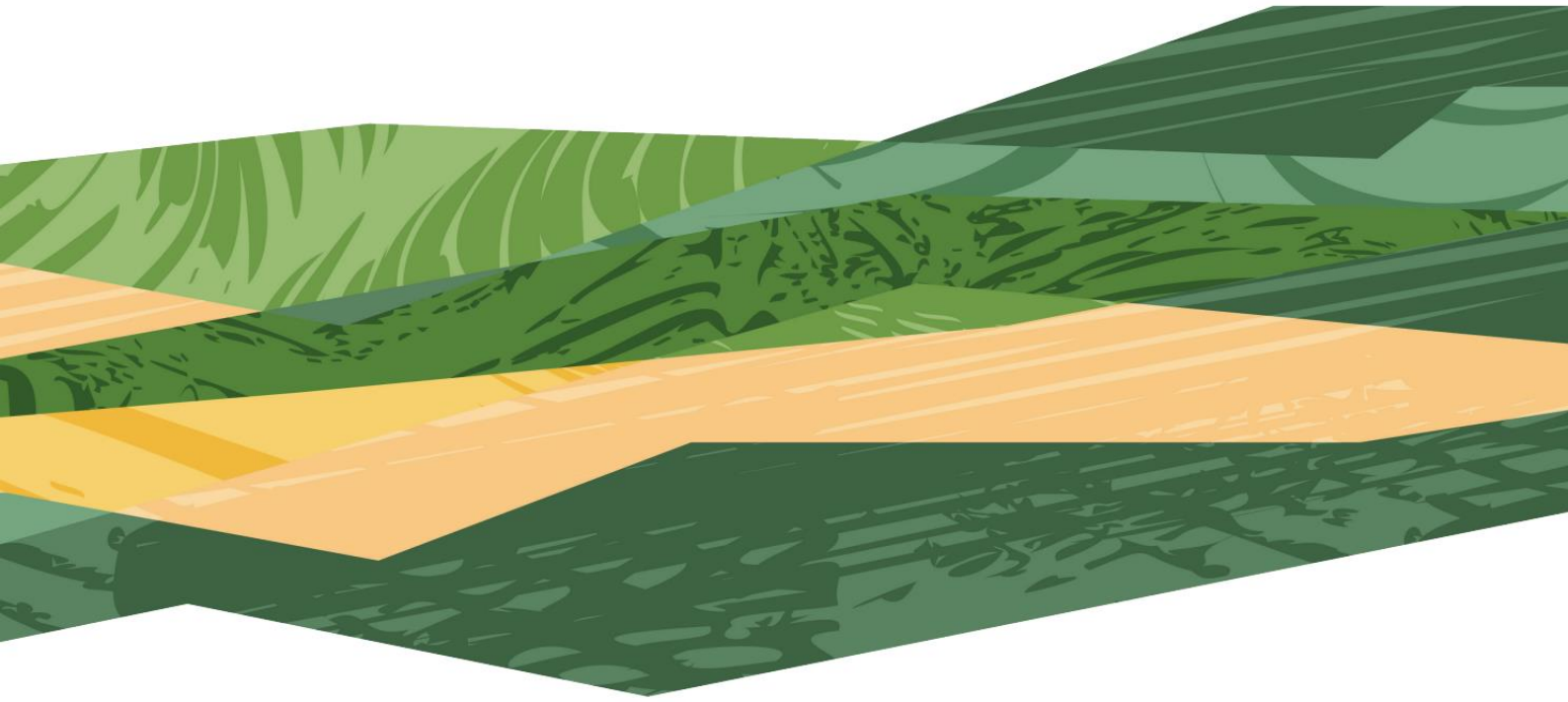

Drought: Prepare, Respond, Recover

REGIONAL DROUGHT RESILIENCE PLANNING PROGRAM:
CITY OF WAGGA WAGGA & LOCKHART SHIRE COUNCIL

DOCUMENT CONTROL

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KEY ABBREVIATIONS

Abbreviation	Meaning
$B	Billions of dollars
$M	Millions of dollars
ABARES	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
AIS	Australian Independent Schools
ANU	Australian National University
BoM	Bureau of Meteorology
CDI	Combined Drought Indicator
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSU	Charles Sturt University
CWW	City of Wagga Wagga
CWFS	Central West Farming Systems
DAFF	Department of Agriculture, Fisheries and Forestry
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPIRD	Department of Primary Industries and Regional Development
EDIS	Enhanced Drought Information System
FSGA	Farming Systems Groups Alliance
GRDC	Grains Research and Development Corporation
GRP	Gross Regional Product
KPI	Key Performance Indicator
LLS	Local Land Services
LGA	Local Government Area
LHN	Local Health Network
LSC	Lockhart Shire Council
MCA	Multi-Criteria Assessment
MEL	Monitoring, Evaluation and Learning
MLA	Meat and Livestock Australia
MPHN	Murrumbidgee Primary Health Network
No.	Number
NSW	New South Wales
RCI	River Condition Index
RDRP	Regional Drought Resilience Plan
RFCS	Rural Financial Counselling Services
ROI	Return on Investment
SNSW	Southern New South Wales Innovation Hub
pa	Per annum
PCG	Project Control Group

1. INTRODUCTION

1.1 BACKGROUND

Droughts have a profound and pervasive impact on Regional Australia, affecting regional communities' agricultural productivity, economic stability, social well-being, and environmental health. Australia is the driest continent (excluding Antarctica), with a diverse and varied environment characterised by frequent and severe natural disasters. Droughts are quite distinct when compared to other natural hazards, which often impact in ways that are identified and responded to quickly (e.g. bushfires or cyclone recovery efforts). Droughts, on the other hand, are a chronic stressor, with the damage often occurring over a longer period and having a less visible impact on communities. The hidden nature of drought impacts often results in failures to adequately address and respond as they occur, leaving communities isolated.

Future climate projections indicate that weather patterns across Australia are set to change, with many regions in Australia set to become drier, with higher average temperatures, decreased annual rainfall, and increased evapotranspiration, defining the country more prone to droughts in the future. The expected increase in future droughts underscores the need to adequately and appropriately plan for future droughts, to ensure that regions have the necessary resilience and adaptive capacity to support communities through these times.

1.2 PURPOSE

The Regional Drought Resilience Plan (RDRP) is a community-led approach to drought resilience planning, that understands that no top-down, one-size-fits-all approach can appropriately address the effects of droughts in each community. Thus, the RDRP is designed to be community-owned, with key inputs and solutions being sourced from local governments, regional organisations, the agricultural sector, local community groups, local health and social care providers, Local Lands Services (LLS), and many more. The RDRP has also been developed on a strong evidence base, aligns with current strategic planning, and identifies key priority actions that will support local communities.

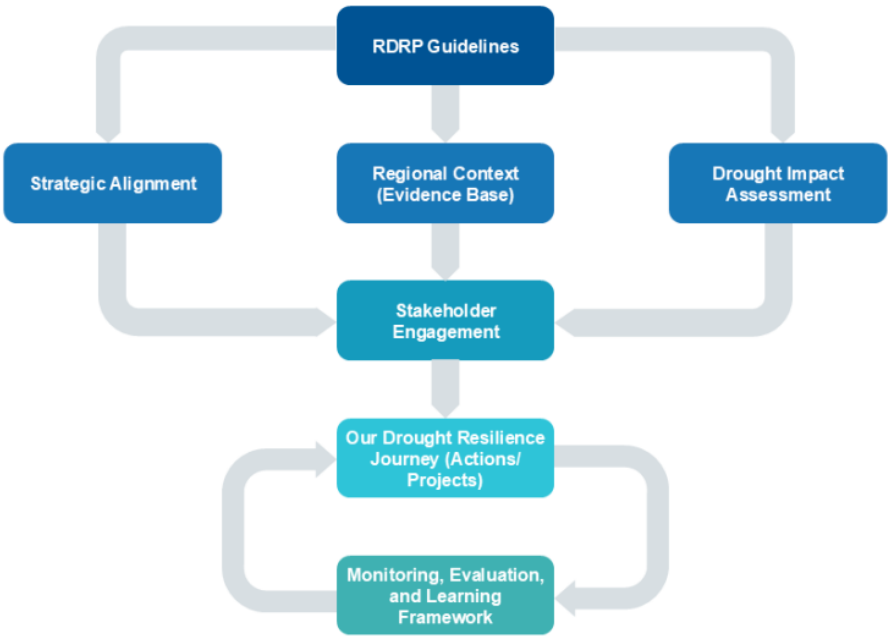
1.3 APPROACH

The development of the RDRP involved the following steps:

- **A Plan for Drought Resilience**: An overview of droughts, the RDRP, resilience, expected benefits and strategic alignment.
- **Regional Context**: A review of the current environmental, community/ social and economic context of the City of Wagga Wagga and Lockhart Shire local government areas (LGAs).
- **Drought Impact Assessment**: An overview of the history of droughts in the region, including stages of drought, how droughts are monitored, historical droughts in the region and their impact on the community, as well as regional case studies on building resilience.
- **Stakeholder & Community Engagement**: An overview of the approach and findings from engagement with key stakeholders and the community.
- **Our Drought Resilience Journey**: An overview of the identified community-led actions to build drought resilience.
- **Monitoring, Evaluation and Learning Framework**: Provides a framework to assist in managing risks, making informed decisions, and demonstrating the project's impact, especially in long-term resilience-building efforts.

The RDRP is a 'living document' with the Monitoring, Evaluation and Learning Framework informing regular updates of the regional drought resilience journey to ensure that the actions and projects continue to be proactive in ensuring increased drought resilience throughout the life of the RDRP.

Figure 1.1. Integrated Planning Approach of the RDRP



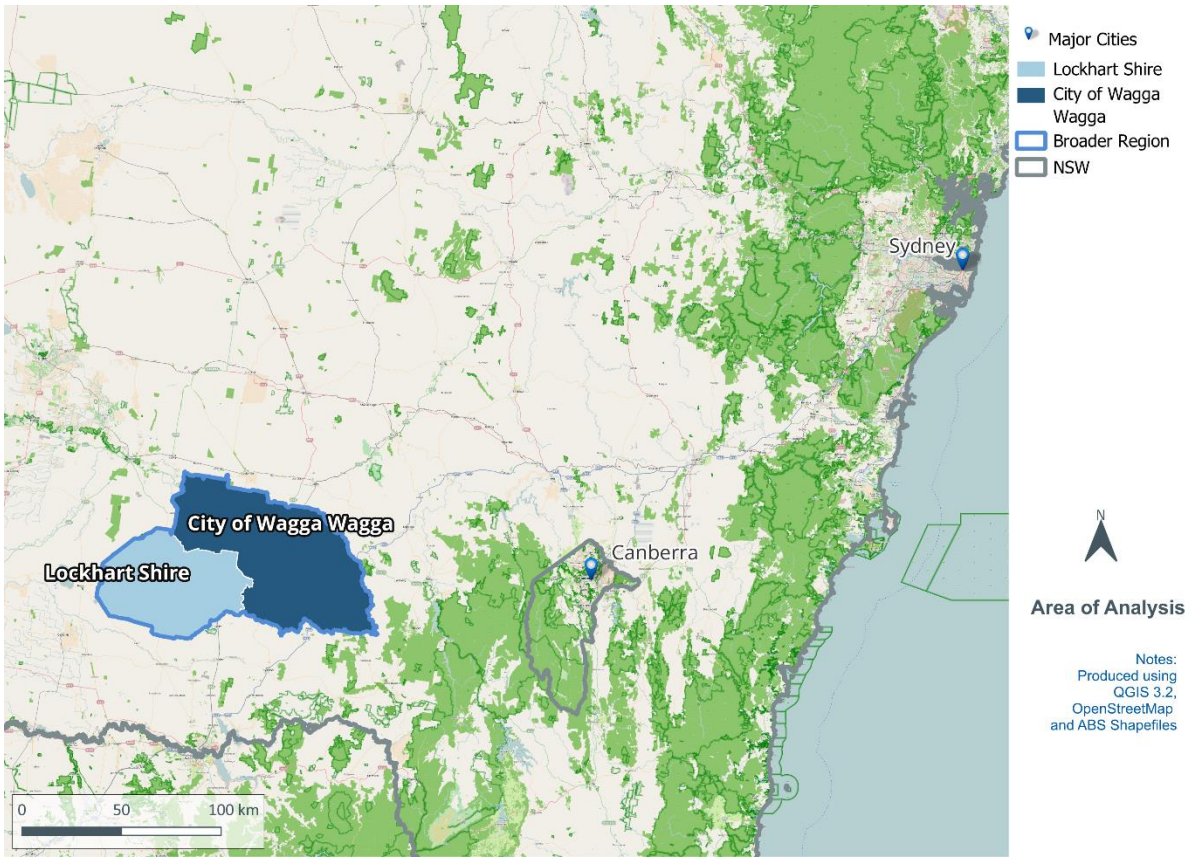
Source: AEC.

1.4 CITY OF WAGGA WAGGA AND LOCKHART SHIRE REGION MAP

The City of Wagga Wagga and Lockhart Shire region is located in the broader Riverina region of South-Western New South Wales, constituting the LGAs of Lockhart Shire and the City of Wagga Wagga. These regions have their own unique identity, strengths and opportunities, which are understood and respected in the RDRP.

City of Wagga Wagga is a very large geographical area, with a main population centre in the Wagga Wagga township and numerous sparsely populated agricultural towns. The Wagga Wagga township acts as a centre for services for communities and other agricultural communities across the Riverina. Lockhart Shire is a relatively smaller LGA with two major townships of Lockhart and The Rock.

Figure 1.2. City of Wagga Wagga and Lockhart Shire



Source: AEC.

The key characteristics of each region within the City of Wagga Wagga and Lockhart Shire are displayed in the table below.

Table 1.1. Key Characteristics of the City of Wagga Wagga and Lockhart Shire

Indicator	Lockhart Shire	City of Wagga Wagga
Population (2023, no. of people)	3,400 people	68,700 people
Average Age (2023, no. of years)	42.6 years	37.5 years
Land area (km^2)	28,957 km^2	48,245 km^2
Settlements	Lockhart, Milbrulong, Pleasant Hills, The Rock, and Yerong Creek	Book Book, Boramabola, Collingullie, Currawarna, Gregadoo, Humula, Ladysmith, Mangoplah, Oura, Tarcutta, Uranquinty and Wagga Wagga
Traditional Indigenous Groups	Wiradjuri Country	

Source: Various.

1.5 VISION, GOALS, AND OUTCOMES

1.5.1 VISION

The City of Wagga Wagga and Lockhart Shire region will be a series of interconnected and thriving communities, connected to each other and the land, ensuring that there are opportunities, services, and choices for all residents. Our journey towards resilience will be driven by our commitment to sustainably growing our economy, protecting our environment and ensuring that our communities are liveable for all. Moreover, we undertake a more inclusive approach to drought planning, including our communities on the land and in our townships, delivering a shared vision and plan for future actions.

1.5.2 PRIORITIES

The City of Wagga Wagga and Lockhart Shire RDRP will deliver increased resilience through a series of actions that will cause change throughout our communities. These actions have been prioritised with reference to the following “pillars”:

- **Community Resilience**: We leverage our strong community identity, strength in volunteerism, and culture to support each other and provide the necessary resources to ensure that our communities are resilient during droughts.
- **Environmental Resilience**: We increase our awareness and stewardship of our natural environment, waterways, and pastures understanding how our actions can exacerbate environmental issues to ensure our environment remains healthy and resilient during droughts.
- **Economic Resilience**: We strengthen our on-farm and off-farm industrial base against the effects of droughts, seeking to diversify our economies and incomes to bolster economic resilience during droughts.

1.5.3 GOALS

There are several overarching goals that the City of Wagga Wagga and Lockhart Shire RDRP seek to achieve, which align with the priorities of the broader drought resilience program, including:

- **Community Goals**: Strengthen mental and physical well-being, foster greater collaborative partnerships, promote education and awareness of issues, and empower the community.
- **Environmental Goals**: Enhance water security, protect, restore and enhance natural resources, more efficient water use, and ensure sustainability.
- **Economic Goals**: Support economic diversification, increase cooperation between businesses, farms and consumers, increase community-based economic solutions, and enhance resilience.

1.5.4 LONG-TERM OUTCOMES

The City of Wagga Wagga and Lockhart Shire RDRP seeks to achieve several long-term outcomes, including:

- A common understanding among the community of what drought resilience is in the City of Wagga Wagga and Lockhart Shire and the steps needed to build resilience throughout the community.
- That all members of the community feel ownership of the path towards resilience, sharing their knowledge and insight into the development of the plan as well as utilising their unique skills and competencies to help deliver a more resilient future.
- The RDRP outlines practical steps that are followed and increase the community, environmental and economic resilience of our communities.

2. A PLAN FOR DROUGHT RESILIENCE

2.1 WHAT IS DROUGHT

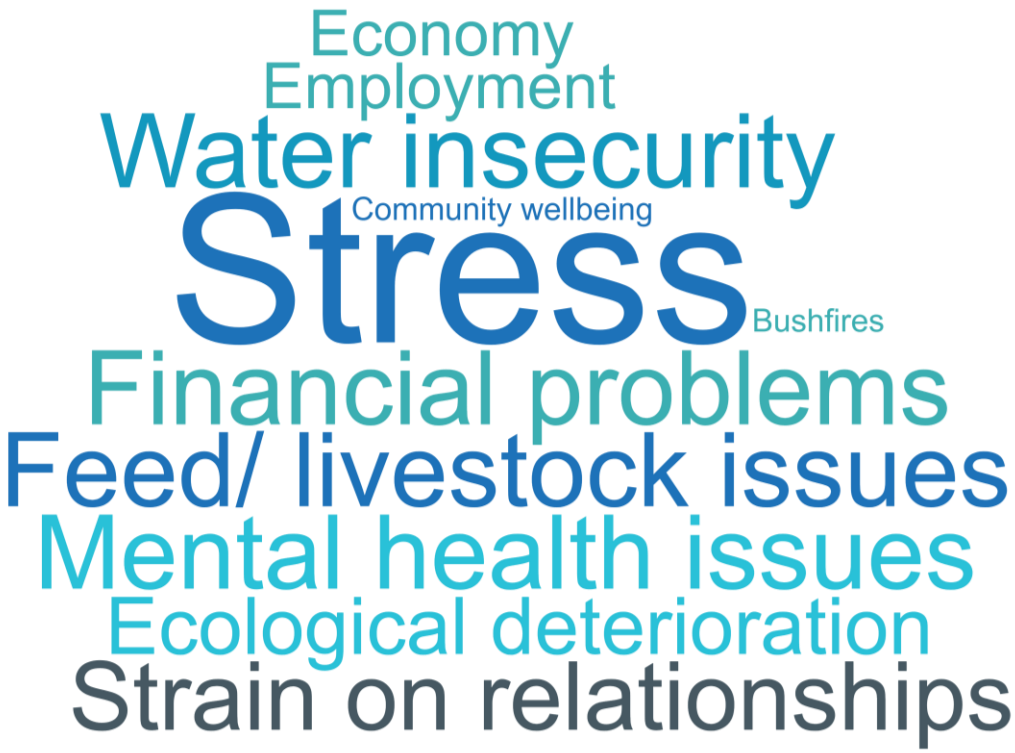
Droughts are often understood as prolonged periods of abnormally dry conditions, resulting in a lack of water availability for normal use (BOM, 2024a). Droughts, however, are not a uniform phenomenon with four types of droughts that can affect a region across the three pillars of community, environment, and community. These types of droughts are (Hennessy et al., 2008):

- **Meteorological Drought**: A period of low rainfall driven by atmospheric conditions, which can be exacerbated by high temperatures and evaporation.
- **Hydrological Droughts**: Prolonged moisture deficiencies that affect surface and sub-surface water supply.
- **Agricultural (Soil Moisture) Drought**: Short-term dryness in soils that affect agriculture crops in growing seasons.
- **Socio-Economic Droughts**: The impact of drought conditions (meteorological, hydrogeological, and agricultural) on the supply and demand of goods and well-being.

2.2 WHAT DOES DROUGHT MEAN TO THE CITY OF WAGGA WAGGA AND LOCKHART SHIRE

The effects of droughts on communities can vary significantly between and within regions across Australia. Community members across the City of Wagga Wagga and Lockhart Shire have identified that droughts mean stress, financial problems, mental health issues, strain on relationships and increased water insecurity, underscoring the effect of droughts on the community, economy and environment.

Figure 2.1. Community Views on the Impact of Droughts



Source: AEC.

2.3 ABOUT THE RDRP

The RDRP is designed to implement a series of actions that strengthen resilience and develop adaptive capacity among the residents and businesses of the City of Wagga Wagga and Lockhart Shire region to support their community, environment, and economic resilience during droughts. In addition to providing resilience, the implementation of the RDRP will also provide opportunities to support the City of Wagga Wagga and Lockhart Shire's growth and development outside of droughts.

The RDRP is a living community-owned document that was co-designed with community leaders, community members, businesses, key industry groups and organisations that leverage their invaluable insight, alongside a strong evidence base to deliver practical and effective actions that will support the community. The journey towards resilience is one we must take together, only with the community's buy-in, can we deliver a more resilient, prosperous, inclusive, and environmental-conscious community that not only survives droughts but thrives during them.

2.3.1 KEY INPUTS

The City of Wagga Wagga and Lockhart Shire RDRP was developed in a holistic approach, leveraging various key inputs to ensure that the RDRP is not only built upon existing planning but also aligns with pre-existing development efforts, addresses pre-existing needs and priorities in the community, and leverages local experience and expertise to direct the future of resilience in the region. This approach was achieved through the cumulation of various key inputs into the development of the RDRP, including:

- **Literature**: Various existing strategic planning documents across local, regional, New South Wales and Australian jurisdictions were assessed to ensure that the RDRP aligns with pre-existing development efforts.
- **Evidence Base**: A review of various key geographical, biophysical, socio-demographic and economic data sets to understand the current environment, community, and economic context of the region to provide context to the various potential inter-connected impacts of drought.
- **Research**: A vigorous review of relevant academic literature on the multifaceted impacts of drought on all segments of the community to understand how droughts can be best mitigated.
- **Consultation**: An extensive key stakeholder and community consultation schedule was carried out to leverage local insights and expertise to develop specific resilience actions that are tailored to the needs of the region.

2.3.2 OUR PARTNERS

The City of Wagga Wagga and Lockhart Shire RDRP was developed by the Lockhart Shire and the City of Wagga Wagga, through a unified Project Control Group (PCG). This RDRP was developed with the invaluable input and support of the New South Wales Department of Primary Industries and Regional Development (NSW DPIRD), the CSIRO, SNSW Innovation Hub, and LLS. Furthermore, the RDRP is a community-led document, with an inclusive and thorough engagement approach being undertaken to gather the insight and input of a wide range of community stakeholders. This process included connecting to the community through a variety of methods, including workshops throughout the region and a survey. Engagement with the community highlighted their ideas of drought resilience and provided key input into the development of actions later in the RDRP.

A broad array of community members from across the region were engaged to ensure that the RDRP is a community-led and community-owned document. This plan includes insights from farmers, regional leaders, business owners, transport operators, educators, community groups, and the general public to ensure that this RDRP is a cross-section of our community, representing the diverse ideas, thoughts, experiences, knowledge, understanding, and expertise of everyone to ensure that the RDRP considers the needs of all community members.

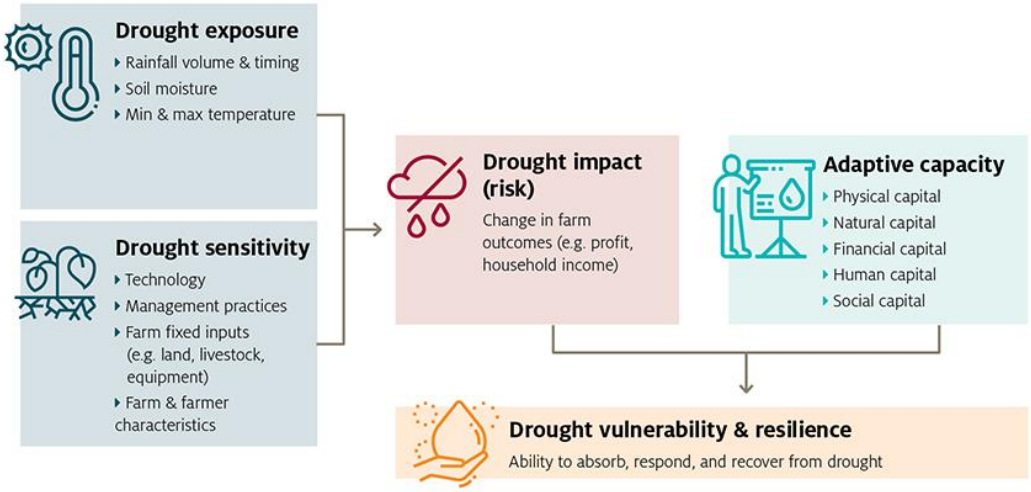
To all the members of the community who contributed to the development of this plan, we would like to thank you.

2.4 ABOUT RESILIENCE

2.4.1 DEFINING DROUGHT RESILIENCE

Resilience is a term that has a wide range of interpretations; generally, it refers to an ability to recover or adjust to change. Specifically, ABARES (2023a) defines drought resilience as "a measure of a system's ability to absorb, respond and recover to drought risk … as well the capacity of the system to adapt". As outlined in the Drought Vulnerability and Resilience Conceptual Framework, developed by Hughes et al. (2020), drought resilience depends on the interplay between drought risk and the adaptive capacity of farms and communities.

Figure 2.2. Drought Vulnerability and Resilience Framework



Source: Australian Government (2023).

2.4.2 THE NEED FOR RESILIENCE

Droughts have always been part of the City of Wagga Wagga and Lockhart Shire region's history, occurring every few decades throughout recorded history. Building resilience is important in addressing the impact of droughts on farms and regional communities (UNCCD, 2016). The need for resilience will only increase in the coming decades, with the frequency and severity of droughts increasing the risk to farms and communities. Predictions of future meteorological and hydrological conditions in the City of Wagga Wagga and Lockhart Shire include increasing average maximum temperature, decreasing average annual rainfall, and increasing potential evapotranspiration (see Table 2.1). This is projected to occur through the 2050s, underscoring the increasing risk of drought and the need for drought resilience in the region.

Table 2.1. Key Climate Projections for the City of Wagga Wagga and Lockhart Shire Region

	Lockhart Shire		City of Wagga Wagga	
Indicator	**1994 – 2023, avg.**	**2050s, avg.**	**1994 – 2023, avg.**	**2050s, avg.**
Annual hot days[(a)]	32 days	42 days	29 days	40 days
Average max temperature	23.6°C	24.7°C	23.3°C	24.5°C
Annual rainfall	475mm	466mm	544mm	533mm
Potential evapotranspiration	150 mm (winter) to 635 mm (summer)	160 mm (winter) to 653 mm (summer)	146 mm (winter) to 629 mm (summer)	156 mm (winter) to 646 mm (summer)

Note:
a) Hot days are defined as days with a maximum temperature of over 35°C.
Source: DAFF (2024).

2.4.3 RESILIENCE ASSESSMENT FRAMEWORK

To ensure that this RDRP takes a holistic approach to building resilience in the City of Wagga Wagga and Lockhart Shire, the plan will be assessed across a Drought Resilience Framework that includes the three pillars of community, environment, and economy.

- **Community**: Drought resilience involves the ability of individuals and communities to cope with the psychological and social impacts of drought. This includes strengthening social networks, community cohesion, and mental health support systems.
- **Environment**: Drought resilience involves the capacity of natural ecosystems and water resources to withstand and recover from the environmental and biophysical impacts of droughts. This includes protecting and restoring habitats, improving water conservation, and preserving biodiversity.
- **Economy**: Drought resilience involves the ability of farms and local economies to adapt to and recover from the economic shock of droughts. This includes diversifying local economics, financial support during droughts, and actions to support increased financial management.

Furthermore, as drought risks include both short-term shocks and long-term stressors, the framework will assess resilience across these timeframes (DPIE, 2021).

2.5 EXPECTED BENEFITS

The RDRP is focused on identifying specific actions that support the community to become more prepared and resilient to future droughts and their impact. This plan will include an overview of the delivery of these actions, which will outline the implementation costs and expected benefits associated with implementing the key recommendations and actions.

2.6 STRATEGIC ALIGNMENT

The alignment of various local, regional, New South Wales and Australian strategic documents was assessed against the pillars of the RDPR, community, environment, and economy, to ensure that the RDRP is built upon existing planning, aligns with pre-existing development efforts, and address pre-existing needs and priorities in the community. The results of this assessment are contained in Appendix A, with a summary of the results displayed below. The strategic alignment assessment found that the vast majority of strategic documents support the delivery of the RDRP and the pillars of the RDRP.

Table 2.2. Strategic Alignment of RDRP to Local, Regional, New South Wales and Australian Strategies

Literature	Community	Environment	Economy	Alignment to RDRP
Local				
Lockhart Shire Tourism and Economic Development Strategy 2016 – 2026	Y	Y	Y	Y
Lockhart Shire Local Strategic Planning Statement 2020 – 2040	Y	Y	Y	Y
Lockhart Shire Community Strategic Plan 2022 – 2032	Y	Y	Y	Y
Integrated Water Cycle Management Strategy – Lockhart Shire	Y	Y	-	Y
Lockhart Shire Local Housing and Employment Strategy	Y	Y	-	Y
Local Strategic Planning Document – City of Wagga Wagga	Y	Y	Y	Y
Community Strategic Plan 2040 – City of Wagga Wagga	Y	Y	-	Y
Regional				
Eastern Riverina Regional Economic Development Strategy – 2023 Update	Y	Y	Y	Y
Riverina Murray Regional Plan 2041	Y	Y	Y	Y
Draft Regional Water Strategy – Murrumbidgee	Y	Y	Y	Y
Riverina Water Business Activity Strategic Plan 2022 – 2032	Y	Y	-	Y

Literature	Community	Environment	Economy	Alignment to RDRP
Integrated Water Cycle Management Strategy – RiverinaWater	-	Y	-	-
Riverina Murray Destination Management Plan 2022 – 2030	-	-	Y	-
Riverina Murray Agritourism Development Strategy 2024 – 2033	-	-	Y	-
New South Wales				
NSW Water Strategy: Towards 2050	Y	Y	Y	Y
Staying Ahead: State Infrastructure Strategy 2022 – 2042	Y	Y	Y	Y
Southern NSW Drought Resilience & Adoption Hub – Prospectus	Y	Y	Y	Y
Australia				
Drought in Australia: Australian Government Response, Resilience and Preparedness Plan	-	-	-	Y

Source: Various.

2.7 EXISTING ACTIONS

This RDRP will build upon existing actions within the region. Charles Sturt University's (CSU) SNSW Innovation Hub is a collaborative effort between several organisations to deliver a series of projects that seek to develop and increase drought resilience throughout the community (CSU, 2024). As of September 2024, the current projects that the SNSW Innovation Hub are implementing are outlined in the following table.

Table 2.3. SNSW Innovation Hub Existing Projects

Project	Proponent	Project Detail
Agricultural Innovation Hubs Program		
Capturing value of AgTech innovation on-farm	MLA, NSW DPIRD, CSU, Beef Producers, FSGA, LLS, KPMG.	An easy-to-use online AgTech return on investment (ROI) calculator to support farmers in estimating the net benefit of adopting Agtech Solutions on their farm.
Managing biosecurity risks	NSW DAFF, NSW DPIRD, NSW Wine and Onside	A program to enhance current biosecurity measures by increasing participation of farms, supply chains and communities.
Sharing early insights for more resilient communities	NSW DAFF, CSU, ANU, Uni Canberra, Uni Wollongong	An evidence-based program to develop a set of indicators and tools to help identify changes in community resilience to provide support services sooner.
Drought Resilient Soils and Landscapes Grant Programs		
Stock Containment VR	LLS	A virtual reality experience to help landowners prepare for future droughts.
Saving Our Soils During Drought	LLS with supporting partners	A program to improve drought resilience by maintaining ground cover across farmland. The program includes practical, hands-on training, field visits and workshops.
Creating Landscape-Scale Change Through the Promotion of Resilient Pasture Systems	Holbrook Landcare Network, FarmLink, CWFS, Monaro Farming Systems, NSW DPIRD, Riverine Plains, LLS	This project demonstrates modern pasture, species combinations, and management practices known to build drought resilience through demonstration sites, knowledge brokers, workshops, case studies and on-farm consultation.
The Improved Drought Resilience Through Optimal Management of Soils and Available Water	Riverina Plains, CWFS, FarmLink, NSW DPIRD, Southern Growers, CSIRO, GRDC	This project demonstrates that the early sowing of slower maturing crops, diverse legume rotations and nitrogen (N) banking can all increase profitability and productivity by increasing soil moisture availability and preventing carbon and nutrient loss under drought conditions through case study examples.
Cross-Hub Collaboration Projects		

Project	Proponent	Project Detail
Drought Management for Health and Longevity of Perennial Horticulture Plants	Various Drought Hubs (led by SA Hub)	The project will demonstrate the recent AgTech around canopy development and soil moisture, optimising irrigation to support resilience.
Managing Rangelands for Drought Resilience	Various Drought Hubs (led by N. WA & NT)	The project showcases the use of satellite-based ground cover to predict ground cover changes to help farm and resilience planning.
Baselining Drought Projects		
Preparing with hindsight	Farming Systems Group Alliance	The project showcases the stories of landholders throughout the stages of pre-drought, drought, and drought recovery from the 2018/19 drought, helping to shape future actions to build resilience.
Baselining drought report	N/A	The project developed a baseline understanding of farmer and community perceptions of drought.
Other Projects		
Forewarned is Forearmed Climate Coaching	MLA	A program that delivers a coaching/training program on how to use seasonal climate forecasts, including the five climate products in on-farm decision-making.
GRDC National Risk Management Initiative	CSIRO	The project seeks to compare the productivity, profitability and sustainability of different management systems over the long term.
Regional Soils Coordinators	NSW DPIRD	The project is part of the National Soil Strategy, which aims to prioritise soil health, empower soil innovation and stewardship, and strengthen knowledge and capability. The Regional Soils Coordinators seek to deliver upon these aims by establishing a unique soils Community of Practice (CoP) and sharing quality scientific data.
On-Farm Water Management Plans	LLS	LLS go to farms to determine water needs for livestock and domestic use and compare this to the current capacity to meet these needs (dam, tank, bore) to develop on-farm water management plans.

Source: CSU (2024).

3. REGIONAL CONTEXT

This section provides an overview of the key geographical, biophysical, socio-demographic and economic context of the LGAs of City of Wagga Wagga (City of Wagga Wagga) and Lockhart Shire Council (Lockhart Shire), which collectively form the Broader Regional Catchment. This section references New South Wales and Australia as appropriate. A more detailed overview is contained in Appendix B.

3.1 COMMUNITY OVERVIEW

The City of Wagga Wagga and Lockhart Shire are constituted by a diverse variety of townships with unique histories, strengths, challenges and opportunities. An overview of the key settlements throughout the region is included below.

Note: The following data is collected from the ABS's Community Profiles which are based on Place of Usual Residence (PoUR) data, presenting the occupations of residents, not necessarily the occupations of people who work in those communities. Whilst care has been taken to accurately reflect the reality of each settlement, data limitations may be present.

Table 3.1. Summary of Key Settlements

Settlement Name	Population (2021)	Role	Description
Lockhart Shire			
Lockhart (Council Seat)	1,019	Rural town	Residential village with a mix of agriculture, mixed retail, local government administration, and good health care with a hospital, aged care and medical services.
Milbrulong	119	Farming community	A rural farming community focused on livestock and grain.
Pleasant Hills	127	Farming community	A rural farming community focused on grain and livestock.
The Rock	1,346	Rural town	A rural town with strong health care and social services (aged care and medical services available) and small retail available.
Yerong Creek	355	Farming village	A rural farming community focused on livestock and grain.
City of Wagga Wagga			
Collingullie	258	Satellite suburb	A diversified outer suburb of Wagga Wagga, with a mix of agriculture, education and transport services.
Currawarna	199	Satellite suburb	A diversified outer suburb of Wagga Wagga, with a mix of agriculture, education and food/ beverage services.
Humula	129	Farming community	A rural farming community focused on livestock.
Ladysmith	339	Satellite suburb	A diversified outer suburb of Wagga Wagga, with a mix of agriculture, and housing for local government administration and legal services workers from Wagga Wagga.
Mangoplah	291	Farming community	A rural farming community focused on livestock, with some transport services.
Oura	246	Satellite suburb	A diversified outer suburb of Wagga Wagga, with a mix of construction, agricultural, retail, education and health services.
Tarcutta	425	Rural village	Rural village with a strong livestock agricultural base and some retail and education services.
Uranquinty	910	Satellite suburb	A diversified outer suburb of Wagga Wagga, with a mix of health care, agriculture and transport services.
Wagga Wagga (Council Seat)	49,686	Population centre	A large regional population centre with a service-based economy driven by health and social assistance services, as well as retail, education and construction services.

Source: ABS (2022e), AEC.

An overview of the key community indicators from across the Broader Regional Catchment is outlined in the following table. A more detailed overview of the community indicators across the Broader Regional Catchment is contained in Appendix B.

Table 3.2. Summary of Community Overview

Indicator	Lockhart Shire	City of Wagga Wagga	Broader Regional Catchment	New South Wales
Population				
Resident Population (2013)	3,096	62,416	65,512	7,404,032
Resident Population (2023)	3,396	69,075	72,471	8,342,285
Population Growth (% pa)	0.9%	1.0%	1.0%	1.2%
Population Projections				
Resident Population (2023)	3,396	69,075	72,471	8,342,285
Resident Population (2041)	4,445	79,632	82,834	9,982,553
Population Growth (% pa)	1.5%	0.8%	0.8%	1.0%
Age Breakdown (2022, % of Total)				
Youth (0 – 14 years)	20.4%	20.6%	20.6%	18.3%

Indicator	Lockhart Shire	City of Wagga Wagga	Broader Regional Catchment	New South Wales
WAP[1] (15 – 64 years)	55.7%	63.0%	62.7%	64.2%
Elderly (65 years and over)	23.9%	16.4%	16.7%	17.5%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Household Income ($/ week)				
Average Weekly Income (2016)	$1,434	$1,640	$1,630	$1,888
Average Weekly Income (2021)	$1,644	$1,976	$1,961	$2,272
Income Growth (% pa)	2.8%	3.8%	3.8%	3.8%
Indigenous Heritage				
Country		Wiradjuri Country		-
Indigenous Population (2021, % of Total Population)	5.3%	6.9%	6.8%	3.6%
Vulnerable Residents				
Need for Assistance for Core Activities (2021, % of Total Population)	7.9%	6.3%	6.3%	6.1%
Receipts for Payments to Support Vulnerable Populations (2023, % of Total Population)	20.3%	18.9%	18.9%	17.4%
Mental Health (2021, % of Total Population)	10.8%	10.5%	10.5%	8.0%
NDIS Recipients (June 2023, % of Total Population)	2.5%	2.8%	2.8%	2.2%

Note: 1) WAP refers to working age population.
Source: ABS (2017a, 2022a, 2023a, 2024a), DSS (2023), New South Wales Department of Planning and Environment (2022), id (2024).

3.2 ENVIRONMENTAL OVERVIEW

An overview of the key environmental indicators from across the Broader Regional Catchment is outlined in the following table. A more detailed overview of the environmental indicators across the Broader Regional Catchment is contained in Appendix B.

Table 3.3. Summary of Environmental Overview

Indicator	Lockhart Shire	City of Wagga Wagga	Broader Regional Catchment	New South Wales
Land Use (% of Total Land Use)				
Water (%)	1.7%	2.0%	1.9%	2.2%
Urban (%)	1.4%	3.1%	2.5%	1.0%
Agricultural (%)	96.5%	92.6%	94.1%	83.5%
Other (%)	0.5%	2.2%	1.6%	13.3%
Total (%)	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Total (km^2)	**28,957**	**48,245**	**77,202**	**8,007,344**
Climate				
Bio-region	South Western Slopes Bioregion, which has a sub-humid climate characterised by hot summers and no dry season (refer to Figure B. 1).			-
Sub-Regions	Within the South Western Slopes Bioregion, there are two Sub-regions: • **The Upper Slopes Sub-region**: located in the eastern half of the Bioregion, the Bioregion is characterised as having a temperate – no dry season (warm summer) climate. • **Lower Slopes Sub-region**: located in the Western half of the Bioregion, the Bioregion is characterised as a temperate – no dry season (hot summer) climate.			-

Indicator	Lockhart Shire	City of Wagga Wagga	Broader Regional Catchment	New South Wales
Water				
Water Catchment	The Murray-Darling Basin through the Murrumbidgee Catchment (refer to Figure B. 2)			-
River Condition Index (RCI)	The Murrumbidgee Catchment has a poor to moderate RCI rank, which varies within the Catchment (refer to Figure B. 3 and Figure B. 4).			-
Combined Drought Indicator (CDI)	Most of the Broader Regional Catchment is declared to be drought-affected, as of July 4, 2024 (refer to Figure B. 5).			
Soil				
Inherent Soil Quality	The soil with the highest inherent soil quality is in the City of Wagga Wagga along the Murrumbidgee River. Throughout the rest of the Broader Regional Catchment, the inherent soil quality is lower, particularly further away from the Murrumbidgee River, the inherent soil fertility ranges largely between moderate and moderately low, with sporadic areas of low inherent soil fertility (refer to Figure B. 12).			-

Source: ABARES (2021), Benson (2008), Department of Environment and Heritage (2023), NSW Department of Planning and Environment (2024b; d), NSW Department of Primary Industries (2024a), NSW Environment Protection Authority (2021).

Table 3.4. Meteorological and Hydrological Conditions

Region	1964 – 1993 Average (mm)	1994 – 2023 Average (mm)	2030s Average (mm)	2050s Average (mm)	2070s Average (mm)
Historical and Projected Rainfall (millimetres per annum)					
Lockhart Shire	493	475	459	466	462
City of Wagga Wagga	569	544	529	533	530
Average Min Temperature (°C)					
Lockhart Shire	9.6°C	10.0°C	10.7°C	11.0°C	11.4°C
City of Wagga Wagga	9.7°C	10.0°C	10.7°C	11.1°C	11.5°C
Average Max Temperature (°C)					
Lockhart Shire	22.8°C	23.6°C	24.2°C	24.7°C	25.2°C
City of Wagga Wagga	22.5°C	23.3°C	24.0°C	24.5°C	25.0°C
Evapotranspiration (mm)					
Lockhart Shire					
Autumn	309	306	321	325	329
Winter	150	150	156	160	161
Spring	418	427	442	450	458
Summer	628	635	650	653	662
City of Wagga Wagga					
Autumn	307	301	317	320	325
Winter	148	146	152	156	157
Spring	412	422	433	442	449
Summer	626	629	642	646	656

Source: DAFF (2024).

3.3 ECONOMIC OVERVIEW

An overview of the key economic indicators from across the Broader Regional Catchment is outlined in the following table. A more detailed overview of the economic indicators across the Broader Regional Catchment is contained in Appendix B.

Table 3.5. Summary of Economic Overview

Indicator	Lockhart Shire	City of Wagga Wagga	Broader Regional Catchment	New South Wales
Gross Regional Product ($M)				
GRP (2012-13)	$206	$5,327	$5,534	$624,269
GRP (2022-23)	$253	$6,672	$6,925	$777,299
GRP Growth (% pa)	2.1%	2.3%	2.3%	2.2%
Top 3 Industries by Industry Value Add	• Agriculture • Health Care • Public Administration	• Public Administration • Health Care • Construction	-	• Finance & Insurance Services • Professional Services • Health Care
Total Agricultural Value				
Agricultural Value ($M, 2016)	$127.8	$214.0	$341.9	$13,085.8
Agricultural Value ($M, 2021)	$210.1	$332.9	$543.0	$18,009.5
Growth in Agricultural Value (% pa)	10.5%	9.2%	9.7%	6.6%
Agricultural Volume and Value, Top 5 Commodities, 2021				
Wheat (tons, $M)	225,634 ($66.4)	349,445 ($102.8)	575,190 ($169.2)	13.0M ($3,815.9)
Canola (tons, $M)	58,635 ($34.0)	61,368 ($52.6)	149,413 ($86.6)	1.5M ($887.9)
Cattle and Calves (no., $M)	31,345 ($20.2)	51,667 ($33.5)	83,012 ($53.7)	4.1M ($2,751.8)
Barley (tons, $M)	66,120 ($21.8)	151,755 ($33.4)	250,875 ($55.3)	4.3M ($938.3)
Wool Sheep (no., $M)	223,707 ($19.2)	345,967 ($30.1)	569,675 ($49.4)	20.7M ($841.8)
Total Employment				
Employed Persons (2012-13)	874	30,075	30,949	3,164,708
Employed Persons (2022-23)	966	37,824	38,790	3,873,847
Employment Growth (% pa)	1.0%	2.3%	2.3%	2.0%
Top 3 Industries by Employment	• Agriculture • Health Care • Education	• Health Care • Education • Retail	-	• Health Care • Retail • Construction
Labour Force				
Average Unemployment Rate (2023)	1.4%	2.6%	2.5%	3.4%

Source: ABS (2017c, 2022c), AEC (unpublished a; b),

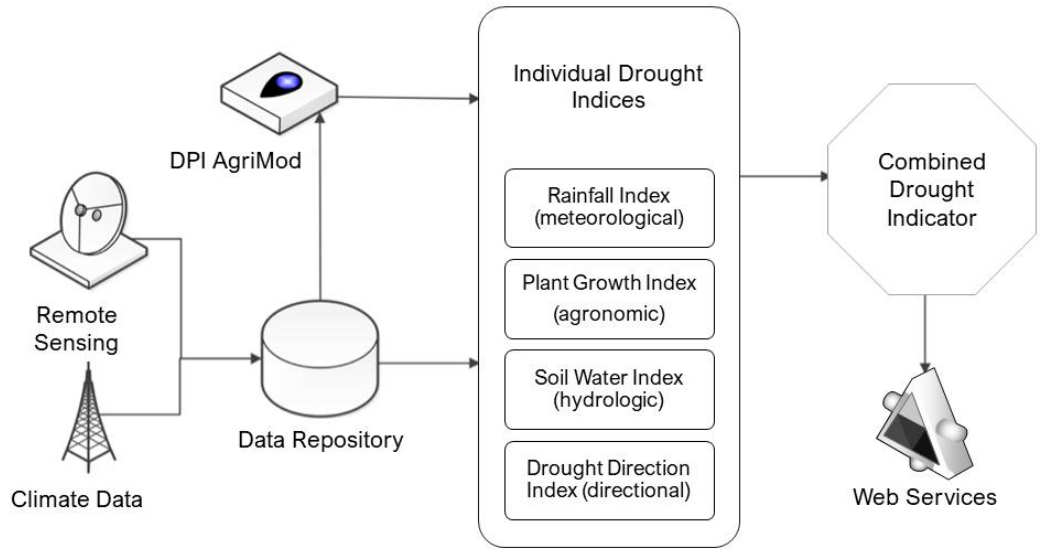
4. DROUGHT IMPACT ASSESSMENT

4.1 HISTORY OF DROUGHT IN THE REGION

4.1.1 DROUGHT MONITORING IN NSW

There are various methods and approaches to assessing, monitoring and declaring droughts across the world; in Australia, it is common to utilise a Combined Drought Indicator (CDI) which includes considerations and indicators for meteorological, hydrological and agronomic droughts (NSW Department of Primary Industries, 2024b). In 2016, the Climate Branch of the NSW Department of Primary Industries launched the Enhanced Drought Information System (EDIS), which seeks to monitor droughts to improve awareness, monitoring and forecasting (NSW Department of Primary Industries, undated). The EDIS is a computer model that incorporates climate data from a range of sources, including factors for rainfall, soil water, plant growth and drought direction, over one year to give a comprehensive CDI indicator.

Figure 4.1. NSW Enhanced Drought Information System



Source: NSW Department of Primary Industries (undated).

4.1.2 STAGES OF DROUGHT

The New South Wales CDI can provide an indication of the severity, or stage, of drought a region is under by assessing the CDI's composite indexes against a technical threshold.

This ensures that the CDI is accurately reflecting the situation in regions across New South Wales. Furthermore, the universality of the CDI indicator also allows for the relative comparison of drought conditions between different regions to assist in planning and responding to droughts. The New South Wales drought stages are outlined below.

Table 4.1. Stages of Drought in NSW

Drought Stage	Technical Threshold
Non-drought	At least one indicator is above the 50th percentile
Recovering	All indicators between 30th and 50th percentile
Drought-affected/ weakening	At least one indicator is below the 30th percentile, with a positive rainfall trend in the last 90 days
Drought-affected/ intensifying	At least one indicator is below the 30th percentile, with a negative rainfall trend in the last 90 days
Drought	At least one indicator is below the 5th percentile
Intense drought	All three indicators are below the 5th percentile

Source: NSW Department of Primary Industries (Undated).

As outlined in Appendix B (Figure B. 5), most of the City of Wagga Wagga and Lockhart Shire is currently drought-affected, as of July 2024 (NSW Department of Primary Industries, 2024a). In parts of the Eastern City of Wagga Wagga, several parishes are still declared to be in drought, including Belmore, Blanch, Book Book, Humula, Kilgowla, Kyemba, Mate, Murraguldrie, Oberne, Umbango and Umutbee. Meanwhile, all parishes in Lockhart Shire are declared to be drought-affected, with regions to the West being declared not in drought.

4.1.3 HISTORICAL DROUGHTS IN NSW

The broader Murray Region has experienced several extreme droughts in the last 130 years, including the four types outlined in Section 2.1 (meteorological, hydrological, agricultural and socio-economic droughts) (NSW Department of Climate Change, Energy, the Environment and Water, 2024). Significant droughts in the region include (BOM, 2024b):

- **The Federation Drought (1895 – 1902)**: One of Australia's worst droughts, affecting the vast majority of Eastern Australia and resulting in severe water insecurity affecting cattle and sheep herds and wheat crops.
- **The World War 1 Drought (1915 to 1915)**: A short, but severe drought that affected wheat crops across both Eastern and Western Australia.
- **The World War II Drought (1937 – 1945)**: This drought was more concentrated in South Eastern Australia and was characterised by periods of intense dryness, which contributed to the deadly Black Friday bushfires of January 1939. The World War II Drought was similar to the Federation Drought.
- **The 1982 to 1983 Drought (1982 – 1983)**: The year-long drought occurred during the most severe period of rainfall deficiency in 20th Century Australia.
- **The Millenium Drought (1997 – 2009)**: The City of Wagga Wagga and Lockhart Shire experienced a period of prolonged dryness between 1997 and 2009, with regions in and around the City of Wagga Wagga and Lockhart Shire experiencing the lowest rainfall in recorded history. This severely affected cropping regions throughout Southern Australia. Meanwhile, parts of Northern Australia received significantly higher than average rainfall. This drought was exacerbated by extreme temperatures, with the average annual temperature in the Murray-Darling Basin in 2005, 2006, 2007 and 2009 being higher than any previously recorded year. This drought, like the World War II Drought, contributed to bushfires throughout southern Australia in the Black Saturday Bushfires.
- **The Most Recent Drought (2017 – 2020)**: The Most Recent Drought followed a particularly wet period, which turned dry by 2017. Rainfall in the City of Wagga Wagga and Lockhart Shire was very much below average, with many regions throughout the Murray Darling Basin experiencing the lowest on record. A strong positive Indian Ocean Dipole extended dry conditions into 2019, which helped contribute to the highest fire weather danger measured by the Forest Fire Danger Index. Ultimately, like the World War II and the Millenium Droughts, the Most Recent Drought helped contribute to significant bushfires across South Eastern Australia in late 2019 and early 2020, including across the Snowy Valleys (to the East of the City of Wagga Wagga and Lockhart Shire).

4.2 OUR HISTORY OF DROUGHT IMPACTS

Some of the most significant droughts in NSW have impacted the City of Wagga Wagga and Lockhart Shire, particularly the Millenium Drought and the most recent drought. The region experienced a number of impacts from these droughts, including a decrease in agricultural production, a decline in population (particularly in smaller communities) and poor river health. An overview of impacts include:

MILLENIUM DROUGHT

The Millennium Drought, spanning from 1997 to 2009, left a profound mark on the Murray-Darling Basin, particularly affecting the Murrumbidgee Valley River ecosystem. The Second Sustainable Rivers Audit assessed the ecosystem's health as poor, with the Slopes Zone, home to the City of Wagga Wagga and Lockhart Shire, being assessed as very to extremely poor. The effect of the drought on the riverine ecosystem was categorised by a significant impact on fish biodiversity and riverine vegetation. Although some improvements have been made since

then, by 2018, the River Condition Index (RCI) still indicated that the system's health ranged from poor to moderate; highlighting the lasting impact of droughts on river health.

The Murrumbidgee Valley River (inclusive of water quality) is managed by the Murray-Darling Basin Authority. Whilst the RCI provides one indication of the impact of drought on the region, the factors impacting river water quality are significantly impacted by decisions made by the managing authority and State that are much broader than the City of Wagga Wagga and Lockhart Shire. Management of RCI is therefore outside the scope of this report.

The Millenium Drought also had a profound impact on Lockhart Shire, which experienced a significant population decline during the drought, losing about 13.1% of its residents between 2001 and 2012.

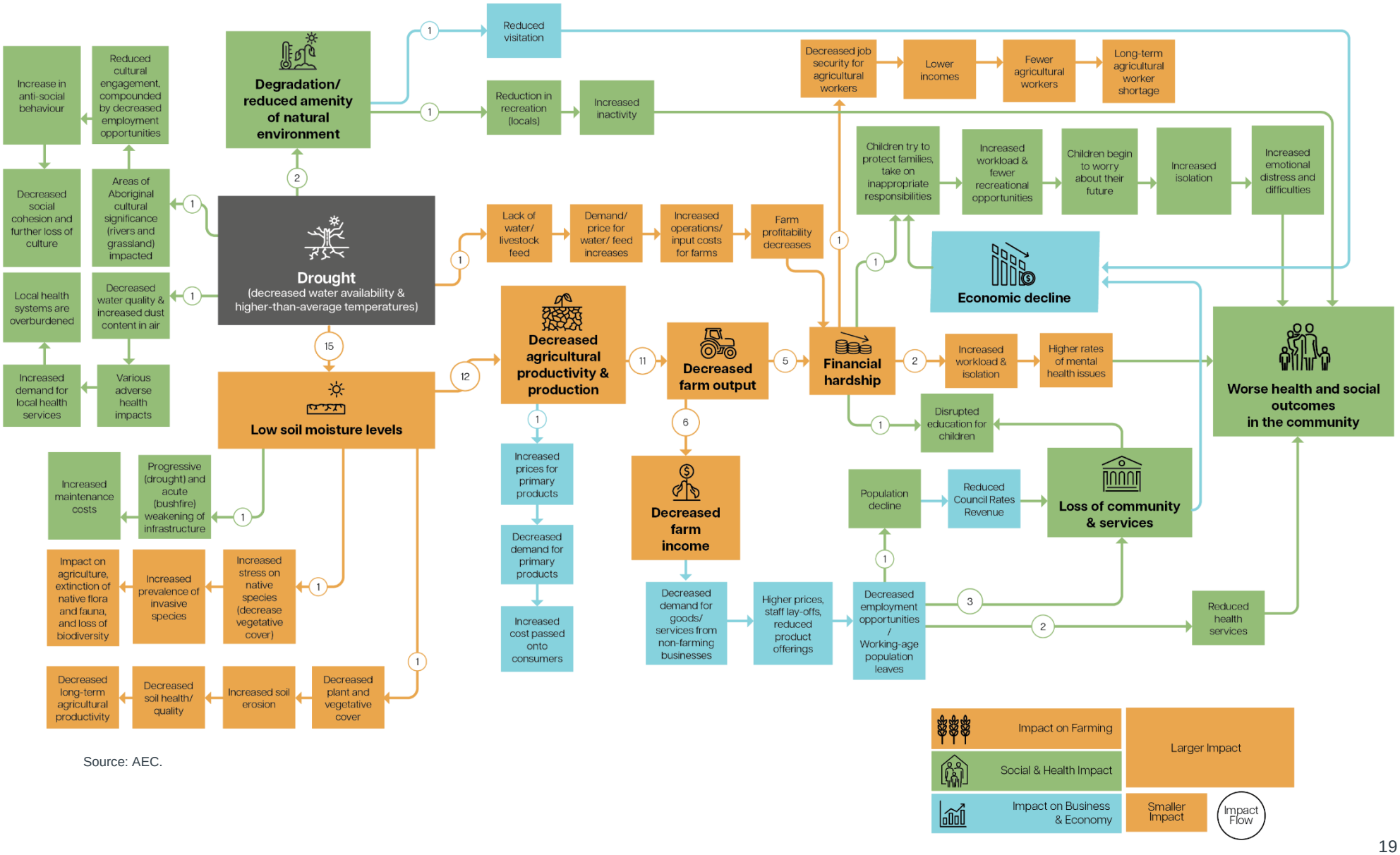
MOST RECENT DROUGHT

The more recent drought from 2017 to 2020 further strained the Broader Regional Catchment. Water usage for agriculture was halved, dropping from 20.1 GL in 2016 to just 10.6 GL in 2021. This drastic reduction in water availability led to a 6% decrease in farm production. While key agricultural outputs such as wheat, canola, barley, and wool rebounded by 2021, cattle numbers saw a significant decline. Across this period, the contribution of agriculture to the Lockhart Shire economy decreased from $94.9 million in 2017-18 to $75.0 million by 2019-20, a decrease of 21.1% over two years. This decrease significantly impacted the transport industry in Lockhart Shire, which decreased from $11.5 million to $6.8 million across the period (a decline of 40.9%).

OUR SOCIAL, ECONOMIC AND ENVIRONMENTAL IMPACTS

Droughts can have widespread impacts on communities, with many effects being the result of a compounding series of impacts leaving the effects of drought to linger in communities long after the drought has broken. Droughts can impact communities across a variety of aspects, ranging from economic hardship to mental health issues, from social isolation to increased health risks, and from reduced recreational opportunities to supply chain issues, among others. These impacts are widespread and felt throughout the community, including farms and non-farming businesses, aboriginal communities and family groups, the elderly and vulnerable, women, local governments and leaders, health care providers, and seasonal workers. The flow of drought impacts can be seen below, which demonstrates the interconnectedness of environmental, economic and social impacts of droughts, with the full detail of each causal chain detailed in Appendix C.

Figure 4.2. Drought Impact Flow-Chart



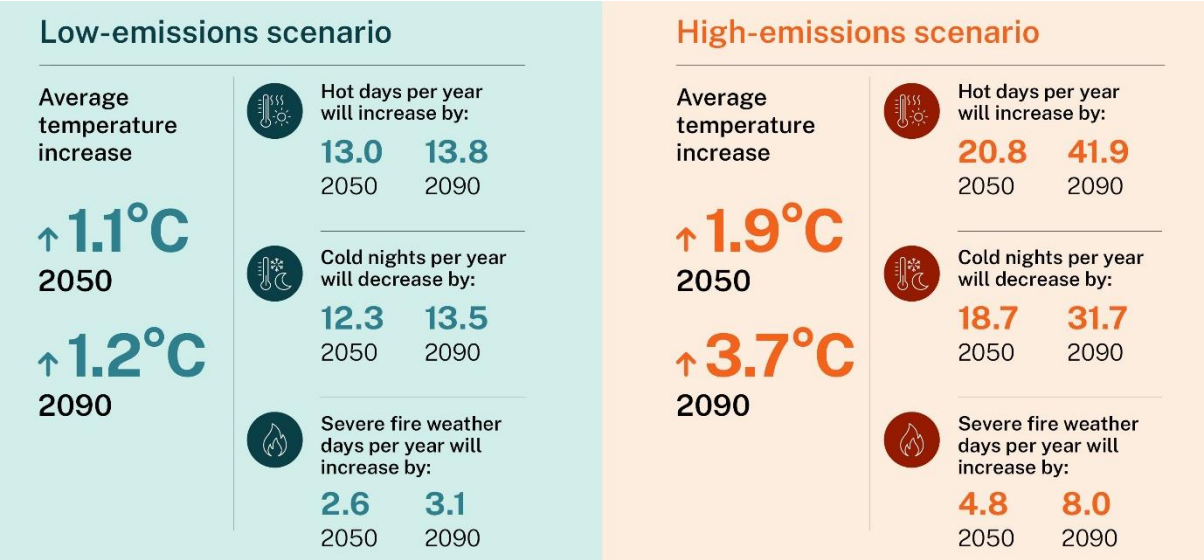
Source: AEC.

4.3 FUTURE DROUGHT SCENARIOS

The future frequency of droughts in the Riverina Murray region, including the City of Wagga Wagga and Lockhart Shire is forecast to be influenced by the future global carbon emissions trajectory, and the success of Australian and Global economies to implement policies that respond to this issue.

The region is projected to experience increased temperatures, changing rainfall patterns, and increased risk of severe weather events, such as droughts (AdaptNSW, 2024c) under the below likely emissions scenarios. Figure 4.3 summarises projected changes in 2050 and 2090 under two representative emissions scenarios.

Figure 4.3. Projected Changes in the Riverina Murray, 2050 and 2090



Source: AdaptNSW (2024c).

Under both scenarios, as well as projections contained in Section 3.2, the instances of droughts are expected to increase; resulting in the more frequent and severe realisation of drought impacts in the City of Wagga Wagga and Lockhart Shire.

5. STAKEHOLDER & COMMUNITY ENGAGEMENT

5.1 APPROACH

5.1.1 PURPOSE

As outlined in Section 1.2, the City of Wagga Wagga and Lockhart Shire RDRP is a community-led approach to drought resilience planning. Therefore, engagement with the community is crucial to the development of the RDRP.

The engagement was carried out on-site to:

- Gather contextual information regarding the existing ecological, community and economic environment of the region
- Identify perceptions, experiences and associated risks of droughts and their flow-on effects throughout society
- Identify local resilience opportunities and limitations in the region (natural/ inherent barriers or advantages that will impact resilience)
- Identify priority projects/ actions to increase drought resilience in the region
- Influence the vision, goals, and outcomes of the RDRP (as outlined in Section 1.5).

The findings from stakeholder engagement have been incorporated throughout the City of Wagga Wagga and Lockhart Shire RDRP. The projects/ actions outlined in Chapter 6 were directly identified through stakeholder engagement, reinforcing the community-led approach to this document.

5.1.1.1 COMMUNITY WORKSHOPS

Stakeholder engagement was carried out within the community through a mixture of in-person and digital engagement strategies. Engagement was facilitated through MentiMeter, an online software that encourages interaction, discussion, and debate.

This is achieved through supporting a facilitated discussion, by allowing the facilitator to raise questions to which the stakeholder participants are invited to provide anonymous responses from their own personal electronic devices (PED - smart phones, etc) in real time. MentiMeter then permits the moderator to instantaneously capture stakeholder feedback and responses, and present in real time an anonymised summary of stakeholder responses to the topics of discussion. Feedback may be sought in the form of short answer text responses (which are presented in word cloud form), identification of options (short text response), prioritisation of alternatives, scoring of options, etc. Where individuals were not comfortable or able to use their own PEDs, they were assisted by moderators to provide feedback.

MentiMeter excels at gaining the full range of perspectives in an anonymous process, not just the usual dominant voices in the room. The live polling feature effectively indicates where a consensus exists amongst stakeholders; and where issues are more contentious, requiring more detailed exploration and discussion. Moreover, MentiMeter allowed for participants to view and respond to the input from other participants in real-time, stimulating facilitated discussion amongst different stakeholders.

Four in-person community town halls were held across the region:

- Tarcutta Hall – August 8, 2024
- The Rock Memorial Bowling Club – August 8, 2024
- Lockhart Council Chambers – August 9, 2024
- City of Wagga Wagga Council Chambers – August 9, 2024

Approximately 50 participants attended the workshops across the region.

5.1.1.2 COMMUNITY SURVEY

In addition to on-site stakeholder and community engagement sessions throughout the region, a community survey was developed and made open to the public for two months (from 2 November 2024 to 18 October 2024) to ensure a thorough capture of the thoughts and opinions of those who were not able to attend in-person engagement.

Council staff promoted the survey through Council's established community consultation channels, and through direct engagement with influential community leaders to optimise the ability of word of mouth and community networks to draw attention to the survey.

A total of 79 community members responded to the survey.

5.2 ENGAGED STAKEHOLDERS

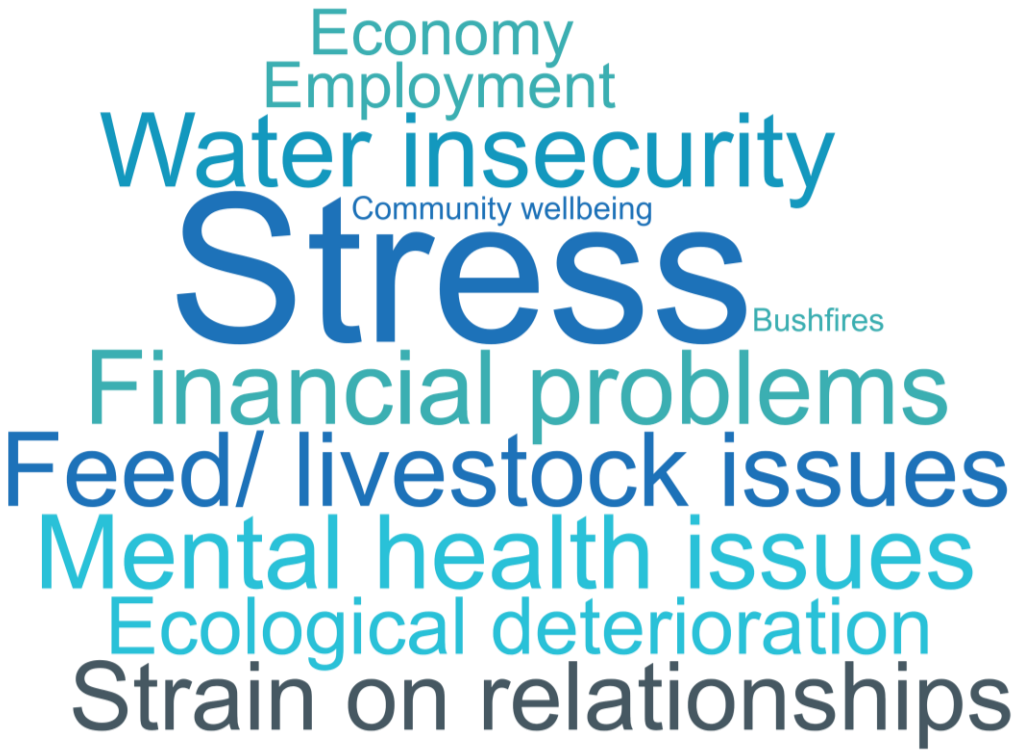
Engaged stakeholders came from across the region, with groups including:

- Farmers and associated businesses (approximately 33.7% of engaged stakeholders)
- Local Councillors and Council Officers (approximately 17.9% of engaged stakeholders)
- Social support service providers (approximately 10.5% of engaged stakeholders)
- Education and/ or training providers (approximately 9.5% of engaged stakeholders)
- Local health and social services providers (approximately 5.3% of engaged stakeholders)
- Manufacturing, transport, construction, etc. (approximately 5.3% of engaged stakeholders)
- Other segments of society (approximately 17.9% of engaged stakeholders).

5.2.1 PREVIOUS IMPACTS

Engagement with stakeholders and the community found that stress was the largest impact of previous droughts in the City of Wagga Wagga and Lockhart Shire. Stakeholders and community members also outlined a variety of complex, interconnected challenges across all aspects of the community, ranging from mental health to ecological deterioration, interpersonal strain to water insecurity, demonstrating the holistic impact of droughts on communities.

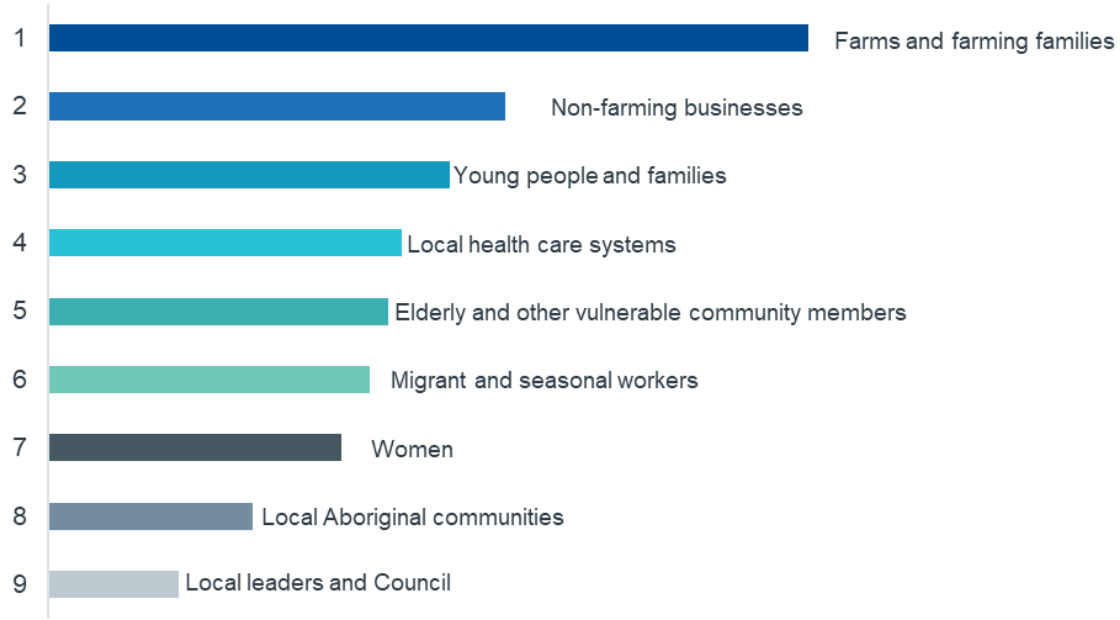
Figure 5.1. Impacts of Previous Droughts



Source: AEC.

The community identified that farms, farming families and farm businesses were the most affected by previous droughts in the City of Wagga Wagga and Lockhart Shire. This was followed by non-farming businesses, young people and families.

Figure 5.2. Most Impacted Community Groups



Source: AEC.

5.2.2 STRENGTHS AND LIMITATIONS OF THE REGION

The local strengths of the City of Wagga Wagga and Lockhart Shire, as identified by stakeholders, are outlined in the image below.

Figure 5.3. Local Strengths

Source: AEC.

The local limiting factors of the City of Wagga Wagga and Lockhart Shire, as identified by stakeholders, are outlined in the image below.

Figure 5.4. Local Limitations

Source: AEC.

5.2.3 EXISTING ACTIONS IN THE REGION

The community have identified a variety of actions that exist within the region that support the building of drought resilience. In particular, the community noted the SNSW Innovation Hub's resources and programs were beneficial in resilience building. Other actions/ initiatives/ services that the community highlighted included LLS, Rural Aid, financial counselling services, mental health providers (such as Riverina Bluebell), and extensive regional planning (such as the NSW Regional Economic Development Strategy (REDS)) to build resilience.

6. OUR DROUGHT RESILIENCE JOURNEY

6.1 APPROACH

The stakeholder and community engagement process (refer to Section 4.3) identified a diverse range of community-identified actions that community members felt would have the potential to strengthen resilience and develop adaptive capacity among the residents and businesses of the City of Wagga Wagga and Lockhart Shire to support their community, environment, and economic resilience during droughts. This process also identified community perceptions of the relative importance of different types of action, targets of intervention, and vulnerable community members in need of support in relation to the negative impacts of drought.

The broad list of community-identified actions was evaluated using a multi-criteria assessment (MCA) with the Project Control Group (PCG) to leverage their insight into the region and project implementation. The criteria were developed to assess the impact of each prospective project on addressing the impact of droughts across the three pillars, community, environment, and community, as well as feasibility. The criteria utilised as part of the MCA included:

- **Drought Resilience Impact**: This criterion evaluates how effectively a project improves the region's ability to prepare for, withstand, and recover from drought. It includes actions directly related to managing water resources, improving agricultural practices, soil conservation, and mitigating drought-related risks.
- **Economic Diversification**: This criterion looks at how well the project contributes to broadening the region's economic base, particularly by reducing reliance on agriculture or other drought-vulnerable sectors. Economic diversification refers to introducing new industries, supporting innovation in existing industries, and creating jobs in non-agricultural sectors.
- **Community Engagement and Benefits**: This criterion evaluates how well the project involves and benefits the local community. The focus here is on social inclusivity, stakeholder involvement, and direct community impacts.
- **Environmental Sustainability**: This criterion focuses on the project's contribution to protecting, conserving, or restoring the natural environment, particularly as it relates to drought resilience.
- **Feasibility and Cost Effectiveness**: This criterion evaluates how realistic and cost-effective the project is, given the available resources and timelines.

Each project was assessed against each of these criteria, with a ranking from zero to ten given in each to provide a quantitative basis for project evaluation and differentiation. This ranking was also informed by community perceptions of need and prioritisation.

The results of this process, in addition to discussions with relevant Council officers, informed a selection of actions to be delivered under the broader RDRP process. In addition to these actions, Council has identified a desire to implement a series of actions (outside the RDRP process) that Council is currently undertaking or has committed to undertake in the future. These actions have been included in the RDRP to provide a consolidated point of reference for future drought resilience planning in the region.

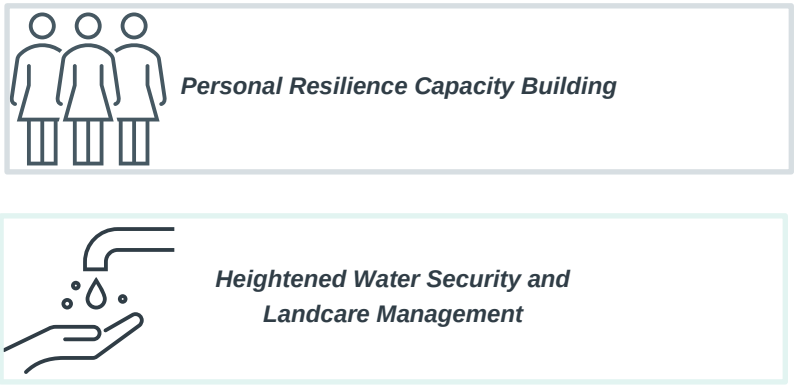
Community-led actions have been categorised into the following sections:

- Projects/ actions Council will seek to implement under the RDRP
- Projects/ actions that Council are already actioning or looking to action in the short run
- Projects/ actions that Council are looking to action in the long run
- Projects/ actions that Council will look to advocate to the New South Wales and Australian Governments
- Projects/ actions that Council acknowledges, however, no further action is anticipated.

6.2 PROJECTS/ ACTIONS TO BE IMPLEMENTED UNDER THE RDRP

Both Councils are committed to cooperating in the delivery of a series of community-identified actions with various project partners. This plan identifies a series of projects that Councils will seek to deliver as part of the RDRP program, in addition to a series of actions and projects that both Councils are committed to delivering outside of the program. The projects that are to be delivered under the RDRP program align with two broad pathways; firstly, heightened water security and land care management, and secondly, personal resilience capacity building.

Figure 6.1. RDRP Project Pathways



Source: AEC.

These actions will look to:

- **Manage**: Actions taken to handle and oversee the impacts of drought, such as implementing measures to mitigate the immediate effects of drought on communities, agriculture, and ecosystems.
- **Modify**: Actions that make changes or adjustments to existing systems, practices, or infrastructure to better withstand drought conditions.
- **Transform**: Actions that fundamentally change the way systems operate to create long-term resilience against drought.

Councils will take on a variety of roles throughout the delivery of the RDRP actions, including:

- **Facilitator**: Councils will connect project beneficiaries with necessary funding provided through the New South Wales and Australian Governments.
- **Investigator**: Councils will lead and provide support into finding ways to address issues and how to implement fixes.
- **Enabler**: Councils will support project partners to lead the delivery of projects/ actions through the provision of Council resources, facilities and staff.

In addition to the City of Wagga Wagga and Lockhart Shire Councils, several potential project partners will assist in developing, implementing and monitoring projects and actions, alongside Council. Whilst preliminary discussions with some partners around certain projects have been undertaken, there has been no formal agreement with any future project partner. Council will look to engage with potential project partners before commencing any project to ensure that roles and responsibilities are clearly outlined.

6.2.1 EXPAND RESILIENCE PROGRAM IN SCHOOLS

DESCRIPTION

Mental health services play a critical role in supporting individuals and families who experience stress, anxiety, and depression due to financial pressures, environmental uncertainty, and feelings of isolation during challenging times. Unfortunately, these services frequently contend with limited funding and staff shortages, particularly when drought persists, challenging their capacity to provide comprehensive support.

Through consultations, community members shared that children are especially affected, witnessing the impact of drought on their families, farms, and communities without a clear understanding of what actions they can take.

In the City of Wagga Wagga, a resilience-based education program has been integrated into several schools to help young people build the skills needed to navigate difficult periods. This program not only strengthens resilience among children but also positions them as active participants, able to share valuable knowledge and coping strategies with family and friends. Feedback from local schools and Conucil highlights the success of the program and the positive impacts that these have had in developing resilience in young people.

ABOUT THE PROJECT

The project aims to build on the existing initiative established at schools within the City of Wagga Wagga and will be seeking to establish the program in five schools in the City of Wagga Wagga and five schools in the Lockhart Shire. The program will cover a mix of public, independent and catholic primary and high schools, from mainly rural settings.

The goal of the program is to start from the ground up to build a more resilient community, and building resilience in younger residents lays a foundation for the future. Early resilience building fosters problem-solving skills, adaptability, emotional regulation and coping mechanisms that young people can draw on as they encounter adversity throughout life.

The benefit of this program is not a 'one-off', as resilient young individuals are also more likely to contribute positively to their communities, support their peers, and spread resilience skills within their families. This proactive approach not only strengthens individual well-being but also bolsters the community's collective capacity to face and adapt to challenges over time.

Table 6.1. Project Information

Indicator	Context
Council's Role	Enabler
Aim	Transform: Transforming the education system to better equip children to withstand the effects of future droughts
Action Owner	City of Wagga Wagga and Lockhart Shire Council in conjunction with participating schools
Location	City of Wagga Wagga and Lockhart Shire
Partners (*Roles and Responsibilities*)	• Local Public, Independent and Catholic Primary and High Schools (*Project Implementation – Support; PWG*) • The Resilience Program (*Project Implementation – Delivery; PWG*) • Riverina Bluebell/ MPHN (*Project Development and Implementation – Support; PWG*) • NSW Department of Education (*Project Development and Implementation – Support; PWG*) • Catholic Education | Diocese of Wagga Wagga (*Project Development and Implementation – Support; PWG*) • Catholic Schools NSW (*Project Implementation – Awareness*) • Association of Independent Schools of NSW (*Project Implementation – Awareness*)
Timeframe	24 months
Project Cost	$100,000 ($50,000 per year)
Success Measure	10 schools (five in the City of Wagga Wagga and five in Lockhart Shire) over a period of two years
KPIs	• Number of schools participating in the program • Number of students participating in the program • Changes in student well-being metrics (gathered through the school surveys) • Stakeholder satisfaction (teachers, parents and administrators)
Resilience Dividend	Community • Increasing the resilience in students will support young people to adequately handle the negative impacts of droughts on their mental, physical, and social wellbeing (i.e. coping skills). Moreover, the project will give young people stronger problem-solving abilities, proactive behaviours and responses, and increase knowledge-sharing, leading to increased community resilience. • Reduced stigma associated with mental health challenges. Economy

Indicator	Context
	• Increasing the resilience of young people will reduce the instances of young people leaving the region (later in life) during droughts due to an inability to withstand the negative impact of droughts, resulting in fewer disruptions to local labour markets.

Note: Action owners and partners should be reviewed prior to project implementation.
Source: AEC.

STEPS FOR IMPLEMENTATION

1 Conduct preliminary discussions with potential project partners (outlined above) to identify their capacity, capability and willingness to contribute to the project; if these partners are unable to support the implementation of the Project, Councils will investigate alternative options

2 Establish a project working group to maintain focus, ensure accountability and decision making. The group should consist of representatives from each Council, local mental health organisations (Riverina Bluebell and the Murrumbidgee Primary Health Network (MPHN)), as well as representatives from local school sectors (i.e. NSW Department of Education, Diocese of Wagga Wagga, etc.), depending on initial discussions with potential project partners

3 Confirm program cost and potential co-contribution from stakeholders, particularly schools

4 Evaluate the current program in the City of Wagga Wagga to identify key successes, areas for improvement and any resource gaps.

5 Incorporate previous program feedback into a new and improved program

6 Promote the program through Council communication channels

7 Incorporate the program activities into each school's program

8 Monitor the success of the programs through a student survey.

NEXT STEPS

1 Develop an online resource hub with materials for students, teachers and parents providing easy access to program resources and allowing participants to revisit resilience-building materials

2 Plan for long-term funding to secure the program's future

3 Raise awareness about the program's impact on mental health and education.

6.2.2 NEIGHBOURHOOD 'CHECK-IN' PROGRAMS

DESCRIPTION

The stigma around mental health services can often leave community members isolated and not seeking the help that they need. In regional areas, feelings of isolation can be heightened by geographic distance, fewer mental health resources, and cultural expectations to "tough it out." While small gestures, like a neighbour checking in, can make a difference, people are often hesitant to engage due to a lack of confidence or knowledge in how to approach these sensitive topics. Community members may worry about saying the wrong thing or feel underprepared to offer meaningful support, which limits the positive impact they could have on those around them.

This program can help build community skills in supportive conversations, recognising mental health dialogue and help reduce the stigma associated with mental health through delivering appropriate mental health first aid training.

Often, a simple 'check-in' from a neighbour can drastically improve the situation of people who are suffering from mental health conditions; however, community members may feel underequipped to appropriately broach difficult subjects with their neighbours, friends or family. A program of workshops, led by Riverina Bluebell and the Local Health Network (LHN) in townships across the region can provide people with the capabilities to adequately check in with their neighbours.

ABOUT THE PROJECT

Mental health programs are already present in the region through Riverina Bluebell and the LHN, however, more awareness and funding are required to expand the skillset of local residents to support their neighbours. Funding will support mental health training workshops across the region, facilitated by mental health experts from Riverina Bluebell and the LHN. Each workshop will provide practical skills and knowledge on how to recognise signs of mental health challenges, approach conversations sensitively, offer support or guide individuals toward professional help if needed, give target help, and support participants in acquiring mental health first aid certificates.

Table 6.2. Project Information

Indicator	Context
Council's Role	Investigator
Aim	Manage: Manage the impacts of droughts on community members through increase community engagement
Action Owner	City of Wagga Wagga and Lockhart Shire Council in conjunction with local mental health organisations
Location	City of Wagga Wagga and Lockhart Shire
Partners (*Roles and Responsibilities*)	• RiverinaBluebell (*Project Development and Implementation – Lead; PWG*) • MPHN (*Project Development and Implementation – Support; PWG*) • Local community groups (*Project Implementation – Support*)
Timeframe	12 months
Project Cost	~$80,000
Success Measure	200 participants undertaking Mental Health Training across 10 workshops hosted throughout the region
KPIs	• Number of workshops • Number of Mental Health First Aid Certificates awarded. • Number of people participating in workshops • Knowledge and confidence gains (survey) • Reduction in mental health stigma • Number of community mental health referrals
Resilience Dividend	Community • Increasing the knowledge and capacity of community members to identify the signs of depression, anxiety and other mental health issues will help community members to reduce the mental health stigma, identify and treat issues in the community, addressing the impacts of droughts on community members when they happen. • Strengthen community support networks to improve mental wellbeing and resilience and empower residents to positive address sensitive issues. Economy • Addressing the instances of mental health issues in the community can lead to lower instances of truancy, people leaving the labour market and mental health issues, all of which will lead to more economic activity in the region, than would otherwise occur. • Equips adults in the workplace with the skills and confidence needed to recognise, respond, and offer initial support to a co-worker or another adult experiencing a mental health problem or mental health crisis, until appropriate professional help is received, or the crisis resolves.

Note: Action owners and partners should be reviewed prior to project implementation.
Source: AEC.

STEPS FOR IMPLEMENTATION

1 Conduct preliminary discussions with potential project partners (outlined above) to identify their capacity, capability and willingness to contribute to the project; if these partners are unable to support the implementation of the Project, Councils will investigate alternative options

2 Establish a project working group with potential project partners identified in the prior step, as well as representatives from each Council

3 Leverage the established project working group for the 'expand resilience program in schools'

4 Confirm program cost and potential co-contribution from Riverina Bluebell and the Local Health Network

5 Gather an understanding of the successes and learnings from similar programs (such as the Paynesville Neighbourhood Centre) to help shape the project through real-life learnings

6 Develop workshop curriculum and materials (e.g., handouts, checklists and local resources)

7 Plan workshop times and promote the program through Council communication channels

8 Monitor the success of the programs through a pre- and post-workshop survey

9 Provide ongoing support and resources through the development of a follow-up system.

NEXT STEPS

1 Expand workshop availability and reach, through additional townships and incorporate more sessions for targeted groups (e.g., farmers, youth, local sporting organisations, etc.)

2 Consider establishing a social media campaign in periods of drought to allow community groups and individuals to promote the importance of mental health. This will further raise awareness of available educational workshops and reduce the stigma associated with mental health

3 Continue to seek funding

4 Develop and promote an online version of the workshops to make mental health training accessible year-round and to reach those unable to attend in-person sessions.

6.2.3 BUSINESS FINANCIAL COUNSELLING SERVICES

DESCRIPTION

Financial counselling services play a critical role in supporting farms during periods of financial and emotional stress, which are often the result of droughts. These services are currently constrained in how they can support farms, limiting the availability of on-farm consultations, leading farmers to make the difficult choice between staying on-farm and working or travelling vast distances to access financial counselling services. Additional funding provided under the RDRP program will allow counsellors (supported by Council and existing providers) the ability to travel to farms to provide financial support and advice to rural-based businesses.

ABOUT THE PROJECT

The project aims to build upon existing financial counselling services within the City of Wagga Wagga and Lockhart Shire to appropriately target the needs of local farmers, when and where they are needed, through the provision of financial counsellors that will travel to affected farms.

The goal of the program is to provide support to farms to build their resilience during periods of increased water insecurity. Increased financial counselling will reduce pressures placed on farming households, support local agribusinesses and provided associated community and social benefits.

Table 6.3. Project Information

Indicator	Context
Council's Role	Enabler
Aim	Modify: Modify existing services to more adequately meet the needs of farms
Action Owner	City of Wagga Wagga and Lockhart Shire Council in conjunction with Rural Financial Counselling Services NSW (RFCS)
Location	City of Wagga Wagga and Lockhart Shire
Partners (*Roles and Responsibilities*)	• RFCS (*Project Implementation – Delivery; PWG)* • NSW Government (*Project Support*) • Australian Government (*Project Support*)
Timeframe	12 months
Project Cost	$250,000
Success Measure	150 properties access on-farm financial services

Indicator	Context
KPIs	• Number of farms participating in the program • Changes in farm finance metrics (gathered through surveys) • Stakeholder satisfaction (counsellors, farms, etc.) • Number of farms accessing the Farm Household Allowance
Resilience Dividend	Economy • Increasing the financial literacy and resilience of farms to reduce the instances of farms falling into periods of financial need, increasing stability and reducing the region's reliance on welfare programs, such as the Farm Household Allowance. Moreover, increased on-farm financial stability will result in increased stability for local supporting businesses. Community • Increasing the financial literacy and resilience of farms will reduce the household stress, limiting the strain on relationships and adolescent development.

Note: Action owners and partners should be reviewed prior to project implementation.
Source: AEC.

STEPS FOR IMPLEMENTATION

1 Conduct preliminary discussions with potential project partners (outlined above) to identify their capacity, capability and willingness to contribute to the project; if these partners are unable to support the implementation of the Project, Councils will investigate alternative options

2 Establish a project working group to maintain focus, ensure accountability and decision making. The group should consist of representatives from each Council, and the RFCS, as well as any other potential partner depending on initial discussions with potential project partners

3 Confirm program cost and potential co-contribution from stakeholders

4 Evaluate the current financial counselling services, focusing on ways to integrate on-farm services with existing services to streamline project adoption

5 Promote the program through Council communication channels

6 Implement on-farm financial counselling services

7 Monitor the success of the programs through a participant survey.

NEXT STEPS

1 Review the effectiveness of the program and identify areas for improvement going forward

2 Provide a comprehensive list of common questions/ queries/ concerns/ issues/ etc that farms across the region are experiencing, readily available on Council's website to provide on-going support for farms after the completion of the project

3 Plan for long-term funding to secure the program's future.

6.3 COUNCIL ALREADY ACTIONING/ TO ACTION IN THE SHORT-RUN

The City of Wagga Wagga and Lockart Shire Council are already actioning/ committed to actioning the following actions within the next few years, outside of the RDRP. These actions are outlined below.

Table 6.4. Projects Already Actioned/ to be Actioned in the Short-Run Outside the RDRP

Project Name	Project Description	Benefit		
		Community	Environment	Economy
Already Actioning				
Education Programs on Sustainable Land Use Initiatives	Council will continue to support Local Land Services, CSU, and other relevant parties to continue to provide education programs that demonstrate successful land use initiatives and teach farmers how to implement them on their own farms, including water management/ water conservation.	-	Y	Y
Educational Programs Showcasing Latest Technology	Council will continue to support DAFF, MLA, NSW DPIRD, CSU, FSGA and LLS to provide education programs to demonstrate successful AgTech innovations to help farms with soil moisture and supporting resilience. This program should also focus on increasing awareness of the services from areas such as the LLS.	-	Y	Y
Accessible Latest Climate & Weather Forecasting	Council, in partnership with relevant entities, are developing accurate, accessible and up-to-date climate and weather forecasting for farmers.	-	Y	Y
Integrate Mental Health Services with Sports Clubs	Council will continue to support the integration of mental health services (such as Riverina Bluebell, LHNs, etc.) within local sports clubs; focusing on the effect of drought on mental health, how to build resilience and support other community members during droughts. Support may include the provision of Council facilities, staff and equipment, information sharing and coordination.	Y	-	-
To be Actioned in the Short Term				
Shop Local Program	A program where Council provides a 'voucher' to customers supporting local businesses, entering them into a raffle to win prizes.	Y	-	Y
Water Restrictions	Implement/ amend relevant plans and procedures to include a range of water restrictions, including limiting the hours of garden watering, 3-minute showers, household limits, etc. during periods of increased water insecurity to more efficiently manage limited water resources.	-	Y	-
Community Events at Sporting Clubs	A small allocation of funds to provide a position at Council for a current/ new employee to manage a program that hosts community events (i.e. fairs, markets, etc.) that piggyback off existing sports days at sporting clubs to increase community connectedness.	Y	-	Y
Public Shower Facilities	Implement/ amend relevant plans and procedures to provide access to public showering and clothes-washing facilities during periods of heightened water insecurity in communities that may lack available water for these services.	Y	-	-
Council Officer for Drought Preparedness Planning	Council will provide a new position, or extend a current position, to include a 'Drought Preparedness Officer'. This officer will support the coordination, promotion and delivery of drought resilience actions, initiatives and programs throughout the region.	Y	Y	Y
Mobile Mental Health Care Services	A small annual fund to support local mental health services to travel to currently not-serviced or under-serviced communities in the region to provide mental health services.	Y	-	-
Arts Program	Cultural/ arts programs support self-expression and increase community pride.	Y	-	-

Project Name	Project Description	Benefit		
		Community	Environment	Economy
Theory of Change Model	Councils may develop a Theory of Change (ToC) model with other stakeholders to investigate when (i.e. using forecasts of climate change) prime agricultural land and other agricultural land may become unviable for agriculture, and what strategies need to be planned for and undertaken at a structural level to ensure economic diversification when required, to protect communities. This will be a forward-looking piece considering tipping points, thresholds, feedback loops (vicious/virtuous cycles), social dilemmas, cross-scale influences, and/or perverse policy outcomes.	Y	Y	Y
Incentives for On-Farm Vegetation Management/ Revegetation	The SNSW Innovation Hub has an existing program, the Improved Drought Resilience Through Optimal Management of Soils and Available Water Project, which demonstrates a series of effective on-farm vegetation management strategies that can be implemented to support increased drought resilience. Integrating these strategies into farms throughout the region can prove to be costly. Financial incentives will help to support the widespread adoption of more sustainable and resilient land practices.	-	Y	Y
Expanded Water Storage Including Additional Quick-Fill Stations	Council will look to support the expanded water storage throughout the community, including additional quick-fill stations to increase water accessibility throughout droughts. Council will conduct preliminary investigations into the potential volume of water saved for various potential water storage investments before looking to expand water storage, in order to ensure that value for money is achieved.	Y	Y	Y
Host Events in Smaller Regional Towns	Council will look to introduce a series of community events across regional towns in the Lockhart Shire, looking to expand upon the successes of the Festival of W in the City of Wagga Wagga and the annual Spring Festival in the Lockhart Shire. Each event will celebrate the unique culture, history, and natural attractions of its host town, while also providing local businesses and artisans with a platform to showcase their goods and services. The events will target residents and visitors alike, aiming to increase regional visitation, strengthen community ties, and stimulate local economies. This initiative involves working with local councils, community groups, and businesses to create and execute events.	Y	-	Y
Drought Initiatives	Council will look to implement a media campaign to promote four key initiatives — mulching, free plant distributions, reusing greywater, and water-saving tips — to promote drought resilience in the community. • **Water saving tips**: to guide residents in making small but impactful changes that reduce overall water usage throughout the year. • **Reusing greywater**: to support educating residents, businesses and community groups on how they can reuse greywater to limit water waste and support long-term water conservation. • **Free plant initiatives**: the project provides community members with free, drought-tolerant plants suitable for the local climate, encouraging low-water landscaping that beautifies properties while conserving resources. • **Mulching**: to outline the benefits associated with mulching including retaining soil moisture, reducing evaporation and protecting plants. • **Water-Smart Plant Selection**: to create and promote collateral outlining water-smart plants.	-	Y	-

Source: AEC.

6.4 COUNCIL TO ACTION IN THE LONG RUN

Council is also committed to the implementation of several long run projects and initiatives that are aimed at building local resilience, outside of the scope of the RDRP. These projects are outlined below.

Table 6.5. Projects Already Actioned/ to be Actioned in the Short-Run Outside the RDRP

		Benefit		
Project Name	**Project Description**	**Community**	**Environment**	**Economy**
Financial Incentives for Agritourism Product Development	The provision of various financial incentives to support farms to explore and implement opportunities to expand the region's agritourism offering. Financial incentives may include: Council rate reductions, grants, and joint ventures.	-	-	Y
Brookong Creek Masterplan	Realising the Brookong Creek Masterplan will support the increased economic, environmental, and social resilience in the Lockhart Township by providing a community space that will lead to increase health outcomes through increased activity and connectivity. Moreover, the redeveloped creek will support increased the offering of nature-based visitor experiences to the region, increasing economic activity, whilst building the natural resilience of the ecosystem.	Y	Y	Y
Education on Impact of Drought on Vulnerable Populations	A fund to develop an educational program, and associated materials, to inform residents of the effect of droughts on vulnerable community members	Y	-	-
Allow Landowners to Undertake Vegetation Management	Change local land practices in relevant local council land plan legislation	-	Y	Y
Public Fund for Landcare and Natural Resource Management Groups	Council provides an annual budget for a local landcare group to advocate and support the expansion of sustainable and resilient landcare practices across the region. Consideration should be provided to best practice initiatives including appropriate ground cover	-	Y	-
Water Pipeline	Extend water pipelines to remote properties that have no access to the town water supply (Riverina Water)	-	-	Y
Drought Bank	Community members have raised the potential of creating a drought fund for the community, where funds are generated during prosperous times and used during drought when businesses are doing it tough	Y	-	Y
Amend Current Planning Controls	Council will engage community members and review existing planning controls to identify potential changes that can increase the supply of housing and unlocking opportunities for economic opportunities.	-	Y	Y

Source: AEC

6.5 COUNCIL TO ADVOCATE NSW/ AUSTRALIAN GOVERNMENTS

The following programs and/or policy changes have been identified as actions that Councils cannot take themselves, but where each participating Council may wish to consider taking up an advocacy position to the New South Wales and Australian Governments:

- **Provision of Checklist for Farm Subsidy Applications**: Councils, together with local financial counselling services, will investigate what additional assistance may be provided by the Australian Government to produce an easily accessible and relevant checklist of all the relevant documentation for farm subsidy applications. Such a checklist may be published on the SNSW Innovation Hub website, through social media **channels, in local newspapers, and mailed to farmers.**
- **Expansion of On-Farm Financial Counselling Services and modified to Expansion of Rural Financial Counselling Services on and off farm-based business.** Financial counsellors, supported by Council and existing providers travel the area to provide financial support and advice to rural-based businesses - **https://rfcsnsw.com.au/**
- **Rate Reductions**: Consider whether the New South Wales/ Australian Governments may provide financial support for Council to provide a discount on Council rates for businesses, farms, and residents during droughts to provide financial relief and rate reductions for farmers impacted by drought conditions.
- **Improved Water Pressure in The Rock**: Advocate for Riverina Water to improve water pressure throughout selected areas in The Rock, supporting future residential growth.
- **Employment Subsidies**: Consider whether the New South Wales/ Australian Governments should implement an employment subsidy program to subsidise the wages of employees/ trainees/ apprentices in industries affected by droughts, similar to the 'JobKeeper' program during COVID-19.
- **Public Housing Trust**: Consider whether the New South Wales/ Australian Governments should establish a Regional Public Housing Trust, to support the purchase/ building of residential properties throughout the region to support the increased provision of rental properties in the market. The Housing Trust's properties can be utilised to incentivise the attraction of new residents that can support the broader economic diversification of the region.
- **Water Restrictions Education**: Council to continue to raise awareness and educate the community on the appropriate times to water throughout the year to ensure the sustainable consumption of water. An allocation of funds is required to communicate this information through social media platforms, in partnership with Riverina Water.
- **Price Floor for Agricultural Commodities:** Farmers have identified issues with pricing, particularly during droughts. If required to sell, an appropriate baseline price needs to be established to ensure costs are covered and farmers are able to break even during periods of drought. Advocate for a guaranteed baseline price for livestock during periods of drought.
- **Feed Storage Expansion:** Farmers have identified the need for an expansion of on-farm feed storage. The purpose is to encourage storing more grain on farms for drought reserves.
- **Subsidies for Stock Feed and Fuel During Drought:** During droughts, it is more challenging for farmers to run a profitable business. Subsidies for the purchase of stock feed and fuel to transport fodder and grain will support a reduction in operating costs during difficult times.
- **Increase Budget for Rural Aid and Red Cross:** Increase in the capacity of current mental health establishments to service landholders throughout the year, particularly during droughts.

6.6 COUNCIL ACKNOWLEDGES, NO FURTHER ACTION REQUIRED

The City of Wagga Wagga and Lockhart Shire Council acknowledges receiving community representation in relation to the following projects, however, at this time no commitment to delivering can be made. This may change in the future. These projects include:

- Community Gardens/ Shade
- Childcare services
- Automatic Farm Welfare Payments During Drought
- Change Council's Pesticide Use.

7. MONITORING, EVALUATION, REPORTING AND LEARNING FRAMEWORK

7.1 ABOUT THE MEL

Monitoring, Evaluation and Learning (MEL) ensures projects achieve their intended outcomes efficiently, providing a tool to continuously monitor progress, assess the effectiveness of interventions, and apply lessons learned for ongoing improvement.

This MEL framework will assist in managing risks, making informed decisions, and demonstrating the project's impact, especially in long-term resilience-building efforts.

The objectives of the MEL are to:

1 Demonstrate progress towards drought resilience

2 Be accountable for the appropriate, efficient and effective use of funds

3 Support knowledge transfer about how to effectively build drought resilience.

To deliver on the above objectives, the Future Drought Fund has provided an overview of the scope to help ensure the region's focus on strengthening resilience.

Figure 7.1. Scope for MEL

Source: DAWE (2020).

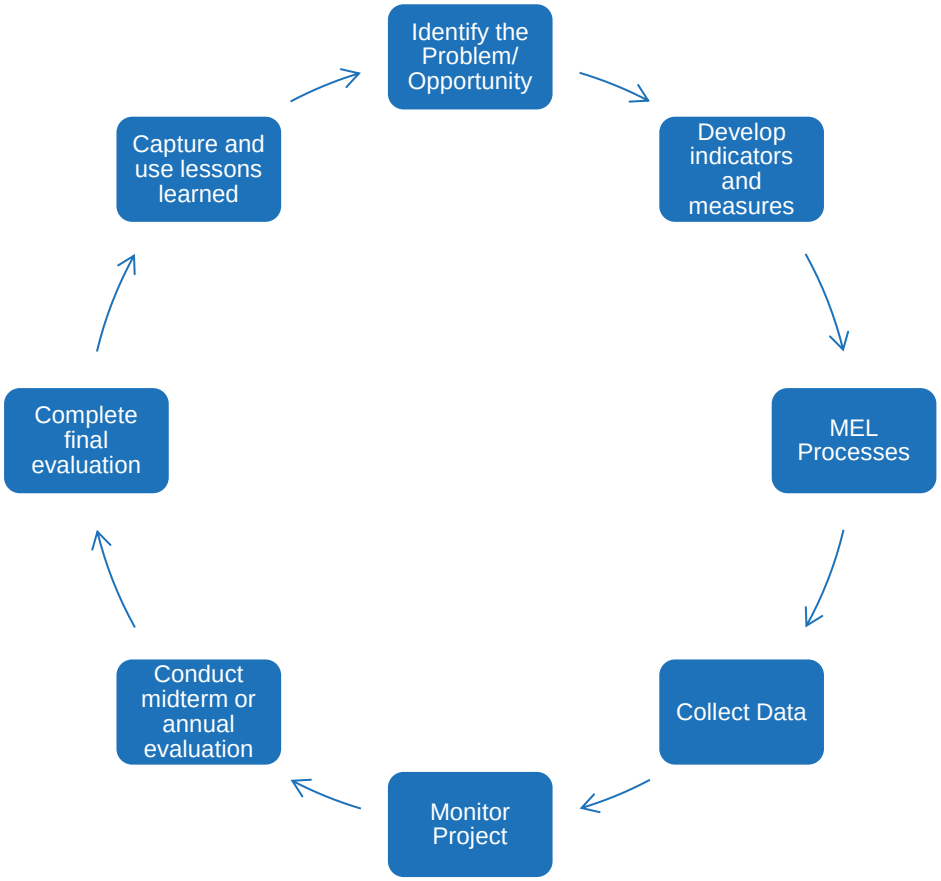
7.2 AN OVERVIEW OF THE PROCESS

To enhance the effectiveness of this project, MEL processes will be incorporated into each stage of planning and implementation. Regular evaluations with input from Council teams, lead project organisations and partner organisations will provide a dynamic approach to tracking progress, allowing for real-time adjustments and knowledge sharing to strengthen project outcomes.

When developing the implementation of the City of Wagga Wagga and Lockhart Shire RDRP, the MEL needs to be considered as a part of the process to ensure that project outcomes are effectively tracked, impacts are measured, and insights are gained to inform future actions.

The figure below provides an overview of the MEL process.

Figure 7.2. MEL Process



Source: AEC.

7.3 MONITORING

The table below lists indicators based on the relevant Future Drought Fund MEL Framework and the actions developed in the City of Wagga Wagga and Lockhart Shire RDRP. Under each of the projects/actions in section 6.2, there is a list of KPIs, which can be used for ongoing monitoring and evaluation at a specific project level.

Table 7.1. Intermediate Outcomes of the Plan (1-4 Years)

Strategic Priorities	FDF Indicators	Specific Plan Indicators	Monitoring Indicators	Data Source/ Tool	Frequency of Collection
Economic Resilience	Agricultural businesses are self-reliant, productive and profitable	• Adoption of on-farm businesses undertaking financial counselling services. • Businesses that have adaptability to economic changes due to natural disasters. • Sustaining regional employment.	• Number of farming businesses adopting financial counselling services. • Increase in on-farm business profitability.	• Quarterly business surveys. • Estimates of Gross Regional Product (GRP). • Expenditure information from local banks. • Regional employment. • Population trends.	Quarterly
Environmental Resilience	Agricultural landscapes are functional and sustainable, with healthy natural capital	• Monitoring of soil quality and moisture retention. • Consideration of changes to biodiversity and ecosystem health. • Monitoring of water quality. • Monitoring effective water resource trends (i.e. volume of water consumption).	• Soil health indicators (organic matter, moisture retention). • Biodiversity metrics in revegetated areas. • Visual assessment of green space health. • Water quality assessment. • Water consumption per hectare for agricultural production.	• Soil testing data. • Biodiversity surveys. • Visual and photographic documentation. • Combined Drought Indicator (CDI). • Volume of water consumed on farm.	Bi-annually
Social Resilience	Agricultural communities are resourceful, adaptable and thriving	• Increased community engagement in resilience activities. • Strengthened networks within community. • Increase in mental health services.	• Participation rates in workshops and community events. • Feedback on social connections and support networks.	• Event attendance records. • Pre- and post-event surveys. • Stakeholder interviews.	As events are held

Table 7.2. Intermediate Outcomes of the Plan (4+ Years)

Strategic Priorities	FDF Indicators	Specific Plan Indicators	Monitoring Indicators	Data Source/ Tool	Frequency of Collection
Economic Resilience	More primary producers adopt transformative strategies and technologies to reduce financial exposure to drought	• High adoption rate of drought-resilient practices, leading to improved productivity and financial stability. • Increased use of technologies to optimise water usage. • Sustainable agricultural productivity. • Diversification of regional industrial mix.	• Percentage of primary producers using drought-resilient practices. • Financial impact (cost savings, revenue stability). • Regional industry mix. • Forecasts of future regional drought recurrence and severity.	• Adoption tracking surveys. • Number of farms utilising drought resilience practices. • Estimates of GRP by industry. • Estimates of employment by industry. • Forecast sustainability of regional industry mix given forecast drought recurrence and severity.	Bi-annually
Environmental Resilience	More primary producers preserve natural capital while also improving productivity and profitability				
	More primary producers adopt whole-of-system approaches to natural resource management to improve the natural resource base, for long-term productivity and landscape health				
Social Resilience	Stronger connectedness and greater social capital within communities, contributing to wellbeing and security	• Strengthened community networks and support systems focused on resilience. • Active engagement in resilience-building programs and community events.	• Participation rates in resilience activities. • Community satisfaction with resilience programs.	• Community network surveys. • Stakeholder feedback sessions. • Event participation records.	Annually
	Communities implement transformative activities that improve their resilience to drought				

7.4 EVALUATION

7.4.1 KEY EVALUATION QUESTIONS

Key evaluation criteria include effectiveness, efficiency, impact, sustainability and relevance. The key evaluation questions to be considered when tracking outcomes of the City of Wagga Wagga and Lockhart Shire RDRP include:

- Economic resilience:
    - Have there been any changes in economic diversification within the region?
    - To what extent has the plan improved the confidence of the agricultural sector in coping with drought or dry periods?
    - Have there been any notable changes in key economic indicators (i.e., employment and GRP)?
- Environmental resilience:
    - Have there been notable changes in vegetation cover, pasture condition, or land degradation?
    - Have landholders reported a change in land productivity?
    - Has there been a shift in on-farm management practices to support sustainability?
    - Have there been any notable changes in on-farm water consumption?
- Community resilience:
    - To what extent has the plan contributed to improving regional stakeholders confidence in coping with successive dry seasons?
    - How effectively has the Plan fostered community cohesion and support?

When considering the overall progress of the City of Wagga Wagga and Lockhart Shire RDRP, the following is to be considered:

- In the implementation of the Plan to date, what lessons can be realised to improve future initiatives to ensure alignment with the Plan's objectives?
- To what extent has the Plan been implemented and what impact has this had on the community? (positive, negative, intended and unintended)
- Do the outcomes that have been achieved by the Plan align with improvements in drought resilience? (and to what extent)
- To what extent can the Plan's successes be sustained beyond the implementation period?
- Were adjustments made during the implantation to improve project outcomes, and if so, what prompted these changes?

7.4.2 EVALUATION PROCESS

The evaluation process should be undertaken by the PCG and the relevant lead agencies on an annual basis.

1 Gather and review data

2 Conduct stakeholder consultations

3 Assess progress against KPIs and strategic priorities

4 Identify challenges and lessons learned

5 Conduct comparative analysis with previous years (if appropriate)

6 Prepare an annual evaluation report

7 Develop recommendations and action plan for the coming year

8 Hold an annual review meeting with the PCG and lead agencies

7.5 LEARNING

Learning will be facilitated through the reflection and analysis of actions in the City of Wagga Wagga and Lockhart Shire RDRP. An annual review of progress will support an improvement of future actions across appropriateness, efficiency, effectiveness and impacts. The following provides an overview of reflective questions that can help collective qualitative information.

- What actions were taken to maximise opportunities and address barriers that emerged?
- Are there any best practice approaches/ innovations that can be shared between industry/community?
- How have lead agencies of actions empowered stakeholders to take accountability, drive adoption and participate in decision making?
- How responsive have lead agencies of initiatives/ actions been to adapting actions to changing needs and opportunities?

7.6 REVIEWING

The RDRP is a 'living document', meaning that Council is committed to updating the RDRP throughout the life of the strategy to incorporate the lessons learnt through monitoring and evaluating both project implementation, and the suitability of the mix of projects being delivered. This review will occur annually, ensuring the RDRP remains a relevant and appropriate document to support our region's journey to drought resilience. This review will consist of:

- Evaluation of project status (yet to commence, in implementation, completed, cancelled, etc.)
- Evaluation of project success (benefits, negatives, lessons learned)
- Evaluation of performance of the three pillars of resilience, and the continuing relevance of projects
- Any updates to projects

7.7 ROLES AND RESPONSIBILITIES

The PCG will continue, operating as a reference governance structure overseeing the City of Wagga Wagga and Lockhart Shire RDRP implementation and ongoing development. The PCG consists of:

- New South Wales Department of Primary Industries and Regional Development
- City of Wagga Wagga
- Lockhart Shire Council
- Any other individual selected by the PCG.

The PCG will be responsible for the ongoing monitoring, evaluation and learning throughout the implementation of the City of Wagga Wagga and Lockhart Shire RDRP.

7.8 RISKS TO IMPLEMENTATION

Provided below is an overview of the key risks to the implementation of the City of Wagga Wagga and Lockhart Shire RDRP and the MEL process. These risks may hinder the successful delivery of resilience initiatives/ actions. The table below identifies potential risks and suggested mitigation measures. The table will need to be reviewed and updated throughout the implementation phase to ensure adaptability.

Table 7.3. Short term and Long Term Risks

Risk	Potential Mitigation
Intermediate Risks of the Plan (1-4 Years)	

Risk	Potential Mitigation
Stakeholders and communities are not willing to share learnings	Foster strong relationships with stakeholders and communities by involving them early in the planning process, providing regular updates, and ensuring transparency.
There are insufficient learnings to inform future implementation activities	Conduct regular monitoring and evaluation activities to ensure that data and insights are collected throughout the implementation phase, not just at the end.
Lack of resources or technical expertise within lead agencies, with a focus on Council	Leveraging partnerships to ensure the right organisations are involved to provide technical expertise or resource support.
Limited communication and coordination among lead agencies, leading to unsuccessful implementation of actions/ initiatives	Schedule regular meetings (e.g., monthly, quarterly or bi-annually, depending on the project timeframe) among lead agencies to review progress, discuss challenges, and align on next steps.
Intermediate Risks of the Plan (4+ Years)	
Implementation plans are not reviewed or updated to incorporate key learnings	Schedule formal review periods (e.g., annually) to assess and update implementation plans based on monitoring and evaluation findings.
Lack of investment by Local, State and Federal Government	Build relationships with local, state, and federal government representatives to secure ongoing support and funding. Regularly report on project successes.
Distribution of government budgets to other priorities	Ensure political buy-in by encouraging collaboration between multiple government agencies and leveraging shared resources and funding to achieve common goals.

Source: AEC.

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APPENDIX A STRATEGIC LITERATURE REVIEW

The Strategic Literature Review (SLR) was conducted to direct the development of the RDRP to be in alignment with existing local, regional, state and national strategic documentation. Moreover, the findings of the SLR have been leveraged for key insights in the creation of the evidence base, conducting community stakeholder engagement, and the creation of actions contained in Section 6: Our Drought Resilience Journey.

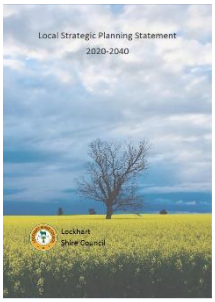
LOCAL

LOCKHART SHIRE TOURISM AND ECONOMIC DEVELOPMENT STRATEGY 2016 – 2026

The Lockhart Shire Tourism and Economic Development Strategy (TEDS) outlines the aspirations of Lockhart Shire for the future of the region (LSC, 2016). The TEDS aligns with the aims and pillars of the RDRP through several objectives, including:

- Developing a strong and resilient farming and agriculture sector
- The responsible use of land to protect and advance local economic viability and sustainability.
- The protection and sustainability of local natural assets
- Increased autonomy
- Stronger community infrastructure

LOCKHART SHIRE LOCAL STRATEGIC PLANNING STATEMENT 2020 – 2040



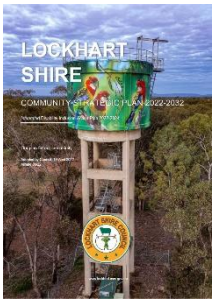
The Lockhart Local Strategic Planning Statement (LSPS) is the Shire's land use framework for all economic, social and environmental land use needs from 2020 to 2040 (LSC, 2020). The LSPS aligns with the aims and pillars of the RDRP through three Priorities, which include:

- A growing and diverse economy
- A healthy environment with pristine waterways
- Strong connected and healthy communities.

Specific planning priorities that align with the aims of the RDRP include:

- Planning priority 1 – Protect agricultural land and grow agribusiness
- Planning priority 2 – Promote opportunities for local employment
- Planning priority 4 – Adapt to the impacts and hazards of climate change
- Planning priority 5 – Protect our natural environment
- Planning priority 7 – Development controls of high quality, to maintain resident amenity and promote a sense of place
- Planning priority 8 – Growing, active and connected communities

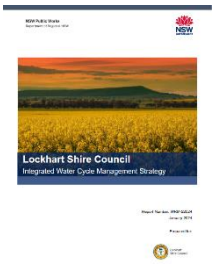
LOCKHART SHIRE COMMUNITY STRATEGIC PLAN 2022 – 2032



The Lockhart Shire Community Strategic Plan 2022 – 2032 (the Plan) outlines the ten-year aspirations and priorities of Lockhart Shire's community (LSC, 2022). The Plan outlines a vision of the Shire to be "Deeply connected to the land and proud of our independence; Dynamic, resilient, and have a strong sense of community; Passionate for innovation and diverse opportunities; and, Welcoming, vibrant, inclusive, accessible and value the rights of people equally". The Plan has several Objectives that align with the aims and pillars of the RDRP, which include:

- A connected and resilient community
- A dynamic and prosperous economy
- An environment that is respected and protected

INTEGRATED WATER CYCLE MANAGEMENT STRATEGY – LOCKHART SHIRE



The Integrated Water Cycle Management (IWCM) Strategy (the IWCM Strategy) is a local water utility's 30-year strategy for the provision of appropriate, affordable, cost-effective, and sustainable urban water services that meet community needs and protect public health and the environment (NSW DPIRD, 2024a). The IWCM Strategy outlines several environmental and social targets that were used to evaluate IWCM Scenarios, of which the following align with the aims and pillars of the RDRP:

- Lockhart Shire has healthy environments with pristine waterways
- Lockhart Shire's environmental practices are sustainable – an opportunity to utilise renewable energy and water-saving practices.
- Lockhart Shire's assets and infrastructure are well planned and managed to meet the demands of the community now and in the future
- Lockhart Shire is attractive and welcoming to businesses, industry, residents and visitors

LOCKHART SHIRE LOCAL HOUSING AND EMPLOYMENT STRATEGY

The Lockhart Local Housing and Employment Strategy (the Strategy) aims to identify issues and outline strategies to address them to endure growth in Lockhart Shire over the next two decades (LSC, 2023). The Strategy outlines several planning priorities that align with the aims and pillars of the RDRP, including:

- Planning Priority 4 – Adapt to the impacts and hazards of climate change
- Planning Priority 5 – Protect our natural environment
- Planning Priority 7 – Development controls of high quality, to maintain resident amenity and promote a sense of place
- Planning Priority 8 – Growing, active and connected communities

LOCAL STRATEGIC PLANNING DOCUMENT – CITY OF WAGGA WAGGA

The Local Strategic Planning Document (the Document) outlines a vision for the City of Wagga Wagga to be a thriving, innovative and connected regional capital that will grow sustainably, and provides new opportunities and choices for employment and lifestyle (WWCC, undated a). The themes and principles outlined in the Document align with the aims and pillars of the RDRP as they are centred on the environment, growing economy, and community place and identity.

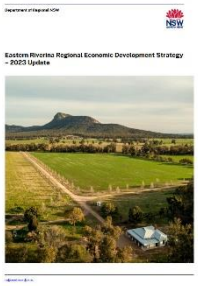
COMMUNITY STRATEGIC PLAN 2040 – CITY OF WAGGA WAGGA

The Community Strategic Plan 2040 (the Plan) is a collaborative plan with the community to develop an aspirational view of the future of the City of Wagga Wagga (CWW, undated b). The Plan outlines several strategic directions, of which growing economy, community place and identity, and the environment align with the aims and pillars of the RDRP. Specific objectives in the Plan that align with the RDRP include:

- The City of Wagga Wagga is a thriving, innovative and connected regional capital city
- Our natural areas are protected and enhanced
- The City of Wagga Wagga is sustainable, liveable, and resilient to the impacts of climate change

REGIONAL

EASTERN RIVERINA REGIONAL ECONOMIC DEVELOPMENT STRATEGY – 2023 UPDATE



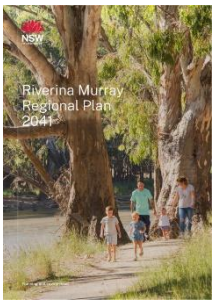
The Eastern Riverina Regional Economic Development Strategy – 2023 Update (REDS) sets out a place-based vision and framework for economic development for each Eastern Riverina, which includes Lockhart Shire, the City of Wagga Wagga, Coolamon Shire, and Junee Shire (NSW Department of Regional New South Wales, 2023). The REDS outlines several macroeconomic trends that will impact the Eastern Riverina:

- Investment in telecommunications infrastructure leading to a digital transformation
- COVID-19 pandemic-related population growth in regional communities
- Growth of the Wagga Wagga Special Activation Precinct, an eco-industrial precinct, to support economic growth in a net zero emissions environment
- Increasing ecological uncertainty

The REDS also outlines several opportunities for growth, resilience and liveability including:

- Public administration and safety (defence)
- Agriculture and food product manufacturing
- Tourism
- Energy supply (including renewables)

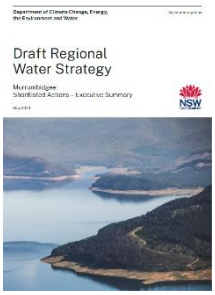
RIVERINA MURRAY REGIONAL PLAN 2041



The Riverina Murray Regional Plan 2041 (the Plan) sets out a vision for the region to be “a diversified economy founded on Australia’s food bowl, iconic waterways and a network of vibrant connected communities” (NSW Department of Planning and Environment, 2023). The Plan contains three parts: environment, communities and place, and economy. The Plan aligns with the aims and pillars of the RDRP through several objectives across its parts, including:

- Part 1: Environment
    - Objective 1: Protect, connect and enhance biodiversity throughout the region
    - Objective 2: Manage development impacts within riverine environments
    - Objective 3: Increase natural hazard resilience
- Part 2: Communities and place
    - Objective 9: Plan for resilient places that respect local character
    - Objective 11: Plan for integrated and resilient utility infrastructure
- Part 3: Economy
    - Objective 12: Strategically plan for rural industries

- Objective 13: Support the transition to net zero by 2050

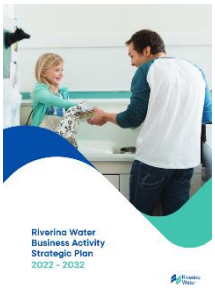


DRAFT REGIONAL WATER STRATEGY – MURRUMBIDGEE

The Draft Murrumbidgee Regional Water Strategy (the Strategy) utilises the latest climate projections and community consultation to effectively manage and plan for the Murrumbidgee's water needs over the coming decades (NSW Department of Planning and Environment, 2024d). The overarching vision of the Strategy is to "support the delivery of healthy, reliable and resilient water resources for a liveable and prosperous region". This will be achieved through a series of priorities and actions, of which the following align with the aims and pillars of the RDRP:

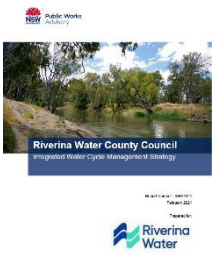
- Priority 1: Continue to improve water management
  - Action 1.1. Improve understanding and management of groundwater sources
  - Action 1.4. Foster ongoing arrangements for the participation of local Aboriginal people in water management
  - Action 1.5. Improve consideration of water in strategic planning processes
- Priority 2: Improve river and catchment health
  - Action 2.1. Rehabilitate ecologically and culturally important sites within the mid and lower catchment
  - Action 2.2. Encourage partnerships with the irrigation sector for environmental water delivery to public and private lands
  - Action 2.7. Support place-based initiatives to deliver cultural outcomes for Aboriginal people
- Priority 3: Support sustainable economies and communities
  - Action 3.1. Support the development of new water-related Aboriginal business opportunities in the Murrumbidgee region
  - Action 3.2. Reduce uncertainty in groundwater security for regional towns and industry
  - Action 3.3. Investigate innovative ways to improve runoff in water supply catchments
  - Action 3.5. Consider an enduring level of supply to support regional towns and centres

RIVERINA WATER BUSINESS ACTIVITY STRATEGIC PLAN 2022 – 2032



The Riverina Water Business Activity Strategic Plan 2022 – 2032 (the Strategic Plan) is Riverina Water, the provider of water in the Eastern Riverina's strategic plan that aims to provide safe and reliable water at the lowest sustainable cost (RiverinaWater, 2022). The Strategic Plan includes three strategic priorities that will guide the work of RiverinaWater, including our people, our business, and our community. Additionally, the Strategic Plan identifies a focus on increased sustainability in RiverinaWater's operations over the coming decades.

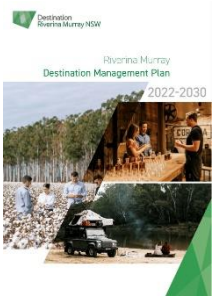
INTEGRATED WATER CYCLE MANAGEMENT STRATEGY – RIVERINAWATER



The Integrated Water Cycle Management (IWCM) Strategy (the IWCM Strategy) is a local water utility's 30-year strategy for the provision of appropriate, affordable, cost-effective, and sustainable urban water services that meet community needs and protect public health and the environment (NSW DPIRD, 2024b). The IWCM Strategy outlines several business objectives and targets which align with the aims and pillars of the RDRP, including the:

- Water security and quality objectives

- Environmental sustainability objective

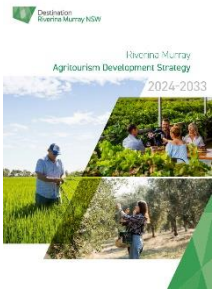


RIVERINA MURRAY DESTINATION MANAGEMENT PLAN 2022 – 2030

The Riverina Murray Destination Management Plan 2022 – 2030 (the Plan) sets out a vision for the Riverina and Murray to be an authentic and sustainable agritourism destination (Destination Riverina Murray NSW, 2020). The Plan sets out a series of actions and priorities that are set to support growth in the Riverina Murray tourism economy, in support of the broader goal to grow tourism expenditure across Regional NSW to $35 billion by 2030. The Plan outlines a series of priorities across the Eastern Riverina, which include:

- Lockhart Shire
    - Strategic development of tourism products at The Rock Nature Reserve / Kengal Aboriginal Place and surrounds
    - Development of major visitor-attracting infrastructure development within the Lockhart Shire Region
    - Development and implementation of Lockhart CBD, Brookong Creek and Galore Hill Scenic Reserve Masterplans
    - Development of agritourism, nature and cultural experiences, trails and events
- City of Wagga Wagga
    - Implementation of various Council Strategic and Master
    - Development and growth of major events and festivals.
    - Development of high-quality culinary and agritourism experiences in the City of Wagga Wagga and surrounds
    - Develop infrastructure to support connectivity and economic growth, including the Wagga Wagga Airport upgrade, electric vehicle (EV) charging investment, and attraction and investment for short-term and long-term accommodation.
    - Continued development of Wiradjuri and First Nations visitor experiences (which may include a future Cultural Centre)

These local priorities align with the RDRP through the pillar of economy.



RIVERINA MURRAY AGRITOURISM DEVELOPMENT STRATEGY 2024 – 2033

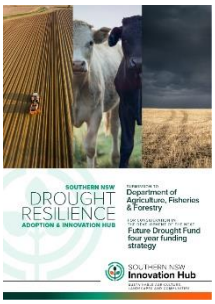
The Riverina Murray Agritourism Development Strategy (the Strategy) sets out a strategy for developing agritourism in New South Wales Riverina and Murray Regions (Destination Riverina Murray NSW, 2024). The Strategy has four essential elements, which include: combining agricultural and tourism industries, attracting members of the public to farms, diversifying farm income through agritourism, and providing recreational/ educational opportunities. These elements help inform the strategic directions and actions of the plan, which include:

- 1. Build capacity across the region's local governments and agritourism sector
    - 1.3. Develop DA Approval flowcharts and educational toolkits for agritourism proposals
    - 1.7. Develop a local food and beverage distributor
    - 1.8. Develop guidance for maximising inclusion of local produce
    - 1.13. Lobby the State government for an agritourism development fund
- 2. Focus support for agritourism development and marketing on emerging agritourism hubs
    - 2.1. Concentrate product development support on agritourism hubs
    - 2.2. Concentrate marketing on agritourism hubs

- 3. Develop lead agritourism products
    - 3.1. Assist primary producers and farm owners to create farm stay accommodation
    - 3.4. Develop a regional agritourism tour operation
    - 3.7. Develop an agritourism experience of sustainable agriculture
- 4. Lead the Region's Marketing with Agritourism
    - 4.9. Build awareness among operators to promote each other's products and experiences

These strategic directions and actions align with the RDRP through the pillar of economy.

SOUTHERN NSW DROUGHT RESILIENCE ADOPTION & INNOVATION HUB – PROSPECTUS



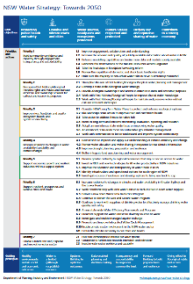
The Southern NSW Drought Resilience Adoption and Innovation Hub (The Hub) is a joint venture, a partnership of interested and co-investing organisations, hosted by Charles Sturt University and based in the City of Wagga Wagga (CSU, 2024). The Hub's mission is to support farmers and rural communities in the Southern NSW region in preparing for and mitigating drought impacts and capitalising on opportunities for recovery from drought. The Hub's Prospectus is developed in consideration of the key themes of social, economic and environment, which align with the pillars of the RDRP.

The Prospectus outlines the five impact areas that will underpin the future operations of the Hub, these are:

- Social and cultural resilience for rural and First Nations communities
- Enhancing and preserving the natural environment
- Optimising land productive and effective ground cover management
- Prioritising soil health and fertility
- Promoting responsible water use

NEW SOUTH WALES

NSW WATER STRATEGY: TOWARDS 2050



The NSW Water Strategy: Towards 2050 (the Strategy) outlines serval core objectives that align with the aims and pillars of the RDRP (NSW Department of Planning and Environment, 2024a), including:

- Water sources, floodplains and ecosystems protected
- Contribute to a strong economy
- Liveable and vibrant towns and cities

The Strategy also contains a series of priorities that also align with the aims and pillars of the RDRP, including:

- Priority 4: Increase resilience to changes in water availability (variability and climate change)
- Priority 5: Support economic growth and resilient industries within a capped system
- Priority 6: Support resilient, prosperous and liveable cities and towns

STAYING AHEAD: STATE INFRASTRUCTURE STRATEGY 2022 – 2042

The Staying Ahead: State Infrastructure Strategy 2022 – 2042 (the Strategy) outlines several New South Wales-wide infrastructure objectives that align with the aims and pillars of the RDRP, including:

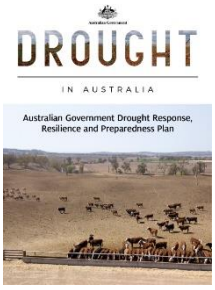
- 3: Boost economy-wide productivity and competitiveness

- 3.4. A thriving regional NSW is fundamental to the State economy, with regional developments to include Special Activation Precincts (SAPs) and investment in water security (through pipelines, weirs and dams) in priority catchments.

- 5: Embedded reliability and resilience
  - 5.4. Resilient infrastructure demands greater investment in asset management
  - 5.7. Infrastructure assets for community resilience, such as rainfall-independent sources of water supply and capacity
- 7: Enhance long-term water security
  - 7.5. Capitalising on the value of wastewater
- 8: Protect our natural endowments

AUSTRALIA

DROUGHT IN AUSTRALIA: AUSTRALIAN GOVERNMENT RESPONSE, RESILIENCE AND PREPAREDNESS PLAN



The Drought in Australia: Australian Government Response, Resilience and Preparedness Plan (the Plan) outlines a vision to have farms and regional communities that are prepared and capable of managing droughts (Department of Agriculture, 2019). The Plan sets out the roles and responsibilities of the Commonwealth and State Governments in increasing reliance, with a focus on three areas:

- Immediate action for drought-affected regions
- Support for the wider communities affected by drought
- Long-term resilience and preparedness

APPENDIX B DETAILED REGIONAL OVERVIEW

This section provides a detailed overview of the key geographical, biophysical, socio-demographic and economic context of the LGAs of the City of Wagga Wagga (City of Wagga Wagga) and Lockhart Shire Council (Lockhart Shire), which collectively form the Broader Regional catchment. This section includes references to broader regional catchments, New South Wales and Australia as appropriate.

The detailed regional overview was leveraged throughout the creation of the RDRP. The overview was utilised to provide key insights into the region, aiding in understanding droughts and their impacts, as well as supporting the development, implementation and evaluation of community stakeholder engagement to effectively develop an RDRP that is built by and for the community.

ENVIRONMENTAL PROFILE

LAND USE

The Broader Regional Catchment covers 7,720 square kilometres (ABARES, 2021). The City of Wagga Wagga comprises 62.5% of this area (approximately 4,820 square kilometres), while Lockhart Shire makes up the remaining 37.5% (approximately 2,900 square kilometres). Of the Broader Regional Catchment's 7,720 square kilometres, only 1.9% is covered by water; lower than the 2.2% across New South Wales. The water availability is lower in the Lockhart Shire, accounting for 1.7% of the land. The lower water coverage across the Broader Regional Catchment compared to New South Wales may underscore issues around water availability, particularly under drought conditions.

Across the Broader Regional Catchment, there is also a relatively low provision of protected land[1] (ABS, 2023a). Protected land only covers 0.2% and 1.7% of total land across Lockhart Shire and the City of Wagga Wagga, respectively, compared to 10.2% across New South Wales.

Across the study regions, agriculture was the most prominent land use (ABARES, 2021). Lockhart Shire recorded the largest agricultural land use (96.5% of total land) and this was followed by the City of Wagga Wagga (92.6% of total land), with both of the LGAs focusing on dryland cropping.

The City of Wagga Wagga recorded the highest proportion of urban land uses (3.1% of total land) across the study regions (ABARES, 2021).

Table B. 1. Land Use, Eastern Riverina and New South Wales, 2020

Land Use	Lockhart Shire	City of Wagga Wagga	Broader Regional Catchment	New South Wales
Water	1.7%	2.0%	1.9%	2.2%
Urban	1.4%	3.1%	2.5%	1.0%
Agriculture	96.5%	92.6%	94.1%	83.5%
Other	0.5%	2.2%	1.6%	13.3%
Total Land Use (%)	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Total Land (km2)	**28,957**	**48,245**	**77,202**	**8,007,344**

Source: ABARES (2021).

CLIMATE

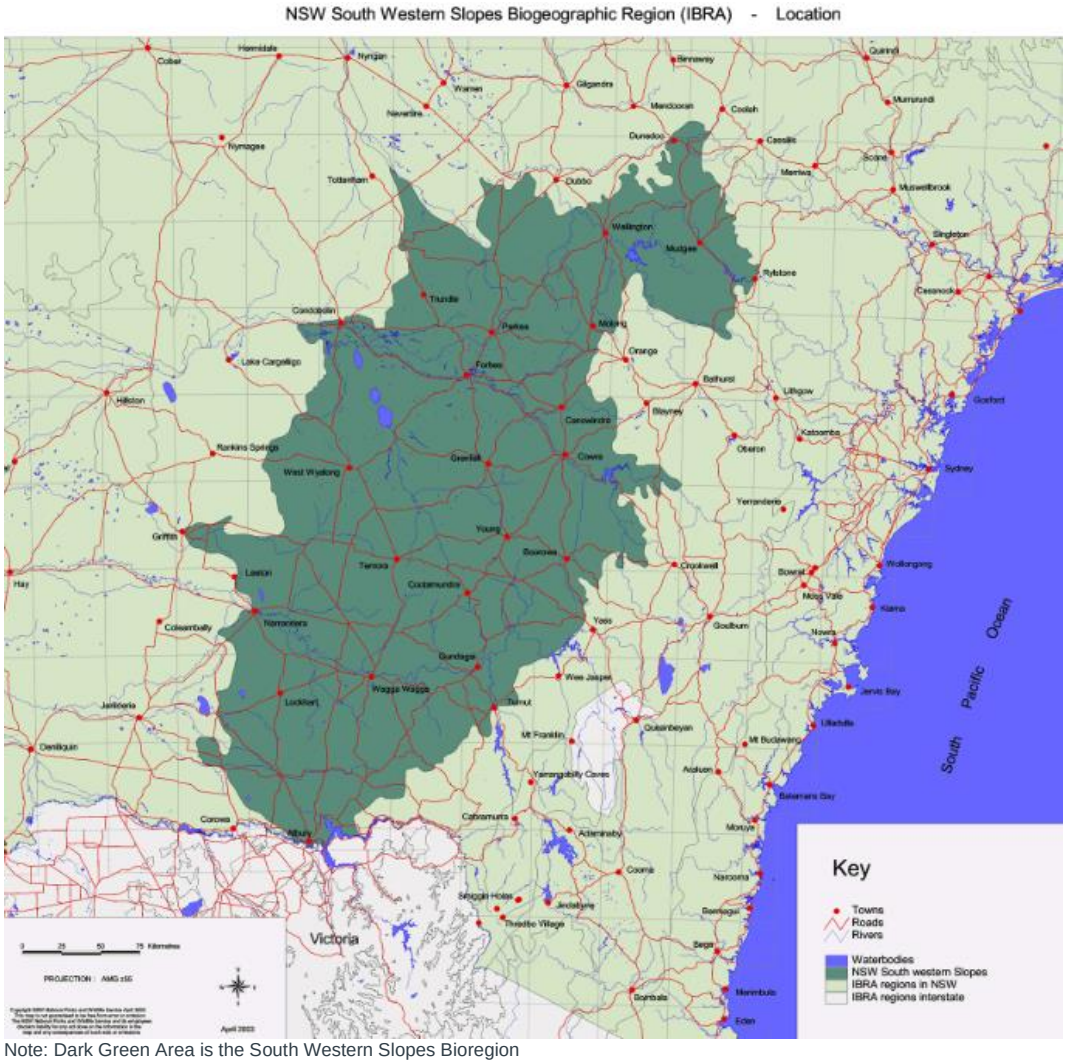
The Broader Regional Catchment is located within the South Western Slopes Bioregion, which has a sub-humid climate characterised by hot summers and no dry season (Department of Environment and Heritage, 2023). At higher elevations throughout the Bioregion, particularly closer to the Great Dividing Range, the climate is more temperate. The bioregion is bounded by the cooler and moister South Eastern Highlands Bioregion to the East and the drier and hotter Western Plains Bioregion to the West (Benson, 2008).

[1] Nature conservation and other protected areas including Indigenous use.

Within the South Western Slopes Bioregion, there are two Sub-regions:

- **The Upper Slopes Sub-region**: located in the eastern half of the Bioregion, contains parts of the Broader Regional Catchment, including the Wagga Wagga township. This area within the Bioregion is characterised as having a temperate – no dry season (warm summer) climate.
- **Lower Slopes Sub-region**: located in the Western half of the Bioregion, contains parts of the Broader Regional Catchment, including the Lockhart township. This area within the Bioregion is characterised as a temperate – no dry season (hot summer) climate.

Figure B. 1. South Western Slopes Bioregion

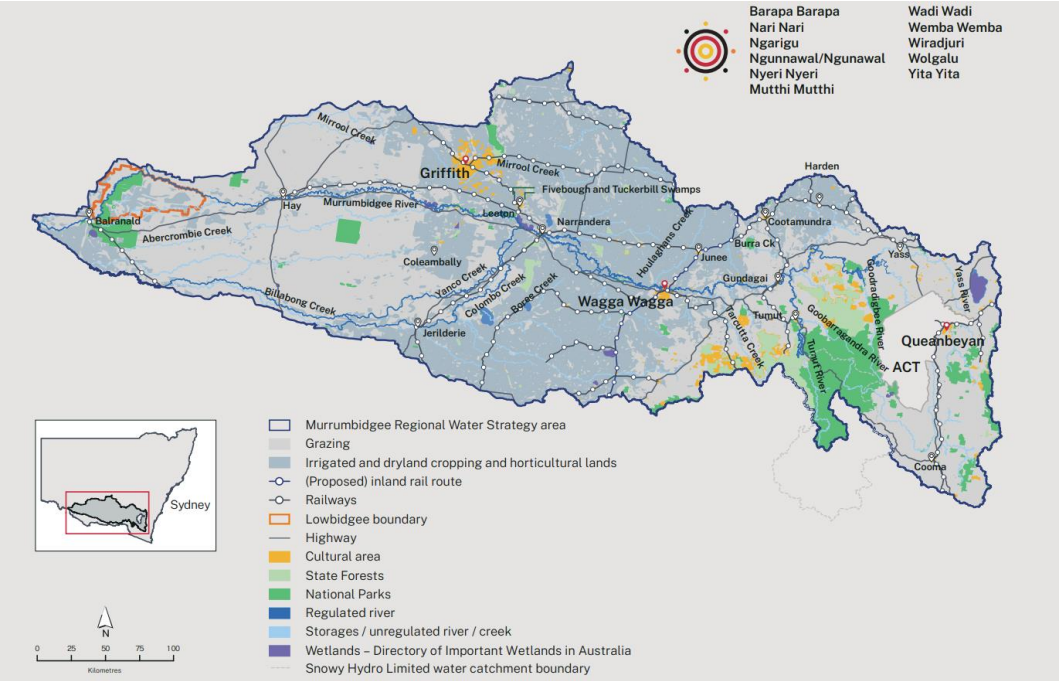


Note: Dark Green Area is the South Western Slopes Bioregion
Source: Department of Environment and Heritage (2023).

WATER CATCHMENT

The Broader Regional Catchment is located within the Murray-Darling Basin through the Murrumbidgee Catchment (MDBA, 2023). The Murrumbidgee Catchment stretches across Southern New South Wales, from Balranald in the West to Yass and Cooma in the East (NSW Department of Planning and Environment, 2024d). The Catchment is based around its namesake, the Murrumbidgee River, however, it also contains a network of creeks, including Tarcutta and Brookong Creeks. This network supports the widespread irrigated and dryland cropping and horticultural uses throughout the central parts of the Murrumbidgee Catchment, as seen in the light blue-grey shading in the figure below.

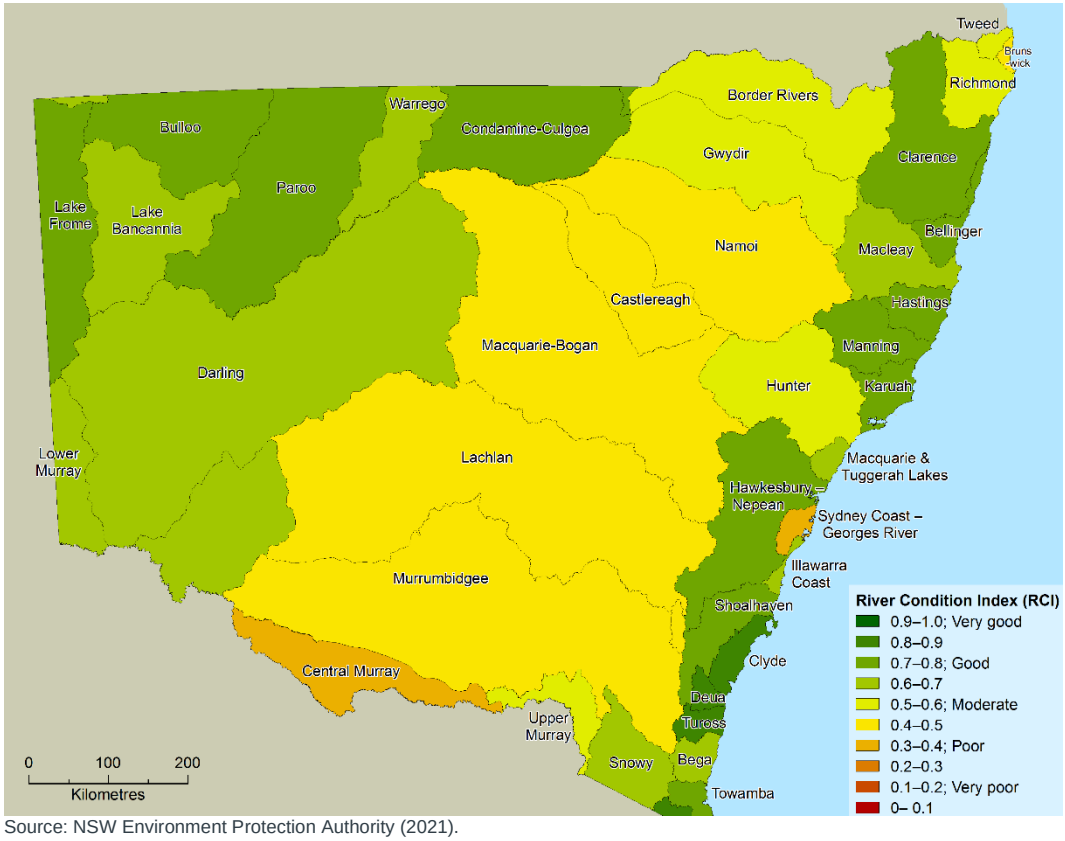
Figure B. 2. Murrumbidgee Catchment



Source: NSW Department of Planning and Environment (2024d).

At the end of the Millennium Drought (which occurred from 1997 to 2009), two Sustainable Rivers Audits were conducted to assess the health of river ecosystems in the Murray-Darling Basin (Sustainable Rivers Audit Program, 2012). The Second Sustainable Rivers Audit assessed the overall health of the Murrumbidgee Valley River ecosystem as poor, with the Slopes Zone, which contains the Broader Regional Catchment, being assessed as very to extremely poor. This assessment was the result of significant issues for fish biodiversity and health, as well as the poor health of riverine vegetation. Whilst improvements across the Murrumbidgee River System have been made in the years since the audit, the broader system was deemed to have a River Condition Index (RCI) of 0.4 to 0.5 in 2018, ranking the health of the system as between poor and moderate (NSW Environment Protection Authority, 2021).

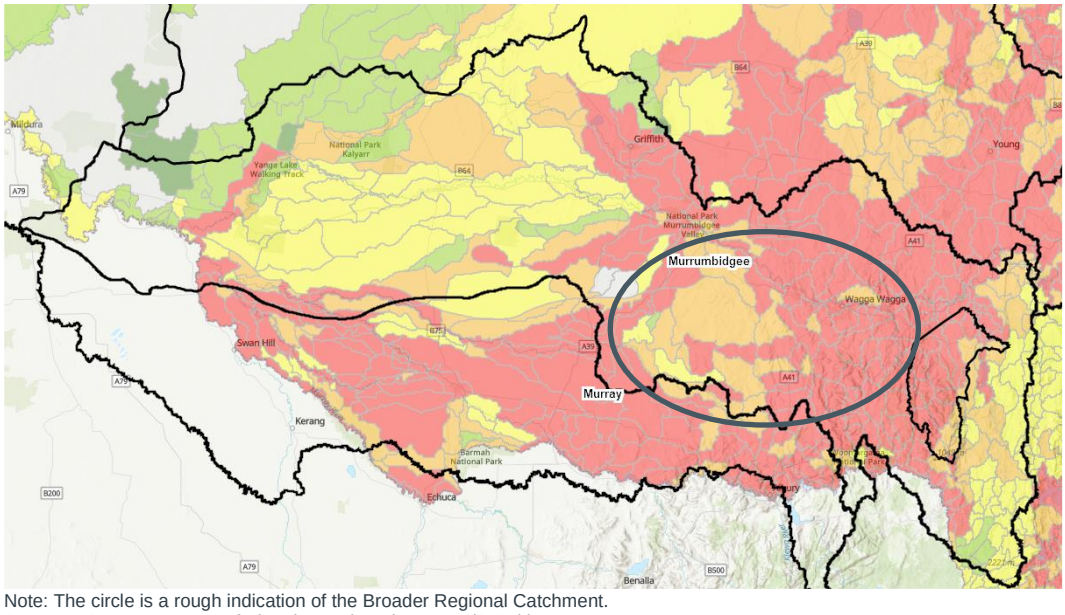
Figure B. 3. River Condition Index for New South Wales Water Catchments, 2018



Source: NSW Environment Protection Authority (2021).

Whilst the Murrumbidgee Catchment has a poor to moderate RCI rank, the RCI varies within the Catchment (NSW Department of Planning and Environment, 2024). In the Far East and West of the Catchment, the RCI is higher, with ratings between moderate and good. Meanwhile, within the central part of the Murrumbidgee Catchment, the RCI varies from very poor to poor. Most of the Broader Regional Catchment has a very poor RCI rating.

Figure B. 4. River Condition Index, Murrumbidgee Catchment, 2023

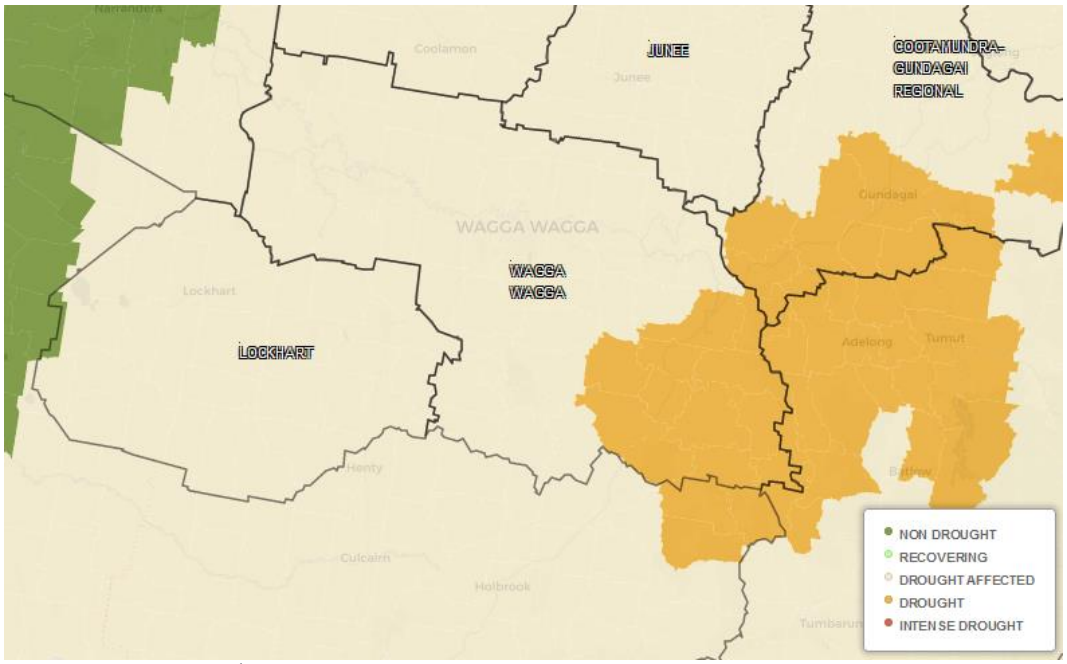


Note: The circle is a rough indication of the Broader Regional Catchment.
Source: NSW Department of Planning and Environment (2024b).

DROUGHT CONDITIONS

According to the Combined Drought Indicator (CDI), the NSW Department of Primary Industries (2024a) has classified most of the Broader Regional Catchment to be drought-affected. This indicator considers rainfall, soil moisture and modelled pasture/ crop growth indices to give a holistic understanding of the level of water availability in a region. The CDI showcases that drought conditions are worse in the Eastern parts of the City of Wagga Wagga around Oberne Creek, which has been declared drought. Meanwhile, to the west of the Broader Regional Catchment, beyond Lockhart Shire, regions are declared to not be in drought.

Figure B. 5. Combined Drought Indicator, Broader Regional Catchment



Note: Data is current as of 4th of July 2024.
Source: NSW Department of Primary Industries (2024a).

METEOROLOGICAL AND HYDROLOGICAL CHARACTERISTICS AND PROJECTIONS

HISTORICAL AND PROJECTED RAINFALL

Historical rainfall across the Broader Regional Catchment has decreased over the last six decades, a trend that is anticipated to continue[2] over the next five decades (DAFF, 2024). The projected decrease is anticipated to be the strongest in the 2030s, with expected annual rainfall set to decrease to 459mm in Lockhart Shire, down from 475mm per annum from 1994 to 2023. A similar trend is forecasted for the City of Wagga Wagga, which is expected to drop from an average rainfall of 544mm per annum across 1994 to 2023 to 529 mm per annum in the 2030s. The Broader Regional Catchment is forecasted to see a slight increase in average rainfall in the 2050s and 2070s, above levels in the 2030s, however, projected rainfall in these decades is still forecasted below historical averages, underscoring the increasing threat of a lack of water availability into the future.

Table B. 2. Historical and Projected Rainfall, Annual, Broader Regional Catchment, 1964 to 2070s

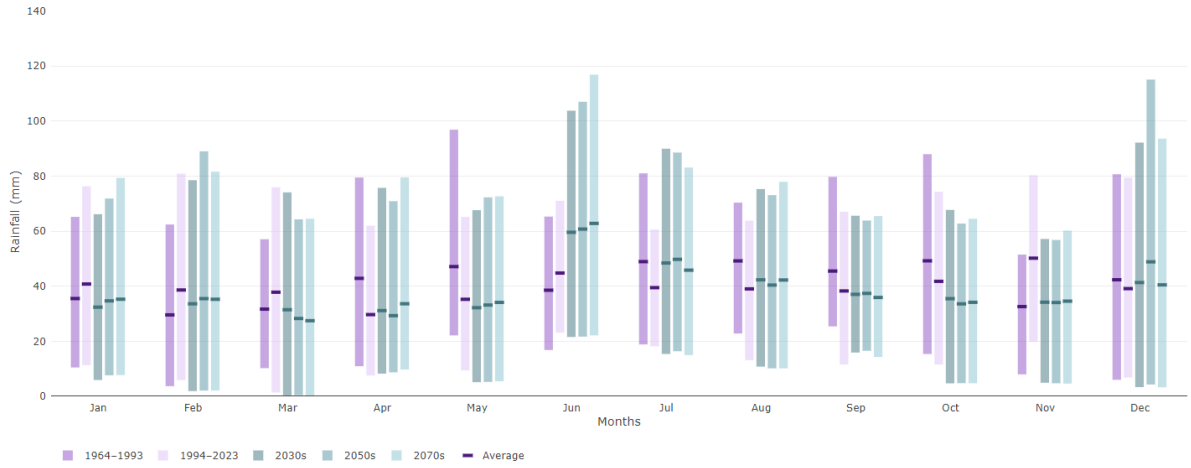
Region	1964 – 1993 Average (mm)	1994 – 2023 Average (mm)	2030s Average (mm)	2050s Average (mm)	2070s Average (mm)
Lockhart Shire	493	475	459	466	462
City of Wagga Wagga	569	544	529	533	530

Source: DAFF (2024).

[2] Projections assume a medium global emissions scenario (RCP4.5).

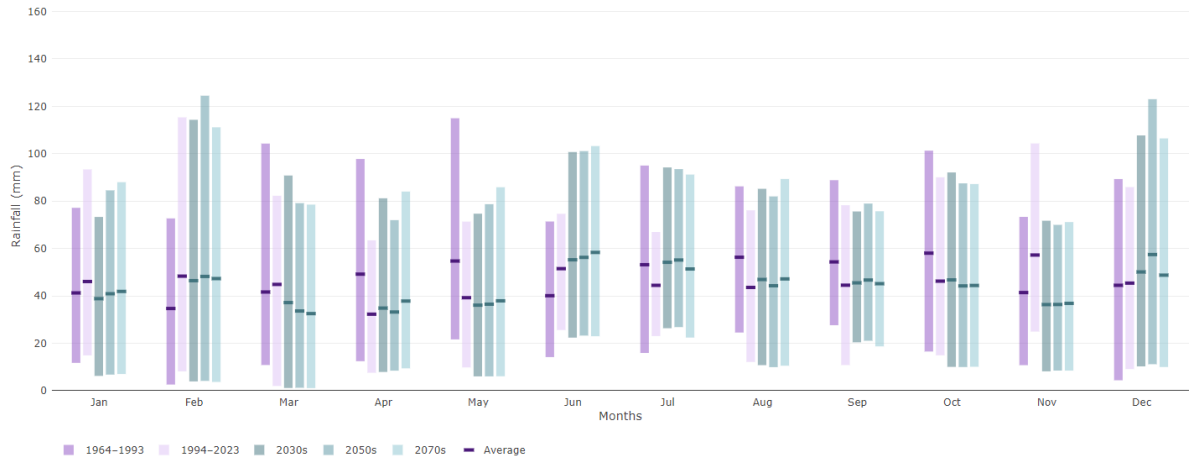
Projected rainfall trends also indicated that rainfall patterns across the year are expected to change (DAFF, 2024). Across the Broader Regional Catchment, it is anticipated that there will be increased rainfall variation in most months, with slight decreases in average rainfall across Autumn and Spring, and slight increases in early Winter and December.

Figure B. 6. Historical and Projected Rainfall, Monthly, Lockhart Shire, 1964 to 2070s



Source: DAFF (2024).

Figure B. 7. Historical and Projected Rainfall, Monthly, City of Wagga Wagga, 1964 to 2070s



Source: DAFF (2024).

TEMPERATURE

Average minimum and maximum temperatures across the Broader Regional Catchment have increased over the last six decades, a trend that is anticipated to continue[3] over the next five decades (DAFF, 2024). The anticipated increase in both the average minimum and maximum temperatures through 2050 is anticipated to be larger than historical increases. Between the two periods, 1964 to 1993 and 1994 to 2023, the average minimum temperature across Lockhart Shire and the City of Wagga Wagga increased by 0.4°C and 0.3°C, respectively. Across the same periods, the average maximum temperature also increased by 0.8°C across the Broader Regional Catchment, reaching an average maximum temperature of 23.6°C in Lockhart Shire and 23.3°C in the City of Wagga Wagga.

This trend is expected to be accelerated in the coming decades, with a 1.0°C and 1.1°C increase in the average minimum temperature expected across Lockhart Shire and the City of Wagga Wagga through to the 2050s. Similarly, the average maximum temperature is expected to increase by 1.1°C and 1.2°C across Lockhart Shire

[3] Projections assume a medium global emissions scenario (RCP4.5).

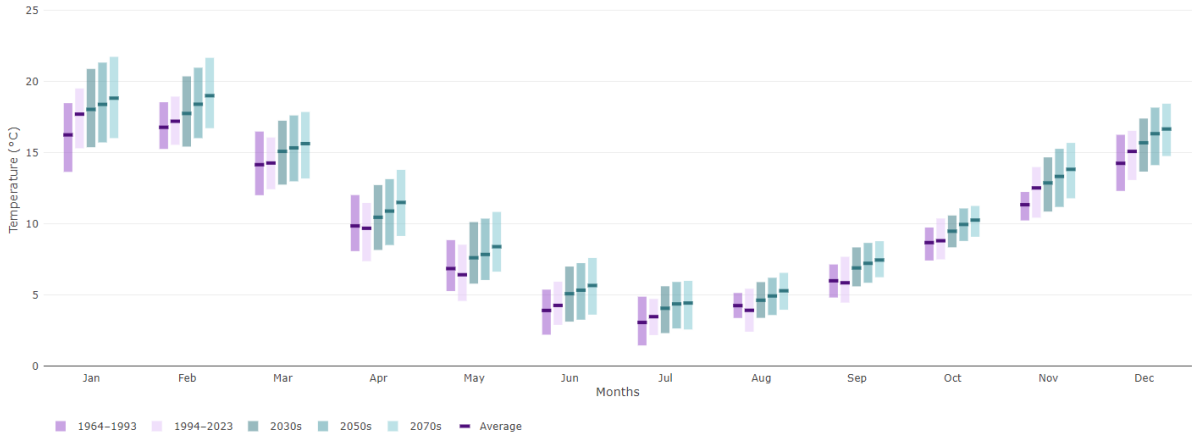
and the City of Wagga Wagga in the same timeframe. The anticipated increases in the average maximum and minimum temperatures are anticipated to occur throughout all months of the year.

Table B. 3. Historical and Projected Average Min and Max Temperatures, Broader Regional Catchment

Region	1964 – 1993 Average	1994 – 2023 Average	2030s Average	2050s Average	2070s Average
Lockhart Shire					
Average Min Temperature	9.6°C	10.0°C	10.7°C	11.0°C	11.4°C
Average Max Temperature	22.8°C	23.6°C	24.2°C	24.7°C	25.2°C
City of Wagga Wagga					
Average Min Temperature	9.7°C	10.0°C	10.7°C	11.1°C	11.5°C
Average Max Temperature	22.5°C	23.3°C	24.0°C	24.5°C	25.0°C

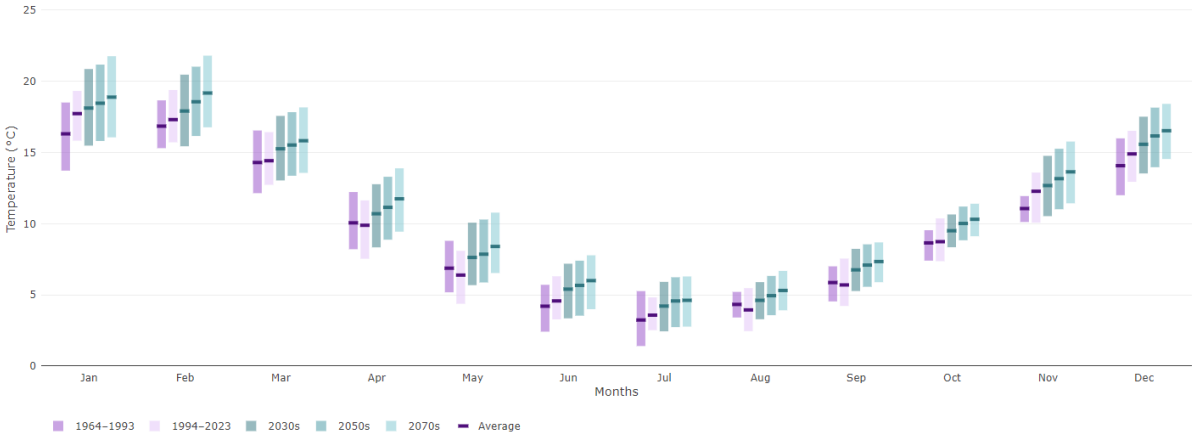
Source: DAFF (2024).

Figure B. 8. Historical and Projected Minimum Monthly Temperature, Lockhart Shire, 1964 to 2070s



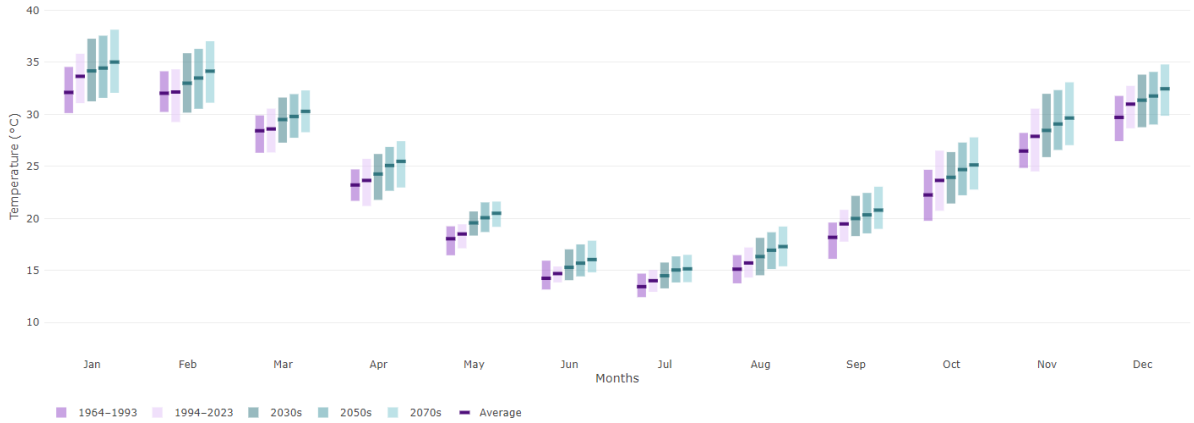
Source: DAFF (2024).

Figure B. 9. Historical and Projected Minimum Monthly Temperature, City of Wagga Wagga, 1964 to 2070s



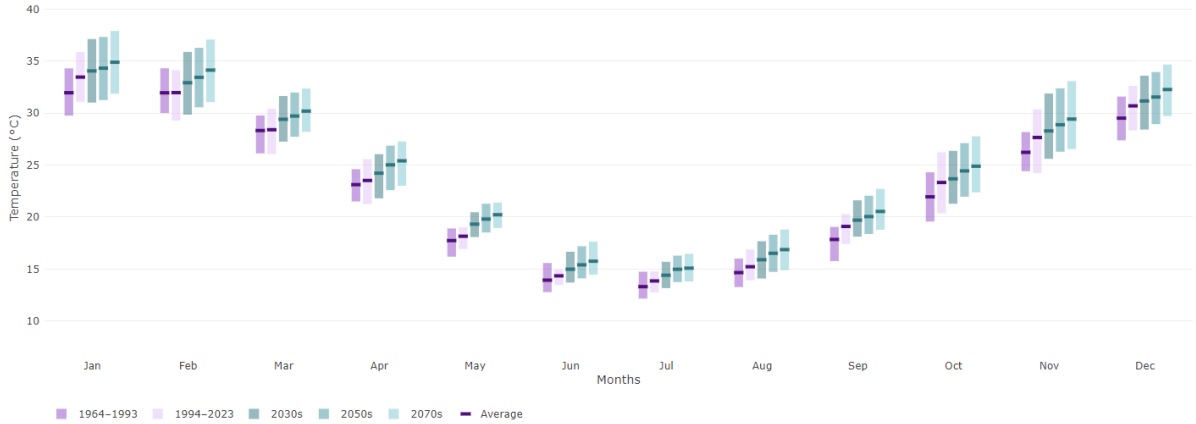
Source: DAFF (2024).

Figure B. 10. Historical and Projected Maximum Monthly Temperature, Lockhart Shire, 1964 to 2070s



Source: DAFF (2024).

Figure B. 11. Historical and Projected Maximum Monthly Temperature, City of Wagga Wagga, 1964 to 2070s



Source: DAFF (2024).

EVAPOTRANSPIRATION

The anticipated increase in average maximum and minimum temperatures over the coming decades (refer above) is expected to increase the amount of water lost through evapotranspiration[4] across the Broader Regional Catchment (DAFF, 2024). Evapotranspiration is anticipated to experience a softer increase in summer, compared to all the other seasons, however, it is still anticipated to be the most significant season in terms of evapotranspiration due to the higher temperatures.

Table B. 4. Historical and Projected Evapotranspiration, Season, Broader Regional Catchment

Region	1964 – 1993 Average (mm)	1994 – 2023 Average (mm)	2030s Average (mm)	2050s Average (mm)	2070s Average (mm)
Lockhart Shire					
Autumn	309	306	321	325	329
Winter	150	150	156	160	161
Spring	418	427	442	450	458
Summer	628	635	650	653	662
City of Wagga Wagga					
Autumn	307	301	317	320	325

[4] Evapotranspiration refers to the part of the water cycle where liquid water is removed from a vegetated area into the atmosphere by a process of evaporation and transpiration (BOM, undated).

Region	1964 – 1993 Average (mm)	1994 – 2023 Average (mm)	2030s Average (mm)	2050s Average (mm)	2070s Average (mm)
Winter	148	146	152	156	157
Spring	412	422	433	442	449
Summer	626	629	642	646	656

Source: DAFF (2024).

SOIL

The soil throughout the Southern Western Slopes Bioregion is mainly alluvial sands and loams, with shallow and stony soils on the tops of ridges and hills, and alluvial clays more common throughout the north of the Bioregion (NSW National Parks and Wildlife Service, 2003). “Alluvial” refers to the process of sand, silt, gravel or clay being deposited in river channels or floodplains (Geoscience Australia, 2023). Meanwhile, sands and loams refer to the texture and makeup of soils; sands mostly contain sand particles, resulting in a ‘gritty’ texture, while loams are a mixture of sand, silt and clay (NSW Agriculture, 2001).

In the Broader Regional Catchment, the soil with the highest inherent soil quality is in the City of Wagga Wagga along the Murrumbidgee River (NSW DCCEEW, 2013). Soils around rivers typically have higher levels of inherent fertility compared to other areas, as rivers deposit large amounts of sediments rich in minerals along their banks (Kaletova et al., 2022). Throughout the rest of the Broader Regional Catchment, the inherent soil quality is lower, particularly further away from the Murrumbidgee River, the inherent soil fertility ranges largely between moderate and moderately low, with sporadic areas of low inherent soil fertility.

Figure B. 12. Inherent Soil Fertility, Broader Regional Catchment

Source: (NSW DCCEEW, 2013).

COMMUNITY PROFILE

KEY SETTLEMENTS

The Broader Regional Catchment contains several key settlements throughout both Lockhart Shire and the City of Wagga Wagga, each with its unique strengths and challenges in the journey towards resilience. These settlements face different challenges and opportunities in the journey toward resilience based on their composition of people, jobs and land use. A summary of the key settlements is outlined below.

Note: The following data is collected from the ABS’s Community Profiles which are based on Place of Usual Residence (PoUR) data, which presents the occupations of residents, not necessarily the occupations of people

who work in those communities. Whilst care has been taken to accurately reflect the reality of each settlement, data limitations may be present.

Table B. 5. Summary of Key Settlements

Settlement Name	Population (2021)	Role	Description
Lockhart Shire			
Lockhart (Council Seat)	1,019	Rural town	Residential village with a mix of agriculture, mixed retail, local government administration, and good health care with a hospital, aged care and medical services.
Milbrulong	119	Farming community	A rural farming community focused on livestock and grain.
Pleasant Hills	127	Farming community	A rural farming community focused on grain and livestock.
The Rock	1,346	Rural town	Rural town with strong health care and social services (aged care and medical services available) and small retail available.
Yerong Creek	355	Farming village	A rural farming community focused on livestock and grain.
City of Wagga Wagga			
Collingullie	258	Satellite suburb	A diversified outer suburb of Wagga Wagga, with a mix of agriculture, education and transport services.
Currawarna	199	Satellite suburb	A diversified outer suburb of Wagga Wagga, with a mix of agriculture, education and food/ beverage services.
Humula	129	Farming community	A rural farming community focused on livestock.
Ladysmith	339	Satellite suburb	A diversified outer suburb of Wagga Wagga, with a mix of agriculture, and housing for local government administration and legal services workers from Wagga Wagga.
Mangoplah	291	Farming community	A rural farming community focused on livestock, with some transport services.
Oura	246	Satellite suburb	A diversified outer suburb of Wagga Wagga, with a mix of construction, agricultural, retail, education and health services.
Tarcutta	425	Rural village	Rural village with a strong livestock agricultural base and some retail and education services.
Uranquinty	910	Satellite suburb	A diversified outer suburb of Wagga Wagga, with a mix of health care, agriculture and transport services.
Wagga Wagga (Council Seat)	49,686	Population centre	A large regional population centre with a service-based economy driven by health and social assistance services, as well as retail, education and construction services.

Source: ABS (2022e), AEC.

PEOPLE

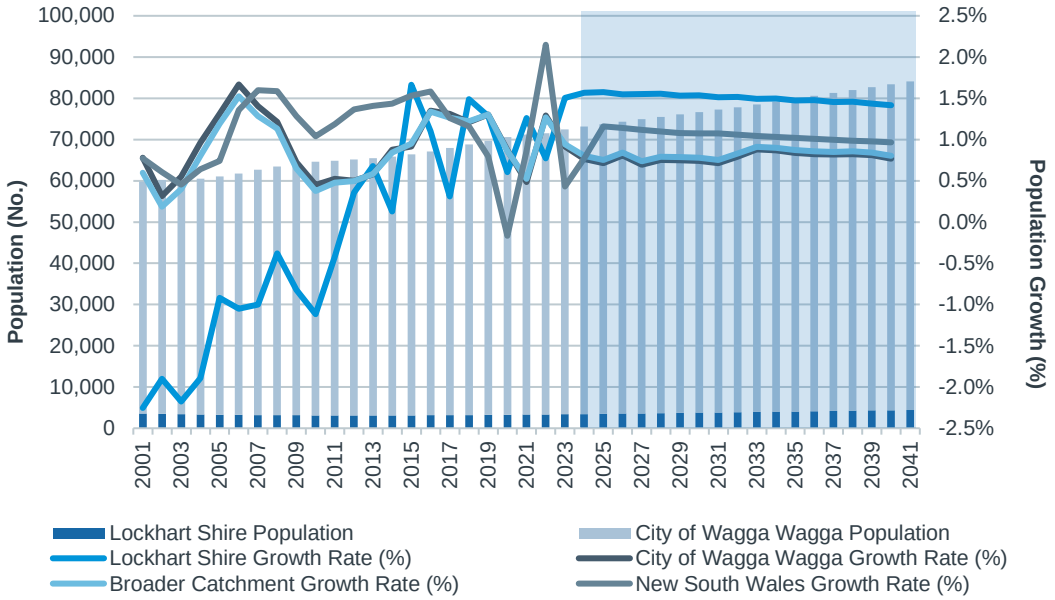
Lockhart Shire experienced a prolonged population decline throughout the Millennium Drought (ABS, 2024a). The drought saw approximately 470 people, or approximately 13.1% of the population, leave Lockhart Shire between 2001 and 2012. Over the decade to 2023, however, Lockhart Shire experienced a modest rebound in population, with an additional 300 residents to reach a population of 3,400. Within Lockhart Shire, the town of The Rock experienced a substantial growth of 9.0% between the 2016 and 2021 Census periods, reaching a population of 1,450 people (ABS, 2017a, 2022a). This growth has been driven by The Rock's proximity to the large population centre of the City of Wagga Wagga.

Meanwhile, the City of Wagga Wagga experienced stable population growth across the two decades to 2023, not experiencing the negative effects of the Millennium Drought on population. In 2023, the City of Wagga Wagga recorded a population of 67,900, an additional 12,200 residents compared to 2003. This growth corresponded to

an annual growth rate of 1.0% per annum, slightly below New South Wales (1.2% per annum growth). Growth between 2016 and 2021 was the strongest in the following townships:

- **Collingullie**: Saw a 16.7% increase between 2016 and 2021, or an additional approximately 40 residents to reach a population of approximately 260 residents.
- **Oura**: Saw a 12.3% increase between 2016 and 2021, or an additional approximately 30 residents to reach a population of approximately 250 residents.
- **Currawarna**: Saw a 5.3% increase between 2016 and 2021, or an additional approximately 10 residents to reach a population of approximately 200 residents.
- **City of Wagga Wagga**: Saw a 2.9% increase between 2016 and 2021, or an additional 1,420 residents to reach a population of approximately 49,700 residents.

Figure B. 13. Historical and Project Population, Lockhart, Wagga and New South Wales, 2001 to 2041



Source: ABS (2024a), New South Wales Department of Planning and Environment (2022), id (2024).

The Broader Regional Catchment has a slightly lower share of working-age residents compared to New South Wales (62.7% compared to 64.2% of residents). In the catchment, Lockhart Shire has a lower proportion of working-age residents compared to the City of Wagga Wagga at 55.7% of residents and 63.0% of residents, respectively (ABS, 2023a).

Moreover, there is a higher proportion of younger residents (0 to 14 years) in the Broader Regional Catchment, accounting for 20.4% of Lockhart Shire's population and 20.6% of Wagga Wagga's population. The following points provide commentary on average the age in each LGA:

- **City of Wagga Wagga**: The larger proportion of younger residents underscores a lower average age in the City of Wagga Wagga (approximately 37.5 years), compared to the average of 39.4 years across New South Wales. There is a stark urban-rural divide in the region, with the average age of urban residents being 38.0 years, a couple of years older than the average of 34.7 years for rural residents. This trend is unique, with many more rural areas typically having a relatively higher proportion of elderly people as younger residents move away for opportunities. The large provision of health and social services in urban Wagga Wagga (outlined later) may contribute to the attraction and retention of older residents in the urban centre.
- **Lockhart Shire**: the LGA has a significantly larger proportion of the population that is elderly (65 years and over), which makes up approximately a quarter of all residents (23.9%). This is significantly higher when compared to the City of Wagga Wagga and New South Wales at 16.4% and 17.5% respectively. The higher proportion of elderly residents results in a higher average age of 42.6 years.

Table B. 6. Age Breakdown by Demographic Group, Broader Regional Catchment and New South Wales, 2022

Age Bracket	Lockhart Shire	City of Wagga Wagga	Broader Regional Catchment	New South Wales
Youth (0 – 14 years)	20.4%	20.6%	20.6%	18.3%
WAP (15 – 64 years)	55.7%	63.0%	62.7%	64.2%
Elderly (65 years and over)	23.9%	16.4%	16.7%	17.5%
Total (%)	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Total (No.)	**3,370**	**68,337**	**71,707**	**8,165,731**

Note: WAP = working age population.
Source: ABS (2023a).

The age breakdown varies slightly between the urban centre of the Wagga Wagga township and the rest of the rural communities in the City of Wagga Wagga, with a relatively higher proportion of rural residents being younger and working age, whilst a higher proportion of urban residents are elderly. This likely reflects the greater provision of health and social services available for elderly populations in urban compared to rural areas.

Table B. 7. Age Breakdown by Demographic Group, Urban and Rural City of Wagga Wagga, 2022

Age Bracket	City of Wagga Wagga (Urban)	City of Wagga Wagga (Rural)
Youth (0 – 14 years)	20.2%	22.7%
Working Age Population (15 – 64 years)	62.5%	65.8%
Elderly (65 years and over)	17.3%	11.6%
Total (%)	**100.0%**	**100.0%**
Total (No.)	**57,472**	**10,865**

Source: ABS (2023a).

HOUSEHOLD INCOME

Household income across the Broader Regional Catchment has consistently been lower than in New South Wales over the last decade, with this divide increasing (ABS, 2012, 2017a, 2022a). From 2011 to 2021, average household incomes in the City of Wagga Wagga increased by $590 per week to reach approximately $1,980 per week in 2021, an average annual increase of 3.6% (in line with income growth across New South Wales).

Lockhart Shire, experienced a higher average annual growth than the City of Wagga Wagga and New South Wales, with an average annual growth of 4.2% across the decade to reach an average weekly household income of $1,640 in 2021. This growth was largely concentrated from 2011 to 2016, with growth softening from 2016 to 2.8% per annum, which was lower than the 3.8% per annum experienced across the other regions. Despite stronger growth from 2011 to 2021, average weekly household incomes in Lockhart Shire ($1,640 in 2021) remain lower than across the City of Wagga Wagga ($1,980) and New South Wales ($2,370).

Table B. 8. Weekly Household Income, 2011, 2016, 2021, Broader Regional Catchment & New South Wales

	Average Weekly Household Income			Growth in Household Income	
Region	2011	2016	2021	2011 to 2021	2016 to 2021
Lockhart Shire	$1,094	$1,434	$1,644	4.2%	2.8%
City of Wagga Wagga	$1,385	$1,640	$1,976	3.6%	3.8%
Broader Regional Catchment	$1,371	$1,630	$1,961	3.6%	3.8%
New South Wales	$1,560	$1,888	$2,272	3.8%	3.8%

Source: ABS (2012, 2017a, 2022a).

CULTURAL DIVERSITY

The Broader Regional Catchment has a long history of Indigenous Australians. Lockhart Shire and the City of Wagga Wagga are located on traditional Wiradjuri Country in the Riverina region of Southern New South Wales. Across the Broader Regional Catchment, approximately 5.3% of the population identifies as Aboriginal and/ or

Torres Strait Islander, higher than the 3.6% of people across New South Wales, highlighting the region's higher levels of cultural diversity (ABS, 2022a).

Indigenous Australians are more concentrated in the City of Wagga Wagga, accounting for approximately 6.9% of residents, compared to Lockhart Shire, where 5.3% of residents identify as Indigenous Australians.

Table B. 9. Number of People who Identify as Indigenous, 2011, 2016, 2021

	2011	2016	2021
Lockhart Shire	79	121	175
City of Wagga Wagga	2,830	3,685	4,656
Broader Regional Catchment	2,910	3,806	4,830
New South Wales	180,788	228,520	291,009

Source: ABS (2012, 2017a, 2022a).

VULNERABLE RESIDENTS

The Broader Regional Catchment has a relatively higher proportion of vulnerable community groups compared to New South Wales (ABS, 2012; 2017a; 2022a; DSS, 2023). In 2011 and 2016 fewer residents in the Broader Regional Catchment had a profound or severe disability and needed help or assistance in core activities when compared to New South Wales. In 2021, however, approximately 6.3% of the Broader Regional Catchment residents required assistance in core activities, higher than the 6.1% of residents across New South Wales. Breaking this down into the two LGAs in Eastern Riveria, approximately 7.9% of residents in the Lockhart Shire have need for assistance for core activity and 6.3% of residents in the City of Wagga Wagga. A higher proportion of urban residents in the City of Wagga Wagga require need for assistance for core activities (6.7%) compared to rural residents (3.8%).

Table B. 10. Need for Assistance for Core Activities, Proportion of Population, 2011, 2016, 2021

Area	2011	2016	2021
Lockhart Shire	6.3%	6.8%	7.9%
City of Wagga Wagga	4.3%	5.2%	6.3%
City of Wagga Wagga (Urban)	*4.6%*	*5.4%*	*6.7%*
City of Wagga Wagga (Rural)	*2.9%*	*3.6%*	*3.8%*
Broader Regional Catchment	4.4%	5.3%	6.3%
New South Wales	5.2%	5.8%	6.1%

Source: ABS (2012, 2017a, 2022a)

The proportion of residents receiving financial assistance that supports vulnerable community members (including aged pension, Commonwealth Rent Assistance and Disability Support Payments) is higher in the Broader Regional Catchment, at 18.9% of residents, when compared to New South Wales (17.4% of residents) (DSS, 2023). In the Lockhart Shire over a fifth (20.3%) of residents receive financial assistance, compared to 18.9% across the City of Wagga Wagga.

Collectively, the higher proportion of residents requiring assistance for core activities and who receive financial assistance underpins the higher levels of vulnerable community groups within the Broader Regional Catchment.

Table B. 11. Receipts for Payments to Support Vulnerable Populations, Proportion of Population, June 2023

Area	Payment Receipts	Population	Ratio
Lockhart Shire	690	3,396	20.3%
City of Wagga Wagga	12,955	68,716	18.9%
City of Wagga Wagga (Urban)	*11,820*	*57,807*	*20.4%*
City of Wagga Wagga (Rural)	*1,135*	*11,268*	*10.1%*

Area	Payment Receipts	Population	Ratio
Broader Regional Catchment	13,645	72,112	18.9%
New South Wales	1,452,905	8,342,285	17.4%

Source: DSS (2023).

The Broader Regional Catchment also has a higher proportion of residents who have been informed by a nurse or doctor that they have a mental health condition (including anxiety and depression), compared to New South Wales (PHIDU, 2024). In Lockhart Shire, approximately 10.8% of residents have reported that they had a mental health condition in 2021, slightly higher than the 10.5% of residents across the City of Wagga Wagga and significantly higher than the 8.0% across New South Wales. Furthermore, the Broader Regional Catchment also has a relatively higher proportion of participants in the National Disability Insurance Scheme (NDIS), compared to New South Wales (PHIDU, 2024). In June 2023, approximately 2.5% of Lockhart Shire's population and 2.8% of the City of Wagga Wagga's population were recipients of the NDIS, compared to 2.2% across New South Wales. The higher levels of pre-existing mental health conditions and NDIS recipients in the Broader Regional Catchment underscores a relatively higher vulnerable population in the Broader Regional Catchment, indicating a higher need for community resilience building during shocks, such as droughts.

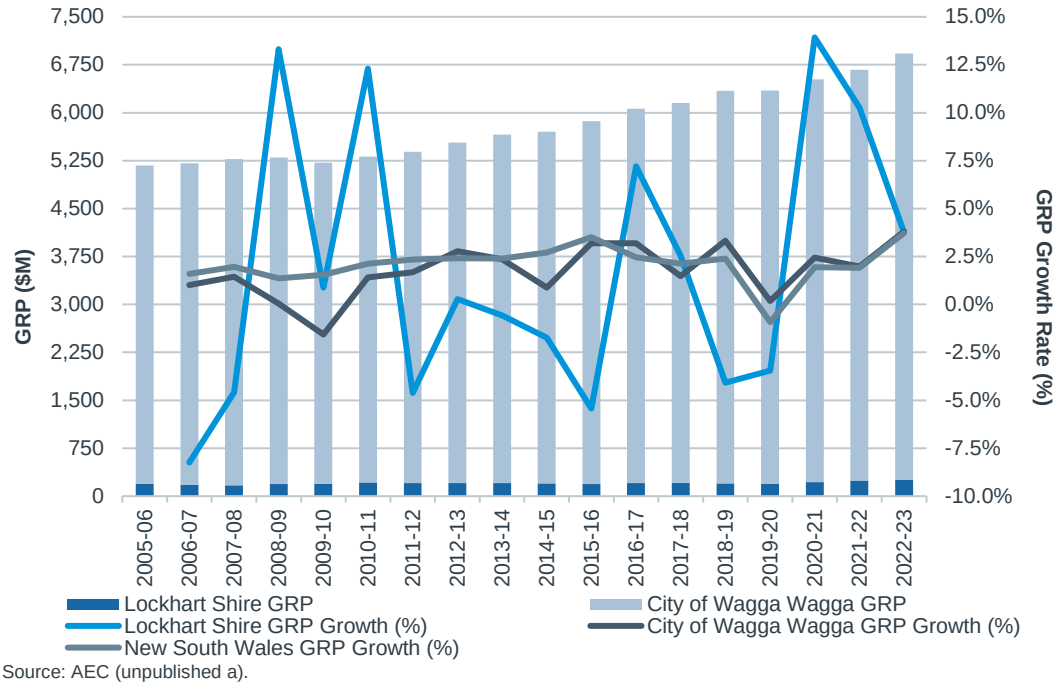
ECONOMIC PROFILE

GROSS REGIONAL PRODUCT

The Broader Regional Catchment economy recorded a Gross Regional Product (GRP) of $6.9 billion in 2022-23, up from the $5.5 billion recorded 10 years prior (2012-13) (AEC, unpublished a). This growth corresponded to an average annual growth of 2.3% per annum, slightly higher than the 2.2% per annum experienced across New South Wales. Growth in Lockhart Shire's GRP was relatively more volatile over the decade than across the City of Wagga Wagga and New South Wales, which is common in economies heavily reliant upon agriculture as gross product and output fluctuate in response to exogenous price factors (see Figure B. 14 below).

Furthermore, GRP growth in the Broader Regional Catchment over the decade to 2022-23 was stronger than the population growth of 1.0% average per annum (AEC, unpublished a; ABS, 2024a).

Figure B. 14. Gross Regional Product, Broader Regional Catchment and New South Wales



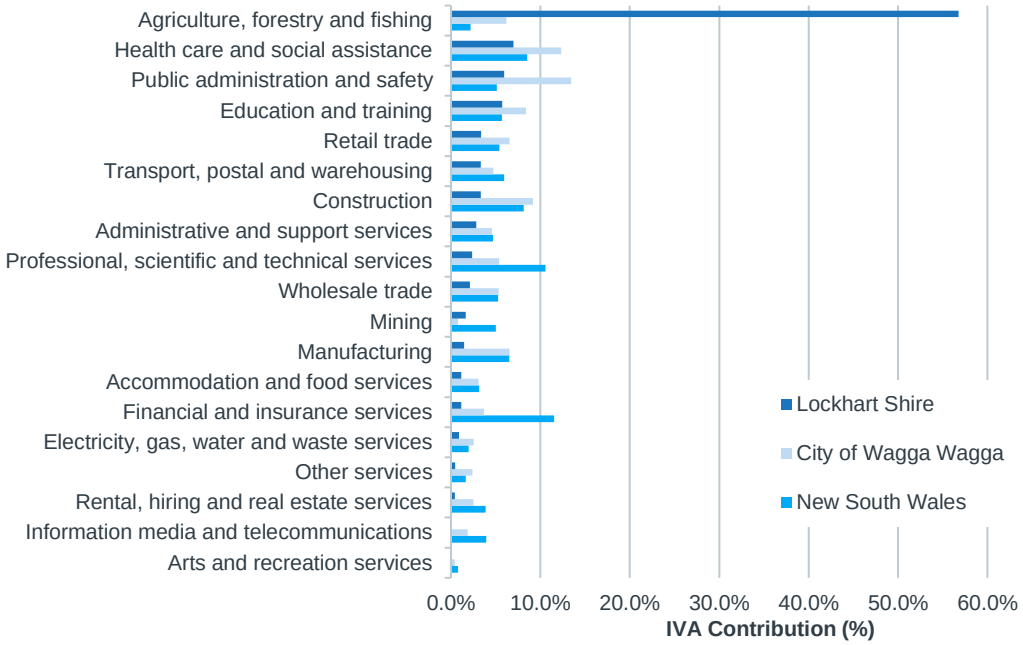
Source: AEC (unpublished a).

INDUSTRY VALUE ADD

The local economies across the Broader Regional Catchment vary significantly. Lockhart Shire's economy is heavily reliant upon agriculture, which contributed approximately 56.8% (or $123 million) to the Shire's Industry Value Add[5] (IVA) in 2022-23 (AEC, unpublished a). Other significant industries in Lockhart Shire include health care and social assistance (7.0%), public administration and safety (5.9%), and education and training (5.7%).

Meanwhile, the City of Wagga Wagga has a more diversified economy, with strong contributions from defence, industrial and population-facing industries. The largest industry in the City of Wagga Wagga in 2022-23 was public administration and safety (13.4% of IVA or $777 million) given the large defence presence in the City of Wagga Wagga with the RAAF Base Wagga. Other significant industries across the City of Wagga Wagga included health care and social assistance (12.3% of IVA or $712 million), construction (9.2% or $530 million), and manufacturing (6.6% or $380 million).

Figure B. 15. Industry Value Add, Broader Regional Catchment and New South Wales, 2022-23



Source: AEC (unpublished a).

The contribution of industries to IVA varies slightly from urban compared to rural. In urban areas, the largest industries are health care and social assistance at 14.0% of IVA (or $704 million), followed by public administration at 10.1% (or $506 million) and construction at 9.5% (or $477 million) (AEC, unpublished a). Meanwhile, in rural areas, the largest industry is public administration at 35.9% (or $271 million), followed by agriculture at 33.9% (or $256 million) and construction at 7.0% (or $53 million).

Table B. 12. Industry Value Add by Industry, Urban and Rural City of Wagga Wagga, 2022-23

Industry	City of Wagga Wagga (Urban)	City of Wagga Wagga (Rural)	City of Wagga Wagga
Agriculture, forestry and fishing	2.0%	33.9%	6.2%
Mining	0.7%	1.7%	0.8%
Manufacturing	7.0%	3.4%	6.6%
Electricity, gas, water and waste services	2.8%	0.9%	2.5%
Construction	9.5%	7.0%	9.2%
Wholesale trade	5.8%	2.0%	5.3%

[5] Industry Value Add (IVA) is a measure of the total value of goods and services produced by an industry, after deducting the cost of goods and services used in the process of production (ABS, 2010).

Industry	City of Wagga Wagga (Urban)	City of Wagga Wagga (Rural)	City of Wagga Wagga
Retail trade	7.4%	1.1%	6.6%
Accommodation and food services	3.4%	0.8%	3.1%
Transport, postal and warehousing	4.9%	3.9%	4.7%
Information media and telecommunications	2.2%	0.0%	1.9%
Financial and insurance services	4.1%	0.8%	3.7%
Rental, hiring and real estate services	2.9%	0.1%	2.5%
Professional, scientific and technical services	5.9%	1.9%	5.4%
Administrative and support services	4.9%	2.3%	4.6%
Public administration and safety	10.1%	35.9%	13.4%
Education and training	9.3%	2.5%	8.4%
Health care and social assistance	14.0%	1.0%	12.3%
Arts and recreation services	0.5%	0.1%	0.4%
Other services	2.7%	0.8%	2.4%
IVA (%)	**100.0%**	**100.0%**	**100.0%**
IVA ($M)	**$5,028**	**$756**	**$5,784**

Source: AEC (unpublished a).

AGRICULTURAL OUTPUTS

The effects of the most recent drought (2017 – 2020) saw a decrease in the volume of water used on farms throughout Broader Regional Catchment. The volume of water used for agricultural purposes in the Broader Regional Catchment decreased from 20.1 GL of water in 2016 to 10.6 GL in 2021 (ABS, 2017b; 2022b). The 2017 – 2020 drought and subsequent decrease in water use affected farm production, which decreased by 6% over the length of the drought (NSW DPIRD, 2023). Production for several key agricultural outputs across the Broader Regional Catchment, such as wheat, canola, barley and wool, however, had recovered by 2021 (refer to Figure B. 13) (ABS, 2017c; 2022c). The only key agricultural output to decrease over the period was cattle and calves, which saw a significant reduction from 92,600 in 2016 to 83,000 in 2021.

Table B. 13. Volume of Top 5 Agricultural Outputs, Broader Regional Catchment, 2016 and 2021

	Lockhart Shire		City of Wagga Wagga		Broader Regional Catchment	
Commodity	2016	2021	2016	2021	2016	2021
Wheat (tons)	138,140	225,634	227,445	349,557	365,585	575,190
Canola (tons)	37,403	58,635	61,368	90,778	98,772	149,413
Cattle and calves (no.)	34,178	31,345	58,446	51,667	92,624	83,012
Barley (tons)	58,627	99,120	93,914	151,755	152,541	250,875
Wool - Merino Sheep and Lambs (no.)	185,559	223,707	304,599	345,967	490,157	569,675
Meat - Sheep and Lamb (no.)	451,984	542,627	753,472	851,969	1,205,455	1,394,595
Hay (tons)	33,305	43,435	56,072	70,947	89,377	114,382
Lupins (tons)	6,195	7,957	9,941	12,602	16,135	20,560
Dairy Cattle (no.)	1,285	1,207	2,314	2,243	3,599	3,451
Oats (tons)	7,123	16,087	11,421	25,226	18,543	41,313

Source: ABS (2017c, 2022c).

Despite the most recent drought, the value of agricultural outputs across the Broader Regional Catchment increased from $342 million in 2016 to $543 million in 2021 (ABS, 2017d; 2022d). Growth was strongest in Lockhart Shire, which saw an additional $82.3 million in agricultural production across the period, to reach $210 million in 2021. This corresponded to an annual growth of 10.5% per annum over the five years to 2021, which was slightly larger than the 9.2% per annum experience in the City of Wagga Wagga. Despite the more pronounced growth in Lockhart Shire, the City of Wagga Wagga had the larger agricultural production value in 2021, at approximately $333 million.

Table B. 14. Value of Top 5 Agricultural Outputs, Broader Regional Catchment, 2016 and 2021, $M

	Lockhart Shire		City of Wagga Wagga		Broader Regional Catchment	
Commodity	2016	2021	2016	2021	2016	2021
Wheat	$37.3	$66.4	$61.5	$102.8	$98.8	$169.2
Canola	$19.4	$34.0	$31.8	$52.6	$51.2	$86.6
Cattle and calves	$18.2	$20.2	$31.1	$33.5	$49.3	$53.7
Barley	$16.0	$21.8	$25.6	$33.4	$41.7	$55.3
Wool	$11.8	$19.2	$19.5	$30.1	$31.4	$49.4
Sheeps and lambs	$8.8	$19.2	$14.7	$30.1	$23.5	$49.4
Hay	$3.5	$10.5	$6.1	$17.1	$9.6	$27.6
Lupins	$2.6	$3.9	$4.2	$6.1	$6.8	$10.0
Milk	$2.1	$2.6	$3.7	$4.8	$5.8	$7.5
Oats	$2.0	$4.0	$3.3	$6.3	$5.3	$10.3
Other	$6.0	$13.9	$12.5	$24.6	$18.5	$38.5
Total	**$127.8**	**$210.1**	**$214.0**	**$332.9**	**$341.9**	**$543.0**

Source: ABS (2017d, 2022d).

Growth in the value of key agricultural outputs, wheat, canola and wool, outstripped growth in production volumes over the five years to 2021, indicating that the value per unit of output had increased (ABS, 2017c, d; 2022c, d). These increases were largely the result of domestic and international supply shortages, with the Russian invasion of Ukraine disrupting a significant proportion of the global wheat market, leading to global price increases as Ukraine is the fifth largest global exporter of wheat (Devadoss and Ridley, 2024). This was compounded by increased demand from China and other Southeast Asian countries, leading to the price of Australian wheat exports to increase by 3 per cent (Nandy and Shahid, 2021).

Meanwhile, severe droughts in Canada, the world's largest exporter of Canola, saw a shortfall in the global canola market of approximately four to five million tonnes in 2021-22, leading to a rise in canola prices (Maxwell, 2021). Furthermore, the depletion of hay and feed grain supplies, as well as reduced yields on broadacre crops increased input costs for farmers across New South Wales (NSW DPIRD, 2023). The increased input costs for producers were passed onto the price for livestock and livestock products, including wool.

Therefore, whilst there was growth in the agricultural output in the Broader Regional Catchment, a series of exogenous shocks have increased the value per output.

EMPLOYMENT

Within the Broader Regional Catchment, employment increased from 30,900 in 2012-13 to 38,800 in 2022-23 (AEC, unpublished a). The employment growth over this period corresponds to an average annual growth of 2.3% (or 7,900 additional jobs), indicating that the Broader Regional Catchment was able to generate jobs for new and existing residents, given the 1.0% per annum population growth (or an additional 6,600 resides) over the same period (ABS, 2024a).

Over the decade, employment growth was weaker in Lockhart Shire, only averaging a 1.0% annual growth compared to the 2.3% experienced in the City of Wagga Wagga. Weak employment growth in Lockhart Shire was the result of a period of employment decline from 2013-14 to 2017-18, corresponding with the onset of the most recent drought, where employment in the Shire decreased from 950 persons to 790 persons, a decrease of 160 persons (or an annual decrease of 4.5%). This was largely due to a decline in agricultural employment, which decreased from approximately 410 persons to 250 persons over the same period (or an average annual decline of 11.7% in the industry). Since 2017-18, however, employment in Lockhart Shire has increased significantly, growing by 4.0% per annum to reach 970 employed persons.

The industries that drive employment in the Broader Regional Catchment largely reflect the key industries by IVA (refer to above). In Lockhart Shire, whilst agriculture is the largest sector by employment, the sector's contribution to total employment (38.8% of jobs in 2022-23) is lower than the sector share to IVA (57.0% of IVA in 2022-23) (AEC, unpublished a; b). The relatively lower share of employment is due to the highly automated nature of agriculture, particularly in horticulture. Meanwhile, the population-facing industries of health care and social

assistance (15.8% of jobs) and education and training (10.8% of jobs) contribute significantly to employment throughout the Shire.

Across the City of Wagga Wagga, population-facing industries drive employment, with the largest industries by employment including health care and social assistance (21.9% of jobs), education and training (11.3%), and retail trade (11.1%).

Table B. 15. Employment by Industry, Broader Regional Catchment and New South Wales, 2017-18 and 2022-23

	Lockhart Shire		City of Wagga Wagga		New South Wales	
Industry	2017-18	2022-23	2017-18	2022-23	2017-18	2022-23
Agriculture, forestry and fishing	32.3%	38.8%	2.4%	3.1%	1.9%	1.8%
Health care and social assistance	20.0%	15.8%	20.4%	21.9%	14.4%	16.3%
Education and training	10.6%	10.8%	10.0%	11.3%	9.1%	9.0%
Transport, postal and warehousing	7.0%	6.2%	5.3%	4.4%	5.0%	5.2%
Retail trade	6.8%	6.1%	12.7%	11.1%	10.6%	10.0%
Public administration and safety	6.7%	6.0%	10.9%	10.5%	5.9%	6.2%
Construction	4.2%	4.0%	9.1%	10.4%	10.2%	10.0%
Accommodation and food services	4.2%	3.6%	6.7%	6.4%	7.4%	7.3%
Administrative and support services	2.5%	3.5%	2.7%	3.2%	3.3%	3.3%
Professional, scientific and technical services	1.9%	1.9%	4.5%	4.3%	8.7%	9.3%
Financial and insurance services	1.4%	1.5%	1.3%	1.8%	5.4%	5.9%
Wholesale trade	1.3%	1.4%	2.9%	2.8%	3.4%	3.0%
Manufacturing	0.8%	0.5%	7.1%	5.2%	6.5%	5.4%
Mining	-%	-%	0.1%	0.2%	1.1%	1.0%
Electricity, gas, water and waste services	0.3%	-%	1.1%	1.2%	1.0%	1.1%
Information media and telecommunications	-%	-%	0.7%	0.8%	2.5%	2.0%
Rental, hiring and real estate services	0.0%	-%	1.0%	0.9%	1.9%	1.8%
Arts and recreation services	-%	-%	1.0%	0.7%	1.6%	1.4%
Total (%)	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Total (No.)	**777**	**959**	**31,850**	**36,162**	**3,416,889**	**3,743,305**

Source: AEC (unpublished b).

Employment within the agricultural sector is broken down further into sub-sectors in the release of each Census. Within the more rural areas of the City of Wagga Wagga and Lockhart Shire have a stronger representation of their agricultural sector in sheep, beef cattle and grain farming, representing approximately 86.2% and 95.5% of farming employment, respectively (ABS, 2022a). Meanwhile, in urban areas, whilst sheep, beef cattle and grain farming employment still dominate the sector (at 54.4% of total employment); agricultural support services (20.9%), dairy cattle farming (13.7%), and nursery and floriculture production (7.7%) provide strong diversified agricultural employment opportunities.

Table B. 16. Share of Agricultural Employment by Sub-Sector, Broader Regional Catchment, 2021

Agricultural Sub-Sector	Lockhart Shire	City of Wagga Wagga	City of Wagga Wagga (Urban)	City of Wagga Wagga (Rural)	Broader Regional Catchment
Nursery and Floriculture Production	1.3%	2.8%	7.7%	0.7%	2.4%
Mushroom and Vegetable Growing	-%	0.2%	0.7%	-%	-%
Sheep, Beef Cattle and Grain Farming	95.5%	76.6%	54.4%	86.2%	81.5%

Agricultural Sub-Sector	Lockhart Shire	City of Wagga Wagga	City of Wagga Wagga (Urban)	City of Wagga Wagga (Rural)	Broader Regional Catchment
Other Crop Growing	-%	1.2%	-%	1.7%	0.9%
Dairy Cattle Farming	-%	6.7%	13.7%	3.7%	5.1%
Other Livestock Farming	1.6%	2.3%	1.2%	2.8%	2.1%
Aquaculture	-%	0.5%	-%	0.7%	0.3%
Forestry and Logging	-%	0.4%	1.3%	-%	0.2%
Fishing	-%	0.0%	0.1%	-%	-%
Support Services	1.7%	9.2%	20.9%	4.2%	7.3%
Total (%)	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Total (no.)	**444**	**1,361**	**409**	**952**	**1,799**

Source: ABS (2022a).

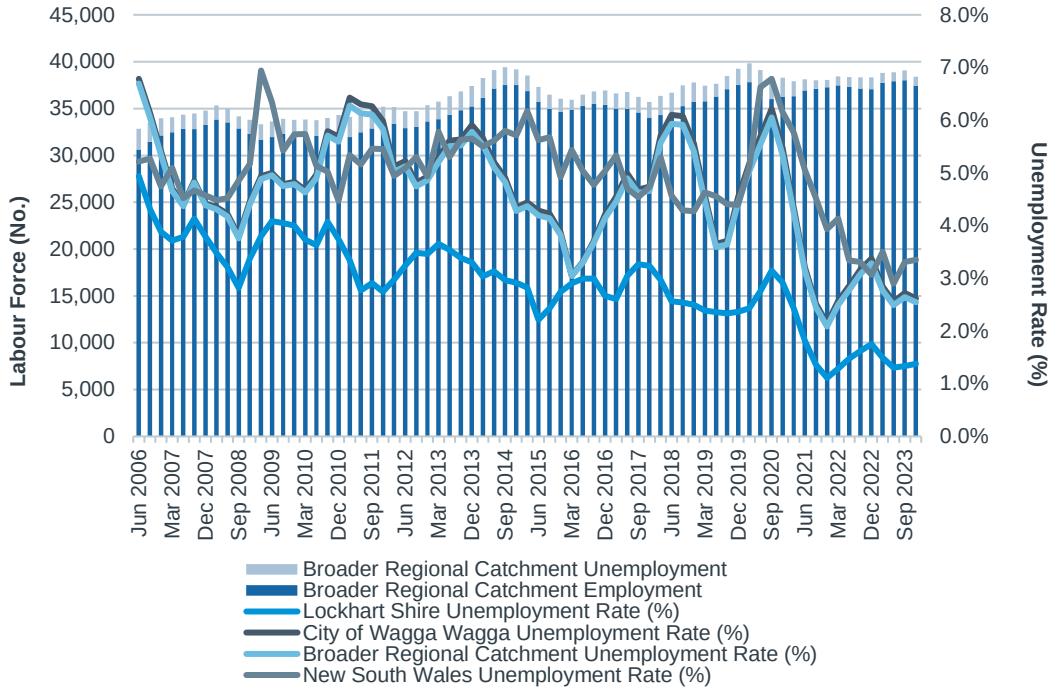
LABOUR FORCE

The labour force across the Broader Regional Catchment has demonstrated a slight increase over time (ABS, 2024b; Jobs and Skills Australia, 2024). The Broader Regional Catchment's labour force increased substantially in 2013-14, which coincided with an increase in construction workers due to the redevelopment of the Wagga Wagga Base Hospital (AEC, unpublished b; NSW Health, 2014). After the completion of the redevelopment, there was a brief period of decline before another labour force spike in late 2019 and most of 2020. This period coincided with the Black Summer bushfires, which affected neighbouring regions to the Southeast of the Broader Regional Catchment. As the City of Wagga Wagga is the closest regional centre, with a regional centre for NSW Fire and Rescue and a major hospital, many emergency workers were temporarily relocated to the City of Wagga Wagga during the bushfires. Furthermore, many residents from nearby affected regions temporarily relocated to the region during the fires (Martinich, 2020). After this increase, the labour force of the City of Wagga Wagga stabilised around 36,000 to 37,000 people for the next three years. Meanwhile, the labour force in Lockhart Shire continued to increase over this period.

The unemployment rate in Lockhart Shire has consistently been lower than that experienced by both the City of Wagga Wagga and New South Wales (ABS, 2024b; Jobs and Skills Australia, 2024). Over the decade to December 2023, the average unemployment rate in Lockhart Shire was 2.4%, substantially lower than the 4.2% and 4.8% average across the City of Wagga Wagga and New South Wales, respectively. The divide between Lockhart Shire's and the City of Wagga Wagga's unemployment rate reflects a trend across Australia where unemployment is higher in larger regional towns than in surrounding areas (Daley et al., 2017). This may be explained by the 'gravitational pull' that larger regional towns have on the younger people from surrounding regions, resulting in those who have a strong connection to the surrounding regions, such as stable employment, remaining, contributing to a lower unemployment rate. Furthermore, agricultural regions, such as Lockhart Shire, possess significantly higher labour mobility, when compared to other regions (Cunningham and Davis, 2011). When employment decreases in these areas, people move away for other jobs, rather than staying unemployed in the region, contributing to a lower unemployment rate. This phenomenon can be observed during the Millennium Drought, where a significant proportion of the Lockhart Shire population left (refer to Population section) whilst the unemployment rate remained relatively low (ABS, 2024a).

The trend of higher unemployment rates in regional towns, compared to the surrounding regions continues to the present day, where as of December 2023, the unemployment rate in the City of Wagga Wagga was 2.6%. This was lower than New South Wales at 3.4%, however, was still significantly larger than the 1.4% unemployment rate in Lockhart Shire.

Figure B. 16. Broader Regional Catchment Labour Market, June 2006 to December 2023



Source: ABS (2024b), Jobs and Skills Australia (2024).

KEY INFRASTRUCTURE

WATER INFRASTRUCTURE

The Broader Regional Catchment is part of the Murrumbidgee Catchment, with the river cutting through the City of Wagga Wagga. The region has a variety of natural water infrastructure include various creeks, canals and lakes, such as the Brookong and Burkes Creek that cuts through Lockhart Shire. In addition, the Broader Regional Catchment also contains the Wagga Water Treatment Plant which was constructed in 2021 (Riverina Water, undated). The new water treatment plant is set to service the populations of the City of Wagga Wagga and Lockhart Shire, as well as parts of Greater Hume and Federation Councils through to 2050. The Murrumbidgee River does flow into the neighbouring Snowy Valleys Council, where there are various dams connected to the Snowy Hydro system, however, there are no dams or weirs in the Broader Regional Catchment (NSW Government, 2024).

INDUSTRIAL AND AGRICULTURAL INFRASTRUCTURE

Whilst various industrial precincts in the City of Wagga Wagga support the region's manufacturing base, most of the industrial and agricultural infrastructure throughout the Broader Regional Catchment supports the region's strong agricultural industries (refer to Industry Value Add section). The industrial and agricultural infrastructure in the Broader Regional Catchment includes:

- GrainCorp storage and transporting facilities (Lockhart, Milbrulong, Boree Creek and Henty West) – Lockhart Shire
- Emerald Grain, The Rock (Agribusiness) – Lockhart Shire
- Lockhart Industrial Park – Lockhart Shire
- Livestock Marketing Centre (Livestock Saleyard) – City of Wagga Wagga
- Delta Livestock & Property (Livestock auction house) – City of Wagga Wagga
- Charles Sturt University Equine Centre – City of Wagga Wagga
- Charles Sturt University Drought Hub – City of Wagga Wagga
- Charles Sturt University Agrifutures Head Office – City of Wagga Wagga

- Riverina Paceway (Racecourse) – City of Wagga Wagga
- Murrumbidgee Turf Club (Racecourse) – City of Wagga Wagga
- Industrial precinct in Bomen – City of Wagga Wagga
- Special Activation Precinct – City of Wagga Wagga.

SOCIAL INFRASTRUCTURE (EDUCATION, HEALTH, ETC.)

The Broader Regional Catchment is home to a range of schools, healthcare and community facilities. The City of Wagga Wagga has 18 primary schools (14 State and four Catholic schools), with five secondary schools (three State and two Catholic), a singular university (Charles Sturt University), four hospitals (two private and two public), and four community centres and halls (NSW Education, 2024; Diocese of Wagga Wagga, 2024; WWCC, undated c).

Lockhart Shire contains four primary schools (three each of State and Catholic), two State secondary schools, a singular multipurpose service health centre, and the Rock Regional Observatory.

OTHER NATURAL RESOURCES

Throughout the Broader Regional Catchment, there is a range of other natural resources that include state forests, nature preserves and wetlands. The natural resources within the Broader Regional Catchment include:

- Brookong Nature Preserve – Lockhart Shite
- Milbrulong State Forest – Lockhart Shire
- The Rock Nature Reserve, Kengal Aboriginal Place – Lockhart Shire
- Galore Hill Scenic Reserve - Lockhart Shire
- The Esplanade - Pleasant Hills
- Marrambidya Wetland – City of Wagga Wagga
- Livingstone National Park – City of Wagga Wagga
- Livingstone State Conservation – City of Wagga Wagga
- Murraguldrie State Forest – City of Wagga Wagga
- Matong State Forest – City of Wagga Wagga
- Pulletop State Forest – City of Wagga Wagga
- Willans Hill Reserve – City of Wagga Wagga
- North Wagga Flats – City of Wagga Wagga.

MAJOR PROJECTS

Several major projects are set to occur within the Broader Regional Catchment that will provide new economic and employment opportunities, as well as improve ecological and liveability outcomes for people in the region. These projects are outlined in the following table.

Table B. 17. Major Projects, Broader Regional Catchment

Project Name	Project Type	Description	Cost	Timeline
Lockhart Shire				
Brookong Creek Restoration	Town Planning	Lockhart Shire Council have developed a masterplan for the redevelopment of the Brookong Creek, Lockhart.	N/A	N/A
Lockhart Business Centre	Town Planning	Lockhart Shire Council have developed a masterplan that will act as a high-level strategic	N/A	N/A

Project Name	Project Type	Description	Cost	Timeline
		document to guide future funding applications and on-ground works for Lockhart's Green Street Business Centre.		
Lockhart Hybrid Renewable Energy Project	Renewable Energy	The Project proponent, Better Energy Technology, proposes developing a renewable hybrid plant comprising 10 MW of solar panels and a 10MW/ 20M battery.	N/A	N/A
City of Wagga Wagga				
Wagga Wagga Special Activation Precinct (Master Plan)	Green Industry	A designated precinct that incentives and support to the development of a manufacturing, agribusiness freight and logistics hub to benefit from the development of Inland Rail	N/A	N/A
Belhaven Battery Energy Storage System (BESS)	Renewable Energy	A 400 megawatt (MW) / 800 megawatt-hour (MWh) energy storage project.	N/A	2025 – Dec 2026
HumeLink	Renewable Energy	Transmission lines to connect the new Snowy 2.0 and the renewable energy sources of the South West Renewable Energy Zone to demand centres in Sydney, Wollongong, and Newcastle	$4.9 B	Jul 2024 – Dec 2026
Broader Regional Catchment				
Inland Rail – Albury to Illabo	Transport	The Inland Rail Project connecting Melbourne to Brisbane/ Gladstone through Central NSW will include a proportion that goes through the Broader Regional Catchment, from Albury to Illabo. This section will include upgrades to the tracks that run through several stations in the Broader Regional Catchment, including The Rock in Lockhart Shire, as well as Uranquinty and Wagga Wagga in the City of Wagga Wagga.	$202 M	N/A

Source: BetterEnergyTechnology (2024), Infrastructure Partnerships Australia (2024), Inland Rail (2024), LSC (2019; 2024), NSW Department of Planning and Environment (2024c).

APPENDIX C DROUGHT IMPACTS

Droughts start as a meteorologic phenomenon; however, the effects of droughts can be far-reaching, impacting numerous social, environmental and economic factors that affect the lives of the City of Wagga Wagga and Lockhart Shire communities.

This section outlines the logical and consequential connections of drought impacts across the community, broken down into causal steps in a chain of consequences. Each causal step represents an opportunity for intervention and/ or mitigation of the flow of effects, which is critical for planning for effective drought intervention and mitigation.

This review of drought impacts formed a baseline understanding of the interconnected nature of drought impacts against the pillars of community, economy and environment. This baseline was refined during stakeholder engagement to better understand and reflect the understanding of drought impacts in the region. This understanding was then utilised to assist community stakeholders in identifying potential projects that could be implemented to address these issues, ensuring that the project takes a holistic approach to resilience building, whilst remaining community-led.

FARMERS AND AGRICULTURAL WORKERS

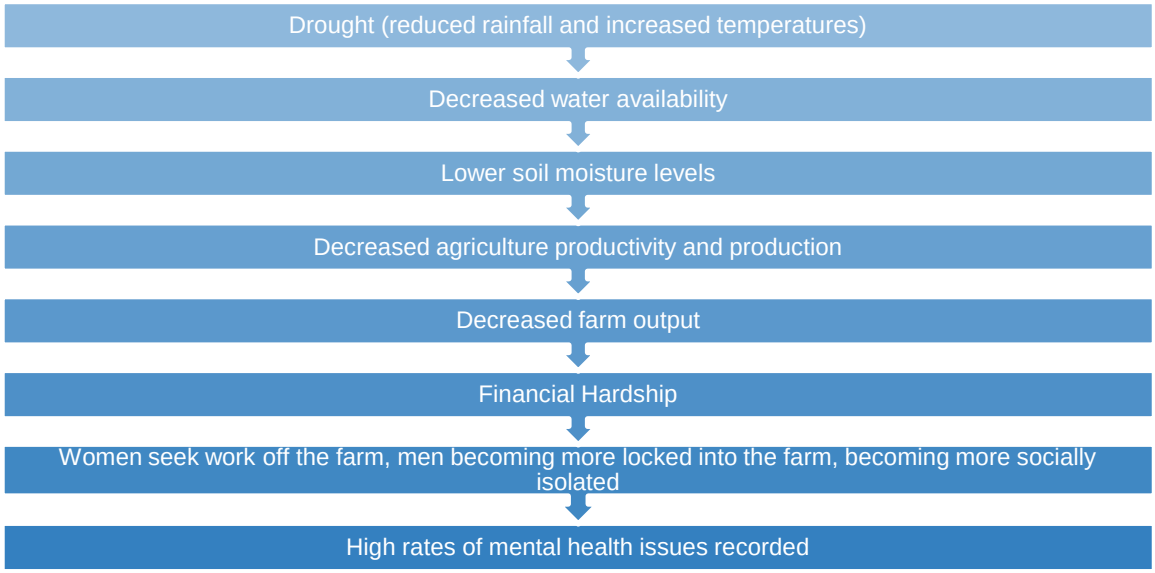
MENTAL HEALTH

Instances of drought are brought about through periods of low rainfall, which in combination with increasing temperatures (BOM, 2024c) leads to enhanced evaporation, changing the timing of water availability and making regions drier (Centre for Climate and Energy Solutions, 2024; MDBA, 2024). The reduction in water availability because of droughts limits soil moisture levels, as well as agricultural production and productivity (Steduto et. al, 2007; Jabal et. al, 2022). The effect of drought on productivity was seen during the Millenium Drought, where between 2002 and 2010, Australia's agricultural total factor productivity decreased by around 18 per cent (Sheng and Xu, 2019). Reduced output and productivity decrease farm output, thus, placing farms under significant financial hardship (Edwards, et al., 2009a).

Often, in response to the financial hardship brought about by drought, women will seek work off the farm to supplement farm income (Alston, 2011). This results in men being more 'locked in' to the farm, experiencing the effects of the drought whilst becoming more socially isolated and potentially experiencing depression as a result.

Evidence indicates that drought-affected farmers experience mental health issues at around four times the rate of non-drought-affected farmers (Edwards et al., 2015). This divide increases with the severity of the drought, reaching over eight times the normal rate.

Figure C. 1. Mental Health Flow



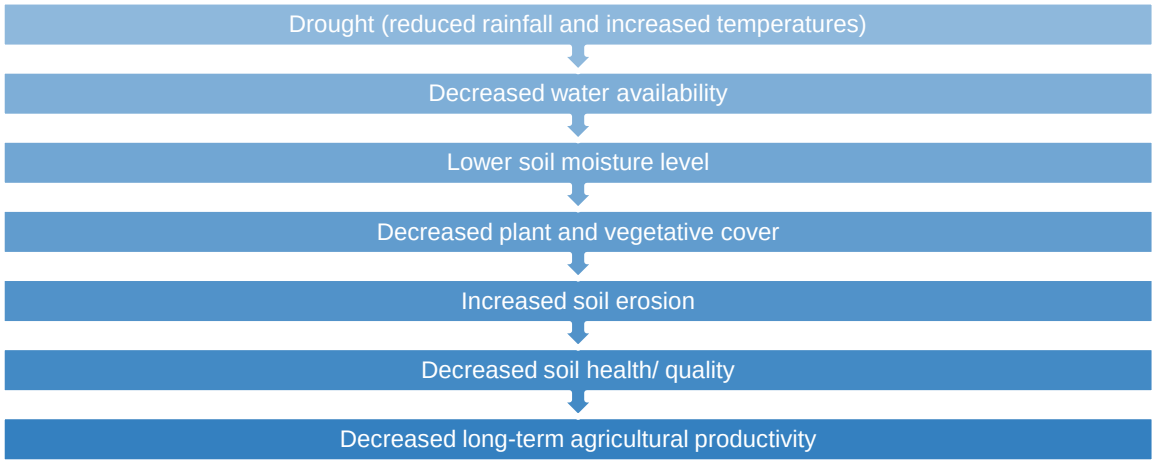
Source: AEC.

SOIL DEGRADATION

Droughts have the potential to significantly impact agricultural productivity even after the immediate drought pressures have eased, due to their lasting effect on soil quality. Prolonged periods of decreased rainfall, associated with droughts, can lead to low soil moisture content (Seleiman et al., 2021), thus leading to a decline in plant and vegetative cover (Young et. al, 2021). As plant and vegetative cover binds soil together, the loss of organic matter results in soil becoming more susceptible to wind and soil erosion (Pimentel and Burgess, 2013). Increased soil erosion can lead to issues in soil health, including increased water repellence, changes in chemical makeup, decreased soil biodiversity through the removal of essential plant nutrients and biota, and decreased soil depth (Pimentel and Burgess, 2013; Young et al., 2021).

The effects of soil degradation are more likely to occur in farm settings, as land-clearing practices employed in agriculture often make soil more prone to erosion (Pimentel and Burgess, 2013). The effects of erosion on soil quality can continue long after the easing of drought pressures, affecting long-term agricultural productivity.

Figure C. 2. Soil Degradation Flow



Source: AEC.

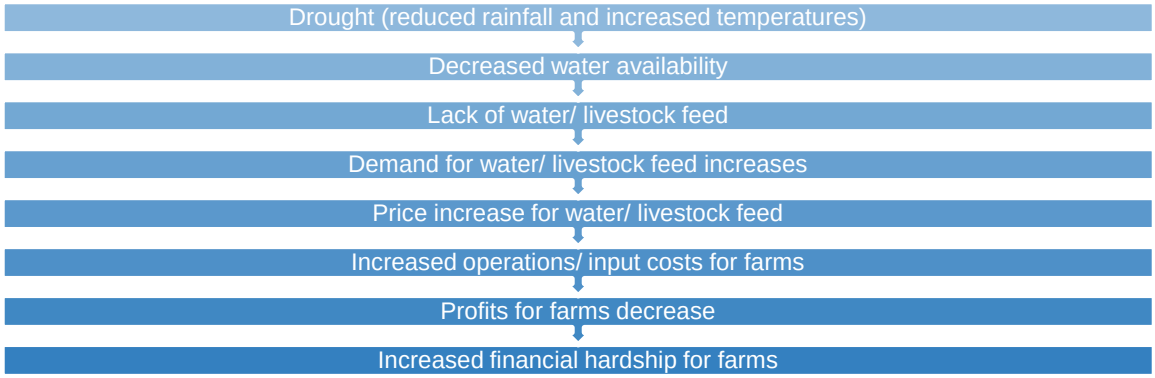
INCREASED OPERATIONS COSTS

Droughts can also affect farms by increasing their operating and input costs. Reduced rainfall during droughts results in lower water availability, as well as reduced plant and vegetative cover for farms (Young et. al, 2021). As

farmers seek to supplement lost water and feed, the cost of water and livestock feed increases; with the last drought (2017 to 2019) resulting in significant increases in the price of water and livestock feed (RBA, 2020).

Farms can also experience increased operations costs from changing farm operations during droughts. Reduced water availability may cause some farms to switch to groundwater systems or change input mixes, which can result in increased operations costs for farms (Fleming-Muñoz et al., 2023). The increase in operations and input costs for farms during droughts affects the profitability of farms, contributing to the financial hardship experienced by farmers during droughts (Martin and Topp, 2018; Hughes et al., 2019; Edwards et al., 2015). Therefore, as droughts decrease the availability of water and vegetation cover for farms, which results in farmers having to purchase more expensive input goods or undergoing structural changes, farms are burdened with higher operations and input costs, leading to lower profit margins and increased financial hardship.

Figure C. 3. Increased Operations Cost Flow



Source: AEC.

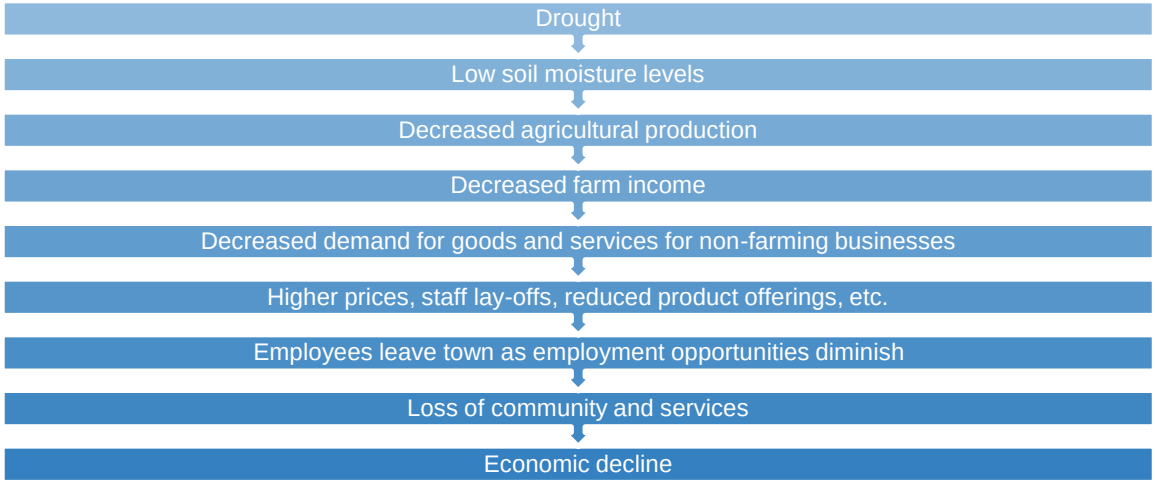
NON-FARMING BUSINESSES

ECONOMIC DECLINE

The financial difficulties experienced by farms during droughts can have far-reaching impacts on local economies. Droughts place farms under significant financial hardship, through decreased output and productivity from a lack of water availability (Edwards et al., 2009a; Steduto et. al, 2007; Jabal et. al, 2022). In regional communities, agricultural production often supports the local economy, through direct (i.e. farm hardware wholesalers) and indirect means (i.e. incomes spent by farming families on local goods, such as food, entertainment, etc.).

In periods of drought, small businesses in regional settings experience decreased demand from customers, especially farm operators (Hyland et al., 2007). This decrease is more pronounced in regions that are more reliant upon agriculture (Aslin and Russell, 2008), which experience an acute decrease in demand (Hyland et al., 2007). This decrease results in higher prices, staff lay-offs, reduced product offerings, and other cost-saving measures. Furthermore, as local supply decreases to meet the reduced demand, people are laid off, often having to leave town to find suitable employment, contributing to the loss of community (Aslin and Russell, 2008). The loss of workers in non-farming businesses often results in a widespread loss of services in drought-affected areas (Edwards et al., 2018), contributing to further economic decline.

Figure C. 4. Economic Decline for Non-Farming Businesses Flow

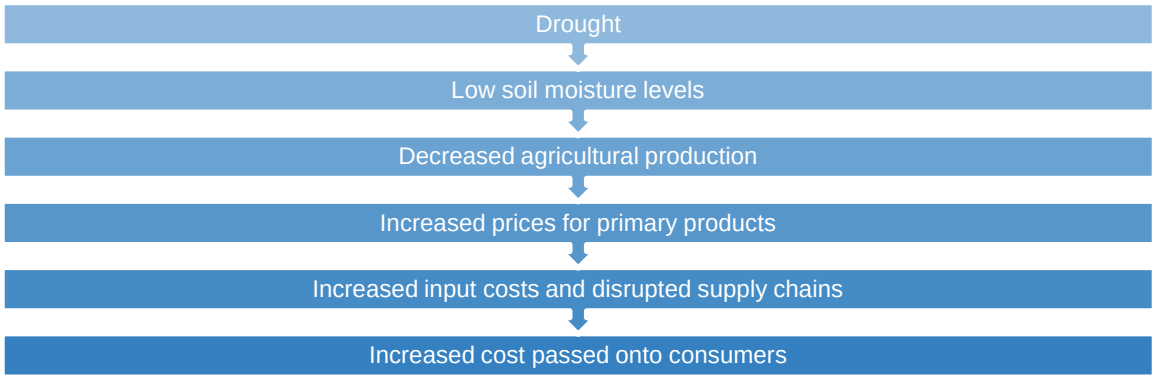


Source: AEC.

SUPPLY CHAIN DISRUPTIONS

Droughts can also disrupt supply chains, through increasing the cost of agricultural products which impact non-farming businesses through increasing input costs and driving up the costs up the cost of goods, disrupting supply chains. The reduction in agricultural output and productivity caused by droughts (Steduto et. al, 2007; Jabal et. al, 2022) can impact non-farming businesses that are reliant upon supply chains that include agricultural products. Disruptions in agriculture can increase the cost of food (Quiggin, 2007) and natural fibre-based raw materials (Webb, 2022; Feeney, 2015). Increases to these costs can flow onto consumers throughout Australia, in the grocery store, supermarket, and in fashion retailers. Thus, the effect of droughts on decreasing agricultural production can affect consumers throughout Australia by affecting supply chains.

Figure C. 5. Supply Chain Disruption Impact Flow



Source: AEC.

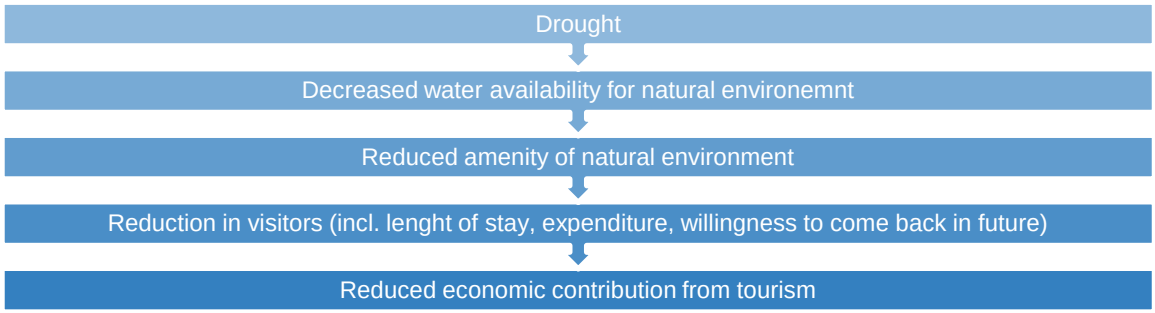
IMPACT ON TOURISM

The effect of droughts on local water availability can impact local tourism markets. The lack of water availability during droughts can impact a region's natural amenities, with water restrictions, changes to animal and bird migratory patterns, dry riverbeds and barren, and brown landscapes impacting the region's perceived attractiveness to visitors (Thomas et al., 2013).

The negative perceptions associated with the effects of droughts on natural environments can lead to behavioural changes for visitors, as seen in visitors to the Murray River region during the end of the Millennium Drought (TRA, 2010; CABI News, 2010). Visitors to the region indicated that they were less likely to visit as often, reduce the length of their stay, reduce expenditure and outright not visit the region again because of the drought. Furthermore, the drought also caused around a fifth of people who had never visited the Murray identifying the drought as a key reason to not visit the region. Cumulatively, by 2008, the effect of the Millenium Drought on the Murray River region

caused the overnight visitors (i.e. tourists) to decrease by 2.2% per annum, a more severe decrease than across comparable regions; resulting in the region's tourism industry experience a loss of $70 million and 6,000 fewer jobs (TRA, 2010; Climate Council of Australia, 2015; van Dijk et al., 2010; AdaptNSW, 2024a). This effect has also been observed in drought-affected regions of Cape Town, South Africa, where a prolonged drought corresponded to visitation growth lagging behind pre-drought periods (Drummond, 2019).

Figure C. 6. Tourism Impact Flow



Source: AEC.

ABORIGINAL COMMUNITIES

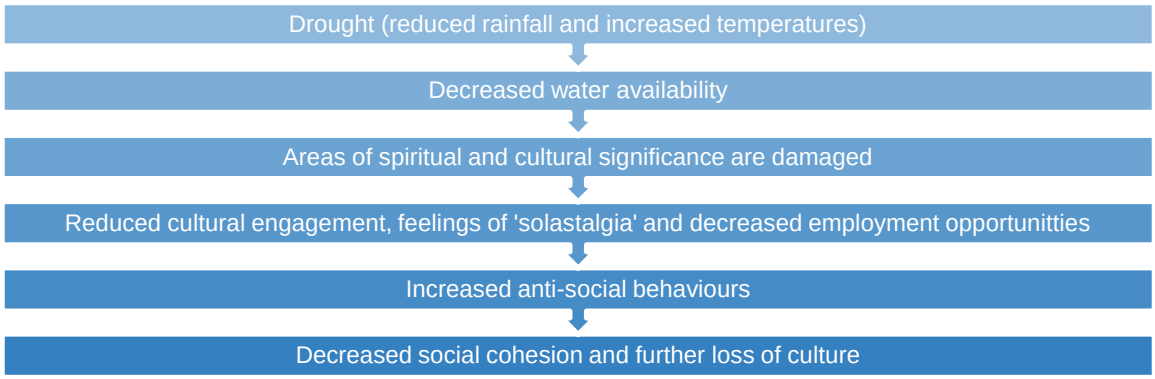
CULTURAL IMPACT

Droughts can impact the culture and traditions of local Aboriginal communities. These effects can disproportionately affect Aboriginal communities, who have close physical and spiritual relationships with the land (Rigby et al., 2011; Standen et al., 2022). When droughts affect rivers of cultural importance, they can reduce traditional practices, identity and culture among community members (Rigby et al., 2011).

Aboriginal Australians may also experience 'solastalgia', a form of emotional distress caused by environmental change, which can negatively impact their sense of belonging (Albrecht, 2005). The cultural impact of drought is often compounded by decreased employment opportunities on farms and in non-farming businesses, leading to increased anti-social behaviours, such as alcohol misuse (Popovici and French, 2013; Mangot-Sala, 2021). A rise in alcohol misuse can result in an increase in aggressive behaviour, violence and conflicts within communities; as well as foster gossiping and mistrust, resulting in further and more enduring cultural impacts (Rigby et al., 2011).

The loss of natural habitats and employment opportunities resulting from droughts can impact the culture of local Aboriginal communities through a reduction in traditional practices and a rise in anti-social behaviour.

Figure C. 7. Aboriginal Cultural Impact Flow



Source: AEC.

HEALTH AND SOCIAL DISADVANTAGE

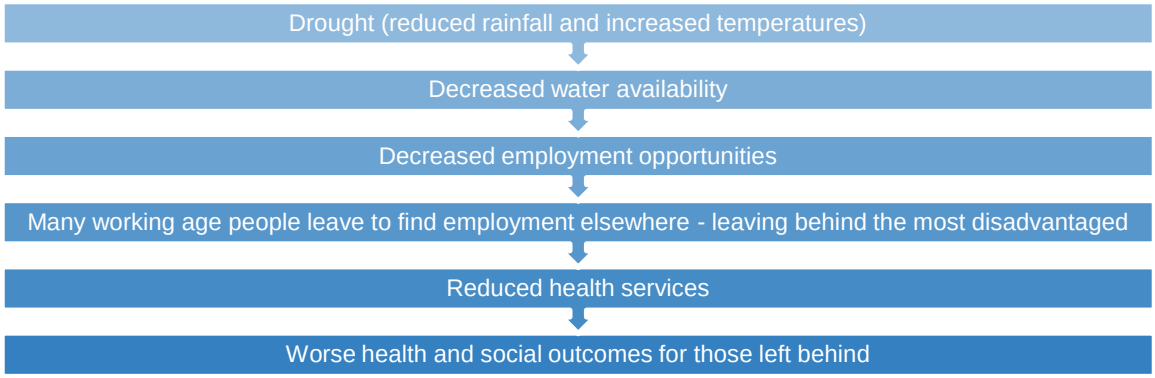
Periods of droughts can impact the health and social standing of Aboriginal community members through decreased services in drought-affected regions. Droughts often decrease employment opportunities for Aboriginals

in regional communities, either through reduced farm labourers (Alston, 2011) or staff layoffs due to falling demand for non-framing businesses (Hyland et al., 2007).

The loss of stable employment has flow-on effects on the ability to purchase basic items, such as food, however, it also affects the self-worth of individuals, as paid work in Aboriginal communities is associated with purpose, identity, security, and an ability to contribute culturally to the broader community (Rigby et al., 2011). Drought recovery is often prolonged (RBA, 2020), with many working-age people leaving regional communities to seek employment, leaving behind high concentrations of vulnerable sections of the community, including the elderly, young, and disabled people (Rigby et al., 2011).

During periods of drought, local services are constricted by a lack of demand (Hyland et al., 2007; Aslin and Russell, 2008), increasing the social disadvantage of the people left behind. Droughts often led to reduced health services, check-ups and related services, especially services provided by Aboriginal health workers (Rigby et al., 2011). The removal of Aboriginal health services is likely to reduce health outcomes (Durey et al., 2016; Mackean et al., 2020).

Figure C. 8. Aboriginal Health and Social Disadvantage Impact Flow



Source: AEC.

YOUTH AND FAMILIES

EDUCATIONAL DISRUPTIONS

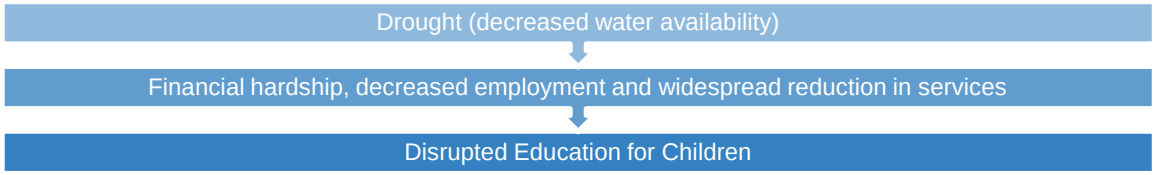
Droughts can also affect family dynamics, disrupting the education of children. The economic downturn from droughts causes increased financial hardship, a decrease in employment, and a widespread reduction in services (Edwards et al. 2015; Aslin and Russell, 2008; Hyland et al., 2007; Edwards et al. 2018), which all affect the educational opportunities for young people in regional communities.

Increased financial hardships, like those brought about during droughts, can:

- Affect the ability of parents to pay for education and extracurricular activities (Aslin and Russell, 2008; Alston and Kent, 2004a).
- Reduce the number of days that young children are enrolled in preschool (Alston and Kent, 2004a).
- Place a high work burden on children at home (Lester et al., 2022)
- Force university-aged children to spend more time working to support themselves (Alston and Kent, 2004a).
- See a withdrawal of students from school and social settings, limiting future opportunities (Carnie et al., 2011).

Furthermore, droughts often result in a reduction of services (Edwards et al. 2018), including small regional schools (ICPA, 1999).

Figure C. 9. Youth Educational Disruption Impact Flow



Source: AEC.

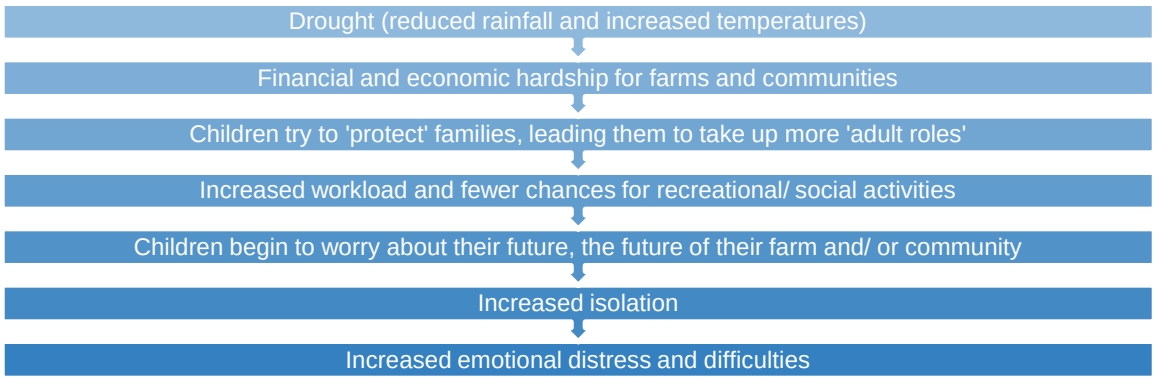
SOCIAL ISOLATION AND MENTAL HEALTH

The economic uncertainty brought about by droughts can have a direct impact on adolescents and families. Droughts can cause economic downturns, resulting in financial hardship, a decrease in employment, and a widespread reduction in services across the community (Edwards et al. 2015; Aslin and Russell, 2008; Hyland et al., 2007; Edwards et al. 2018).

These impacts can affect families, with children often sensing the tension of financial and economic strain on parents and farms, reacting by feeling a need to 'protect' their family (Emerging Minds, 2018; Carnie et al., 2011). This protection can often manifest in children taking on more 'adult roles' in the household or even avoiding telling parents about their own struggles (Emerging Minds, 2018). The financial hardship of droughts often requires children to work more as farms cannot afford to hire labourers (Aslin and Russell, 2008; UNICEF, 2019). The increased workload expected of children often comes at the expense of recreation and social opportunities (UNICEF, 2019). Children also begin to worry more about the decline of businesses and services in the community, their future, and the future of the farm/ community (Carnie et al., 2011).

The culmination of the above impacts has led many young people to feel isolated and cut off from friends and community activities. The heightened isolation for children, resulting from the onset of drought, is positively associated with increased emotional difficulties, including hyperactivity, problematic behaviour, and increased levels of distress among children (Dean and Strain, 2010).

Figure C. 10. Youth Social Isolation Impact Flow



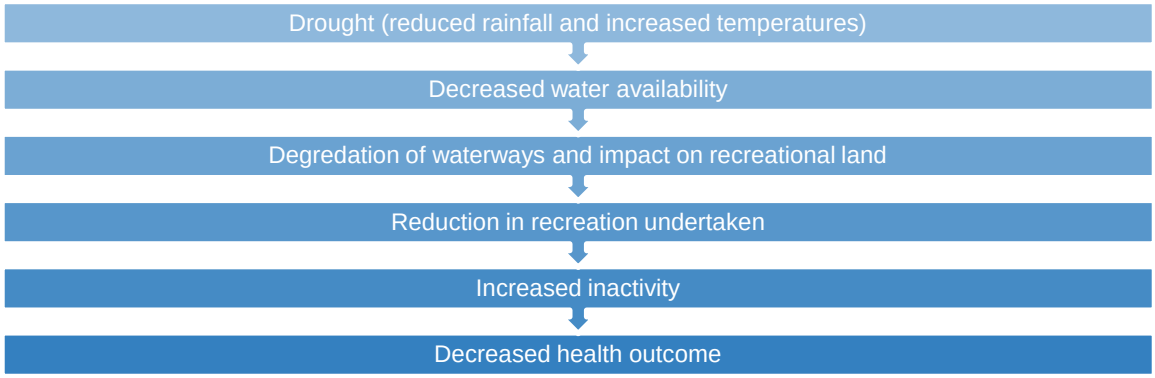
Source: AEC.

REDUCED RECREATION

Droughts can impact the recreational activities of residents. Droughts often lead to the degradation of waterways, which can limit the availability of water-based activities, such as boating, rafting, canoeing, fishing, and swimming (NIDIS, 2024). Furthermore, the lack of water availability during droughts can impact common recreational facilities, such as soccer, rugby, and grass tennis courts, affecting the ability of people to participate in active recreation (Clearing House for Sport, undated).

The effect of droughts limiting the availability of outdoor recreational activities is a contributing factor to inactivity, which can have wide-ranging impacts on individuals and communities (Medibank, 2008). Increased inactivity can lead to higher healthcare costs as people become less healthy, lower productivity through increased absenteeism and presenteeism, reduced life expectancy and quality of life, and the social cost of premature deaths.

Figure C. 11. Youth Social Isolation Impact Flow



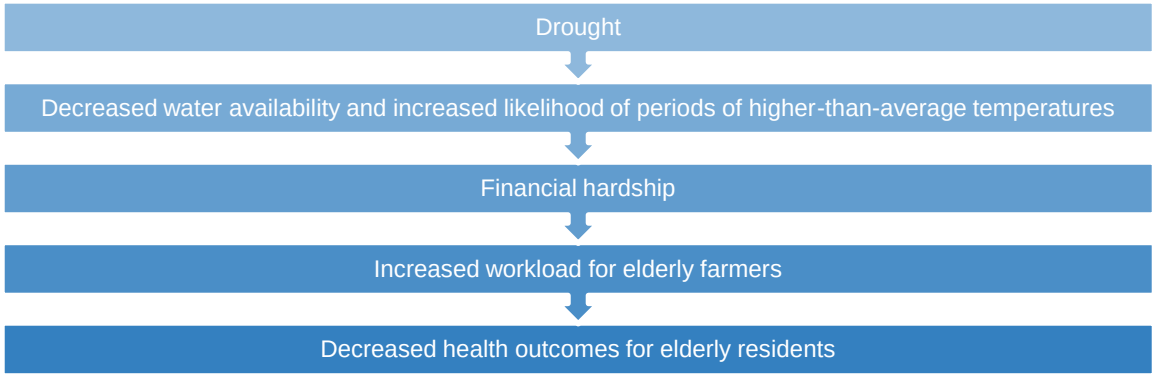
Source: AEC.

ELDERLY AND VULNERABLE POPULATIONS

HEALTH RISKS

Droughts are often associated with periods of higher-than-average temperatures (Lester et al., 2022); which present a major health risk to older populations, including heat exhaustion, cramps, and heart attacks (Horton et al., 2010). Due to the financial hardship brought about by droughts (Edwards et al. 2015), elderly farmers often must increase their workloads (Lester et al., 2022) compounding the effects of droughts.

Figure C. 12. Elderly Health Impact Flow

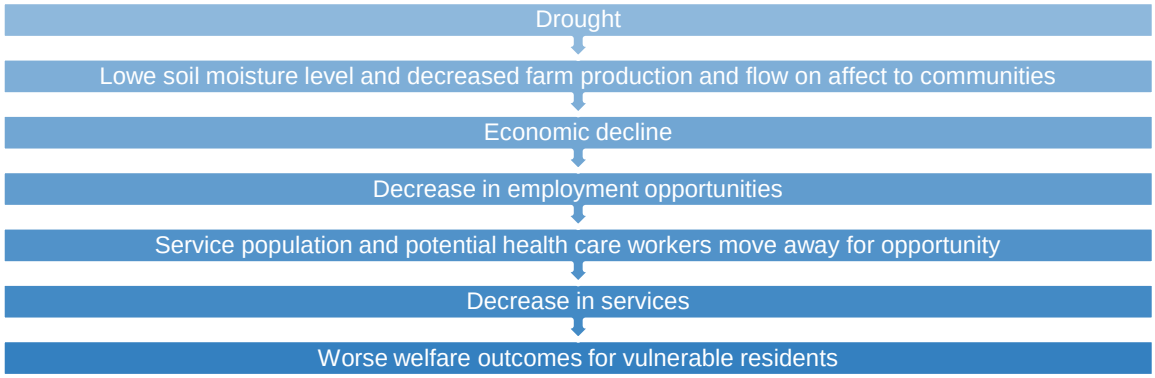


Source: AEC.

REDUCED ACCESS TO SERVICES

Droughts can reduce employment opportunities and incomes in regional communities (Edwards et al. 2015; Aslin and Russell, 2008; Hyland et al., 2007). Many working-age people leave regional communities to seek employment, leading to a loss in social capital and services (Rigby et al., 2011; Alston and Kent, 2004a; Edwards et al., 2018). This leaves vulnerable community groups, such as the elderly, young, and disabled, with fewer services (Rigby et al., 2011), whilst having a significant demand for services, in particular health services (AIHW, 2014; 2023; 2024a). Reduced services can leave these vulnerable populations with worse welfare and health outcomes.

Figure C. 13. Elderly Access to Services Impact Flow



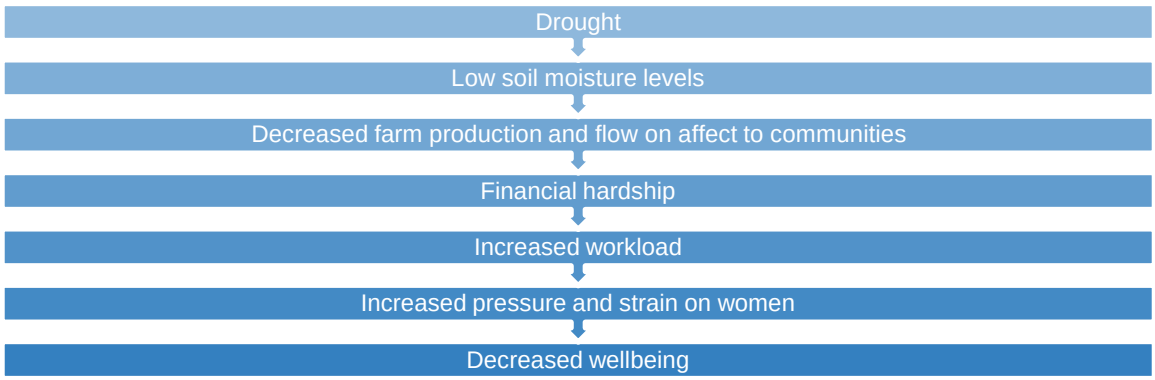
Source: AEC.

WOMEN IN RURAL AREAS

INCREASED WORKLOAD

Financial hardship felt across farms and throughout regional communities in times of drought (Edwards et al., 2009a; Hyland et al., 2007) often places pressure on women to change their employment situation. This occurs through either seeking off-farm/ more distant work to supplement lost income (Casey et al., 2021) or becoming more involved with farm work (Alston, 2006; Stehlik et al., 2000). Women in regional communities often ignore their mental health issues to care for their families and often working past their retirement age (Alston, 2006; 2011).

Figure C. 14. Women Increase Workload Impact Flow



Source: AEC.

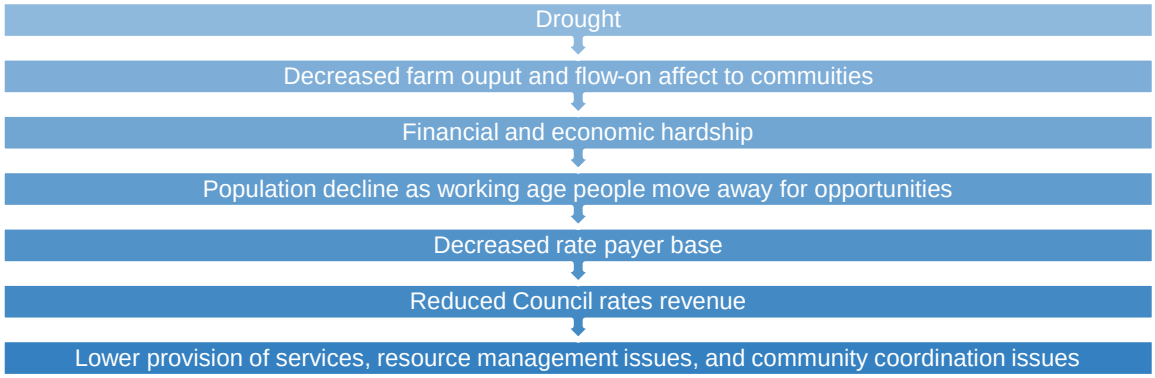
LOCAL GOVERNANCE

SERVICE PROVISION

Droughts can affect the service provision, financial and resource management and community coordination for Local Government Areas (LGAs) and community leaders. Droughts often lead to a reduction in services as working-age people move away due to a lack of economic and employment opportunities (Edwards et al. 2015; Aslin and Russell, 2008; Hyland et al., 2007; Lester et al., 2022; Alston and Kent, 2004a).

As residents move away, the ratepayer base decreases leading to reduced Council rates revenue. In the most recent droughts in Queensland, various drought-affected Councils experienced prolonged periods of population decline and financial deficits (AEC, 2018). Decreased revenue for LGAs can negatively impact the management of community and Council resources, strain existing resources, and affect community coordination as people compete for limited resources. Revenue decreases will also affect the provision of services by Council, further compounding the widespread decrease in services in drought-affected areas (Edwards et al., 2018).

Figure C. 15. Local Government Service Provision Impact Flow



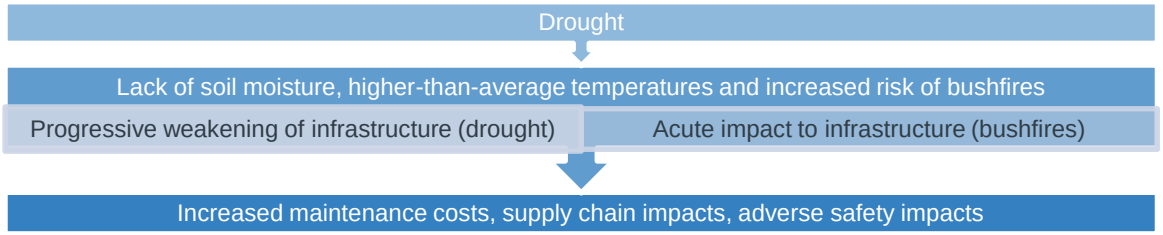
Source: AEC.

IMPACT ON INFRASTRUCTURE

The lack of soil moisture associated with droughts can impact infrastructure through soil cracking which can damage the foundations of buildings (AdaptNSW, 2024b). When droughts occur with higher-than-average temperatures this can impact transport infrastructure, including train lines buckling, increased 'rutting' and buckling of roads, as well as accessibility issues with ports (DHS/OCIA, 2015; Mills and Andrey, 2002; Thomson, 2023).

Furthermore, the dry conditions that result from prolonged droughts can increase the risk of bushfires (AdaptNSW, 2024a; RBA, 2020). The effects of droughts on infrastructure can increase costs in maintaining assets, impact supply chains, as well as potentially cause serious safety concerns to the public.

Figure C. 16. Infrastructure Impact Flow



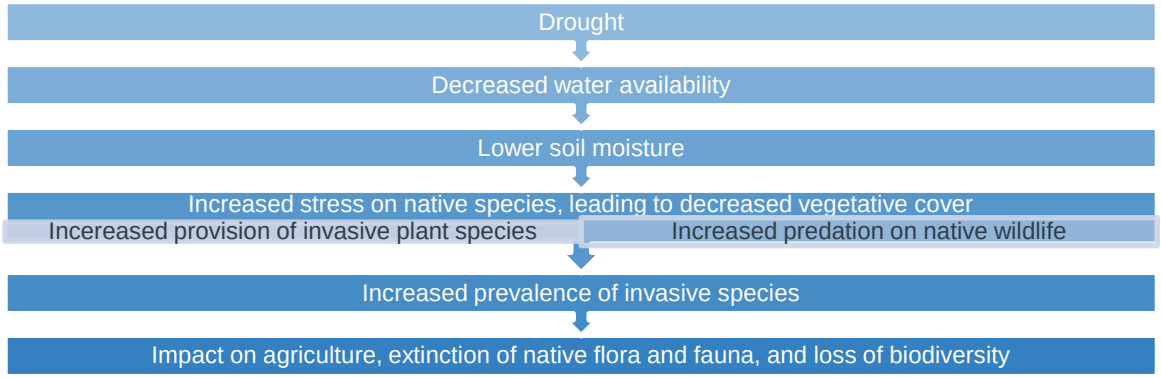
Source: AEC.

INVASIVE SPECIES

Prolonged periods of decreased rainfall, associated with droughts, can lead to low soil moisture content (Seleiman et al., 2021), contributing to increased stress on native species and a decline in plant and vegetative cover (Invasive Species Council, 2009; Young et. al, 2021). The barren landscape, left by the decrease in native vegetation, is then taken over by invasive plant species.

Additionally, the initial loss of plant and vegetative cover can lead to an increase in introduced species (such as wild cats and foxes) preying upon native wildlife (Invasive Species Council, 2009). Invasive species contribute to an economic burden from impacts on agriculture, as well as extinctions and biodiversity losses (Bradshaw and Hoskins, 2021). It is estimated that invasive species contribute to a cost equivalent to 1.26% of Australia's Gross Domestic Product per year, equivalent to $24.5 billion in 2021.

Figure C. 17. Local Government Service Provision Impact Flow



Source: AEC.

HEALTH CARE AND SOCIAL SERVICES PROVIDERS

OVERBURDENING OF SERVICES

The lack of water availability and higher-than-average temperatures associated with droughts can lead to a series of adverse health impacts. Droughts can lead to health concerns from water-related diseases, airborne and dust-related diseases, and mental health issues (Stanke et al., 2013).

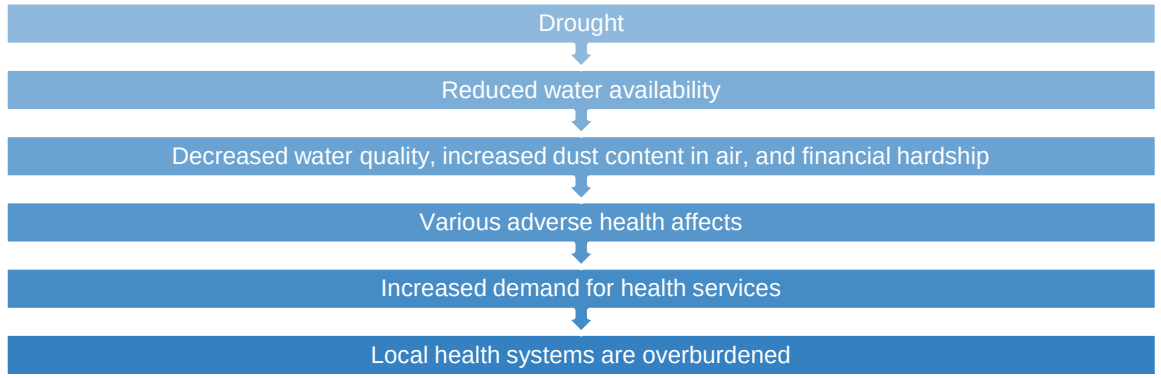
During drought, people often turn towards other water sources, such as private water sources or recycled water. These alternative water sources, however, are not as highly regulated as municipal water sources, which could lead to the spread of infectious diseases (Said et al., 2003; O'Toole et al., 2007). Additionally, due to decreased water flow and filtration, droughts can contribute to a build-up of harmful by-products in water sources, such as chemicals, nutrients, and solid particles, which can affect water quality and health (Endale et al., 2011).

Droughts can lead to the following health impacts:

- Significant and potentially fatal respiratory effects from the inhalation of dust (Gwon et al., 2023; Cook et al., 2007) associated with increased wind erosion of soil from lower moisture content and vegetative cover (Seleiman et al., 2021; Young et. al, 2021; Pimentel and Burgess, 2013).
- Serious mental health issues through increased financial hardship, social isolation, and the loss of identity associated with droughts (Carnie et al., 2011; Dean and Stain, 2010; Edwards et al., 2015).

The cumulative impact of these problems can increase the demand for health services in drought-affected regions, leaving local health systems overburdened, especially as rural health systems often experience issues in staffing levels (Alston and Kent, 2004b; AMA, 2019).

Figure C. 18. Overburdened Health Care Services Impact Flow



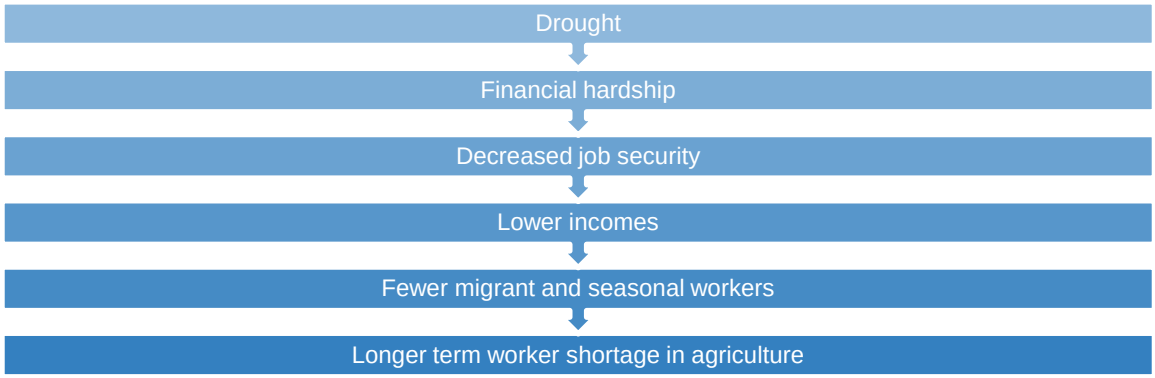
Source: AEC.

MIGRANT AND SEASONAL WORKERS

INCREASED EMPLOYMENT INSTABILITY

As mentioned previously, droughts often result in increased financial hardship for farms (Edwards, et al., 2009a), reducing the demand for agricultural workers, as seen in the unprecedented decline in agricultural employment during the 2002-03 drought (Lu and Hedley, 2004). Reduced demand for agricultural workers during droughts can lead to reduced security of employment for migrant and seasonal agricultural workers, resulting in lower expected long-term incomes. The reduction in expected long-term incomes may lead workers to change industries or return to their home countries, resulting in a long-term reduction in the available agricultural workforce.

Figure C. 19. Migrant and Seasonal Worker Impact Flow



Source: AEC.

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