton production on community wellbeing and resilience across the MDB*, Cotton Catchment Communities Co-Operative Research Centre, Narrabri

² JSA (2010) Report 2: *Quantifying the impacts of cotton production on employment within cotton growing areas in the MDB and in Southern Queensland*, Cotton Catchment Communities Co-Operative Research Centre, Narrabri; and JSA (2010) Report 3: *Quantifying the impacts of cotton production on community wellbeing and resilience across the MDB*, Cotton Catchment Communities Co-Operative Research Centre, Narrabri

³ JSA (2010) Report 1: *Scoping Paper: Exploring the Relationship Between Community Wellbeing, Resilience and Cotton Production in the MDB*, Cotton Catchment Communities Co-Operative Research Centre, Narrabri

Murray Darling Basin in different types of irrigated agricultural communities. The eight case study areas are Dalby-Wambo, Queensland; Balonne, Queensland; Moree Plains, NSW; Bourke, NSW; Griffith, NSW; Campaspe, Victoria; Mildura, Victoria; and Murray Bridge, South Australia. These are augmented by an overview of the regional context or of smaller communities within these areas to illustrate some of the impacts that are likely at different scales.

This report presents the findings of the Murray Bridge SA case study. The key findings from the study, particularly the area's current status against a range of wellbeing and resilience indicators is presented first, and is followed by a detailed discussion of quantitative and qualitative findings from the research. It is important to note that, although we have only been able to focus on eight areas, it is hoped that the case studies will provide some learnings for communities within the Basin facing similar challenges, and draw out the characteristics that are likely to mitigate or exacerbate the impacts of permanent reductions in irrigation water.

1.2. How Resilient is Murray Bridge Likely to be to Permanent Reductions in Water?

1.2.1. Overview of Findings

Modelling of various irrigation water reduction scenarios for **City of Murray Bridge case study area** indicates that impacts of such reductions are likely to be significant, but lesser in magnitude than for other selected case study areas, as irrigated agriculture forms a relatively small proportion of agricultural industries in Murray Bridge. That said, the effects on Murray Bridge are likely to be understated due to Census undercounting, and its role as a major service centre for the **Murraylands Region** and the relatively high rate of jobs in value-adding agricultural processing, transportation, storage, packing and distribution. Impacts are likely to be more significant in the regional context, where most areas are highly dependent on agriculture. Smaller, more remote and agriculturally dependent areas are likely to be far more seriously affected, as has been the case in the latter part of the drought.

A number of factors are likely to mitigate or exacerbate projected impacts on Murray Bridge. Mitigating factors include that it is far less remote than most other MDB case study areas, its proximity to Adelaide, feasible commuting distance to Adelaide and other larger centres, lower Indigenous population, more diverse economy, current and projected employment and population growth under SA planning frameworks, and opportunities related to liberalised water trade. Strong community leadership in the area's regional development, business, civic and NRM institutions is also evident, with clear evidence of agencies and communities working together to respond to ongoing challenges observed during field visits.

Exacerbating factors include existing indicators of significant community vulnerability including very high levels of disadvantage, unemployment, educational and employment status, disability and ill health. Such factors point to limited adaptive capacity of some people and communities to changes in its economic base. A further factor that is likely to limit adaptation of irrigated agricultural is the limited next best use for agricultural land with less water. The fact that many

efficiency gains appear to have been made over the past two decades in irrigated dairy and horticulture also calls into question the extent to which further efficiency gains can be made to offset further reductions in irrigation water. The relatively low level of participation in existing Federal Government programs is reported to be due to the size or relative profitability of agricultural enterprises and limited remaining efficiency gains. The extent to which Murray Bridge's value-adding industries source produce from the MDB, and level of commitment by the SA Government to regional economic development including the future growth of Murray Bridge will also play a role in the future resilience of Murray Bridge if there are significant permanent reductions to irrigation water.

The impacts on smaller, more remote and agriculturally dependent towns and LGAs in the wider Murraylands Region are likely to be more severe, and a range of social and economic impacts have already been experienced in the last few years. Until 2006, the area below Lock 1 was relatively cushioned from the worst effects of the drought due largely to high levels of water security. However, the combined effects of prolonged drought followed by three historically low flow years, low river and lake levels, related additional costs of extending infrastructure or buying in feed, and fluctuations in various commodities prices, have had significant economic impacts since this time. This includes major reductions in irrigated agricultural production, and flow on to related industries and communities. Tourism and recreation industries are also reported to be adversely affected. Significant social impacts include individual and family stress, health and psychological impacts, suicide, and loss of community and industry leaders at a critical time. The statement that, 'we are now losing the efficient operators and industry leaders' was heard frequently in fieldwork, as well as concerns about such loss for post-drought recovery. In many respects, reduced access to water in the latter part of the drought may be regarded as a real time simulation for permanent reductions in water under Federal policy including *Water for the Future* and the forthcoming *Basin Plan*.

Despite reported social and economic impacts during the latter part of the drought, however, responses by farmers, industries and communities also indicate ongoing resilience in the face of significant stress, and there is some optimism about the future of agriculture and related industries 'when the water comes back'. Most noted the 'long-term resilience of agriculture' to ongoing changes in the internal and external environment. Nonetheless, there is considerable concern that more permanent reductions in allocations will limit the ability for industry and communities to 'bounce back' and severely reduce post-drought recovery for agriculture and related industries and communities. As well as the environment, however, a winner from increased water below Lock 1 may also be recreational boating, marina and other urban developments and tourism with if river and lake levels are restored.

Overall, and by comparison with other case study areas, the outcome of reduced water availability in Murray Bridge is likely to be continued existence and growth, but in a different form, changing from an agricultural economy to one that is increasingly dominated by manufacturing, services and retail and by overspill from the Adelaide housing and labour market, albeit generally at the lower cost and potentially lower skilled end of the spectrum. Although growth is likely to continue, rates of growth with reduced water will likely be less than would otherwise be expected. However, other areas are reported in the region are reported to have been 'devastated' by the recent drought, and to some extent Murray Bridge will grow at the expense of

these areas, particularly if water for irrigation is permanently reduced in the future. For smaller centres attractive as new urban settlement areas (like Woodlane), it is likely that the demographic mix and character of the area will change significantly.

1.2.2. City of Murray Bridge's Resilience 'Report Card'

The following provides an overview of key factors that have led to this assessment of how resilient Murray Bridge is likely to be in the face of permanent reductions in water availability. Key factors are reviewed as a 'report card' on resilience, and include:

- Projected changes in employment, population, and indicators of community wellbeing modelled for 10%, 25% and 50% cuts in irrigation water on the 2005/06 growing season;
- Degree of reliance upon agriculture and in particular irrigated agriculture and related industries;
- Factors that have a statistically significant relationship on wellbeing and resilience;
- The current status of Murray Bridge in terms of existing socio-economic indicators; and
- Factors that are likely to mitigate or worsen projected impacts.

Each of these is looked at in turn below. This is followed by detailed data and information from desktop analysis and fieldwork undertaken from November 2009 to June 2010.

1.2.3. Population and Employment Impacts Forecast

Modelling carried out by JSA indicates that, with a permanent reduction in water availability ranging from 10%, 25% and 50%, the **City of Murray Bridge case study area** could lose between 120 and 550 people, and between 40 and 200 jobs. This represents a loss of 7% of employment on the 2006 base year, and an 8% population loss with reductions of 50% of irrigation water. The impacts of such water reductions on Murray Bridge are likely to be significant, but lesser in magnitude than for other selected case study areas, as irrigated agriculture forms a relatively small proportion of agricultural industries in Murray Bridge. The effects of cuts to irrigation water on Murray Bridge are thus significant, but lesser in scale than for other case study areas, as irrigated agriculture forms a relatively small proportion of agricultural industries in Murray Bridge.

However, Murray Bridge also acts as the major regional centre for the five LGAs in the **Murraylands Region**, with the LGA making up half of the population of the region. Around 40% of the region's workforce was employed in agriculture including diverse irrigated agriculture in 2006, with some LGAs having up to 70% of their employment in agriculture. Modelling of a 10%, 25% or 50% reduction in water across the Murraylands Region indicates that there would be related job losses of around 200 (1.4%), 500 (3.5%) or 1,000 (7%) jobs respectively. Population loss of around 560 (1.6%), 1,500 (4%) or 2,800 (8%) on 10%, 25% and 50% reduction in permanent water is also projected depending on the amount of water lost.

The effects on the Murray Bridge case study area are also likely to be understated due its role as a regional centre and the relatively high rate of jobs in value-adding agricultural processing, transportation, storage, packing and distribution. Recent studies indicate that these jobs have already been adversely affected by the drought, with significant impacts projected into the future.⁴ The extent to which such industries will be resilient to future changes in agricultural production will depend upon the extent to which such industries are sourcing produce from outside the Murraylands region and the MDB more generally. Population and employment loss will also depend on the extent to which people from the region settle in City of Murray Bridge versus other centres outside the region such as Adelaide.

Finally, the impacts of permanent reductions in irrigation water are likely to be disproportionately experienced by smaller, more remote and more agriculturally dependent communities within Murray Bridge LGA and the Murraylands, hastening trends to urbanisation or rural decline, exacerbating existing levels of disadvantage and the aging of the population in such communities.

1.2.4. Factors Affecting Wellbeing and Resilience

A number of factors were found to predict changes in indicators of wellbeing and resilience in earlier stages of this study,⁵ including changes in employment and population. Our findings for the MDB were generally in line with other research on rural and regional communities, and included the degree of ‘remoteness’, degree of urbanisation (population size), proportion of Aboriginal people particularly remote populations, and age of the population.⁶ The degree of economic diversity and opportunities to diversify were also relevant factors identified in the literature,⁷ though our findings indicate that these are largely a function of other factors such as remoteness, proximity to a large urban centre, or the presence of other economic resources such as extractive industries.

Table 1.2 below provides an overview of these key factors. In summary, City of Murray Bridge is likely to be more resilient in the face of changes to water allocations than most of the other case study communities, and certainly compared to areas that are smaller, more remote and more dependent on local agricultural production including some of those in the wider Murraylands Region. Murray Bridge’s advantages include its relative degree of urbanisation (including size and proximity to Adelaide), relatively low level of Aboriginal people, and relative economic

⁴ Murraylands Regional Development Board (2009) *Murraylands Growth Update 2009*

⁵ JSA (2010) Report 2: *Quantifying the impacts of cotton production on employment within cotton growing areas in the MDB and in Southern Queensland*, Cotton Catchment Communities Co-Operative Research Centre, Narrabri; and JSA (2010) Report 3: *Quantifying the impacts of cotton production on community wellbeing and resilience across the MDB*, Cotton Catchment Communities Co-Operative Research Centre, Narrabri

⁶ JSA (2010) Report 2: *Quantifying the impacts of cotton production on employment within cotton growing areas in the MDB and in Southern Queensland*, Cotton Catchment Communities Co-Operative Research Centre, Narrabri; and JSA (2010) Report 3: *Quantifying the impacts of cotton production on community wellbeing and resilience across the MDB*, Cotton Catchment Communities Co-Operative Research Centre, Narrabri

⁷ JSA (2010) Report 1: *Scoping Paper: Exploring the Relationship Between Community Wellbeing, Resilience and Cotton Production in the MDB*, Cotton Catchment Communities Co-Operative Research Centre, Narrabri

diversity compared with the MDB average. Its continued population and employment growth over the last census period and the fact that it is targeted for growth under the State Government's strategic planning framework⁸ also indicate that it is likely to be relatively resilient.

That said, Murray Bridge has not yet achieved the size or critical mass found to be important in the previous stage of this study to make it fully independent of the fortunes of its agricultural base and related industries,⁹ and remains somewhat vulnerable in this regard. Supportive State Government regional development policy remains important to the future of the area.

Table 1.1: Key Factors in Community Resilience

Statistically Significant Factors	Likely to be Resilient	Comment
Remoteness	✓	Murray Bridge is much less remote on the ABS Remoteness classification than the MDB average of areas, and has the status of 'Inner Regional Australia'.
Degree of Urbanisation:	?	At around 18,000 people, Murray Bridge has not achieved the critical mass to be a stand alone service centre. Nonetheless, it acts a service centre for a wide agricultural hinterland.
<ul style="list-style-type: none"> Population Size Proximity to a large regional centre 	✓	Murray Bridge is less than 1 hr from Adelaide by expressway.
Indigenous Population	✓	Though almost double the national average (4.2% compared with 2.3%), Murray Bridge's Aboriginal population is lower than the MDB average (4.9%), and much lower than most of the Northern Basin areas.
Age	?	Older than the national average (39 compared with 37 years), but younger than the MDB average of areas (40 years).
Degree of economic diversity	✓?	20% of jobs in agriculture, which was lower than the MDB (29%) but much higher than Australia (3.5%). A more diversified rural economy than the MDB average, though considerably less diverse than the national economy, indicating its role as a regional service centre; and a strong value-adding manufacturing sector that sources agricultural produce and livestock from a wide hinterland and in some cases interstate, and related transport, storage and wholesaling sectors. Continued economic growth will depend upon ongoing population growth, confidence of existing businesses, relocation of projected new businesses, and the extent to which sectors related to agricultural production source their produce from the hinterland and areas within the MDB affected by reductions in water.

⁸ SA Department of Planning and Local Government (2010), *The 30 Year Plan for Greater Adelaide: A volume of the South Australian Planning Strategy*.

⁹ JSA (2010) *Report 3: Quantifying the impacts of cotton production on community wellbeing and resilience across the MDB*.

1.2.5. Current Status on Community Resilience Indicators

The current status of City of Murray Bridge regarding key indicators of community wellbeing and resilience are also important in understanding its vulnerability to changes in water.

Despite the generally positive outlook for Murray Bridge noted in Table 1.2 above, Murray Bridge is the most disadvantaged of the eight case study areas when indicators related to socio-economic status and health are considered. The area also performs poorly against a number of key indicators of resilience, including having a relatively low-skilled labour force, very low indices of economic, educational and occupational resources, high unemployment and low levels of labour force participation. These indicate the presence of very vulnerable populations, and a potentially less adaptive work force, so that the area cannot necessarily be complacent about its future wellbeing despite projected housing and employment growth. The nature of its housing and employment sectors means that it is likely to continue to absorb less advantaged groups from the Adelaide housing and labour market, and it is not a typical ‘tree change’ location.

Table 1.2: Current Status Report on Indicators of Community Resilience

Proxy Indicator of Resilience	Likely to be Resilient?	Comment
Community Wellbeing:		
SEIFA Disadvantage (includes indicators related to people's access to material and social resources, and their ability to participate in society)	✘	The most disadvantaged of the eight case study areas on the index of SEIFA Disadvantage at 900 compared with 1000 for Australia.
SEIFA Economic Resources including income, housing expenditure and assets of households)	✘	Low at 928, compared with 1000 for Australia, most likely related to low skilled jobs and availability of cheaper housing including social rental accommodation.
Median Household Income	✘	Very low compared with MBD and the national median (\$672 compared with \$779 and \$1027 respectively), probably as a result of the high level of employment in low skilled and entry level jobs (e.g. in manufacturing, warehousing, value adding processing), high unemployment, relatively low work force participation rate, and high reliance on pensions and benefits.
Social Capital / Volunteering rate	✓?	Much higher than Australia, but low for a regional area (25% compared with 29% for the MDB). Very high in some smaller communities.
Disability Support Pension	✘	Much higher than the MDB and national average, likely due to high proportion of social housing and low cost accommodation, an older population, as well as a better level of services than much of the hinterland.
Premature Death	✓	Higher than Australia, but slightly lower than the MDB average of areas, signalling less accidents and suicide, but also likely due to a lower % of

Proxy Indicator of Resilience	Likely to be Resilient?	Comment
		Aboriginal people.
Profound or severe disability	✘	Highest of the case study areas and considerably more than the MDB and national average (5.2% compared with 4.6% and 4.1% respectively), likely due to the presence of older people, high proportion of social housing, low cost accommodation, and MB's role as a service centre.
Chronic Ill Health	✘	Somewhat higher than the MDB and national average, and likely due to higher than average social housing, age structure and general disadvantage.
Economic growth:		
Change in Total Employment 2001-06	✓	Much higher than the MDB average (7.1% compared with 1.2%) though lower than Australia (9.7%), likely due to the proximity to Adelaide, its attractiveness for industry relocation, and the growth in retail, manufacturing and wholesale/distribution jobs
Labour force participation 15+ years	✘	Lower level labour force participation compared with the MDB and national averages (57% compared with 60% and 61% respectively), likely due to higher levels of welfare dependence, disability and lower skilled people including in social housing and the local prison.
Labour force participation 65+ years	✓	Very low level of participation by older people, despite its large agricultural base, and less than half the MDB average (7% compared with 15%).
Post-school qualification (skills base)	✘	Very low level of post-school qualifications among the local labour force (26% compared with 32% for MDB and 39% for Australia).
School participation at 16 years	✘	Somewhat lower than MDB and Australia (70% compared with 71% for MDB and 75% for Australia).
SEIFA Index of Education and Occupation (includes relevant Census variables on the general level of education and occupation-related skills and status of a community)	✘	Very low at 876 compared with 953 for MDB and 1000 for Australia. The ABS (2006) SEIFA Index of Education and Occupation focuses on the general level of education and occupation-related skills of people within an area, and brings together relevant Census variables.
GINI co-efficient of household income distribution/polarisation	✘	Like other areas of the MBD, the Murray Bridge shows quite a high level of polarisation between the 'haves' and 'have nots' based on household income.
Youth unemployment rate	✘	Much higher than the national and MDB average (around 14% compared with 10% for the MDB and Australia), despite the presence of opportunities in low skilled and entry level jobs.
General unemployment rate	✘	Much higher than the MDB average (7% compared with 5%), and among the highest of the case study

Proxy Indicator of Resilience	Likely to be Resilient?	Comment
		areas, despite the presence of opportunities in low skilled and entry level jobs.
Amenity		
Population Growth /Retention 2001-06	✓	MB's 5.4% growth was almost equal to national growth (5.8%) from 2001-06, and around 5 times the MDB average, likely due to MB's proximity to Adelaide, low cost housing, availability of entry-level and low skilled jobs, industrial land, etc. A 70% population increase for City of Murray Bridge is forecast over the next 30 years under the <i>30 Year Plan for Greater Adelaide</i> , with commensurate job growth also an aim of the Plan.
In-migration 2001-06	✗	Shows a relatively low level of in-migration compared with MDB and Australia (19% compared with 23% for the MDB and 24% for Australia), which indicates that a reasonable amount of the change in population may be from natural increase and retention of the existing population from 2001-06.

1.2.6. Predicted Changes in Indicators of Wellbeing and Resilience

As noted above, Murray Bridge is the most disadvantaged of the eight case study areas in relation to most socio-economic status, health, income, education and employment indicators measured. Our modelling reported in Section 3.2 below indicates that there is not likely to be any significant deterioration in its socio-economic profile as a result of reduced water availability. However, its already highly disadvantaged profile and reliance upon agriculture and related sectors could make it more vulnerable than projected to changes in its agricultural base. The loss of established residents and community leaders engaged in farming and related sectors is also a likely impact of permanent reductions in water for irrigation.

1.2.7. Other factors indicating vulnerability or resilience

Fieldwork and other consultations have provided valuable insights into other aspects of current and future vulnerability or resilience, and other factors that are likely to mitigate or worsen projected impacts. This is reported in detail including in **Section 4.2** below, with key issues summarised in the following table.

Table 1.3: Other Factors in Resilience from Consultations

Factor	Likely to be Resilient?	Comment
Nature of 'next best' land use with reduced	✗?	Irrigated agriculture is the next best use, as all water licences are high security and existing uses are generally

Factor	Likely to be Resilient?	Comment
water		<p>high value (fruit, vegetables, grapes, irrigated dairy).</p> <p>Although there has already been much farm consultation with various modernisation programs over the past two decades, total land used for horticulture and the like would generally not make broad acre or dryland uses viable.</p>
Potential benefits of water trade	✓?	<p>Open trade in water is likely to be beneficial, and the area has been a net importer of water due to high value uses, permanent plantings, etc. Trade has also allowed for increased flexibility in production and financial management (e.g. increased sophistication regarding sale of entitlements, leasing in seasonal water, etc).</p> <p>However, this can be a double-edged sword for some, particularly where water has been purchased at inflated prices in early trading rounds, increasing potentially unsustainable levels of debt .</p>
Ability to 'recover' from drought and past responses	✓?	<p>Unlike the Northern Basin, Murray Bridge was largely cushioned from early years of drought by highly regulated river system and upstream storages, and predominance of high security licences. Serious impacts have been felt since 2006/07 with historically low allocations and low flows, and low water levels, the latter making it impossible to access allocations and increasing costs through extending infrastructure for those who have been able to do so. This has been exacerbated by fluctuations in commodities prices in various sectors.</p> <p>Area reported to have had significant reductions in agricultural production in the past 3 years. Loss of permanent plantings, lowering of the water table, cracking in river banks and river flats, and damage to infrastructure will require significant replanting or remediation and make it difficult to bring some land back into production.</p> <p>Nonetheless, there is a general view that agricultural has been resilient over the long-term, changing crop mix depending on growing and market conditions, increasing land and water efficiency, and responding to fluctuations in commodities prices. As such, it is reported that much of what has been lost since 2006 may come back into production provided there are a 'few good seasons' provided there is not a permanent loss of water. Vegetable growers, for example, have relocated significant production to groundwater irrigation (e.g. onions in the Southern Mallee), but intend to move production back to Murray Bridge if conditions improve.</p> <p>There has been increased farm consolidation, and most report that they are 'playing a waiting game' regarding the Basin Plan and winter snow/rainfalls. Significant uncertainty is affecting the decisions of irrigators regarding sale of water and business investment at the time of writing.</p>
Ability to make efficiency gains	✗	<p>Reported to be difficult due to previous rounds of modernisation in horticulture and later dairying, with system losses through pump and pipe schemes reported to</p>

Factor	Likely to be Resilient?	Comment
		<p>be as low as 1-2%. Lack of participation in recent federal infrastructure upgrades through Water for the Future (e.g. PIIP SA) reportedly due to difficulties finding further gains.</p> <p>Further, whilst liberalisation of the water market since 2009 and the opportunity to participate in Federal government programs has been a boon for some, the fact that SA has undergone an extensive modernisation process in recent decades means that many of those currently selling water to government and on the open market are reported to be among the 'more efficient operators'. Few in the Murray Bridge area are reported to be eligible for either the Small Block Exit Package nor the Exceptional Circumstances program as a result.</p>
Access to Other Economic Opportunities	✓	Proximity to Adelaide and inclusion in the <i>30 Year Plan for Adelaide</i> has benefits including residential and employment development, industry relocation, etc. Will in part depend on continued support from SA regional development policy.
Natural attributes	✓	Located at the end of the end of the South Eastern Freeway, and near the junction of interstate transport links. Beautiful part of the Lower Murray River, with high amenity recreational opportunities in houseboats, recreational craft, fishing etc, and in reasonable proximity to the Coorong and other natural attractions.
Leadership	✓	Strong leadership evident in all consultations, including from City of Murray Bridge Council and the Murraylands Regional Development Board, local politicians and agricultural and irrigator groups.
Other factors in future resilience from consultations	✓?	Potential for urban development in smaller areas may also add to income opportunities for farmers and retention of population, though this will also significantly change the composition and character of such small communities.
Other factors in future vulnerability from consultations	✗	Smaller, agriculturally dependent areas within Murray Bridge like Mypolonga (see Section 3.2.2 below) and smaller LGAs in the Murraylands Region are particularly vulnerable to reductions in irrigation water (surface or groundwater), and such reductions are likely to hasten trends to urbanisation, rural decline and socio-economic disadvantage

2. Introduction

2.1. Overview

In June 2009, Judith Stubbs and Associates (JSA) were engaged by the Cotton Catchment Communities Co-operative Research Centre to undertake a significant research project investigating wellbeing and resilience of communities, particularly those engaged in irrigated agriculture including cotton, within the Murray Darling Basin (MDB). The study seeks to understand the likely social and economic impacts on communities at different scales arising from changes in government water policy, in particular, Water for the Future and the forthcoming Basin Plan, and projected climate change. This project included three research strategies and has so far produced three reports.¹⁰

2.2. Rationale

Given findings from the literature and the first three reports of this study, it is likely that the social and economic impacts related to changes in water availability will be experienced differently at different geographic scales (eg. farm, local community, region, MDB, national), and by different groups within a community (e.g. farmers, Aboriginal people, businesses). Key factors will include the existing wellbeing and resilience of these communities, and other mitigating factors such as access to the water market and alternative economic opportunities.

In order to understand the differential impacts upon areas and groups, we have carried out a cost-benefit analysis to determine impacts at the MDB and national levels and prepared eight case studies to explore the likely impacts at the farm, regional and local community levels. These documents comprise the fourth and final report for this study.

The eight case study areas were selected in order to represent different states, different CSIRO Sustainable Yields Regions, cotton and non-cotton producing areas, a diversity of irrigated agricultural uses and diversity across three key attributes including population size, remoteness and Indigenous population. The eight case study areas include Dalby-Wambo, Queensland; Balonne, Queensland; Moree Plains, NSW; Bourke, NSW; Griffith, NSW; Campaspe, Victoria; Mildura, Victoria; and Murray Bridge, South Australia.

2.3. Case study methodology

This case study is informed by JSA's extensive analysis of agriculture and population data; a review of policy, relevant document and reports; and a series of telephone and face-to-face interviews with individuals from a range of perspectives and organisations. These included a wide range of staff and elected or appointed representatives of the following agencies/ groups:

- City of Murray Bridge Council

¹⁰ JSA (2010) Report 1: Scoping Paper, JSA (2010) Report 2: Quantifying the impacts of cotton production on employment within cotton growing areas in the MDB and in Southern Queensland, and JSA (2010) Report 3: Quantifying the impacts of cotton production on community wellbeing and resilience across the MDB.

- Central Irrigation Trust
- Murraylands Drought and Rural Support Centre
- South Australian Murray-Darling Basin Natural Resources Management Board
- Drought advisor to the Premier of South Australia
- Price Merrett Consulting
- Murray Futures Project
- Wellington Local Action Planning Committee
- SA Murray Irrigation
- Lower Murray Irrigators
- Individual irrigators and industry groups
- Interested community members who attended workshops and report back sessions

Interviews, workshops and field visits to the Murray Bridge area were conducted from February to May 2010 in order to understand how water availability, agricultural land use and agricultural employment has changed in recent years as a result of government policy and short term climatic change (eg, the recent drought); how these changes resulted in social and economic impacts at the farm and wider community levels; and therefore how permanent reductions in water availability (eg, new SDLs through the MDBA Basin Plan) are likely to affect wellbeing and resilience at the farm and community level.

2.4. Case study content overview

This case study provides:

- A description of the case study area including its location, land and water use, water policy, and relative social and economic wellbeing and resilience against key indicators;
- A prediction of impacts to community wellbeing and resilience based on hypothetical reductions in water availability of 10%, 25% and 50% from the most recent year for which comparative agricultural and population data is available (the 2005/06 growing year and 2006 Census);
- An exploration of the ‘short term’ social and economic impacts that have been experienced as a result of the recent drought, fluctuations in commodities prices, water market and other relevant factors affecting communities; and
- An analysis of how the attributes of the area and other factors have exacerbated and/or helped to mitigate the impacts already experienced as an indicator of the area’s resilience, and how it may therefore respond to more permanent changes in water availability under the forthcoming Basin Plan or permanent trade out of area.

3. Description of the Case Study Area

3.1. Location



The **Murray Bridge case study area** (Rural City of Murray Bridge LGA) is located in southeastern South Australia in the catchment of the Lower Murray River within the **Murray Sustainable Yield Region**.¹¹ It covers an area of over 1,800 sq kms including part of Lake Alexandrina, and is around 80 kms from Adelaide at the end of the South Eastern Freeway.

Murray Bridge is also at the heart of the **Murraylands Region**, made up of Mid Murray, Coorong, Karoonda East Murray, Southern Mallee and Rural City of Murray Bridge LGAs, for which Murray Bridge acts as the major regional centre. The region's income is mainly sourced from agriculture and associated industries such as value adding in meat production. Though there has been growth in diverse economic sectors over the past decade or so, agriculture is the primary source of direct employment, with flow-ons to many other sectors.¹²



Map 3.1: Murraylands Economic Development Region

Source: Murraylands Regional Development Board Inc

¹¹ For more information see <http://www.csiro.au/partnerships/MDBSY.html>.

¹² <http://www.murraylands.org.au>

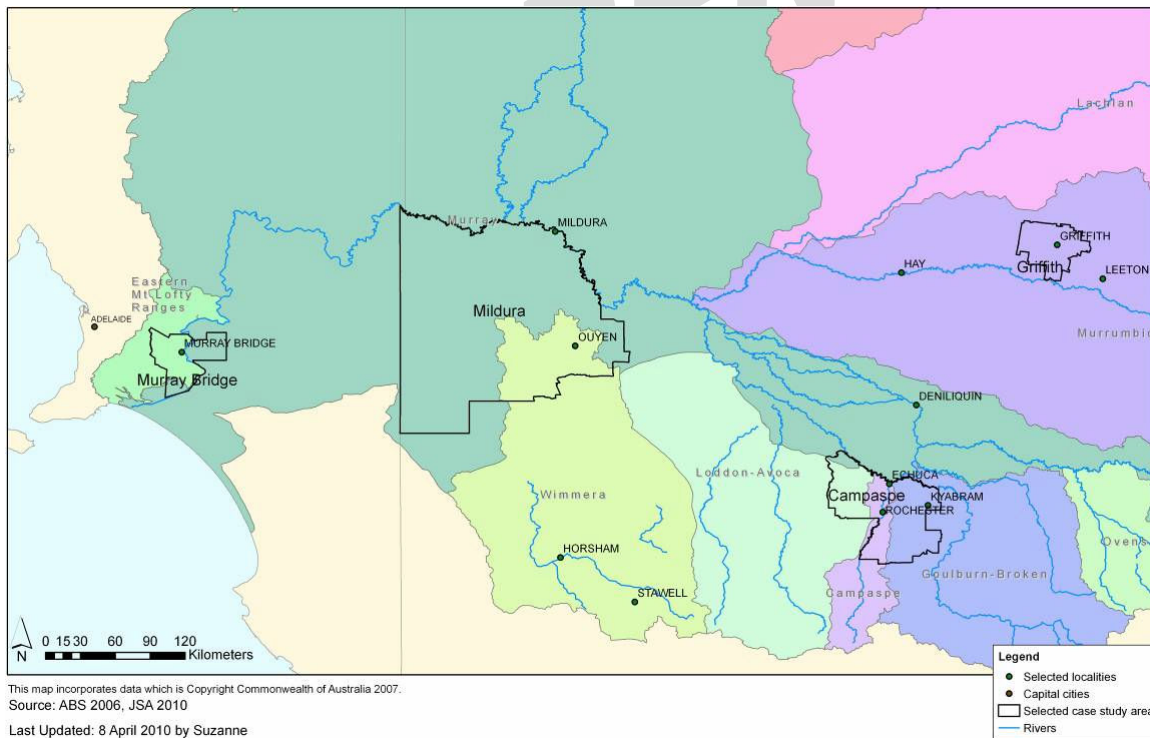
3.2. Water and Land Use Context

3.2.1. Overview of Current and Projected Water Use

The Murray Bridge case study area is located in the **Murray Sustainable Yield Region (SYR)**,¹³ which straddles the NSW-Victorian and SA borders. The SYR is based around the Murray and the Lower Darling Rivers below Menindee, and runs the full length of the Southern Basin from east to west.¹⁴

The Murray SYR covers 19.5% of the total land area of the MDB, and uses over 36% of water diverted for irrigation in the MDB. It uses around 14% of groundwater extracted in the Basin under current levels of development.¹⁵ The SYR has a ‘high’ assessed level of usage of available surface water,¹⁶ while groundwater makes up only 5% of total water used.¹⁷

Map 3.2: City of Murray Bridge and Other Southern Basin Case Study Areas



¹³ In 2008, the CSIRO completed a series of reports through the Sustainable Yields Project, which assessed the current and future water availability in the Murray-Darling Basin in terms of catchment development, changing groundwater extraction, climate variability and climate change. For more information on the CSIRO Murray-Darling Basin Sustainable Yields Project, see <http://www.csiro.au/partnerships/MDBSY.html>.

¹⁴ CSIRO (2008) *Water Availability in the Murray, Summary Sheet from the CSIRO MDB Sustainable Yields Project*, p.1.

¹⁵ CSIRO (2008) *Water Availability in the Murray, Summary Sheet from the CSIRO MDB Sustainable Yields Project*, p.1.

¹⁶ Average surface water availability for the Murray region is 11,162 GJ per year under the **historical climate** (1895 to 2006), of which 36% is reported to be used under current levels of development aggregated to Wentworth. This is assessed as a ‘high’ level of available surface water usage in the region (CSIRO (2008) *Water Availability in the Murray, Summary Sheet from the CSIRO MDB Sustainable Yields Project*, p.1).

¹⁷ CSIRO (2008) *Water Availability in the Murray, Summary Sheet from the CSIRO MDB Sustainable Yields Project*, p.1.

Of note, the Southern Basin has been in severe drought since 1997 and the catchment runoff in the southernmost parts of the MDB to 2006 was the lowest on record.¹⁸ This event is reported to occur only once in more than 300 years, although such conditions may become increasingly common with climate change.¹⁹ Drought conditions in the south of the MDB worsened from 2007,²⁰ and rainfall that brought relief to parts of the Northern Basin in early 2009, and particularly early 2010, has generally not been experienced in the Southern Basin at the time of writing.²¹

The most likely estimate of **climate change** assumes that impacts on surface water availability will be less severe than the recent past,²² with availability predicted to fall 14% by 2030, average diversions by 4%, and end of system flows by 24%.²³ Likely **future development** of farm dams and plantations for the Murray SYR is expected to be ‘negligible’, although groundwater use is expected to treble by 2030.²⁴

3.2.2. Overview of River Systems and Regulation

The **Murray SYR** receives inflows from the Barwon-Darling system, which joins the Murray at Wentworth in NSW (350 kms upstream from Murray Bridge), having collected water from most river systems in the Northern Basin. The Murray River is also strongly affected by upstream flows from the Murrumbidgee, Ovens, Goulburn-Broken, Campaspe and Loddon-Avoca river systems in the Southern Basin.²⁵

Compared with the Northern Basin, the river systems of the Southern Basin are highly regulated, with an extensive system of dams and weirs the length of the Murray River, and major upstream storages east of Albury (Hume Weir completed in 1931) and in the Victorian Alps (Dartmouth Dam completed in 1979).²⁶ These have provided for a relatively constant water level since the 1930s and (until recently) a high level of water security to facilitate intensive irrigation for horticulture, dairying, viticulture, feed and other irrigated crops in the surrounding otherwise semi-arid areas, where dryland wheat and grazing are the predominant land uses. A smaller storage is located upstream at Lake Victoria, just east of the NSW-SA border.²⁷

In addition to weirs, there are also 11 locks from Mildura (Lock 11), around 500 km upstream of the **Murray Bridge case study area**, to Blanchetown (Lock 1), around 150 km upstream. The

¹⁸ CSIRO (2008) *Water Availability in the MDB: A Report from the CSIRO to the Australian Government*, p. 5.

¹⁹ CSIRO (2008) *Water Availability in the MDB: A Report from the CSIRO to the Australian Government*, p. 5.

²⁰ CSIRO (2008) *Water Availability in the MDB: A Report from the CSIRO to the Australian Government*, p. 5.

²¹ Site Visit, Southern Basin April 2010.

²² The duration and severity of the recent drought is reflected in projections based on the **recent climate** (1997 to 2006), with regional surface water availability forecast to fall by 30%, diversions by 13%, and end of surface flow by 50% (CSIRO (2008) *Water Availability in the Murray, Summary Sheet from the CSIRO MDB Sustainable Yields Project*, p.1).

²³ CSIRO (2008) *Water Availability in the Murray, Summary Sheet from the CSIRO MDB Sustainable Yields Project*, p.1.

²⁴ CSIRO (2008) *Water Availability in the Murray, Summary Sheet from the CSIRO MDB Sustainable Yields Project*, p.1.

²⁵ CSIRO (2008) *Water Availability in the Murray, Summary Sheet from the CSIRO MDB Sustainable Yields Project*, p.1.

²⁶ These have respectively 3038 G1 and 3906 G1 of storage capacity (MDBA April 2010).

²⁷ Storage capacity of 547 G1 (MDBA April 2010)

Murray River enters the Southern Ocean about 70 km south of Murray Bridge at the Murray Mouth, downstream of Lake Alexandrina and adjacent Lake Albert, two important Ramsar-listed wetlands. The SA Government constructed a system of barrages across Lake Alexandrina where it discharges into the Coorong and thence the Southern Ocean. These were completed in 1940 to guarantee a source of permanent fresh water for surrounding communities for domestic and irrigation uses. These barrages effectively form another weir at the end of the system below Lock 1, and separate Lake Alexandrina from the Murray Mouth and the estuarine environment of the Coorong, another Ramsar-listed site of considerable ecological importance for fish and bird breeding.

Barrages at Lake Alexandrina have also generally kept water below Lock 1 at levels suitable for extraction by irrigators and for other uses. However, current development combined with historically low flows on top of a severe drought have lowered the river level to the point where extraction of even their reduced water allocations has not been possible for many irrigators below Lock 1 over the past 18 months or so. At the time of writing, the River was at 1.5 metres below 'pond level'.²⁸ Administrative decisions, that provided for almost 100% allocations throughout the River Murray Prescribed Water Course²⁹ during the drought until 2006/07 may also have contributed to the depletion of water from major upstream storages,³⁰ and the need for the sharp cut in water allocations over the past three years.

It is also noted that the SA Water pipeline from Murray Bridge and downstream at Taillem Bend currently boosts Adelaide's water supply, without which it is reported Adelaide could not support its current population.³¹ The Adelaide desalination plant will upon completion provide for around half of Adelaide's potable water supply,³² which will no doubt affect the relative importance of water sourced from below Lock 1.

²⁸ The point at which the river reaches the top of the weir, observed during Site Visit Murray Bridge March 2010.

²⁹ SA uses a system of 'prescribed management areas' under the *Natural Resources Management Act 2004 (SA)*. An area is prescribed under the Act when the level of water use in the area indicates that a regulatory control is needed to secure sustainable management and support water-dependent ecosystems. Once a water resource is prescribed, users need to be authorised by a licence (or other approval) to extract water (see for example National Water Commission (NWC) (2009) *Australian Water Markets Report 2008-2009*, p.108).

³⁰ In April 2009, Hume was at around 4% of capacity, and Dartmouth and Lake Victoria at around 20% (see Figure 4.3.2 in NWC *op cit*, p.112).

³¹ <http://www.murraybridge.sa.gov.au/>

³² SA Department of Planning and Local Government (2010), *The 30 Year Plan for Greater Adelaide: A volume of the South Australian Planning Strategy*.

3.2.3. Key Environmental Issues



Without the barrages, the historically low water level of Lake Alexandrina³³ would likely lead to an inflow of seawater, turning a long-term freshwater ecology into a marine one and removing fresh water for consumptive uses for communities surrounding both Lake Alexandrina and adjacent Lake Albert.³⁴ Likewise, water levels in Lake Albert are extremely low, and there are risks from prolonged exposure of acid sulphate soils to the long-term health of the

Lake.³⁵ Exceptionally low flows in recent years combined with historical development have also contributed to the silting up of the Murray Mouth, which means that the naturally saline environment of the Coorong is in danger of becoming hyper-saline.³⁶

Debate about the future of the Lower Lakes is complex, and includes the pros and cons of removing the barrages, potentially hastening a marine ecology, and the extent to which this may occur with the intensification of climate change in the future. Farmers who use the Lakes for irrigation extraction, recreational boating enthusiasts, developers and local community members often have differing view regarding the best future for the Lower Lakes.³⁷

Although protecting the social and economic life of communities to a far greater extent than in the Northern Basin during times of drought or low flows, the downside of such a highly regulated river system in the Southern Basin includes ecological impacts associated with increased time between flood events to water key environmental assets. Water resource development is reported to have caused ‘major changes in flooding regimes that support’ such wetland systems.³⁸ Of relevance to the Murray Bridge case study area (below Lock 1), modelling indicates that total flow at the Murray Mouth from development throughout the Basin has been reduced by 61%, so that the River now ceases to flow through the Mouth 40% the time compared with 1% of the time in the absence of water resource development.³⁹

³³ Around 0.7 metres below sea-level in early 2010 (Site Visit Lower Lakes March 2010).

³⁴ Photo of Lake Alexandrina at the Barrages (JSA March 2010).

³⁵ Government of SA (2009) *The Future for Lake Albert: An adaptive Management Plan*, October 2009

³⁶ *Ibid.*

³⁷ SA Government (2009) *Murray Futures Lower Lakes & Coorong Recovery: Community Consultation Stage 2 Report*.

³⁸ CSIRO (2008) *Water Availability in the MDB: A Report from the CSIRO to the Australian Government*, p. 5.

³⁹ CSIRO (2008) *Water Availability in the MDB: A Report from the CSIRO to the Australian Government*, p. 5.



At the time of writing in early 2010, fresh water was being pumped from Lake Alexandrina to Lake Albert by the South Australian Government to address what is perceived to be the greater ecological need,⁴⁰ and the Murray Mouth is being kept open by round-the-clock dredging to protect the environment of the Coorong.⁴¹

The Murray SYR also includes other large and important wetlands along the Murray River, the Lower Darling River, the Great Darling Anabranch, and the Edward Wakool system. A number of these are also listed as sites of international importance under the Ramsar Convention including those upstream of the Murray Bridge case study area – the Hattah-Kulkyne Lakes near Mildura LGA, the Riverland Wetland Complex near Renmark, and Barmah-Millewa Forest and Gunbower Forest further east.⁴² Increased time between flood events related to current levels of development exacerbated by the protracted severe drought is also reported to be affecting these sites, doubling the average time between flood events and significantly reducing flood volumes.⁴³

3.2.4. Overview of Relevant Policy and Water Regulation

The SA Department of Water, Land and Biodiversity Conservation (DWLBC) is responsible for issuing water licences and permits (entitlements) and managing the allocation of SA water resources. The nature of agricultural production combined with local climatic conditions means that virtually all water entitlements are ‘high security’ in SA.⁴⁴

Relevant to the case study area of Murray Bridge, there are several delivery mechanisms for irrigation water in this part of River Murray Prescribed Water Course (PWC). Irrigation water to the extensive ‘dairy swamps’, which have supported the irrigated dairy industry for at least a century,⁴⁵ is delivered to irrigators through a system of sluice gates and levees that provide for gravity fed flood irrigation when the river is at an appropriate level. Until recently, river levels have been maintained at this level, assisted by the end-of-system barrages in Lake Alexandrina, described earlier. Water efficiencies supported by the State Government saw the introduction of a range of measures to ‘modernise’ irrigated dairy and improve water quality and efficiency

⁴⁰ Photo of pumping of water from Lake Alexandrina to Lake Albert (JSA March 2010).

⁴¹ Site visit March 2010.

⁴² CSIRO (2008) *Water Availability in the Murray, Summary Sheet from the CSIRO MDB Sustainable Yields Project*, p.1.

⁴³ CSIRO (2008) *Water Availability in the Murray, Summary Sheet from the CSIRO MDB Sustainable Yields Project*, p.2.

⁴⁴ NWC *op cit*,

⁴⁵ Around 5,000 ha of River flood plain was reclaimed along an 80 km length of the Murray River from Mannum to Wellington from the late 1800s to 1915 including the installation of an extensive levee system with mechanisms to allow water into the fields and back to the River after irrigation (Workshop with SA MDB NRM Board staff, March 2010).

completed by 2004/05, although the impact of the drought since 2006 has meant much of these works have been effectively rendered useless.⁴⁶

Several irrigation trusts are also active in the case study area as are a number of private irrigators, with pump and pipe systems delivering water to fruit, vegetables, grapes, and feed and other crops grown in the more elevated land above the river flats. Capital works to achieve water efficiency in these sectors was undertaken earlier than for the dairy industry, with modernisation schemes rolled out in SA since the 1980s, funded by government and industry. The Central Irrigation Trust (CIT), the largest trust in SA covering around 50% of irrigation areas,⁴⁷ has taken over management of the irrigation network for Mypolonga, a horticultural area within Murray Bridge LGA discussed in detail later. The CIT has also been assisting the Woodlane Irrigation Trust following the loss of its pumping system during a riverbank collapse by allowing it to connect to the CIT system while a new pump was being constructed.⁴⁸

A view was regularly expressed during consultations that modernisation over the past few decades means that ‘most water efficiencies that can be gained have been gained.’⁴⁹ As such, there was a strongly held view among most interviewed that there is likely to be limited value in participating in programs like the Private Infrastructure Investment Program (PIIP SA).

Other Federal Government programs under *Water for the Future* such as Restoring the Balance (the ‘buyback’) and the Small Block Exit Package are reported to be more popular among irrigators, particularly given the extreme stress many are facing. Similar to other areas in the Southern Basin, irrigators in the Lower Murray had close to 100% allocations throughout much of the drought, unlike those in the less regulated river systems of the Northern Basin, where full allocations have not been experienced by many for a decade. However, seriously low levels in upstream storages⁵⁰ combined with the lowest flows on record led to the first major cuts in water allocations experienced – down to 60% in 2006/07, 32% in 2007/08 and 18% in 2008/09 for the River Murray PWC.⁵¹

Low water levels below Lock 1 meant that many irrigators could not access even their reduced water allocation without significant augmentation of infrastructure. This has added an extra level of cost for irrigators in this part of the system, and been a ‘tipping point’ for some when considered in the context of increased debt from buying in water or feed to supplement low allocations and more recent fluctuations in commodities prices, and led even the more efficient operators to apply to sell their water under the buyback, or seek to exit irrigation by taking a package. However, there have been limitations to the extent to which irrigators in the Murray

⁴⁶ Interview with CIT and Regional NRM officers.

⁴⁷ The CIT has been expanding its management services to a larger number of trusts, and now operates 10 individual trusts (see for example NWC *op cit*, p.108).

⁴⁸ The new pump is being largely funded by the SA government in exchange for achieving additional water efficiencies., with industry contributions.

⁴⁹ Interview with CIT and Regional NRM officers.

⁵⁰ In April 2009, Hume was at around 4% of capacity, and Dartmouth and Lake Victoria at around 20% (see Figure 4.3.2 in NWC *op cit*, p.112).

⁵¹ (National Water Commission (NWC) *Australian Water Markets Report 2008-2009* National Water Commission (NWC) (2009) *Australian Water Markets Report 2008-2009; 2007-2008; 2006-07*.

Bridge case study area have been able to benefit from such programs, as discussed later in more detail.

Progressive deregulation of the water market in SA since the early 2000s has also assisted some to ride out the recent water crisis. It has provided some with the means to buy in water to supplement allocations; to sell water entitlements permanently or for a defined period to buy in feed or seasonal water; to change production mix; or to exit the industry entirely. However, as discussed later, this has also not been without its social and economic costs to producers and to communities.

A number of more recent reforms have made the open trade in water within SA and between states even easier. Together with the unprecedented reduction in allocations, fluctuations in commodities prices and other factors, these reforms appear to have contributed to substantially increased market activity in recent times. From 1 July 2009, new legislation⁵² enabled the unbundling of existing water licences into four instruments that separate entitlements,⁵³ allocations,⁵⁴ works⁵⁵ and site use.⁵⁶ In particular, this makes it possible to easily transfer the seasonal volume of water (allocation) independent of an ongoing water right (entitlement).⁵⁷ Initially implemented in the River Murray PWC, this will be progressively rolled out in other prescribed areas in SA.⁵⁸ The gazettal of other legislation⁵⁹ means that, since April 2009, Irrigation Trusts are no longer able to restrict permanent trade out of irrigation districts, and are required to facilitate such trade at the request of members'. Exit fees will generally apply for sale of water out of the network.⁶⁰

There was a significant increase in water market activity in 2008/09, which corresponded with the lowest allocations on record (2% in July 2008 rising to 18% in early 2009).⁶¹ Importantly, the

⁵² *Natural Resource Management (Water Resources and other matters) Amendment Act 2007 (SA)*

⁵³ Water Access Entitlements (or Water Licences) provide for the ongoing right to a specified share of the water resource expressed in unit shares, and provides for an asset that can be sold or transferred permanently or for a limited period (South Australian Department of Water, Land and Biodiversity Conservation (2010) *Unbundling Water Rights – What Does It mean?*)

⁵⁴ Allocations are the actual volume of water able to be extracted in a given year, and may vary from year to year, depending on water availability. It is an asset that can be sold or transferred (South Australian Department of Water, Land and Biodiversity Conservation, *op cit.*)

⁵⁵ A Water Resource Works Approval is a permission to construct, operate and maintain works (such as a pump, metre, well or dam) to extract water at a particular location in a particular way. This permission is not transferable to another location (South Australian Department of Water, Land and Biodiversity Conservation, *op cit.*)

⁵⁶ A Site Use Approval is a permission to use the water at a particular location in a particular way, and is also not transferable to another location.

⁵⁷ Water entitlements can be traded permanently or for a defined period under a lease arrangement, in full or in part.

⁵⁸ SA uses a system of 'prescribed management areas' under the *Natural Resources Management Act 2004 (SA)*. An area is prescribed under the Act when the level of water use in the area indicates that a regulatory control is needed to secure sustainable management and support water-dependent ecosystems. Once a water resource is prescribed, users need to be authorised by a licence (or other approval) to extract water (see for example National Water Commission (NWC) (2009) *Australian Water Markets Report 2008-2009*, p.108).

⁵⁹ *Irrigation Act 2009 (SA)*; and *Renmark Irrigation Trust Act 2009 (SA)* introduce these requirements at the request of members and in accordance with the *Water Act 2007 (Cth)*.

⁶⁰ The Commonwealth has capped termination fees since 1 September 2009 for the 2009/10 water year (see for example NWC *op cit.*, p.110).

⁶¹ See Table 4.3.7 in NWC *op cit.*, p.119.

volume of permanent water traded in 2008/09 was three times that traded in 2007/08, though the number of trades increased by around one-quarter. South Australia was by far a net importer of water (around 336 GJ net in 2008/09),⁶² with the most active water market in the River Murray PWC, and 98% of water imported from NSW.⁶³ The imperative to buy in water to keep permanent plantings alive and to maintain dairy herds and pasture built up over generations is evident in these trading figures.

3.2.5. Overview of Land Use & Water Use in Murray Bridge LGA

Around 117,000 ha of land were under cultivation in **Murray Bridge case study area** in the 2005/06 growing season. Cereals,⁶⁴ oilseeds and other broad acre crops and grazing (including irrigated dairy) were the dominant land uses. Horticulture and grapes was a smaller but significant use, as shown in the following table.

Table 3.1: Agricultural Land Uses, Murray Bridge

Agricultural Use	# Hectares	% of Agricultural Use Hectares
Vegetables	692	0.59%
Fruit	314	0.27%
Grapes	85	0.07%
Grazing	72,553	62.07%
Cereal, oilseeds, other broadacre	43,249	37%
Rice	0	0
Cotton	0	0

Source: ABS (2006) and JSA (2009)

Around 36 GJ of water was used for irrigated crops and pasture in the Murray Bridge case study area in 2005/06. Of this 85% was used for irrigated grazing, with 75% of agricultural employment in this sector. This shows the importance of dairy to the local area, and indicates the job losses that would be expected with major reductions in dairying. Vegetables were the next largest user of water, with fruit, other crops and grapes also irrigated uses in the LGA.

⁶² Interestingly, whilst around 340 GJ was traded into the Murray River PWC from other states, only 3.6 GJ was traded out (Table 4.3.11 in NWC *op cit*, pgs.121-122).

⁶³ NWC, *op cit*.

⁶⁴ Includes cereals, feed, oilseeds and other broadacre crops

Table 3.2: Irrigated Water Use and Employment in Murray Bridge LGA 2005/06

Employment & Water Use	2005/06	% Ag Employment
Employment in Vegetables	141	8.7%
Irrigation water use	3.0 G1	
Employment in Fruit	23	1.4%
Irrigation water use	1.7 G1	
Employment in Grapes	13	0.8%
Irrigation water use	0.2 G1	
Employment in Grazing	1207	75.3%
Irrigation water use	30.0 G1	
Employment in Cereals (incl. feed, oilseeds, etc)	44	2.7%
Irrigation water use	1.2 G1	
Employment (Balance Agriculture)	174	10.9%
Total Agricultural Employment	1603	100%
Total Irrigation Water Use	36.1	
Total Employment	7,970	

Source: ABS (2006) and JSA (2009)

It is noted that the case study area is also at the heart of a larger regional area of **Murraylands**,⁶⁵ for which Murray Bridge acts as the main regional service centre. It is also important to understand the likely social and economic impacts of changes in water availability on Murray Bridge case study area in its regional context, as there are substantial areas of diverse irrigated agriculture in parts of the Murraylands. Key irrigated water uses are therefore also summarised for the Murraylands region below.

⁶⁵ Murraylands region includes Rural City of Murray Bridge (with the major service centre of Murray Bridge city), Mid Murray, Coorong, Karoonda East Murray and Southern Mallee.

Table 3.3: Irrigated Water Use and Employment in Murraylands Region 2005/06

Irrigated Water Use for:	GI Used 2005/06					
	Murray Bridge	Mid Murray	Coorong	Karoonda East Murray	Southern Mallee	Regional Total
Employment in Grazing	1,206	242	699	91	193	2,430
Irrigated water used by grazing	30.0	9.3	17.3	0.0	0.0	56.6
Employment in Vegetables	141	114	16	32	92	395
Irrigated water used by vegetables	3.0	10.5	0.9	1.4	22.2	38.0
Employment in Cereals (incl. Stock feed)	45	122	174	185	231	758
Irrigated water used by Cereals (incl. Stock feed)	1.2	4.4	27.7	0.0	0.0	33.3
Employment in Fruit	23	65	11	0	11	110
Irrigated water used by Fruit	1.7	6.3	1.1	0.0	0.9	10.0
Employment in Grapes	13	107	0	0	0	120
Irrigated water used by Grapes	0.2	0.0	0.0	0.0	0.0	0.2
Employment (Balance Agriculture)	174	98	158	18	37	484
Total Agricultural Employment	1,603	747	1,058	325	564	4,297
Total Irrigation Water Use	36.1	30.5	46.9	1.4	23.1	138.1
Total Employment	7,102	3,182	2,456	555	1,083	14,378

Source: ABS (2006) and JSA (2009)

Note: ABS employment values for agriculture type have been multiplied by 1.11 to adjust for 'not stated' and 'inadequately described'

Though less significant than in Murray Bridge, the above table again indicates the importance of irrigated dairy to the economy of the Murraylands region in the 2005/06 growing season. Around 40% of irrigation water in the Murraylands was used for irrigated grazing in this year. Almost 28% of water was used to irrigate vegetables, which were especially important in the Southern Mallee and Mid Murray, while around one quarter was used for irrigated 'cereals'⁶⁶

⁶⁶ Includes cereals, feed, oilseeds and other broadacre crops

including stock feed. Just over 7% of water used for irrigation went to fruit, and a much lower amount went to wine and table grapes. The latter was far more heavily concentrated in nearby LGAs including Alexandrina⁶⁷ where almost 7,000 ha was under cultivation for grapes in areas like Langhorne Creek and Currency Creek.⁶⁸ The implications of the regional situation will be examined in more detail when social and economic impacts are discussed later.

3.3. Social and Economic Context

3.3.1. Overview of Murray Bridge Case Study Area

Murray Bridge LGA had a total population of around 18,000 people in 2006, with most people living in the main urban area of Murray Bridge (14,000 residents).⁶⁹ Remaining residents were concentrated in the smaller towns and villages of Myponga, Woodlane, Callington, Jervois, Wellington and Woods Point, with the remainder scattered across the sparsely settled hinterland.⁷⁰ Murray Bridge also acts as the major regional centre for the **Murraylands Region**, made up of Mid Murray, Coorong, Karoonda East Murray, Southern Mallee and City of Murray Bridge LGAs. The combined population of these five LGAs was around 35,000 people in 2006.⁷¹

Prior to European settlement, the Murray Bridge area was inhabited by the Ngarrindjeri people, who were supported for thousands of years by the river, wetland and estuarine environment. The first European to come to the area was Captain Charles Sturt who rowed a whaleboat down the Murrumbidgee in late 1829 and reached the junction with the Murray River in January 1830. He continued down the Murray and passed what is now Murray Bridge in early February, reaching Lake Alexandrina soon after. Murray Bridge was established when a road bridge over the Murray River was completed in 1879, and the original town (called Mobilong) was laid out in 1883. This was followed in 1886 by the Adelaide-Melbourne railway line, which secured the city's importance as a link across the River. Later renamed 'Edwards Crossing', the town gained its existing name when a new railway bridge was constructed across the River in 1924.⁷²

The construction of an expressway in 1979 that linked Murray Bridge to Adelaide also saw the construction of around 900 Housing Trust homes to accommodate the workforce that was to service the expansion of Monarto, a planned growth centre that was never realised as the popularity of more interventionist regional developed policies waned.⁷³ Not surprisingly, the population of Murray Bridge township increased markedly around this time, growing by 3,229 (37%) between 1981 and 1986. Though relatively stable from 1991 to 2001, the city grew by around 700 people from 2001 to 2006. This is likely related to the availability of affordable

⁶⁷ Including Coastal and Strathalbyn areas

⁶⁸ Interviews in Murray Bridge Site Visit March 2010

⁶⁹ ABS 2006 Census

⁷⁰ ABS 2006 Census

⁷¹ ABS 2006 Census

⁷² <http://www.murraybridge.sa.gov.au>

⁷³ Interview, staff of Murraylands Regional Development Board, March 2010

housing, with median weekly rental of \$220 in Murray Bridge compared with \$380 in Adelaide in 2009,⁷⁴ and of lower skilled entry-level jobs including in the area’s large value-adding processing and warehouse /distribution sectors.⁷⁵

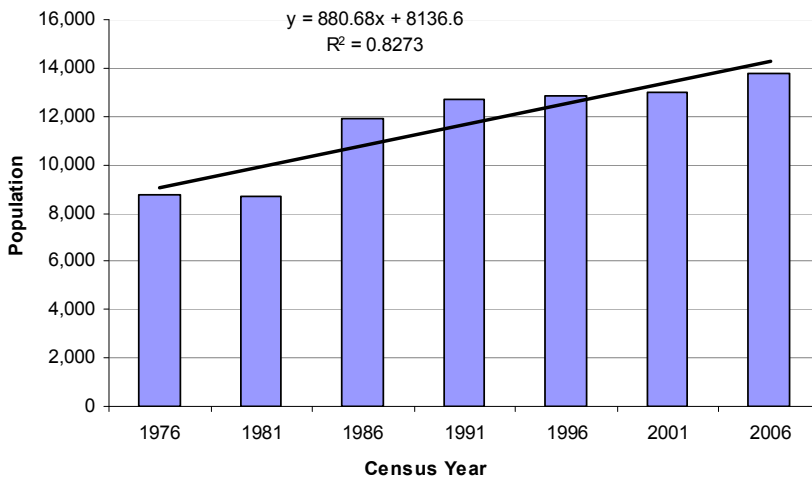


Figure 3.1: Population Change 1976-2006 for Murray Bridge township

Source: ABS Census 1976, 1981, 1986, 1991, 1996, 2001, 2006, by Place of Enumeration

City of Murray Bridge LGA has also been steadily growing over the past thirty years, increasing by 5,092 people (41%) between 1976 and 2006. However, most of this growth has been within Murray Bridge urban centre itself. It is likely that smaller towns and villages in the hinterland have maintained their population or had small growth over the 30-year period including the most recent inter-censal period, given the population differentials shown in the two graphs.

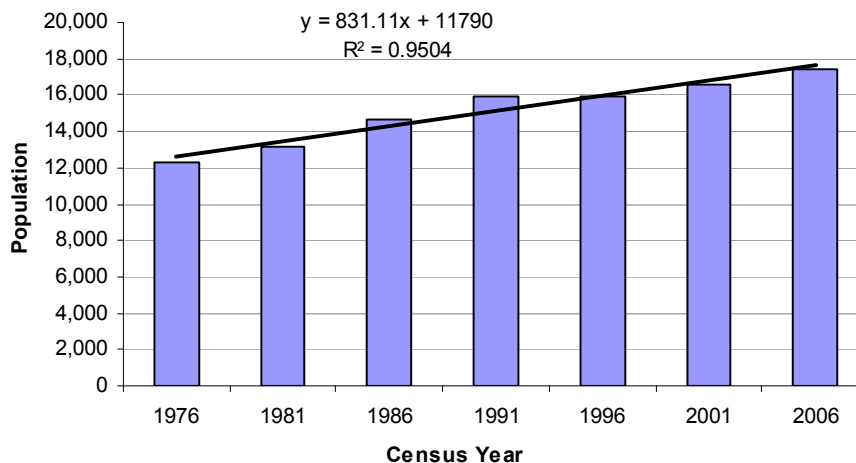


Figure 3.2: Population Change 1976-2006 for Murray Bridge LGA

Source: ABS Census 1976, 1981, 1986, 1991, 1996, 2001, 2006, by Place of Enumeration

⁷⁴ Taylor-Neuman, L.V.N., and Balasingham, M.R. (2009) *Sustaining Settlement in Murray Bridge South Australia*, Lutheran Community Care, citing Suburbview.com (2009)

⁷⁵ Taylor-Neuman *et al*, *op cit*.

Population growth in Murray Bridge LGA between 2001 to 2006 was the highest of any of the eight selected case study areas, and similar to that of Australia during this time (5.4% and 5.8% respectively). It was around 5 times the average growth for the MDB, and very different to the substantial population loss experienced by most of the Northern Basin case studies.⁷⁶

The increasing unaffordability of the Adelaide housing market⁷⁷ combined with good local employment opportunities and a feasible commuting distance to Adelaide, are likely to support continued urban growth in Murray Bridge. Commuting from Adelaide to the substantial entry level jobs in agricultural processing and the warehousing sectors including for recently arrived migrants and refugees is also significant.⁷⁸ More recently, Murray Bridge has been identified as a major regional growth centre by the SA State Government's blueprint for development, *The 30 Year Plan for Greater Adelaide*,⁷⁹ which includes Murray Bridge as one of fourteen 'New Strategic Growth Areas', though this will be subject to further investigation and consultation by the State Government.⁸⁰ This could lead to a 70% increase in the population of Murray Bridge and surrounds over the next 30 years if such growth occurs, with commensurate job growth also an aim of the Plan.⁸¹

3.3.2. Employment and Industry Profile

Employment has likewise grown significantly over the past three decades in the Rural City of Murray Bridge. The most recent inter-censal increase in jobs of 7.1% was again the largest of any of the eight selected case study areas, and out-stripped local population growth by around 25%. Employment growth was around 6 times the MDB average growth for 2001-06, but lower than the national average (9.7%). This was markedly different to the significant employment *decline* experienced by most case study areas of the Northern Basin for the same period,⁸² and indicates the extent to which Murray Bridge is cushioned by its regional centre status and proximity to Adelaide, as well as the protection of full water allocations until 2006/07 for its large agriculturally-dependent hinterland.

In 2006, 7,180 people were employed in Murray Bridge case study area. Of these, just over 20% were employed in agriculture, which is lower than the MDB average (29%) but much higher than the national rate (3.5%). Grazing including irrigated dairy and vegetables were the most significant agricultural employers at 15% and 2% of total employment respectively, and Murray Bridge was in the top 10 vegetable growing areas in the MDB.

⁷⁶ See Report 4 of this study (forthcoming) for all comparative demographic data for the 8 case study and benchmark areas referred to in this case study report.

⁷⁷ JSA (2009) *Affordable Housing Mapping and Incentives Project*, City of Perth.

⁷⁸ Taylor-Neuman, L.V.N., and Balasingham, M.R. (2009) *Sustaining Settlement in Murray Bridge South Australia*, Lutheran Community Care

⁷⁹ SA Department of Planning and Local Government (2010), *The 30 Year Plan for Greater Adelaide: A volume of the South Australian Planning Strategy*.

⁸⁰ *Ibid*, p.82-85

⁸¹ Murray Bridge and surrounds is projected to contribute additional accommodation for around 13,400 additional people by 2036 (*ibid*, p.91).

⁸² See Report 4 of this study (forthcoming) for all comparative demographic data referred to in this case study report.

Compared with the MDB average, a higher than average proportion of the local workforce is employed in health, administration and public administration, financial services, communications, transport, wholesale and manufacturing and utilities, which indicates a more diversified rural economy, though still considerably less diverse than Australia in most sectors apart from public administration, health and retail. A strong value-adding processing sector is evident in the ‘manufacturing’ figures, as well as in transport, storage and wholesaling sectors, as discussed below.

It is interesting to note that, despite the emphasis on recreational opportunities for visitors and local people in promotional materials,⁸³ including to its natural environmental assets to the south, employment in recreation is average and in food and accommodation (typically associated with tourist visitations) is lower than the MDB and national averages.

The following table shows this employment breakdown in more detail.

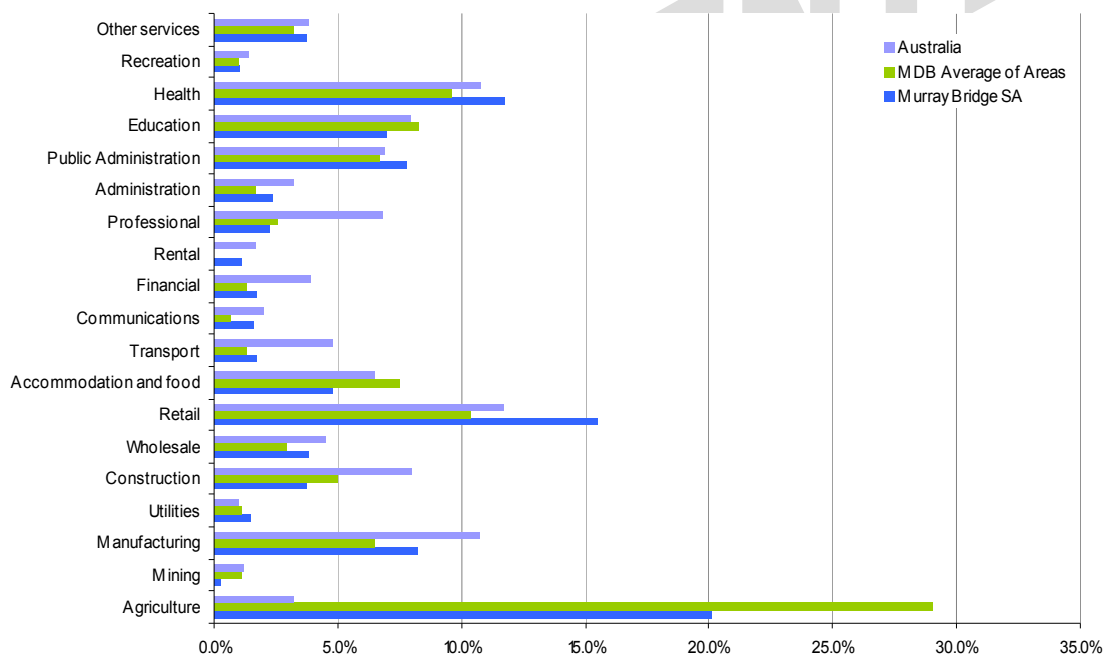


Figure 3.3: Employment Profile, Murray Bridge SA

Source: ABS (2006) Census of Population and Housing, JSA (2009)

The status of Murray Bridge as the major service centre for the Murraylands region is evident in the town’s strong retail, service and value adding manufacturing sectors,⁸⁴ as is its accessibility to Adelaide. It is also near the cross-roads of interstate trade.⁸⁵ Importantly for the assessment of impacts of permanent water reduction, the other four LGAs that make up the Murraylands region had a very high reliance upon agriculture in 2006 including irrigated agriculture, producing significant grain and feed crops, dairy products, livestock, vegetables, fruit, flowers and

⁸³ <http://www.murraybridge.sa.gov.au/>

⁸⁴ Taylor-Neuman, L.V.N., and Balasingham, M.R. (2009) *Sustaining Settlement in Murray Bridge South Australia*, Lutheran Community Care

⁸⁵ <http://www.murraybridge.sa.gov.au/>

wine grapes. As shown below, these areas had a very high proportion of their workforce employed in agriculture (42%) compared with the MDB average (29%), with Karoonda East the highest at 69%. Though much of this is likely to be in dryland grazing, the above figures on regional irrigated water use also show a strong irrigation sector in most LGAs. Note that, unlike figures for Murray Bridge reported earlier, the following represents direct employment only and so significantly understates the degree of reliance upon agriculture when related activities like value-adding processing, storage and the like are added.

Table 3.4: Agricultural Employment in Murraylands Region (balance)

Irrigated Water Use for:	Mid Murray	Coorong	Karoonda East Murray	Southern Mallee	Balance Murraylands
Agricultural Employment	520	732	225	383	1860
Total Employment	1843	1453	325	683	4304
% Agricultural Employment	28%	50%	69%	56%	42%
Total Population	8,035	5,670	1,163	2,134	17,002

Source: ABS (2006) and JSA (2009)

The largest single employer in City of Murray Bridge is T&R Pastoral meat processing plant, which sources livestock from a number of Australian states.⁸⁶ Murray Bridge is also a developing hub for warehousing and the distribution of goods including the existing Big W distribution centre, and business growth is also expected to be strong in the short- to medium-term particularly in retail, manufacturing and wholesale/distribution. The expected relocation of a number of larger and smaller enterprises,⁸⁷ and future development of an intermodal road/rail facility at Monarto, is also expected to increase business activity in the area.⁸⁸

Nonetheless, there has been a strong reported downturn in agriculture, value-adding manufacture and related transport and storage industries in the last few years, and projections for growth related to reduced water allocations and access have been seriously affecting certain sub-sectors. Although horticulture is a ‘stabilising influence’ in some areas of the Murraylands which have had major setbacks in dairying, the drought and more recent reductions in water availability have reportedly taken a ‘heavy toll’ on horticultural industries and the industries which service it.⁸⁹ Dairying has been particularly hard hit, and businesses directly related to it including two milk-processing plants are reported to be under threat at the time of writing.⁹⁰ As such, ‘many businesses and some whole businesses’ are reported to be experiencing ‘very real setbacks’, in particular the value adding manufacturing sector. A number of wholesale and storage

⁸⁶ Taylor-Neuman *op cit*; and interviews with Murray Bridge Councillors conducted in March and April 2010

⁸⁷ Murraylands Regional Development Board (2009) *Murraylands Growth Update 2009*

⁸⁸ Taylor-Neuman *op cit*; and interviews with Murray Bridge Councillors conducted in March and April 2010

⁸⁹ Murraylands Regional Development Board (2009) *Murraylands Growth Update 2009*

⁹⁰ Interviews with Murray Bridge Councillors conducted in March and April 2010

organisations which rely upon produce from Murray River irrigators have likewise ‘experienced a severe loss of business and some have foundered’ in the latter part of the drought.⁹¹

Respondents to a recent business growth survey also report that it is more difficult to obtain finance for business expansion, in part due to the Global Financial Crisis. Small business and those which are over-stretched are particularly at risk of contraction.⁹²

The more optimistic forecasts of business growth overall by the Murraylands Regional Development Board appear reasonable,⁹³ particularly given the location of Murray Bridge and its linkages to Adelaide. Nonetheless, the case study area remains highly dependent upon agriculture and related industries, and its surrounding region particularly so. The need to continue to diversify and attract major new industries including those not related to agriculture remains a future challenge for the area, particularly if water is removed permanently from the area under the forthcoming Basin Plan or Federal policy initiatives.

3.3.3. Indicators of Community Wellbeing and Resilience

Overview

Murray Bridge is the most disadvantaged of the case study areas in relation to many of the selected indicators of wellbeing. This could make it particularly vulnerable to changes in its agricultural base and related economic and social flow-ons. Importantly, certain groups and smaller local communities are likely to disproportionately experience the impacts of changes to water availability, and have already done so during the drought and more recent changes to water allocations, as discussed in below. Its significant socio-economic disadvantage is also a relevant consideration in this regard.

However, other factors indicate that Murray Bridge is likely to be more resilient in the face of changes to water allocations. These include its relative degree of urbanisation (including size and proximity to the capital city), and relative economic diversity. It is the least remote of the eight case study areas, and less remote than the MDB average (a remoteness index of ‘1’ compared with ‘1.8’ for the Basin). Its continued population and employment growth over the last census period and the fact that it is targeted for growth under the State Government’s strategic planning framework⁹⁴ also indicate that it is likely to be relatively resilient.

Nonetheless, the area also performs poorly against a number of key indicators of resilience including the skills base of its labour force, very low index of educational and occupational resources, high unemployment and low level of labour force participation. These indicate the presence of more vulnerable populations, and a more at risk demography overall, so that the area cannot necessarily be complacent about its future wellbeing, despite the fact that housing and employment growth is projected. It has not yet achieved the critical mass found to be important

⁹¹ Murraylands Regional Development Board (2009) *Murraylands Growth Update 2009*

⁹² Murraylands Regional Development Board (2009) *Murraylands Growth Update 2009*

⁹³ Interview and workshops March and April 2010

⁹⁴ SA Department of Planning and Local Government (2010), *The 30 Year Plan for Greater Adelaide: A volume of the South Australian Planning Strategy*.

in the previous stage of this study to make it independent of the fortunes of its agricultural base and related industries,⁹⁵ and remains somewhat vulnerable in this regard.

Indicators of Wellbeing and Resilience

Unlike other more disadvantaged case study areas in the Northern Basin, Murray Bridge has a relatively low level of Aboriginal residents (around 4% compared with 29% for Bourke, 19% for Moree Plains and 15% for Balonne SLAs), and was slightly lower than the MDB average (around 5%). The proportion of Aboriginal people in a community is generally strongly related to indicators of disadvantage or less favourable indicators of community wellbeing.⁹⁶ It is understood that such indicators in Murray Bridge are related to the high level of social housing, the presence of a prison including family visitation and post-release settlement, the concentration of semi- and low-skilled jobs in the large abattoirs, meat, poultry and milk processing operations, and the waves of more disadvantaged migrants who have settled in the area including recent refugees and humanitarian visas. The relatively low cost of purchase and rental accommodation in close proximity to Adelaide are also likely to be a significant attractor for less well off groups.⁹⁷

Murray Bridge has the lowest SEIFA Index of Disadvantage of any of the case study areas (900 compared with 1000 for Australia), the lowest labour force participation rate among those aged 15+ years (56% compared with 60% for the MDB and nationally, and 70% for Balonne Shire). It has by far the lowest median household income (\$670 compared with \$1030 for Australia and \$780 for the MDB). As would be expected from the economic base of the area, skill levels are low, with only 26% of local residents holding some form of post-secondary qualifications compared with around 40% nationally, which was again the lowest rate of any of the eight case study areas.⁹⁸ The SEIFA Index of Education and Occupation for Murray Bridge was extremely low (876 compared with 1000 for Australia and 953 for the MDB), and was again by far the lowest of the case study areas. Youth unemployment at 13.5% was also the highest of the selected case study areas apart from Bourke, and much higher than the national and MDB averages (both around 10%). General unemployment was also high (6.6%) and second only to Bourke among selected case studies, although lower than the national average of 7.3%. Labour force participation among those 65+ was low (7.2% compared with 15.4% for the MDB and 8.4% nationally)⁹⁹ though this may also be due to access to a younger labour force and was lower than average compared with the MDB.

Murray Bridge also had the highest proportion of disability support pensioners of any case study area (at around 10% of the population and almost double the national average), and the highest proportion of those with a profound or severe disability. This may be partly related to the relatively high median age (39 years compared with 37 for Australia, though lower than the Basin

⁹⁵ JSA (2010) *Report 3: Quantifying the impacts of cotton production on community wellbeing and resilience across the MDB*,

⁹⁶ JSA (2010) *Report 3: Quantifying the impacts of cotton production on community wellbeing and resilience across the MDB*.

⁹⁷ Interviews conducted during site visit {date}; see also Taylor-Neuman *et al*, *op cit*.

⁹⁸ See Report 4 of this study (forthcoming) for all comparative demographic data for the 8 case study and benchmark areas referred to in this case study report.

⁹⁹ See Report 4 of this study (forthcoming) for all comparative demographic data for the 8 case study and benchmark areas referred to in this case study report.

average of 40 years). The level of chronic ill health was also slightly higher than the MDB and national average, though not as high as case study areas in the Northern Basin.¹⁰⁰

More positively, the school participation rate of those aged 16 years was higher than many case study areas (as low as 51% for Moree Plains in the Northern Basin), and was only slightly lower than the MDB and national average (70% for Murray Bridge compared with 71% and 75% respectively). This may be due to the higher than average level of youth unemployment which may encourage more young people to stay at school despite opportunities for entry level jobs in the local economy; or to the reported value of schooling among the City's migrant and refugee populations.¹⁰¹

In terms of other indicators related to social capital, there was a relatively stable population during the inter-censal period, with 19% changing address from outside the SLA compared with 24% for Australia and the 23% for the MDB. This indicates that in-migration has not been particularly high, and at least some of the increase in inter-censal population is likely to be related to natural increase (childbearing). Volunteering was much higher than the national average (26% compared with 18% for Australia), but quite low for a regional area (29% for the MDB average of areas).¹⁰²

Moreover, this is a highly disadvantaged resident population with indicators that show a high level of vulnerability to change in the economic base, including in agriculture and related entry-level jobs in value-adding agriculture, storage, packing, and transport/distribution. This is supported by anecdotal information provided during fieldwork within the case study area. Other studies also highlight the vulnerability of the migrant and refugee populations that have increasingly made their home in the area to gain access to affordable housing and entry-level employment, and of the commuter population from these groups who travel to Murray Bridge for such employment each day.¹⁰³ Recent research among such disadvantaged groups also indicates that the community of Murray Bridge is strongly welcoming and supportive of migrants and refugees who live or work in the area,¹⁰⁴ so that less tangible aspects of community wellbeing and resilience are likely to be positively experienced in Murray Bridge.

¹⁰⁰ See Report 4 of this study (forthcoming) for all comparative demographic data for the 8 case study and benchmark areas referred to in this case study report.

¹⁰¹ See Report 4 of this study (forthcoming) for all comparative demographic data for the 8 case study and benchmark areas referred to in this case study report.

¹⁰² See Report 4 of this study (forthcoming) for all comparative demographic data for the 8 case study and benchmark areas referred to in this case study report.

¹⁰³ See for example Taylor-Neuman *op cit*; and interviews discussed below.

¹⁰⁴ See for example Taylor-Neuman *op cit*.

4. Potential Impacts of the Long-Term or Permanent Reductions in Water

4.1. Modelling and Quantification of Impacts

The impact on the Murray Bridge case study area from permanent reductions in the availability of irrigation water that may occur through reductions in SDLs under the forthcoming *Basin Plan* and trade of permanent water out of area (whether open market or government ‘buyback’) has been modelled using data from Research Strategies 1 and 2 of this study.¹⁰⁵

The extent to which additional reductions in entitlements or allocations may occur under the Basin Plan is at the time of writing unknown. As such, we have modelled 10%, 25% and 50% cuts in irrigation water from that used in 2006. The results of that modelling in relation to the likely impact on employment, population and other key indicators of wellbeing and resilience are summarised here, and detailed in the table below.

The effects of cuts to irrigation water on Murray Bridge are significant, but lesser in scale when compared to the effects on other case study areas. This is because irrigated agriculture forms a relatively small proportion of agricultural industries in Murray Bridge. In addition, the area has a relatively small Aboriginal population with a labour force participation rate similar to the non-Indigenous community. That said, the effects are probably understated, as Murray Bridge has a relatively high rate of jobs value-adding processing, transportation, storage and distribution and warehousing related to agricultural production, and is servicing a wider regional economy that is highly agriculturally dependent (42% average for Murraylands in direct agricultural employment, and likely as many in flow-ons to other industry sectors). As noted above, recent studies indicate that these jobs have already been adversely affected by the drought, with significant impact projected into the future.

The primary effect of reductions in the availability of irrigation water in the Murray Bridge SLA is projected to be a loss of employment, with a 2.5% loss (201 jobs) predicted from a 50% reduction in irrigated water use based on 2006 data, including direct and indirect employment in agriculture and multipliers. Given the fact that irrigated agriculture is anecdotally stated to have higher multipliers than the average for agriculture, and the likelihood that some agricultural jobs have not been identified in our analysis, this is again almost certainly an underestimate. It is also noted that, though small in quantum, employment loss in a highly disadvantaged economy like Murray Bridge can have significant social impacts.

Subsequent population loss is estimated at 3.2% (560 people). However, Murray Bridge also acts as the major regional centre for the six LGAs in the **Murraylands Region**. Around 40% of the region’s workforce was employed in agricultural including diverse irrigated agriculture in 2006,

¹⁰⁵ JSA (2010) Report 1: Scoping Paper, JSA (2010) Report 2: Quantifying the impacts of cotton production on employment within cotton growing areas in the MDB and in Southern Queensland, and JSA (2010) Report 3: Quantifying the impacts of cotton production on community wellbeing and resilience across the MDB.

with some LGAs having up to 70% of their employment in agriculture. Results of modelling a 10%, 25% and 50% reduction in water across the Murraylands Region are displayed in the table below.

Table 4.1: Predicted job and population losses in the Murraylands due to water reduction

Water Reduction		10%	25%	50%
Job Loss:	No.	200	500	1,000
	%	1.4%	3.5%	7%
Population Loss:	No.	560	1,500	2,800
	%	1.6%	4%	8%

Source: JSA calculations based on ABS 2005/06 Agricultural Census

There may also be flow-one to City of Murray Bridge from regional job and population loss, and Murray Bridge is likely to suffer additional jobs and population loss associated with loss of agricultural production in surrounding towns and rural areas. This will in part depend on the extent to which people leaving smaller LGAs in the hinterland settle in Murray Bridge compared with another major centre outside the Region such as Adelaide or Mt Barker.

Socio-economic indicators of wellbeing and resilience are expected to remain largely unchanged as a result of reductions in availability of water for irrigation in Murray Bridge. However, the severely disadvantaged socio-economic profile of its existing community has already been noted. It appears to be an area highly vulnerable to changes that would lessen the employment and service opportunities for local residents.

Impacts on regional indicators are likely to be more significant, including an accelerated aging of the population and increased disadvantage arising from a more residualised population due to the remoteness of these areas and their population size. Areas like Karoonda East Murray, Southern Mallee and Coorong LGAs and smaller towns within these area are likely to be highly vulnerable to any changes in the agricultural base. This includes changes to groundwater extraction that may also occur under the Basin Plan (for example, in the Southern Mallee where vegetable growing has been relocated from Murray Bridge due to problems accessing water due to low river levels – see fieldwork information below).

The following table shows these projections for Murray Bridge case study area in more detail.

Table 4.2: Murray Bridge Projected Changes in Employment and Population with 10%, 25% and 50% Reductions in Irrigation Water

Indicator	Base case 2006	Predicted indicators for 2006 for reduction in irrigation water			Notes
		10% reduction	25% reduction	50% reduction	
Irrigation water use (GJ)	36.1	32.5	27.1	18.1	
Employment (total) ⁽¹⁾	7970	7928	7868	7769	
% decrease in employment		0.5%	1.3%	2.5%	
Employment (Vegetables) ⁽²⁾	141	136	128	116	
Irrigation water use (GJ)	3.0	2.7	2.3	1.5	
Employment (Fruit) ⁽²⁾	23	20	16	8	
Irrigation water use (GJ)	1.7	1.5	1.3	0.9	
Employment (Grapes) ⁽²⁾	13	13	12	11	
Irrigation water use (GJ)	0.2	0.2	0.2	0.1	
Employment (Grazing) ⁽²⁾	1207	1194	1175	1144	Assumed next best use
Irrigation water use (GJ)	30.0	27.0	22.5	15.0	
Employment (Cereal) ⁽²⁾	44	44	44	44	Likely to reduce but estimates are unreliable
Irrigation water use (GJ)	1.2	1.1	0.9	0.6	
Employment (Balance Agriculture)	174	174	174	174	
Employment (Total Agriculture)	1603	1581	1550	1497	
Population ⁽³⁾	17678	17561	17394	17115	Remains above 10,000 threshold
estimated % decrease in population		0.7%	1.6%	3.2%	
Indigenous population ⁽⁴⁾	4.2%	4.2%	4.2%	4.2%	
Number of indigenous people	742	739	735	727	
Dependent variables:					
SEIFA disadvantage	900	900	900	900	
SEIFA Economic	928	928	928	928	

Indicator	Base case 2006	Predicted indicators for 2006 for reduction in irrigation water			Notes
		10% reduction	25% reduction	50% reduction	
Resources					
Premature death	295.6	295.7	295.8	295.9	
LFP 15+	55.6%	55.6%	55.5%	55.5%	
Median Household income	\$ 672	\$ 672	\$ 672	\$ 672	
Disability support pensioners	9.7%	9.7%	9.7%	9.7%	
Profound or severe disability	5.2%	5.2%	5.2%	5.2%	
Chronic ill health	209.6	209.6	209.6	209.5	
LFP 65+	7.2%	7.2%	7.2%	7.3%	
Median Age	39	39.0	39.0	39.0	
Skills Base	25.9%	25.9%	25.9%	25.9%	
Education participation	70.3%	70.2%	70.1%	69.9%	
SEIFA Education and Occupation	876	876	876	875	
Polarisation	0.84	0.84	0.84	0.84	
Youth unemployment	13.5%	13.5%	13.6%	13.7%	
Unemployment	6.6%	6.6%	6.6%	6.6%	
Change of SLA five years ago	19.3%	19.3%	19.3%	19.4%	
Voluntary work	25.5%	25.5%	25.5%	25.5%	
Assault (Non domestic violence)	643	643	642	640	2006 value estimated
Assault (Domestic violence)	433	433	433	433	2006 value estimated
Property Crime	4107	4103	4096	4085	2006 value estimated

(1) Includes factor of 1.11 to account for census under reporting, and allows loss of 0.9 jobs for each lost agricultural job

(2) Estimates using data from Table 3.1 of report two and using regression analysis data to account for dryland production, factor of 1.11 included)

(3) Assumed one job per household, 2.8 people per household, unemployed households leave the area

(4) In 2006, the indigenous LFP rate was 51%, compared to 59% for the non-Indigenous population.

Note: JSA has assumed that job losses will have a lesser effect on indigenous populations, leading to an increased proportion of indigenous people in the population, at the rate of the loss of one indigenous person for each 1.2 non-Indigenous persons.

4.2. Field Work: Understanding Likely Impacts Through Responses to the Recent Drought and Other Stressors

4.2.1. Overview

Compared to a ‘long term’ or permanent reduction in water availability that may occur as a result of government policy and climate change, the recent drought represents a relatively short- or medium-term impact. Given its duration and severity, in many ways it represents a ‘real time simulation’ of what may happen if water for consumptive or productive uses is removed permanently from production, and how communities may experience the impacts and respond.

It also sheds some light on the way in which government policy and progressive deregulation of the water market is already affecting communities, the ‘winners and losers’ that may be created, and the way in which water policy is experienced and responded to in communities facing significant stress.

Moreover, an understanding of how farms, agricultural industries and the local community have responded to the ‘short to medium term’ stressor of the drought is necessary to better predict the likely impacts of ‘long term’ stressors like more permanent reductions in water availability in the context of other important issues facing communities.

The following case study firstly focuses on the Rural City of Murray Bridge in the context of the wider social, economic and environmental impacts being experienced in the area below Lock 1. It illustrates the responses of key stakeholders, including government, farmers and communities, to the drought and other stressors facing this area.¹⁰⁶ The case study then focuses on a specific area within the Murray Bridge LGA, Mypolonga, a small agricultural community to the north of Murray Bridge urban centre that has been particularly affected by reductions in water allocations and access in the last few years, and the responses of this community to what is arguably unprecedented ‘stress’.

Each of these areas – Murray Bridge in the context of the area below Lock 1 and the small community of Mypolonga – provide a different lense through which to understand the likely impacts of and responses to more permanent reductions in water availability that may occur under the Basin Plan or climate change.

¹⁰⁶ A wide range of staff and elected or appointed representatives of the following agencies and groups were interviewed and/or attended workshops City of Murray Bridge Council; Central Irrigation Trust; Murraylands Drought and Rural Support Centre; South Australian Murray-Darling Basin Natural Resources Management Board; Drought advisor to the Premier of South Australia; Price Merrett Consulting; Murray Futures Project; Wellington Local Action Planning Committee; SA Murray Irrigation; Lower Murray Irrigators; Individual irrigators and industry groups; Interested members of the community who attended workshops and report back sessions. Individual attributions for comments have not generally been provided as a number of participants made their comments confidentially.

4.2.2. The Area Below Lock 1

The area below Lock 1 has been particularly hard hit by a combination of very low water allocations since 2006/07¹⁰⁷ on top of a decade long drought. The 2008/09 growing season was particularly bad, starting at 2% allocations in July 2008 and reaching 18% by April 2009.¹⁰⁸ The area has experienced what some interviewees describe as a ‘triple whammy’ since 2006 – very low allocations, an initial very high cost of leasing water for permanent plantings and pasture,¹⁰⁹ and a more recent decline in commodities prices.¹¹⁰ Historically low river and lake levels led to significant additional costs for irrigators as they extended infrastructure to reach water sources, at least until they could no longer afford to do so or purchased in feed.¹¹¹

Whilst some areas in the upstream states of NSW and Victoria report that ‘twenty years of adjustment happened in just 3 years’, the situation is more complex in South Australia. Significant infrastructure upgrades to achieve water efficiency were completed by the late 1990s including ‘pump and pipe’ systems throughout most of Lower Murray provided through joint government-industry funding.¹¹² System loss is now reported to be as low as 1-2%.¹¹³ ‘Rehabilitation’ of the dairy swamps and industry modernisation occurred somewhat later, with upgrading of 100-year-old infrastructure on the reclaimed dairy swamps along 80kms of river frontage from Mannum to Wellington completed by the mid-2000s.¹¹⁴ Undertaken principally to stem increasing eutrophication of the river system and Lower Lakes, this involved laser levelling land and metering to increase efficiency of water use, and limiting discharge of irrigation water to the river, with costs again shared between government and farmers.¹¹⁵

During this time, there was reported to be significant structural adjustment.¹¹⁶ Fruit, grape, vegetable and irrigated crop growers who were less efficient or were not prepared to go through the infrastructure ‘modernisation’ process due to age or other factors often exited the industry, with sale of blocks leading to increased farm consolidation during this time.¹¹⁷ Likewise, those wanting or needing to exit the dairy industry chose not to participate in the ‘rehabilitation’ process, and a process of farm consolidation also occurred.¹¹⁸ The opportunity to exit farming was also made easier by the progressive deregulation of the water market including early ‘unbundling’ of water rights in the early 2000s, with SA Water offering to purchase water

¹⁰⁷ 60% in 2006/07, 32% in 2007/08 and 18% in 2008/09

¹⁰⁸ National Water Commission (NWC) *Australian Water Markets Report 2008-2009* National Water Commission (NWC) (2009) *Australian Water Markets Report 2008-2009; 2007-2008; 2006-07*.

¹⁰⁹ Initially reported to be up to \$1200 /Ml (Interview, Staff of CIT, 18 March 2010)

¹¹⁰ Particularly for grapes, but also citrus and dairy products (Interview, Staff of CIT, 18 March 2010)

¹¹¹ Interviews with irrigators, Field Visit March 2010

¹¹² Interview, Staff of CIT, 18 March 2010.

¹¹³ Various interviews, March 2010

¹¹⁴ Various interviews, March 2010

¹¹⁵ Various interviews, March 2010

¹¹⁶ Various interviews, March 2010

¹¹⁷ Various interviews, March 2010

¹¹⁸ Various interviews, March 2010

including for the environment and Adelaide's potable use.¹¹⁹ A typical comment heard in interviews in this areas noted that, 'There's been quite a shakeout of less viable farmers over the past few decades, and a lot of restructuring down here by the time the worse of the drought hit [in 2006]. What we're often seeing now is good operators leaving the business. It's good that they've got the opportunity [with the buyback and water trade], but really many have no option. The last 2 years have just been too much'.

This sentiment was echoed strongly by a staff member of the SA Murray Darling Basin Natural Resource Management Board, who has worked collaboratively with local producers and communities over many years to improve on-farm water efficiency and practices, and environmental health. It reflects what the researcher heard repeatedly during consultations in this area.

What we're losing now [through the Small Block Exit package and 'buyback'] are the good operators. The people we should be helping to stay are being encouraged to leave. We're hitting them at a very vulnerable time – we're saying 'We've got no confidence in you'. We're losing the knowledge base of some of the best operators when we buy them out and make them rip out the infrastructure they've just put in and say, 'The land can't be used for 5 years¹²⁰ and exit them from the industry – possibly for good.' We're going to face a leadership vacuum in these communities, and it will be all the harder when the drought breaks and the River is up again. Some communities are being absolutely devastated. Really, with a bit of support, this doesn't have to happen.

Commenting on the proposition that Federal programs are assisting with necessary restructuring of inefficient enterprises, the NRM officer commented,

The Federal Government is saying that it's 'industry adjustment', but that's not the case for many selling out in the past couple of years. We've been through two decades of modernisation – that's why we're not seeing many taking up the PIIP.¹²¹ We're seeing a lot of good businesses in the Lower Murray going now – the ones who modernised early, kept their block immaculate, always delivered the best produce – getting no help, paying a fortune for their water, borrowing to buy in feed. But this last year or two, many of them just couldn't do it any longer. They took the [Federal] money but they were saying at the same time, 'Why won't someone help me to stay?'

A farmer I've worked with for years [in land management] - a really good operator - just bulldozed his whole block, his whole life. His dad handed the block to him, now it's all gone. Broken his heart. Told his son to go and get a job away. Why on

¹¹⁹ Interview, Staff of CIT, 18 March 2010

¹²⁰ Requirements under the requirements of the Small Block Exit Package include that irrigation infrastructure must be removed, and the land not used for irrigated agriculture for 5 years, and that the water entitlement must be sold to the Federal Government Water Holder.

¹²¹ Private Irrigation Infrastructure Program SA (PIIP) is providing \$110.0 million to SA irrigators to upgrade infrastructure in exchange for water efficiencies under Water for the Future.

earth does he have to pull out a drip system the government paid him \$20,000 to put in 6 months ago? They could just lock off the water meter. Honestly, it's policy on the run, and there's a risk some will go out of production forever. In the meantime, we're turning our districts into dustbowls, over-run with vermin, thistles, sandflies and foxes – it's an example of how an area benefits from good management – and what happens when it become unmanaged. And the hydrology means that it's much harder on those who try to stay in production because the water goes to the dried out areas. Honestly, after all these years, you'd have to ask, 'What is a 'natural' system now, especially in these areas?'¹²²



The requirement to decommission and remove all irrigation infrastructure and ensure that the property is not used for agriculture for 5 years was raised frequently in other areas where the Small Block Exit package has been more prevalent (see for example the Mildura case study).

A further concern of the NRM Board was that collaborative programs developed over some years with local communities to improve environmental outcomes and water use will be in jeopardy through reduced program funding and what is perceived as a more 'top-down' or centralised approach to natural resource management by the current Federal Government. As an NRM Officer noted,

Appropriate responses to land and water management are many and varied – one-size fits-all approach is rarely successful. Our *Land and Water Management Plan* was negotiated with the local community, which is essential to gain real outcomes. We've seen real improvements through the *Salinity Management Plan* as well. This has now been replaced by *Water for the Future* and we've lost 80% of our program funding.

Our bottom up work is now being compromised. We can't engage the community if we've got nothing tangible to offer. Participation in deciding what programs are implemented are key engagement tools. Without this, how can we help with the massive job of [post-drought] recovery? The whole district ends up with no hope, no future. But if the government doesn't see us as a priority, maybe we have no future.¹²³

¹²² Workshop with staff and consultants of the SA Murray Darling Basin Natural Resource Management Board, 18 March 2010

¹²³ Workshop with staff and consultants of the SA Murray Darling Basin Natural Resource Management Board, 18 March 2010

Staff of the Central Irrigation Trust (CIT) also expressed strong concerns about the impacts they are seeing in irrigation districts throughout the SA River Murray PWC.¹²⁴ Originally licensed to extract 155 Gl of water after the amalgamation of 10 providers, it now administers 120 Gl due to sale of water by individual irrigators under Federal Government programs in the past 18 months – a loss of around 23% from their system. CIT staff report that most water sold has come out vineyards, which have been affected by commodity price fluctuations, and some from citrus. Together with restricted allocations, problems accessing water and the cost of leasing water,¹²⁵ this has had a big impact on industry and communities.

Even the most efficient producers were hurting. Water prices reached \$1200 a MI in 2006/07 before settling to a more realistic price, but lot of people panicked. They weren't used to dealing on the open market. Then commodities prices took a dive and that exacerbated the situation.

With the unbundling [since 1 July 2010],¹²⁶ a common strategy has been to retire debt through selling permanent water and buying in seasonal water. But some say they're out for good or they've turned off the water to permanent plantings. But if they still own the land and delivery rights they can come back in when the price is right. Properties are cheaper with no water, and there's more buy ups of neighbours' properties – it's a good time to buy - so we'll see more consolidation.

It's more of a problem if you've taken the Exit Package, though 50% of those we talk to intend to come back in after the 5-year moratorium is up. 'Apply for delivery rights, lease some water, grow some vegies', that's the way a lot are talking. Others are undecided.

Highlighting the difference between short-term responses and more long-term impacts with the permanent removal of water and productive land, he commented,

Australian agriculture is very resilient and adaptable – years ago they were growing apricots, then grapes, and later vegies. A lot of what's been dried out could come back into production, but we still need the water. Nothing happens without it. Now there's less water in the system overall [with the 'buyback' and Exit Packages], so you'd expect more permanent impacts, though they can still purchase in water from other areas or states.

It's a different matter altogether if SDLs [under the *Basin Plan*] remove water permanently and there's less water for everyone in the long-term. Open trade could help but when water is traded out of the area, then one community is sustained at the expense of another. Overall, it depends on how much water is

¹²⁴ The CIT is the largest trust in SA and manages around 50% of SA's irrigation areas.

¹²⁵ Leasing cost of water is reported to have reached \$1200/MI in 2006/07 (Interview, Staff of CIT, 18 March 2010).

¹²⁶ Under the *Natural Resource Management (Water Resources and other matters) Amendment Act 2007 (SA)*, Water Access Entitlements (or Water Licences) provide for the ongoing right to a specified share of the water resource expressed in unit shares, and provides for an asset that can be sold or transferred permanently or for a limited period (South Australian Department of Water, Land and Biodiversity Conservation (2010) *Unbundling Water Rights – What Does It mean?*)

traded and from where, but there are practical limits to trade across the Basin. But when water goes out of the system for good, production is reduced permanently – there's less to trade.

The CIT officer felt that City of Murray Bridge probably hadn't been as badly affected as some other areas in the region, in part due to the efficiency of irrigation and previous farm consolidation. There was a feeling that other areas including those in the wider hinterland had been badly affected by cuts to water and take up of Federal programs, with likely flow ons throughout the region including the regional centre.

Since 2006/07 we've lost about 85% of dairy, 20-30% of fruit production. Some areas have lost 50% of vegies, and others have had 75% of grapes go out of production.

Not that much [water] was sold out of Murray Bridge [in the 'buyback'] – about 1 Gl, maybe because they were already more efficient and farms are larger and more resilient. So a lot weren't eligible for the [Small Block Exit] Package either. But other areas like Loxton and Kingston sold about 30% of their water and a lot took the Package, mainly the areas where there are still a lot of smaller soldier settlement blocks. Some of these areas have been devastated. This is bound to have flow on effects to larger centres in the region in the longer-term.¹²⁷

In towns like Barmera [where the CIT head office is located and which is close to the irrigation districts of Loxton and Kingston] heaps of shops have closed, tourism is down, all the clubs are losing members, the whole place is hurting. In Waikerie, ten shops have closed, warehousing and transport businesses are really struggling, the school is losing teachers. House prices are at rock bottom - people are getting \$165,000 for a home worth \$280,000 2 years ago. Prices were going up – it's only an hour and a half from Adelaide. Now there are 67 homes on the market and you can't sell them.¹²⁸



Later, in the main street of Barmera, a lovely town with undulating relief and a view of Lake Bonney around 100 kms above Lock 1, more than one in three shops were closed. Tourism was also badly affected and caravan parks on the lakeshore were not booked out at Easter 'for the first time in memory', though locals noted that, 'You can see there's still plenty of water in the Lake. The media talking things up all the time is really not helping us.' A spare parts and machinery

¹²⁷ Interview, Staff of CIT, 18 March 2010

¹²⁸ A search of several real estate database confirmed what the CIT representative had reported

repair business reflected the view of other businesses interviewed in the town. They noted that most of obvious signs of economic downturn had occurred in the past 2 years.

People around here are blaming the farmers for taking the Exit Package, but you can't blame them. The last 2 years have been really bad. You should go to the backblocks and see how many are left. It wouldn't be so bad if you could keep using the land, but they're not allowed to, and the water's gone so that's that.

It's really sad that a lot of guys are leaving with nothing when they pay their debts. The younger people are leaving to go and work in the mines. Once they would have come back to take over their father's property, but now it's different. There's nothing to come back to. In a few years we'll start to see the effects of this – everyone in the town getting older and no one to run things. I don't understand why they couldn't keep using the land for something. It just seems wrong for the whole community.

Though smaller satellite centres that are highly agriculturally dependent are particularly hard hit, it is evident that medium sized service centres like Waikerie and Barmera are also experiencing a significant contraction in higher-level services. The process of urbanisation occurring in many rural areas is likely to be accelerated through opportunities presented by out of area trade or administrative reductions in water. Such a process may be effectively instigated in towns not otherwise 'declining'. The extent to which this is 'inevitable', provides a 'positive exit' for farmers, or opportunistically 'hits a grower when he's down' – all of which are comments from stakeholders - essentially depends on who you are and the vantage point from which you view such changes. An overwhelming feeling among those interviewed throughout the region was that there was limited assistance available for those wanting to stay and no assistance with 'community restructuring' that was being actively facilitated by recent public policy.

The next day, in the City of Murray Bridge, other impacts were raised by civic and community leaders. Though Murray Bridge is forecast to grow over the next 30 years as part of Adelaide's growth strategy,¹²⁹ the Council was far from complacent about the future of the area. They noted the impacts on the houseboat, recreation and tourism industries in this part of the River, as well as the likely closure of one if not both milk processing plants due to the loss of most irrigated dairy in the past few years, and the problems facing other businesses from the recent agricultural downturn in Murray Bridge area and surrounding LGAs that are heavily dependent on agriculture. The Council was also thinking about the impact of future urban development and 'If all the water goes for domestic [use], what will happen to agriculture?' Social issues were a major concern of civic leaders.

If this is your first time here, you probably can't imagine what it was like before the [river] flats dried out – so lush and green it hurt your eyes. Now it's dry and brown all along the flats. We've had to let most of the parklands go, and people can't keep their gardens. It's so demoralising for people who have lived here for a long time, and it will certainly affect visitors and those who might be thinking of moving here.

¹²⁹ SA Department of Planning and Local Government (2010), *The 30 Year Plan for Greater Adelaide: A volume of the South Australian Planning Strategy*

We're seeing more social problems, and I can't say for sure but the depressing look of the whole area has got to be affecting people. For these towns, it's all about perceptions.

Like studies on Murray Bridge that find it is a very positive place for refugee and humanitarian migrants to settle compared with metropolitan areas,¹³⁰ the Mayor was positive about the social cohesion of his community.

It's still a good place to live. We're actively welcoming of people who are different. We had a suicide of an Afghani man here a few years ago and we all banded together to make sure that never happens again. We've got really good community leaders in the Aboriginal community, too. It certainly has a much more disadvantaged profile, but the people here are good people. Again, it's more about perception than reality.

I think one of the biggest concerns is the people we're losing now – some of the farmers and community leaders who put a lot of time into running things. They're the ones who are going or thinking of going – a lot have leased out their water and are waiting to see what happens when the water comes back. So we hope we don't lose them for good. There are very disadvantaged groups here, and we need to keep strong leadership.

It's really bad in some of the other dairying areas too, like the Narrung Peninsular. They've lost most of their dairying [due to low Lake levels].

As another Councillor commented,

The Lakes are on life support. Some of the communities are on life support. There really are few winners below Lock 1.

Like the Murraylands Regional Development Board, Council also talked about the likely resilience of the city due to future residential and economic development and potential industry relocation. Nonetheless, they were concerned about specific industries that were being seriously affected through reduced water allocations and access, and the possible flow on effects from more permanent loss of irrigated agriculture in the Murraylands region.

Council's concern for the future of its smaller communities was evident in the composition of the large group the Mayor had assembled to attend the workshop. Among these were irrigators and peak bodies, as well as a group of farmers for the small rural town of Mypolonga, 17 kms to the north of Murray Bridge city centre.

¹³⁰ Taylor-Neuman, L.V.N., and Balasingham, M.R. (2009) *Sustaining Settlement in Murray Bridge South Australia*, Lutheran Community Care

4.2.3. The Town of Mypolonga



The statistics on Mypolonga tell a story of a small community with a high level of community engagement and a stable population in recent years. There was little change in from the 680 or so residents who live there in 2001 in the 2006 Census count,¹³¹ and it has twice the national rate of participation in voluntary activities.¹³² In 2006, it had a relatively young population,¹³³ but was less advantaged than the national average in terms of educational and occupation,¹³⁴ skills,¹³⁵ broad socio-economic

status,¹³⁶ income¹³⁷ and youth unemployment.¹³⁸ It is also somewhat more disadvantaged than the MDB average across a range of socio-economic indicators.¹³⁹ Moreover, the area has been changing over the past decade or so through a combination of urban development, dairy and horticulture ‘modernisation’ and farm consolidation,¹⁴⁰ and most recently the effects of the prolonged drought.

The description of a community worker, interviewed just before our visit to the community paints perhaps a more lasting picture. In her words,

It was just the most beautiful place – the river makes an oasis in the middle of the drylands. If you could have seen it [before the drought]. The most beautiful fruit and vegetables. Olive trees and orchards sitting above the green dairy flats.

¹³¹ Mypolonga and the adjacent Woodlane area has a resident population of 682 in 2001 and 669 in 2006 (ABS Census 2001 and 2006).

¹³² 34% compared with 17.9% (ABS Census 2006).

¹³³ Median age 35 years compared with 37 years for Australia (ABS Census 2006).

¹³⁴ SEIFA Index of Education and Occupation of 908 compared with 1000 for Australia (ABS Census 2006).

¹³⁵ 32% had some form of post-secondary qualification compared with around 40% for Australia (ABS 2006 Census)

¹³⁶ A score of 908 on the SEIFA Index of Educational and Occupational Resources compared with 1000 for Australia (ABS 2006 Census).

¹³⁷ \$830 compared with \$1,025 median household income nationally (ABS 206 Census)

¹³⁸ At 15%, youth unemployment was 5 percentage points higher than the NDB average of areas, and doubled between 2001 and 2006 (ABS Census 2001, 2006).

¹³⁹ ABS 2006 Census

¹⁴⁰ Direct employment in agriculture declined by around 50% between 2001 and 2006 (from 40% to 20%), though this does not include the significant level of employment in value-adding processing and other related activities, nor the flow ons to other sectors. There is evidence that the newer arrivals in the release area at Woodlane are employed in professional, administrative and service sector jobs due to the increased in such jobs inter-censally, likely as commuters to Adelaide, Mt Barker, Murray Bridge and other centres (ABS 206 Census).

But now, to chop the trees down and burn them in piles in the fields. The women come in to talk to me. The thing they talk about is the smell of smoke all the time over the valley. And the vandalism of turning the water off and destroying what's taken 80 or 100 years to build up. Men at the abattoirs saying, 'Why are they sending 2 or 3 year old heifers here to be slaughtered, milk dripping from their udders?' Saying, 'I can't do this. It's the most terrible waste – a tragedy'.

I've seen suicides in the last few years, and other things you'd never see. The wives come in and say they're worried about their husbands. They just go out and sit on their tractor all day like they've done all their lives, but now there's no purpose. Others have found them just in time – with a hose connected up to the inside of the car. If they don't come in by 7 or 8 at night they get worried and go looking for them. More heart attacks, family fights. You can't say for sure that it's directly related, but they're under so much stress. A lot of people have shut down. They're not going to functions. Some haven't left the house in 18 months. Why can't they help the poor buggers who have been there for generations?

It's really hard to see what's happening to the town, too. The school was in danger of shutting down but now they're bussing kids out from Murray Bridge – it's got a really good name. It's affecting the sporting clubs – they're now providing incentives for kids from other areas to come and play here, buying their uniforms, things like that. And it's affecting churches and Mypolonga Traders – they're hanging in for the moment.

They call this 'adjustment', but most of the inefficient ones left years ago. That's why the ones left haven't been eligible for the [Federal] packages. Almost no-one in Mypolonga was able to get the EC¹⁴¹ because they are 'too viable', and I think only one or two got the [Small Block] Exit Package. They're worth too much. But borrowing to buy in water or feed in the last few years has tipped the balance for some. Others have decided to sell their water [entitlements] and are leasing water in, but some haven't been able to. With permanent plantings it's a hard decision – it takes years to re-establish your trees. Dairy herds that have taken decades of breeding are being slaughtered. Some have said they just don't have the heart to come back [into farming], but there are others buying up a lot of blocks. We'll see what happens when the water comes back.

At the Council workshop we met Mike,¹⁴² a third generation Mypolonga fruit grower. He showed us around his town for a day with obvious pride - the oval that they are keeping green with purchased water to keep the sporting teams going, the Mypolonga Traders, a community institution where produce has been sorted and packed and farm equipment sold for 80 years, the school where children were being brought in from Murray Bridge to keep it going 'until the water comes back'.

¹⁴¹ Exceptional Circumstances

¹⁴² Not his real name.

He took us to the dry hills on the outskirts of the town areas where the still living grapes, stone fruit, citrus and olive groves perch on the contours above the river flats, and below it all the brown channel of the River Murray - a scene, as we had been told, that would not look out of place on a post card from Umbria.



Other scenes were less bucolic. Dying trees where the water had been turned off some time ago. Grapes unpicked dying on the vines. Massive piles of trees in fields waiting to be burnt. Fields a patchwork of thriving and dying groves.

Down on the River, Mike showed us where the Woodlane irrigation pump had been destroyed when the River bank collapsed due to low water levels.

We changed from stone fruit to citrus and then to grapes a few years ago. You change as the market changes. Bought more land, planted Chardonnay, Shiraz, Grenache. Had a contract with Orlando. They were good times. But 2009, commodities prices were very bad and projected to be bad for 3 years. On top of the water problems and the debt, I would have been working for nothing and I can't do it at my age. My son was doing the books, and he saw what was coming. He left before I had to say anything.

Mike, like other growers, is making decisions about water based on water price and availability, commodities prices, opportunities provided by policy, and other social, economic and personal factors.

I tried to sell my water to the Commonwealth, a bit of an ambit claim. A protest, if you like. Then I tried to sell to SA water, but they were offering less than what it was said to be worth. Then I leased it to CIT [through their brokerage scheme] so SA Water didn't want to buy it. I'll have another go in Round 2 [of the 'buyback'] – really I don't know if I want to sell my [permanent] water, but I might end up losing more [under the forthcoming Basin Plan]. They said that Penny Wong might just be able to take your water and not give you anything, so maybe I should try to sell now. I don't know what to do, it's all so uncertain.

But it breaks your heart to turn the water off. I'm a third generation farmer. My father still lives on the property in the house he was born in 50 meters up the hill from me. I'm ashamed I've let him down. He's 93 and he's passionate about farming, passionate about the River. It's been his whole life. How can I just rip out everything he's worked for and his father before him? I know it's not good business, but I'm watering 3 rows of citrus and some stone fruit just to keep some greenery around dad. It would be an amazing thing not to be able to go out and pick fresh fruit off a tree.

Mike took me to the home of John,¹⁴³ another third generation farmer and one of the larger growers in the area with 20 ha under cultivation for stone fruit, citrus and wine grapes. His two sons are ‘away at uni’, but one ‘might come back and make it fourth generation’. He provided the perspective of someone committed to staying in production.

I’ve got no intention of going. I can get by for quite a few years with the existing infrastructure and plantings. These were all soldier settlements blocks in the 1920s - 6 to 20 acres. There’s been a lot of consolidation over the years, and we’ve mostly modernised, that’s why we can’t meet the target of the PIIP.¹⁴⁴

There’s no reason why things can’t come back into production here. We’ve got a magnificent irrigation system [provided through CIT] as long as we’ve got the water and commodities prices pick up. Most of what’s gone recently could come back or we can grow something else. That’s what people have always done here.

In many ways, Mypolonga is at a crossroads. Its proximity to Murray Bridge and its rural amenity is making it popular among people wanting a rural lifestyle within commuting distance to major service centres. Rural residential subdivision has been occurring in the area and smaller lots with a pleasant aspect near the River at Woodlane have been constructed over the past 10 years.



The extent to which Council will encourage or enable further subdivision into smaller lots is at this stage unknown. As is the case in many such communities, planning authorities grapple with issues of urban and rural sustainability including the need to provide sufficient housing for growing population balanced against the loss or fragmentation of prime agricultural land and need to ensure housing is provided close to services and transport through consolidation in larger urban centres rather than in more outlying

areas.¹⁴⁵ As John commented,

Mike may not agree – I know he’s keen to subdivide some of his land if he can - but I’d rather see land come back into production. It’s better for the community to have people living here committed to the local area rather than becoming a dormitory suburb, better for agricultural production, better for us all. To some extent, it will depend on the SDLs [under the *Basin Plan*] and Council’s position

¹⁴³ Not his real name

¹⁴⁴ Private Irrigators Infrastructure Program (PIP) is providing \$110.0 million to SA irrigators to upgrade infrastructure in exchange for water efficiencies under WFTF

¹⁴⁵

[on strategic planning for future development]. We're not sure about either of those things.

We then dropped in on Brian,¹⁴⁶ a former shearer and a dairy farmer for the past 30 years. He owns the last dairy currently operating in Mypolonga. The property supports a milking herd of around 600 head, with related enterprises in lucerne and heifers around 100 kms away. The river flats near Mypolonga and adjoining Woodlane once supported around 30 dairies. Modernisation in the late 1990s and early 2000s saw the number of dairies fall to 9, with those that remained largely consolidating herds of less than 200 to around 400. Most of the remaining dairies have gone out of operation in the last 3 years.

They just cut us loose below Lock 1. Just left us for dead. I've never seen it like this – never though it could dry out. There's been no support. Some areas [for example, grapes in Langhorne Creek] are getting water piped in largely paid for by government. We've got nothing.

I'm buying in feed now. I did try to irrigate last year but I used 12 MI [of water] to the hectare instead of the usual 0.5 MI – the cracks are so deep you just can't water it. So I lease out my water and buy in feed.

I've bought up eight other dairies along the river swamps. I could run 1500 head. There's no reason this land can't come back into production when the water situation improves and the market picks up. Dairy isn't finished here, but it is going to be difficult [with the degree of land subsidence]. We'll see what happens.

Brian runs a modern rotary dairy constructed in 2000 with 'half of the cost from dairy modernisation money.' Despite the hard work and early mornings, he has no intention of leaving dairying.

My son and grandson are in the business with me. You'll have to carry me out in a box. I'm not going anywhere.



A visit to the Mypolonga Traders shed some light on CSIRO predictions that ground water use in the Murray SYR is likely to treble in the next 30 years with decreased access to surface water. The manager of the store showed us around the large packing and distribution shed with onions of all colours and types piled high on wooden pallets ready for transportation to Woolworths and other stores throughout Australia. As he explained,

Onion production is down 50% in the area because of low allocations and low river levels. Other vegies are way down as well. Citrus would probably be at 25% of average production. Some are keeping

¹⁴⁶ Not his real name

the trees alive but not giving them enough water enough for fruiting. Onion growers have moved down to the Southern Mallee til things improve. They're putting in pivots and irrigating off groundwater. They'd much rather be here – there's a cost socially and economically. They miss their kids sporting events. Families are disrupted. The cost of trucking [the onions] back here [for packing and distribution] is high and they had to put in bores and pivots [for groundwater irrigation]. But there's a good market with Woolies buying as much as they can grow. Hopefully it's only temporary and they can come back when the water comes back. It's a different story for citrus growers. They can't just shift their operations, and prices have been down as well.

He also explained the difference that the 'look' of produce can make can make to a producer's profitability.

It might sound silly, and they're really the same product, but those perfect white onions are the farmer's profit –the difference between being able to pay some of your debts and just hang in. In today's market, people expect their vegies without blemish and pay top dollar, and we do our best to produce it. Sometimes it's the difference between life and death for a grower.

As far as their business is concerned, things are hard but they are surviving.

Business is probably down about 50% locally, but probably only 15% net when you consider we're doing a lot more transport from places like the Southern Mallee. We've also been promoting ourselves to the drylands [for transport and packing] and we're picking up business there. We're going wider and its working for now, but obviously the growers would rather be back here.



Mike took us to his cousin's place where the vines were still producing in abundance. We stopped now and again so Mike could pick different types of grapes for us to taste.

With pride Mike, explained the difference in the top quality grapes he'd been growing, Grenache, Merlot and the now unfashionable Chardonnay.

Back at his own property, many of the fields were obviously dying. But some vines were refusing to die, though the water had been turned off 8 months ago.

Orlando bought out my contract. But some of these grapes are hardy – they're the drought resistant variety. If they last through the winter, I might give them some water. Maybe we'll grow something else. We'll see.

At the end of the day, Mike took us to visit his father. The sorrow was clear in the man who had relied on the River for his livelihood all his life, and the confusion about why ‘the city has turned against the farmers’. He asked a number of times during our discussion, ‘What’s happened to the River?’ and when the water [flowing down the lower Darling at that time from floods in the north] was coming? Before we left he said,

Tell Mike to give you some dried fruit before you go. Take it back to the city and give it to people. Tell them what fruit used to taste like...before we bought it all in from overseas.

Back at Mike’s home, talking to his wife who works as a teacher in Murray Bridge in one of the region’s most disadvantaged schools, Mike brought in a massive bag of dried apricots and peaches. Maybe it was the setting, or knowing where they had come from, but they did taste like nothing this writer had eaten before.

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