Nyah to Border community profile
(including Sunraysia, Victoria and NSW)

Irrigation region

Key issues for the region

1. Region’s population — The population of the Nyah to Border region is approximately 60,000, including 3,500 farm businesses.

2. Gross value of irrigated agricultural production (GVIAP)
   - The drought affected gross value of irrigated agricultural production was an estimated $600 million for 2008-09. The non drought gross value of irrigated agricultural production, based on the existing area, is estimated to be $800 million.

3. Water entitlements (approximate)
   - Surface Water Long-term Cap -700 GL.
   - Victorian high reliability water shares 481 GL. NSW High Security - 190 GLi, NSW General security — 75 GLiv
   - Groundwater entitlements - negligible.

4. Major enterprises – Major enterprises for the Nyah to Border region include wine grapes, citrus, table grapes, almonds, dried fruit, and vegetables.

5. Government buyback- The Commonwealth Government buyback cannot be separated out for the Nyah to Border region as it is part of greater Murray valley buyback program.

6. Water dependence — Very high capital investment on-farm and off-farm makes the regional economy highly water dependent.

7. Current status
   - Nyah to Border’s regional economy of around $3 billion has a high dependence on irrigation, with wineries, packing sheds and other food processing reliant on a consistent supply of irrigated crops. Around 25% of employment is associated with irrigated horticulture and associated manufacturing.
   - There is a high population of 60,000 people including 3,500 growers, 65% of whom farm 26% of the irrigation area on small farms in community districts. These districts were established as Government irrigation schemes from 1887 to 1947.
   - There has been rapid growth in the irrigation area over the last 15 years. This has been facilitated by water trade and includes large areas of almonds, wine grapes and vegetables. Managed Investment Schemes funded much of this new development. There is an expectation that growth in irrigation will continue given the region’s competitive advantages in soils, mix of crop types possible, water quality, reliability and ability to buy water. The rate of growth will depend upon commodity price and cost of production.
   - The region developed with the expectation of 100% reliable water. Since 2006-07 the region has suffered a series of low allocations, e.g. 35% allocation in 2008-09 for Victoria. Low water allocations have led to high debt from annual water purchases e.g. 180 GL purchases in Victoria in 2008-09.
• Low water allocations combined with low prices (especially wine grapes) have resulted in 10,000 to 20,000 ha perennial plantings being dried off (around 20% of districts). There is very little capacity to fund replanting at $25,000 to $45,000/ha and three to seven years until mature yield production. There has been some land amalgamation and diversification into annual crops such as vegetables.

• The area has suffered a slump in confidence and there is high stress caused by current low wine grape prices, variability in other commodity prices over a number of years and low water allocations. This has led to unsaleable developed blocks and low equity. Some irrigators are choosing to sell entitlement and buy water annually to retire debt or gain access to capital.

• Nyah to Border’s mid to large sized farmers (15 to 100 ha) currently are facing the highest stress, as a group. They lack the opportunities to generate off-farm income that are relatively more feasible for small farmers, and conversely, lack the economies of scale available for large farmers.

• Irrigation supply systems and farm water efficiency is already very high with limited scope for water savings. There has been significant investment in pressurised irrigation through private investment that was supported by land and water management plans. A 4.5 GL/y saving has been estimated with the Stage 1 of the Sunraysia Districts Modernisation Project. A similar volume has been estimated for Stage 2. This Project will enable growers to further invest in drip and other micro-systems, which will lift irrigation to world’s best practice.

8. Responses to water availability scenarios

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

• Any reduction in water availability greater than 20% of long-term water availability would affect critical mass and community irrigation district viability.

• There is no scope for farm transformation to dryland as irrigation property sizes are too small (only 0.5 % to 1% of the area required for dryland operations).

• The response to any permanent and material reduction in sustainable diversion limits (SDLs) is uncertain and will depend upon long-term horticultural profitability. At the moment this is low, especially for wine grapes, and could result in a likely reduction in horticultural area, no replanting of dried off areas, and people abandoning properties. This would lead to reduced employment in an area where unemployment is already 2% above State averages. However, if horticulture profitability returns then the region will be able to purchase water from other areas and expand production, as it has over the last fifteen years. Some growers see an opportunity in being able to buy or being supplied water from the environment water holder in dry years and selling or supplying water to it in wet years.

• Water security is essential to industry confidence and investment; if the SDL provided a reduction in the frequency of low allocation years then this would assist.
Regional overview

For the purposes of this report the region is defined as the area supplied by the Murray River from Nyah to the South Australian border and the Lower Darling within the Murray Weir pool. The two major regional towns are Mildura in Victoria and Wentworth in New South Wales.

Mildura and Wentworth are surrounded by an irrigation-based horticultural area, with dryland cropping on its fringe. Agriculture, coupled with a population of around 60,000 enables the region to sustain a significant commercial and industrial base.

Indigenous people lived in the Mallee for many thousands of years before European settlement, and their descendants still live in the region.

Explorers began occupying land for sheep grazing from the 1840s. In 1887, the Canadian brothers, George and William Benjamin Chaffey, at the invitation of Alfred Deakin, designed and set up irrigation colonies at Renmark and Mildura.

The region’s first horticultural industry was raisins and sultanas, followed after World War II by citrus. More recently horticulture has been dominated by wine grapes, table grapes, large scale wine production and food processing (Mildura Fruit Company Ltd, Sunbeam Foods and Irymple Group). Currently, the region produces approximately 20% of Australia’s total wine grape crush, 29% of citrus production, 70% of table grape production and almost 100% of Australia’s dried vine fruit production.

Emerging new industries are solar power and mineral sands mining. Major deposits of mineral sand are located north of Wentworth and south of Mildura.

The regional climate is warm and dry. The average annual rainfall total of 292 mm is distributed evenly throughout the year. The climate, along with attractions of the Murray and Darling Rivers, has led to an important tourism industry. The region has established sporting and recreational facilities and a series of festivals attracts visitors all year round.

All major services such as hospitals, airport, schools, banks, supermarkets, cinema, doctors, lawyers, accountants, other professionals and tradespersons are available. There is a strong commercial centre that has grown as a result of the horticultural industry and its expansion. For example, it is estimated that 85% of the wine grapes grown in the region are processed locally.

The semi-arid country includes some of Australia’s most unusual and diverse flora and fauna. The Mildura region comprises 40% of Victoria’s National Parks, including Murray Sunset, Big Desert, Wyperfeld and Hattah Kulkyne. The NSW region is adjacent to the Mungo National Park and the Mallee Cliffs National Park.

Irrigation overview

Irrigation in the Nyah to Border region includes irrigation districts (listed in Table 1) managed by Lower Murray Water (LMW, Victoria) and Western Murray (NSW) as well as some smaller Trusts and a large area of private diverters.
Figure 1 Location of irrigation district
History of irrigation

The First Mildura Irrigation District was established in 1887 and constituted in 1895. Curlwaa was established in 1890, Merbein was established in 1909. Coomealla and Red Cliffs were built as soldier settlement districts following World War I. Robinvale was established as a World War II soldier settlement. Buronga was established in 1957. Private diverters, as opposed to government sponsored irrigation districts, became more established in the 1950s as power and pumping technology became more economic. There are also cooperative group schemes or trusts running irrigation systems at Euston, Gol Gol Creek, Mourquong, Pomona and a number of other areas.

Balance between public and private infrastructure

Approximately 26,000 ha are serviced from community supplied schemes in Victoria and NSW. These are publicly owned in Victoria or privatised irrigation companies in NSW. Around 60,000 ha are serviced by privately owned pumps and infrastructure from the River (private diverters).

Commodities

The main commodities are shown in Figure 2. There are 3,500 properties in community supplied districts, of which approximately 65% are smaller properties.

Significant changes in commodities, water supplies over the last ten years

There has been a 75% expansion in area since 1997, mainly in the industries of wine grapes, almonds, olives and vegetables. Wine grapes grew 57% from 1997 to 2006, table grapes grew 48%, dried fruit reduced by 35%. Citrus has remained relatively stable. Since 2006 there have been low water allocations and low wine grape prices, which resulted in the area of wine grapes and other crops being reduced. Approximately 20% of the irrigated area dried off in 2009. The industry of table grapes has continued to be maintained or grown and the dried fruit industry has started to recover with new plantings and confidence starting to return to the industry.

Managed Investment Schemes underpinned much of the large corporate farm expansion in private irrigation schemes. Some of these schemes went out of business during the Global Financial Crisis and due to the impact of drought, but have been taken over by other investors. The large expansion in almonds or other crops may continue as confidence returns.

Unique features

The region has access to a well established new development process that accounts for salinity impacts from water trade. It also has access to large areas of suitable dryland for further development when market drivers and investment confidence returns. The area is capable of receiving transfers of water from both upstream and downstream districts. New developments over the last 15 years have generally been based on water trade from the Goulburn Murray Irrigation District.
Rural water supply

Regional system description

The Murray is the source of water for Nyah to Border. The infrastructure is mostly piped, with main channels (mostly lined) in the community supplied districts (Table 1). Under normal conditions the infrastructure is around 85% or more efficient. Major upgrades to a pressured supply are occurring in Robinvale. The Sunraysia Modernisation Project (covering Mildura, Merbein and Red Cliffs) is planning investment in new pumps, channel lining/covering, and (as an option for later stages) pressurised supplies for spurs.

The extent of the buyback under the Restoring the Balance program and other trade out has had an impact on Western Murray Irrigation in NSW, with an estimated 6% of irrigators leaving. The 4% cap in Victoria is currently limiting the ability of a small number of irrigators to sell water entitlement outside of the community districts. The net sale of entitlement from private irrigators is expected to be small.

Within the Community Districts approximately 80 properties have taken the Commonwealth Small Block Irrigator Exit Grants. There is widespread concern that the requirement to remove infrastructure to prevent irrigation for 5 years is threatening the viability of those remaining in the District.

The farm

Natural capital

Property sizes within the irrigation districts are too small for dryland operations (Figure 4). It has been estimated that, over the last five years, 20% of the area has been dried off due to low water allocations and low commodity prices (Figure 3). This varies from district to district. Community supplied districts have experienced the most drying off, especially Merbein (around 40% plus). Robinvale (around 10%) has had less dried off due to a higher proportion of table grapes compared to wine grapes. There has been a range of government programs including Small Block Irrigator Exit Grants, Exceptional Circumstances, professional planning and advice grants as well as irrigation management grants.

Financial capital

There is a high level of debt caused by water purchases, declining wine grape prices and variability in other crop returns. The value of land developed and planted for irrigation has also fallen, which has reduced equity. Most of the capital is the value of water entitlements. Some land values close to Mildura have been affected by changes in planning rules re subdivision. There has been a substantial increase in presentations at rural financial counsellors.

There is enormous financial pressure, particularly in the wine grape growing industry. This has led to the wine grape industry requesting relaxation of the 4% cap on water trade out of Victorian Districts to enable irrigators to gain access to capital.
Guide to the proposed Basin Plan

Technical background Part III

Figure 2  Main commodities by area (2006 pre-drought estimates)

Table 1  Irrigation water usage excluding NSW private pumpers, 2009 (ML)

<table>
<thead>
<tr>
<th>Water business</th>
<th>District</th>
<th>Total water shares allotted to district &amp; diversion*</th>
<th>Total delivered in district</th>
<th>Total delivered outside District</th>
<th>Total delivered diversions from Rivers and Lakes</th>
<th>Total usage</th>
<th>Number of customers (approx)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMW</td>
<td>Red Cliffs</td>
<td>42,635.0</td>
<td>25,576.5</td>
<td>138.5</td>
<td>0.0</td>
<td>25,715.0</td>
<td></td>
</tr>
<tr>
<td>LMW</td>
<td>Robinvale</td>
<td>21,220.6</td>
<td>18,877.0</td>
<td>0.0</td>
<td>0.0</td>
<td>18,877.0</td>
<td></td>
</tr>
<tr>
<td>LMW</td>
<td>Merbein</td>
<td>30,323.3</td>
<td>15,375.0</td>
<td>0.0</td>
<td>0.0</td>
<td>15,375.0</td>
<td></td>
</tr>
<tr>
<td>LMW</td>
<td>FMID</td>
<td>64,085.0</td>
<td>30,296.0</td>
<td>0.0</td>
<td>0.0</td>
<td>30,296.0</td>
<td></td>
</tr>
<tr>
<td>LMW</td>
<td>Millwa WWD</td>
<td>0.0</td>
<td>0.0</td>
<td>755.2</td>
<td>755.2</td>
<td>755.2</td>
<td></td>
</tr>
<tr>
<td>LMW</td>
<td>Murray below Nyah</td>
<td>322,707.8</td>
<td>0.0</td>
<td>0.0</td>
<td>270,590.2</td>
<td>270,590.2</td>
<td></td>
</tr>
<tr>
<td>Total LMW</td>
<td></td>
<td>480,972.2</td>
<td>90,124.5</td>
<td>138.5</td>
<td>271,345.4</td>
<td>361,608.4</td>
<td>7,067</td>
</tr>
<tr>
<td>Western Murray</td>
<td>Buronga</td>
<td></td>
<td>2,973</td>
<td></td>
<td>30</td>
<td>2,973</td>
<td>30</td>
</tr>
<tr>
<td>Western Murray</td>
<td>Coomealla</td>
<td></td>
<td>18,922</td>
<td></td>
<td>209</td>
<td>18,922</td>
<td>209</td>
</tr>
<tr>
<td>Western Murray</td>
<td>Curlwaa</td>
<td></td>
<td>4,578</td>
<td></td>
<td>117</td>
<td>4,578</td>
<td>117</td>
</tr>
<tr>
<td>Total Western</td>
<td></td>
<td></td>
<td>26,473</td>
<td></td>
<td>356</td>
<td>26,473</td>
<td>356</td>
</tr>
<tr>
<td>Estimated for</td>
<td>NSW districts and</td>
<td>190,000 NSW High Security Includes WMI 75,000 NSW</td>
<td></td>
<td></td>
<td>100,000 includes (26,000 ML WMI above)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>private diverters</td>
<td>General Security</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Includes Red Cliffs or Merbein water shares including entitlements attached to properties supplied via those systems, but located outside the District boundary.
Figure 3  Regional issues — horticultural farms

Note: 1 = no problem to 5 = significant problem. Number of respondents = 84.

Figure 4  Survey respondents by farm type

Number of respondents = 93. Some respondents reported multiple types.
Human capital

Stress has reached very high levels due to a combination of drought and low wine grape prices. The timescale for adjustment will be critical to determine the success of community adaptation. Perennial horticulture requires investment confidence, which is currently lacking. Providing a clear time frame and clarity about SDL implementation will be important for investment decision-making. The area that is currently dried off probably represents unutilised capacity of 20% of the land, water infrastructure and human capacity. There is further suitable dryland in the private diversion areas that is likely to be taken up for new development given appropriate market drivers.

In summary, there is infrastructure and capacity for replanting and expansion, and its utilisation will depend upon the SDL and market conditions.

Financial ratios

Financial ratios are highly dependent upon industry. In general positive returns on capital are expected for dried fruit, table grapes, almonds and citrus. However, they are strongly negative for wine grapes. Vegetables are highly competitive and rely upon continuous market relationships to be successful.

Debt levels have increased because of the need to fund water purchases as well as the low commodity returns.

The following pages provide more detail about farms within the horticulture sector in the region.

The farm: horticulture farms

Figures 5–7 and the table on this page present results from the telephone survey of irrigation farmers undertaken in the region. They include:

- farmers’ ranking of a range of issues that they considered problematic;
- farm financial measures (note that 40% of horticulture farmers in Nyah to the border including NSW and Vic Sunraysia have off-farm income (81 survey respondents)); and
- measures of optimism, and how satisfied farmers are with a range of life issues.

Table 2 Farm financial measures

<table>
<thead>
<tr>
<th>Ratios</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return on assets(^1)</td>
<td>-7.33%</td>
</tr>
<tr>
<td>Debt ratio(^2)</td>
<td>26.92%</td>
</tr>
<tr>
<td>Value of Water/total assets</td>
<td>54.24%</td>
</tr>
</tbody>
</table>

\(^1\) Profit/Assets

\(^2\) Total debt / Total assets

On-farm irrigation water use

Irrigation application methods

The most commonly used irrigation method is drip followed by low level and overhead sprinklers (Table 3). There is a small area of flood irrigation remaining, although most of this has been dried off in the drought.
Figure 5: Farm issues — horticultural farms

Note: 1 = No problem to 5 = Significant problem. Number of respondents = 36

Figure 6  Farm financial measures

Farm revenue (2004-09)
Farm costs (2004-09)
Farm profit (2004-09)
EC payments
Asset value excluding water
Value of water
Total asset value
Farm debt
Opportunities/trends

There has been a major shift to drip irrigation (Table 3).

There is some scope to improve water use efficiency by improvements in on-farm irrigation infrastructure. This will be dependent upon the Sunraysia Modernisation Project, which after Stage 2, will provide a higher level of service (water on demand possibly pressurised and all year round) and will lead to further adoption of drip and micro systems in the older Victorian community supplied districts. The NSW districts are generally all fully modernised.

Water entitlements

Most water entitlements comprise Victorian Murray High Reliability Water Shares and NSW Murray High Security. During low allocations there has been substantial temporary trade of water allocation (at high cost) into the Region. During normal allocations NSW High Security irrigators have been net temporary sellers of water. In the Victorian part of the region high reliability water shares are 481 GL (Table 1), which is supplemented by annual purchases. In the New South Wales part of the region, entitlements are estimated at 190 GL High Security and some General Security.\textsuperscript{vii} 470 GL\textsuperscript{viii} was used in 2005-06 (Victoria 100% allocation) and 488 GL\textsuperscript{ix} in 2008-09 (Vic 35% allocation). The region has developed with the expectation of 100% reliable water. Since 2006-07 the region has suffered a series of low allocations e.g. there was only 35% allocation in 2008-09 for Victoria. Low water allocations have led to high debt from annual water purchases, e.g. 180 GL purchases in Victoria in 2008-09. The value of entitlements currently represents a high proportion of the total farm capital and would be close to 100% for wine grape properties or dried off areas with no housing.
Table 3  On-farm irrigation management (2007-08)\textsuperscript{iv}

<table>
<thead>
<tr>
<th>Irrigation parameter</th>
<th>Horticulture %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method</td>
<td></td>
</tr>
<tr>
<td>Flood flow</td>
<td>15</td>
</tr>
<tr>
<td>Travelling</td>
<td>1</td>
</tr>
<tr>
<td>Microject fixed sprinklers</td>
<td>14</td>
</tr>
<tr>
<td>Drip/trickle</td>
<td>63</td>
</tr>
<tr>
<td>Other</td>
<td>27</td>
</tr>
<tr>
<td>Timing irrigation on the basis of</td>
<td></td>
</tr>
<tr>
<td>Soil moisture measuring tools</td>
<td>60</td>
</tr>
<tr>
<td>Calendar based</td>
<td>11</td>
</tr>
<tr>
<td>Weather forecast</td>
<td>38</td>
</tr>
<tr>
<td>Own observations/knowledge</td>
<td>62</td>
</tr>
<tr>
<td>Percentage of farms trading</td>
<td>81 traders</td>
</tr>
<tr>
<td>Purchasing</td>
<td>69</td>
</tr>
<tr>
<td>Selling</td>
<td>30</td>
</tr>
</tbody>
</table>

**Soil moisture measurement**

Most growers have adopted some form of soil moisture monitoring. This includes a combination of methods and there are soil moisture scheduling services available from private businesses in the region. There has been a strong extension push and incentives for improved irrigation scheduling over the last 20 years, which has been driven by land and water management plans.

**Irrigation timing**

Due to a relatively high adoption of technology there is little scope to improve irrigation timing. Although some improvement is expected in the Victorian community supplied districts as a result of the Sunraysia Modernisation Project.

**Regional agricultural production**

**Regional agricultural value chain**

The major participants in the value chain are wineries, citrus packers, transport companies. There is also research being undertaken by the major commodities to add value to fruit e.g. easy peel citrus, improving shelf life of table grapes, improving colour of dried fruits etc.

The region grows 20% of Australia’s wine grape crush and major wineries have processing facilities in Mildura. Wine grapes and juice are also imported and exported from the region for processing and bottling.

The region grows 95% of Australia’s dried grapes with three processors, Sunbeam, Australian Premium Dried Fruits and Clyne Foods. The majority is processed by Sunbeam within the region.

70% of Australia’s table grapes are grown in the region of which 40% are exported. Larger operations have well established networks (often family owned) to market the fruit. Smaller growers rely on agents and larger growers to assist in marketing.

The region produces over 29% of Australia’s citrus, of which 55% is exported. There are 45 packing houses, two very large, five medium and the remainder are smaller grower packers. The Mildura Fruit Company is the largest packer. There is a coordinated citrus export program to the United States.

In 2006 grapes delivered the highest gross value of agricultural production (GVAP), followed by fruit and nuts (Figure 8). Vegetable production is rather lower in gross terms, but delivered a GVAP of over $3,500 per megalitre of water (Figure 9). However, this data should be treated with caution, as it is highly sensitive to changes in commodity price and yield. Successful vegetable growing relies upon long-term market relationships.
Figure 8  Gross value of agricultural production (GVAP) (2006)

Figure 9  Gross value of agricultural production $/ML of water used (2006)
The region’s community

![Figure 10: Level of highest school education (2006)](image)

![Figure 11: Higher education (2006)](image)
Figure 12 Employment (2006)\textsuperscript{xii}

Figure 13 Nominal income (2006)\textsuperscript{xiii}
Appendix C  Irrigation district community profiles

The region’s community — education, employment and income

Community overview

The major service centre is the City of Mildura (30,000 people). All commodities are both exported and imported for processing and packing. 15% of wine grapes are transported to the Riverland and to the Murrumbidgee for wine making. There is a net import of citrus into the Region for packing and marketing. The region is a major service centre for commercial and government services for North West Victoria and Western NSW. The regional population is estimated to be 60,000 and experiencing strong growth (9% growth in the city of Mildura and steady or slower growth in neighbouring Local Government Areas (LGAs)).

Mildura continues to grow at a steady rate. Robinvale has also grown by 8% from 2001 to 2006 due to the large scale managed investment scheme (MIS) development. Some of this has caused housing shortages and overstretched services. Wentworth has also experienced some growth due to large developments along the River Darling.

The Nyah to Border region as a whole does not perform well against national socio-economic indicators. It has low socio-economic status, low literacy, high drug and alcohol abuse, high unemployment and significant pockets of disadvantage. The unemployment rate in Mildura in 2006 was 5.7%. This provides challenges to social cohesion and inclusion. The greater proportion and extent of seasonal work tends to create higher unemployment. At the same time there is also a shortage of professional trained staff for larger business and service industries. The impact of drought has yet to flow through to many official social indicators. Mildura has two main tertiary institutes. LaTrobe University have a campus providing accounting, arts, business, education, graphic design, marketing, social work and arts. It has a community of over 330 students. The Sunraysia Institute of Technical and Further Education (SuniTAFE) provides a wide range of courses with over 300 teaching staff. TAFE NSW Riverina Institute has a campus at Coomealla. Mildura is serviced by an extensive road network linking it to Adelaide, Melbourne and Sydney. It has a rail network for freight to Melbourne. A busy regional airport provides regular services to Melbourne and Adelaide. Transport and logistics is a major industry. The region has a high multicultural mix and has a history of migrants successfully establishing horticultural businesses and providing seasonal work force.
Figure 14 Regional issues

Note: 1 = No problem to 5 = Significant problem. Number of respondents = 25

Figure 15 Optimism (regional people)

Note: 1 = Completely dissatisfied to 10 = Completely satisfied. Number of respondents = 25
The region’s community — demographics and key statistics

Table 4. Demographics and key statistics (LGAs within study area. 2006)\textsuperscript{iv}

<table>
<thead>
<tr>
<th></th>
<th>Mildura</th>
<th>Wentworth</th>
<th>Swan Hill</th>
<th>Balranald</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>47,170</td>
<td>6,211</td>
<td>5,695</td>
<td>824</td>
<td>59,900</td>
</tr>
<tr>
<td>Total Indigenous persons</td>
<td>1,397</td>
<td>597</td>
<td>375</td>
<td>47</td>
<td>2,416</td>
</tr>
<tr>
<td>Farm and farm managers</td>
<td>1,384</td>
<td>376</td>
<td>670</td>
<td>80</td>
<td>2,510</td>
</tr>
<tr>
<td>Farm and farm managers as percentage of total employed</td>
<td>7%</td>
<td>14%</td>
<td>26%</td>
<td>20%</td>
<td>10%</td>
</tr>
<tr>
<td>Households</td>
<td>16,350</td>
<td>2,210</td>
<td>1,435</td>
<td>290</td>
<td>20,285</td>
</tr>
<tr>
<td>Dwelling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fully owned</td>
<td>41%</td>
<td>45%</td>
<td>45%</td>
<td>48%</td>
<td>42%</td>
</tr>
<tr>
<td>Being purchased - directly or rent/buy scheme</td>
<td>27%</td>
<td>24%</td>
<td>17%</td>
<td>24%</td>
<td>26%</td>
</tr>
<tr>
<td>Rented</td>
<td>28%</td>
<td>25%</td>
<td>30%</td>
<td>20%</td>
<td>28%</td>
</tr>
<tr>
<td>Community services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population per education employee</td>
<td>31.88</td>
<td>29.62</td>
<td>26.16</td>
<td>19.42</td>
<td>30.93</td>
</tr>
<tr>
<td>Population per health employee</td>
<td>43.08</td>
<td>33.81</td>
<td>29.32</td>
<td>41.26</td>
<td>40.78</td>
</tr>
<tr>
<td>Population per culture and recreation employee</td>
<td>5.05</td>
<td>3.38</td>
<td>4.39</td>
<td>-</td>
<td>4.74</td>
</tr>
</tbody>
</table>

The regional economy

Primary production employs the greatest number of people in the region, followed by retail trade (Figure 16) although other sectors also are strong employers, giving the region a relatively high employment diversity index of 0.87. The main economic factors in the region are:

- international competition e.g. exchange rates, increasing horticultural production from South America, China, Iran, Turkey and South Africa;
- domestic market prices;
- labour costs and mechanisation;
- input costs, e.g. future fuel and power costs;
- scale of production; and
- access to capital for redevelopment of dried off areas for the wine grape industry.
Main future risks, opportunities and constraints to the major industries

The wine industry has been drying off land and removing plantings to adjust to 20% over-supply and low prices. The dried fruit industry is starting to recover after a decade or more of low or static prices. Table grapes are expanding, particularly on the smaller properties in the older community-supplied districts where higher labour and high skills are a greater advantage than scale. Citrus remains a relatively stable planting and has not changed in area for many years, except for drying off of valencias. Within the industry there has been a dramatic change away from juicing valencias to fresh fruit navels, particularly for export to the USA. New almond and olive plantings have slowed with the demise of MIS, but may return as the global financial crisis passes. International investment has occurred through the purchase of some of the MIS properties. Other investments include a new olive processing factory being constructed in the region. Vegetables continue to grow steadily in importance, especially as large scale operators diversify production from multiple regions.

Tourism is estimated to be worth $210M/y, but has not shown growth in recent years. It is also underpinned by the amenity created by irrigation and water based activities in the weir pools created for irrigation.
Regional response over the last five years

Water shortage

The extent of water shortages over the last 5 years has been as low as 35% allocation (65% reduction) in Victoria and approximately 50% allocation of High Security in NSW, although these occurred in different years e.g. Victoria experienced finishing allocations of 43% in 2007-08, 35% in 2008-09 and 100% in 2009-10. NSW High Security irrigators in Nyah to Border experienced finishing allocations of approximately 69% in 2006-07, 50% in 2007-08 and 95% in 2008-09. Both types of entitlement are High Security with an expectation of achieving 100% in over 90% of years. The reasons for the differences in allocation between NSW and Victoria, across the same stretch of river, have been a point of confusion for some growers. The cumulative impact of several years of low allocations has been widespread drying off of perennial horticulture, especially wine grapes and older plantings that needed to be redeveloped (with an estimated 10,000 to 20,000 ha of crops dried off out of a total of 90,000 ha irrigation). There is also the hangover of high levels of debt to fund temporary water purchases. An element of panic buying caused water prices to reach $1,100/ML in 2007-08 when irrigators looked like running out of water. Equity levels have fallen due to high borrowings and falling land values. It is estimated that an overall average of 20% of the irrigation area has been dried off. This has been magnified by oversupply in the wine grape industry, which would have caused some drying off of vines regardless of the drought. In addition, there are older plantings of other crops, some due for replacement that have been dried off, but not yet replanted. In 2008-09 (a year of 35% allocation on the Victorian Murray) Victorian Nyah to Border purchased 180 GL, of temporary water.xxvi

Regional response

Some properties with older plantings have abandoned plantings, sold water and taken work off-farm. The latter response has been more applicable to properties in the older community supplied irrigation districts, where opportunities for work in Mildura exist. There has also been an expansion in the area of annual vegetable crops to cope with the variability in annual allocations and use the dried off areas. Some growers see current low land values as the opportunity to expand and amalgamate blocks.

All sectors have been impacted, although wine grape-growers have been hit hardest through the “double whammy” of low prices and high water costs. The low allocation years have had a major impact as recovery takes many years for establishing perennial horticulture. The impact of these low allocations is estimated to be:

- 10,000 to 20,000 ha (around 20%) dried off resulting in lost production of $60M/y to $130M/y (out of total of 90,000 ha of land developed for irrigation, worth an estimated $600M/y for pre-drought production).
- 180 GL in temporary water purchases at an estimated $400/ML, approximately $70M per year.
- Total cost of $130M/y to $200 M/y, plus value of lost plantings dried off and their replacement costs.
The total land area developed for irrigation is estimated to be 90,000 ha. In 2006 this comprised 9,000 ha seasonal crops, 18,000 ha fruit and nut trees, 35,000 ha grapes, 8,000 ha vegetables and 10,000 not utilised. Since 2006 there has been an estimated 10,000 ha of new plantings of almonds and olives.

There has also been a major impact on downstream processing and services. Middle to large sized properties (15 to 100 ha) have been most exposed, but there has been one substantial area of wine grapes abandoned by a large scale MIS Scheme. Labour efficiency in the wine grape sector is now extremely high for both private diverters and district with little potential for further improvements.

Regional vulnerability

Regional vulnerability

The region is highly vulnerable to a reduction in available water. Perennial plantings have no capacity to vary planted area with changed water availability and vegetables requiring water security to meet long-term contracts. The economy is built on a high dependence of water for agriculture. The historic High Security of water combined with suitable soils and climate has led to long-term investment in capital intensive perennial horticulture and a high level of capital investment in value adding for processing, packing and distribution industries.

Regional water dependence

The Nyah to Border regional economy is highly dependent on irrigated agriculture. It is estimated approximately 30% of all jobs are directly related to the horticultural industries and value adding.

Community resilience to change in water allocation

The community has had to adapt to low water allocations in the recent drought. This has been at the cost of increased debt and the removal of plantings. In addition to this, low wine grape prices and a high reliance on wine grapes (approximately 30% of irrigated GVAP) have caused low resilience to change in water allocation.

The community does have a variety of different crops, which assists in managing market risk, but all crops are totally dependent upon irrigation for survival and production. In 2008 unemployment levels were above State averages for NSW and Victoria; ongoing low water allocations are contributing to a high rate of unemployment. The community also has a large non-English speaking background that will require special consideration with regard to consultation.
Figure 17  Index of Relative Socio-economic Advantage and Disadvantage (2006)\textsuperscript{xxvii}

Figure 18  Unemployment and labour force participation (2006)\textsuperscript{xxviii}
Scope for regional transformation

*Scope for farm transformation*

The capacity to transform to different commodities is:

- low for transformation to dryland agriculture. Existing farms are 0.5% to 1% of the area required for dryland farms;
- medium for more intensive high value irrigated horticulture such as table grapes, herbs, flowers and vegetables. Farms do not have access to capital for this transformation, but do have access to skills for existing crops;
- medium to high capacity for innovation and adaptation. The key limitations are water security, labour and specialised skills for new crops and markets; and
- high for growth due to the sustainable competitive advantages of water quality, water reliability (in most years), soils, infrastructure, labour, service industries and mix of crops.

Transformation and confidence for investment will need to be underpinned by certainty in water availability and reliability. Water reliability is a high priority. There is concern that climate change will increase crop water requirements and that new varieties are more vigorous with higher water requirements and there is little scope for reductions in water volume required per ha.

*Scope to strengthen irrigation management*

On-farm: Already at a very high level due to drought impacts. There is some concern that insufficient leaching has resulted in higher soil salinities than is sustainable. Therefore, there is a little scope to save water from farm technology.

Delivery system: There is limited scope for water savings in some main irrigation channels. However, most of the supply system is already pipelined. The implementation of the Sunraysia Modernisation Plan Stage 1 is expected to save 4.5 GL/y in the modernisation of Red Cliffs, Merbein and Mildura Irrigation Districts. Stage 2 is expected to save a similar volume. Western Murray Districts are fully pipelined.

Freeing up of water trade rules: The key limitation to water trade is the 4% cap in the Victorian districts of FMID, Red Cliffs, Merbein and Robinvale. This has restricted the sale of entitlements outside of these districts and has not enabled growers to restructure capital in line with drying off of plantings. However, these growers have been able to sell temporary water allocation when not irrigating and data suggests the cap has only affected a small number of growers. The cap is expected to be lifted in increments over the next few years. NSW High Security users historically had a higher level of entitlement at 14 ML/ha compared to Victoria at 9 ML/ha, which for those who have not sold permanent water, has provided additional buffer to low allocations or has enabled them to trade unutilised water. For example, the Western Murray Irrigation Districts of Buronga, Coomealla and Curlwaa during 2008-09 (a year of 97% allocation) experienced net temporary trade out of 23 GL and usage of 26 GL. This reflected both drying off of areas from previous low allocations and the high level of entitlement held. Some irrigators have sold unused entitlement, which has reduced the “buffering” capacity. The private diverter areas also have less capacity as they have either sold spare water or expanded development.
Water availability scenarios - introduction

Description of scenarios

Face-to-face interviews of key stakeholders, and a telephone survey of dryland and irrigation farmers, businesses and community members, were undertaken in the region.

In addition to providing information for the development of the community profile, respondents were asked about the likely impacts of a range of water availability scenarios. These scenarios are not linked to possible Sustainable Diversion Limits; rather, they are intended to test a range of responses from irrigators, and flow-on effects in communities.

The following pages present the results of those discussions.

Water availability scenarios were expressed relative to the long-term cap equivalent water entitlements for the irrigation region. Baseline data are provided below.

The figures below are estimates derived from a range of sources. Usage in the drought years has been above the water allocation issued due to significant water purchases on the temporary market. The need for water purchase in recent years of low allocations has added significantly to production costs and has contributed to decisions taken by some growers to exit the industry. Around 20% of properties have been dried off and the capacity for replanting and renewal is low. Low wine grape prices have been the main driving factor in drying off of vineyards rather than low water allocations. Growers in other commodities have responded by removing barely viable plantings of older citrus and other crops and have either replanted or intend to replant with newer more profitable varieties. Replanting will depend upon the confidence of each industry to be able to purchase water at an economic price.

Table 5 Baseline water data by region (LTCE, approximate, rounded)

<table>
<thead>
<tr>
<th>Region</th>
<th>LTCE allocation volume (GL, approx, rounded)</th>
<th>Drought average use (GL, July 2002 to June 2009)</th>
<th>Buybacks (GL) (already delivered, or committed to)</th>
<th>Efficiency project savings (GL, committed)</th>
<th>Number of irrigators (number, approx)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nyah to Border</td>
<td>700xxx</td>
<td>500</td>
<td>30xxx</td>
<td>&lt;5</td>
<td>3,500</td>
</tr>
</tbody>
</table>

Confidence to replant dried off areas will be dependent upon water availability, water security, and expected commodity prices and water prices. Confidence levels in each horticultural sector are mostly commodity price driven and growers’ confidence is currently improving for all commodities other than wine grapes. The outlook by industry has been reported as follows:

- recent consolidation in the dried fruits industry has left a core of committed growers with a reasonably good outlook;
- citrus growers have responded to low water allocations by continuing to change from juicing to fresh fruit varieties, a continuation of a long established trend, which is beginning to restore profitability to their industry;
- table grape-growers report an optimistic outlook for domestic prices and prospects of export growth for high quality produce;
- vegetables can bring good returns but require highly efficient production systems and good long-term market relationships to be successful (growers cannot switch to these crops quickly);
- planned expansion in almonds was halted however confidence is rebuilding and there is a positive outlook overall; and
- wine grape prices remain well below production costs and the outlook is generally poor with few producers seeing opportunity at the moment.
Annual horticultural crops such as vegetables will buy water until price is prohibitive and will then relocate to lower cost production areas. Perennial horticulture, which is capital intensive, will buy water and dry off plantings depending on the relative profitability of crops and water price. Water reductions of greater than 20% will threaten district viability and critical mass of industries. The wine grapes sector is most at risk due to low profitability. Over the long-term the horticulture will only pay water prices that are economical. These prices will be much lower price than the prices they were prepared to pay for short-term drought, where the cost of maintaining plantings (avoiding high replanting costs) drove decisions.

Table 6 Water availability scenarios — reductions from estimated LTCE entitlement volume

<table>
<thead>
<tr>
<th>Region</th>
<th>Comment</th>
<th>Sector</th>
<th>20% GL</th>
<th>40% GL</th>
<th>60% GL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nyah to Border (including NSW and Vic Sunraysia)</td>
<td>TOTAL</td>
<td>Perennial and annual horticulture</td>
<td>560</td>
<td>420</td>
<td>280</td>
</tr>
</tbody>
</table>

Water availability scenarios — direct impacts (face-to-face interviews)

The response to any permanent and material reduction in water availability is uncertain and will depend upon the long-term profitability of horticulture. At a lower level of reduction, the impacts could be mitigated through water trade providing horticultural commodity prices improve. At higher levels, the need for more water purchase will adversely affect cash flows and growers will exit the industry. This would result in abandoned land and undermine district viability and has planning scheme implications. At the moment the profitability of horticulture is only modest and especially low for wine grapes. A reduction in water availability would result in a reduction in horticultural area, no replanting of dried off areas, and people abandoning properties. This would lead to reduced processing industries and reduced employment in an area where unemployment is already 2% above State averages. However, if profitability in horticulture returns, then the region will be able to purchase water from other areas and expand production as it has over the last fifteen years. There is a strong feeling that any reduction beyond 20% would affect critical mass. But there are mixed views, depending on markets for commodities and water. Some believe that perennial horticulture is more concerned about reliability than the volume of water available and there may be an acceptable level of trade-off between the two. The main concern is the impact of lower water availability on water price and the availability in the lowest allocation year rather than the average allocation.

Irrigation supply systems and on-farm water efficiency is already very high with only minor scope for water savings. There is a strong feeling amongst growers that the region has already negotiated a water sharing arrangement in the 1999 ‘Sharing the Murray’ program where Victorian irrigators gave up access to sales water. They feel that a reduction on top of this demonstrates government going away from the agreement made. There are also differences in projected impacts of reductions on irrigation districts between the two States due to varying water allocation per land area and crop type, and water security and trading rules.
### Table 7  Summary of direct (irrigation) responses to water availability scenarios

<table>
<thead>
<tr>
<th>Region</th>
<th>Key sectors</th>
<th>-20% LTCE</th>
<th>-40% LTCE</th>
<th>-60% LTCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nyah to Border (including NSW and Vic Sunraysia)</td>
<td>Perennial and annual horticulture</td>
<td>Mostly purchase water; some drying off of older and unviable plantings</td>
<td>Drying off of larger areas. Critical mass of many industries threatened. Community District viability threatened</td>
<td>Contraction to smaller industry, mostly located in private diverter areas.</td>
</tr>
</tbody>
</table>

### Water availability scenarios — telephone survey responses

For Nyah to the border as a whole, in the telephone survey conducted for this assignment, 32% of irrigation farmers indicated they would seek to exit if water availability reduced by 20%, with 50% indicating they would seek to exit if it reduced by 40%.

This is substantially higher than those seeking to exit horticulture across the entire Murray–Darling Basin in response to these scenarios (30 and 37% respectively, discussed in the Synthesis Report for this assignment).

![Figure 19 Nyah to the border: telephone survey responses to water availability scenarios](image-url)
Water availability scenarios — value chain and flow-on impacts (face-to-face interviews)

The regional economy is estimated to be $3 million and a large proportion of this is based on the irrigation industry. Value adding infrastructure includes large wineries, packing sheds, juicing factories, transport and supporting industries. The key determinant of the impact will be the relative profitability of horticulture versus the water price for buying in water to maintain the industry. If the water price is affordable then the impacts will be much less.

Some growers are under severe financial stress enduring low land values and high debt. They are angry with government organisations/industry groups with regard to a range of factors including:

- Facilitating the rapid expansion of horticulture e.g. MIS developments out competing districts and ending in oversupply in some markets
- Water trade causing less reliable water security for users
- Allowing food imports into local markets (loss of tariffs)

There is a sense of abandonment by government amongst some members of the community, which will be exacerbated by water reductions.

The region has some strong comparative advantages in distribution, processing and service provision. It has an excellent climate for horticultural production with irrigable and available tracts of cleared land still generating interest in new development. Expansion in horticulture is likely to continue once confidence in the industry returns.

There is expected to be a continuing net transfer of water into the Region as a result of this expansion through water purchase from other regions.

The small block exit grant, however, is seen as a major impediment for redevelopment given the need to remove infrastructure and not irrigate for 5 years. This is an important issue for the viability of community supplied districts.

The Sunraysia Modernisation project was seen as important to improve water service levels and efficiency for growers, which would facilitate higher adoption of new farm irrigation systems.

Table 8 Summary of indirect (flow-on) responses to water availability scenarios

<table>
<thead>
<tr>
<th>Region</th>
<th>Key sectors</th>
<th>-20% LTCE</th>
<th>-40% LTCE</th>
<th>-60% LTCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nyah to Border (including NSW and Vic Sunraysia)</td>
<td>Perennial and annual horticulture</td>
<td>Some loss of plantings resulting in reduced seasonal work and closure of some wineries.</td>
<td>Larger scale losses of plantings and resulting lost direct and indirect employment. Community district viability questionable for some areas. Large scale social impacts would be expected e.g. High unemployment and social costs.</td>
<td>Large scale employment loss and high social impacts. Increase in welfare dependencies. Very large scale social impacts expected.</td>
</tr>
</tbody>
</table>
Figure 20 Map of irrigation district
Endnotes

1 Based on 55,000 ha perennial plantings averaging $10,000/ha (= $550 million)
2 Based on 70,000 ha perennial plantings and vegetables averaging $10,000/ha (= $700 million), plus 20,000 ha of other irrigation at $5,000/ha (= $100 million). Total = $800 m. Prior to the drought the planted area was smaller and cannot be compared with current planted area
3 Estimated from crop area of perennial plantings of 13,385 ha at 14 ML/ha (= 190 GL) and checked against Murray Region High Security which gives 200 GL for Nyah to Border
4 Estimated from crop areas of 7,585 ha field crops/annual cropping at 10 ML/ha
5 Mildura Region Economic Profile 2009 with additional agricultural GVAP for Swan Hill Shire
6 Mildura Region Economic Profile 2009
7 Lower Murray Water (LMW) data from “LMW Annual Report 2008-09”. Western Murray data from Arche Consulting, 2009, Western Murray Irrigation Modernisation Plan (presentation)
8 MJA Socio-economic Survey for MDBA 2010
9 MJA Socio-economic Survey for MDBA 2010
10 MJA Socio-economic Survey for MDBA 2010
11 MJA Socio-economic Survey for MDBA 2010
12 MJA Socio-economic Survey for MDBA 2010
18 ABS 2006
20 ABS 2006
21 ABS 2006
22 ABS 2006
23 ABS 2006a. Note that the Swan Hill LGA was divided between the Nyah to border profile, and the Goulburn Murray profile.
24 ABS 2006b
25 Victorian Water Register
26 ABS 2006b
27 ABS 2006b
29 Buyback from Nyah to Border is unknown, but is estimated to be in the order of 30 GL (assuming 50% of Murray downstream of choke buyback to Dec 2009).
30 MJA Socio-economic Survey for MDBA, March-April 2010. n=132 (-20% scenario), n=120 (-40% scenario). Samples were independent.