

Water Advocacy Paper

'The connection of water to people and place'

MURRAYLANDS RIVERLAND
LOCAL GOVERNMENT ASSOCIATION



**Murraylands and Riverland
Local Government Association**



Australian Government

**Department of Infrastructure, Transport,
Regional Development, Communications and the Arts**

This project was supported by the Building Better
Regions Fund of the Australian Government.



Murraylands and Riverland Local Government Association

An initiative of the MRLGA and member councils .

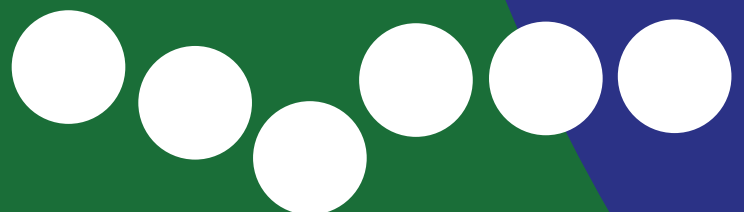


First Nations Acknowledgement

The Murraylands and Riverlands Local Government Association (MRLGA) acknowledges and respects First Nations people as the state's first peoples and nations and recognises First Nations people as traditional owners and occupants of land and waters in South Australia. We acknowledge their deep cultural, social, environmental, spiritual and economic connection to their lands and waters.

First Nations peoples' spiritual, social, cultural, and economic practices come from their lands and waters, and they continue to maintain their cultural heritage, economies, languages and laws which are of ongoing importance.

The MRLGA wishes to pay its respects to First Nations culture, and to Elders past, present, and emerging.



Forward

Water is the lifeblood of the Murraylands and Riverland region and the Murray Darling Basin.

The Murraylands and Riverland Local Government Association (MRLGA) is formed from a cooperation of eight constituent councils including Berri Barmera Council, Coorong District Council, District Council of Karoonda East Murray, District Council of Loxton Waikerie, Mid-Murray Council, Renmark Paringa Council, Rural City of Murray Bridge and Southern Mallee District Council. Together, it recognises the importance of water to the region. It also acknowledges the important role that the MRLGA and its eight constituent Councils has and can continue to show in water use efficiency and stewardship.

The MRLGA knows the region is dependent on water resources and the future reliability is under pressure. It supports the water reform that has occurred across the region (and broader State and Basin) over the last decade, including the aims of the Basin Plan – but it knows more will be required to ensure the region continues to thrive sustainably, economically and environmentally.

The Commonwealth govern water legislation while each State develops ancillary policy for water allocation, management and use. So in many respects, water is not the primary business of the MRLGA, it knows that for the region, water underpins everything. Without it, its communities, economy and flora and fauna would not survive. Everything the region does is related to, linked to, or supported by, its water resources. Therefore, the MRLGA and elected members from its Constituent Councils sought to understand how they can represent their communities to support the region to achieve its strategic and long-term aspirations.

For this reason, the eight constituent Councils who form MRLGA embarked on a journey to build a shared understanding of the value of water in the region and its future. To enable this, they formed a working group Chaired by Cr Andrew Kassebaum (Berri/Barmera Council) and comprised of key members of local government and the Murray Darling Association (MDA) and engaged an external consultant to assist in preparing a Regional Profile (RP) and this Advocacy Paper.

This Paper is a strategic document that aligns with and supports the MRLGA 2020 25 Strategic Plan. It aims to demonstrate the vital connection of water to people and place and provide guidance for advocacy in the context of a complex network of state and national legislation and governance arrangements.

The MRLGA knows that it is at the beginning of this journey and that this Paper will not resolve all the challenges it will face in the future. It is committed to continuing to engage with its communities to increase awareness and understanding of the value of water and proactively collaborate with its partners to advocate in the best interest of communities. It understands that water affects everyone, and it is committed to ensuring that it supports its communities as best as it can.

It thanks those that have provided valued contributions to the paper. It knows that future water reform, in the face of pressures from a changing climate, reduced water availability and increased demand, will not be easy. The region will continue to rise to these challenges – and this Paper provides a central voice for the MRLGA and its constituent Councils to proactively advocate for the region and future water reform.

Mayor Caroline Phillips
President, MRLGA

Cr Andrew Kassebaum
Chair, MRLGA Water Advocacy Paper Working Group

Contents

Part 1. Introduction	3
About the region	3
Part 2. Planning for the future	5
Water-related challenges	5
Part 3. MRLGA's water advocacy approach	7
Principles	7
Governance	8
Advocacy areas of focus	9
Closing remarks	16
Appendix 1	17



Part 1. Introduction

Water is the lifeblood of the Murraylands and Riverland region. The growth and development of the region has, in many respects, been shaped by its water resources which support it, particularly the River Murray. But like many regions situated in the Murray Darling Basin, there have been many challenges and changes. For the region to continue to grow and thrive, water is crucial, and therefore the MRLGA will advocate for processes that demonstrate evidence to support the fragile balance between economy and environment as it relates to supporting a connected, resilient, healthy and economically growing region. This Water Advocacy Paper has been prepared in acknowledgement of the important role that water plays in the future of the region, and to ensure that local government is positioned and prepared to proactively contribute to future discussions about water for the benefit of all users in region.

The purpose and intent of the MRLGA's Water Advocacy Paper (and supporting Regional Profile (RP) is to:

- Acknowledge the connection of water to people and place and document the significant reliance the region has on it to build strong thriving communities across the region.
- Assist its eight constituent Councils to have coordinated responses to the 2024/25 Murray Darling Basin Plan Review, as well as other engagement opportunities that arise.
- Offer principles for leadership and future advocacy, particularly for times when water debates may become politicised.
- Begin to define the role local government can play in helping outcomes that benefit the region.
- Better understand the governance structure for the Murray Darling Basin and as such identify advocacy opportunities

The MRLGA acknowledges there can be competing needs regarding water resources and management, and this is not limited to the region, but occurs across States and the Basin. These competing priorities can present challenges for local government to advocate effectively to ensure their contribution is beneficial, balanced, clear and consistent. The MRLGA is committed to continuing to listen, participate and advocate for water management outcomes that benefit the region.

This challenge extends to local government not having any legislative responsibilities for the management of water, yet it is often a local touch point for communities to ask for help, query government decisions, seek support or respond to media inquiries that relate to community impacts.

The creation and initiation of an advocacy paper for the MRLGA's eight constituent Councils is a step forward in their leadership to act with collaboration, and as a connected region at the Local Government level. It is aware that it is in its infancy with the journey, and that this document will serve as a starting point.

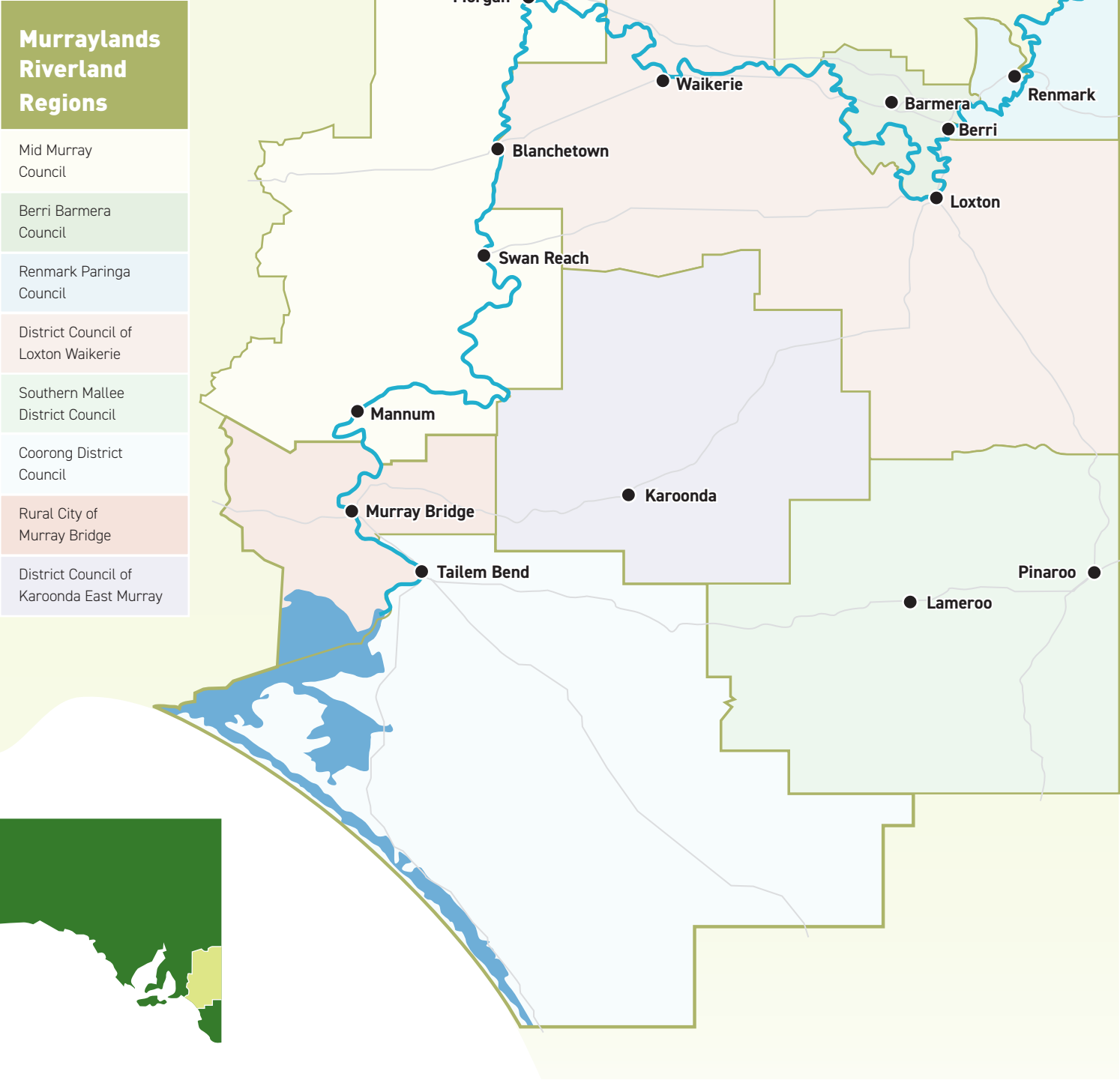
It is intended this document is updated on an as needs basis to reflect the views, opinions and principles of the MRLGA as a whole.

About the region

The Murraylands and Riverland region of South Australia (Figure 1) is home to over 73,000 people and is renowned for its premium wine and food production, including citrus, almonds, and vegetables, for export both domestically and internationally. It boasts several of South Australia's premium tourism destinations, including the Coorong, River Murray, Dark Sky and more, and is home to significant environmental and cultural assets, and a strong First Nations connection. These natural assets rely on water and therefore the management and protection of these water resources is crucial to the long-term growth and prosperity of the region.

The Murraylands and Riverland region has and will continue to evolve and change. The population is aging and moving, industries are shifting and evolving, and our climate is changing. Collectively, this is placing pressure on water resources and changing how we use and manage these resources. For the region to continue to grow and thrive into the future, we will need to use water wisely and manage it for a more variable climate. New technologies and ways of doing business present us with the opportunities to achieve this, but the region will need to ensure that it is able to embrace these opportunities. This means having the right people, technologies, policies, and management in place.

Figure 1. The Murraylands and Riverland region



Part 2. Planning for the future

Water-related challenges

This advocacy paper has been developed through a process of research and engaging with key stakeholders (Appendix 1 List of consulted stakeholders) to better understand the challenges facing the region, and how the MRLGA can respond as a local government subsidiary, representing eight constituent Councils. This paper should be read in conjunction with the Regional Profile (RP) that was developed as part of this work. The RP provides a comprehensive overview of the region's water resources, how it is used and managed, trends that are driving change across the region, and highlights some of the water-related challenges that the region will need to contend with.

These challenges include:

- **Changing climate** which is driving increased temperatures, more extreme events, biosecurity risks and reduced water availability
- **Changing population** including an aging and more diverse population and a redistribution towards larger towns and changing land ownership and use
- **Global trade, export and business conditions** changing what and where products are grown and produced and providing both challenges and opportunities
- **New technologies**, data, and ways of doing business and communicating
- Changing and evolving **community values, beliefs, and attitudes**.

The Regional Profile also considered how these trends will influence water management in the future and identified nine challenges (as described over the page). These challenges by no way cover all the issues or topics relating to water management, but rather reflect those which the MRLGA considers important to address to ensure water resources can continue to support the long-term resilience and growth of the region. The table below briefly summarises the water related challenges identified that collectively will impact water management and use in the region. Each of these are further explored in the Regional Profile.

The MRLGA has reflected on these challenges to inform the advocacy opportunities outlined in Part 3.



Challenge	Current and emerging themes
 Reduced availability of water	As a result of both climate change, periods of drought and water recovery, water availability from all sources is expected to decline (in regards to commercial or human use). This will occur in an environment that is hotter and where there are more extreme events. This will result in increased demand for increasingly scarce resources. Within this context it is anticipated that the overall cost for water will increase, and the reliability of supply, particularly those from climate dependant sources will reduce. Therefore, the region will likely need to learn to adapt to an environment where water is more expensive and less reliable.
 Changing demand and use of water	As a result of changing global demand for products, the cost of water and changes to how irrigators manage their water needs, has, and continues to change what is grown where. This is both changing the distribution of water supply across the region, but also increasing the demand for water. This trend is occurring across the Basin. This trend combined with a long-term reduction in water availability is increasing the risk that many irrigators will be more exposed to fluctuating water market conditions and prices, which may reduce their resilience in times of drought.
 Limited opportunities for further gains in water efficiency	The Murraylands and Riverland region has for a long time been a leader in water use efficiency and stewardship. The changes to how water is distributed and used over the last 50-70 years has set the region up as one of the most efficient in Australia. However, this achievement also comes with the challenge of how to find further efficiency gains. This considering a future where there will be less reliability and higher costs of water will make it difficult for the Region to make further significant gains. Therefore, it will need to continue to invest in further research and innovation and find new ways of using water efficiently.
 Complexity impacting decision making at all levels	Water management is complex. It involves multiple layers of government and numerous stakeholders. How water is allocated and traded is also complex, particularly in the Basin. For those whose water management is not their core business, this complexity can make good decision making difficult. While there has been progress made to improve the communication and literacy of water users, this issue remains. Providing easy access to consistent information is important as too is reducing misinterpretation. But so is making sure that all States are as consistent as possible in the water policies, products and approaches to water management and allocation.
 Politicisation of water management	Because water is so important to so many industries and communities it has often become a political issue. This is compounded by the complexity of how water is managed and used and the layers of government legislation and policy. But this politicisation holds back good management and decision making. It contributes to short term policies and the growing mistrust held by some communities. To effectively manage water sustainably for the long term requires bi-partisan support and trust. We all will need to work together to re build this if we are to be successful.
 Regional town water security	The MRLGA wants its regions to grow and attract new people. It also wants to diversify its economy and attract new industries. But to do this its towns require safe, reliable sources of water. Many of the regional towns are reliant on either groundwater or the River Murray. Both are increasingly under stress. These towns will need to start to consider if they are water secure, and how they can better use their existing resources and possibly identify new sources of water.
 Ensuring that the region is not left behind	While water is fundamental to the future of the region, so are many other factors such as housing, jobs, infrastructure, and internet connectivity. These underlying factors can either enable the region to embrace new opportunities or, if not addressed hold the region back. These factors are open for local government to influence, drive, fund, support and/or be part of solutions. Continuing to address these, it will ensure the region is well positioned to take on new challenges and opportunities brought about by changing conditions.

Part 3. MRLGA's water advocacy approach

The MRLGA knows that it is not a water expert, but it also understands that it and its constituent Councils have an important role to play in advocating for its communities. It is within this context that the MRLGA has developed the following advocacy principles and opportunities. Collectively these provide a platform for the MRLGA and its Councils to play a role in advocating for change across seven key focus areas fundamental to water reform and broader community resilience.

Principles

The MRLGA acknowledges that water is a shared resource, and it is an enormous challenge to drive collective action. To support its communities, Constituent Councils, and the region more broadly, the MRLGA has prepared a set of advocacy principles. These principles inform advocacy opportunities and represent the values and approach the MRLGA will lead by to seek outcomes and/or work through challenges.

MRLGA Advocacy Principles



Inclusive water management - Water is vital to the health and resilience of the region, its people, its industries, its environment, and its economy. Therefore, it is in the interest of all to be better informed, aware, and involved in how water is stored, used, managed, owned, traded, leased, purchased, locally and state-wide. The MRLGA is committed to continuing to listen, participate and advocate for water management outcomes that benefit the region and supporting inclusive decision-making for all.



Sustainability - The future sustainability of the region's water resources is under threat and the MRLGA is committed to working towards supporting the sustainable management of all water resources in the region (including the sustainability of irrigation trusts), now and into the future.



A whole of Basin approach - The management and long-term sustainability of the Murray Darling Basin requires an integrated and whole of system approach where we make decisions for the whole of the Basin, and not just parts. Only with this will we be able to build long-term resilience of the Basin, which in turn will build long term resilience of the Murraylands and Riverland economy, communities, and the environment. This means all levels of government and stakeholders need to work together to build trust and drive a holistic approach to managing water across the Basin.



Open and transparent communication with stakeholders - The MRLGA is committed to working with stakeholders to be transparent, honest and open about challenges and opportunities for the region, ensuring it works collaboratively with stakeholders across the region to support inclusive decision-making.



Adapt - There is and will continue to be change. As the challenges evolve and change, so do the technologies, policies, and solutions. Change can be difficult, and communities need to be informed and supported to adapt to change.

Governance

The creation and initiation of an advocacy paper for the MRLGA's eight constituent Councils is a step forward in their leadership to act with collaboration and as a connected region at the local government level. The MRLGA is aware that it is at the beginning of this journey, and that this document will serve as a starting point.

Water is a complex topic. The MRLGA is keen to build greater awareness, knowledge, support, governance and influence about water resources and management to support its region and the broader needs of the Basin. Currently, the MRLGA recognises the importance of planning for changing water security and stewardship as part of its Strategic Plan 2020-25. But to enable proactive planning, the MRLGA needs to work together towards a consistent and holistic vision for the region over the next five, 10 and 20 years (and beyond).

While the MRLGA recognises that water is only one part of its Strategic Plan, it is an important one. The economic development and prosperity of the region is tightly coupled with water availability and use. In achieving its strategic vision of 'attractive, liveable region – prosperous communities', the MRLGA and its Constituent Councils need to elevate the role of water as the lifeblood of the community and the key contributor towards the region's future prosperity.

The MRLGA acknowledges that responding to water-related challenges across the region, and the Basin more broadly, will face in the future requires a strong, central voice for water advocacy in the region. While each Council may differ, the MRLGA and its Councils must unite to be able to advocate for unified and clear opportunities in a complicated water reform space.

To move forward, MRLGA and its Constituent Councils are committed to:

- **Working efficiently together** to enable a strong voice, adopting the advocacy principles to unite the MRLGA and its Constituent Councils
- **Developing an advocacy structure** that supports the region to deliver a central voice from Local Government on the Murray Darling Basin. This structure will consider how the MRLGA can partner with existing advocacy bodies, such as the Murray Darling Association regions 5 and 6, to advocate for opportunities for the region.
- **Developing a vision** for water advocacy in the region endorsed by the MRLGA Board. This will ensure that, despite the challenges occurring in the region, the region will be able to maintain focus on a collective end goal. This will enable a sustainable management of water resources, while simultaneously driving resilient, connected, and healthy communities.



Advocacy areas of focus

The achievement of a resilient region and Basin relies on the continuous and meaningful support of all levels of government. MRLGA is committed to advocating for these areas on behalf of its region to support the sustainable management of all its water resources.

The following section outlines the issues and areas of focus opportunities MRLGA will take to advocate for good water management that supports its communities and region. The MRLGA has identified seven areas of focus to advocate for change to support the region. Each of these areas relate directly to one or more of the challenges described above.

Murray Darling Basin Plan and reform

The MRLGA acknowledges the complexity of managing water in the Basin, and the work already undertaken by Commonwealth and State Governments. The MRLGA supports the implementation of the Basin Plan and its objectives. It also acknowledges the challenges in relation to meeting the needs of various users and stakeholders. However, overall, the experience for the region regarding implementing the Basin Plan has been difficult and, at some times, contentious. More work is required to collaborate with communities to ensure that regions are not left behind.

FOCUS AREA 1: Murray-Darling Basin Plan and reform

The MRLGA advocates for:

- 1a The implementation of the Murray-Darling Basin Plan should be completed in full before embarking on any new or additional reform to ensure current targets, programs and mechanisms are met.
- 1b A national approach to managing the Murray Darling Basin (including the setting of water use at an environmentally sustainable level) is critical, and all governments must continue to work together to commit to the approach.
- 1c The MDBA's response and implementation to reform recommendations should be clearly tracked and transparent for all stakeholders. The MRLGA advocates and supports the ongoing improvement and reform of the governance and reporting structures as a central part of the long term management of the Basin.
- 1d Greater accountability and transparency for projects that have received public funding to deliver outcomes under the Basin Plan.
- 1e Supporting Commonwealth and State Governments to continue to work towards a healthy and functioning Coorong and Lower Lakes system as this will ensure the health of the river system as a whole.

Challenges that this area relates to



Water markets, trading, and allocation

Water trading has helped Basin irrigators become more productive and contributed to more sustainable management of water by placing a real value on water. The market, and water products, have created incentives for water to move to higher value uses. However, the market is becoming increasingly complex and challenging to navigate, and not all users have benefited equally from these changes. As the market continues to evolve, so does the need for the regulatory framework in which it exists.

For water markets to operate efficiently and provide equitable opportunity to participate, market participants need access to reliable and transparent information. With increasing changes in water supply and demand, users need to navigate an increasingly more complex market and policy environment, and they may not always have the tools they need.

The MRLGA supports the needs of all water users in its communities. It notes that broader support from industry bodies and Commonwealth and State governments has helped make significant strides in the water literacy space; but it remains complex and challenging to understand for many decision-makers. Smaller farm businesses, for example, are often not able to navigate the changing and complex nature of water allocation and determine the best possible outcome for their business. Similarly, the evolving landscape of water products has impacted strategic decision-makers from making longer-term decisions for the benefit of a range of water users. Finally, the complexity of management arrangements, policies and regulations act as a deterrent for the broader community to engage in water management.

FOCUS AREA 2: Water markets, trading, and allocation

The MRLGA will advocate for:

- 2a** Support of the recent reform initiatives, and that Commonwealth and State governments continue to ensure the water market is appropriately governed, transparent and fit-for-purpose. This includes advocating for consistency and transparency of water products to help manage consumptive and environmental water delivery issues across the Basin .
- 2b** Continued water literacy sessions, workshops and programs for:
- irrigators to stay informed and connected to all end users
 - Local Government representatives, to support non-experts understand the competing issues, and
 - schools to support water literacy from an early age.

Challenges that this area relates to





Climate adaptation and reduced water availability

Climate change is the most significant driver of change that will continue to affect water availability across the Basin. It impacts all water resources in the region and is projected to continue to increase demand for water, particularly as temperatures increase and the region becomes drier.

The region must proactively plan and respond to a future with less water. This will take a concerted effort, many challenging conversations, and difficult decisions. But this can only occur if the region has access to timely and scalable information. While climate change projections are available for the region, the impacts for water sources and adaptation planning for the region, are under-resourced, impacting confidence in decision-making.

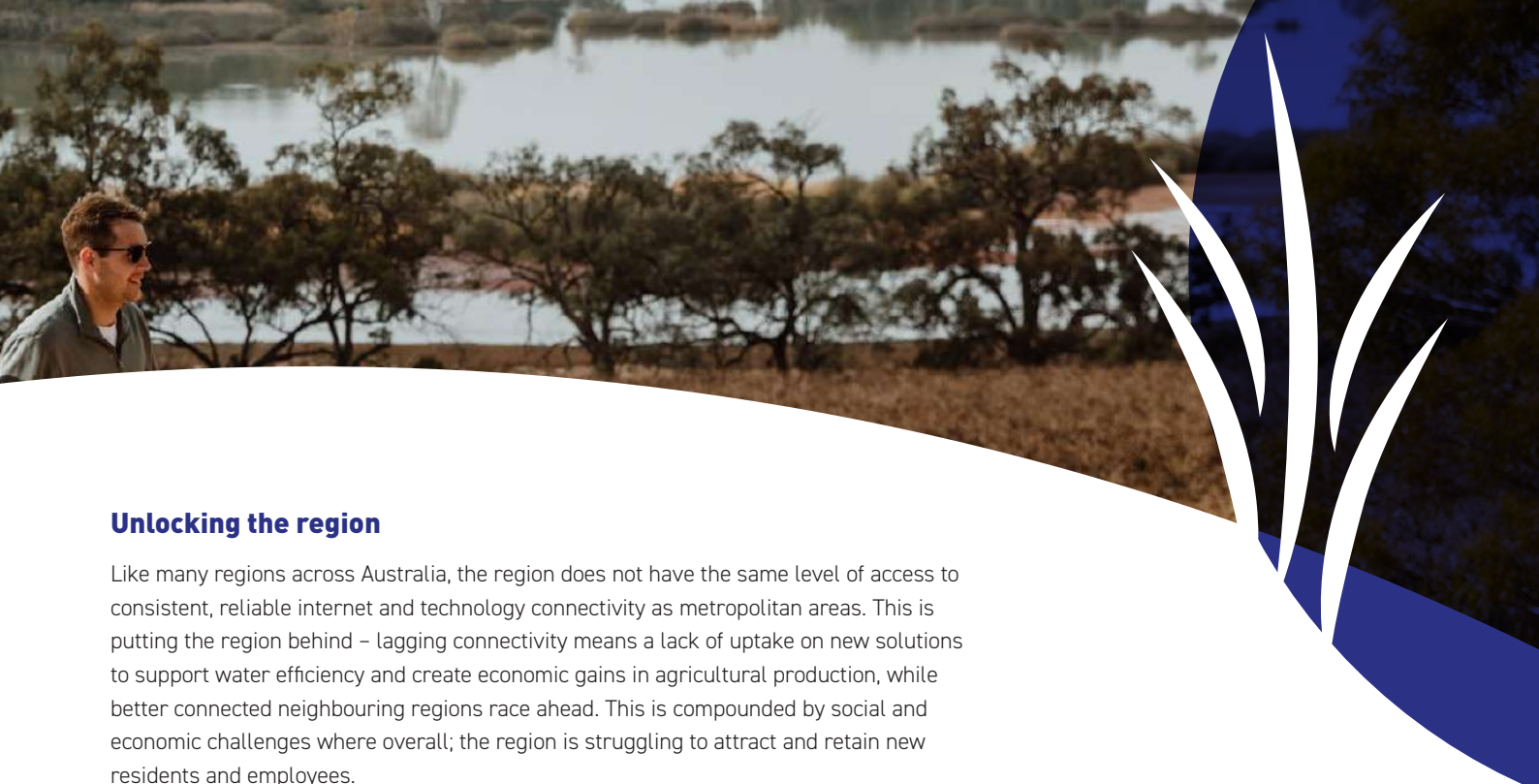
FOCUS AREA 3: Climate adaptation and reduced water availability

The MRLGA advocates for:

- 3a MRLGA supports the work of the MDBA and Murray-Darling Water and Environment Research program to understand whole-of-Basin climate change risks. This extends to identifying adaptation options and evaluating efficacy across economic, environmental, social and First Nations' values.
- 3b The components of the Basin system cannot be understood in isolation – the climate change assessment needs to consider the functioning of the Basin as a whole, including all water sources (groundwater as well as surface water and rainfall). In addition, Commonwealth and State governments should consider the interdependencies with other systems, such as the flow-on impacts to services, population health, and non-water dependent industries. The outcomes of this work should be made available to all relevant stakeholders to support longer-term investment decisions and planning.
- 3c Basin reform should consider the climate change risk assessment for the Basin as a whole.
- 3d The capacity of local stakeholders and regional needs should be considered in the implementation of climate change adaptation. Any co-design approach implemented to support this research and the implementation of actions should involve local governments and communities. This particularly includes the development of regional adaptation plans as part of the Program.
- 3e Councils can consider working towards 'gold' certification under the Alliance for Water Stewardship (AWS) standard, following Renmark Paringa Council's accreditation achievement.

Challenges that this area relates to





Unlocking the region

Like many regions across Australia, the region does not have the same level of access to consistent, reliable internet and technology connectivity as metropolitan areas. This is putting the region behind – lagging connectivity means a lack of uptake on new solutions to support water efficiency and create economic gains in agricultural production, while better connected neighbouring regions race ahead. This is compounded by social and economic challenges where overall; the region is struggling to attract and retain new residents and employees.

The MRLGA recognises that the economic prosperity of the region is very closely tied with water, particularly irrigated agriculture. In moving to a more resilient future, it needs to consider how to keep pace with other regions, attract future water leaders and support the economic and social resilience of the region.

FOCUS AREA 4: Unlocking the region

The MRLGA will advocate for:

- 4a** Future improvement in water management relies on access to digital technology and solutions. Commonwealth and State governments should invest in essential infrastructure in regions that are disadvantaged by lack of digital connectivity.
- 4b** Commonwealth and State governments to work closely with regional communities, including through an ongoing commitment to applied research and development, to develop solutions to adapt to climate change, reduced water availability and changes along the River corridor.
- 4c** The South Australian Government to work with local government to develop policy that supports and enables appropriate development along the River corridor and recognises the importance of supporting economic sustainability, regeneration and growth for all Basin communities.

Challenges that this area relates to





Supporting inclusive communities in decision-making

While great strides have been made in water reform, the implementation of the Basin Plan and subsequent consultation has left many Basin communities feeling over-consulted and under-listened to. The MRLGA recognises that place-based decision-making is key to ensuring communities are included and appropriately accounted for in future planning decisions for the region.

First Nations people, in particular, have an ongoing connection with water, land and the environment. The MRLGA recognise that First Nations people must have a voice as part of all levels of governments conversations and decision-making.

FOCUS AREA 5: Supporting inclusive communities in decision making

The MRLGA will advocate for:

- 5a** The continued inclusion of First Nations representatives in water resource and management engagement opportunities. The MRLGA and its Constituent Councils support the efforts of State and Commonwealth governments to understand the perspectives and values of its First Nations stakeholders with the aim of achieving meaningful cultural outcomes for First Nations.

MRLGA acknowledges:

- 5b** The MRLGA acknowledge this is its first document released for water advocacy. The MRLGA will continue to work with regional stakeholders and communities to develop its approach where it believes it can best advocate. This will help it understand the challenges and opportunities going into any future water reform.

Challenges that this area relates to





Support further innovation in water use

The region has and continues to be a leader in adopting and adapting to new technologies and water use efficiency. Emerging from the Millennium Drought, the region has adapted to more water efficient production technologies, systems, and crop types, as well as diversifying and value adding traditional products. This has created a strong foundation for the region to continue to prosper during challenging times.

With increasing uncertainty around water availability, and more demand from agricultural plantings, the region will need to support leadership of water efficiency. While this situation has created limited opportunities for further significant gains, the region will need to be innovative – considering and adopting new technologies and opportunities for efficiency and improvement in water management.

FOCUS AREA 6: Support further innovation in water use

The MRLGA will advocate for:

- 6a State government to work with its councils and communities to plan for diversification of water sources in the region. This plan should investigate the projected long-term effects on the existing water sources, and alternative new water sources, as well as efficiencies that can be made.
- 6b MRLGA advocates the state government to partner with research bodies such as the CSIRO to provide research and development support for new technologies to support existing water sources or new sources, such as long-term water banking. Additional efficiencies, such as water sensitive urban design, to improve rainfall capture and reduce demand for potable sources should also be considered.
- 6c Support and stay connected to the One Basin CRC to ensure practical, innovative solutions and technologies that support the region to transition to new business models.

Challenges that this area relates to





Supporting its regional centres

MRLGA recognise the need for increased water security in its urban centres, such as Murray Bridge, Mannum, Berri, Loxton and Renmark, which have been experiencing population growth over the past few decades and is expected to continue as farms are consolidated across the region.

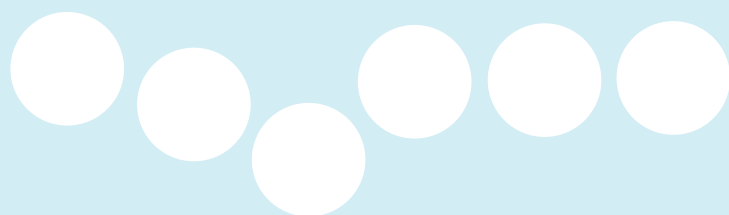
If long-term urban water requirements are not appropriately planned for, regional centres may be at risk of running out of water during long-term droughts.

FOCUS AREA 7: Supporting its regional centres

The MRLGA will advocate for:

- 7a** The MRLGA to support investigation by its Constituent Councils for the viability of alternative water sources for regional centres (non-potable uses). This could include investigating the potential to increase water recycling and stormwater reuse to meet non-critical needs, such as landscape irrigation. Councils could take a lead role in developing local water security plans that consider Council water needs and where efficiencies could be driven.

Challenges that this area relates to



Closing remarks

The MRLGA will continue endeavours towards fostering wide understanding of water-related challenges in the Murraylands and Riverland region and across municipal lines. There are common and varied issues and opportunity's along the river corridor and lakes system (both within South Australia and the Basin at large). It intends to build on an existing culture of collaboration across Councils to continue dialogue with everyone to work together to increase literacy, understanding and solutions on Murray Darling Basin Plan issues, with a common goal to embrace balanced conversations that achieve outcomes for communities, economy, and environment.

The MRLGA acknowledges that effective water management and advocacy require a collective effort across various sectors. The organization emphasizes the significance of engaging with stakeholders, including First Nations communities, to develop comprehensive solutions that reflect diverse perspectives and needs. This inclusive approach not only fosters a deeper understanding of water issues but also strengthens the region's capacity to adapt to changing environmental conditions and policy landscapes.

As the MRLGA moves forward, it remains committed to supporting innovative practices and technologies that promote water efficiency and sustainability. And will embrace a forward-thinking mindset, crucial for addressing the ongoing and future challenges posed by climate change and water resource constraints.

The Paper serves as a guiding document, outlining the strategic actions necessary to achieve goals and reaffirm the association's commitment to enhance the region as both resilient and thriving place to live, work and visit.

MRLGA wishes to acknowledge all regional stakeholders, and the many contributions, including time, experience, expertise, foresight and effort to contribute to the development of this work. We acknowledge the critical role everyone has played as leaders and influencers to our water.

The work reflects a point in time that was pre-flood, when workshops with stakeholders and community was undertaken. It was prepared for the lead up to MDBA's review of the Murray Darling Basin Plan.

However, its finalisation and release was paused when a State Emergency was declared in the region for the 22/23 River Murray Flood. While the paper was in its final stages post flood, the Commonwealth Government produced the Restoring Our Rivers Bill Amendment, that then passed in late December 2023.

It therefore notes:

The Restoring Our Rivers amendment was passed after consultation was done on this paper, and therefore the paper is not designed to influence the Restoring our Rivers Framework (which was evolving at the time of this release). However for more detailed discussion(s) on the framework or how local government is participating and contributing to the process MRLGA Ceo or MDA Region (5 and 6) Chairs (<https://www.mda.asn.au/regions>) can be contacted.

The MDBA has released it Early Insights Paper and a roadmap for consultation commencing in 2025 that is recommended reading. A link to the MDBA early insight report is provided <https://www.mdba.gov.au/water-management/2026-basin-plan-review>

We also wish to recognise the MDBA Basin Community's Committee Representatives in the region who are conduits for information to the MDBA <https://www.mdba.gov.au/about-us/governance-and-committees/basin-community-committee>

January 2023

Lead Consultant

Prepared for

Murraylands & Riverland Water Advocacy Paper

Jacobs Consulting
3/121 King William Street
Adelaide, SA 5000
(08) 8113 5400
www.jacobs.com

Murraylands and Riverland Local Government Association

Appendix 1

Stakeholders invited to contribute

Almonds Australia

Berri Barmera Council

Central Irrigation Trust

Citrus Australia - SA Region

Coorong District Council

Coorong Lower Lakes and Murray Mouth SAG and CAP

Coorong Tatiara Local Action Plan

Dairy SA

Department for Environment and Water (DEW)

Destination Riverland

DEW - Coorong Partnership

District Council of Karoonda East Murray

District Council of Loxton Waikerie

Goolwa to Wellington Local Action Planning Association

Goyder Institute

Grain Producers SA

Livestock SA

Mallee Sustainable Farming

MDA Committee 5

MDA Committee 6

MDBA - Murray Bridge office

Mid Murray Council

Mid-Murray Landcare

MR Lakes and Coorong

MRLGA Board

Murraylands and Riverland Landscape Board

Murraylands Food Alliance

Ngarrindjeri Aboriginal Corporation

Ngarrindjeri Regional Authority

Ngopamuldi Aboriginal Corporation

PIRSA

Primary Producers SA

RDA, Murraylands and Riverland

Renmark Irrigation Trust

Renmark Paringa Council

River Murray and Mallee Aboriginal Corporation

Riverland Horticultural Future

Riverland West Landcare

Riverland Wine

Riverland Winegrape Growers Association

Rural Business Support

Rural City of Murray Bridge

SA Murray Irrigators

Southern Fisherman's Association

Southern Mallee District Council

Summer Fruits SA



Water Advocacy Paper

'The connection of water to people and place'

MURRAYLANDS RIVERLAND
LOCAL GOVERNMENT ASSOCIATION



**Murraylands and Riverland
Local Government Association**

Contact Details: Chief Executive Officer,
Murraylands and Riverland Local Government Association
ceo@mrlga.sa.gov.au



Australian Government

**Department of Infrastructure, Transport,
Regional Development, Communications and the Arts**

This project was supported by the Building Better
Regions Fund of the Australian Government.

Regional Profile

*To be read with the
Water Advocacy Paper*

MURRAYLANDS RIVERLAND
LOCAL GOVERNMENT ASSOCIATION



**Murraylands and Riverland
Local Government Association**



Australian Government

**Department of Infrastructure, Transport,
Regional Development, Communications and the Arts**

Forward

The River Murray is the lifeblood of the Murraylands and Riverland region. It is vital to our people, our industries, our places of significance and culture. We know that the regional economy is reliant on the water we receive from the River Murray, and our other water sources.

Ensuring that the region has a sustainable and growing economy is critical to sustaining the population and vibrancy of the region. As so much of the economy is dependent on water, maintaining secure, reliable, and affordable water is crucial to our future prosperity.

But we also know that with this dependence on water comes vulnerability. The region, and our relationship with water, has been shaped by broader water reforms across the Murray-Darling Basin (the Basin). Managing water in the region is an ongoing challenge as we aim to balance the needs of the environment alongside the need to support and grow our economy, much of which is based on irrigated agriculture. The region has embraced this challenge, becoming a leader in water efficiency, but this task cannot stop. As we face a potentially hotter, drier future with increased demand for water, the region must continue to find new ways to evolve and face these new challenges. We must continue to be a leader.

The MRLGA supports and acknowledges the importance of the water reform that has occurred across the Basin to date, including the aims of the Basin Plan; however, we recognise that more must be done to ensure the resilience of our key water sources, and as such, the resilience of the region into the future.

The MRLGA has embarked on a journey to build a shared understanding of the vital role that water plays in the future of the region. To enable this, we formed a Working Group led by Andrew Kassebaum that is comprised of key members of local government and Murray Darling Association (MDA) to ensure that we bring the community and its views along in the process.

This Regional Profile is the first step in our journey. It aims to provide a consolidated view of the region and the role that water has and will continue to play in shaping its future. This RIS complements and informs the development of a Water Position Paper, which will provide a unified voice and agreed positions for managing water in the future.



First Nations Acknowledgement

The Murraylands and Riverlands Local Government Association (MRLGA) acknowledges and respects First Nations people as the state's first peoples and nations and recognises First Nations people as traditional owners and occupants of land and waters in South Australia. We acknowledge their deep cultural, social, environmental, spiritual and economic connection to their lands and waters.

First Nations peoples' spiritual, social, cultural, and economic practices come from their lands and waters, and they continue to maintain their cultural heritage, economies, languages and laws which are of ongoing importance.

The MRLGA wishes to pay its respects to First Nations culture, and to Elders past, present, and emerging.



Contents

Foreword	iii
Part 1 – Introduction and overview	6
Introduction.....	6
An overview of the region	7
Planning for change	9
Part 2 – The MRLGA Region and how it is evolving	10
The industries that shape the region	10
Trends impacting industries and the economy	13
The people and culture of the region	15
Trends changing the communities in the region	17
The climate and environment	21
Trends impacting the region’s environment.....	23
Part 3 – Managing water - the lifeblood of the region	25
River Murray water supporting irrigation development	25
Other sources of water	28
Water efficiency in the region	29
Murray Darling Basin	30
Part 4 –Challenges affecting future water management	37
Overall reduced availability of water – increasing demand, reducing reliability of supply, and driving up costs.....	37
Changing demand and use of water - driving up competition and increasing risk exposure	38
Limited opportunities for further gains in water efficiency	39
Complexity of water management	39
Politicisation of water management.....	40
Regional town water security.....	40
Ensuring that the region is not left behind	40
Closing remarks	41
References	42

Appendices

Appendix A. Summary of Basin Plan Reviews	44
Appendix B. Prescribed well areas (PWAs) in the Murraylands and Riverland region	46

Table of Tables

Table 1. Changing water use by crop type 2009-2019 (DEW, 2022b).....	27
Table 2. Examples of Murray Darling Basin WEP projects in the region	29
Table 3. The Murray-Darling Basin Water Market	35
Table 4. Annual transfer volumes and volume weighted average prices (VWAP) for major Southern Murray Darling Basin entitlement types, 2017-18 and 2018-19 (Aither, 2021)	39

Table of Figures

Figure 1. The Murraylands and Riverland region	6
Figure 2. Areas of significance across the Murraylands and Riverland region	7
Figure 3. Snapshot of the Murraylands and Riverland region.....	8
Figure 4. Key drivers of change influencing the future of the region.....	9
Figure 5. Gross Value of Agricultural Commodities Produced in the Region (ABS,2021)	10
Figure 6. Murraylands and Riverland total exports by sector (ABS, 2022)	10
Figure 7. A growing tourism industry in the Murraylands and Riverland region (ABS, 2020)	11
Figure 8. Industry sector of employment for Murraylands and Riverland region (upper) and South Australia (lower) in 2016 (ABS, 2016).	12
Figure 9. Murraylands and Riverland Total Exports (ABS, 2022)	13
Figure 10. Age-sex pyramid for Murraylands and Riverlands region, comparing ages of males and females in 2001 and 2016 (ABS, 2016).	18
Figure 11. Percentage change in population in Murraylands and Riverland region compared to South Australia. Overlaying this are the years in drought (blue shading). (ABS, 2020)	19
Figure 12. Government distrust (red) vs Government doing a good job running the country (green) (Roy Morgan, 2022)	20
Figure 13. Annual average maximum temperature (°C) climate projections for towns in the SA Murray Basin (Siebentritt, et al., 2014)	24
Figure 14. Annual average rainfall (mm) climate change projections for towns in the SA Murray Basin (Siebentritt, et al., 2014)	24
Figure 15. Consumptive water use from the River Murray in South Australia (DEW, 2022a)	25
Figure 16. How River Murray water is used in the region (2018-2019) (DEW, 2022a)	26
Figure 17. Map of irrigation expansion and areas in the region retired from 2018 to 2021 (retired area in orange) (SunRISE, 2022)	26
Figure 18. Prescribed water sources in the Murraylands and Riverlands region, including the River Murray	28
Figure 19. Water use and allocation for prescribed water resources in the region from 2015 to 2019 (DEW, 2022)	28
Figure 20. Water reform across the Murray Darling Basin (left) compared to water management in the region (right).....	32
Figure 21 SDLAM in the Basin Plan (Source: MDBA, 2021)	32
Figure 22. Figure 23 Water allocation under the Murray Darling Basin Agreement (Interim Inspector-General of Murray-Darling Basin Water Resources, 2020)	33
Figure 23. How water is allocated in South Australia under the Murray Darling Basin Agreement.....	33
Figure 24. Water pipelines from the River Murray in South Australia (MDBA, 2022a).....	34
Figure 25. Key factors that impact water delivery in the Murray Darling Basin (MDBA, 2022a)	36
Figure 26. Annual time series of streamflows to the River Murray with projected changed under 2° C global average warming (RCP8.5) climate change. Projections show the median, 10th and 90th percentile results from hydrological modelling of climate change (Prosser, Chiew, & Smith, 2021)	37
Figure 27. Water availability scenarios and projected permanent horticulture water demand (at full maturity) for the lower Murray region (DEWLP, 2019).....	38

Part 1 – Introduction and overview

Introduction

The Murraylands and Riverland region's heart is the River Murray – it traverses the length of the region and is the lifeblood of its economy and communities, including First Nations peoples. It brings life to unique environments such as the Coorong, and Lakes Albert and Alexandrina. The development of the region has been shaped by the river, the industries it supports and the droughts and floods that it brings. Ensuring that the River Murray along with other vital water resources in the region are well managed is of critical importance to everyone who lives and works in the region.

The Murraylands and Riverland Local Government Association (MRLGA) recognises the importance of water to the region. It also acknowledges that the future reliability of this resource is under threat. A changing climate, overextraction and politics continue to affect how the River Murray is managed and used. To enable the MRLGA to proactively advocate for the River and its other water resources, an understanding of the role that water plays in the region and the trends that may influence the region in the future is required.

This Regional Profile has been prepared to assist the MRLGA in shaping and informing its position and approach to water management. This supports the MRLGA's Water Position Paper, which outlines the MRLGA's position and future opportunities for managing water in the region in a manner that will ensure future prosperity of the region.

It should be noted that the Regional Profile has been developed using the latest available Census data (2021); however, some trends may have evolved since the last reporting period.

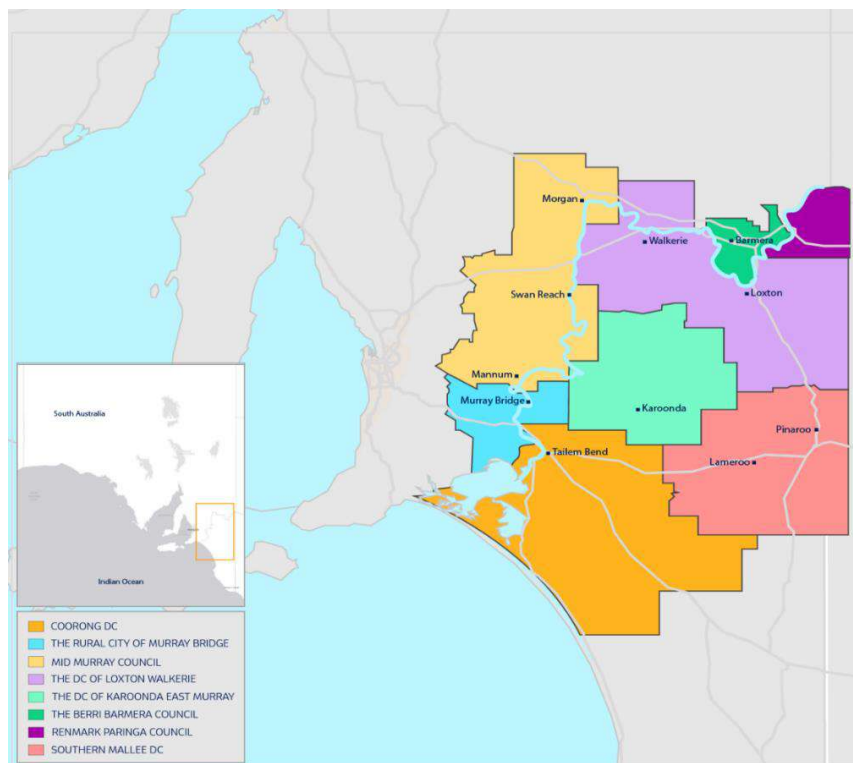


Figure 1. The Murraylands and Riverland region

An overview of the region

The Murraylands and Riverland region of South Australia is home to over 73,000 people and encompasses an area of 36,213 square kilometres (as shown in Figure 1). It encompasses:

- The Riverland, which includes the upper South Australian River Murray and surrounding areas and is covered by the local governments of Berri Barmera Council, District Council of Loxton Waikerie, Renmark Paringa Council and parts of Mid Murray Council
- The Murraylands, which includes the lower Murray River from Blanchetown and surrounding areas, extending east until the Victorian Border. It encompasses the local governments of Rural City of Murray Bridge, Coorong District Council and parts of Mid Murray Council.
- Part of the Limestone Coast, including the Coorong, as far south as the border with the District Council of Kingston.
- The South Australian Mallee region, which overlaps with both the Riverland and Murraylands – bound by the River Murray in the north and west and extending to the Victorian border in the east. This includes the Southern Mallee District Council, District Council of Karoonda East Murray, and Parts of the District Council of Loxton Waikerie.

In terms of land use, the region is predominantly rural, with townships at Barmera, Berri, Loxton, Mannum, Murray Bridge, Renmark and Waikerie (Figure 2). Across the region, there are many areas and sites of significance. The region is renowned for its premium wine and food production, including citrus, almonds, and vegetables for export both domestically and internationally. It also boasts several of South Australia's premium tourism destinations, including the Coorong, and is home to significant environmental and cultural assets, including international recognised conversation sites, native flora and fauna, and a strong First Nations connection to the land dating back nearly 30,000 years (Westell, et al., 2020).



Figure 2. Areas of significance across the Murraylands and Riverland region

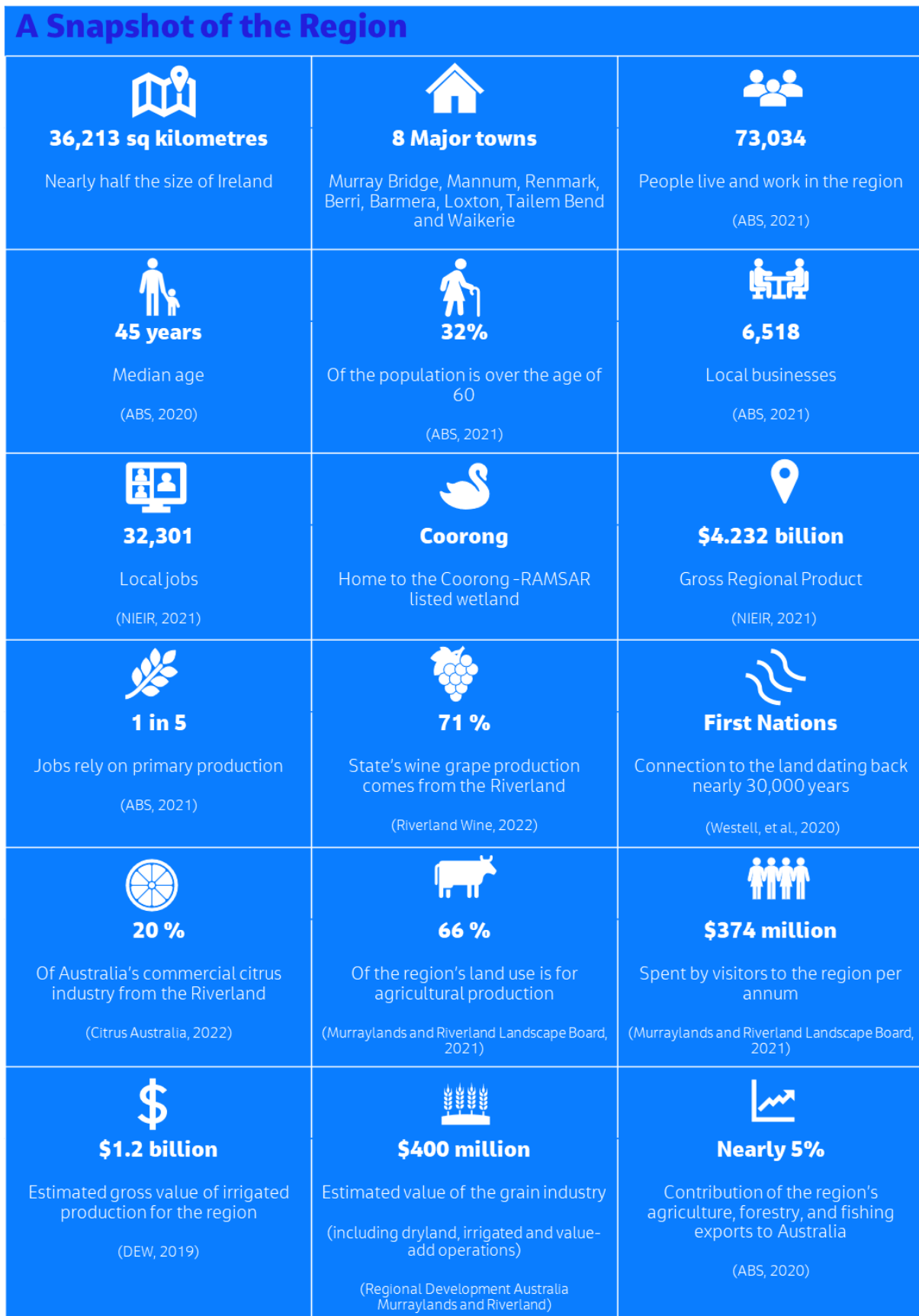


Figure 3. Snapshot of the Murraylands and Riverland region

Planning for change

The Murraylands and Riverland region has and will continue to evolve in response to changing global, national, and local drivers. Understanding how the region may change, and the relationship these changes may have on the future management and use of water, will help the region to prepare effective long-term responses. Figure 4 summarises the key drivers of change influencing the region. These drivers (or trends) are often interrelated and may influence each other. The following sections of this report describe the region and its industries, communities, and environmental assets. It also outlines the trends being observed, and how they may influence future supply, use and management of water.

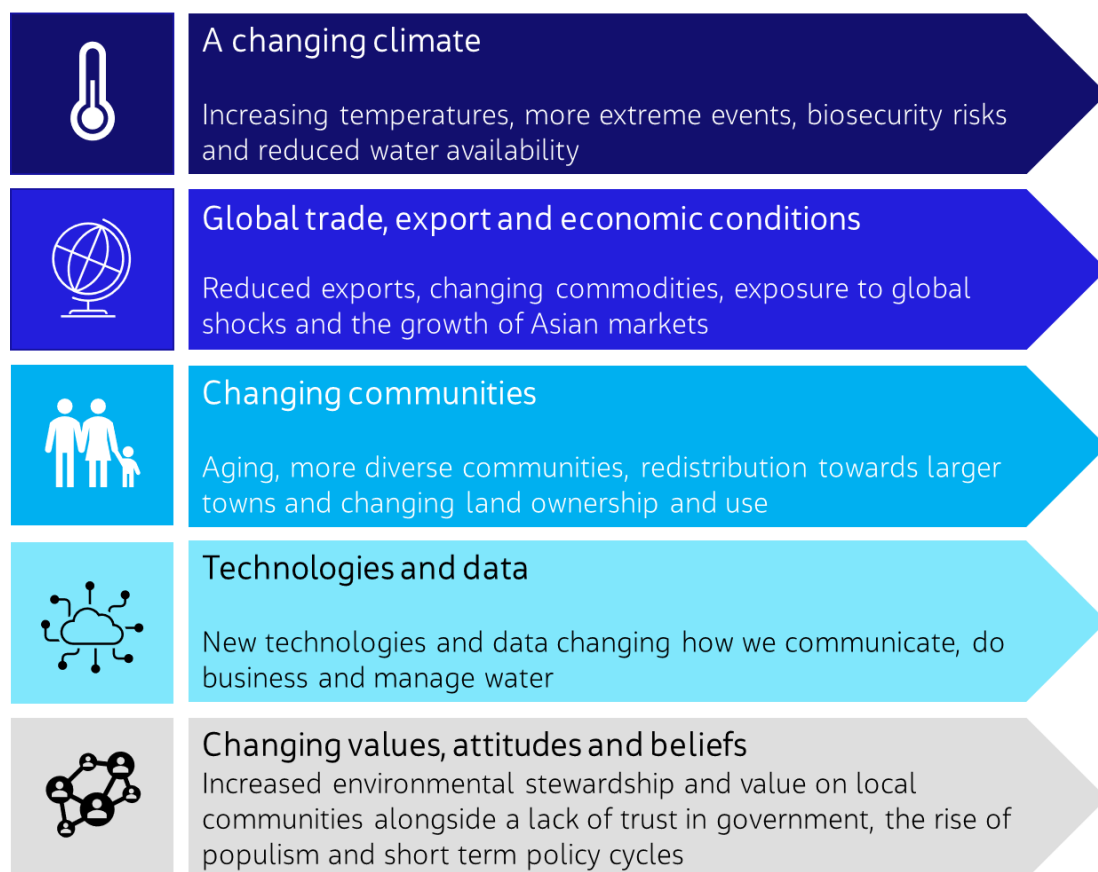


Figure 4. Key drivers of change influencing the future of the region

Part 2 – The MRLGA Region and how it is evolving

The Murraylands and Riverland region is evolving in response to changing global, technological, social, and economic conditions. The region, traditionally reliant on agriculture, is seeing a diversification and growth in new industries including tourism and services. Key changes are emerging in the agricultural sector including the increased use of technology to maximise efficiency. Mirroring trends in rural South Australia, the Murraylands and Riverland region has an aging population. Climate change is placing pressure on the environmental assets in the region. However, significant investment is being made to protect the environmental values while ensuring water is available for consumptive use.

The industries that shape the region

Irrigated agriculture

Known as the ‘food bowl’ of South Australia, the Murraylands and Riverland region is underpinned by a strong primary production sector. This includes agriculture, forestry, and fishing contributing 51% of the goods exported from the region (Figure 6).

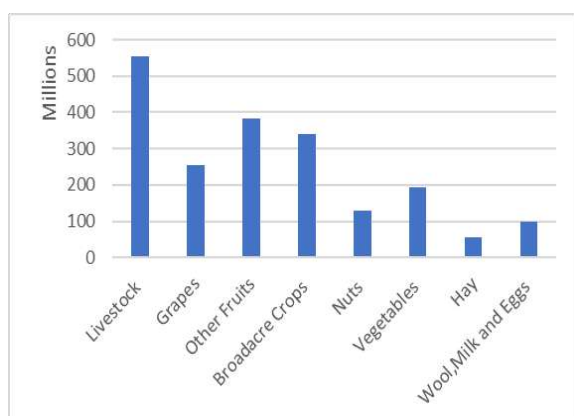


Figure 5. Gross Value of Agricultural Commodities Produced in the Region (ABS, 2021)

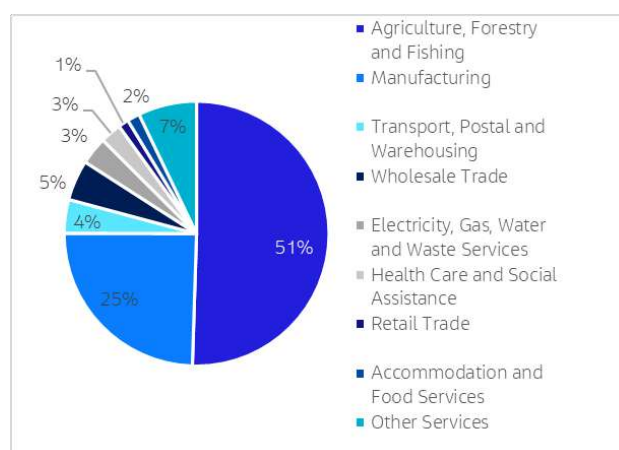


Figure 6. Murraylands and Riverland total exports by sector (ABS, 2022)

1150 irrigation business in the region are supported by water from the River Murray (MDBA, 2020).

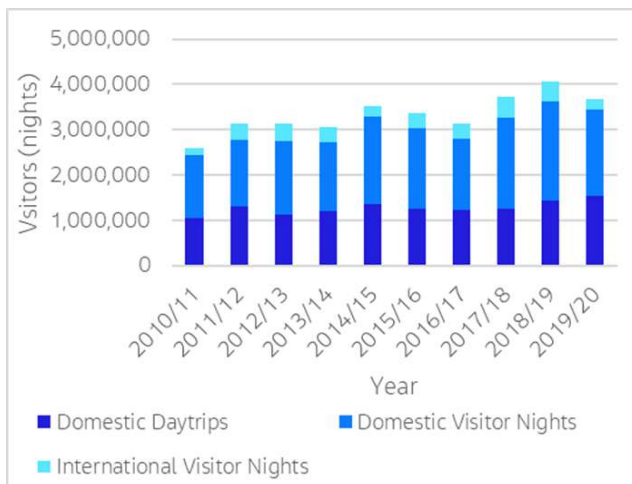
Key agricultural commodities in the region include grapes, citrus, vegetables, and nuts (predominantly almonds) as well as livestock and dryland farming. The Riverland is home to the third largest citrus growing region, with orchards from Blanchetown to Renmark accounting for 20 percent of Australia's commercial citrus industry (Citrus Australia, 2022).

Dairy production is principally located in the Lower Murray Swamps and Meningie Lower Lakes. Dryland farms are spread across the region, particularly in the Mallee area, with major commodities being wheat, barley, canola, and legumes. Permanent horticulture accounts for 85 percent of regional irrigation demand (DEW, 2022). The Riverland wine region represents 71 percent of South Australia's crush and 30 percent of the national crush (Riverland Wine, 2022). Nut crops, such as almonds, have an estimated value of over \$150 million (Figure 5) having increased by 188 percent between 2003-2018 in the lower Murray (MDBA, 2019).

Both the Central Irrigation Trust and Renmark Irrigation Trust are instrumental in providing irrigation infrastructure for the region. The Renmark Irrigation District has been fully piped since 1975, containing over 140km of irrigation pipeline over an area exceeding 4,900 hectares (Renmark Irrigation Trust, 2022).

A growing tourism sector

Along with agriculture, the region also supports a growing tourism industry, largely associated with the production of food, wine and nature-based experiences (Figure 7). Visitors to the area contribute approximately \$374 million per year to the region's economy. (Murraylands and Riverland Landscape Board, 2021). Boutique wineries, distilleries, local produce, and restaurants help entice visitors to the region.



288,353 nights spent by international visitors to the region in 2019/20 (Tourism Research Australia, 2020)

600 business in the tourism sector across the region (June 2020) (South Australian Tourism Commission, 2021)

Figure 7. A growing tourism industry in the Murraylands and Riverland region (ABS, 2020)

Iconic landmarks including the Coorong as well as the River Murray offer a diversity of recreational experiences and value to the region, containing incredible scenery, local wildlife, and an abundance of activities such as kayaking, boating, and fishing. Visitors and residents alike can enjoy picturesque picnics along the riverfront and learn about the diverse environmental features and unique history of the region.

There is also an increasing interest in the region to create opportunities for agribusiness to expand or diversify into the tourism industry, supported by federal government programs.

International Dark Sky Reserve

The River Murray and the values its water provides are not the only major drawcard to the region. Located near Swan Reach, the region also boasts Australia's first international Dark Sky Reserve.

Around the world, Dark Sky Reserves are known as the most remarkable places to camp and stargaze, especially amongst astronomers, astrophotographers and outdoor/nature enthusiasts.

The River Murray International Dark Sky Reserve receives enhanced darkness with unpolluted skies, high quality of vision, low population, and lack of major development.



Other sectors

In 2020, health care and social assistance made up 13% of employment in the region (ABS, 2022). The region has several hospitals in towns and cities such as Berri, Murray Bridge, Loxton, Renmark, and smaller health services across the region, as well as aged and childcare services. This sector is predicted to grow due to increasing demand for services alongside an ageing population. In 2020, the other major source of employment was wholesale and retail trade which collectively contributed 12 percent and was similar to South Australia's overall employment figures (

Figure 8).

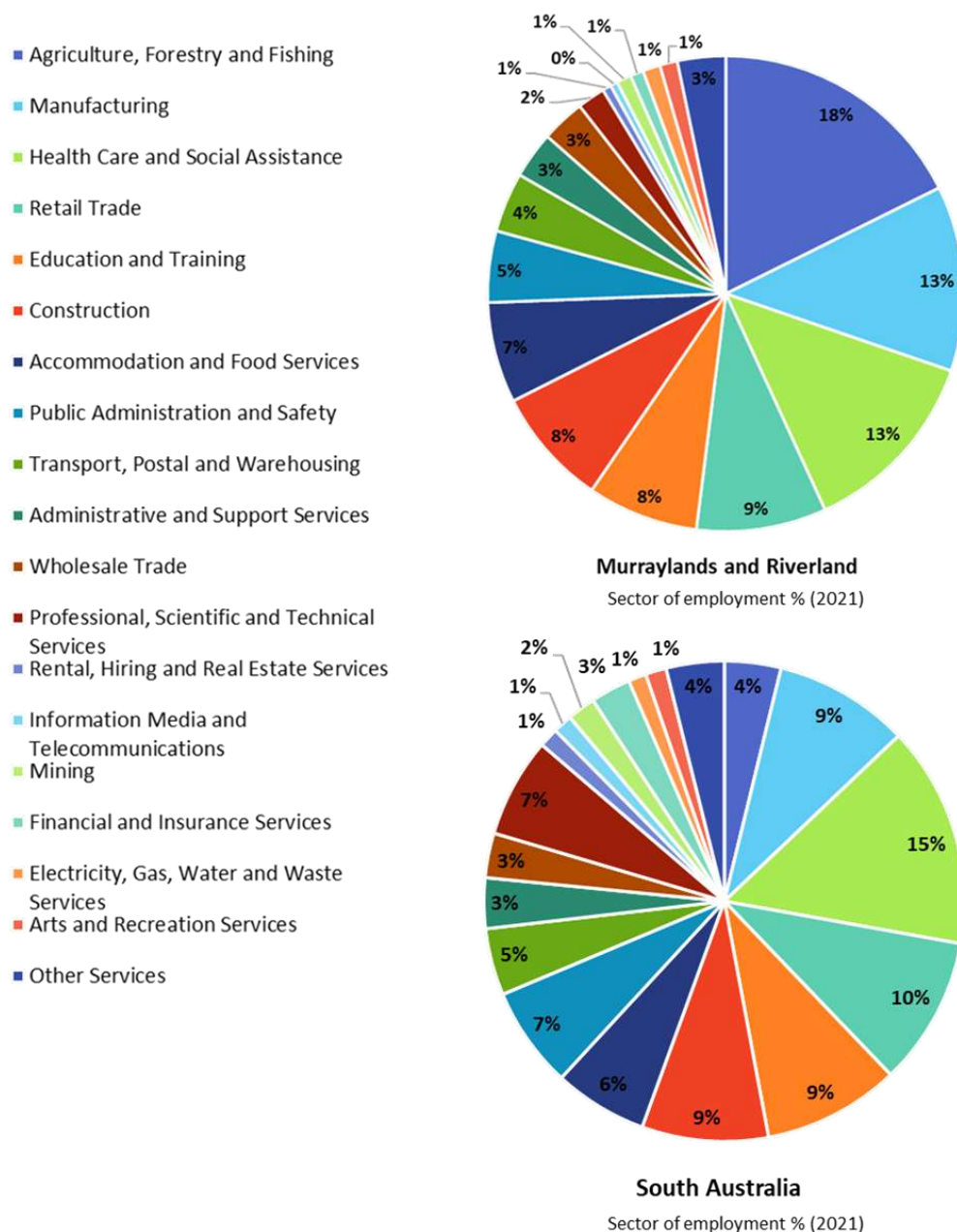


Figure 8. Industry sector of employment for Murraylands and Riverland region (upper) and South Australia (lower) in 2021 (ABS, 2021).

Trends impacting industries and the economy

Reduction in exports

With a strong reliance on export-focused agricultural production, the region is exposed to changes in global markets and events outside of its control or influence. The region has seen an overall reduction in exports (international and domestic) in the last twenty years (Figure 9). In the 2020-21 financial year, \$3.27 billion of the region's goods were exported, down from \$3.43 billion in 2019-20. This is consistent with the trend across South Australia, principally driven by a decline in production of field crops and wine (PIRSA, 2020), as well as the effects of the COVID-19 Pandemic.

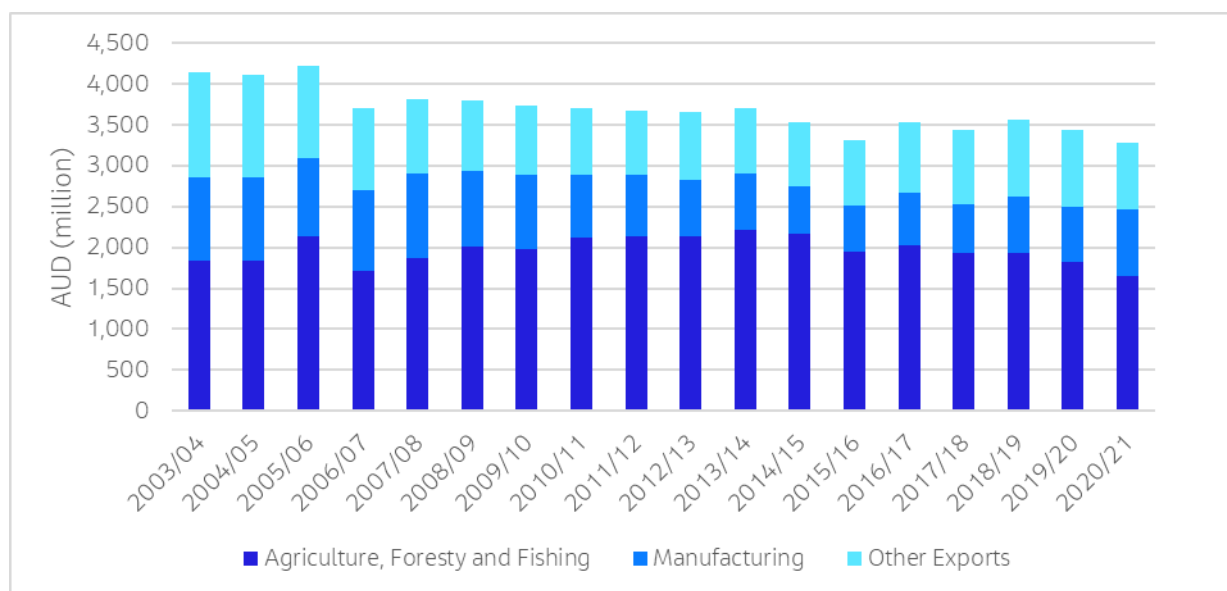


Figure 9. Murraylands and Riverland Total Exports (ABS, 2022)

There are several interrelated factors contributing to this overall decline including:

- Trade barriers, due to changing international agreements and tariffs with major partners, specifically China
- COVID-19 Pandemic, resulting in interruptions to supply chain limiting both supply and demand for exports
- A declining labour force and skills shortage, exacerbated by the COVID-19 pandemic
- High water entitlement prices, limiting the expansion of agriculture and horticulture, and
- Drought and soil acidification caused by changing hydrology, resulting in less productive growing seasons.

The wine industry has been heavily impacted by changing geopolitical conditions. More than 40 percent of South Australian wineries experienced a decrease in sales in the 2020-21 financial year as Chinese tariffs, labour shortages and the coronavirus pandemic resulted in reduced demand and lower prices (Gleeson, Addai, & Cao, 2021). Of those businesses, 57 percent have quit the Chinese market altogether and only 22 percent plan to continue exporting there (Spence, 2021).

There was a significant decrease of employment in the agriculture, forestry, and fishing sector from 2001 to 2016. This has been more prominent in certain locations across the region. For example, Renmark experienced a 42.7 percent reduction in the agricultural workforce between 2001-2016 (MDBA, 2017). The South Australia Wine Industry Snapshot also found that two-thirds of businesses interviewed were impacted by staff and labour shortages in 2020-21 financial year.

Changing commodities

The type of goods produced and exported is also changing across the region. Crops including almonds and other niche products such as avocados are on the rise, while traditional crops such as grapes and citrus have declined. As the cost of water (a main input cost) increases, the trend towards higher-margin products is expected to continue.

Another trend influencing this change is the growth in agricultural technologies (AgTech), which is resulting in less labour-intensive and more capital-intensive production systems. This is compounded in the region by having skill shortages and labour market mismatches; where the skills required to support this agricultural shift are not readily available.

Rise of Asia

As incomes rise around the world and urbanisation continues, consumer demand for healthy, sustainable, and ethical produce will increase. This is linked to market conditions, and the increased demand for 'clean and green' products grown in Australia from countries such as China. The rise in demand for almonds is a clear example of this; ABARES (2019) suggest that consumer perceptions in China tend to prefer Australian products over domestic production, as they are perceived to be safer and of a higher quality.

AgTech transforming what, where and how food and fibre is produced

The rise of new technologies, internet connectivity, and automation of data has and will continue to transform what, where and how primary production occurs. Tasks that have been traditionally undertaken by people (for example, picking and sorting) are more likely to be replaced by automation and data is increasingly available to manage agricultural production. Climate change, pressure on scarce resources, and a growth of new export markets (particularly in Asia) are all creating the conditions that will encourage further innovation and uptake of these new technologies in agricultural processes across Australia.

Reports have suggested increasing the uptake of technology on-farm could return up to \$2.6 billion per annum to the South Australian economy (PIRSA, 2019).

Farming systems will increasingly rely on connected sensors embedded across farm equipment to generate "Big Data" sets. This will increase the likelihood of remote farming systems, which will not require people to be co-located on farm sites.

The Riverland is embracing AgTech to improve on-farm productivity, increase efficiencies and competitive advantage. Loxton AgTech demonstration farm supports businesses to understand innovations and application of AgTech products for Riverland and Murraylands primary production, including citrus, nut, and grape growers. For more information, visit: https://www.pir.sa.gov.au/primary_industry/agtech

The people and culture of the region

People of the region

Like many regions across Australia, the population is aging in the Murraylands and Riverland region. But the diversity of the population is also evolving with new immigrants from the Philippines, Taiwan, Vietnam, China and elsewhere increasing the representation of people born overseas by 10.6 percent from 2011 to 2021 (ABS, 2022).

Diverse employment opportunities are limited in the region to attract and retain workers. Compared with the job diversity of South Australia as a whole, in 2021 the region demonstrated a heavy reliance on a limited number of industries for employment (Figure 8): the agricultural sector (17.8 percent), followed by manufacturing (12.7 percent) and retail trade (8.9 percent) (ABS, 2021).

This is compounded by the region having limited tertiary education opportunities. In 2021, 3 percent of the region's population are attending a tertiary educational institution, again lower than the state-wide percentage of 6.8 percent (ABS 2021).

The region has been investing in addressing this gap through programs such as the Murray River Study Hub. Providing access to tertiary training supports those in the workforce who want to retrain or require further training for their profession. Additionally, it encourages young people to stay and work in the region. This is also important as the jobs available in dominant sectors (such as agriculture, tourism, and health and aged care) increasingly require more training and diverse expertise.

Regionally, residential housing prices are lower than the median for South Australia. However, increased demand and lower availability are creating a housing crisis, which is placing upward pressure on both purchase and rental processes and reducing availability. For example, median house prices in Berri rose by 12.2 percent over a 12-month period; at the time of writing only five houses were available for rent on popular online platforms (Smart Property Investment, 2021), most of which were low-quality housing. This crisis is impacting on the ability to bring and retain people in the region.

Volunteering and involvement in the local community is important across the region, with 20 percent of the region's population completing voluntary work in 2021 (ABS, 2021). People participate in a range of activities including supporting Local Action Planning groups, Landcare groups, sustainable production groups and many sporting and recreation groups.

River Murray Study Hub

The Murray River Study Hub provides opportunities for regional students to pursue tertiary education and VET alternatives without having to travel or relocate outside of the region.

Courses are offered online and mix mode by our partnered education partners, CQUniversity Australia, Flinders University and TAFE SA.

The first facility was launched at Murray Bridge TAFE SA Campus in 2019. Additional campuses also exist in Berri, Loxton and Renmark to service the Riverland region.

More information is available at www.murrayriverstudyhub.org.au



First Nations connection

For thousands of generations, Aboriginal people of the river nations have cared for Murrundi (River Murray) and called it home.

The River Murray and surrounding waterways have and continue to play a crucial role in supporting the culture of First Nations groups in the region by providing an abundance of natural resources. Historically, this contributed to the region being one of the most densely populated areas in Australia prior to colonisation.

The Murraylands and Riverland include the countries of the Ngarrindjeri, the First Peoples of the River Murray, as well as the Mallee Region and Peramangk. In 2021, nearly 4 percent of the population identified as Aboriginal and/or Torres Strait Islander, which is higher than the state-wide proportion (2 percent) (ABS, 2021).

First Nations peoples have expressed a desire for a future that maintains the continuation of their culture upon Country. Access to and allocation of water for cultural flows is an important part of this process. The Northern Murray-Darling Basin Aboriginal Nation and the Murray Lower Darling Rivers Indigenous Nations, define cultural flows as:

Water entitlements that are legally and beneficially owned by the Indigenous nations and are of sufficient and adequate quantity to improve the spiritual, cultural, environmental, social, and economic conditions of those Indigenous nations.

First Nations peoples are important voices in decision-making, and this finding is supported by the new Landscape SA Act which requires the integration traditional Aboriginal knowledge into decision making.

The land and waters is a living body. We the Ngarrindjeri people are a part of its existence. The land and waters must be healthy for the Ngarrindjeri people to be healthy.

Spoken by Ngarrindjeri Elder,

Tom Trevorrow (deceased), quoted in Ngarrindjeri Nation Yaruluwar-Ruwe Plan, 2006.

Importance of the River to First Nations People

As described in DEWNR (2017) Aboriginal river nations along Murrundi (River Murray) refer to freshwater wetlands as 'nurseries' in recognition of the important role these areas play in providing food and shelter for many types of ngartjis (animals, birds and fish).

Poor water quality in the river, particularly in the Lower Lakes, has impacted on the breeding cycle of *Kungari* (black swan), and they no longer breed with seasonal predictability. Kungari are considered a totemic species for the Ngarrindjeri people (Commonwealth of Australia and DEW, 2016).

Source: ABC 2022



Trends changing the communities in the region

Changing communities

The region is undergoing a significant demographic transformation. Between 2010-2021, the region experienced a steady average population growth of 0.5 percent. However, population changes have been distributed asymmetrically across the region, with migration trending towards regional centres and cities. For example, the Rural City of Murray Bridges estimated to have experienced an increase in population of 1.5 percent between 2019 and 2020, which was the highest recorded in the region. This may be attributed to regional migration to the largest town in the region, Murray Bridge. The District Council of Karoonda East Murray, on the other hand, experienced a declining in population of 0.5 percent in the same period (NIEIR, 2021)

This adjustment in population has led to changes in land use and ownership. Migration to regional centres and cities has resulted in some farm consolidation. For agricultural areas across the Basin, it is expected that the total number of farms will reduce within five to ten years, and larger corporate farms will become more prominent (Sefton et al., 2020).

Farm consolidation is improving efficiency and productivity by increasing the uptake of technology. However, this has produced some negative effects on permanent labour (Sefton et al., 2020). This effect is being seen throughout the supply chain, with the increased consolidation of processing centres and distribution hubs across the Basin.

As a consequence, agricultural employment is declining across the region, following a broader Australian trend. Between 2016 and 2021, agricultural employment declined from representing 20.2 percent of employment in the region in 2016 to 18 percent of employment in 2021 (ABS, 2022).

As the nature of agricultural production shifts to more technology-based methods, value-added production, and higher-value crops, the region is likely to experience changes in the types of jobs available in dominant sectors. Jobs in primary production, for instance, will require new skills and knowledge to support this transition. While not directly related, the region experienced an increase of 52.7 percent in the number of people that have a Bachelor degree between 2006 and 2016, demonstrating an increasing value of education in the region (ABS, 2016). Additionally, between 2016 and 2021, the region experienced a 17 percent increase in the number of people who have completed Year 12 or equivalent (ABS, 2022). Nevertheless, like other areas across the Basin, the region may suffer from a mismatch of skills required to support this uptake of technology.

Ageing population

The region has experienced a marked shift in the age composition of the population. These trends have flow-on effects on workforce availability, both in terms of overall numbers as well as the skills that are required for the available market.

Between 2001 and 2021, the region saw an ageing population, with the largest increase in age growth in those aged 60 to 84 years old (Figure 10).

At the same time, region has experienced a loss of younger generations. Between 2011 and 2020, the region saw significant migration out of the area by those aged 18-24, totaling approximately 30 percent of the population. This follows a broader Australian trend of young people moving out of rural areas towards the city to be in closer proximity to employment, social and educational opportunities (Sefton et al., 2020, ABS 2022).

On the other hand, regional centres have experienced population growth, including from those under 45. Between 2001 and 2021, Murray Bridge saw an increase in under 45s of 11% (ABS, 2021).

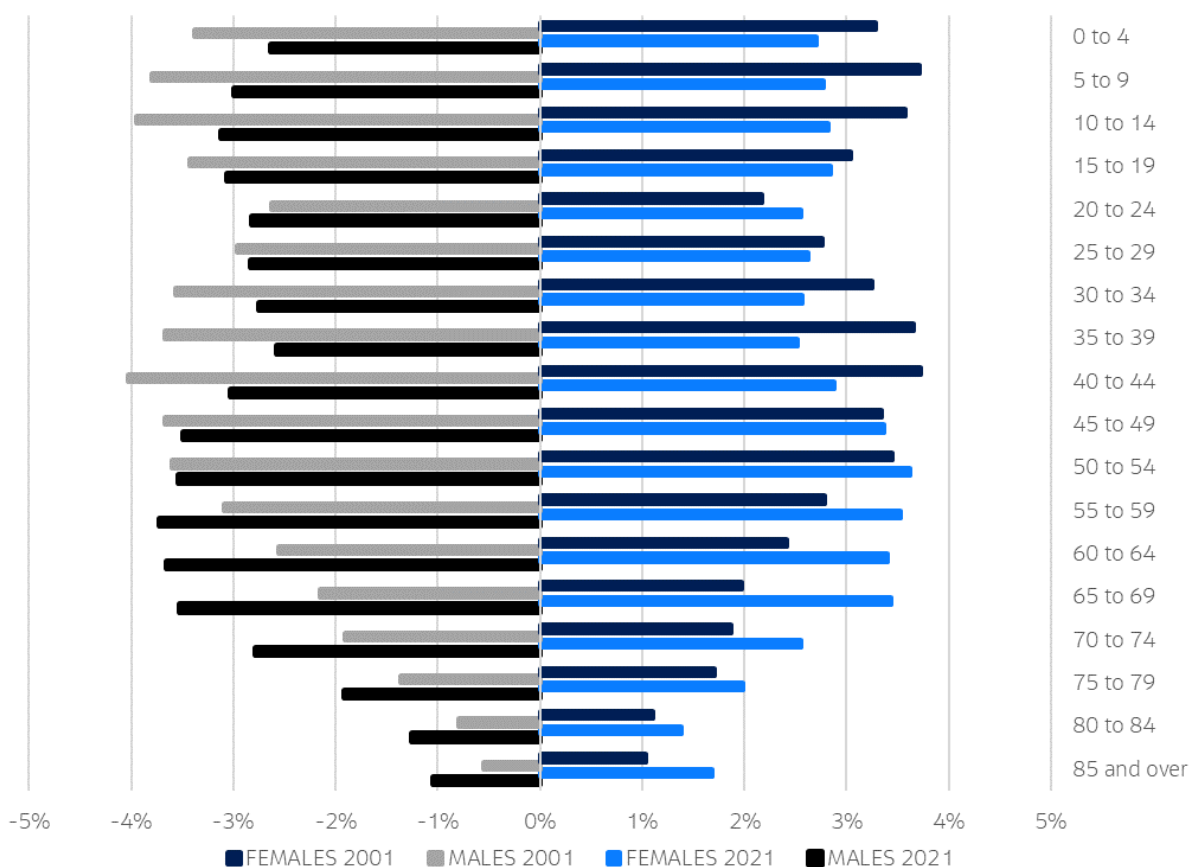


Figure 10. Age-sex pyramid for Murraylands and Riverlands region, comparing ages of males and females in 2001 and 2021 (ABS, 2021).

Water and people- intrinsically tied

Population changes in the region can be linked to drought years and reduced water supply. As seen in Figure 11, the region's population declined during the Millennium Drought and 2017/19 drought year, particularly in towns that border the River Murray. It is evident that **the economic prosperity of the region is very closely tied with water**, particularly in irrigated agriculture.

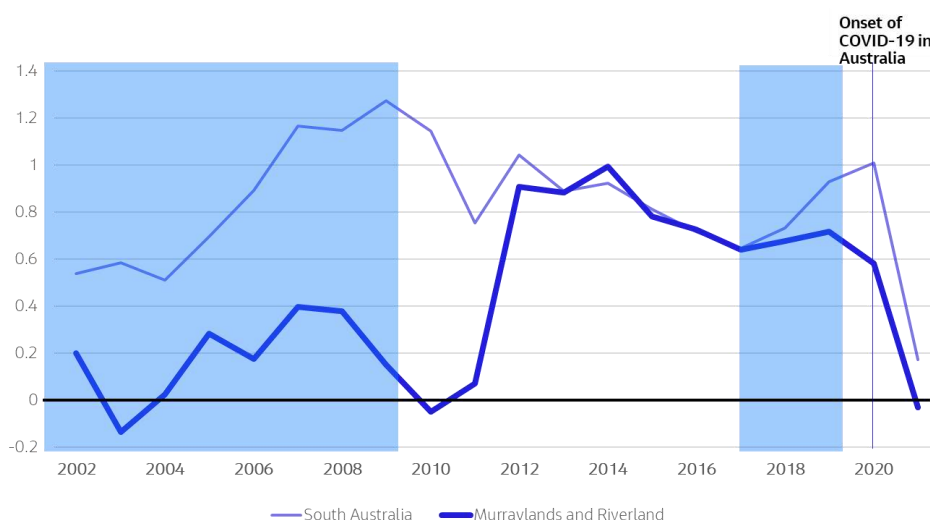


Figure 11. Percentage change in population in Murraylands and Riverland region compared to South Australia. Overlaying this are the years in drought (blue shading). (ABS, 2020)

Connectivity

In a globalised world, the internet is critical for both information and education purposes, allowing for social connection and economic development.

The region has made significant progress in terms of its telecommunications network. In 2016, 69 percent of households in the region had an internet connection (ABS, 2016).¹ However, like many regions across Australia, the Murraylands and Riverland region does not have the same level of access to consistent and reliable connectivity compared to metropolitan areas (in 2016, the national rate was 80%) (ABS, 2016). However, this data was not collected in the 2021 census given increased mobile internet usage on personal devices outside the home.

Changing attitudes

More broadly across Australia, increasing access to information has occurred in parallel with community attitudes becoming increasingly polarised. Members of the community, particularly in rural and regional areas, are becoming more disenfranchised and distrustful of government and other institutions. Roy Morgan (2022) surveys on 'trust' and 'distrust' of government have recently found that government distrust has generally remained higher than government trust and belief since 2010 (Figure 12).

¹ It should be noted that this statistic is reasonably outdated and the level of digital connectivity would likely be higher in the region today.

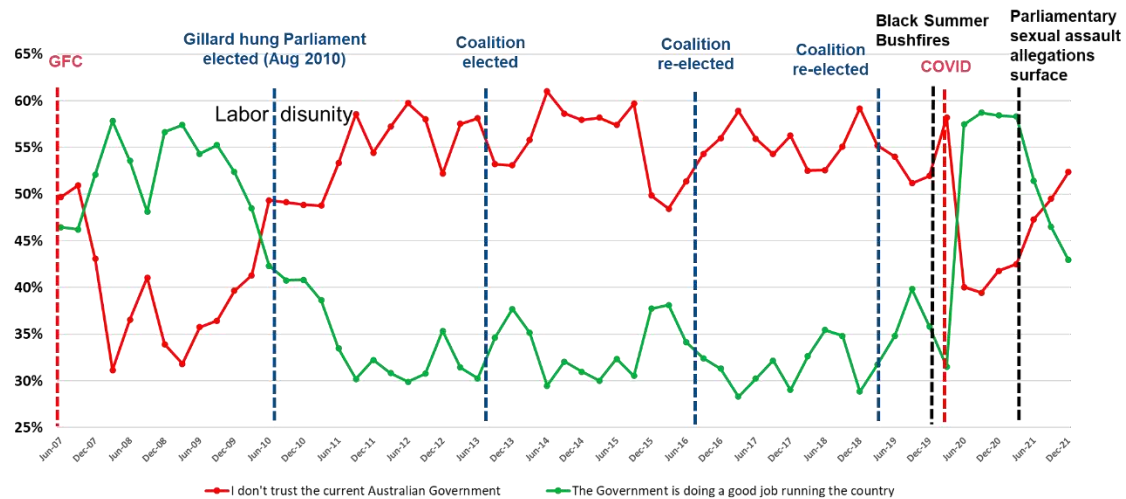


Figure 12. Government distrust (red) vs Government doing a good job running the country (green) (Roy Morgan, 2022)

Key findings from the Sefton Review and the Keelty Inquiry (refer to Appendix A. Summary of Basin Plan Reviews) confirm a trend of growing distrust in the government across Basin communities. The Sefton Review notes:

'We found many people have diminished trust in federal and state governments to deliver good long-term policy and support rural and regional Basin communities. There have been over 40 reviews into the Basin Plan or Basin water management since the Plan was legislated in 2012 and we heard frustration over perceived lack of action in response to these reviews.'

While there is no explicit data for the region's communities, across Australia, there is a broader rise in populism which can be attributed to this declining trust in government, as well as backlash against the pace of social change (Wood, Daley, & Chivers, 2018).

The climate and environment

A unique environment

The Murraylands and Riverland landscape is characterised by the River Murray and its associated estuarine, floodplain and wetland environments. These environments provide habitat for an incredible diversity of native flora and fauna, including Murray cod, mullocky, yabbies, waders and waterfowl birds, frogs. More broadly, the region's landscape provides home for over 2,000 flora species and more than 450 fauna species (Murraylands and Riverland Landscape Board, 2021).

National and conservation parks total 30 percent of the land use (ABS, 2016). There are 250 wetland complexes (sets of wetlands that are dependent upon each other) along the SA River Murray. Three wetlands of Ramsar international importance exist along the River Murray and support the unique features of the region's environment: the Coorong, Lower Lakes and Murray Mouth; Riverland; and Banrock Station Wetland Complex. The Coorong wetland system is recognised for supporting endangered migratory birds from across the world, threatened wildlife and rare plants. Its importance is also recognised through international migratory bird agreements.

Most of these wetlands are suffering from the impacts of river regulation, water extraction and pest species, as well as the devastation caused by the Millennium drought. A combination of increased pollution (increased salinity and siltation), and decreased flows in the river, lakes and the Coorong has led to a decline in the number of native flora and fauna species, and a rise in pest plants and animals. This, along with an increasingly regulated river system which provides stability in flows, is impacting the unique environmental features of the region (Goyder Institute for Water Research, 2022).

Bookmark Creek

Located near Renmark, Bookmark Creek is a 8km anabranch of the River Murray. It is home to vegetation including red gums, black box, saltbush and reeds, as well as native fish, significant birds and frogs.



Department for Environment and Water, 2021



Coorong Country, 2022

Significant species

The region, in particular the Coorong, is renowned for supporting a range of migratory bird species such as curlew sandpiper, black swan, cape barren goose, musk duck, strawnecked ibis, royal spoonbill, and Australian pelican.

The Coorong



DEW, 2019



DEW, 2021



DEW, 2021

Spanning 140km, the Coorong is a shallow, brackish to hypersaline narrow coastal lagoon that is separated from the Southern Ocean by a coastal dune barrier.

Located at the end of the Murray-Darling Basin, the Coorong forms part of the 140,000-hectare Coorong and Lakes Alexandrina and Albert Ramsar listed wetland. The site is the only pathway for fish that move between freshwater and marine habitats and is the only natural pathway to export salt from the Murray-Darling Basin. It is also home to a unique mosaic of 23 wetland types that support a diverse range of native waterbirds, fish, invertebrate and plant communities. The region is visited by 25 species of migratory birds and is home to threatened species such as the Fairy Tern, Southern Bell Frog and Murray Hardyhead. (Commonwealth of Australia and DEW, 2016).

The forthcoming Coorong, Lakes Alexandrina and Albert Wetland Ramsar Ecological Character Description (ECD) details how several critical components, processes and services that define the ecological character of the Coorong are at risk of exceeding their limits of acceptable change. Although the key ecological features of the Coorong that make it a unique and valuable place are still present, the system is in a vulnerable state, with little capacity to absorb continued and cumulative environmental stress.

Reduced water availability, exacerbated by the Millennium Drought, has contributed to a decline in the ecological state of the Coorong. While the Coorong has received recent freshwater inflows, other aspects of its ecological function have not recovered. In the Coorong South Lagoon, for example, the prevalence of filamentous green algae is preventing aquatic plants from completing their lifecycle and interfering with the ability of waterbirds to feed on both plants and invertebrates in mudflats (Goyder Institute for Water Research, 2022).

The Healthy Coorong, Healthy Basin Program is part of the South Australian Government's Project Coorong Initiative to ensure the system contains a diverse range of species, adequate flow and is resilient to future changes.

Trends impacting the region's environment

A changing climate

Like many other regions across the Basin and Australia, the Murraylands and Riverland will continue to face complex challenges as a result of a changing climate. Climate change will lead to a drier and hotter climate in the region, with reduced average rainfall and an increased risk of extreme weather events such as heatwaves, drought, and bushfires.

By 2050 it is projected that in the South Australia Murray Darling Basin region

- Average annual rainfall could decline by **11-22%**
- Average annual maximum temperatures could increase by **1.9-3.6 °C**
- Average annual minimum temperatures could increase by **1.5-3 °C**

(Goyder Institute for Water Research, 2022)

The impacts of a changing climate are already being felt in the region. In 2019, the overall mean temperature in South Australia was 1.45 °C above average, making it the state's second-warmest year on record. In addition, the rainfall that year was 65 percent below average, the state's driest year on record. Figure 13 and Figure 14 show some key climate change projections for towns in the region to 2070 (based on a low-high emissions scenario).

These conditions will result in reduced water availability from both surface and groundwater resources. Critically, there has been a 50 percent reduction in inflows in the River Murray since the start of the century (Interim Inspector-General of Murray-Darling Basin Water Resources, 2020). While river flows across the Basin experience high inter-annual variability, modelling by the Murray Darling Basin Authority (MDBA) and CSIRO projects that in an extreme dry scenario, there will be an average 30 percent reduction in annual replenishment flows across the Basin (Zhang, 2020).

Wetlands and climate change project



The Murraylands and Riverland Landscape Board led an investigation to understand the vulnerability of native vertebrate fauna to climate change, to help inform management of wetlands and floodplains along South Australia's River Murray. 37 species of aquatic ecosystem-dependent vertebrate fauna were identified as most vulnerable to the impacts of climate change, due to their reliance on seasonal flooding and flow and low tolerance to salinity.

For more information, visit www.landscape.sa.gov.au

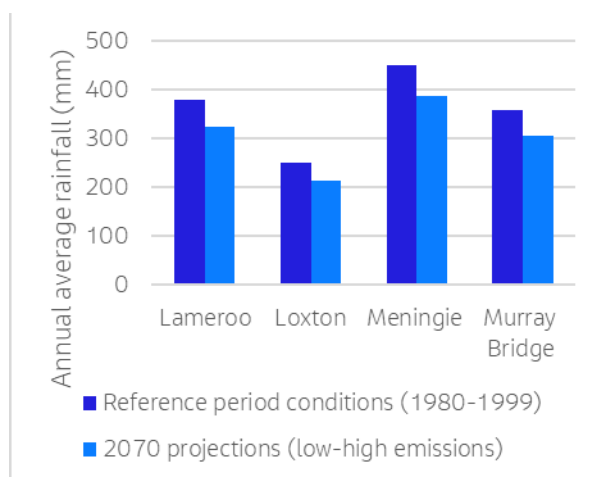


Figure 14. Annual average rainfall (mm) climate change projections for towns in the SA Murray Basin (Siebentritt, et al., 2014)

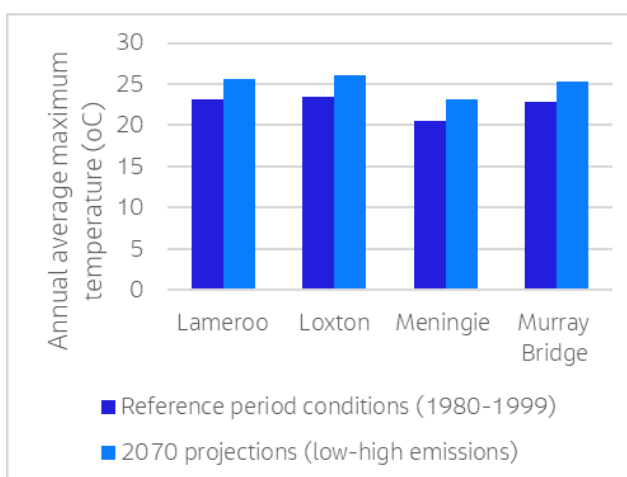


Figure 13. Annual average maximum temperature (°C) climate change projections for towns in the SA Murray Basin (Siebentritt, et al., 2014)

In addition, climate change is projected to have lasting impacts on the natural environment. These projections include:

- **Impacts to the specific environment of the Coorong and Lower Lakes.** In the Millennium drought, reduced flows resulted in shallow water levels in the Lower Lakes. This resulted in no flow through the barrages to the Coorong estuary for over three years, leading to habitat loss, exposure of waterlogged soils causing areas of acid sulfate soils, and elevated salinity in the Coorong (Siebentritt, Halsey, Meyer, & Williams, 2014). Policies and programs have been implemented to target salinity control in the area, including the installation of barrages to maintain separation of freshwater in Lake Alexandrina from the estuarine environment of the Coorong and Goolwa Channel – however, it is anticipated that projected sea level rise will impact the effectiveness of these actions.
- **Nutrient and fertility loss in soils** as a result of wind erosion, salinity, riverbank slumping and compaction.
- **Reduced environmental flows** available for critical aquatic species such as Golden Perch and Murray Cod, as well as resident and migratory waterbirds.
- **Vegetation stress**, with species potentially pushed beyond their natural tolerance in a hotter and drier climate.
- Increased likelihood of invasive **pest plants and animals** as a result of more fragile ecosystems unable to defend against invasive species. This may have flow on impacts to the biosecurity of primary production systems.
- Increased risk of **diseases** affecting primary production, both livestock and crops.

How the region is responding

Despite the projected impacts of climate change, the region is no stranger to drought conditions. Government programs are providing support to enhance the resilience of the region to future significant weather events, particularly where these affect primary production. Some examples of these programs include:

- **Regional Drought Resilience Planning (2020-2024)** - The Australian Government is working with state and territory governments to support regions to develop regional drought resilience plans to prepare for and manage future drought risks. \$197,000 has been dedicated to the MR Landscape Board to develop regenerative farming practices to operate in low rainfall areas.
- **Farm Business Resilience Program (2020-2024)** - Through this program, farmers (including farm managers and employees) will have access to subsidised learning and development opportunities in strategic business management, farm risk management and decision-making, natural resource management, and personal and social resilience to better manage their risks relating to drought. Over \$2 million has been made available to South Australian farmers as part of the roll out of the program.

Part 3 – Managing water - the lifeblood of the region

Water, and in particular the River Murray, is at the very heart of the region and its development. The River Murray is the main source of water for the region, as well as being a significant resource for metropolitan Adelaide and regional towns across the state. Additional water is sourced from local catchments, such as dams, and groundwater. Water is used for irrigated horticulture, livestock, water supply for towns, the environment and recreation.

River Murray water supporting irrigation development

The region has a long history of irrigation development, dating back as early as 1887. Irrigation in the Riverland supports approximately 40,000 hectares of crops and pasture. (PIRSA, 2022). Today, the region has a prescribed water entitlement from the River Murray for approximately 400-450 gigitalres, approximately 24% of the South Australia's entitlement.

The actual volume diverted (or used) in any year is dependent on climatic conditions, the volume allocated on South Australia River Murray water entitlements, and the volume traded from interstate entitlements. Figure 15 outlines the volume of water that has been used for irrigation, town, and metropolitan use from the River Murray each year from 2014 to 2019 compared to the volume allocated (adjusted for trade).

The River Murray has been instrumental in creating agricultural value in the region – an average of 75 percent of the water taken from the river annually is used for primary production in South Australia.

(DEW, 2022)

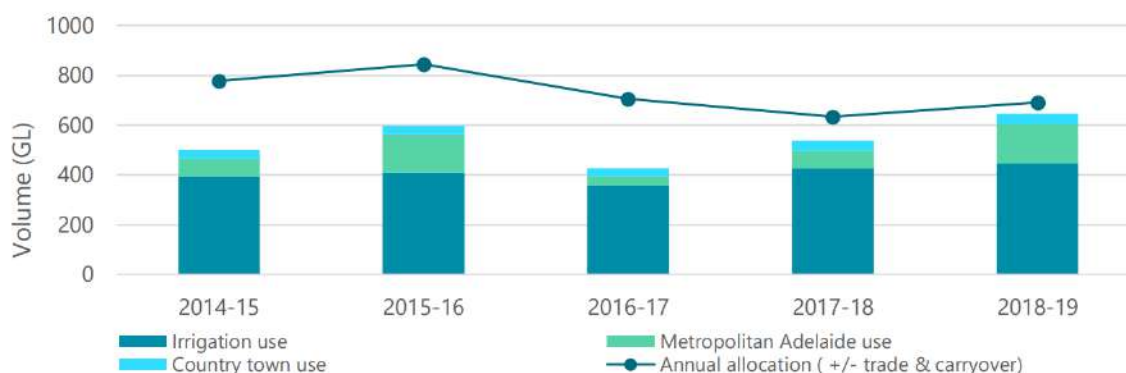


Figure 15. Consumptive water use from the River Murray in South Australia (DEW, 2022a)

The level of water use in the region has remained relatively stable since the end of the Millennium drought, with the total irrigable area (ha) of 79,680 ha in 2009 versus 91,735 ha in 2019 (DEW, 2022) – however, the region did see a large increase in irrigable area of 6,510 ha between 2015 and 2018 predominantly due to an increase in permanent plantings such as almonds. Since 2003, wine grapes have remained as the dominant crop type; however, since 2003, almonds have seen an exponential increase in planted hectares of 263% (SunRISE, 2022). Citrus, stone fruit, and vegetable crops comprise the bulk of other crops in the region (Figure 16).

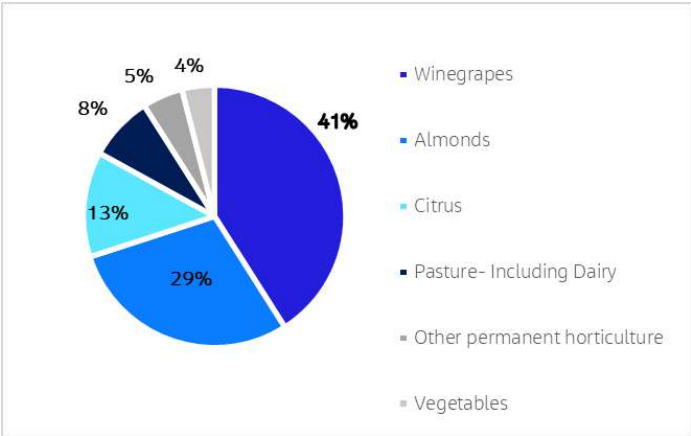
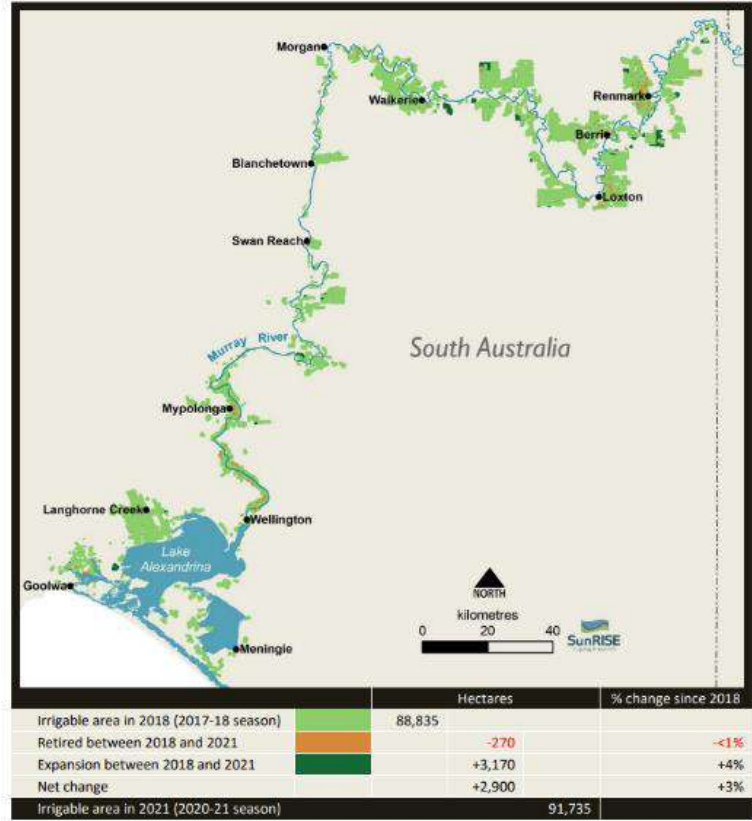


Figure 16. How River Murray water is used in the region (2018-2019) (DEW, 2022a)

Irrigation in the region is highly sophisticated and efficient, with over 60% being drip irrigation for permanent plantings and over 30% being overhead for seasonal plantings (SunRISE, 2022).

A combination of historical challenges with salinity, periods of low water allocations and high-water prices, and programs such as the SA River Murray Sustainability Program (SARMS) have encouraged the achievement of a very high level of water use efficiency.

Figure 20 provides a snapshot of water management in the region, showing how key interventions have contributed to creating a highly water efficient community, alongside broader Murray Darling Basin water reform. Further detail on water use is found in the (draft) Murraylands and Riverland Water Allocation Plan (2021).



2018 to 2021 (retired area in orange) (SunRISE, 2022)

Figure 17. Map of irrigation expansion and areas in the region retired from

Regional Profile

Table 1. Changing water use by crop type 2009-2019 (DEW, 2022b)

Changing water use	2009	2019
 Winegrapes	51% Winegrapes largest horticultural water	41% Winegrapes still largest user, but % decrease 
 Almonds	17% Almonds second largest user	29% Almond water use increases significantly 
 Citrus	17% Citrus equal second largest user	13% Citrus using less water 

Other sources of water

As Figure 19 describes, while the River Murray is the main source of water for the region, groundwater is also used for crop irrigation and for some townships public water supply purposes. Across the region, there are four prescribed water resources areas (PWA) which have a Water Allocation Plan. These are defined in Figure 19. Prescribed well areas (PWAs) in the Murraylands and Riverland region and shown in Figure 18.

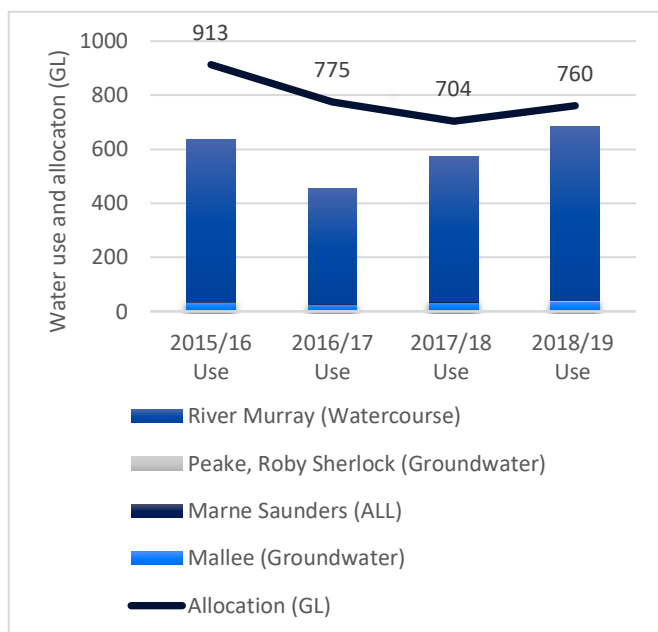


Figure 19. Water use and allocation for prescribed water resources in the region from 2015 to 2019 (DEW, 2022)



Figure 18. Prescribed water sources in the Murraylands and Riverlands region, including the River Murray

Prescribed water sources

In South Australia, where there is a high demand for a water resource and a need to sustainably manage this resource – the water resource is ‘prescribed’ (under the Landscape Act). Water allocation plans (WAPs) are developed for these prescribed water resources and set out sustainable limits and rules around the taking and use of water.

Where water resources are not prescribed, water affecting activities, like the construction of dams or wells, are managed through a permit system. Water allocation plans and water affecting activity policies for water resources are developed by regional landscape boards. Appendix B provides further detail about the PWAs in the Murraylands and Riverland region.

Water efficiency in the region

The region has and continues to be a leader in adopting and adapting to new technologies and water use efficiency. Learning lessons from the Millennium Drought, the region has adapted to more water-efficient production technologies, systems, and crop types, as well as diversifying and value-adding traditional products.

The region has achieved national and international recognition of this leadership through the Alliance for Water Stewardship. Renmark Irrigation Trust and Renmark Paringa Council are two of only 130 global organisations with a gold accreditation from the Alliance for Water Stewardship. (Alliance for Water Stewardship, 2022).

The Murraylands and Riverland Landscape Board have been working in partnership with the Australian Government and irrigators to deliver the Murray-Darling Basin Water Efficiency Program (WEP). This program is supporting projects that are demonstrating significant efficiencies in irrigation as highlighted in Table 2.

Table 2. Examples of Murray Darling Basin WEP projects in the region

Location	Water to be recovered	Summary of project
Langhorne Creek	21.70 ML	- Project involving irrigation upgrades for wine grape growing - Proposed to increase the utilisation of existing licensed groundwater entitlements, the installation of dam pumps, pump suction, primary filtration, automation and control and the construction of a 12 ML lined storage dam \$292,354.83 (incl. GST) of project funding
Loxton	8.40 ML	- Project involving irrigation upgrades for citrus growing - Proposed to convert 15.3ha to surface drip irrigation, installing/upgrading fertigation, filtration, pumping infrastructure and soil moisture monitoring devices 119,358.36 (incl. GST) of project funding
Loxton	3.40 ML	- Project involving irrigation upgrades for citrus growing \$46,650.07 (incl. GST) of project funding

Murray Darling Basin

The River Murray in South Australia sits at the end of the Murray-Darling Basin system, which is a resource shared with Victoria, NSW, ACT and Queensland. Water sharing arrangements and inter-jurisdictional agreements dictate the volume and pattern of flows to South Australia. South Australia diverts around 7 percent of the Basin’s extracted surface water resources.

Water reform in the Basin

As early as 1917, in response to growing concerns regarding availability of water and environmental decline, governments along the Basin came together to better manage and share water, with the first intergovernmental agreement being signed (Figure 20) shows some of the key elements of water reform since this time, particularly in the 1990s when there was significant progress in the reform of water sharing and water management. However, the fundamental issue of over-extraction remained.

The Millennium Drought — a significant drought across much of the Basin from the late 1990s to 2010 — exposed the limits and weaknesses of existing water management and highlighted the need for further reform to ensure ongoing river health and sustainability. This led to the Australian Government passing the *Water Act 2007* with bipartisan support. The Water Act required the MDBA to prepare a Basin Plan to manage the Basin water resources in the national interest to optimise economic, social, and environmental outcomes.

In 2008, the governments of South Australia, Victoria, New South Wales, Queensland, and the Australian Capital Territory (ACT) committed to implement the Basin Plan through an intergovernmental agreement (the Murray Darling Basin Agreement). The Basin Plan was passed by Parliament in 2012 (MDBA, 2021).

Central to the Basin Plan are **Sustainable Diversion Limits (SDLs)**, which limit the average amount of water that can be extracted from the Basin for use by households, industry, and irrigators. The MDBA has estimated that the amount of water diverted from the Basin needs to be reduced by **3,200 GL** to achieve a healthy and productive Basin (DAWE, 2022). Collectively, States and the Commonwealth, under guidance of the MDBA, are working to return water to the environment to achieve this target.

1,850GL  Annual Water Entitlement from the River Murray for South Australia (MDBA, 2022)	20.4 %  of water entitlement from the River Murray is for environmental flows (MDBA, 2020)	\$97/ML  Average price of water in the SA Murray Water Market in average conditions (2022) (Downham, Walsh, Westwood, & Gupta, 2022)
---	---	---



Figure 20. Water reform across the Murray Darling Basin (left) compared to water management in the region (right).

Implementing the Basin Plan

The implementation of the Basin Plan has been challenging. Communities along the River have grappled with the impacts of drought and floods alongside such significant reform. As a result of growing discontent and concern over the management of the Basin and the impacts of the Basin Plan implementation, a series of significant reviews (over 40 since 2012) have occurred into the Basin Plan or Basin water management. Two recent reviews, the 'Sefton Review' in 2020 and the 'Keelty Inquiry' in 2020, have provided a series of recommendations with common themes including:

- Re-confirming that 'the primary driver in reduced water availability is the reduction in flows through the River Murray in the last two decades'
- That growing distrust and a lack of transparency and 'water' literacy has added to the confusion and concern over how the Basin is managed, and
- That communities have been generally, over engaged, yet under listened to.

Appendix A. Summary of Basin Plan Reviews summarises the key findings and recommendations arising from these reviews.

Sustainable Diversion Limit Adjust Mechanism (SDLAM)

The Basin Plan includes a mechanism to adjust SDLs in the southern Basin. It provides the opportunity to implement a suite of projects that enable Basin Plan outcomes to be achieved with less water (referred to as SDLAM). In 2017, the SDLAM draft determination found that supply and constraint measures, as a package, could deliver an offset of 605 GL/y, meaning 605 GL/y less water would need to be recovered from consumptive users (MDBA, 2021).

SDLAM also provides for the recovery of 450 GL of additional water for the environment, over and above that required under the Basin Plan, through 'efficiency measures' (water efficiency projects) that entail no adverse economic impacts on Basin industries and communities.

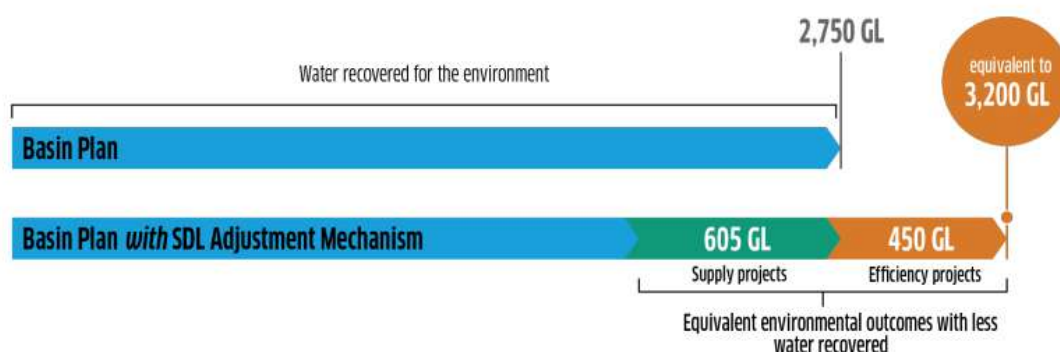
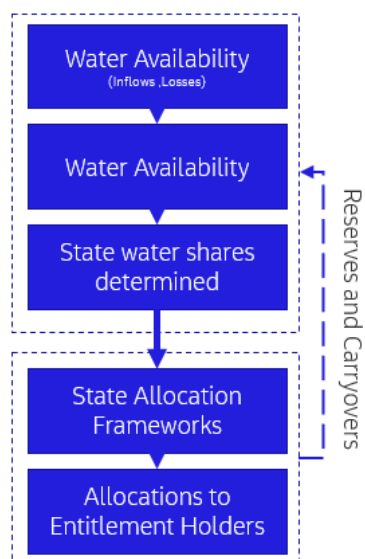


Figure 21 SDLAM in the Basin Plan (Source: MDBA, 2021)

Allocating water under the Murray Darling Basin Agreement

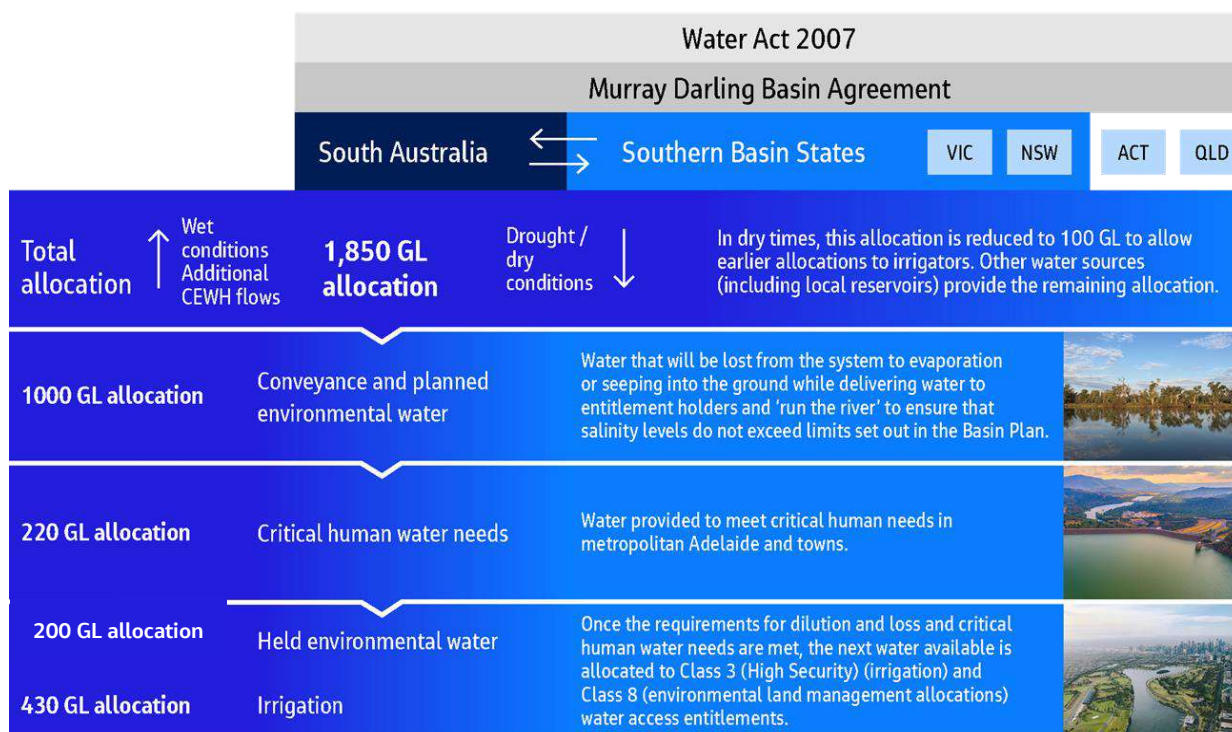


Water sharing arrangements for each state are determined under the Murray Darling Basin Agreement – but these are subject to water availability year on year, generally due to climatic factors. For this reason, each state is responsible for the way in which they allocate this water share, with the water market supporting to ensure the purpose of the Basin Agreement is achieved and outcomes are optimised.

Unlike the upstream states of NSW and Victoria, South Australia's allocation is relatively secure and fixed - South Australia receives an annual entitlement of 1850GL under the Agreement, however the actual allocation received can vary depending on weather conditions. Where South Australia does not receive the full entitlement, they will receive a third of the available flows from the River Murray (MDBA, 2022) as described in Figure 23.

High water supply security is required by South Australia because of the predominance of permanent plantings in irrigated areas and the reliance on the River Murray for urban and industrial supplies. These uses are normally fully satisfied because of the high security of South Australia's entitlement flow. Water pipelines for use of River Murray sources across South Australia are shown in Figure 24.

Figure 22. Figure 23 Water allocation under the Murray Darling Basin Agreement (Interim Inspector-General of Murray-Darling Basin Water Resources, 2020)



For more information, visit <https://www.mdba.gov.au/water-management/allocations-states-mdba/guide-allocations>

Figure 23. How water is allocated in South Australia under the Murray Darling Basin Agreement

Regional Profile

Environmental water

The Basin Plan provides water for the environment to protect and improve the health of wetlands, floodplains and rivers and their ecosystems. Water for the environment delivered to South Australia is provided by a number of water holders including the Commonwealth Environmental Water Holder (CEWH) and The Living Murray (TLM) program.

The water resource plans define environmental water for the South Australian River Murray, including both held and planned environmental water. This water will benefit wetlands and floodplains along the River Murray as well as supporting the environmental requirements of the Lower Lakes and Coorong (DEW, 2022b). Typically, the volume of environmental water flows in the River Murray increases throughout winter, peaking in spring and declining to a lower value throughout summer and autumn (MDBA, 2022).

Environmental water is especially critical to manage the health of the Coorong and Lower Lakes as it acts to manage salinity and provides critical habitat for animal species.

Further detail on the held environmental water register and number of shares (KL) is available from <https://www.environment.sa.gov.au/topics/river-murray/improving-river-health/environmental-water>.



Figure 24. Water pipelines from the River Murray in South Australia (MDBA, 2022a)

Water markets and trade in the Basin

The southern-connected Murray-Darling Basin is one of the most mature water markets in the world. It is based on a 'cap and trade' system, whereby the cap represents the total pool of water available for consumptive use and water can only move among licence holders and new businesses by trade.

Water in the Murray-Darling Basin can be bought and sold, either permanently or temporarily. This water is traded through markets – within catchments, between catchments (where possible) or along river systems. This form of trading allows water users to buy and sell water in response to their individual needs. For example, sometimes an entitlement holder will use 30 percent of their allocation, sometimes they will carry over to the next water year. This is an individual business decision that requires entitlement holders to consider climate and rainfall, their cropping cycle, and their own business plans. This allows water to be moved to more productive and higher value uses.

Table 3. The Murray-Darling Basin Water Market

Water markets facts	
	Most water traded in the Murray-Darling Basin is surface water; however, some groundwater licences are also traded. The region has a vast groundwater supply throughout the eastern Murraylands.
	Water prices fluctuate in response to changes in supply and demand, which is principally influenced by climatic, and irrigation demands respectively. Price differs across regions and type of rights, and with time.
	Water is traded for a variety of reasons; however climatic conditions are the primary driver. Climatic conditions impact on the water available for allocation in a particular season; and demand for irrigation water. In South Australia, the volume of water available for allocation and trading will depend on the overall allocation to South Australia for that year.

There are two types of water trade:

	Permanent trade	is the trade of water entitlements (known as 'entitlement trade'). For example, if an entitlement holder sold their water entitlement permanently.
	Temporary trade	is the annual trade of water allocations (known as 'allocation trade'). For example, an entitlement holder can trade their allocation in any season, based on their own business model.
	Interstate trades with NSW and Victoria are possible, but as each state has its own process and rules for allocating water, it can be challenging.	

Water deliverability

When releasing water, the MDBA or other water managers must consider how long it takes for water to get from storage to the entitlement holder who has placed the order. Water managers need to consider the characteristics of the river system, as well as natural conditions such as weather and evaporation (Figure 25). For example, in the absence of floods, it can take three to four weeks for water released from the Hume Dam to reach the South Australian border. On the other hand, during flood times, this can take six weeks or longer.

Shortfalls can occur when water that has been allocated but cannot be delivered to users where and when it is needed. This has not occurred for irrigation water since 2002 but did occur in 2018 for environmental water.

The risk of shortfalls is increasing for users downstream of the Barmah Choke, including the South Australian Murray region (MDBA, 2021). This is because the Choke restricts the maximum regulated flow and for much of summer the flow is at the maximum. This will be an increasing risk for users and communities, including for the region, as water may not be able to be delivered to users when they want it.

According to the MDBA, several factors impact water delivery as described in Figure 25:

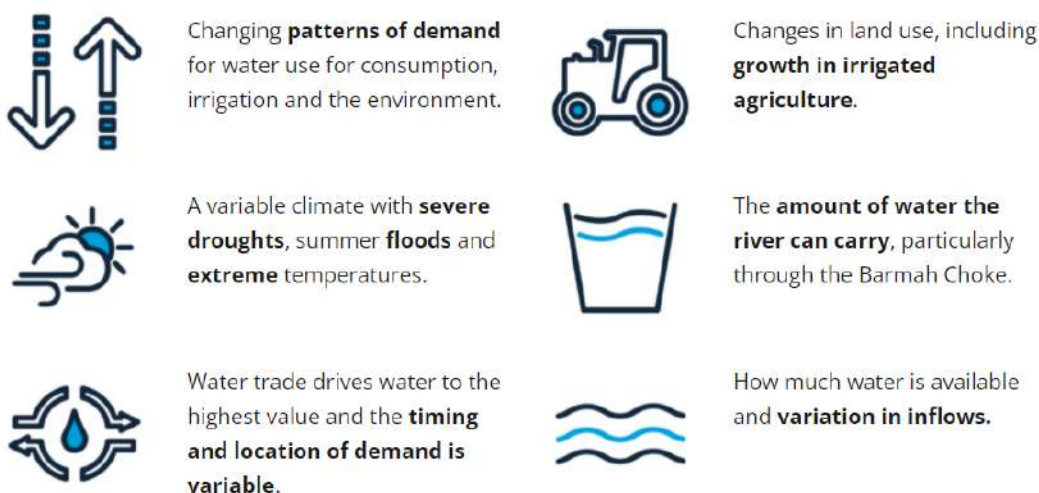


Figure 25. Key factors that impact water delivery in the Murray Darling Basin (MDBA, 2022a)

Part 4 –Challenges affecting future water management

This section of the Regional Profile summarises some of the challenges that are emerging and will need to be considered by the MRLGA in developing their positions and actions.

Extreme variability

As a result of a changing climate and continued high levels of extraction, the overall availability of water in the region is anticipated to change and likely decrease. This is likely to occur for all sources and will have impacts on all users.

Ongoing studies of the Basin have shown that there has been an overall significant reduction of inflows into the Basin. Figure 26 shows this decline over the past century. Over the lowest 11 years of flow since 1900, six have occurred since 1997 (Prosser, Chiew, & Smith, 2021). This trend is expected to continue under climate change. Being located at the final section of the River Murray, the inflows received by South Australia are subject to both effects from overall Basin water availability and upstream usage. Between 2012-2019, 22 percent of the expected water under the Basin Plan was not received through the River Murray at the South Australian Border (Colloff & Pittock, 2022). During this, SA still received Class 3 irrigation entitlements, which is critical to maintain.

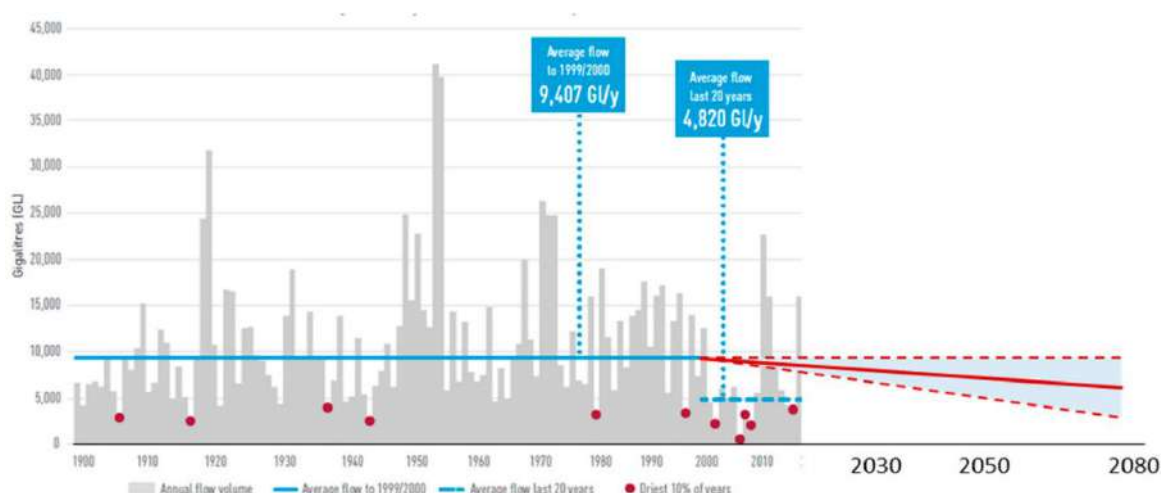


Figure 26. Annual time series of streamflows to the River Murray with projected changed under 2° C global average warming (RCP8.5) climate change. Projections show the median, 10th and 90th percentile results from hydrological modelling of climate change (Prosser, Chiew, & Smith, 2021)

The region is well versed in the effects of drought, and this is likely to continue as a result of climate change and reduced inflows to the River Murray. For example, during the Millennium Drought, consumptive and irrigation use was restricted, and the environment suffered with areas of significance such as Lake Alexandrina at risk of significant harm. While funding and investments have been put in place to increase the resilience of the region, it must contend with a long-term trend of reduced inflows and more frequent, intense, and extended drought conditions.

Currently, South Australia's storage arrangements for River Murray water enable it to defer and store limited water in the upper River Murray storages to meet critical human water needs and private carryover (DEW, 2022b). However, this is still dependent on the availability of flows in the River Murray. The region's reliance on the River Murray as a primary source of water puts the region at risk compared to other regions, where water sources are more diversified.

Other water sources in the region, including prescribed water sources from groundwater, and rainfall, are also at risk of decline from a changing climate. This places additional pressure on the region's water sources for alternative options. Studies suggest significant reductions in use will be needed to sustain capacities for some groundwater resources; however, this will be challenging if rainfall reduces and greater groundwater usage is required to supplement crops (EPA South Australia, 2018).

Salinity is also a major issue impacting the water resources available. Reduced stream flow, groundwater through-flow, and sea-level rise are causing potential increases in salinity of freshwater sources.

Overall, this situation is resulting in the region being heavily reliant on increasingly unreliable sources of water to support its industries, towns, people and environment. The volume of water available for allocation each year is therefore likely to vary, with flow-on effects to water users. Changing climatic conditions therefore are likely to both increase the demand for water in industry and residential settings and restrict supply. These two factors occurring across the Basin will have a significant impact on both water prices and allocations across the Basin (Goesh, Legg, & Donoghoe, 2020).

Changing demand and use of water - driving up competition and increasing risk exposure

Changing demand and use of water use in the region will affect water availability in the future. There are several factors at play, including the increase in permanent plantings, reduced water allocation, higher water prices and increase in challenges navigating the water market. Together, these factors combine and can create volatility in the market for irrigators.

Changing crop types - demanding more water

Changing market conditions driven by global events and external forces have a direct relationship and impact on water demand. Permanent horticulture such as nuts, grapes, citrus and stone fruit have increased in the region due to water reform policies and increases in customer demand, both domestically and internationally. However, these plantings need to have reliable water from year to year to ensure continued crop maturation.

Aither (2021) estimate that current horticultural water demand in the southern Murray-Darling Basin is 1,230 GL per year and will grow to 1,400 GL once all current plantings (of almonds) reach full maturity. This is around 55 percent higher than recent estimates by the Australian Bureau of Statistics (DELWP, 2019).

Annual crops, such as rice and cotton, do not have this strict reliance and a decision about whether to plant these crops, or how much to plant, can be made once growers are confident that enough water is going to be available. Broad estimates by the Department of Environmental, Land Water and Planning (DELWP) in Victoria for the lower Murray region, shows that horticultural demand currently accounts for almost all allocation against entitlements held in the lower Murray region (including VIC Murray and NSW Murray, below Barmah Choke) in 'average' years. In extreme dry years, water supply hardly meets half the demand (

Figure 27).

To manage this demand, irrigators use the water market to trade and manage water licenses. But as water sources become more unreliable, irrigators in the region may find it more difficult to meet their demands using the water market in dry to average years and may contend with increasing prices.

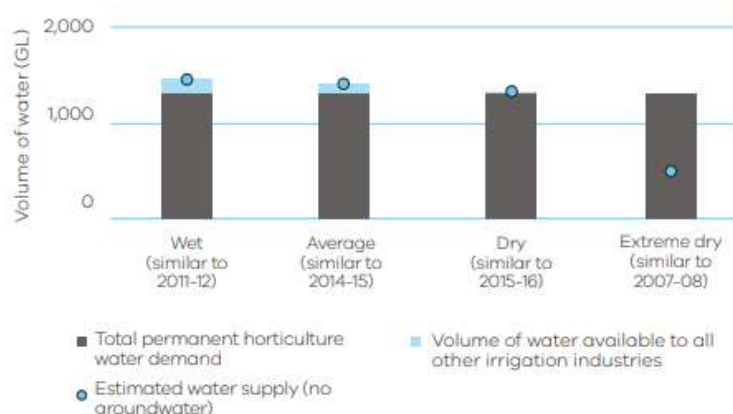


Figure 27. Water availability scenarios and projected permanent horticulture water demand (at full maturity) for the lower Murray region (DELWP, 2019)

Regional Profile

Market fluctuations have been seen in the past, shown in Table 4. Research undertaken by Aither (2021) determined that water entitlement prices increased significantly during 2018-19 across all regions of the Basin, including the SA Murray which experienced a price increase of 51 percent from 2017-18 prices. This reflects the expansion of permanent plantings in the region and demand for carryover.

Table 4. Annual transfer volumes and volume weighted average prices (VWAP) for major Southern Murray Darling Basin entitlement types, 2017-18 and 2018-19 (Aither, 2021)

Entitlement type	No. traded	Volume traded (ML)	Annual VWAP (\$/ML)		Annual change in price (%)	Three-year change in price (%)
			2017-18	2018-19		
Vic 1A Greater Goulburn HRWS	845	38,647	\$2,792	\$3,628	30% ▲	41% ▲
Vic 1A Greater Goulburn LRWS	348	27,281	\$366	\$517	41% ▲	75% ▲
Vic 6 Murray (above Choke) HRWS	272	22,847	\$2,865	\$3,830	34% ▲	47% ▲
Vic 6 Murray (above Choke) LRWS	142	12,516	\$375	\$558	49% ▲	99% ▲
Vic 7 Murray (below Choke) HRWS	961	39,416	\$3,249	\$4,530	39% ▲	56% ▲
Vic 7 Murray (below Choke) LRWS	191	12,259	\$386	\$620	61% ▲	115% ▲
NSW Murray HS	63	4,082	\$3,892	\$5,740	47% ▲	70% ▲
NSW Murray GS	75	30,944	\$1,362	\$1,964	44% ▲	62% ▲
NSW Murrumbidgee HS	25	7,994	\$3,743	\$5,762	54% ▲	62% ▲
NSW Murrumbidgee GS	44	22,383	\$1,664	\$2,139	29% ▲	46% ▲
SA Murray HS	165	18,710	\$3,039	\$4,578	51% ▲	62% ▲
Total	3,131	237,078				

Limited opportunities for further gains in water efficiency

The region has and continues to be a leader in adopting and adapting to new technologies and water use efficiency, including through recognition from the Alliance for Water Stewardship. But this also means that the region is limited in opportunities to drive further efficiencies in irrigation. With increasingly less water available in a hotter and drier climate, and more water demand from permanent agricultural plantings, the region will need to consider new technologies and opportunities for efficiency and improvement.

Complexity of water management

Water policy and management, and in particular the water market is a complex topic. Information is often not easily accessed or understood. This high level of complexity makes it challenging for those who are outside of the system (such as local government) to make meaningful inputs. It also can impact on irrigators, who have to traverse this information to make informed business decisions.

A report by Marsden Jacob Associates for the MDBA notes that “a significant proportion of market instruments are offered off-the-market, with direct corporate-to-corporate or investor-to-corporate deals being very common with Leases and Forwards. This not only weakens market transparency, but also limits the availability of these products to a broader group of irrigators.” As noted in the report, this also challenges a like-for-like price comparison of products, which further impedes irrigators from understanding and determining the best decision for their business (Marsden Jacob Associates, 2020)."

While the Commonwealth and State governments provide resources and information to support and enhance water literacy, smaller farm businesses are not always in a position to navigate the changing and complex nature of water allocation and determine the best possible outcome for their business, particularly in the long term (Sefton, et al., 2020).

Politicisation of water management

One of the largest challenges for managing water is the increasing polarisation and politicisation of views, which is contributing to a growing lack of trust. This is compounded by water being a complex topic that assumes large amounts of knowledge and information, that is not readily available or easy to understand.

Communities and decision-makers alike often struggle to navigate the complex web of policies and reform, institutional arrangements, and allocation systems, including understanding how and when environmental water is used. This 'short-term frustration', combined with a spread of misinformation of Basin policies, is increasingly disenfranchising communities to trust in government institutions. While there is bipartisan support to deliver the Basin Plan, short-term policy cycles and politics creates complications across the Basin.

Regional town water security

The Murraylands and Riverland region, like other regions across the Basin and Australia, is experiencing growth in its regional centres - in turn, driving a demand for urban water which is largely sourced from groundwater and the River Murray.

If populations continue to grow as expected in regional centres, there will be an increased demand for urban water. It is anticipated that over the next five years demand from public water supply customers will grow by 1.2 percent per annum (Murraylands and Riverland Landscape Board, 2022). For some centres, increased demand may correlate with reduced supply, with long-term drought presenting a risk for critical human water needs.

Ensuring that the region is not left behind

The Murraylands and Riverland region has significant economic and social resilience – but it is challenged when compared to many other regions around Australia, and this is affecting future water management capability and capacity in the region. Lagging digital connectivity means a lack of uptake on new solutions to support water efficiency and create economic gains in agricultural production, while better connected neighbouring regions race ahead.

Closing remarks

The Murraylands and Riverland region is an important and diverse region. It makes a significant contribution to the South Australian economy and is home to some of its most iconic and important environments. The region is changing and evolving in response to global and national trends. The region, which is dominated by irrigated agriculture, is heavily reliant on its water resources and these resources are under threat.

The risk of more extreme water variability is high, and therefore it places an increased demand for co-operation and partnerships amongst stakeholders and government to collaborate together to minimize the risks and preserve South Australian economy's and communities. Hence, having policy and processes that enable 'adaption' during periods of extreme variability. The region has and continues to be a leader in water efficiency and stewardship. This leadership will be required to ensure the region not only responds but looks for opportunities to thrive.

The Water Position Paper prepared alongside this Regional Profile outlines a series of principles, positions, and actions for the region to continue to work towards a future where water is supporting healthy and thriving environments and communities.

References

- (n.d.).
- ABS. (2016). *RDA Murraylands and Riverland Profile*. Retrieved March 11, 2022, from <https://economy.id.com.au/rda-murraylands-riverland>
- ABS. (2020). *RDA Murraylands and Riverland*. Retrieved March 11, 2022, from <https://profile.id.com.au/rda-murraylands-riverland>
- ABS. (2021). *RDA Murraylands and Riverland, Economic Profile*. Retrieved from <https://economy.id.com.au/rda-murraylands-riverland/value-of-agriculture>
- ACCC (Australian Competition and Consumer Commission). (2021). *Water Monitoring Report 2019-20*. Canberra: ACCC.
- Aither. (2021). *Water Markets Report : 2020-21 Review and 2021-22 Outlook*. Melbourne: Aither Pty Ltd.
- Alliance for Water Stewardship. (2022). *About the Alliance for Water Stewardship*. Retrieved March 25, 2022, from <https://a4ws.org/about/>
- Citrus Australia. (2022). *South Australia*. Retrieved March 11, 2022, from <https://citrusaustralia.com.au/growers-industry/south-australia>
- Colloff, M., & Pittock, J. (2022). Mind the Gap! Reconciling Environmental Water Requirements with Scarcity in the Murray-Darling Basin, Australia. *Water*, 14, 208.
- Commonwealth of Australia and DEW. (2016). *Restoring and Protecting the Coorong, Lower Lakes and Murray Mouth*. Retrieved March 11, 2022, from <https://www.awe.gov.au/sites/default/files/documents/restoring-protecting-coorong-lower-lakes-murray-mouth.pdf>
- DAWE. (2022). *Progress on Murray-Darling Basin water recovery*. Retrieved April 8, 2022, from <https://www.awe.gov.au/water/policy/mdb/progress-recovery>
- DEW. (2019). *Mallee and Peake, Roby and Sherlock Prescribed Wells Area. 2018-19 Groundwater Status Overview*. . DEW. Retrieved from https://www.waterconnect.sa.gov.au/Content/Publications/DEW/Mallee_Peake_2018_19_WRA_Factsheet.pdf
- DEW. (2019a). *Water Resources Assessments for Groundwater and Surface Water*. Retrieved May 18, 2022, from <https://www.waterconnect.sa.gov.au/Content/Publications/DEW/96404%20DEW%20Groundwater%20and%20Surface%20Water%20status%20reports%20A3%202021%20FINAL.PDF>
- DEW. (2022). *River Murray*. Retrieved March 11, 2022, from <https://www.environment.sa.gov.au/topics/river-murray/about>
- DEW. (2022a). *Water Security Statement 2022*. Government of South Australia.
- DEW. (2022b). *South Australia's River Murray Water Allocation Statement*. Government of South Australia.
- DEWLP. (2019). *Fact Sheet 2 : Water Supply and Demand*. Retrieved March 18, 2022, from https://www.vgls.vic.gov.au/client/en_AU/search/asset/1301080/0
- Downham, R., Walsh, J., Westwood, T., & Gupta, M. (2022). *Water Market Outlook - April 2022*. Canberra: ABARES. Retrieved March 18, 2022, from <https://www.awe.gov.au/abares/research-topics/water/water-market-outlook>
- EPA South Australia. (2018). *State of the Environment*. Adelaide: EPA South Australia.
- Fred Consulting. (2019). *Regional Profile and Wellbeing Indicators Report*. Fred Consulting.
- Gleeson, T., Addai, D., & Cao, L. (2021). *Australian wine in China, Impact of China's anti-dumping duties*. ABARES. Retrieved from https://daff.ent.sirsidynix.net.au/client/en_AU/search/asset/1032321/0
- Goesh, T., Legg, P., & Donoghoe, M. (2020). *Murray-Darling Basin water markets, Trends and drivers 2002-03 to 2018-29*. Department of Agriculture, Water and Environment, Australian Government.
- Gonzalez, D., Dillon, P., Page, D., & Vanderzalm, J. (2020). The Potential for Water Banking in Australia's Murray-Darling Basin to Increase Drought Resilience. *Water*, 12, 2936.
- Goyder Institute for Water Research. (2014). *SA Climate Ready, Climate Projections for South Australia: SA Murray-Darling Basin*.
- Goyder Institute for Water Research. (2022). *Healthy Coorong, Healthy Basin Scientific Trials and Investigations Project*. Retrieved March 25, 2022, from <http://www.goyderinstitute.org/research/healthy-coorong-healthy-basin/>
- Interim Inspector-General of Murray-Darling Basin Water Resources. (2020). *Impact of lower inflows on state shares under the Murray-Darling Basin Agreement*. Canberra: Australian Government.
- Marsden Jacob Associates. (2020). *Murray-Darling Basin Water Market Products Scoping Study*. Sydney: Marsden Jacob Associates.
- MDBA. (2010). *Annual Report 2009-10*. Canberra: MDBA.
- MDBA. (2017). *Southern Basin Community Profiles*. Retrieved March 24, 2022, from <https://www.mdba.gov.au/publications/mdba-reports/southern-basin-community-profiles>
- MDBA. (2019). *Irrigated crop area data for the Lower Murray-Darling 2003 to 2018*. Canberra: MDBA.
- MDBA. (2020). *Flows to the lower Murray-Darling Basin*. Canberra: MDBA.
- MDBA. (2021). *Murray-Darling Basin Authority Annual Report 2020-21*. Canberra: Murray-Darling Basin Authority.
- MDBA. (2022). *How allocations work in the Murray-Darling Basin*. Retrieved March 25, 2022, from <https://www.mdba.gov.au/water-management/allocations-states-mdba/guide-allocations>
- MDBA. (2022). *MDBA's river operations*. Retrieved March 25, 2022, from <https://www.mdba.gov.au/water-management/river-operations>
- MDBA. (2022a). *MDBA's river operations*. Retrieved March 25, 2022, from <https://www.mdba.gov.au/water-management/river-operations>
- Murraylands and Riverland Landscape Board. (2021). *2021-2026 Regional Landscape Plan*. Government of South Australia.
- Murraylands and Riverland Landscape Board. (2022). *Water Allocation Plan for the River Murray Prescribed Watercourse*. Retrieved from <https://cdn.environment.sa.gov.au/landscape/docs/mrl/2022-RM-WAP-private-carryover-amendments.pdf>
- Natural Resources SA Murray-Darling Basin. (2019). *Water Allocation Plan - Eastern Mount Lofty Ranges*. Murray Bridge: Government of South Australia.

- NIEIR. (2021). *RDA Murraylands and Riverland, Economic Profile*. Retrieved March 11, 2022, from <https://economy.id.com.au/rda-murraylands-riverland>
- PIRSA. (2019). *Regional Strategy Engagement Report*. Adelaide: Government of South Australia.
- PIRSA. (2019). *South Australian AgTech Strategic Plan*. Adelaide: Government of South Australia.
- PIRSA. (2020). *Primary Industries Scorecard 2019-20*. Government of South Australia. Retrieved from https://www.pir.sa.gov.au/_data/assets/pdf_file/0009/385092/pirsa-score-card-2019-20.pdf
- PIRSA. (2022). *Irrigation development and management in South Australia's Riverland*. Retrieved from History of Agriculture in SA: https://www.pir.sa.gov.au/aghstory/natural_resources/water_resources_ag_dev/murray-darling_basin/irrigation_development_and_management_in_the_sa_riverland
- Podger, G., Yang, A., Brown, A., Teng, J., Power, R., & Seaton, S. (2010). *Proposed River Modelling Methods and Integrated River System Modelling Framework Design for use in Basin Plan Modelling*.
- Prosser, I., Chiew, F., & Smith, M. S. (2021). Adapting Water Management to Climate Change in the Murray-Darling Basin ,Australia. *Water*, 13, 2504.
- Regional Development Australia Murraylands and Riverland. (n.d.). *Open for Business : Grain in the Murraylands and Riverland*. Regional Development Australia Murraylands and Riverland.
- Riverland Wine. (2022). *The Wine Resource*. Retrieved April 8, 2022, from <https://www.riverlandwine.com.au/about/the-wine-resource/>
- Roy Morgan. (2022). *Since March 2019 government trust and distrust have fluctuated but 2021 ended with soaring levels of distrust*. Retrieved March 31, 2022, from <http://www.roymorgan.com/findings/8933-political-trust-distrust-australian-leaders-march-2022-202203220543>
- Sefton , R., Peterson , D., Woods, R., Kassebaum, A., McKenzie , A., Simpson, D., & Ramsay, M. (2020). *Final Report: Independent assessment of social and economic conditions in the Murray-Darling Basin*. Melbourne .
- Siebentritt, M., Halsey, N., Meyer, W., & Williams, R. (2014). *Building resilience to a changing climate in the South Australian Murray-Darling Basin: a climate change adaptation plan for the South Australian Murray-Darling Basin*. Murray Bridge: South Australian Murray-Darling Basin Natural Resources Management Board.
- South Australian Tourism Commission. (2021). *Murray River, Lakes and Coorong : the value of tourism*. Retrieved March 18, 2022, from https://tourism.sa.gov.au/media/0j3jp1ka/satc_corporate-affairs_research-and-insights_the-value-of-tourism_october-2021_murray-river-lakes-and-coorong.pdf
- Spence, A. (2021). *SA wine industry report reveals pain of pandemic, China hit*. Retrieved March 30, 2022, from <https://indaily.com.au/news/2021/11/02/sa-wine-industry-report-reveals-pain-of-pandemic-china-hit/>
- SunRISE. (2022). *Phase 1 report: Irrigated crop area data for the Lower Murray-Darling 2003 to 2021*. Canberra: MDBA.
- Tourism Research Australia. (2020). *RDA Murraylands and Riverland Region, Tourism Visitor Summary*. Retrieved March 18, 2022, from <https://economy.id.com.au/rda-murraylands-riverland/tourism-visitor-summary>
- Wood, D., Daley, J., & Chivers, C. (2018). Australia demonstrates the rise of populism is about more than economics. *The Australian Economic Review*, 399-410. doi:10.1111/1467-8462.12294
- Zhang, L. H. (2020). *Plausible Hydroclimate Futures for the Murray Darling Basin*. Canberra: CSIRO.

Appendix A. Summary of Basin Plan Reviews

Impact of lower inflows on state shares under the Murray-Darling Basin Agreement (2020) 'Keelty Inquiry'

This report determines:

- **The impact of changing distributions of inflows to the southern Basin on state shares under the Murray–Darling Basin Agreement**
- **Any consequential impacts on state water shares resulting from the reserves required under the Murray–Darling Basin Agreement. This includes how these interact with state water allocation policies**



The Keelty Report finds that:

- The primary driver in reduced water availability is the reduction in flows through the River Murray in the last two decades
- There is increasing distrust in government, fuelled by misinformation about the Basin policies.
- Particularly in the Lower Lakes in South Australia, there is a high degree of climate scepticism amongst irrigators. Additionally, increasing water literacy is needed to navigate the water market, with irrigators feeling excluded from the processes.

Some key recommendations include:

- (2) To increase trust in and transparency about water-sharing, the MDBA should provide clear and easily accessible information about Special Accounting measures, including the circumstances under which they are applied and how they are used to determine State allocations.
- (5) The Basin Officials Committee should consider ways through which States and agencies could work together across their respective jurisdictions to include water literacy in high school and higher education curriculums, including VET, in regional areas.

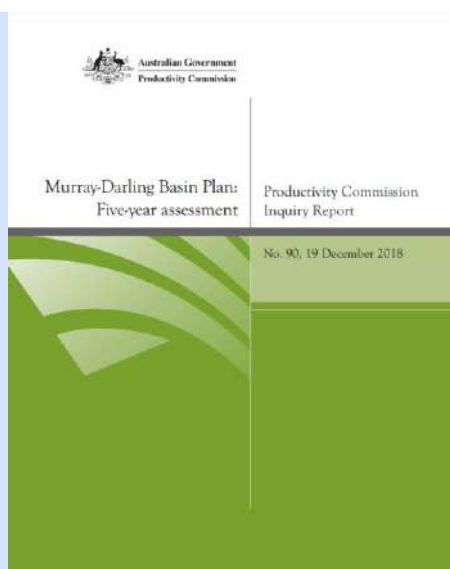
Murray Darling Basin Plan: Five-year assessment (2018) 'Productivity Commission Inquiry Report'

The report makes findings on progress to date in implementing the Basin Plan and recommendations on actions required to ensure effective achievement of Basin Plan outcomes.

The report finds that:

- Significant progress has been made – About 20% of the water that was available for consumptive users a decade ago is now dedicated to the environment. About \$6.7 billion has been spent to recover about 2000 gigalitres (GL). Water recovery is within five per cent of the July 2019 target.
- The arrangements for managing environmental water are working well, with evidence of improved ecological outcomes at the local and system scale.

However, it acknowledges that the next phase is challenging and achieving equivalent environmental outcomes using 605 GL less water recovery is highly ambitious.



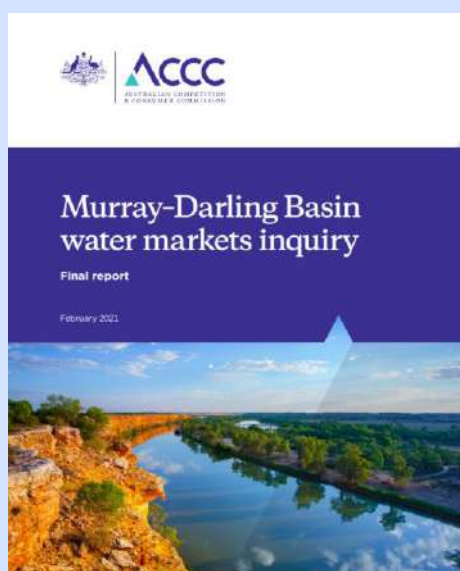
The process has lacked transparency and candour with stakeholders.
– It has been unclear who is responsible and accountable for leading implementation.

Key recommendations include:

- Sound governance arrangements are therefore required to support integrated delivery
- In addition, Governments should develop a monitoring strategy to enable effective evaluation ahead of the review of the Plan in 2016.

ACCC Murray Darling Basin water markets enquiry (2021) 'ACCC Report'

The report makes recommendations to enhance markets for tradeable water rights, including their operation, transparency, regulation, competitiveness and efficiency.



The ACCC found that:

- There is a lack of quality, timely and accessible information for water market participants
- There is a lack of regulatory transparency and no particular body to oversee trading activities, undermining confidence in fair and efficient markets.
- The Basin's market settings are complex and can only be best understood by professional traders and large agribusiness
- Changing conditions, such as reduced inflows, shifts in water use, declining channel capacity and increasingly binding trade restrictions, are challenging key assumptions that underpin trade arrangements and the design of tradeable water rights.

The ACCC recommends:

- (26) establishing a new independent Basin-wide Water Markets Agency
- (27) improving the consistency and transparency of rule-making processes and decision-making that significantly impact Basin water markets
- (28) requiring governments to obtain and consider advice from the proposed Water Markets Agency on matters with significant impacts on Basin water markets
- (29) improving transparency and clarity over the roles, functions and strategic priorities of intergovernmental committees

Appendix B. Prescribed well areas (PWAs) in the Murraylands and Riverland region

Prescribed Resources	Use and allocation	Challenges
Mallee PWA Groundwater	- Majority used for irrigating crops – primarily potatoes, as well as carrots, onions, and olives. Irrigation demand increased from 25,029ML in 2001 to 40,118ML in 2009. - Use in 2009 was also for Stock (189ML), recreation use (366ML) and town supply (307ML)	74 percent of wells in the PWA currently have water levels that are below average (2018-19) (DEW, 2019) - Water quality varies across the region. Further development is limited by water quality and suitable soils (DEW, 2022a), which is likely to be further exacerbated with climate change. - PWA likely to experience increased demand, particularly from irrigation.
Peake, Roby and Sherlock PWA Groundwater	- Extractions of nearly 20000ML per year - Demand primarily consists of stock, domestic purposes, and irrigation for horticulture (cereal, olives, pistachios)	Consists of an unconfined and confined aquifer: Unconfined aquifer: salinity of this water is too high to be currently utilised (excess of 15,000 mg/L total dissolved solids). Future opportunities may exist in underwater desalination or aquaculture Confined aquifer: significantly lower salinity levels (1500-3000 mg/L TDS). confined aquifer is managed through extraction limits to minimise the risk of excess salinity and collapse of the overlying confining layer.
Eastern Mount Lofty Ranges PWA Surface and groundwater	- Demand consists of environmental water needs and other non-consumptive needs (e.g. recreation, cultural values) - Demand for consumptive water use predominantly includes domestic use (503ML), irrigation (12GL for surface water, and 30GL for underground water), and stock (2551 ML/y)	- Water extraction and infrastructure in this area has resulted in less connectivity between ecological habitats and increased vulnerability. - There is a need for baseflow to be protected. - The availability of water in this PWA may reduce by up to 18 percent by 2030 because of climate change (Natural Resources SA Murray-Darling Basin, 2019).
Marne Saunders PWA Surface and groundwater	Smallest water resource area with an allocation of 6,140ML	90 percent of the flow in the area occurs between July and October - Experiencing reduced surface water flows and declining water ecosystems because of climate change as well as existing use
Parts of Tintinara-Coonalpyn PWA	Murraylands encompass part of the Tintinara-Coonalpyn PWA, located in the Limestone Coast	- Demand in this area is not likely to substantially increase over time - Some areas of this plan (Tintinara and Tolmer) are currently over allocated