Border Rivers community profile

Irrigation region

Key issues for the region

1. Region’s population — the population of the Border Rivers region is approximately 49,646, and the ABS records around 570 irrigating agricultural businesses.

2. Gross value of irrigated agricultural production — the drought affected gross value of irrigated agricultural production for 2006 in the Border Rivers was $350million.

3. Water entitlements (approximate)
   - Surface Water Long-term Cap (long-term average annual extraction volume) 399 GL, to be shared between NSW and Queensland.
   - High Security — 1 GL (NSW).
   - General Security 265 GL (NSW).
   - Supplementary licences 120 GL (NSW).
   - Groundwater entitlements — nominal volume 7 GL (Queensland).
   - Surface water entitlements upper reaches (unsupplemented) — nominal volume 21 GL (Queensland).
   - Surface water entitlements in the lower reaches (supplemented) nominal volume 102 GL (Queensland).
   - Surface water entitlements in the lower reaches (unsupplemented) — nominal volume 210 GL (Queensland).

4. Major enterprises — broadacre furrow irrigation, principally cotton, is the major irrigated enterprise, with cereal crops, fodder crops, fruit and vegetables also grown in different parts of the catchment.

5. Government Buyback — the Commonwealth Government’s buyback in the region has been 7 GL so far.

6. Water dependence — The Border Rivers is highly dependent on water, because agriculture, particularly irrigated agriculture, is a major driver in the economies of Goondiwindi, Stanthorpe and several smaller towns.

7. Current status
   - The Border Rivers is an agricultural region with several large towns, notably Inverell, Glen Innes, Goondiwindi, Stanthorpe and Tenterfield, with relatively diverse economies. Of these, Goondiwindi and Stanthorpe are more irrigation dependent towns likely to be affected significantly by any move to lower sustainable diversion limits. Several smaller towns are even more vulnerable. Because agriculture is the predominant employer directly and indirectly, any impact on that sector also takes its toll on the next largest regional employment sectors, retailing, and health and community services.
• The Border Rivers and the Upper Condamine are the only two working rivers in the MDB given a ’moderate health’ rating by the Sustainable Rivers Audit. With only 12.6% of its catchment behind dam walls, the Border Rivers is essentially a free-flowing system. No new licences have been issued since the early 1990s, and there has been no increase in extractions since 1998 following a policy decision to this effect by the Premiers of New South Wales and Queensland. At 61%, the Border Rivers has the highest percentage of pre-development end of system flows of any of the developed catchments in the Basin. It also has robust environmental flow rules, with a 10,000 ML starting threshold and an absolute minimum of 25% of the total volume of a flow event passing through the system. In a major flood, over 90% of the water flows downstream into the Barwon–Darling system.

• The smaller irrigated agricultural towns are working towns adapted to the variability of water availability; people move if irrigated agriculture is not providing work. Other small towns, such as Boggabilla and Mungindi, have large Indigenous populations with strong links to country. The residents of these towns tend to stay in the region during the good and bad times, living in expectation of employment returning to the region during bad times.

• Reduced water availability because of drought has significantly reduced economic activity in the region over the past nine years. One of the five cotton gins in the region has been mothballed as a result of the drought, while the others are running well below optimum levels.

• The most immediate issue is the potential for business recovery following the drought. The economic prospects for broadacre irrigated production are reasonably sound, but those prospects cannot be realised without water. After several years of low incomes, the proportion of irrigators with high debt levels will find it extremely difficult to recover from the drought.

• Water use efficiency, principally in terms of the cotton produced per ML of total water use, has improved steadily over time. In the Queensland Murray–Darling Basin in 2010, research by the National Centre for Engineering in Agriculture (NCEA) indicates that 84% of all irrigation was carried out by furrow irrigation, 14% overhead spray (lateral move and centre pivot), 1% drip and microspray and 1% other spray. There has been gradual adoption of pressurised irrigation in some regions, but for the great majority of irrigators the reliability of the water is already too low to justify the major capital investment involved in conversion from furrow. Pressurised irrigation also brings with it the risk of increasing energy costs over time. Drip irrigation is generally not favoured for the heavy cracking clay soils common in the floodplain areas.

• Current research by NCEA indicates that broadacre irrigated production on the floodplains of the Queensland Murray–Darling Basin accounts for about 80% of irrigated production overall. The percentage of cotton varies, being 69% of irrigated crop area in 2001–02 but only 53% in 2005/06. Broadacre irrigation excluding cotton accounted for 10% in 2001–02 and 25% in 2005–06. In the more intensive areas, pasture for livestock occupies about 12% of irrigated area, grapes, fruit and vegetables 7%, and other agriculture 3%.
• There is some scope to increase fruit and vegetable production in the upper reaches of the region, but much depends on access to markets and transport economics. These are finite domestic markets already being met by irrigators from areas with comparative advantages. Lucerne and fodder production in the middle reaches might continue to increase in response to growth in the feedlot industries. Nonetheless, it is highly unlikely that these enterprises will make significant inroads into the dominance of the cotton broadacre furrow irrigation industry. Moreover the outlook for cotton production is good. When cotton prices are above $450/bale no other irrigated broad acre crop is as profitable, providing there is sufficient water to support that production.

• Commodity prices will continue to fluctuate. If agriculture were still the large share of exports it was a generation ago, cycles in international prices would be partly offset by changes in exchange rates. The future is uncertain, but the recent rapid growth of mining suggests that future exchange rates will not be significantly affected by the ups and downs of agriculture. By contrast, agricultural profitability will be affected by changes in exchange rates. Agriculture has no choice but to continue to try to adapt as it has in the past. This is made more difficult by costs increasing at a much greater rate than income, and a plateau in efficiency gains as benefits are outweighed by costs.

8. Responses to water availability scenarios
• The relationship between water availability and economic activity is more or less a straight line; the more water available for irrigation, the more economic activity. Consequently, outside the usual concerns about variable water availability, uncertainty about future water security, that is, uncertainty about sustainable diversion limits, is influencing confidence and investment in irrigation enterprises. In particular, uncertainty about the nature of the move to sustainable diversion limits is eroding confidence and investment.

• If any sustainable diversion limit is achieved through buyback, something that local communities are now familiar, but uncomfortable, with, then the remaining irrigators will keep on with business as usual unless buyback triggers the loss of economies of scale e.g. a major contraction in the service sector. For them, yields, quality and productivity may continue to improve, although there is a limit to the gains in these areas. Terms of trade pressures will continue to grow, as they do for all of agriculture. Increasing competition for labour from mining industries will continue to make skilled labour scarcer and it will increase the need for capital efficiency. The mining sector is highly likely to dominate exchange rates for the foreseeable future, leading to a high Australian dollar. Commodity price trends, input price trends and exchange rate trends will continue to drive the search for economies of scale. However, recent research by the Centre for Agricultural and Regional Economics indicates that, for a sample of case study communities (Narrabri, Moree, Narromine, Warren in NSW and a defined region on the Darling Downs in Queensland) where the cotton industry is a significant industry, there has been only slow improvement in overall growth and the development of a more diverse economic structure. The research identifies that growth in specialised agricultural regions can arise from a small number of broadly-defined sources, principally:
  – deriving additional value from the region’s natural resources; and
  – developing new businesses that are primarily based on technology, knowledge and human capital.
• The experience in these regions has been that a decline in the availability of natural resources, particularly water that has been impacted by 15 years of reforms and the long running drought, has curtailed most attempts to diversify regional economies. Businesses based on technology, knowledge and human capital are more likely to establish in “lifestyle” areas closer to the coast. Therefore, any significant reduction brought about by the new SDLs will reduce income and make economic diversification almost impossible to achieve.

• If the sustainable diversion limit were to be achieved through universal cuts to existing entitlements, then the effects on overall economic activity may be much the same, but the number of individuals directly affected would increase. Total transaction costs would be greater with this sort of approach. A series of market adjustments would be required help to consolidate the remaining water on to fewer farms. Irrigators are wary of this approach as they feel it would not give significant recognition to previous reforms (Water-Sharing Plans in NSW and Resource Operation Plans in Queensland) that have already reduced the volumes of water that irrigators can expect to receive, and the reliability with which they can expect to receive those nominal volumes. Irrigators strongly believe that they deserve recognition of what they have already done in working with government since 1994 to improve the sustainability of irrigation.

• Whatever approach to sustainable diversion limits is adopted, people would feel less threatened by the change if they had confidence that environmental benefits were transparent and achievable. People in the region are extremely concerned that there might be a lot of economic pain for little or no environmental gain. They want to understand the potential environmental gains. Since the Border Rivers do not end in terminal wetlands, unlike the Gwydir and Macquarie Rivers, people are genuinely concerned to understand what environmental benefits would be achieved by further reductions to consumptive use given the high end-of-system flows and robust environmental flow rules. They are worried that any water intended for South Australia’s lower lakes would end up being evaporated in the Menindee Lakes or lost to evaporation or groundwater recharge along the way.

• The owners of small businesses in the smaller agricultural towns feel particularly vulnerable to the potential reduction in diversions. Their livelihoods are affected, but they don’t have any control over the decisions to buy or sell water.

Regional overview

The major towns in the Border Rivers region are Glen Innes, Goondiwindi, Inglewood, Inverell, Stanthorpe and Tenterfield. These towns are strategically located on or near the major Brisbane–Melbourne or Brisbane–Sydney transport links. They are popular stopover destination for travellers. Stanthorpe and Tenterfield have the added advantage of being within weekend retreat distance of Brisbane. Consequently, hospitality is a significant part of their economies. Goondiwindi in particular has been identified as a primary transport hub, with five State and National Highways converging at or near the town.

Irrigation is important to Goondiwindi, Inglewood and Stanthorpe; they are likely to be the most severely affected if there is a move to lower sustainable diversion limits. Smaller towns likely to be adversely affected include Ballandean, Boggabilla, Bonshaw, Boomi, Croppa Creek, Mungindi, Talwood and Texas.
Figure 1 Location of irrigation district

Collection District based Irrigation Regions
- capital city
- main town
- state border
- main rivers
- Basin Plan regions

Riverland irrigation districts
Sunraysia irrigation district
Goulburn-Murray irrigation district
NSW Central Murray irrigation districts
Murrumbidgee irrigation district
Murrayland irrigation district
Mogolari irrigation district
Surance irrigation district
Namoi irrigation district
Gwydir irrigation district
Border Rivers irrigation district
Lower Balonne irrigation district
SA Below Lock 1 Irrigation District
Irrigation overview

History of irrigation

The Border Rivers Catchment covers 49,500 km², with around half each in NSW and Queensland. The main streams are Dumaresq River, Severn River (Queensland), Tenterfield Creek, Mole River, Bearyd River, Macintyre Brook, Severn River (NSW), Macintyre River Weir River and Barwon River (an extension of the Macintyre which becomes the Darling above Bourke). The catchment has three distinct zones with widely varying topography: tablelands; slopes; and plains. The catchment has summer dominant, highly variable rainfall, resulting in highly variable river flows between seasons. Coolmunda Dam on Macintyre Brook was completed in 1968, and Pindari Dam, on the NSW Severn River, in 1969. Initially they serviced the now-defunct tobacco industry around Inglewood and Texas. Glenlyon Dam, on Pike Creek, a tributary of the Dumaresq River, was completed in 1976. Pindari Dam was increased from 37,000 ML to 312,000 ML in 1995 in a joint venture between irrigators and the NSW Government.

Today, small-scale crops such as grapes, stone fruit, vegetables and apples are grown in the tablelands near Stanthorpe and Tenterfield and mixed cash crops and lucerne are grown on the slopes in the Inglewood and Texas areas, while cotton dominates the plains between Boggabilla and Mungindi. Broadacre irrigated production, principally cotton accounts for more than 80% of the irrigated area even though the first cotton crop was planted on the Macintyre River as recently as 1977. The cotton industry expanded rapidly in the 1980s and early 1990s, but development slowed in the late 1990s as the NSW and Queensland Governments reached a consensus prohibiting further development in this shared system.

According to the local irrigators’ group, Border Rivers Food and Fibre, once the NSW and Queensland governments decided not to build any new dams, they strongly encouraged irrigators to develop their own storage capacity on farm with assurances that access to ‘high flows’ was guaranteed. There is a strong sense of grievance in the Border Rivers that this access has been reduced over time, and there is a further sense that the SDLs will be yet another episode in this trend. Confidence has taken a severe battering over the last two decades, and the security of a stable water allocation and access regime, if it is ever achieved, is seen to be a long way off. Publicly owned water storages now account for only half the of the total storage capacity on the Border Rivers system, while numerous on-farm ‘ring tanks’ account for the rest.

The entitlements to harvest water into these on-farm storages have now been converted to tradable water allocations with clearly specified conditions, including the:

• flow conditions that determine when water may be taken;
• rate at which water may be taken;
• nominal volume defining each individual’s share of available water; and
• volumetric limit that may be taken over a given period.

These entitlements have been issued in perpetuity as unsupplemented water allocations in Qld, but the conceptually similar supplementary access licences in NSW are subject to change without compensation when the

1 The State of Queensland (Department of Natural Resources and Water), 2008, Border Rivers Resource Operations Plan
Border Rivers Water Sharing Plan expires in 2014\(^2\). As such, the value of the NSW assets is less certain. This is a major source of grievance amongst irrigators. There is disbelief that what they view as two apparently equivalent licences on the same river system are so different to each other in practice.

Cotton growing has been difficult in this region since a long run of wet, albeit variable, years ended in 2001–02. World prices have also declined significantly, and the exchange rate has gone from US$0.60 to near parity. There have been only two reasonable years since 2001. Low rainfall has meant reduced water availability. This has translated into dramatic reductions in the area planted to cotton and consequently dramatic reductions in total production.

**Rural water supply**

**Regional system description**

In the northern Basin, summer-dominant rainfall means much rain during the growing season. If the delivery infrastructure were similar to that in the southern Basin, it would result in numerous "rainfall rejections". The market adaptation has instead been to have private on-farm storage to allow producers to take advantage of episodic flows, and once built on-farm storages were used to harvest overland flows. Evaporation from on-farm storages is very high, but the mix of public and private storages is a rational response to highly variable river systems. On-farm application systems have become more efficient, but most irrigators believe pressurised irrigation systems are uneconomic for cotton. End of valley flows are high in the Border Rivers compared to other regions.

Irrigators in the middle reaches of the catchment worry keenly about reduced water availability. Unlike cotton growers, they can draw on just one type of water entitlement. These low-flow entitlements have been relatively stable during the drought, so irrigators would feel any reduction immediately. By contrast, a return to average rainfall, even with a cut to long-term average water availability, might see cotton farmers, at least in the short-term, being marginally better off than they have been these last several years. In the long-term a reduction in total diversions would make it harder for existing cotton growers to get out of debt and thereby survive in the industry.

**The farm**

Please note: due to low respondent numbers, this profile does not include some of the farm type analysis that was able to be included in other regional profiles.

**Natural capital**

The climate and soils on the floodplains in the lower reaches are very well suited to cotton production. The Border Rivers is in the centre of an area stretching from Emerald to Warren and is one of the premier cotton growing areas in the world because of its latitude, topography, climate and soils. The limiting factors are water, markets and input costs. Irrigated cereal rotations are part of the farming system, but in most years irrigators make their money from cotton. The upper reaches are better suited to lucerne production, vegetables and fruit crops. Large scale changes to the crop mix are thought unlikely, as many years of attempted diversification have produced very few results.

Financial capital

The current run of dry years has played out differently for different irrigators. Much has depended on the age and stage of individual farm businesses. Some growers hit peak debt as total production went well below long-term averages. Those farmers have high levels of debt and limited financial capacity to recover from the drought. Other farmers, with low debt, have been able to contain their costs and wait for the opportunity to generate revenue once water becomes available. For most irrigators in the Border Rivers, the opportunities for increasing off-farm income are low.

Human capital

The levels of stress amongst farming families have increased over the last five years. A continuation of those conditions would see considerable adjustment and fewer farmers. A further reduction in water availability would compound these strains. This is accompanied by a very flat market, with many farms for sale but few, if any, buyers. Lower SDLs would further affect those irrigators already struggling in the Border Rivers.

Outside the large centres, there is limited capacity to support farming families through further change. Wherever possible, irrigators have tried to retain their skilled staff. There are high opportunity costs associated with having water available without skilled staff to help convert this water into irrigated commodities.
**Financial ratios**

Debt to equity ratios have increased because low water availability during the drought has reduced the potential to generate on-farm revenue. By contrast interest payments and fixed overhead costs mean that there is a need for regular cash flow which has been notably lacking in recent years.

**On-farm irrigation water use**

**Irrigation application methods**

Drip irrigation is used for fruit and vegetable crops in the upper reaches, but the vast majority of cotton is furrow irrigated. Drip irrigation is generally considered to be unsuitable for heavy, self-mulching, clay soils. Overhead sprays are commonly used on lucerne. Changes over the last five years have mostly focused on decisions around the right time to irrigate and the right volume to apply. This has improved efficiency. Technically, more efficient systems are possible for cotton, but they come with almost prohibitive extra costs. Water logging and salinity are not significant problems. In theory, efficiency can continue to improve. There may be scope to limit evaporation from on-farm storages, and a return to profit may see some conversions from furrow irrigation to lateral moves and centre pivots.

Most cotton farms depend on river pumps, ring tanks, open-channel conveyance systems and siphon-fed furrow irrigation. Groundwater pumps are an important adjunct in many places. The efficiency of furrow irrigation has increased by applying water at faster rates and by irrigating only every second row.

**Opportunities/trends**

Reduced water availability combined with the potential to sell water entitlements will continue to encourage improvements in water use efficiency, however the speed of these improvements will be limited by cash flow. The cotton industry is actively researching the potential to reduce evaporation from on-farm storages by making them deeper to reduce the surface area to volume ratio or through the application of thin monolayers to the water surface. There is potential to significantly reduce existing evaporation losses. The main technical problem is wind shear of the monolayer films; wind-induced wave action breaks the films up and allows evaporation to continue.

**Water entitlements**

As with the other valleys in the northern Basin, irrigators in the lower reaches of the river, where large on-farm storages are viable, rely on a mix of three sources of water to meet their needs. On allocation entitlements (General Security in NSW and Supplemented water allocations in Qld) allow them to order water for delivery from the headwaters dams. Off allocation entitlements (Supplementary access licences in NSW and Unsupplemented water allocations in Qld) provide access to flow events according to the rules in the respective state water plans which have been coordinated through interstate agreement. Water pumped from the rivers is stored in large on-farm dams. These same dams are used to harvest water from the third source, overland flows, commonly referred to as floodplain harvesting. Typically this water comes from out-of-bank flows from the rivers during floods rather than water from local rainfall moving across country to the rivers. There is a cap on floodplain harvesting in both states, with infrastructure controls in Qld and a licensing process currently under way in NSW.
Soil moisture measurement

Soil moisture is monitored in the region using capacitance probes. The scope to improve water use efficiency through improved soil moisture monitoring is being continuously refined. The adoption of this technology is very high in the cotton industry relative to other extensive irrigated crops.

Irrigation timing

Best practice irrigation management is about applying the right amount of water at the right time. Irrigators use their understanding of soil moisture levels and evaporative demands to guide their decisions about when to irrigate. The aim is to apply irrigation water late enough to ensure that the technical limits of the application method will not result in water logging, but not so late that the crop suffers from moisture stress.

Regional agricultural production

Regional agricultural value chain

Because agriculture is the biggest employer, climate variability is a major economic driver; the people of the Border Rivers depend on the returns from good years to help them ride out the bad years.

The ups and downs of the irrigation industry have a big impact on other sections of the regional economy. Relative to other agricultural industries a higher proportion of the income generated from cotton goes outside the region. These funds are spent servicing debt and purchasing inputs directly from suppliers outside the region. However the total revenue involved is so large, that what does stay in the regional economy drives many other economic activities and supports many jobs. Low water availability over the last five years has seen a drop in the number of people directly employed in irrigated production. Labour problems have been mitigated somewhat by the almost universal move to genetically modified cotton and the emergence of more efficient picking systems (bales rather than modules), but a return to normal seasons is expected to stretch the available workforce to or beyond its limits.

Water availability is the major constraint for irrigated agriculture. As just one example, there are five cotton gins in the region, two near Goondiwindi, two near Mungindi, and one between Talwood and Boomi. Therefore, at face value, a sustainable diversion limit that reduced long-term average water use by 20% might result in the closure of one gin. A 40% reduction might see two close and a 60% reduction, three or more as economies of scale are reduced. A reduction in irrigated agriculture would profoundly shock Goondiwindi’s economy, and it would have an even bigger impact on small centres like Mungindi, Talwood and Boomi. These are working towns and people move away if there is no work. Reduced water availability would therefore put a big dent in the demand for the existing scant retail and service sectors in those towns. This would make it harder again for farmers in the more remote parts of the catchment to attract and retain skilled workers, especially those with young families desiring ready access to schools and other services. Any gin closures would also change transport patterns, possibly incurring significant costs in road maintenance.
Figure 3 Gross value of agricultural production (GVAP) (2006)\textsuperscript{\textregistered}

Figure 4 Gross value of agricultural production (GVAP) $/ML of water used (2006)\textsuperscript{\textregistered}
The region’s community

Figure 5 Level of highest school education (2006)

Figure 6 Higher education (2006)
Figure 7  Employment (2006)

Figure 8  Nominal income (2006)
The region’s community — education, employment and income

Community overview

Goondiwindi is the major service centre for the irrigated parts of the Border Rivers. It has a somewhat diversified economy, but is still largely dependent on agriculture in general, and irrigated agriculture in particular. It is an important transport hub and has a significant highway-based hospitality industry. As the regional centre, Goondiwindi attracts retirees from surrounding parts of the region. Stanthorpe and Tenterfield, the other major towns, attract retirees from the eastern end, but irrigation has less impact on their economies. Stanthorpe and, to a lesser extent, Tenterfield are within weekend retreat and telecommuting range of Brisbane. Irrigation is a significant part of the local economy for Inglewood and Texas. Boggabilla is home to a large Indigenous population with significant economic and social links to Goondiwindi.

The region’s community — demographics and key statistics

Table 1  Demographics and key statistics (LGAs within study area, 2006)

<table>
<thead>
<tr>
<th>Population</th>
<th>Balonne</th>
<th>Glen Innes</th>
<th>Goondiwindi</th>
<th>Gwydir</th>
<th>Inglewood</th>
<th>Inverell</th>
<th>Millmerran</th>
<th>Moree Plains</th>
<th>Stanthorpe</th>
<th>Tenterfield</th>
<th>Waggamba</th>
<th>Total</th>
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<tr>
<td>Total Indigenous persons</td>
<td>103</td>
<td>7,753</td>
<td>4,718</td>
<td>622</td>
<td>2,532</td>
<td>13,844</td>
<td>851</td>
<td>2,224</td>
<td>10,107</td>
<td>4,142</td>
<td>2,750</td>
<td>49,646</td>
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<td>Farm and farm managers</td>
<td>5</td>
<td>416</td>
<td>256</td>
<td>22</td>
<td>102</td>
<td>780</td>
<td>16</td>
<td>749</td>
<td>206</td>
<td>233</td>
<td>35</td>
<td>2,820</td>
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<td>Farm and farm managers as percentage of total employed</td>
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<td>342</td>
<td>74</td>
<td>154</td>
<td>225</td>
<td>484</td>
<td>108</td>
<td>230</td>
<td>479</td>
<td>212</td>
<td>414</td>
<td>2,726</td>
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<tr>
<td>Households</td>
<td>10%</td>
<td>12%</td>
<td>3%</td>
<td>48%</td>
<td>20%</td>
<td>9%</td>
<td>30%</td>
<td>28%</td>
<td>11%</td>
<td>13%</td>
<td>29%</td>
<td>13%</td>
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<tr>
<td>Dwelling</td>
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<tr>
<td>Fully owned</td>
<td>31%</td>
<td>25%</td>
<td>26%</td>
<td>15%</td>
<td>20%</td>
<td>27%</td>
<td>23%</td>
<td>14%</td>
<td>26%</td>
<td>23%</td>
<td>24%</td>
<td>25%</td>
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<tr>
<td>Being purchased — directly or rent/buy scheme</td>
<td>12%</td>
<td>23%</td>
<td>36%</td>
<td>10%</td>
<td>21%</td>
<td>25%</td>
<td>11%</td>
<td>35%</td>
<td>23%</td>
<td>23%</td>
<td>12%</td>
<td>24%</td>
</tr>
<tr>
<td>Rented</td>
<td>27%</td>
<td>2%</td>
<td>2%</td>
<td>26%</td>
<td>7%</td>
<td>3%</td>
<td>8%</td>
<td>12%</td>
<td>3%</td>
<td>3%</td>
<td>18%</td>
<td>5%</td>
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<tr>
<td>Community services and wellbeing by remoteness</td>
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<td></td>
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<tr>
<td>Population per education employee</td>
<td>34</td>
<td>23</td>
<td>26</td>
<td>69</td>
<td>27</td>
<td>20</td>
<td>28</td>
<td>37</td>
<td>25</td>
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<td>Population per health employee</td>
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<td>352</td>
<td>278</td>
<td>0</td>
<td>60</td>
<td>220</td>
<td>0</td>
<td>371</td>
<td>230</td>
<td>197</td>
<td>688</td>
<td>271</td>
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<tr>
<td>Population per culture and recreation employee</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
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</table>
Figure 9 Regional issues

Note: 1 = No problem to 5 = Significant problem. Number of respondents = 55

Figure 10 Optimism (regional people)

Note: 1 = Completely dissatisfied to 5 = Completely satisfied. Number of respondents = 55
The regional economy

*Regional economic structure*

Agriculture, retailing, health and community services account for most employment in the region. Inland tourism, retiree settlement, tree-changers, and coal seam gas development may offer some scope for growth, and diminished dependence on agriculture for Goondiwindi, Stanthorpe and Tenterfield. However, Goondiwindi’s amenity and its attraction to new residents, depends on continuing access to water. Moreover, as research by the Centre for Agricultural and Regional Economics indicates, regional development is not easy to achieve in regions with specialised economies.

Boggabilla, Bonshaw, Boomi, Croppa Creek, Mungindi, Talwood and Texas are heavily dependent on irrigated agriculture.

Main future risks, opportunities and constraints to the major industries

Cotton has reasonable prospects for the future, provided there is adequate water to support its production, markets are favourable and input costs stabilise.

Fresh fruit and vegetables from Stanthorpe will continue to find a ready market in Brisbane. Wine production there will continue to add to its appeal as a weekend retreat.

Growth in the feedlot industry would further augment demand for crop and fodder production around Inglewood and Texas.

Figure 11  Industry segmentation (2006)*

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* *
Regional response over the last five years

Water shortage

Water shortages have had a very high impact in the Border Rivers over the past five years, having substantially reduced incomes and made the business of irrigated production very difficult. Seasonal conditions and the regulatory regime will largely determine whether the irrigation industry ever regains its former role as a strong supporter of the local, regional, state and national economies.

Regional response

In general, irrigators have scaled back production and tried to minimise costs. They have taken what opportunities they can to diversify into other crops, but there is very limited potential for them to transform their businesses. Most irrigation farms are too small to be viable dryland enterprises, and there is a pressing need to generate a return from existing investments in on-farm water infrastructure so that equity to debt ratios can be improved. Cotton is where there is the most potential to be viable in the long-run. The future for the cotton industry hangs in the balance, with the current Basin-wide reforms a decisive factor in how the future evolves.

Relative to the southern Basin, water trade has played a limited role in managing the risk of drought. In each of the northern valleys, cotton is the dominant crop, diminishing the scope for individual irrigators to swap risks with each other. By contrast, in the southern Basin, horticulturists and dairy farmers have been able to buy water from rice farmers. This has allowed the horticulturists and dairy farmers to maintain their enterprises, and it has allowed rice farmers to make more money from selling their limited allocations than they would have by using it.

For larger cotton farming enterprises, one risk management strategy has been to have a presence in more than one valley, which has helped to ride out the variability. Within each valley there has been some consolidation of water from several farms on to individual farms held in the same ownership. Often the chosen farm offers better water use efficiency, but sometimes it might be the one closest to the gin, thereby helping to contain transport costs. There has also been some trade from the mid-reaches of the system, Inglewood and Texas, to the lower reaches.

Some cotton farmers have now run down the equity in their businesses and will struggle to recover from the drought. A long-term reduction in the average amount of water available for irrigation will see a decrease in the total number of farm businesses and a corresponding contraction in the regional economy, with all the attendant social consequences.

Regional vulnerability

Regional vulnerability

A few of the larger towns in the region have somewhat less specialised economies and are therefore less vulnerable than the many smaller towns and the towns that are heavily dependent on irrigated agriculture. The very high labour force participation rates in some parts of the region show that these are working towns and people will move out if there are no employment opportunities.
Regional water dependence

The region is vulnerable to changes in sustainable diversion limits because irrigated agriculture plays a prominent role in the regional economy. Irrigation is important to Goondiwindi, Inglewood and Stanthorpe and these towns would be seriously affected by the move to lower sustainable diversion limits. Smaller towns certain to be affected include Ballandean, Boggabilla, Bonshaw, Boomi, Mungindi, Talwood and Texas.

Community resilience to change in water allocation

Community resilience to changes in water allocation is low in the small irrigation dependent towns. Larger towns such as Goondiwindi have slightly more capacity to adapt, but they too are dependent on water to maintain amenity and viability.

Scope for regional transformation

Scope for farm adjustment in response to low water availability

There is very low if any capacity for cotton farms to transform profitably into the production of different commodities or specialty crops under current circumstances. Attempts to shift to large scale vegetable production have failed in the past, mainly because of marketing difficulties. Moreover, these crops are typically grown closer to markets. Some specialty crops have been successful (e.g. seed production, gritting corn grown under contract for the thoroughbred industry), but these are niche markets with very limited demand. There is no large scale crop other than cotton that can be irrigated for profit.

Scope to strengthen irrigation management

There is limited scope to improve irrigation management. Further changes are likely to be evolutionary rather than revolutionary. An active program of efficiency improvements now appears to have plateaued. Reduced water availability may result in some consolidation of farms and the cessation of irrigation on some marginal lands.

Water availability scenarios – introduction

Description of scenarios

Face-to-face interviews of key stakeholders, and a telephone survey of 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 (LTCE) water entitlements for the irrigation region. Baseline data are provided below.
Figure 12 Index of Relative Socio-economic Advantage and Disadvantage (2006)

Figure 13 Unemployment and labour force participation (2006)
Cap baseline conditions, as agreed under the Murray–Darling Basin Agreement, for the Border Rivers is the level of development at 1993–94 with an allowance for an enlarged Pindari Dam. This is deemed to be equivalent to the water use development that existed in November 1999. An assessment of the long-term average annual extraction that would occur under the conditions for NSW and Queensland has been made using the Border Rivers IQQM computer model which indicates a long-term average annual extraction volume of 399,400 ML to be shared between NSW and Queensland. This has been rounded to 400 GL for the purposes of illustrating different scenarios in this profile.

It is important to note that these figures do not include the volumes harvested as overland flows, these are estimated to average 13 GL.

Table 2  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>Border Rivers</td>
<td>400</td>
<td>250</td>
<td>2</td>
<td></td>
<td>570</td>
</tr>
</tbody>
</table>

This profile uses a range of scenarios of possible changes in water availability to support discussions (20%, 40% and 60% reductions against the long-term average).

Table 3  Water availability scenarios — reductions from estimated LTCE entitlement volume

<table>
<thead>
<tr>
<th>Region</th>
<th>Sector</th>
<th>20% GL</th>
<th>40% GL</th>
<th>60% GL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Border Rivers</td>
<td>Not differentiated</td>
<td>320</td>
<td>240</td>
<td>160</td>
</tr>
</tbody>
</table>

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

Cotton accounts for more than 80% of the irrigated area. The relationship between water availability and economic activity is more or less a straight line; the more water available for irrigation, the more economic activity. Under the 20% scenario irrigators would initially scale-back production and try to minimise costs. Irrigators would take what opportunities they could to grow crops opportunistically, but there is very limited potential for business transformation. Most farms are too small to be viable dryland enterprises, and most farmers want to generate a return from their existing investments in on-farm water infrastructure. Cotton is where they have most potential to make money in the long-run and the future for the cotton industry is bright if there is enough water to produce a viable crop. The 20% scenario would affect profitability and would see some people leaving farming. The 40% and 60% scenarios would result in major changes. A series of market adjustments would consolidate the remaining water on to fewer farms.

Table 4  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>Border Rivers</td>
<td>Cotton, horticulture, livestock</td>
<td>Reduced profitability, scaling back of production, efforts to reduce costs, many exiting irrigation, resulting in water market adjustments.</td>
<td>Significant cuts in production and consolidation of water onto fewer farms through water market adjustments.</td>
<td>Further significant cuts in production and consolidation of water onto many fewer farms through water market adjustments.</td>
</tr>
</tbody>
</table>
Figure 14 Map of irrigation district
Water availability scenarios — value chain and flow-on impacts (face-to-face interviews)

Communities

A reduction in irrigated agriculture would shock Goondiwindi’s economy. It would have an even bigger impact on small centres, which could be reduced to welfare-dependency and a reduction in services. This would make it harder again for farmers in the more remote parts of the catchment to attract and retain skilled workers, especially those with young families desiring ready access to schools and other services. The owners of small businesses in the smaller agricultural towns would be particularly vulnerable to the potential reduction in diversions. Their livelihoods would be affected, but they don’t have any control over the decisions to buy or sell water.

Table 5 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>Border Rivers</td>
<td>Cotton, horticulture, livestock</td>
<td>Significant loss of economic activity in water dependent communities</td>
<td>Major loss of economic activity in water dependent communities and significant loss of activity in more diverse centres</td>
<td>Catastrophic loss of economic activity in water dependent communities and major loss of activity in more diverse centres</td>
</tr>
</tbody>
</table>

Endnotes

1. MJA Socio-economic Survey for MDBA 2010
16. Published figures from the Commonwealth Government were used to estimate buybacks.
17. Note that due to insufficient respondent numbers for responses to water availability scenarios, that output from the telephone survey is not included here. Please refer to MJA’s Synthesis Report for information about survey outcomes.