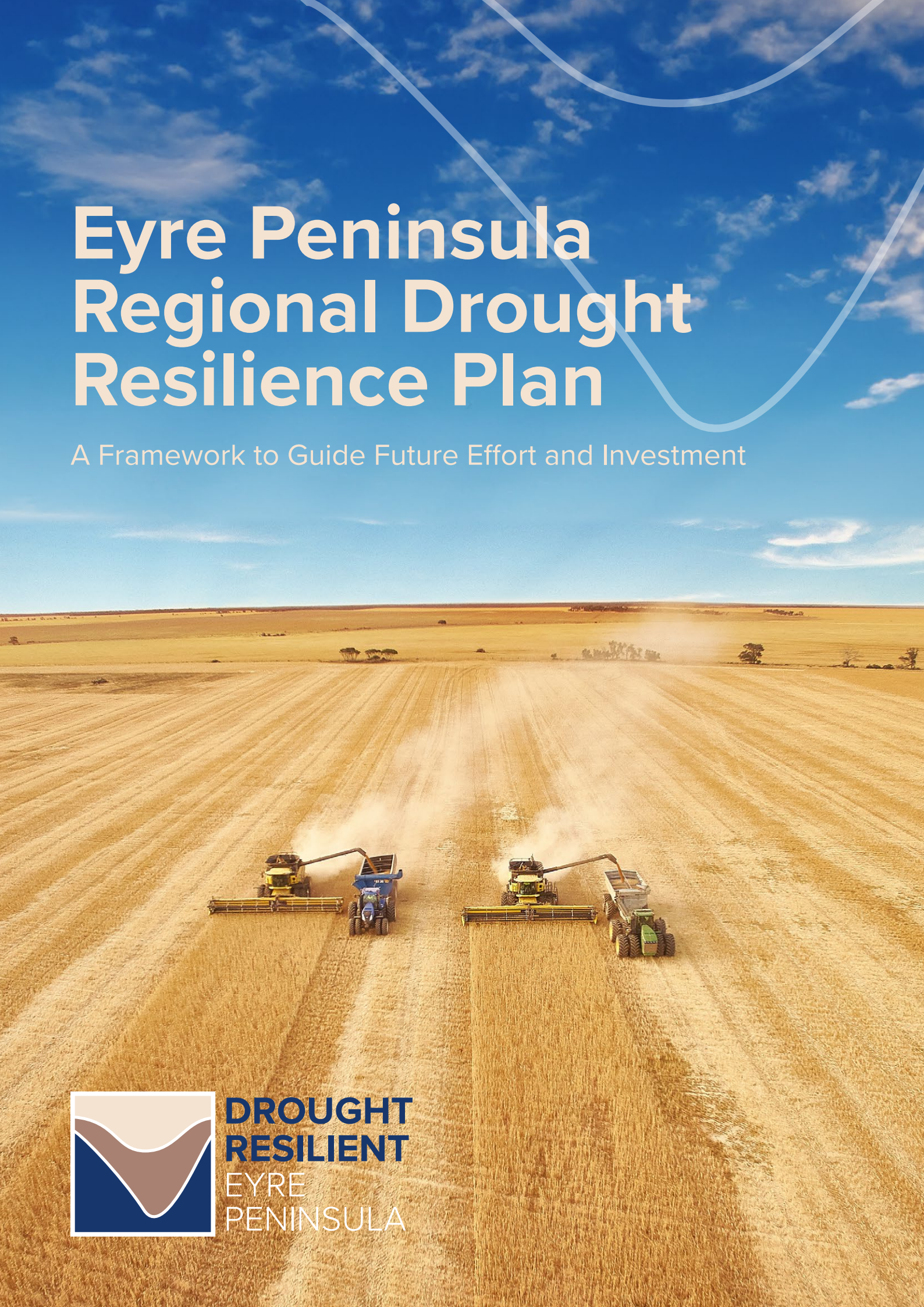
Eyre Peninsula Regional Drought Resilience Plan

A Framework to Guide Future Effort and Investment



DROUGHT RESILIENT EYRE PENINSULA

Acknowledgement of Country

We acknowledge the Traditional Custodians of the land on which we work, live and play and their continuing connection to land, sea, culture and community. We pay respect to Elders past and present, and extend that respect to all Aboriginal and Torres Strait Islander peoples in our community.

In particular, we acknowledge the Aboriginal peoples of the Eyre Peninsula region covered by this Plan, including the Barngarla, Nauo, Wirangu, Kokatha and Mirning peoples.

Contents

This program is jointly funded through the Australian Government's Future Drought Fund and the Government of South Australia.

This plan has been prepared by URPS for the Eyre Peninsula Drought Resilience Advisory Group.
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PHOTO CREDITS: Regional Development Australia Eyre Peninsula, Agricultural Innovation & Research Eyre Peninsula, Eyre Peninsula Landscape Board, Nathan Peters.

01 Introduction

The economic, social and environmental costs of drought on the Eyre Peninsula are immense and persistent. The toll drought takes on the region and its communities is high and the impacts can linger for decades. In a region where agriculture accounts for almost 30% of jobs outside of regional centres, past droughts such as the Millennium Drought (1997-2009) have left lasting impacts, causing crop and stock profits to plummet, forcing the sale of many farms and businesses, devastating the environment, and disrupting the livelihoods and wellbeing of regional communities.

The projected increase in time spent in drought over coming decades means that preparing for drought is more important than ever. The cascading ramifications on the farms, farmers, communities, economies and natural landscapes of the Eyre Peninsula will undoubtedly be more extensive and potentially catastrophic if left unchecked.

We can no longer afford to wait until drought hits to respond and recover. We need to plan now for the next drought and consider how to do things better or differently to ensure the heath, vibrancy and sustainability of our community and agricultural economy can be sustained even through extended periods of drought.

Farmers on the Eyre Peninsula are not new to adapting to changing conditions. They have a long history of being leaders and innovators in developing and adopting new and enhanced ways to sustain their farms during times of reduced rainfall.

Improved farming practices have increased crop yield and ground cover, reducing soil erosion during dry periods that would have devastated the region decades ago. Leveraging existing strengths and capitalising on new opportunities will enhance the resilience of all who live and work in the region and help the Eyre Peninsula to be in a stronger place next time drought hits.

The Australian Government established the Future Drought Fund (FDF) to provide secure, ongoing funding for drought resilience initiatives. Through the FDF, the South Australian Government has supported the Eyre Peninsula to develop this Regional Drought Resilience Plan to prepare for and manage future drought risks.

The Eyre Peninsula Drought Resilience Advisory Group has guided the preparation of this Plan. The Advisory Group includes representatives of Regional Development Australia Eyre Peninsula (RDA EP), Agricultural Innovation & Research Eyre Peninsula (AIR EP), Eyre Peninsula Landscape Board (EPLB), SA Drought Hub, Local Government (Eyre Peninsula Local Government Association (EPLGA) and councils), and Department of Primary Industries and Regions South Australia (PIRSA). URPS were engaged to work with the Advisory Group to develop the Plan.

This Plan has been prepared as a framework or prospectus to guide future effort and investment in regional drought resilience. It is not a drought response plan and will not replace what may be needed to respond to drought in the future.

Our vision for the Eyre Peninsula

Eyre Peninsula farms, businesses and communities that are strong, sustainable, vibrant and drought resilient.

Our Goals

Farming Innovation

Profitable, productive and adaptive agriculture thriving in a variable and changing climate

Financially Sustainable Enterprises

Long-term financially viable businesses and management capabilities

Community Wellbeing

Capable individuals and healthy communities working together to benefit the region

Landscapes and Environments

Healthy soil, water and biodiversity that sustain productive landscapes

Governance and Advocacy

Local, effective and coordinated action led and governed by local people that understand the region

Regional Infrastructure and Services

Future-proofed water supplies, local services and infrastructure that attracts, retains and supports residents

Regional Economic Development

Sustainable regional development that contributes to drought resilience

What is drought?

Drought is a period of abnormally dry conditions that impacts negatively on water availability and agricultural production in a region and, consequently, impacts negatively on the economy and environment of the region and the health and wellbeing of its residents.

What is drought resilience?

Drought resilience is the ability of communities, economies and environments to withstand the impacts of drought and adapt and find new and potentially transformational ways of doing things, enabling functions and values to be sustained over the longer term.

1.1 A new approach to resilience through the National Drought Agreement

In the past, the Government of South Australia made declarations of drought with associated Exceptional Circumstances support and focused the majority of their drought support on the 'during' and 'after' phases of drought.

This approach changed with the introduction of the first National Drought Agreement in 2018 and its recent revision (2024-2029).[1] All Australian, state and territory governments have agreed to and signed the Agreement which explains how they will work together to help the Australian agriculture sector better withstand drought.

A key feature of the agreement is a greater focus on enhancing drought resilience before drought, to enable farms, people, businesses and the environment to minimise the impact of drought rather than waiting until drought hits to act.

Another is the elimination of drought and Exceptional Circumstances declarations. Previous drought declarations necessitated the drawing of lines on maps to identify regions in drought. Community and stakeholders recognised that this approach was challenging and often flawed with some farmers in need being ineligible to access support. The new approach recognises that support needs are highly variable, and eligibility should be based on need, not activated by drought declarations.[2]

The development of this Plan is consistent with the Agreement's objectives to prioritise objectives and outcomes that enhance long-term preparedness, sustainability, resilience and risk management for farming businesses and farming communities.

During the engagement undertaken to inform the development of this plan, it was evident that there remains a belief that drought declarations may still be made in South Australia. Increasing awareness and understand of the National Drought Agreement has been identified as an opportunity for action in this Plan.

1.2 Preparing this Plan

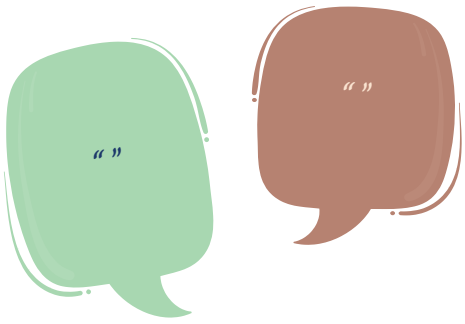
This Plan was informed by information collated through the following tasks:

- Literature review.
- Key informant interviews with local community leaders and subject matter experts.
- Key informant interviews with drought resilience planners from other regions.
- Regional in-person engagement across the 11 Eyre Peninsula councils.
- Aboriginal in-person workshops.
- Online workshops and online surveys.
- Regular Advisory Group meetings.

98 community members and stakeholders were engaged in the first round of engagement to inform the draft Plan, each sharing a diversity of perspectives, experiences and priorities. A further 27 community members and stakeholders then provided feedback on the draft Plan.

All parts of this Plan have been informed by the literature review and engagement. The key findings of these tasks have been analysed, summarised and integrated to prepare the content of the Plan and set out a holistic vision for a more drought resilient Eyre Peninsula. Further detail and findings from all tasks are described in the Key Insights Paper including the Engagement Summary Report prepared for this project and provided as Attachment 1.

Quotes from community members and stakeholders collected through the engagement activities are included in the speech bubbles throughout this Plan. While these quotes were raised by individuals to share their personal experiences and views, they have been included in the plan because they generally align with wider community views shared during the engagement.



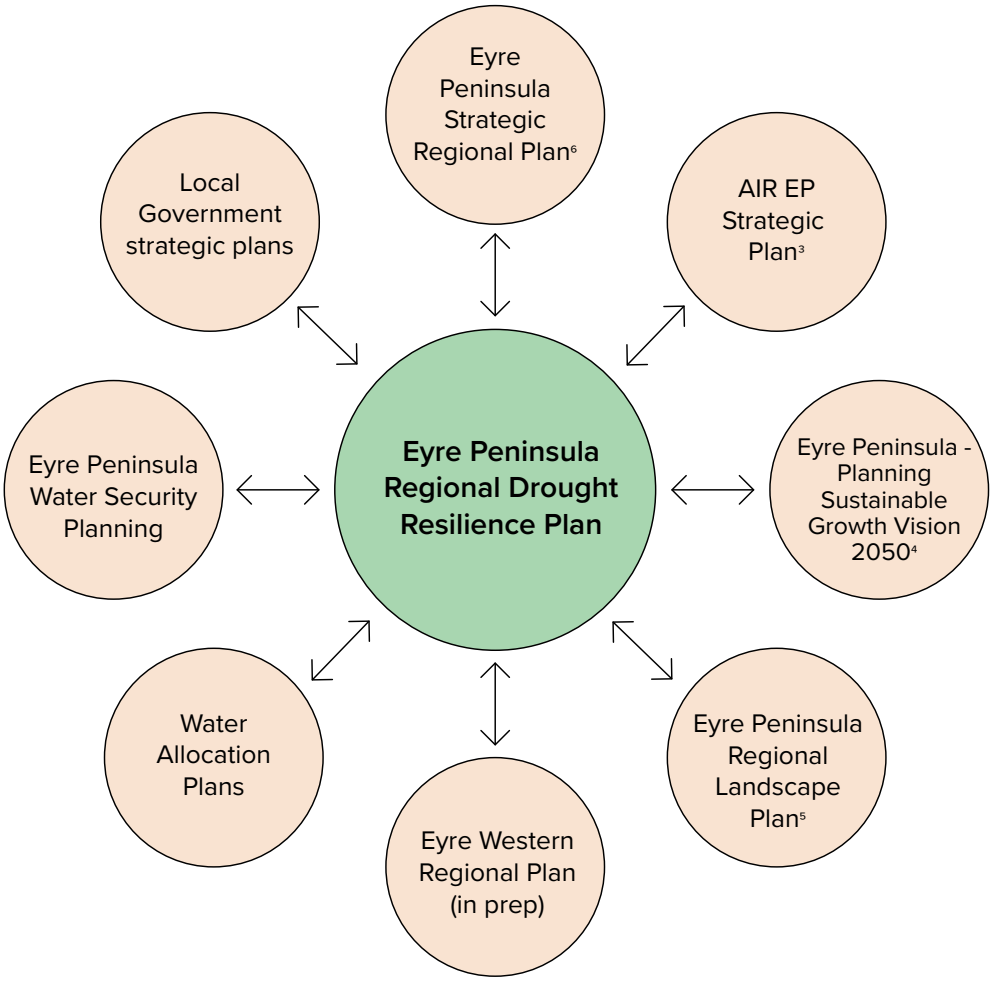
1.3 How to read this Plan

There are four key parts to the Eyre Peninsula Regional Drought Resilience Plan:

Section 1	Introduction and summary of the Plan
Section 2-5	Background to drought and drought resilience on the Eyre Peninsula
Section 6	Opportunities for action - the vision, goals, strategies and opportunities for action for building drought resilience on the Eyre Peninsula
Section 7	How the Plan will be implemented

1.4 Strategic context

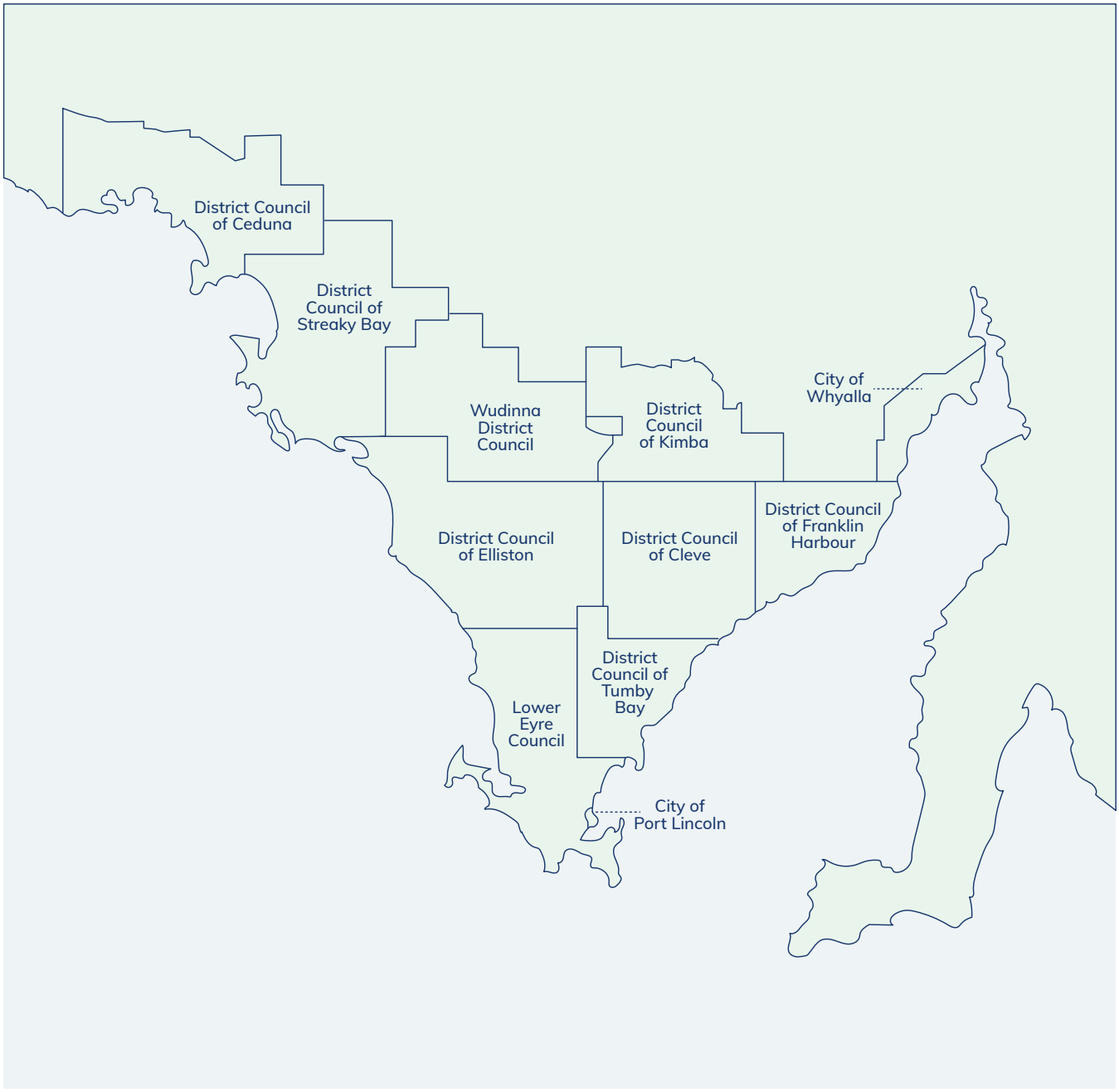
The Eyre Peninsula Regional Drought Resilience Plan has been prepared to align with and complement other regional strategic plans. Some of the opportunities for action within this Regional Drought Resilience Plan refer to actions identified in these plans, and may be already underway. Planning for the implementation of the opportunities in this Plan will consider alignment with other strategic plans to maximise efficiency and minimise duplication of effort.



02 The Eyre Peninsula

The Eyre Peninsula Regional Drought Resilience Plan region encompasses the 11 Eyre Peninsula councils from Whyalla in the east, along the Gawler Ranges in the north, to Ceduna in the west. The region covers 44,290 square kilometres (Figure 1). The far west of South Australia (unincorporated areas beyond District Council of Ceduna) is covered by the Outback SA Regional Drought Resilience Plan and is not included in this Plan.

Figure 1 The Eyre Peninsula Regional Drought Resilience Plan region



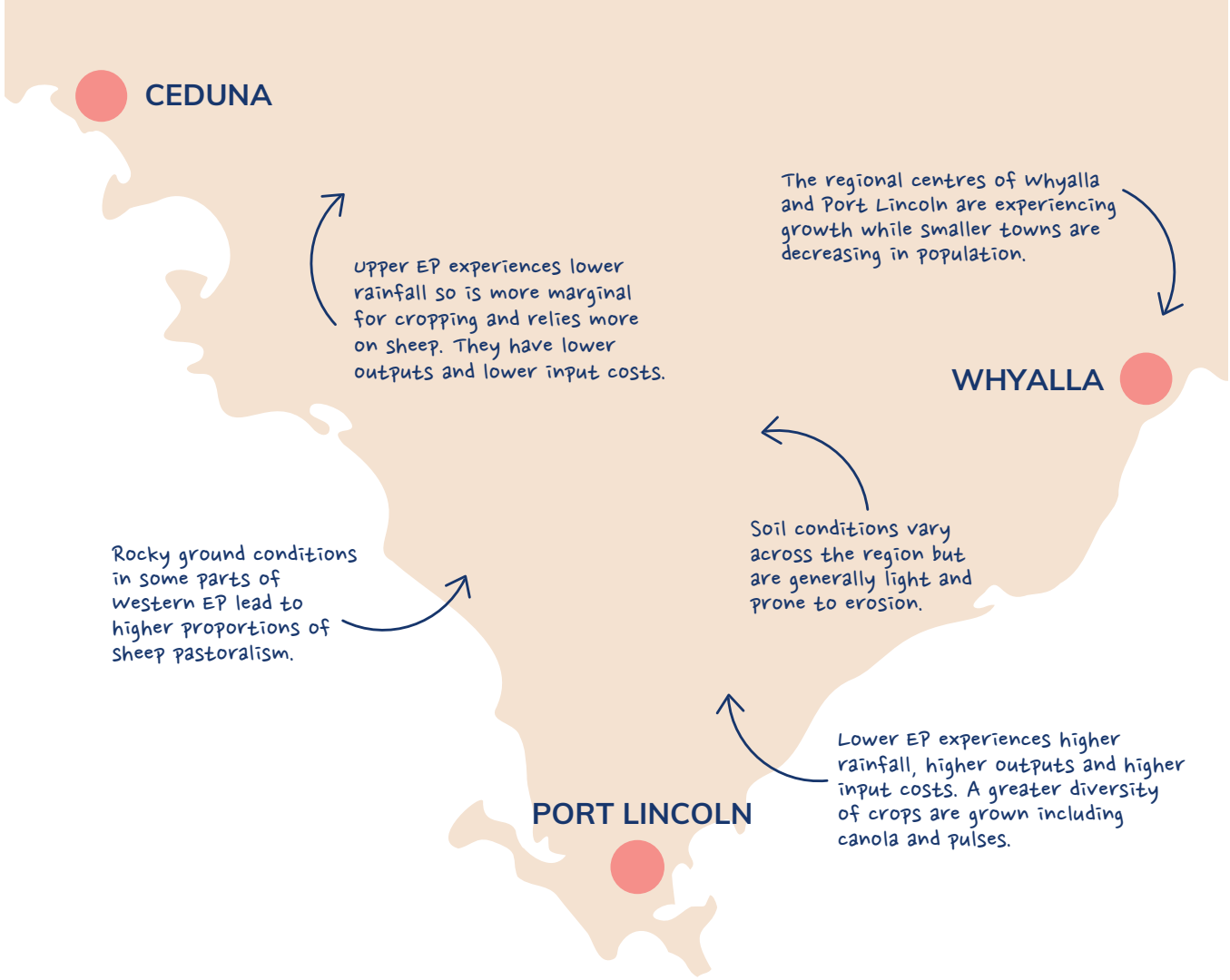


Figure 2 Variance in conditions across the Eyre Peninsula

Characteristics such as a close-knit community atmosphere, reliance on agriculture and strong sporting culture are consistent across the Eyre Peninsula. However, other factors vary. Each town has unique characteristics, perspectives, priorities, challenges and needs. Some key characteristics that vary across the region are described in the figure above, including climate, soils and population trends.

The following pages summarise key features of the Eyre Peninsula that influence its resilience to drought. Please refer to Attachment 1 Key Insights Paper for more information about these features.

2.1 People and economy

The Eyre Peninsula's population is dispersed, with major population centres in Whyalla and Port Lincoln and many people living on farming properties. The region enjoys a strong sense of community spirit and connectedness. Agriculture is the highest industry of employment outside the key population centres of Whyalla and Port Lincoln.

	Eyre Peninsula	South Australia
Resident population	56,265 people	1,781,516 people
Median age	43 years	41 years
Highest level of education		
Bachelor degree level and above	8.8%	22.7%
Certificate III & IV Level	17.7%	17.6%
Year 12	31.2%	15.2%
Year 10	15.6%	9.4%
Unemployment rate	2.4%	5.4%
Volunteering rate	18.0%	14.1%
Top 3 industries of employment (Entire EP region)	Health care & social assistance (14.1%) Agriculture, forestry & fishing (12.8%) Retail trade (9.9%)	
Top 3 industries of employment Eyre Peninsula region excluding Whyalla and Port Lincoln	Agriculture, forestry & fishing (28.0%) Health care & social assistance (12.4%) Education & training (9.3%)	
Total GRP (2022/23) Entire Eyre Peninsula region	$4.467 billion	

Table 1 Key demographics and economic statistics for the Eyre Peninsula region and SA[7,8]

DATA NOTE – All economic data has been soured from the RDA Eyre Peninsula Region's economic profile from .id community. The area covered by this data includes all the council areas as well as the far west coast which includes Maralinga Tjarutja (AC) and Unincorporated SA (part).

2.2 Agriculture

The Eyre Peninsula has an extensive, productive agricultural industry. Approximately 80% of the region's land area is owned by private enterprises and used for cropping and grazing, with a significant proportion of this land having native vegetation cover. Dryland broadacre cropping of wheat, barley, canola, lentils, lupins and oats and livestock grazing predominantly sheep for meat and wool are the most common agricultural land uses. Recent market conditions and innovations in farming technology have led to an increase in production of lentils and other pulses, while sheep grazing is in decline.

The region produces approximately one quarter of South Australia's cereal crops and other broadacre crops, valued at $1.43 billion in 2022/23. The total value of agricultural output accounted for approximately 11% of South Australia's total agricultural output in 2020/21.[9]

Eyre Peninsula farmers are challenged by issues that are unique to their environments, as well as constraints that are experienced more broadly across the state. These include:

- Degraded soils, leading to soil acidification, dryland salinity, soil structure decline, wind erosion and water repellence.
- Variable and challenging weather conditions such as low and high rainfall, extreme heat, frost and wind.
- Decreasing populations of small towns.
- Increasing costs of farming inputs driven by global energy prices and geopolitical events.[10]
- Fluctuating market conditions, exacerbated by a heavy reliance on often volatile export markets.[11]
- Pests, weeds, overabundant native species and diseases.

However, Eyre Peninsula farmers are renowned for their innovation. Research and development led innovations, improved risk management and business decision making, and changes to how land and water resources are managed has led to significant advances in agricultural production in the region. The willingness of Eyre Peninsula farmers to adopt new technologies and make improvements based on research outcomes ensure their farms are on the cutting edge of productivity and profitability.

The agricultural sector plays a vital role in South Australia's food production, regional export revenue, and as a foundation of strong and cohesive rural communities. Continuing to support the success of the sector is essential.

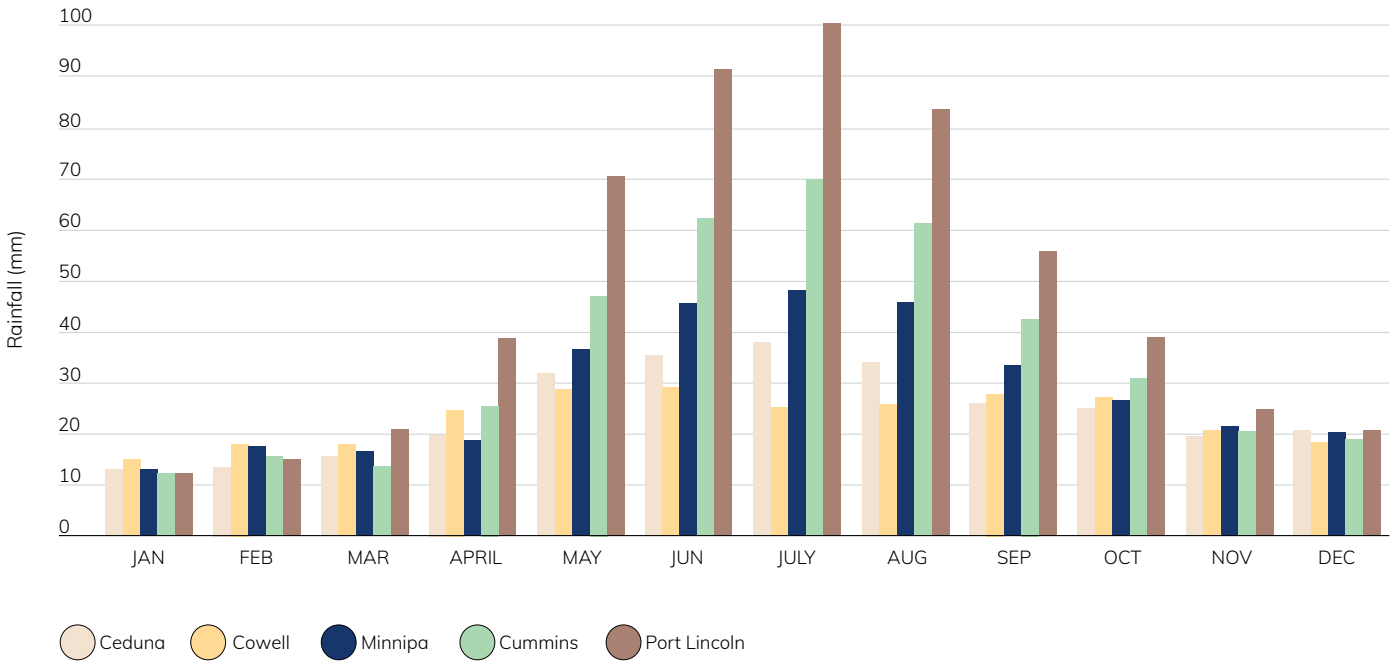
2.3 Climate

2.3.1 Rainfall

The Eyre Peninsula region experiences a Mediterranean climate characterised by warm, dry summers and mild, wet winters. The southern areas have a milder, wetter climate compared with the warmer and drier north and northwest parts of the region.

Average monthly rainfall between 1964 to 2023 for five locations across the Eyre Peninsula is shown in Figure 3. While November to March rainfall is similar at all locations, winter rainfall is significantly higher in the southern locations of Port Lincoln and Cummins.

Figure 3 Average monthly rainfall 1964 to 2023 in towns across the Eyre Peninsula[12]



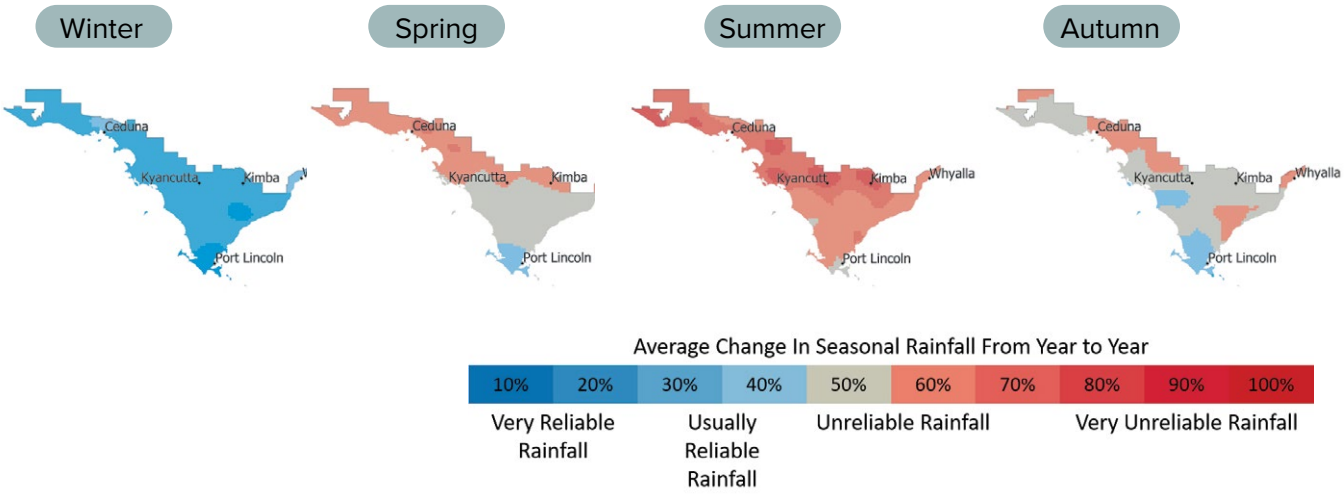
Rainfall has been declining in recent decades. Data from myclimateview.com.au shown in Table 2 indicates rainfall has reduced from the period 1964-1983 to 1984-2023, with reductions greater in northern locations.

Table 2 Average annual rainfall change 1964 to 2023[13]

Location	Average annual rainfall (1964 to 1993)	Average annual rainfall (1994 – 2023)	Change
Ceduna	298mm	268mm	-10%
Cowell	297mm	259mm	-13%
Minnipa	346mm	311mm	-10%
Cummins	451mm	429mm	-5%
Port Lincoln	530mm	481mm	-9%

Rainfall reliability maps for 1989 to 2018 (Figure 4) show winter rainfall has been moderately reliable across the region (blue areas), with usually only about 40 mm difference from one year to the next.[14] This contrasts with spring and autumn rainfall, which has been less reliable (beige and light red areas).

Figure 4 Rainfall reliability (1989 – 2018)

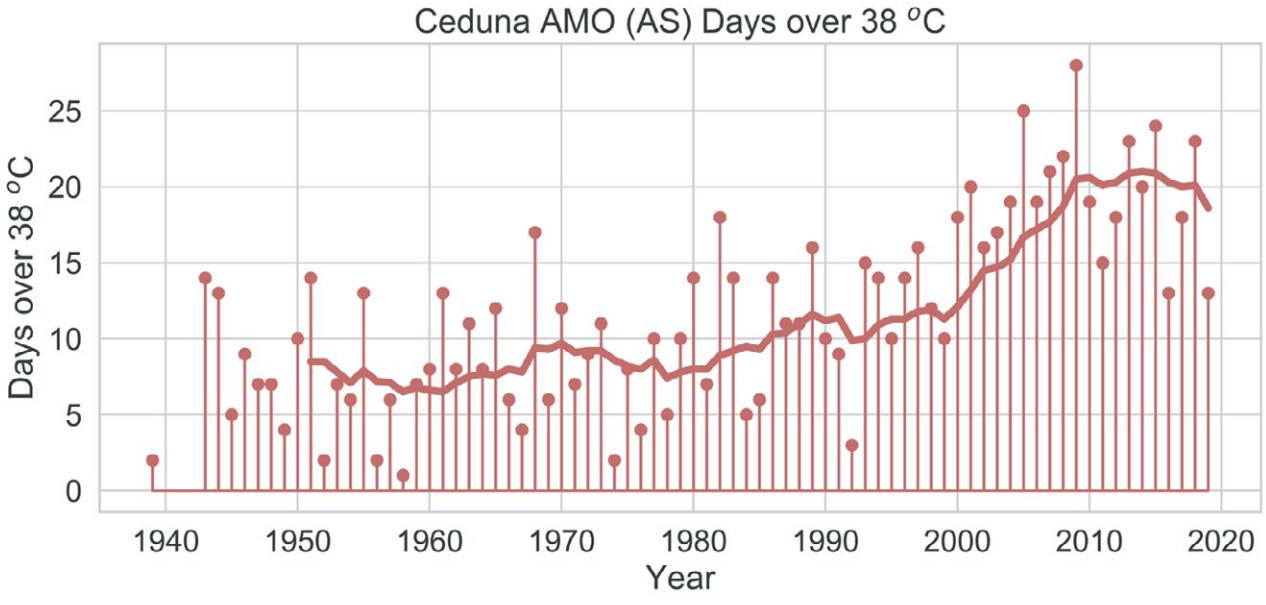


2.3.2 Temperature

The Eyre Peninsula experiences average annual maximum temperatures of 18 to 27°C and average summer maximum temperatures of 21 to 33°C.[15]

The Eyre Peninsula has experienced more hot days in the past 30 years. Figure 5 shows the annual number of days above 38 °C (red bars) with a 10-year running average (solid red line) for Ceduna.[16] Ceduna experienced an average of 16 days per year above 38 °C between 1989–2018, compared to an average of nine days per year above 38 °C between 1959–1988.

Figure 5 Number of days per year over 38°C



2.4 Water Resources

There is a scarcity of potable water resources on the Eyre Peninsula. Groundwater is the main source of water for public water supply, irrigation, stock and domestic use.

Table 3 Key characteristics of Eyre Peninsula's water resources

	Feature	Characteristics
	Groundwater	The Water Allocation Plan for Southern Basins and Musgrave Prescribed Wells Areas controls the taking and use of most of the fresh groundwater in the region.[19] Three-quarters of the region's drinking supply comes from the Uley South Basin in the Southern Basins Prescribed Wells Area.[20] Expert modelling says water is being drawn from this Basin at unsustainable rates, with recorded water levels 'below' or 'very much below average' in almost half of its wells during the past 12 months. This was despite rainfall in 2021 and 2022 being well above average.[21] The Department for Environment and Water has modelled that underground water resources in the southern basins will no longer be able to sustainably meet the demands for water supply on Eyre Peninsula in the short term. The Water Allocation Plan is currently under revision as a result, with the new plan to significantly reduce SA Water's pumping allowance from the Southern Basins. Alternative water sources will be required to supply the region.
	Surface water	Surface water features on the Eyre Peninsula include watercourses, lakes, dams, wetlands, springs and soaks.[22] Most watercourses are ephemeral, experiencing peak flows during winter, and often ceasing to flow by late spring or early summer.[23] Many wetlands and creeks are saline and unsuitable for drinking.
	Water storages	The Tod Reservoir is the only major surface water storage on Eyre Peninsula. Due to deteriorating water quality, this resource has not been used as a water supply since early 2002 and is held as an emergency supply of water only.[24]

2.5 The Eyre Peninsula 'system'

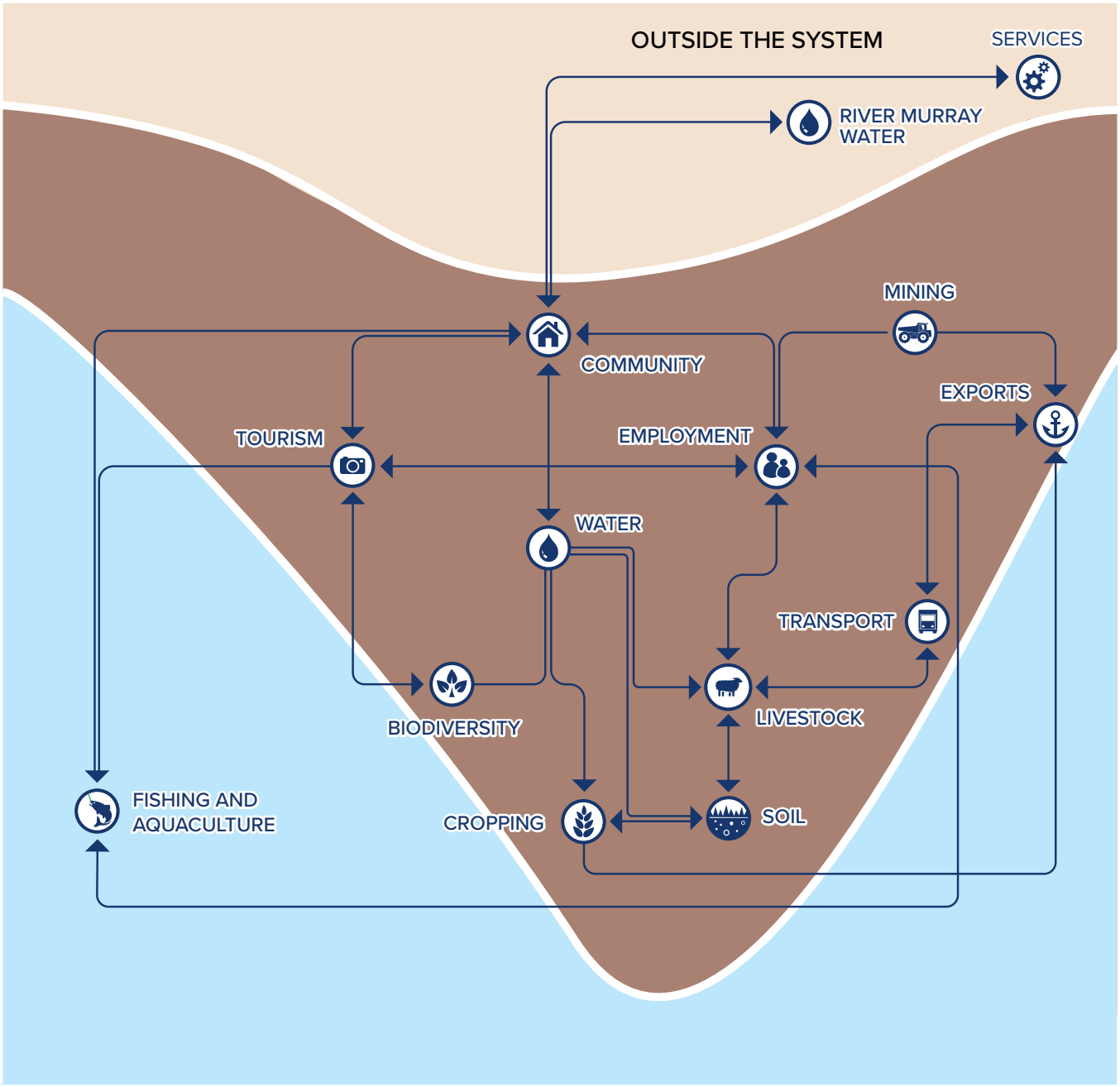
The Eyre Peninsula is a complex system of connections and interactions between people, industries and the natural environment. These connections and interactions mean that when one feature is impacted, flow on effects will be experienced by other features in the system. Considering these connections and interactions is called 'systems thinking'. Systems thinking helps to identify the factors that make the system resilient or vulnerable to change.

Key features of the Eyre Peninsula system include agriculture and water resources, as these have many connections with other valued features.

Maintaining agriculture and its connections to other features is integral to the viability of the region, as is provision of secure water supplies. When agriculture and water supply are threatened by drought, these impacts are also felt by the wider population, community groups, social fabric, services and regional economy. When agriculture, water supplies and other features are supported to be more resilient to drought, these benefits will also flow through the system.

It is important to note that the way these cascading impacts and benefits are felt differs substantially across the region depending on the local context.

Figure 6 The Eyre Peninsula 'system'



03 Drought

Drought is not simply low rainfall. Rather, drought is a comparatively dry period compared to normal conditions that has an impact on water users including the environment.

For this plan, drought is defined as:

> A period of abnormally dry conditions that impacts negatively on water availability and agricultural production in a region and, consequently, impacts negatively on the economy and environment of the region and the health and wellbeing of its residents.

3.1 Drought on the Eyre Peninsula

Drought on the Eyre Peninsula is caused by a number of natural atmospheric conditions including the Positive Indian Ocean Dipole, El Niño-Southern Oscillation and Southern Annular Mode. Anthropogenic climate change is also projected to impact on drought conditions. The Key Insights Paper in Attachment 1 provides more information on these climate drivers.

Before European colonisation, the Aboriginal peoples of the Eyre Peninsula region would have experienced numerous drought periods.[25] Since then, the region has experienced a number of significant droughts including:

- The Federation drought: 1895 to 1902
- The 1914 to 1915 drought
- The World War II drought: 1937 to 1945
- The 1965 to 1968 drought
- The 1982 to 1983 drought
- The Millennium drought: 1997 to 2009
- The 2017 to 2019 drought (the Tinderbox drought)

3.2 Drought impacts on the Eyre Peninsula

The impacts of drought on the Eyre Peninsula are profound. The literature and stakeholders have identified the following key impacts.[26,27] Refer to Attachment 1 for a more comprehensive summary of these impacts, including Section 3.3 and 3.5 of the Key Insights Paper and Section 3 of the Engagement Summary Report.

There's a slow, grinding, wears-you-down effect, mentally, financially and physically

Social impacts

- Reduced mental health and wellbeing exacerbated by loss of income, hard and emotional decision making, stress, loss of hope and shame. This can lead to anxiety, depression, substance abuse, social isolation and suicide in extreme cases.
- Stress and wellbeing impacts can lead to relationship breakdowns, domestic violence, impact on children and flow on effects to friends and the wider community.
- When farmers are forced to shoot and bury their stock because it is too costly to send them to market, this takes a major mental toll.
- Reduced amenity associated with a drought affected landscape and flow on impacts on health and wellbeing.
- Population shrinkage as farms and businesses sell, staff are laid off and people move away for job opportunities elsewhere, with flow-on effects including reduced social fabric and township vibrancy, less volunteers, less local businesses and services, less school enrolments and fewer members in sporting clubs.

Financial and business impacts

- Reduced income on farms as crop yields reduce, and destocking occurs, sometimes at low prices. High input and machinery maintenance costs remain, placing farmers in greater and greater debt. Some farms are forced to sell.
- Young farmers who have had a drought in their first year are particularly affected, with a major impact on their finances and willingness to stay in the industry.
- Financial hardship for other regional businesses as farmers "tighten their belts" and stop spending as much in communities.
- Agricultural plan derailment as otherwise well strategically planned farming operations have to "throw out'' their plans.
- Changed farming practices as farmers destock, plant different crops which are less reliant on rainfall, or do not plant crops particularly in marginal country.
- Loss of workers, particularly farm workers, other skilled agricultural allied industry workers and young people who are difficult to get back after drought.
- Lack of willingness for younger farmers to adopt family succession plans, instead opting to leave the district or pursue other professions.

I've stitched old sheets together and prayed for new shoes for my kids in drought years

It's very depressing to see bare paddocks, skinny stock and dead animals

Environmental impacts

- Loss of vegetation cover and increased soil erosion, leading to loss of topsoil and dust storms.
- Reduction in water availability.
- Reduced crop yield, stock numbers, native vegetation and native animals.
- Increased bushfire risk.
- Loss of gardens and green space.
- Introduction of weeds as feed from other regions is brought in for stock.

Service and infrastructure impacts

- Loss of local services as businesses are forced to close.
- Mains water restrictions.
- Soil erosion causes soil to accumulate on roads, causing driving hazards and in some cases cutting properties off until roads can be cleared.
- Lack of water for personal use such as showers.

Beneficial impacts

While minimal in comparison to the negative social impacts of drought, participants identified that drought can occasionally cause positive social impacts:

- Increased community closeness as community initiatives proliferate to bring people together, sporting clubs become a more important lifeline than ever, and families and friends support becomes vital.
- Increased time for those who have less workload due to less economic activity have more time for family, recreation, volunteering and education (if funds and mental wellbeing allow).
- Increased awareness of drought and how to respond which improves forward planning and response in the next drought.

What doesn't kill you makes you stronger

3.3 Climate projections and drought

Climate projections describe what the future climate could be like, sourced from multiple climate models, and based on numerous assumptions about the factors that influence climate and the trajectory of change in greenhouse gas emissions in the atmosphere. Each model uses different assumptions and algorithms to project how climate variables such as temperature, rainfall and evapotranspiration will respond in different emissions scenarios over different time frames. The projections presented in online tools and viewers each use a different combination of global climate models and so show slightly different results.

For this Plan, we have used the regional projections described by the CSIRO and Bureau of Meteorology in Climate Change in Australia. Location specific projections have been taken from MyClimateView which downscales these regional projections to provide location specific projections.

Climate change is projected to increase the amount of time spent in drought on the Eyre Peninsula. Annual rainfall is projected to decrease, and temperatures to increase. Climate Change in Australia provides the following climate projections for the region.

Table 4 Projections for the Southern and South-Western Flatlands East sub-cluster (including the Eyre Peninsula)

Weather event		Projection	Confidence*
Rainfall	**Annual rainfall**	Decreasing annual rainfall	High
	Winter rainfall	Decreasing winter rainfall	High
	Spring rainfall	Decreasing spring rainfall	High
	Summer and autumn rainfall	Unclear, although downscaling results suggest a continuation of the observed autumn declines.	Low
Drought		Increasing time spent in drought	High
Extreme rainfall events		Increasing intensity of extreme rainfall events	High
Average, maximum and minimum temperatures		Substantial increase in mean, maximum and minimum temperatures	Very high
Hot days and heatwaves		More hot days and warm spells	Very high
Frost		Fewer frost risk days	High
Potential evapotranspiration		Increased potential evapotranspiration in all seasons	High
Bushfire		Harsher fire-weather climate	High

*NOTE – Climate Change in Australia refers to confidence in a climate projection as a measure of how plausible the projected range of change is for a given emission scenario. High agreement of numerous, high-quality lines of evidence is needed to have high confidence.

Climate Change in Australia notes that on an annual and decadal basis, natural variability in the climate system can act to either mask or enhance any long-term human induced trend, particularly in the next 20 years and for rainfall.

Rainfall and temperature projections from MyClimateView for five Eyre Peninsula towns at 2050 using a high emissions scenario (Representative Concentration Pathway (RCP) 8.5) are shown in the table below. Total annual rainfall is projected to decrease in all locations. In the southern areas, the decrease is driven largely by decreases in spring rainfall, whereas further north, larger decreases are projected in summer and autumn rainfall. Average temperatures and number of hot days annually are projected to increase in all locations.

Table 5 Selected climate projections for five Eyre Peninsula towns

	Ceduna		Cowell		Minnipa		Cummins		Port Lincoln	
	(1994 – 2023)	2050s ave	(1994 – 2023)	2050s ave	(1994 – 2023)	2050s ave	(1994 – 2023)	2050s ave	(1994 – 2023)	2050s ave
Total annual rainfall	268mm	241mm	259mm	232mm	311mm	283mm	424mm	381mm	481mm	452mm
Summer rainfall	47mm	35mm	56mm	40mm	51mm	45mm	58mm	46mm	57mm	46mm
Autumn rainfall	61mm	51mm	59mm	49mm	64mm	54mm	87mm	80mm	102mm	100mm
Winter rainfall	98mm	94mm	74mm	78mm	122mm	114mm	189mm	173mm	215mm	212mm
Spring rainfall	62mm	59mm	70mm	63mm	75mm	69mm	91mm	81mm	107mm	93mm
Average maximum temperature	24.0°C	25.3°C	23.9°C	25.2°C	24.6°C	26.0°C	22.0°C	23.2°C	21.2°C	22.2°C
Annual hot days (over 35°C)	30 days	38 days	28 days	37 days	38 days	51 days	13 days	18 days	6 days	8 days

The potential impacts of climate change on Australian agriculture are well documented and include reductions in crop yields, pasture growth, animal health, carrying capacity and soil condition as well as increased invasion of weeds, pests and diseases.[28] Of primary concern for farmers on the Eyre Peninsula is how a warming and drying climate could influence broadacre cropping yields and production of pasture for grazing. In the northern parts of the Eyre Peninsula greater areas of farming land may become marginal for cropping.[29]

The region has been proactively planning for climate change for many years through supporting research projects and industry and community work into climate change impacts and potential adaptation options.

Various agricultural practices that are considered leading edge will provide some measure of adaptation in the short term. However, long term adaptation may require more transformational responses.

04 Drivers of change

Weather is not the only factor that influences the success of farms, business, community and the environment on the Eyre Peninsula. A number of economic, social and environmental trends, challenges and opportunities have a direct or indirect influence on the resilience of the Eyre Peninsula to drought and other stressors. These have been summarised in the table below.[30,31,32,33,34]

Table 6 Drivers of change on the Eyre Peninsula

Trend, challenge or opportunity	Influence on the Eyre Peninsula
Improvements in farming practices	Eyre Peninsula farmers have always been on the forefront of innovative agricultural practice. Improvements in technology and machinery have increased crop yields enormously over the past few decades and will continue to do so.
Changing crop types and stocking rates	Recent changes in demand and agricultural practice have led to changes in crop types and stocking rates. This has led to reduced sheep numbers, particularly merinos, an increase in more frost and drought tolerant varieties and increased area planted to lentils.
Lack of local agricultural value-add opportunities	Due to a lack of local agricultural value-add opportunities on the Eyre Peninsula, and the prohibitive road freight distance to many domestic markets, farmers are forced to bulk export only, affecting their potential profits.
Market competition	Until recently, Viterra had a monopoly over the crop market. The introduction of T-Ports has created competition and significantly improved market conditions for Eyre Peninsula farmers.
Increased agricultural input costs and lack of local supply of inputs	Over the last four years, the cost of agricultural inputs including seed, chemicals and machinery has substantially increased. This has impacted the profitability of Eyre Peninsula farms. The distance of Eyre Peninsula farms from many providers of agricultural inputs results in increased transport costs, reduced choice, and a need to order supplies so far in advance that this cannot be informed by the year's conditions.
Market volatility	Sudden and unexpected widespread trade disruptions resulting from global pandemics, conflict, geopolitical tensions, disease, or similar events can have significant impacts on supply chains, demand, and commodity prices. The financial success of agricultural businesses is influenced by fluctuating market prices for agricultural goods. Other market changes such as bans on the export of live sheep also influence the profitability of the agricultural industry.
Consolidation of agricultural interests	Farms on the Eyre Peninsula have become bigger over the past few decades. As farms have been sold, neighbours or commercial entities have purchased and amalgamated them into larger properties, resulting in physically larger enterprises owned and run by fewer people.

Trend, challenge or opportunity	Influence on the Eyre Peninsula
Interest rates	Recent low interest rates have helped Eyre Peninsula farmers to service their debts. As interest rates rise, this has a major impact given high debt levels of many businesses in the sector. The higher interest rates of the 1990's are still recognised as a time that changed the course of the agricultural sector on the Eyre Peninsula as many farmers unable to service their loans were forced to sell their farms.
Growth in new markets	The Eyre Peninsula is well positioned to capitalise on recent growth in emerging markets. This includes lentils, wind and solar energy, hydrogen, mining for minerals critical for the net-zero transition, space technology, seaweed and local processing and manufacturing.
Decreasing population in small towns	It can be challenging for small regional towns to retain population numbers and compete with the economic, educational and social opportunities available in urban areas and regional centres. Conglomeration of farms and increasing mechanisation of work on farms has further exacerbated this. Younger generations are often seen leaving the region, resulting in ageing populations and changing social dynamics.
Tight regional labour markets	Regional areas including the Eyre Peninsula are experiencing greater difficulty in attracting and retaining labour across a number of industries.
Lack of services and infrastructure	A lack of services including childcare, education, medical services and housing present major challenges to the Eyre Peninsula community.
High reliance on volunteers	Volunteering rates are falling across the region, particularly in younger age groups. This has implications for the future viability of sporting and other clubs which play a very important role in keeping communities connected and vibrant.
Digitalisation	An increasingly digital world has opportunities for improved farming practices and business management, online work and study, telehealth and online shopping. With technology and automation come consequences for jobs and security.
Water security challenges	Decreasing groundwater levels on the Eyre Peninsula pose a major water security challenge for the region. Alternative water sources such as a desalination plant are necessary to construct as soon as possible to limit water restrictions and long-term negative impacts on local water resources.
Climate change and decarbonisation	Responding to climate change requires a shift in the agricultural sector to reduce carbon emissions and adapt to a new and changing climate. Mining, manufacturing, transport and other industries will also require transformational change.
Decline in biodiversity and ecosystem health	The abundance and diversity of biodiversity and ecosystems globally are in rapid decline. Many species have become extinct, and more are highly threatened. The continued effects of climate change, land clearing, pollution, invasive species and direct exploitation (eg wild fishing) will result in further biodiversity loss.

05 Drought resilience

For this Plan, drought resilience is defined as:

> The ability of communities, economies and environments to withstand the impacts of drought and adapt and find new and potentially transformational ways of doing things, enabling functions and values to be sustained over the longer term.

Resilience is more than just bouncing back. In some cases, disruption can be seen as an opportunity to move in a new direction, not just recover back to a previous state. Resilience is about proactively changing in order not to be changed involuntarily.

Building resilience will help the Eyre Peninsula to get through droughts with less negative impacts and recover from them sooner.

5.1 Why is drought resilience important?

In the past, droughts have had serious impacts on the Eyre Peninsula. They have major consequences for the ability to grow crops or feed livestock, jobs and income, mental health and wellbeing, the size of regional populations, and the health of the environment.

Resilience is about taking action to try to avoid or minimise these negative impacts before they happen rather than waiting until they do occur to act, or just focusing on recovery. Building resilience can create economic, social, and environmental development opportunities. By having good business, financial and technical skills and having a plan developed before drought, the decision-making load and much of the stress of primary producers can be reduced when drought hits. This can help them to weather the drought until rains break.

It is important to recognise that drought resilience is also important for the wider community, economy and environment beyond primary producers. Other people, businesses and environments are directly impacted by drought, and the impacts of drought on farms have flow on effects to the wider region.

5.2 How will drought resilience change over the coming years?

Eyre Peninsula farmers have been at the forefront of innovative agricultural practice to adapt to changing conditions and improving technologies for decades. This has kept their productivity and profitability on the rise. However, as the climate continues to change into the future, these incremental (small adjustments) and transitional (deliberately moving from one way of doing things to another) changes may no longer be enough.

More transformational actions (fundamental shifts) may be required to maintain the resilience of our communities, economy and environment. Future iterations of this Plan are likely to place a greater focus on these type of actions in order to support resilience.

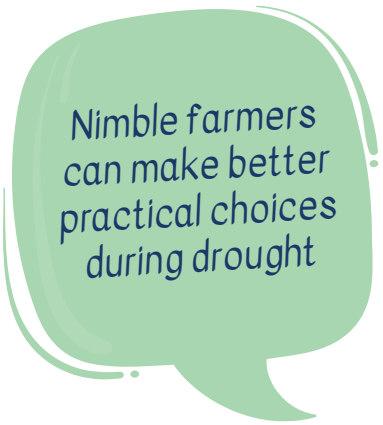
5.3 Characteristics of drought resilient individuals, communities, and regions

We heard again and again that Eyre Peninsula farmers are inherently resilient. Eyre Peninsula farmers and other community members are continually faced with a suite of challenges which have enhanced their resilience and problem-solving skills through generations.

Particular characteristics of resilience are summarised below in Table 7. These have been identified though the engagement and literature.[35,36,37,38,39]

Table 7 Characteristics of resilient individuals, communities and regions

	Key characteristics
Social characteristics	• Strong social connections with family, friends, and the wider community facilitated through formal and informal networks. • Past experience and learnings of drought or other adversity. • Good stress management and decision making including when under high pressure. • Good mental mindset, maintaining optimism where possible. • Having involved and diverse community groups, sporting clubs and other community spaces that support community connection and cohesion.
Economic characteristics	• Good business and financial management skills, including through formal education. • Having a financial buffer. • Being prepared for drought. • Good decision making in responding to drought, noting that luck can play a role given no one can control the weather. • Household and regional income diversification. • Implementing good farming practices to maximise profitability in the long term. • Having a good relationship with bank managers or other financial institutions. • Being flexible and adaptable.



	Key characteristics
Environmental characteristics	• Implementing farming techniques that maintain and enhance soil health and minimise soil erosion. • Planting more drought-tolerant species and varieties. • Integrated, widespread, preventative pest plant and animal control. • Changing farming practices early when drought begins.
Infrastructure and service characteristics	• Water infrastructure that provides water security and affordability. • Local services including childcare, healthcare, shops, housing and banks that are not just located in regional centres. • Regular and ongoing social and wellbeing services. • Local accurate weather stations and short- and long-term weather forecasts. • Local, reliable and affordable supply of farming inputs. • Competition between local services which improves market conditions. • Good port access and facilities.
Innovation, research and development characteristics	• Continually learning and being receptive to new technologies, techniques, varieties, chemicals etc. • Continual research and development into more effective farming practices, varieties etc. with good extension and uptake of this information in the broader agricultural community. • Locally specific research and development. • Good access to relevant information and knowledge.

06 Opportunities for action

This Plan sets out a vision, goals, strategies and actions to help the Eyre Peninsula to enhance its resilience to drought. Our vision is:

> Eyre Peninsula farms, businesses and communities that are strong, sustainable, vibrant and drought resilient.

6.1 Delivery principles

The following principles will guide drought preparedness, response and recovery work through this Plan:

- Investment will be focused largely during the preparation phase, to help people, businesses and the environment to set themselves up to minimise the impacts of drought. This will help to enhance long-term preparedness and resilience in the region.
- Support will be available to everyone as needed and not disadvantage those that respond early to emerging risks or issues.
- Timing of delivery of programs during drought is critical. Policy intervention will be mobilised quickly to ensure an appropriate response when it is most needed.
- Where existing, successful initiatives exist, these will be supported, promoted and enhanced where required rather than delivering new initiatives.
- A bottom-up, community-driven approach will be used wherever appropriate, to understand what locals want and need and how to deliver programs in a way that suits them. This will be delivered through active and ongoing community engagement.

6.2 Goals, Strategies and Opportunities

The goals, strategies and opportunities to build drought resilience on the Eyre Peninsula are described in the following sections. The strategies seek to leverage existing strategic planning and avoid duplication of effort by referring to the implementation of other regional plans. Strategies are high level to provide flexibility to accommodate changing circumstances, new evidence and evolving knowledge while remaining accountable to the stated goals, vision and regional values.

The vision and goals were developed collaboratively by the Advisory Group using information collected through the first phase of engagement. These were then tested with the community through the second phase of engagement.

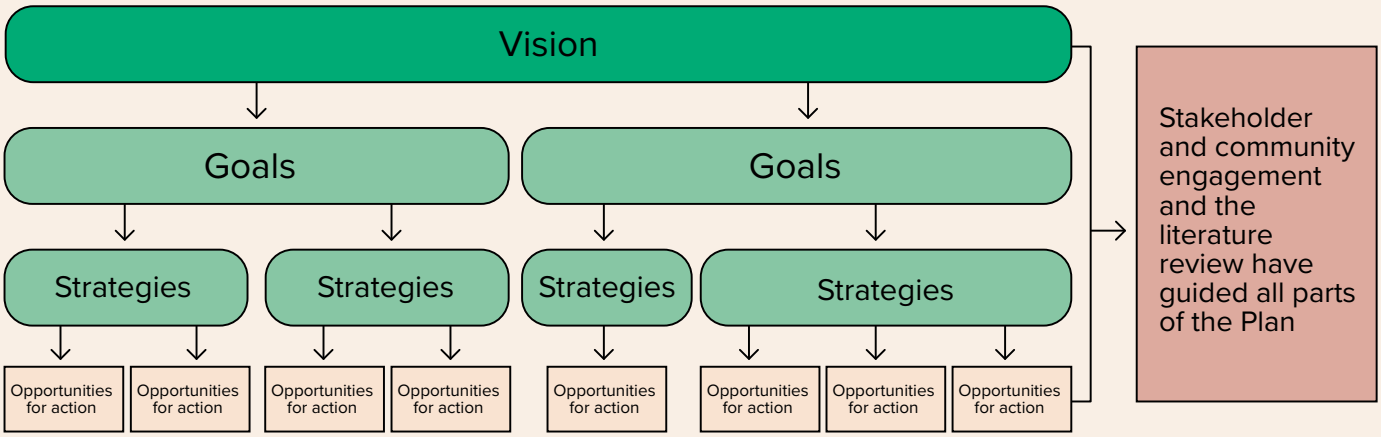
The strategies and opportunities for action have been developed directly from the ideas raised by stakeholders and the community throughout the engagement, as the actions they believe will be most effective for their region.

These have been supplemented and strengthened by the literature review and discussion with the Advisory Group.

While targeted at the impacts of drought, this support provides co-benefits for broader resilience and adaptation.

The goals, strategies and opportunities are presented under the following:

- Farming innovation
- Community wellbeing
- Financial sustainability
- Landscapes and environments
- Governance and advocacy
- Regional infrastructure and services
- Regional economic development.

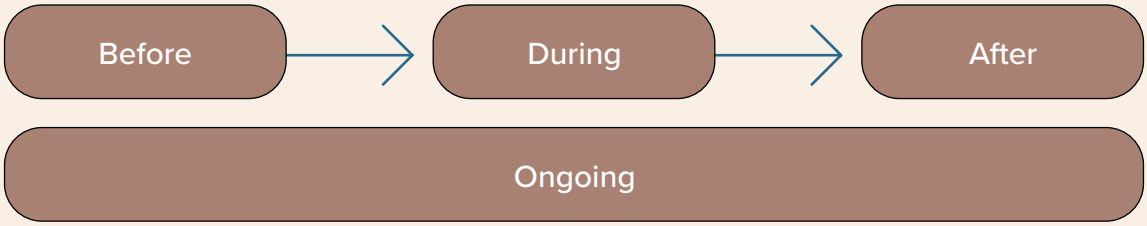


Timing

The timing for delivery of each opportunity has been categorised according to when it would fit within the drought cycle.

The Plan places a focus on actions to be undertaken before drought hits. By focusing effort and investment in this phase, Eyre Peninsula farmers, communities, businesses and environments will be better set up to minimise the impacts of drought, rather than enduring them when they come.

This approach will help to support the long-term preparedness, sustainability and resilience of farm businesses and communities. Nonetheless, it is recognised that support will still be needed during and after drought, and this plan will help deliver this support particularly during extended, severe droughts.



Individual action

Opportunities in the plan have been scoped as actions to be taken at a community or regional scale. However, many of these can also be progressed at an individual scale. For example, while regional organisations may provide training and grants for household income diversification, farms and families may be able to diversify their income themselves without external support. These sorts of actions are identified with a **person icon**.

New initiatives

Many of the strategies relate to work that is already underway, and either need to be extended, expanded, promoted or accelerated to have greater benefit. Other strategies present opportunities that are limited in their current application or are not at all part of current action on the Eyre Peninsula. These present new opportunities that could lead to significant or transformational change for the region and are flagged with a **lightbulb icon**.

Potential partners

Lead organisations have not been identified for each opportunity in this Plan.

Responsibilities will be identified in an Implementation Plan (see section 7.1)

Partners may include members of the Drought Resilience Advisory Group as well as other organisations including:

- Regional Development Australia Eyre Peninsula (RDAEP)
- Agricultural Innovation & Research Eyre Peninsula (AIR EP)
- Eyre Peninsula Landscape Board (EPLB)
- SA Drought Hub
- Local Government (including the Eyre Peninsula Local Government Association and councils)
- Department of Primary Industries and Regions South Australia (PIRSA)
- South Australian Research and Development Institute (SARDI).

FARMING INNOVATION

Eyre Peninsula farmers continually look to make sustainable improvements to their businesses. They are well known for how readily they adopt new technologies and make improvements based on research outcomes to ensure their farms are productive and profitable.

Ongoing research, development and extension is needed to continue to drive the advancement of farming systems on the Eyre Peninsula. There are many areas for further investigation to enable continued productive capacity, profitability and resilience in the face of a drying climate and changing market conditions. The importance of evidence-based, practical, locally relevant information is recognised.

Innovation needs to be farmer-centred, with farmers as an integral part of the planning and delivery of research, development and extension. Peer-to-peer learning and use of existing trusted communication channels will be prioritised.

Capacity building actions will primarily occur 'before' drought to provide the greatest potential to mitigate drought impacts.

Continuing to provide access to information and support to build capacity to adapt and respond to risks will allow farmers to improve their practices and pass on healthier and more sustainable farms for future generations.

Goal: Profitable, productive and adaptive agriculture thriving in a changing climate

Potential partners:
AIR EP, EPLB, PIRSA, SARDI, SA Drought Hub, Minnipa Agricultural Centre, Primary Producers SA, Livestock SA, Grain Producers SA, farming systems groups, agricultural service providers, Research and Development Corporations, Australian Government Department of Agriculture, Fisheries and Forestry, Local Government, RDAEP, education institutions

Strategies	Opportunities for action	Timing
Support capacity building and implementation of farm and land management actions that strengthen drought resilience	Build understanding, capacity and support for farmers to implement modern, locally proven agricultural practices and resilience building farm, business and land management approaches.	Before
	Provide capacity building activities to support farmers to understand the potential benefits and application of installing infrastructure that can support drought resilience such as small farm scale water management infrastructure, on-farm or in-system feed storage, feedlots, weather stations and on-site energy generation and storage.	Before
	Investigate and promote funding for infrastructure that contributes to farm resilience, including to manage water, feed, stock, vegetation and soils.	Before
	Educate and communicate with the community on the weather forecast tools available so that better more informed decisions can be made, in conjunction with local knowledge.	Before
	Support farmer reflective practices, drought learning documentation and peer experience sharing through online platforms, diaries, and experience sharing forums.	During and after

Goal: Profitable, productive and adaptive agriculture thriving in a changing climate		
Strategies	**Opportunities for action**	**Timing**
Drive adoption of on farm innovation through agricultural research, development and extension	Identify and communicate key agricultural research and development priorities across the region through targeted engagement with agricultural groups, farmers, agricultural suppliers and other key industry stakeholders.	Before
	Invest in priority agricultural research, development, extension, cost-benefit analysis and adoption of new farming systems, techniques, varieties, technologies, tools and products that increase profitability and climate resilience of primary production in the long-term.	Before
	Regularly communicate research and development findings to farmers and their key influencers using a diversity of platforms, for example Stickybeak days, field days, workshops, podcasts, YouTube videos, case studies, newspaper articles, webinars, extension officers, FaB mentors, Rural Business Support, Ag Bureau groups, agronomists, demonstration farms etc. Minimise costs of information access.	Before
	Ensure Eyre Peninsula farmers have the best available information and local demonstrations on emerging ag tech opportunities including automation, artificial intelligence, monitoring technologies, data management and use in decision making, etc. to drive farm efficiency.	Before
	Continue and expand networks with other agricultural research centres around Australia and overseas to build knowledge of emerging research and development, seek opportunities to trial approaches on the Eyre Peninsula and share local research findings.	Before
	Identify and implement opportunities for small scale farm trials and demonstrations including funding for farmers to trial new techniques, products and practices on their own farms to validate innovations and new and emerging research findings.	Before
	Implement the AIR EP Strategic Plan to continue to provide leadership and direction to deliver relevant and innovative, farmer driven research, development and extension to advance agriculture on Eyre Peninsula.	Before
Support uptake of carbon farming and other practices that support income diversification and the transition to net zero 	Build carbon farming literacy and identify and demonstrate opportunities for carbon sequestration into soils via contemporary farming practices and perennial vegetation.	Before
	Support farmers to measure their farm emissions profile and develop strategies to manage on-farm emissions.	Before
	 Investigate and support the uptake of agricultural practices that increase biodiversity including regenerative agricultural practices, quantifying the value of biodiversity on-farm, and revegetation programs.	Before

FINANCIALLY SUSTAINABLE ENTERPRISES

Farmers are no longer 'just farmers' – they are now business people, managing millions of dollars of inputs and outputs each year.

Loss of income is one of the most immediate effects of drought on farmers. This then flows through to the wider economy, as farmers "tighten their belts" and reduce their spending at local shops and suppliers.

The following strategies and opportunities for action aim to upskill and support farmers and business owners to manage their businesses and finances in a way that enables them to maintain an income stream, minimise debt and staff layoffs, and manage their business as best as possible before, during and after drought. This will help to support individuals and businesses to set themselves up to get through drought without the need for external financial handouts, and to operate their finances more successfully in the long term.

The opportunities for action also identify effective ways to support economic activity and employment during droughts for those in need, which has beneficial flow on effects for the wider community.

Goal: Long-term financially viable businesses and management capabilities

Potential partners:
RDAEP, Local Government, Rural Business Support, AIR EP, PIRSA, SA Drought Hub, EPLB, SARDI, Minnipa Agricultural Centre

Strategies	Opportunities for action	Timing
Enhance financial and business management literacy and planning that supports drought planning	Provide support including training, resources, funding for consultants and scenario planning workshops for farmers to prepare a Farm Drought Plan that supports decision making leading in to and during drought.	Before
	Support and promote locally provided education and training initiatives to enhance farmer's financial and business management skills to support good business management, contingency planning, forward planning and succession planning.	Before
	Scope opportunities to establish or enhance existing communities of practice and network approaches for farmers to continually learn, share and update their business, financial and technical skills with their peers.	Before
	Promote existing mechanisms for farmers to save money in high income years including Farm Management Deposits (FMDs) to be accessed during droughts.	Before
	Provide a forum for finance professionals (bankers, accountants, business advisers) and agricultural suppliers to interact with farm technical advisers (including machinery and input suppliers) to develop a more informed and shared understanding of farm finance decision making.	Before

Goal: Long-term financially viable businesses and management capabilities		
Strategies	**Opportunities for action**	**Timing**
Support diversification of income at a farm scale	Support farmers to explore and implement action to diversify on- and off-farm income, including through different crops, sheep, tourism, online jobs, businesses and town or transport jobs including through mentoring, support for business establishment and advocacy for improved childcare services.	Before
	Investigate and share emerging opportunities for biodiversity credits, carbon farming, emissions reduction and other approaches that enable diversification and can deliver financial benefit from nature positive outcomes.	Before
	Scope opportunities to support workers in the agricultural sector to gain additional education and skills to diversify their income, for example through provision of training or educational grants.	Before, during
Scope local programs to keep locals employed and stimulate local economic activity during drought	Scope and prepare collaborative opportunities in advance for projects or programs that can be delivered during drought, to ensure funding can be spent quickly and effectively once drought hits. Prioritise projects that provide continuing value to the local community during and after drought.	Before
	Seek funding to implement these programs to stimulate local economic activity, provide jobs and income to local workers who may be out of work and source local materials from local businesses.	During
Support aspiring farmers to enter the agricultural industry	Explore opportunities to influence loan programs (eg Agristarter) to increase ease of accessibility into the sector for aspiring farmers.	Before
	Support young and new farmers to thrive in the agricultural industry through targeted capacity building, mentoring and the establishment of a “next generation” farming support network.	Before

COMMUNITY WELLBEING

Drought takes a major toll on mental health and wellbeing. Farmers, their families and the wider community need to be supported to maintain hope, connectedness and positivity through these trying times. Those who have strong connections with their friends, family and community, positive aspects of their life that they can focus on (such as sport, events or gatherings), and access to support when they need it are better able to minimise the mental health effects of drought.

It is important to provide a range of initiatives that meet the needs of diverse communities. Not all people are able or willing to recognise when their mental health is in decline and not everyone reaches out when they need help. Reaching these people is particularly critical.

Each community also has their own needs, and initiatives will be tailored to meet these. A one-size-fits all approach will be avoided wherever possible as past experience has shown that this is not effective.

There are a large number of existing successful regional initiatives in this space which will be supported and promoted through this plan.

Goal: Capable individuals and healthy communities working together to benefit the region		
Potential partners: **Local Government, SA Health, Local Health Networks, PIRSA including PIRSA Family and Business (FaB) mentors, rural counsellors, Centrelink, RDAEP, AIR EP, EPLB, SA Drought Hub, Rural Aid, Rural Business Support, Not for Profit organisations, SARDI, Minnipa Agricultural Centre, Red Cross, external/out of region community organisations**		
Strategies	**Opportunities for action**	**Timing**
Maintain and strengthen community health and wellbeing	Coordinate and promote delivery of existing and new mechanisms for mental health and wellbeing counselling, mental health first aid training, mentoring, events (such as inspirational speakers or workshops), and other support services for Eyre Peninsula farmers, farming families and wider communities.	Before, during, after
	Provide formal and informal opportunities for people with experience of drought to share what helped them through it so others are aware of what might happen, and acknowledge that farmers are not alone in drought.	Before, during, after
Facilitate community connection through events and activities	Work with community groups to prepare and deliver a program of free or low-cost initiatives that bring the community together, tailored to community needs and different audiences, for example community events, workshops, presentations, comedy shows, family fun days, sport and art initiatives.	Before, during, after
Support local sport, interest and service clubs and community leaders to continue to play their important role in sustaining community connections	Support local sporting and other interest or service clubs to run their day-to-day programs as well as one-off events that facilitate community connection and wellbeing.	Before, during
	Support volunteer and volunteer organisation involvement, and review systems and processes to identify opportunities for improvement to reduce burden on volunteers and make it easy for volunteers to participate.	Before, during
	Develop local leadership capacity by delivering and encouraging participation in leadership programs.	Before

LANDSCAPES AND ENVIRONMENTS

Healthy ecosystems are more resilient to drought. By proactively managing, protecting and restoring our natural environment before drought, it will be better able to withstand drought and continue to provide benefits to our communities and economies.

There are emerging opportunities on the Eyre Peninsula for nature-based solutions that can offer cost-effective on farm protections while delivering co-benefits such as carbon capture and improved food and water security. Sustainable natural resource management, including of soil, water, and biodiversity, must be prioritised for building resilience to drought.

Goal: Healthy soil, water and biodiversity that sustain productive landscapes		
Potential partners: **EPLB, Aboriginal groups, SA Drought Hub, Department for Environment and Water, National Parks and Wildlife Service, Local Government, conservation and environmental NGOs and community groups, SA Water, schools**		
Strategies	**Opportunities for action**	**Timing**
Protect and enhance soil health	Implement the Eyre Peninsula Landscape Board's Land Management Control Policy to support landholders to minimise risk of land degradation.	Before
	 Facilitate land management to improve soil health and vitality.	Before, during
Effectively manage surface water and groundwater extraction	Effectively manage water allocation planning in Prescribed Wells Areas and water affecting activities to ensure the sustainable and equitable use of the prescribed water resources, while also making sure the needs of the environment are taken into account.	Before, during, after
	Implement water resource efficiency programs or water restrictions to protect the condition of local groundwater aquifers.	Before, during
Control pest and overabundant native animals and plants	 Continue to support land managers to control priority pest plants and animals including through the implementation of the Eyre Peninsula Landscape Board's Pest Plant and Animal Control Policy, provision of bait for pest animals and culling of overabundant native animals.	Before

GOVERNANCE AND ADVOCACY

This Plan will not reach its goals without effective governance. With clear leadership, coordination and communication the Plan can deliver on its goals in a way that is strategic, effective, minimises duplication, fills gaps and delivers what is most needed on the ground. Engagement with communities to understand what they need and how to deliver this in a way that suits them is central to this.

There are many opportunities to partner with others to enhance and broaden outcomes.

Goal: Local, effective and coordinated action led and governed by local people that understand the region		
Potential partners: **RDAEP, EPLB, Local Government, AIR EP, PIRSA, SA Drought Hub**		
Strategies	**Opportunities for action**	**Timing**
Establish effective drought governance to support drought plan implementation	Continue the Eyre Peninsula Drought Resilience Advisory Group and explore opportunities to expand membership. Drive implementation of this plan including: • Advocate for and support long-term funding. • Support review and improvement processes to ensure partner organisations and agencies learn from drought experiences. • Collaborate with other government agencies, not-for-profit organisations and private companies to identify opportunities for resource sharing, particularly where organisations have shared/ common goals.	Before
	Seek funding for a project officer to support the Eyre Peninsula Regional Drought Resilience Advisory Group to implement the Plan, including to support the delivery of drought resilience funding applications and projects, and improve the coordination of programs from different agencies to maximise efficiency and effectiveness and avoid duplication of effort.	Before
	Develop a communications strategy and establish mechanisms for the Eyre Peninsula Drought Resilience Advisory Group to engage with communities about drought plan implementation and available support before, during and after drought.	Before

Goal: Local, effective and coordinated action led and governed by local people that understand the region		
Strategies	**Opportunities for action**	**Timing**
Promote regional primary production and good news stories to protect social licence to farm	Work with other regions and organisations to improve public perception and appreciation in metropolitan areas of farmers and the important role they play in South Australia's food security and economy.	Before
	Celebrate farming and community successes, promoting good practice that will or is strengthening drought resilience.	Before, during, after
	Investigate opportunities to build Eyre Peninsula's agricultural brand.	Before
Work in partnership with Aboriginal communities to build drought resilience	Engage and collaborate with Aboriginal individuals and groups to better understand their needs and what would assist in enhancing the drought resilience of their communities and the environment and support the delivery of identified projects.	Before, during
Advocate for changes to financial mechanisms to support farmers to build savings, manage tax and get through extended droughts	Advocate for Farm Management Deposits (FMDs) to be accessible during drought and available to all farms regardless of business structure.	Before
	Advocate for potential taxation system supports beyond FMDs to help farmers through drought periods.	Before
	Advocate for ongoing financial support for farmers through the RIC (Regional Investment Corporation) or other schemes particularly to support farmers in subsequent years of extended droughts. Financial support should support forward planning and good decision making and not disadvantage those in need for example those working a second job to provide for daily needs.	During

The member organisations that make up the Eyre Peninsula Drought Resilience Advisory Group specialise in a range of different sectors. Future governance will lean into the strengths of each organisation, ensuring the organisation most suited to the task will deliver each action. The focus areas of the Advisory Group organisations are summarised in the table below.

Advisory Group member	Area of focus
Regional Development Australia Eyre Peninsula (RDA EP)	Regional economic development
Agricultural Innovation & Research Eyre Peninsula (AIR EP)	Agricultural research, development and extension
Eyre Peninsula Landscape Board (EPLB)	Sustainable natural resource management
SA Drought Hub	Drought resilience of farmers and regional communities
Eyre Peninsula Local Government Association (EPLGA)	Service and leadership for councils
Eyre Peninsula councils	Management of local issues and community
Department of Primary Industries and Regions South Australia (PIRSA)	Primary industries and regions

REGIONAL INFRASTRUCTURE AND SERVICES

Agricultural communities cannot thrive without adequate infrastructure and services to support them.

Infrastructure including desalination plants, weather stations and ports are critical to the future of the Eyre Peninsula. Water security at a regional scale is required to continue to enable our towns and farms to function. Local and regional scale water supply planning and investment is required to address supply constraints and future demand.

New and community-focused approaches to delivering infrastructure and services should be explored, for example through community cooperatives, that benefit the community.

Appropriate access to services including education, childcare and healthcare is an ongoing challenge in small towns across the Eyre Peninsula. Improving these service offerings will make the Eyre Peninsula a more desirable place to live and allow residents to reach their full potential and lead happy, healthy and purposeful lives.

Goal: Future-proofed water supplies, local services and infrastructure that attracts, retains and supports residents and regional investment

Potential partners:
RDAEP, EPLGA, PIRSA, Department for Infrastructure and Transport, SA Water, Local Government, Department for Energy and Mining, SA Power Networks, education institutions

Strategies	Opportunities for action	Timing
Provide regional mains water security for the Eyre Peninsula	Advocate for investment in infrastructure to deliver water security for the whole Eyre Peninsula.	Before
	Advocate for further investment for network upgrades and improvements to water security to accommodate the region's projected water demand.	Before
Optimise the use of fit for purpose water	Advocate for wastewater reuse in towns to maintain irrigation of cool, green spaces.	Before
	Identify opportunities to install additional water infrastructure to provide water for firefighting.	Before
Improve regional weather data collection and forecasting	Develop a business case to install a BOM compliant mesonet weather station network across the Eyre Peninsula to improve localised forecasting including inversions, frost and severe weather events.	Before
	Develop a business case to install a doppler radar system that covers the lower, central and eastern Eyre Peninsula to allow for more informed on-farm decision making and reduce risk.	Before

Goal: Future-proofed water supplies, local services and infrastructure that attracts, retains and supports residents		
Strategies	**Opportunities for action**	**Timing**
Improve the services and infrastructure that support, maintain and connect communities	Invest in the places where community gather such as sporting clubs and other community spaces, so they provide places for activity and connection.	Before
	Work with the education sector to enhance local education and training opportunities to keep young people in the region, working in the agricultural sector and provide them with better school subject options, enhanced local teacher attraction and retention, and better access to technology to access online education.	Before
	Advocate for improved internet and mobile connection across the region to allow for improved communication and enable use of on-line tools and information services that enhance farm and other business management.	Before
	Implement the Eyre Peninsula Strategic Plan actions to facilitate investment in strategic transport infrastructure, particularly on critical grain and livestock transport routes, to create new cost effective avenues to export markets, reduce costs and facilitate opportunities for local processing and value adding ventures.	Before
	Implement the Eyre Peninsula Strategic Plan actions relating to housing, healthcare, childcare and education that support the resilience of the community.	Before
	Lobby government for a consistent region wide television and radio coverage (SA / Eyre Peninsula based) so that all communities across the region are better connected and function as a united and cohesive local information and promotion service. This should include the re-introduction of a local news service.	Before
	Investigate models for community cooperatives and shared farm infrastructure such as community owned and run grain storage facilities, shared transport, truck stops etc. that reduce costs and benefit communities.	Before

REGIONAL ECONOMIC DEVELOPMENT

The Eyre Peninsula has strengths that make it well suited to capitalising on the benefits of new and emerging markets. These include renewable energy (wind, solar and hydrogen), mining, value-add agribusiness, tourism and space. A new and exciting economy based on decarbonisation provides significant prospects for the Eyre Peninsula as it moves into a more sustainable world.

Diversity enhances economic and social resilience and provides employment choice. Diversification also increases convenience and provides greater opportunities for businesses to capture local expenditure, allowing communities to support local businesses.

Goal: Sustainable regional development that contributes to drought resilience		
Potential partners: **RDAEP, Local Government, community organisations, NGOs, Eyre Peninsula Cooperative Bulk Handling, Eyre Hub**		
Strategies	**Opportunities for action**	**Timing**
Support diversification of the economy at a regional scale	Implement regional strategic plans to encourage and support the development of new and emerging high value industries (not reliant on rainfall) to diversify the regional economy and decrease community reliance on agricultural income, including through provision of adequate infrastructure.	Before
	Scope and implement opportunities for local agricultural value-add that provides alternatives to the bulk production of a commodity where there is little market control, for example local mills, abattoirs, oil presses, feed pelletising manufacturing, protein powder manufacturing.	Before
Investigate and advocate for opportunities to influence farming input and output prices and availability	Explore the development of an ammonia production facility to produce a local supply of fertiliser to reduce reliance on global markets, provide security of supply, reduce travel costs and reduce emissions.	Before
	Scope opportunities to enhance diversification of suppliers of the agricultural industry to promote competition and security of supplies and services.	Before
Maintain population levels in regional towns	Support marketing of the Eyre Peninsula as a regional “lifestyle destination”, to support the attraction of new residents and tourists, highlighting the unique selling points of each diverse part of the Eyre Peninsula.	Before, after
	Leverage remote working opportunities to encourage workers, especially those with highly sought after skillsets, to live and work in the region.	Before
Support shopping locally	Work with regional community and business support organisations to develop and implement shop local schemes during periods of drought, with a focus on supporting local small businesses.	During

07 Implementation, monitoring and evaluation

7.1 Implementation

This Plan has been prepared as a framework or prospectus to guide future effort and investment in regional drought resilience.

The opportunities identified in this Plan are unfunded and some may only be progressed with further investment. Funding opportunities may be through the Future Drought Fund, industry funding, or other funding streams. A central purpose of this Plan and the Advisory Group that governs it is to ensure the region is well prepared to apply for any funding opportunities that arise in a proactive, strategic and well informed manner.

Many of the opportunities identified in this Plan will be delivered through other programs such as those run directly through the Future Drought Fund. The Advisory Group will monitor these opportunities to avoid any duplication and provide input and feedback as to how these programs can be delivered in a way that will meet the needs of the Eyre Peninsula.

It is proposed that the Eyre Peninsula Drought Resilience Advisory Group established to develop this Plan will drive and be accountable for the delivery of the Plan. Implementation of specific opportunities may require collaboration between smaller groups of partners.

Some opportunities may also be delivered in partnership with other regions where this can enhance outcomes.

The first step in delivering this Plan will be to develop an implementation plan that identifies potential partners and delivery mechanisms. These partners may include organisations represented on the Advisory Group, other government agencies, non-government organisations and the private sector. The Advisory Group will aim to identify the most appropriate partners for each opportunity, considering alignment with current or planned actions and existing responsibilities. As many of the opportunities will require an ongoing program of work, the capacity and capability of potential partners may need to be considered. Some opportunities relate to an expansion or acceleration of existing programs, and existing program leads may be best placed to continue their roles in these programs.

Through the engagement to support the development of this Plan we have heard clearly that farmers and communities want to be involved in the decisions that affect them. Planning the delivery of all projects will include local stakeholders and community from the start, to get buy-in and support beneficial outcomes.

7.2 Governance

It is proposed that the Advisory Group established to develop this Plan continues to coordinate and support project funding applications and project delivery to avoid duplication of effort and maximise local and regional benefits. Additional membership may be investigated.

It is proposed the group meets regularly to maintain an ongoing shared understanding of emerging issues, report on progress of actions and track all related funding applications.

As identified in the Governance and Advocacy topic, funding will be sought for a project officer to support the Eyre Peninsula Regional Drought Resilience Advisory Group in implementing the Plan. The officer would help to coordinate and deliver drought resilience project funding applications and project delivery, and improve the coordination and funding of programs from different agencies to maximise efficiency and effectiveness and avoid duplication of effort. The officer would be hosted by one of the Advisory Group organisations.

7.3 Monitoring, evaluation and reporting

This Plan and its implementation will be monitored, evaluated and reported on according to the Regional Monitoring, Evaluation and Learning Guide prepared by the Department for Primary Industries and Regions for the South Australian Regional Drought Resilience Plans.

Monitoring and evaluation are essential parts of delivering any plan, project or program. Undertaking monitoring and evaluation will help the Advisory Group, stakeholders and the community understand if the vision and goals are being progressed.

It ensures accountability and provides information to share with partners and stakeholders to demonstrate program value.

An adaptive learning approach will be taken, with successes and limitations of past and current actions reviewed and used to assist in refining future approaches to optimise project outcomes. The Plan will be an adaptive document that is adjusted over its lifetime as necessary to respond to emerging challenges, opportunities and research and maintain its relevance and usefulness.

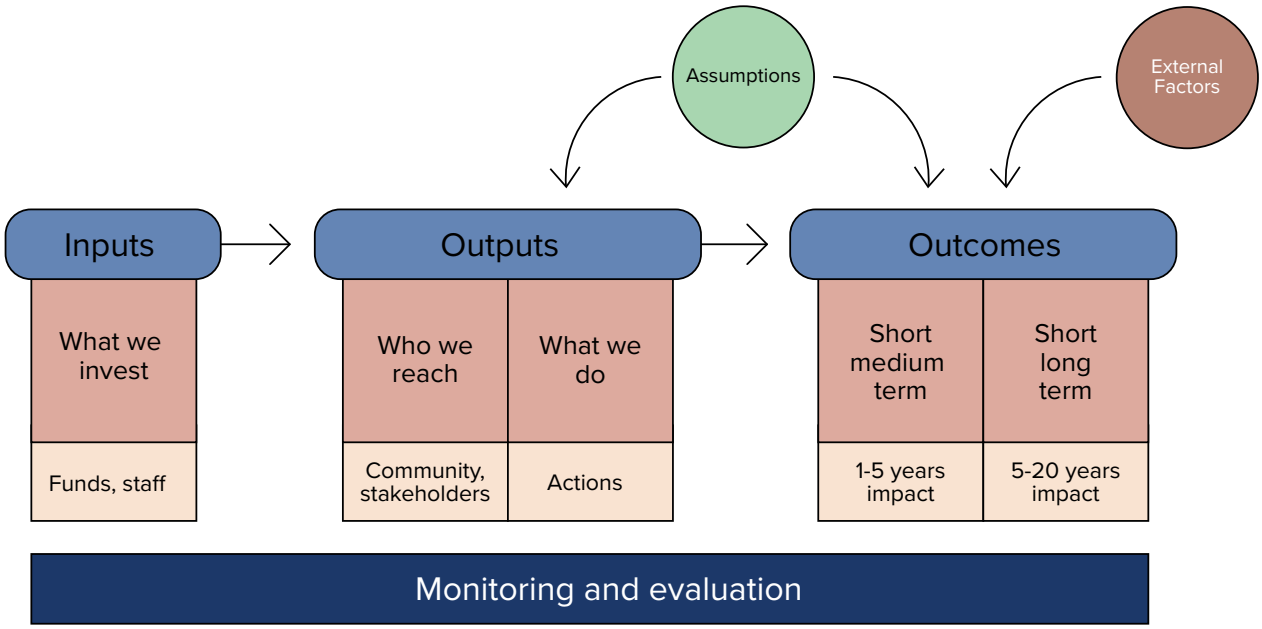
The below monitoring and evaluation framework is based upon a program logic approach. Program logic illustrates cause and effect relationships to provide understanding of how program resources are used to produce outputs and deliver outcomes in the short to long term. The model also acknowledges the interaction of assumptions and external factors with outputs and outcomes. The elements of the program logic model are defined below in Figure 7.

Outputs: measurement of the direct actions taken, for example the activities and events delivered, the services provided and the funds spent. Output measures include both activities and associated participation.

Assumptions: the expectations we have that the actions we take and the participants involved will lead to the outcomes or change we seek to achieve.

Outcomes: the desired results of direct actions on individuals, groups, communities, organisations and the environment in the short-medium and medium-long term. Outcomes in the medium-long term are often influenced more by external factors (actions undertaken by others or changes in environmental, social or governance factors).

Figure 7 Program logic model for the delivery of the Plan



External Factors: the uncontrollable factors in the wider environment surrounding our programs that may interact with and influence outcomes.

The program logic and monitoring indicators for a selection of example strategies from the Eyre Peninsula Regional Drought Resilience Plan are provided in Appendix A. This will be reviewed, revised and expanded as projects are funded and planning for delivery commences.

As projects are scoped for funding and then implemented, an evaluation process will be established that will consider:

- How effective was the project/program in achieving its intended outputs and outcomes?
- To what extent did the project/program contribute to the relevant goals, and what other things helped or hindered its implementation?

Once implementation commences, a biannual evaluation of the Eyre Peninsula Regional Drought Resilience Plan itself will be initiated that will consider:

- To what extent has the Plan been implemented and has impacted on regional stakeholders' capacity and resources to better plan, manage and recover from drought?
- What changes/support are/is needed to ensure that the Plan best provides an effective framework for action and stakeholders can effectively work together towards implementing those actions?

08 Glossary

Adaptation	Adjustment or modification in natural and/or human systems in response to actual or expected shocks and stresses to moderate harm, reduce vulnerability and/or exploit beneficial opportunities.
Climate projection	A scenario of future climate, generally resulting from running a global climate model with a specified greenhouse gas concentration scenario (or RCP). A projection differs from a prediction in that it is conditional on the representation of a particular global climate model and the uncertain assumptions of the model inputs (primarily the greenhouse gas concentration scenario, or RCP).[42]
Carbon farming	Carbon farming includes: • sequestering carbon in the landscape through regeneration and planting of native vegetation; farm and plantation forestry; and improving soil management to ensure that carbon inputs exceed outputs. • reducing emissions, such as livestock methane emissions; fertiliser emissions and through manure management.[43]
Decarbonisation	The removal or reduction of carbon dioxide and other greenhouse gas outputs into the atmosphere.
Drought	A period of abnormally dry conditions that impacts negatively on water availability and agricultural production in a region and, consequently, impacts negatively on the economy and environment of the region and the health and wellbeing of its residents.
Drought resilience	The ability of communities, economies and environments to withstand the impacts of drought and adapt and find new and potentially transformational ways of doing things, enabling functions and values to be sustained over the longer term.
El Niño-Southern Oscillation	The El Niño and La Niña are part of one of the strongest climate drivers for the Eyre Peninsula. They are part of a natural cycle known as the El Niño–Southern Oscillation (ENSO) and are associated with many months of warming (El Niño) or cooling (La Niña) in the central and eastern tropical Pacific.[44]
Governance	Governance is the structures and processes by which individuals, groups and agencies in a society share power and make decisions. It can be formally institutionalised, or informal.
Indian Ocean Dipole	The Indian Ocean Dipole (IOD) is defined by the difference in sea surface temperatures between the eastern and western tropical Indian Ocean. A negative phase typically sees above average winter-spring rainfall in Australia, while a positive phase brings drier than average seasons.[45]

Southern Annular Mode	The Southern Annular Mode, or SAM, refers to the north/south movement of the strong westerly winds that blow almost continuously in the mid- to high-latitudes of the southern hemisphere. The SAM phase that influences rainfall on the Eyre Peninsula is the SAM summer negative phase which, when active, decreases chance of summer rain in the region.
Transformational change	The process of radically changing or building a new system with different structure, functions, feedbacks and identity.
Trigger point	A pre-agreed situation or event, that when met, activates a management intervention. Trigger points are usually defined in the planning phase.

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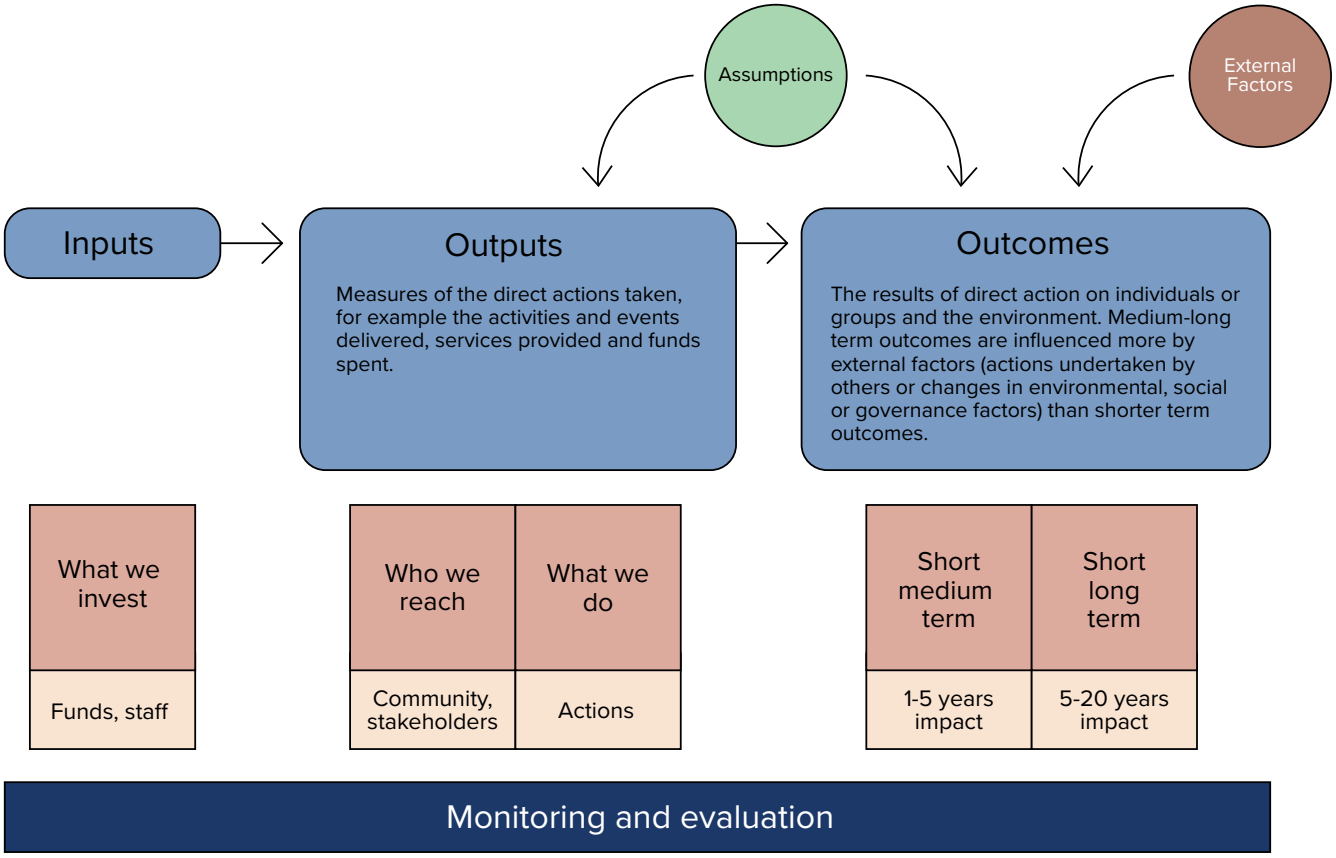
10 Appendix A

Program logic and monitoring indicators for selected strategies

The table below describes the program logic for selected strategies in the Eyre Peninsula Drought Resilience Plan and identifies proposed monitoring indicators for outputs and outcomes.

Program logic illustrates cause and effect relationships to provide understanding of how program resources are used to produce outputs and deliver outcomes in the short to long term. The model also acknowledges the interaction of assumptions and external factors with outputs and outcomes.



STRATEGY - SUPPORT CAPACITY BUILDING AND IMPLEMENTATION OF FARM AND LAND MANAGEMENT ACTIONS AND INFRASTRUCTURE THAT STRENGTHEN DROUGHT RESILIENCE

Opportunities for action

- Capacity building for resilience-building farm and land management approaches
- Integrated agricultural weed and pest management
- Education to enhance understanding of weather forecasts and decision making
- Support young and new farmers to thrive in the agricultural industry
- Capacity building for drought-resilient infrastructure
- Promotion and provision of infrastructure funding

POTENTIAL OUTPUTS Activities and participation	DESIRED OUTCOMES Related goal	OUTCOME INDICATORS	
		1-5 years	5-15 years
• Number of workshops, training sessions, and field days conducted • Number of farmers participating in capacity-building activities • Number of successful grant applications or funding approvals for infrastructure projects	Profitable, productive and adaptive agriculture thriving in a changing climate	• Implementation of resilience-building farm and land management practices (target increase) • Pest plant and animal populations and distribution (target decrease) • Young and new farmers employed in the agricultural industry (target increase)	• Adoption of sustainable and resilient farming practices across the region (target increase) • Continued use and optimisation of infrastructure for managing water, feed, stock, and soils (target increase) • Farm productivity and profitability (target maintain or increase)

STRATEGY - DRIVE ADOPTION OF ON FARM INNOVATION THROUGH AGRICULTURAL RESEARCH, DEVELOPMENT AND EXTENSION

Opportunities for action

- Identify and communicate research priorities with stakeholders
- Expand research networks
- Investment in priority agricultural research
- Share information on emerging agricultural technologies
- Small-scale farm trials
- Communicate research findings
- Events or activities to share learnings and experiences

POTENTIAL OUTPUTS Activities and participation	DESIRED OUTCOMES Related goal	OUTCOME INDICATORS	
		1-5 years	5-15 years
• Number of new research initiated or expanded on the Eyre Peninsula • Investment in research and development projects • Number of communication materials developed and shared • Number of farm trials • Number of extension events or activities to share learnings	Profitable, productive and adaptive agriculture thriving in a changing climate	• Adoption of new farming systems, technologies, and practices (target increase) • Number of farmers accessing communication materials	• Sustained adoption of innovative farming practices and technologies (target increase) • Established culture of continuous learning, reflection, and knowledge sharing among farmers (target increase)

STRATEGY - SUPPORT DIVERSIFICATION OF INCOME AT AN ENTERPRISE SCALE

Opportunities for action

- Explore and share opportunities for farm income diversification on Eyre Peninsula
- Provide education and training in business establishment
- Advocate for improved childcare services
- Investigate and share information on biodiversity credits, carbon farming and emissions reduction
- Provide education and training to build new skills

POTENTIAL OUTPUTS Activities and participation	DESIRED OUTCOMES Related goal	OUTCOME INDICATORS	
		1-5 years	5-15 years
• Number of education and training programs run • Participants in education and training programs • Information prepared on viable diversification options • Information prepared on local application of biodiversity and carbon credits and emissions reduction	Long-term financially viable businesses and management capabilities	• Local employment and income generation (target increase) • Local economic activity and business continuity during drought periods (target increase) • Community support for biodiversity or carbon farming (target increase)	• Farm enterprise sustainability (target zero loss of farm businesses due to drought) • Area of land managed for biodiversity or carbon farming (target increase)

STRATEGY - PROVIDE REGIONAL MAINS WATER SECURITY FOR THE EYRE PENINSULA

Opportunities for action

- Advocate for water infrastructure investment
- Network upgrades and town water security improvements

POTENTIAL OUTPUTS Activities and participation	DESIRED OUTCOMES Related goal	OUTCOME INDICATORS	
		1-5 years	5-15 years
• Investment in water infrastructure projects • Number of network upgrade projects completed	Future-proofed water supplies, local services and infrastructure that attracts, retains and supports residents and investment	• Funding allocated to water security projects in the Eyre Peninsula (target increase) • Water supply interruptions and shortages across the region (target decrease)	• Significant reduction in water-related risks for residents and businesses in the Eyre Peninsula (target decrease) • Attraction of new residents, businesses, and investments to the region (target increase) • Ongoing improvements in water infrastructure, keeping pace with technological advancements and population growth (target increase)

STRATEGY - SUPPORT LOCAL SPORT, INTEREST AND SERVICE CLUBS AND COMMUNITY LEADERS TO CONTINUE TO PLAY THEIR IMPORTANT ROLE IN SUSTAINING COMMUNITY CONNECTIONS

Opportunities for action

- Provide support for clubs and organisations to run programs and events
- Identify and progress opportunities to support volunteer-run organisations' administration and finance
- Continue to deliver community leadership programs

POTENTIAL OUTPUTS Activities and participation	DESIRED OUTCOMES Related goal	OUTCOME INDICATORS	
		1-5 years	5-15 years
• Number of community groups, programs and events supported • Investment in community groups and programs • Number of community members participating • Number of volunteer groups supported to reduce load • Number of participants in leadership programs	Strong, healthy individuals and connected communities learning and working together for a positive future	• Membership of community groups and organisations (target maintain or increase) • Number of functioning and viable community groups and organisations (target sustain)	• Community volunteering (target maintain or increase) • Community physical and mental health (PHIDU* self-reported (target increase) * Public Health Information Development Unit - Torrens University

DROUGHT RESILIENT
EYRE PENINSULA

Eyre Peninsula Drought Resilience Advisory Group
24ADL-0635
January 2025

ATTACHMENT 1

Eyre Peninsula Regional Drought Resilience Plan - Key Insights Paper

Key Insights Paper

January 2025

Lead consultant	URPS 27 Halifax Street Enter via Symonds Pl Adelaide SA 5000 (08) 8333 7999 urps.com.au
In association with	Strategy Road & Richardson Consulting
Prepared for	Eyre Peninsula Drought Resilience Advisory Group
Consultant Project Manager	Anna Pannell, Associate Director apannell@urps.com.au
URPS Ref	24ADL-0635

Document history and status

Revision	Date	Author	Reviewed	Details
V1	18.07.24	E. Mansfield, R Liew, A Pannell	A Pannell, T Forrest	Draft paper for Advisory Group review
V2	30.08.24	E. Mansfield, A. Pannell	Advisory Group, E. Mansfield	Updated paper following Advisory Group review
V3	07.12.24	E. Mansfield, A. Pannell	A. Pannell	Minor update following CSIRO review

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Contents

Acknowledgement of Country

We acknowledge the Traditional Custodians of the land on which we work, live and play and their continuing connection to land, sea, culture and community. We pay respect to Elders past and present, and extend that respect to all Aboriginal and Torres Strait Islander peoples in our community.

In particular, we acknowledge the Aboriginal peoples of the Eyre Peninsula region covered by this Plan, including the Barngala, Nauo, Wirangu, Kokatha and Mirning peoples.

1. Introduction

Drought poses a major challenge to the future prosperity of Eyre Peninsula's agricultural productivity, natural environments, and communities. The projected increase in time spent in drought over coming decades means that preparing for drought is more important than ever.

Drought resilience refers to the ability for communities, economies and environments to withstand the impacts of drought and adapt and find new and potentially transformational ways of doing things, enabling functions and values to be sustained over the longer term.

Farmers on the Eyre Peninsula are not new to adapting to changing conditions. They have a long history of being leaders and innovators in developing enhanced and new ways to sustain their farms during times of reduced rainfall and drought or other challenges. The region will benefit from leveraging existing strengths and capitalising on new opportunities to enhance drought resilience.

The Australian Government established the Future Drought Fund (FDF) to provide secure, continuous funding for drought resilience initiatives. Through the FDF, the Australian Government is working with the South Australian Government to support the Eyre Peninsula region in developing a Regional Drought Resilience Plan to prepare for and manage future drought risks.

The Eyre Peninsula Drought Resilience Advisory Group is guiding the preparation of a Regional Drought Resilience Plan for the Eyre Peninsula. The Advisory Group includes representatives of Regional Development Australia Eyre Peninsula (RDA EP), Agricultural Innovation & Research Eyre Peninsula (AIR EP), Eyre Peninsula Landscape Board (EPLB), SA Drought Hub, Local Government (Eyre Peninsula Local Government Association (EPLGA) and councils), and Department of Primary Industries and Regions South Australia (PIRSA). URPS has been engaged to work with the Advisory Committee to develop the Plan.

The Eyre Peninsula Regional Drought Resilience Plan will document how the region's shared values might be impacted by drought, describe a desired future vision that acknowledges increasing impacts of drought and identify strategies and actions to build resilience to ensure regional values are maintained and economic and social development opportunities are optimised. The Plan must recognise that agriculture on the Eyre Peninsula does not occur in isolation; what happens on farms has flow on impacts to communities, the natural environment and regional economy.

This Key Insights Paper will be the foundation for preparing the Eyre Peninsula Regional Drought Resilience Plan.

1.1 Preparing the Key Insights Paper

This Key Insights Paper was prepared through the following tasks:

- **Literature review**: collation and synthesis of information about the region and shared values, challenges and opportunities through review of regional plans and strategies and other relevant regional documents. The review also looked at literature on leading resilience practice, planning and implementation from elsewhere to identify 'lessons learnt' or ideas for action.
- **Key informant interviews with local community leaders and subject matter experts** to understand how drought has impacted the Eyre Peninsula in the past, what programs have worked well to build drought resilience and how the Regional Drought Resilience Plan can best be implemented. Interviews were held with the following stakeholders:

- Bill Long: farmer and farm consultant, current AIR EP Chair
- Brett Klau: Landowner Information Services Officer, Rural Business Solutions, former ABB Grain, Australian Wheat Board, Ag Engineer
- Brian and Tim Wibberley: accountants and agricultural scientists
- Bryan Smith: farmer, former SAGIT Board member and former AIR EP and EPARF Chair
- Chris Fitzgerald: farmer, Rural Financial Counsellor, Rural Business Solutions
- Chris Miller: Senior Agribusiness Relationship Manager Bendigo Bank Cummins
- Heather Baldock: farmer, RDA Board Member, Founding Member Workshop 26, former Chair EP Landscape Board
- Issac Gill: farmer
- Karen Baines: farmer, Board Member and Executive Officer EP Cooperative Bulk Handling
- Peter Kuhlmann: farmer, Former SAGIT and EPARF Board member
- Tim Scholz: farmer, Managing Director EP Cooperative Bulk Handling, former Wudinna Mayor, former President South Australian Farmers Federation (SAFF) and former Vice President National Farmers Federation (NFF)
- Tristan Baldock: farmer.

- **Key informant interviews with drought resilience planners from other regions** to learn from the experiences of other regions and gain insights into how the Regional Drought Resilience Plan can be prepared most effectively for the Eyre Peninsula. Interviews were held with drought resilience planners who worked on the following Regional Drought Resilience Plans:
  - Northern and Yorke Regional Drought Resilience Plan
  - South West Queensland Regional Drought Resilience Plan
  - The Murraylands and Riverland Plan
  - Outback SA Regional Drought Resilience Plan
  - Adelaide Hills, Fleurieu and Kangaroo Island Regional Drought Resilience Plan.
- **Regional engagement** with 56 people across Eyre Peninsula to understand how drought impacts the region, what makes individuals, communities and regions resilient to drought, and what the region needs to build its resilience to drought. Workshops were held in every Eyre Peninsula council area in the following locations:

Ceduna	Cummins	Kimba
Streaky Bay	Port Lincoln	Cowell
Wudinna	Tumby Bay	Whyalla
Elliston	Cleve	

- **First Nations engagement** with three First Nations people across two First Nations workshops held in Ceduna and Port Lincoln.

- **Online workshop and an online survey** to engage stakeholders and community unable to attend the regional workshops. 26 survey responses were provided.

A summary of all engagement activities is provided in Appendix A - Regional Engagement Summary Report.

2. The Eyre Peninsula Region

The Eyre Peninsula Drought Resilience Plan Region encompasses the 11 Eyre Peninsula councils from Whyalla in the east, along the Gawler Ranges in the north, to Ceduna in the west. The region covers about 44,290 square kilometres (Figure 1). The far west of South Australia (unincorporated areas beyond District Council of Ceduna) is covered by the Outback SA Regional Drought Resilience Plan and will not be included in this Plan.

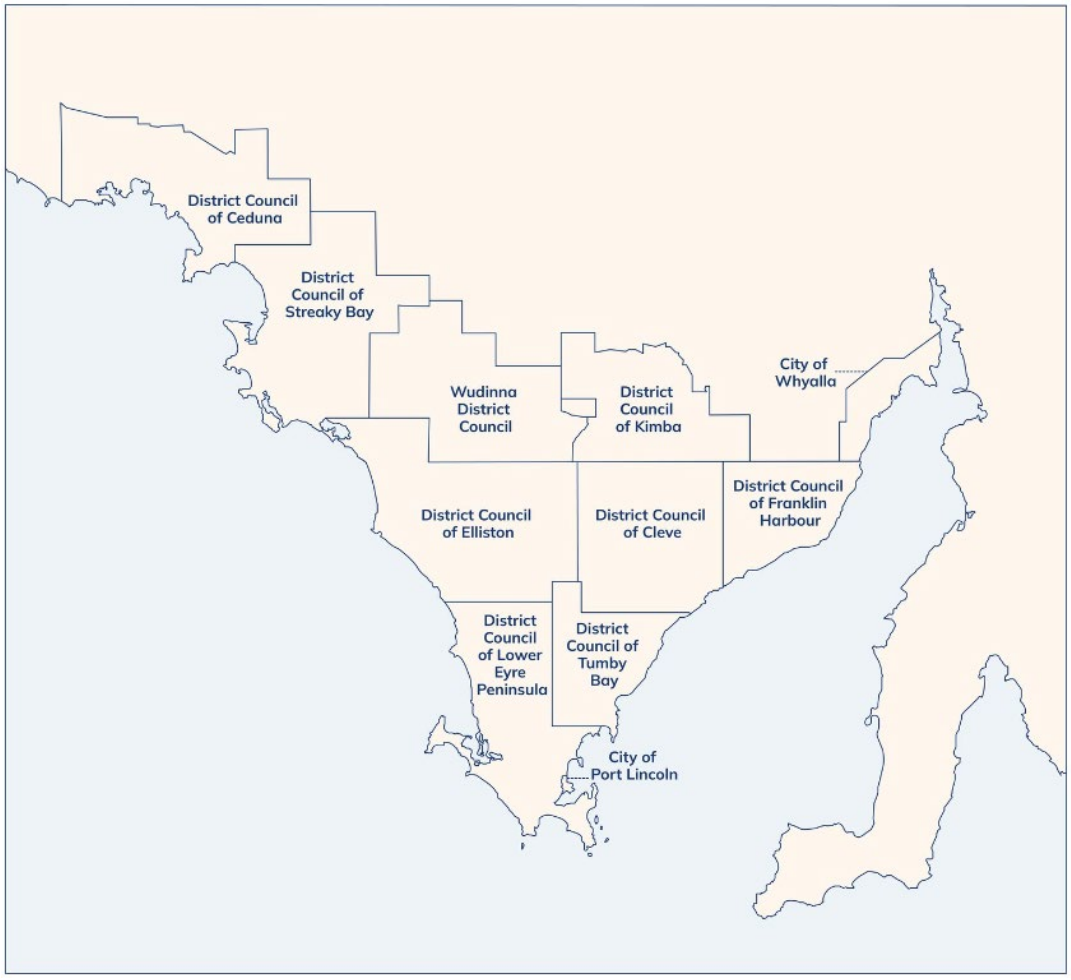


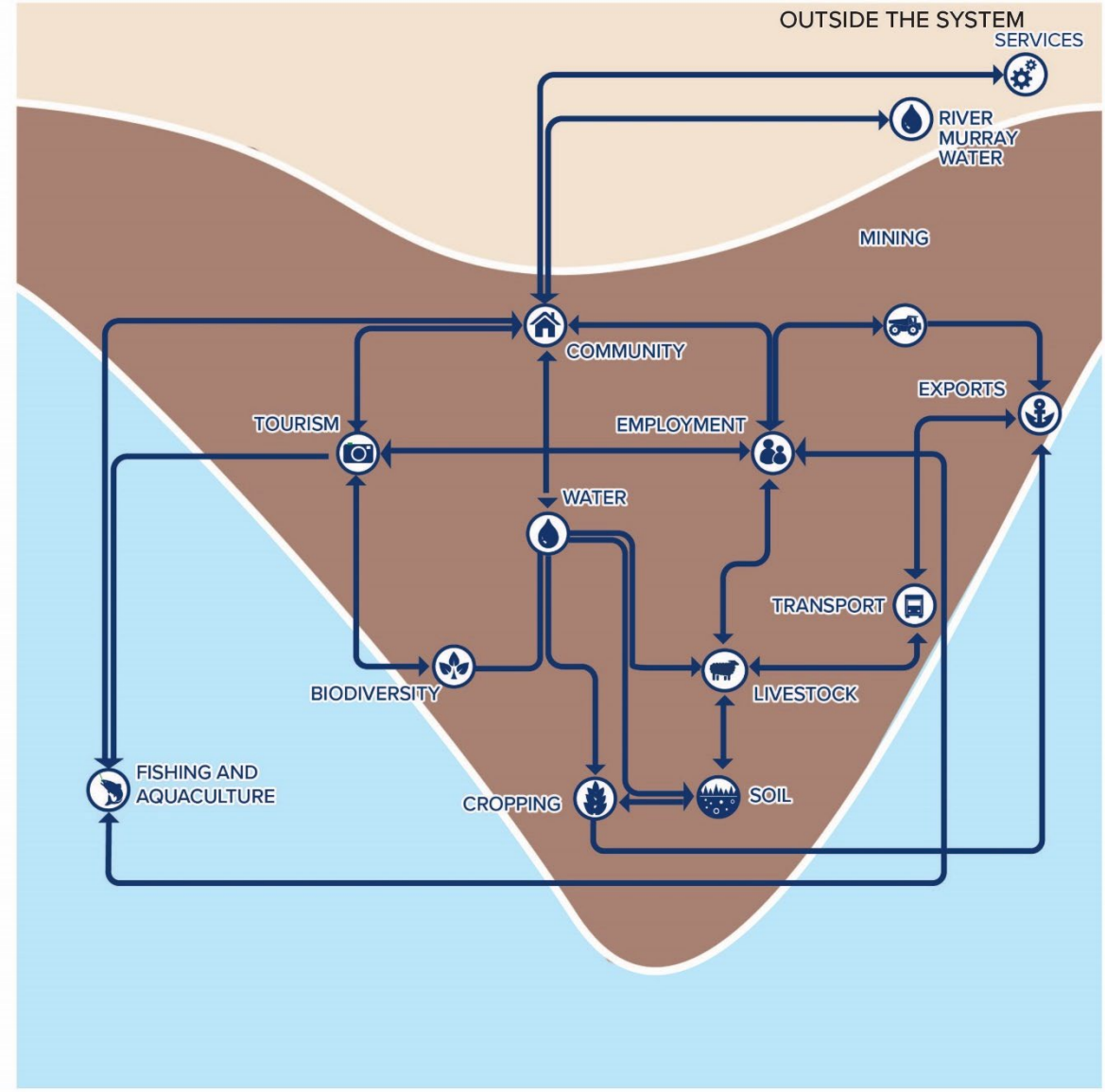
Figure 1 The Eyre Peninsula Regional Drought Resilience Plan region

2.1 The Eyre Peninsula "system"

The Eyre Peninsula is a complex system of connections and interactions between people, industries and the natural environment. These connections and interactions mean that when one feature is impacted, flow on effects will be experienced by other features in the system. Considering these connections and interactions is called 'systems thinking'. Systems thinking helps to identify the factors that make the system resilient or vulnerable to change.

Key features of the Eyre Peninsula system include agriculture and water resources, as these have many connections with other valued features (Figure 2). Maintaining agriculture and its connections to other features is integral to the viability of the region, as is provision of secure water supplies. Without viable agriculture and water to support the population, community groups, social fabric, service provision and the regional economy will be at risk.

Figure 2 Eyre Peninsula systems map



2.2 Population

The Eyre Peninsula's population is dispersed, with major population centres in Whyalla and Port Lincoln and many people living on farming properties. Key features of the region's population include:

- A stable total population with lower rates of growth projected than for the rest of South Australia.

- A larger proportion of children aged 0-14 years and adults aged 50-79 years.
- A less culturally and linguistically diverse community.
- A higher proportion of residents identifying as Aboriginal and Torres Strait Islander peoples.
- A smaller proportion of the population with university qualifications and more households in middle income brackets.
- Lower rates of unemployment.
- Higher rates of volunteering.

Key demographic statistics from the Australian Bureau of Statistics (ABS) 2021 Census and REMPLAN have been summarised in Table 1.

Table 1 Key demographics for the Eyre Peninsula and SA (ABS 2021, REMPLAN Community 2011)

	Eyre Peninsula	South Australia
Resident population	56,265 people	1,781,516 people
Population change	Increasing population (1.1% increase from 2011 to 2021)	Increasing population (11.3% increase from 2011 to 2021)
Projected population (Plan SA, for Eyre Peninsula & South West and Whyalla regions)	15.5% increase from 2021-2041 (medium growth scenario)	22.0% increase from 2021-2041 (medium growth scenario)
Median age	43 years	41 years
Ages cohorts	As compared to SA: Higher proportion of young people 0-14 years and people aged 50-79 years Lower proportion of people aged 15-44 years	N/A
Aboriginal and Torres Islander peoples	6.0%	2.4%
Households where a non-English language is used	4.6%	19.0%
Most common language other than English used at home	Tagalog (0.4%)	Mandarin (1.8% speak at home)
Highest level of education		
Bachelor degree level and above	8.8%	22.7%
Certificate III & IV Level	17.7%	17.6%
Year 12	31.2%	15.2%
Year 10	15.6%	9.4%

	Eyre Peninsula	South Australia
Labour force (includes employed and unemployed)	26,169 people	834,812 people
Unemployment rate	2.4%	5.4%
Population that needs assistance with core activities	6.3%	6.7%
Volunteering rate	18.0%	14.1%
Proportion of households earning less than $650 per week	14.8%	19.6%
Proportion of households earning more than $3000 per week	13.2%	17.7%
SEIFA Index of Relative Socio-economic Disadvantage (The lower the number, the greater disadvantage)	Lower Eyre: 1033 Kimba: 1020 Wudinna: 1009 Streaky Bay: 1000 Cleve: 989 Elliston: 959 Franklin Harbour: 959 Port Lincoln: 948 Tumby Bay: 994 Ceduna: 943 Whyalla: 883	982

2.2.1 Aboriginal people

Aboriginal people have lived on the Eyre Peninsula for thousands of years. Aboriginal people have a strong connection to this Country, in particular the Barngala, Nauo, Wirangu, Kokatha and Mirning peoples, and there are many sites of cultural importance. The regional population has a higher proportion of Aboriginal and Torres Strait Islander people when compared to South Australia as a whole. Larger Aboriginal populations are located in Ceduna, Port Lincoln and Whyalla.

2.3 Economy

The Eyre Peninsula generated $4.47 billion in gross regional product in 2022-23.

Agriculture is the highest industry of employment outside the key population centres of Whyalla and Port Lincoln (Table 2).

Manufacturing (dominated by primary metal and metal products) is the highest output generating industry sector, followed closely by agriculture and construction.

DATA NOTE – All economic data has been soured from the RDA Eyre Peninsula Region's economic profile from .id community. The area covered by this data includes all the council areas as well as the far west coast which includes Maralinga Tjarutja (AC) and Unincorporated SA (part).

Table 2 Economic characteristics of the Eyre Peninsula region (Profile.id, 2023)

<table>
<tr><th>Indicator</th><th>Measure</th></tr>
<tr><td>Top 3 industries of employment (Entire EP region)</td><td>Health care & social assistance (14.1%)
Agriculture, forestry & fishing (12.8%)
Retail trade (9.9%)</td></tr>
<tr><td>Top 3 industries of employment (EP region excluding Whyalla and Port Lincoln)</td><td>Agriculture, forestry & fishing (28.0%)
Health care & social assistance (12.4%)
Education & training (9.3%)</td></tr>
<tr><td>Total gross regional product (GRP) (2022/23)</td><td>$4,468,000,000</td></tr>
<tr><td>GRP per capita (2022/23</td><td>$75,495 per capita</td></tr>
<tr><td>GRP per worker (2022/23)</td><td>$177.875,470 per worker</td></tr>
<tr><td>Top 5 industries by value of economic output (2022/23)</td><td>
<table>
<tr><th>Industry</th><th>Output ($m)</th></tr>
<tr><td>Manufacturing</td><td>1613.7</td></tr>
<tr><td>Agriculture, Forestry and Fishing</td><td>1430</td></tr>
<tr><td>Construction</td><td>1376.4</td></tr>
<tr><td>Mining</td><td>920.9</td></tr>
<tr><td>Health Care and Social Assistance</td><td>409.2</td></tr>
</table>
</td></tr>
</table>

2.4 Agriculture

The Eyre Peninsula has a highly productive agriculture industry. The total value of agricultural output in 2020/21 was $801 million, producing approximately 11% of South Australia's total agricultural output in that year (Profile.id 2024; ABS 2021). Table 3 shows the value of key agricultural outputs and the proportion of the state's agricultural output produced on Eyre Peninsula. Data has been used for 2020/21 to enable comparison with the whole state.

In 2023/23 the total value of agricultural output on Eyre Peninsula was $1.04 billion.

Approximately 83% of the region's land area is owned and farmed by private enterprises, including cropping, grazing and native vegetation. Dryland broadacre cropping of wheat, barley, oats, canola and pulses and livestock grazing predominantly sheep for meat and wool, are the most common agricultural land uses.

Table 3 Value of agriculture production 2020/2021 (RDA EP Economic Profile 2023; ABS 2021)

Outputs (product)	Eyre Peninsula Value $m	South Australia Value $m	Percentage of EP vs SA
Total cereal crops and other broadacre crops	659.1	2,520.9	26%
Wheat for grain	396.3	1,628.5	24%
Barley for grain	114.4	1,118.9	10%
Canola	103.3	251.3	41%
Lentils	16.5	251.7	7%
Lupins	13.2	31.2	42%
Oats for grain	8.8	48.4	18%
All other cereal crops for grain and broadacre crops	6.6	228.5	3%
Total livestock slaughtering	71.4	1,650.5	4%
Sheep and lambs	67.2	457.3	15%
Cattle and calves	2.8	273.6	1%
Pigs	1.4	325.4	0%
Crops for Hay	14.6	338.0	4%
Grapes (wine and table)	3.8	707.2	1%
Nurseries & cut flowers	0.3	77.2	0%
Vegetables	0.1	575.3	0%
Total agriculture	$801.2	$7,232.6	11%

2.4.1 Challenges to agriculture on the Eyre Peninsula

Eyre Peninsula farmers are challenged by issues that are unique to their environments, as well as constraints that are experienced more broadly across the state. This includes poor quality soils (including soil acidification, calcareous soils with low phosphorus, sandy soils, dryland salinity, soil structure decline, wind erosion and water repellent soils), adverse weather conditions, pests, weeds and diseases, decreasing small town populations and fluctuating markets (SARDI, 2023). As a region whose agricultural products are primarily exported, the sector is exposed to international trade forces more than many other agricultural regions in Australia.

Pests of particular concern include mice, snails, invertebrates, rabbits, foxes and dingoes. Overabundant native species including kangaroos and emus can also compete with stock for feed and water.

Adverse weather conditions can cause devastation to crops and livestock, including:

- High rainfall can cause "wet droughts", soil erosion, limit paddock access and encourage weed growth. Low rainfall or drought can affect seed germination and limit pasture growth and stock water availability.
- Extreme heat impacts livestock condition, crop condition and growth and grain fill.
- Frost at the wrong times can cause crop failure.
- Wind can cause soil erosion and damage crops.

However, Eyre Peninsula farmers are renowned for their innovation. Investment in research and development has led to significant advances in grain production, resulting in increased yield (SARDI 2023). The willingness of Eyre Peninsula farmers to adopt new technologies and make improvements based on research outcomes ensure their farms are on the cutting edge of productivity and profitability.

2.4.2 Increasing costs of farming inputs

Over the past few years, farmers on the Eyre Peninsula and across Australia have faced a significant increase in the cost of farming inputs, driven by global energy prices and geopolitical events. The war in Ukraine has notably exacerbated these costs, particularly for essential inputs like fertiliser, pesticide, seed and machinery. From February 2020 to July 2022, the average import price of Australian fertiliser surged by 153%, largely due to high natural gas prices and export restrictions by Russia and China (Department of Agriculture, Fisheries and Forestry 2024a).

Diesel prices have also spiked, affecting the cost of operating machinery and transporting goods. These rising input costs have strained profit margins, with some crops becoming financially unviable to grow (Prendergast 2024). The increased costs are not only impacting profitability but also leading to higher grocery prices. For farmers in the Eyre Peninsula, who heavily rely on efficient and affordable inputs, these challenges are particularly critical. As global food prices fluctuate and seasonal conditions remain unpredictable, the financial strain on the agricultural sector is likely to persist, further highlighting the need for strategic planning and support to ensure long-term sustainability.

2.4.3 Rural Landholder Benchmarking Report 2020

In 2020, a partnership between AIREP, EPLB (formerly Eyre Peninsula Natural Resource Management Board), Southern Cross University, Charles Sturt University and the Soil Cooperative Research Centre undertook a benchmarking survey to understand the drivers of on-farm decision making on Eyre Peninsula as part of a national survey (Luke et al, 2020). Key findings of this survey relevant to drought resilience and farming are provided below:

- The 'ability to pass on a healthier and more sustainable farm for future generations' was the most important value attached to the property for both full- and part-time farmers on the Eyre Peninsula.
- 'Looking after my family and their needs' was the most important "held" value across all farmer types, followed by the environmental value of 'preventing pollution and protecting natural resources', though this ranked as even more important for hobby and non-farmers.
- Water security ranked in the top three issues for all farmer types.
- Despite the high levels of concern for water security, this was not necessarily linked to accelerated climate change, and did not seem to have a clear influence on action around climate change.

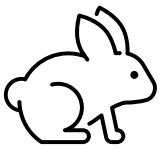
- All landholder types engaged with farming practices indicated a very high degree of openness toward new ideas about farming.
- Less than 50% of farmers consider themselves to have a sufficient knowledge-level to act on a range of topics and practices, meaning there remains substantial opportunity to improve farmer knowledge on a range of topics.
- 25% of full-time farmers indicated that they were not coping well with the associated stresses and challenges of managing their farm.

2.5 Natural environment

The Eyre Peninsula is fringed by the Southern Ocean on the west coast, the Spencer Gulf on the east coast and the Gawler Ranges in the north. The topography of the Eyre Peninsula is varied and includes rolling hills and ranges, granite outcrops, shallow limestone plains, and extensive farmlands that support a variety of native plants and animals. The region is home to several national parks including the Lincoln National Park and Coffin Bay National Park which play an important role in conserving the region's biodiversity. Key features and characteristics of the region's natural environment are described in Table 4.

Table 4 Key features and characteristic of the Eyre Peninsula's natural environment

Theme	Key features and characteristics
Protected areas 	Eyre Peninsula includes 3 National Parks, 3 Wilderness Protection Areas, 58 Conservation Parks and 9 Conservation Reserves that cover approximately 12% of the Eyre Peninsula's land area
Species and communities with conservation status 	The Eyre and Far West National Parks District record: • 25 flora species and 72 fauna species with national conservation ratings under the *Environment Protection and Biodiversity Conservation Act 1999* • 208 flora species and 166 fauna species with state conservation ratings under the *National Parks and Wildlife Act 1972*
	At least 40 plant species endemic (occurs nowhere else) to Eyre Peninsula (Eyre Peninsula Landscape Board 2024c)
	Several endemic animal species including the Eyre Peninsula Southern Emu-wren; the Pearson Island Black-footed Rock-wallaby; the Sandhill Dunnart; and the Eyre Peninsula Dragon (Eyre Peninsula Landscape Board 2024c)
	Four nationally threatened vegetation communities: The Southern Temperate Coastal Saltmarsh, Peppermint Box (*Eucalyptus odorata*) Grassy Woodland of SA, Drooping Sheoak (*Allocasuarina verticillata*) Grassy Woodland on Calcrete of the Eyre Yorke Block Bioregion and the Eyre Peninsula Blue Gum communities (Eyre Peninsula Landscape Board 2024c)

Theme	Key features and characteristics
Pest species 	Priority pest animals include rabbits, foxes, dingos/wild dogs, feral cats, feral deer, and feral goats Priority pest plants include buffel grass, white weeping broom, African lovegrass, bridal veil, boneseed and many more

2.5.1 Water resources

There is a scarcity of drinkable water resources on the Eyre Peninsula. The region has no major surface water supplies. Groundwater is the main source of water for public water supply, irrigation, stock and domestic use. Dwindling groundwater supplies mean that securing an alternative water source for the Eyre Peninsula is a priority in the short term.

Table 5 Key characteristics of Eyre Peninsula's water resources

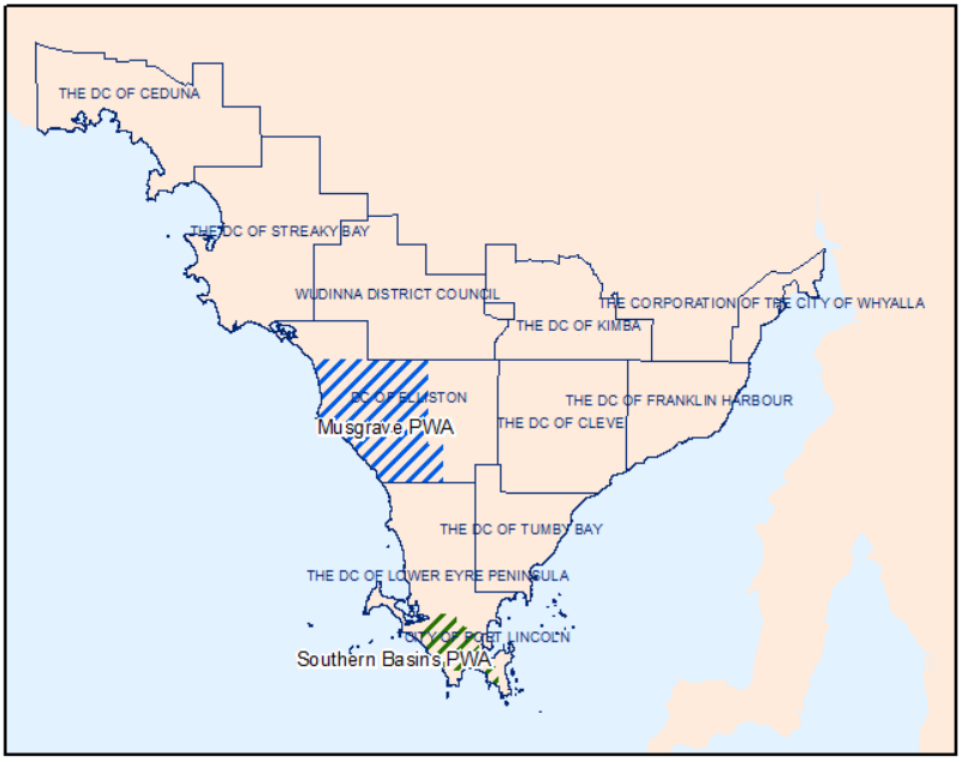
Feature	Characteristics
Groundwater 	The Water Allocation Plan for Southern Basins and Musgrave Prescribed Wells Areas controls the taking and use of most of the fresh groundwater in the region (Eyre Peninsula Natural Resources Management Board 2016). Three-quarters of the region's drinking supply comes from the Uley South Basin in the Southern Basins Prescribed Wells Area (SA Water 2024b). Expert modelling says water is being drawn from this Basin at unsustainable rates, with recorded water levels 'below' or 'very much below average' in almost half of its wells during the past 12 months. This was despite rainfall in 2021 and 2022 being well above average (Eyre Peninsula Landscape Board 2024d). The Department for Environment and Water has modelled that underground water resources in the southern basins will no longer be able to sustainably meet the demands for water supply on Eyre Peninsula in the short term. The Water Allocation Plan is currently under revision as a result, with the new plan to significantly reduce SA Water's pumping allowance from the Southern Basins (Eyre Peninsula Landscape Board 2024d).
Desalination plant 	To address water security concerns on the Eyre Peninsula driven by the reduction in groundwater resources, SA Water are currently planning to develop a 5.3 gigalitre per annum reverse osmosis desalination plant at Billy Lights Point in Port Lincoln, to be operational by mid-2026. Construction is proposed to commence in 2024.
Surface water	Surface water features on the Eyre Peninsula include watercourses, lakes, dams, wetlands, springs and soaks (Eyre Peninsula Landscape Board 2024b).

Feature	Characteristics
	Most watercourses are ephemeral, experiencing peak flows during winter, and often ceasing to flow by late spring or early summer (Eyre Peninsula Landscape Board 2021a).
Water storages	The Tod Reservoir is the only major surface water storage on Eyre Peninsula. Due to deteriorating water quality, this resource has not been used as a water supply since early 2002 and is held as an emergency supply of water only (Green et al. 2012).
Saline water 	There is a prevalence of saline water resources including large saline wetland complexes, brackish creeks and saline aquifers on the Eyre Peninsula (Eyre Peninsula Landscape Board 2021a).

Groundwater

Groundwater is used extensively on the Eyre Peninsula with the largest potable groundwater supplies coming from shallow freshwater zones of Quaternary Limestone aquifers in the Southern Basins Prescribed Wells Area (PWA) and Musgrave PWA further west (Figure 3). The taking of groundwater is regulated through a water allocation plan for both PWAs. There was around 69 ML of groundwater taken from the Musgrave PWA in 2020-21 (DEW, 2022) and 5,449 ML from the Southern Basins with most of that coming from Uley South water source (supplying 75% of water used across Eyre Peninsula).

Figure 3 Prescribed wells areas on the Eyre Peninsula



2.5.2 Soils

The Eyre Peninsula region has 15 main soil groups ranging from calcareous soils, hard red-brown soils over alkaline sub soils, deep loamy textured soils, and deep sands to ironstone soils. Land management risks differ across the region and include soil acidification, low nutrition, dryland salinity, soil structure decline, wind erosion and water repellent soils (Eyre Peninsula Landscape Board 2021b). These soil characteristics pose limitations to the agricultural system, and farmers implement a range of practises to maintain healthy soil management to increase their agricultural productivity and general health of their land.

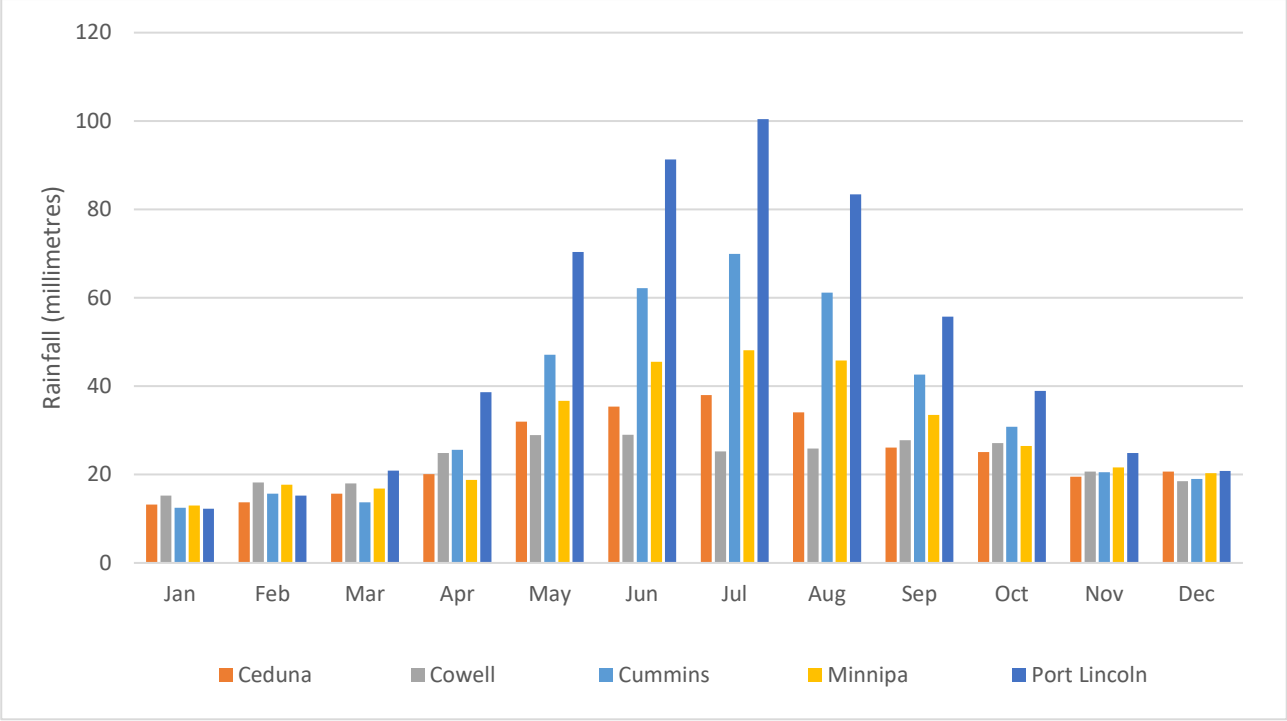
2.6 Climate

2.6.1 Rainfall

The Eyre Peninsula experiences a Mediterranean climate characterised by warm, dry summers and mild, wet winters. The southern areas have a milder, wetter climate compared with the warmer and drier north and northwest parts of the region.

Average monthly rainfall 1964 to 2023 for five locations across the Eyre Peninsula is show in Figure 4. While November to March rainfall is similar at all locations, winter rainfall is significantly higher in the southern locations of Port Lincoln and Cummins.

Figure 4 Average monthly rainfall 1964 to 2023 in towns across the Eyre Peninsula (My Climate View 2024)



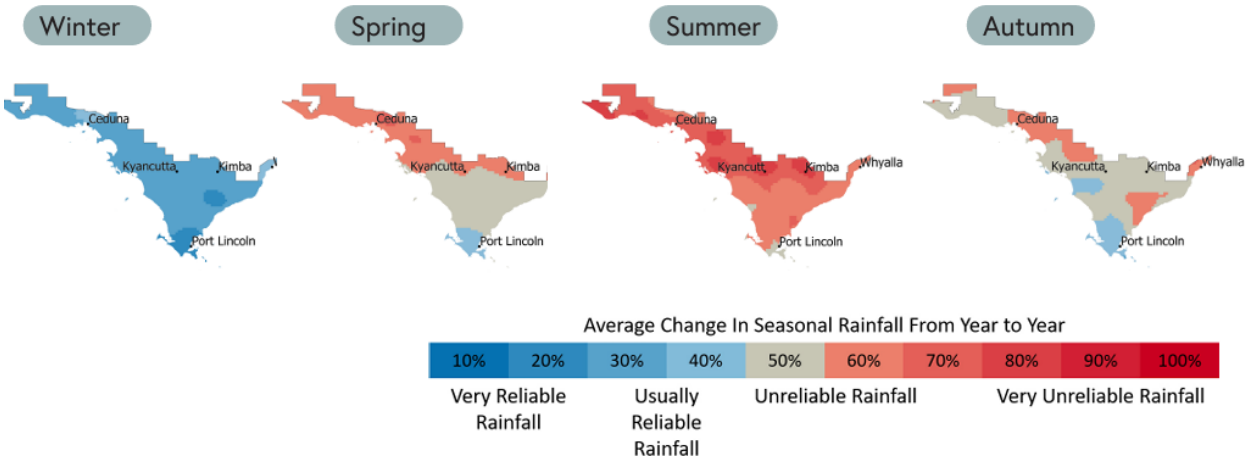
Rainfall has been decreasing in recent decades. Data from myclimateview.com.au shown in Table 6 shows rainfall has reduced from the period 1964-1983 to 1984-2023.

Table 6 Average annual rainfall change 1964 to 2023 (myclimateview.com.au)

Location	Average annual rainfall (1964 to 1993)	Average annual rainfall (1994 – 2023)	Change
Ceduna	298mm	268mm	-10%
Cowell	297mm	259mm	-13%
Cummins	451mm	429mm	-5%
Minnipa	346mm	311mm	-10%
Port Lincoln	530mm	481mm	-9%

Rainfall reliability maps for the past 30 years (Figure 5) show winter rainfall has been moderately reliable across the region (blue areas), with usually only about 40 mm difference from one year to the next (Bureau of Meteorology & CSIRO 2019). This contrasts with spring and autumn rainfall, which has been less reliable (beige and light red areas). Summer rainfall has been unreliable across the region (red areas), and although there have been some wet summers in the past 30 years, summer rainfall has not been reliable from year to year.

Figure 5 Rainfall reliability (Bureau of Meteorology & CSIRO 2019)



2.6.2 Impact of rainfall on agricultural yield

Using data reported in PIRSA crop and pasture reports, growing season rainfall and wheat yield for three reporting regions since 2000 have been analysed. Figure 6, Figure 7 and Figure 8 show that yields follow rainfall trends in most years, for example lower growing season rainfall in 2007 - 2009 saw lower yields. There have been some years when high yields occurred when rainfall was lower (2017) and other years when high rainfall did not see higher yields (2000 and 2003).

Figure 6 Southern Eyre Peninsula wheat yield vs rainfall (Cummins) 2000 – 2023 (PIRSA 2024a; My Climate View 2024)

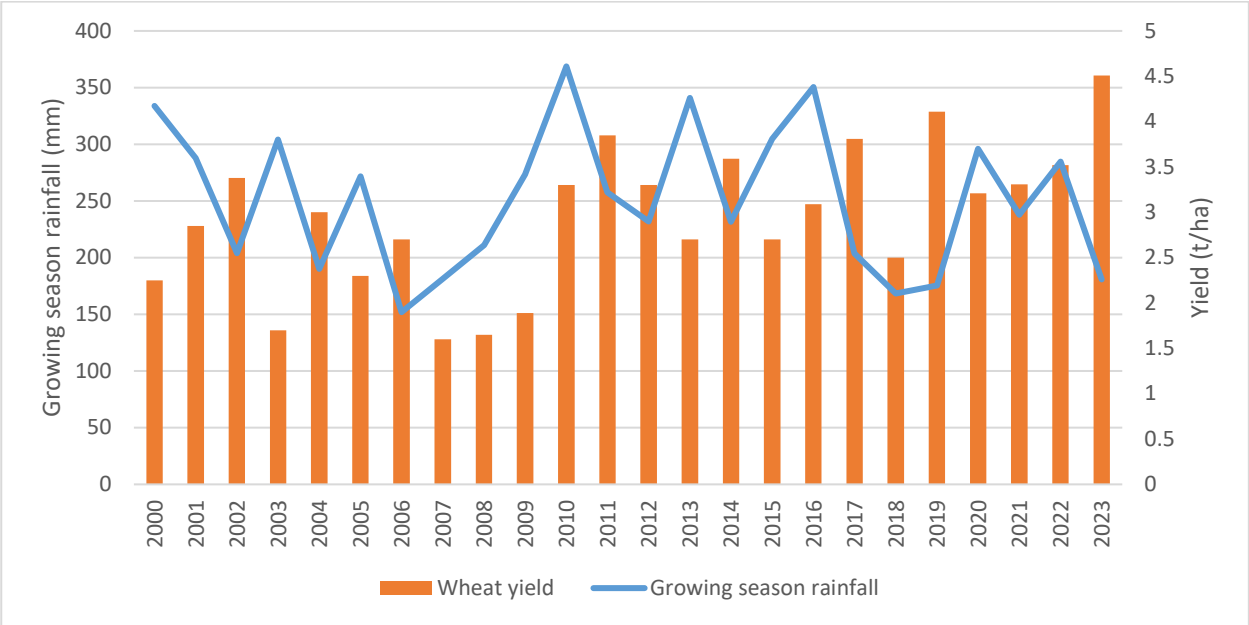


Figure 7 Eastern Eyre Peninsula wheat yield vs rainfall (Cleve) 2000 – 2023 (PIRSA 2024a; My Climate View 2024)

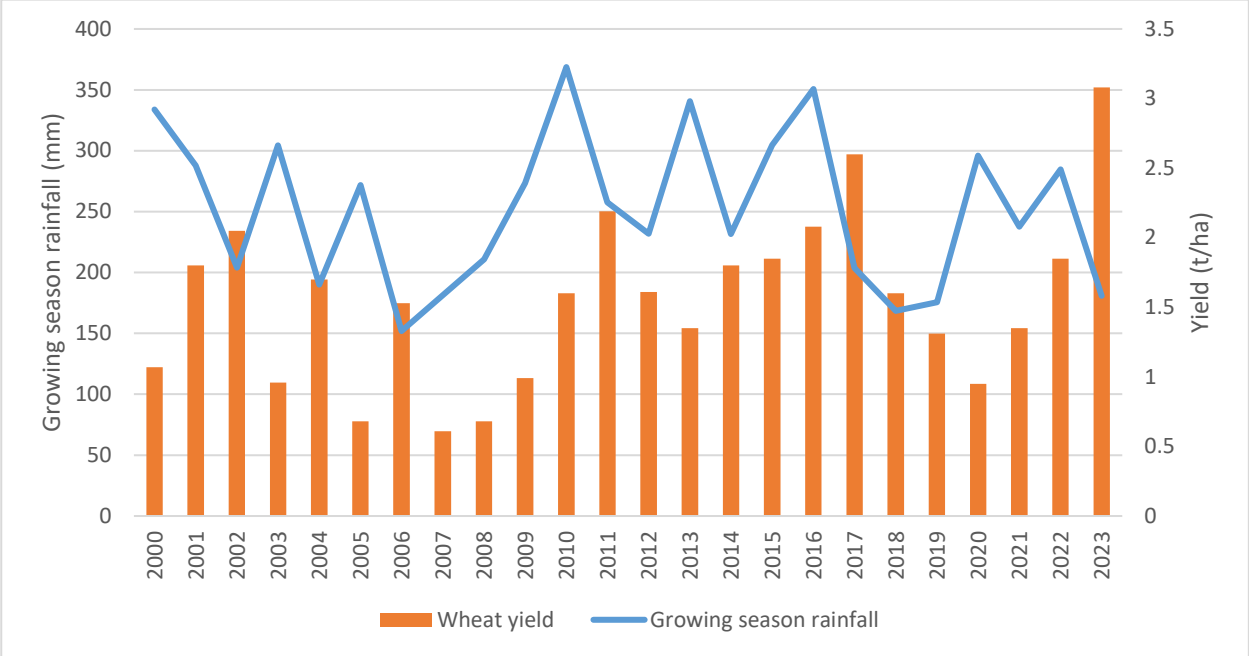
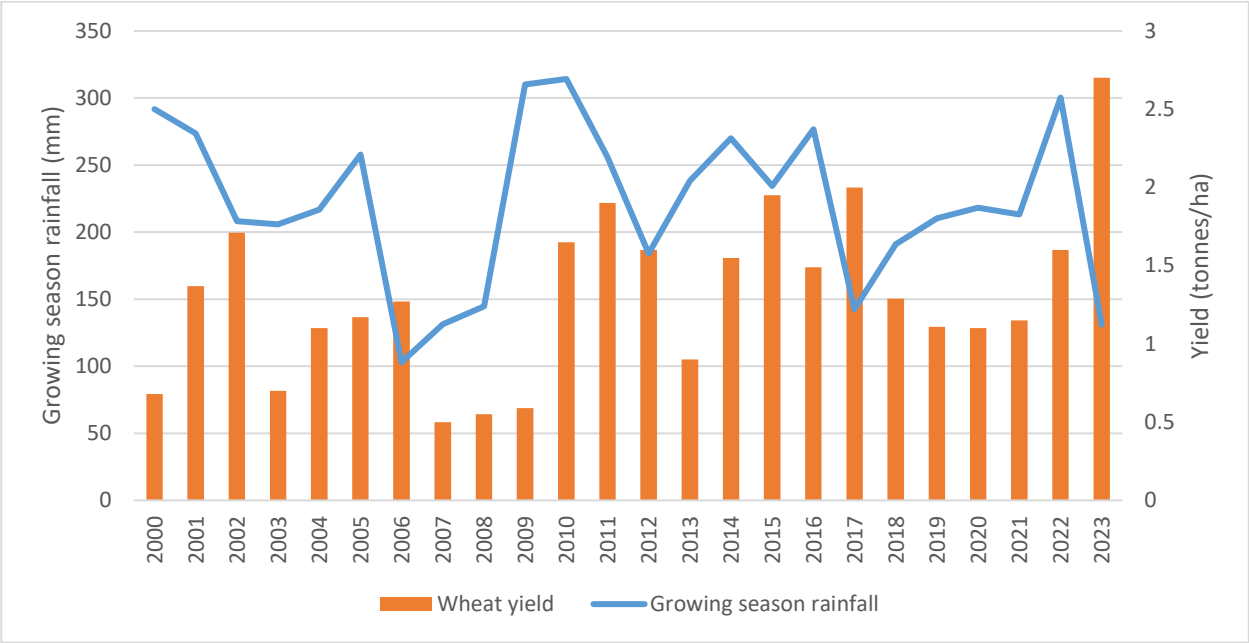


Figure 8 Western Eyre Peninsula wheat yield vs rainfall (Minnipa) 2000 – 2023 (Source: PIRSA 2024a; My Climate View 2024)

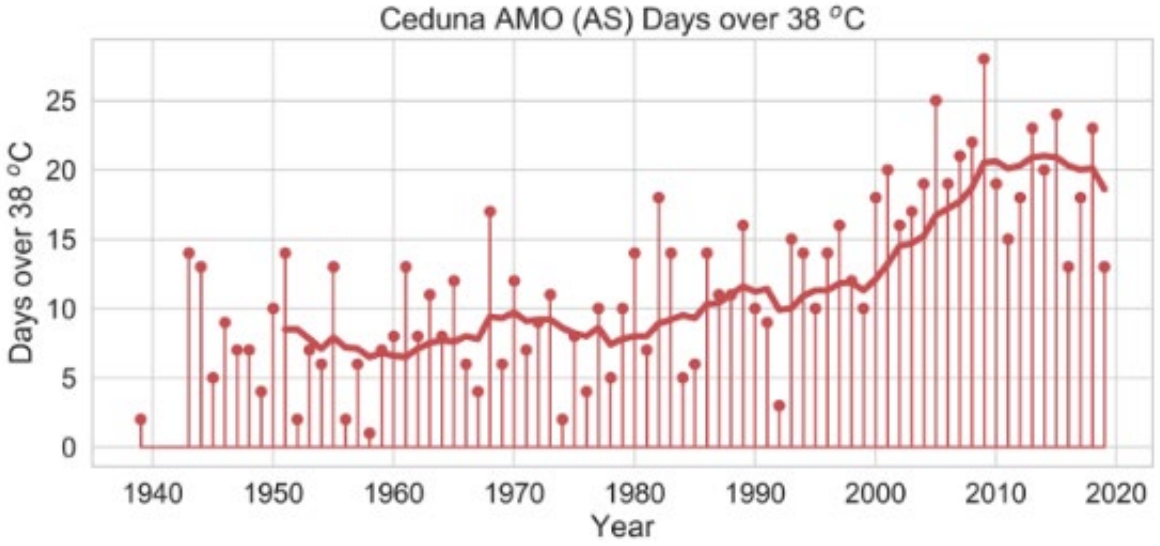


2.6.3 Temperature

The Eyre Peninsula experiences average annual maximum temperatures of 18 to 27 °C and average summer maximum temperatures of 21 to 33°C (Bureau of Meteorology 2022).

The Eyre Peninsula has experienced more hot days in the past 30 years. Figure 9 shows the annual number of days above 38 °C (red bars) with a 10-year running average (solid red line) for Ceduna (Bureau of Meteorology & CSIRO 2019). Ceduna experienced an average of 16 days per year above 38 °C between 1989–2018, compared to an average of nine days per year above 38 °C between 1959–1988.

Figure 9 Number of days per year over 38°C (Bureau of Meteorology & CSIRO 2019)

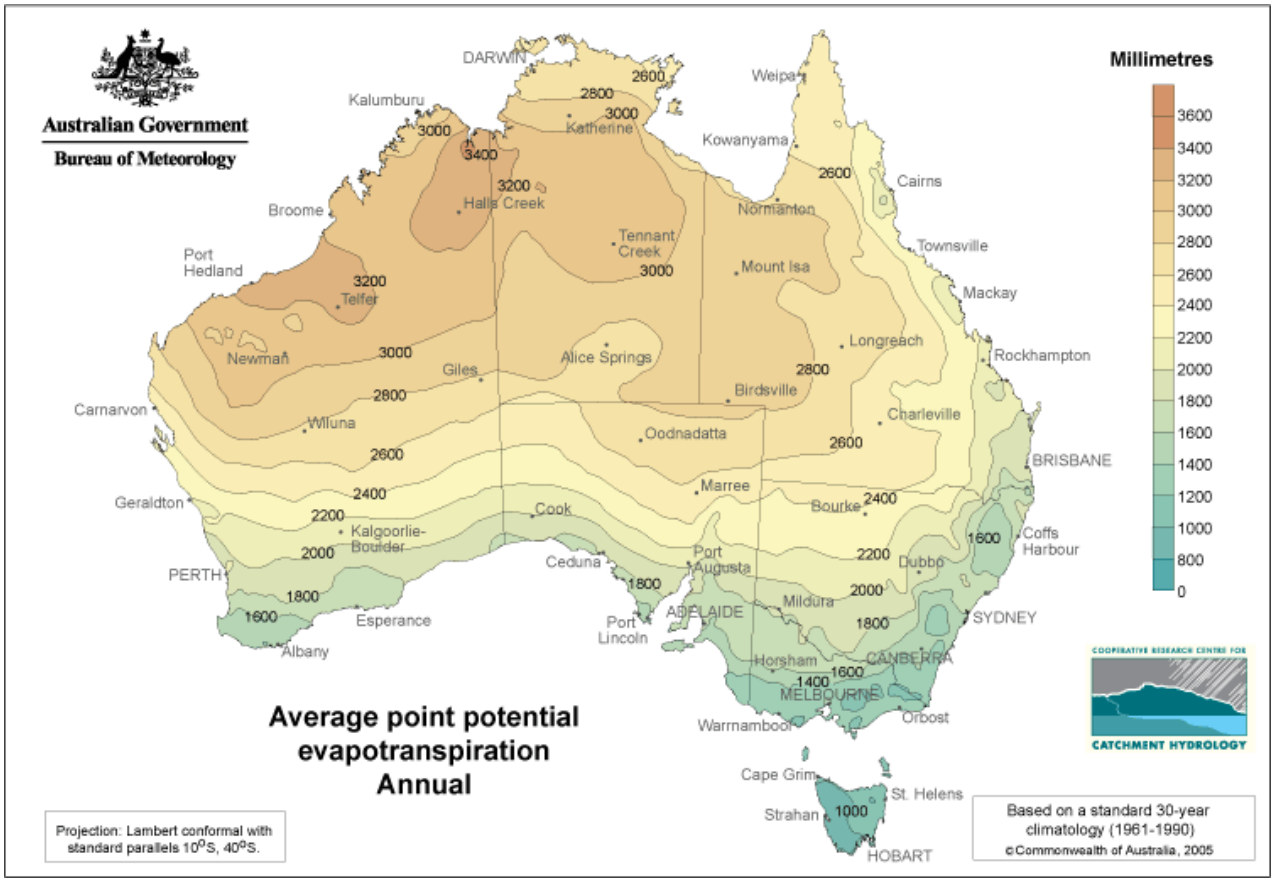


2.6.4 Evapotranspiration

Evapotranspiration is a collective term for the transfer of water, as water vapour, to the atmosphere from both vegetated and un-vegetated land surfaces. It is affected by climate, availability of water and vegetation.

Point potential evapotranspiration in the region is between 1.4 meters in the south and 2 meters in the north (refer Figure 10) (BOM 2005).

Figure 10 Average point potential evapotranspiration 1961 to 1990 (total annual) (Bureau of Meteorology, 2005)



2.6.5 Wind

The Eyre Peninsula is characterised by strong and persistent winds, which significantly influence the region's climate and environmental conditions. These winds predominantly blow from the west and southwest, bringing with them moisture from the Southern Ocean. Their strength and frequency can lead to several challenges for the region.

One of the primary impacts of strong winds is the increased rate of evaporation, which exacerbates the already dry conditions of the semi-arid climate. This accelerated loss of moisture from the soil can intensify drought conditions, making it more difficult for crops and vegetation to grow.

Wind erosion is a significant concern on the Eyre Peninsula. Powerful winds can lift and transport topsoil, leading to soil degradation and loss of fertility. This process not only diminishes the land's agricultural

productivity but also contributes to the dust storms that can affect air quality and visibility (Eyre Peninsula Landscape Board 2024e). When vegetation cover is low due to drought conditions, wind erosion impacts are exacerbated. Loss of topsoil is an impact that can take many years to recover from.

2.6.6 Frost

The Eyre Peninsula experiences a relatively low number of frost days. Figure 11 shows that the number of frost days on average ranges from 0-10 days along the more coastal regions, to 10-20 days in the central Eyre Peninsula (Bureau of Meteorology 2024a). Frost can have devastating impacts on crop yield.

Frosts have tended to occur through dry winter and spring periods, when soil moisture is low and cloud cover infrequent. In an average year at Kyancutta, there are eight more potential frost nights during a dry winter and spring than during a wetter one (Bureau of Meteorology & CSIRO 2019).

Figure 11 Potential frost days (BoM, 2006)

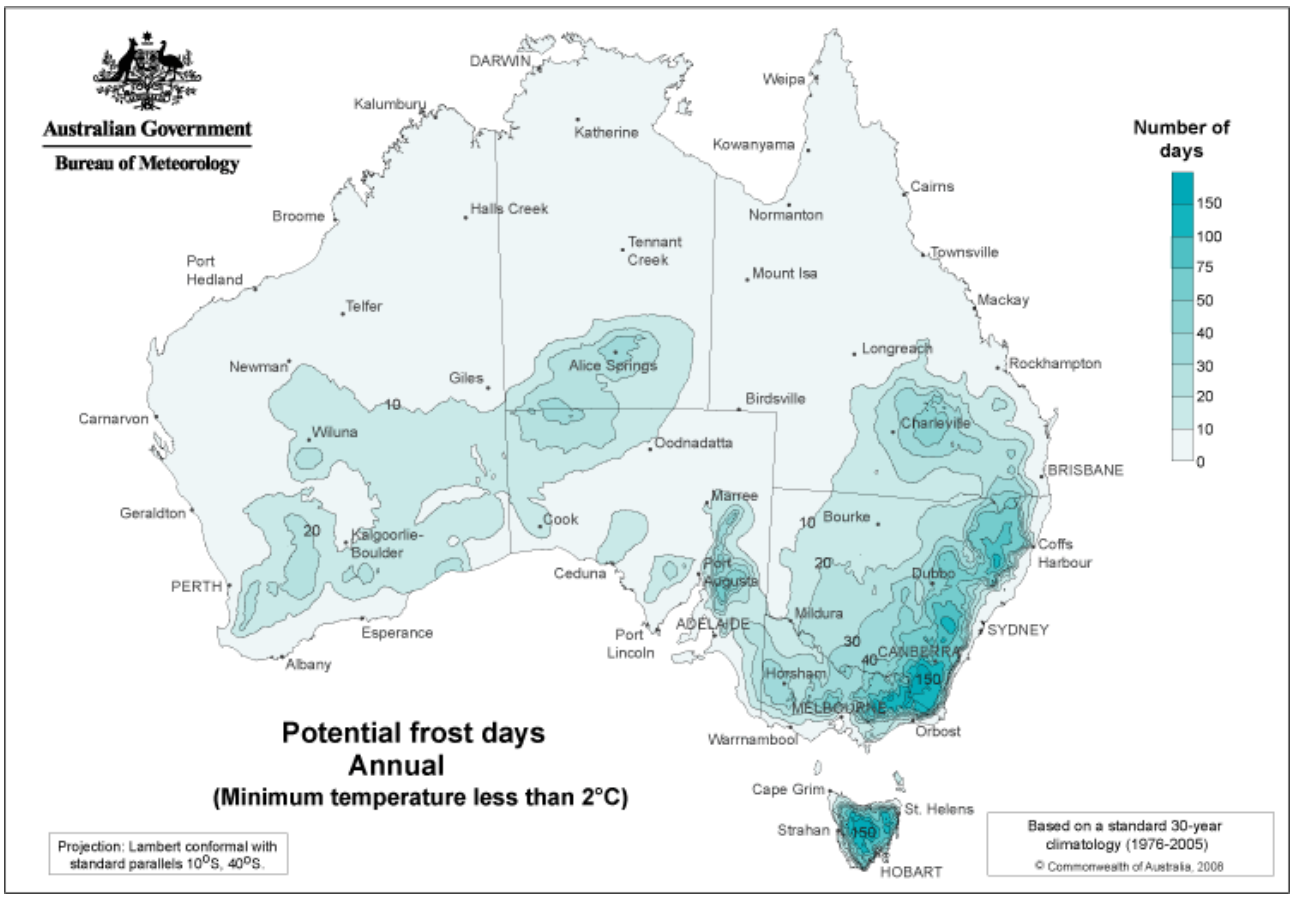
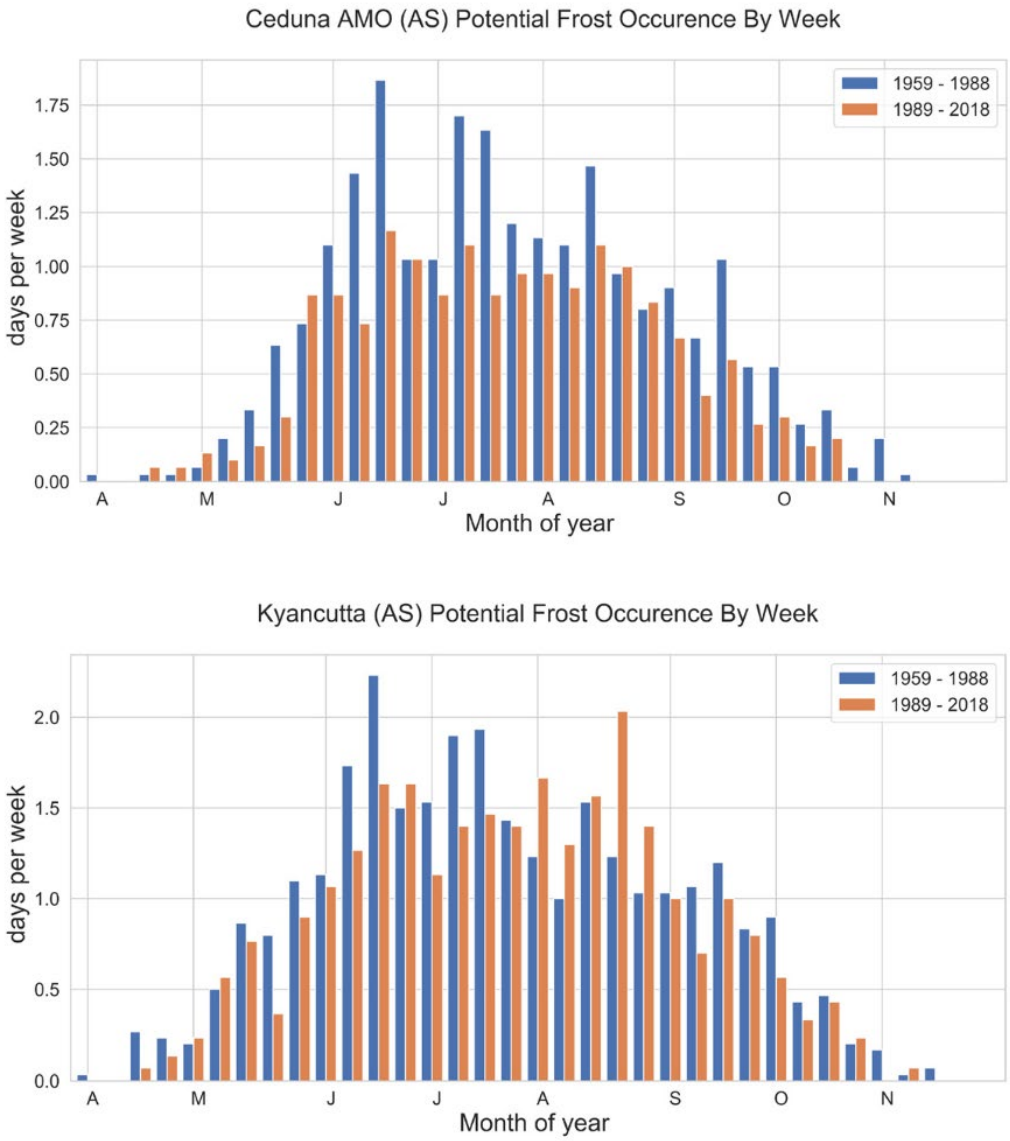


Figure 12 shows the number of potential frosts has decreased at Ceduna and Kyancutta between 1989–2018 (orange bars) compared with 1959–1988 (blue bars) (Bureau of Meteorology & CSIRO 2019). Although projections suggest frost risk will continue to decline, in southern regions of Australia, despite global warming, the number of spring frosts has increased and the period of frost occurrence has changed (Crimp et al, 2016).

Figure 12 Frost potential at Ceduna and Kyancutta (BOM, 2019)



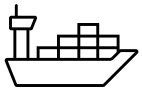
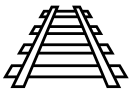
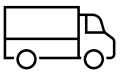
2.7 Assets and infrastructure

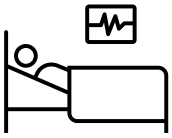
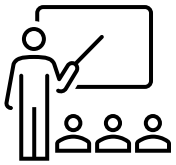
The Eyre Peninsula relies on infrastructure that supports individuals, communities and industries. RDA Eyre Peninsula reports that the limited capacity, condition and age of the region's infrastructure is a major issue and substantial upgrades are required to facilitate future development. The region is reliant on limited climate dependant water supplies including from outside the region (River Murray water).

Promoting strategic infrastructure investment is a key goal of the Eyre Peninsula's Strategic Regional Plan (RDA EP et al. 2022) including in transport (roads/ports/rail), power supply, water security and telecommunications connectivity.

Critical infrastructure assets on the Eyre Peninsula are described in Table 7.

Table 7 Key infrastructure assets (RDA EP, 2024)

Infrastructure	Description
Water 	Approximately 75% of total Eyre Peninsula water supply is sourced from the Uley South Basin (Southern Basins Prescribed Wells Area) with about 24% from the River Murray at Morgan via the Morgan-Whyalla pipeline. Groundwater levels in the Uley South Basin have been declining and the EP Landscape Board have identified that water allocations are likely to be significantly reduced (EPLB 2024d). Increasing concerns about water security on the Eyre Peninsula have led SA Water to propose the construction of a desalination plant at Billy Lights Point (SA Water 2024a). The proposed Northern Water project will involve the construction of another desalination plant in the Spencer Gulf which will be piped along the east coast of the Eyre Peninsula as well as to the north of the state (Government of South Australia 2023).
Ports 	Major ports are located at Ceduna (Thevandard), Port Lincoln, Whyalla and Lucky Bay and facilitate the export of iron ore, grain and mineral products. Port facilities also support fishing and aquaculture. Ports are currently for bulk-export only. Additional deep-sea ports have been proposed for Port Spencer and Cape Hardy.
Rail transport 	The narrow-gauge railway network was closed in 2019 resulting in the subsequent growth in grain cartage by road. A number of developments in planning and approval phases have identified opportunities to develop standard gauge heavy rail to support transport of iron ore or grain.
Road transport 	State maintained roads that provide key freight routes include The Eyre Highway (Port Augusta west to the border), Lincoln Highway (along the east coast to Port Lincoln), Flinders Highway (Port Lincoln to Ceduna) and the central Tod and Birdseye Highways. There is an extensive network of sealed and unsealed roads that connect towns and highways, most of which are the responsibility of the relevant local governments.
Air transport 	Commercial domestic airports are located at Whyalla, Port Lincoln and Ceduna. Smaller aerodromes and landing strips are located throughout the region and are used for private flying, charter, firefighting operations and Royal Flying Doctor Service aircraft.

Infrastructure	Description
Tele-communications 	Telecommunications are being improved across the Eyre Peninsula however there continue to be areas with no or limited connectivity. The closure of the Telstra 3G network on 31 August 2024 may lead to some users being unable to access the mobile network if their devices are older and unable to connect to newer networks. Starlink (satellite) infrastructure for high-speed Wi-Fi is increasingly being accessed by remote properties.
Health services 	Major hospitals are located in Whyalla, Port Lincoln and Ceduna with smaller hospitals in eight locations across the region. Community health centres are provided in a number of larger centres and dedicated Aboriginal health centres are located in Port Lincoln, Ceduna and Whyalla. The Royal Flying Doctors Service provides patient retrieval services across the region.
Education 	37 government and five private schools are located in the region. The University of South Australia has a campus at Whyalla and study centres at Port Lincoln and Ceduna. There are several TAFE campuses located at Port Lincoln, Whyalla, Ceduna, and Wudinna. Training is also offered at various local venues like libraries, council chambers, restaurants, and sports clubs (TAFE SA n.d.). Port Lincoln is the only campus in the region that offers specialised agricultural programs, including agriculture, rural operations, agribusiness, aquaculture, and horticulture. Additionally, online courses are available including certifications in agribusiness and pest management.

2.8 Governance

There are a range of organisations with responsibilities that include aspects that do or could contribute to drought resilience on the Eyre Peninsula. These organisations are described in Table 8.

Table 8 Roles and responsibilities of regional organisations

Organisation	Roles and responsibilities
RDA Eyre Peninsula (Regional Development Australia Eyre Peninsula 2023)	General role – • Encourage partnership between all levels of government and industry to enhance the growth and development of Australia's regional communities. • Develop and review the region's Strategic Plan. • Facilitate sustainable industry growth and diversification. • Support regional procurement and job creation. • Encourage regional tourism initiatives to grow the visitor economy. • Advocate for the provision of economic enabling infrastructure. • Assist with regional workforce attraction, retention, and development. • Promote greater regional awareness of and engagement with government policies, grants, and programs. • Improve regional policy making by providing intelligence and evidence-based advice to governments on regional development issues.
	Drought related – • Facilitate sustainable agricultural practices to ensure productive landscapes. • Secure scalable sources of non-climate dependent water to support population and industry growth.
Eyre Peninsula Landscape Board (Eyre Peninsula Landscape Board 2024a; Eyre Peninsula Landscape Board 2024f)	General – • Work with community, industry, and other government agencies to sustainably manage the region's natural resources, with a focus on soil, water management, biodiversity, and pest plant and animal control. • Develop simple and accessible five-year regional landscape plans based on community and stakeholder input. • Develop water allocation plans for prescribed water resources. • Operate as the relevant authority for a range of water, land protection and animal and plant control activities.

Organisation	Roles and responsibilities
	Drought – • Support landholders to reduce the risk of land degradation to protect the region's valuable soils. • Provide grants and funding for environmental and agricultural projects (e.g., Sustainable Agriculture Facilitator, Agricultural Projects and grassroots grants). • Provide information on water use efficiency and managing water affecting activities. • Support landholders to control prioritised pest plants and animals, as well as reduce threats from impact-causing native species.
PIRSA (PIRSA 2023; PIRSA 2024b) SARDI Minnipa Agricultural Centre (MAC)	General – • Maintain the prosperity and support the development and sustainability of the state's primary industries and regions.
	Drought – • Collaborate across government and industry to help the state adapt, prepare, and respond to climate change – including drought. • Provide technical and financial assistance to farmers and agribusinesses. • Promote carbon farming/sequestration. • Provide information on how to manage drought. • Coordinate the Regional Drought Resilience Planning Program and Farm Business Resilience Program funded through the Australian Government's Future Drought Fund. • Promote research and innovation to enhance industry productivity and sustainability (SARDI MAC) including in response to drought.
SA Drought Hub (SA Drought Hub 2024)	General – • Serve as a central resource for drought-related information and support services. • Coordinate research and innovation efforts to improve drought resilience.
	Drought – • Support a wide range of projects with the objective of enhancing drought resilience and recovery across all farming sectors, along with the industries and communities they support. • Facilitate access to drought-related research, tools, and technologies. • Disseminate up-to-date information and resources.
AIR EP (AIR EP 2024; AIR EP n.d.)	General – • Deliver quality applied research for the benefit of farmers on the Eyre Peninsula. • Develop relationships and partnerships in collaboration with government and the private sector.

Organisation	Roles and responsibilities
	Drought – • Support diverse projects aimed at enhancing drought resilience and recovery. • Build resilience and capacity of the agricultural sector through education, training, and extension.
EP LGA (Eyre Peninsula LGA 2024)	General – • Act as a platform for Member Councils keen to advocate on legislation and policy changes. • Assist in coordinating a range of activities seeking efficiencies for Councils at the operational level.
	Drought – • Support other organisations and efforts in building drought resilience.
Councils	General – • Provide local governance and deliver essential services to communities. • Manage local infrastructure, planning, and development projects. • Support community well-being through health, recreation, and cultural programs.
	Drought – • Support the integration of drought resilience into local planning and policy frameworks.

3. Drought

3.1 A definition of drought

Because people use and view water in so many different ways, there is no universally agreed definition of drought. It is measured in different ways and at different timescales, for example (Kirono et al, 2020):

- Meteorological drought – below normal rainfall.
- Agricultural or soil moisture drought – below-normal water storage in the saturated soil zone.
- Hydrological drought – below-normal water availability in streams, lakes and/or groundwater.
- Socioeconomic drought – when water needs cannot be met.

This lack of a clear definition can present a barrier to effective drought planning (Hughes et al. 2022). Governments often select meteorological indicators (such as rainfall and temperature) to serve as drought policy triggers due to their objectivity and transparency. However, this fails to capture the socio-economic outcomes of drought, which can lead to some non-drought affected areas receiving assistance and vice versa.

The Bureau of Meteorology defines drought as *a prolonged, abnormally dry period when the amount of available water is insufficient to meet our normal use* (Bureau of Meteorology, 2024).

Drought is not simply low rainfall. Rather, drought is a comparatively dry period compared to normal conditions. It also considers the ability of those affected to cope with drier than usual conditions.

For the purpose of the Eyre Peninsula Regional Drought Resilience Plan, drought is defined as:

> ***A period of abnormally dry conditions that impacts negatively on water availability and agricultural production in a region and, consequently, impacts negatively on the economy and environment of the region and the health and wellbeing of its residents.***

3.1.1 The National Drought Agreement

Many primary producers and other stakeholders associate drought being when a drought is officially 'declared' by the government.

It is important to note that the Government of South Australian no longer makes any declaration of drought, consistent with the National Drought Agreement.

In December 2018, the Council of Australian Governments agreed and signed a National Drought Agreement that sets out a joint approach to drought preparedness, responses and recovery (Council of Australian Governments 2018). One of the principles underpinning this agreement was that 'there should no longer be Exceptional Circumstances declarations and associated lines on maps'. This means that all government agreed that drought declarations would no longer be made as a trigger for support becoming available.

A review of the 2018 NDA was published in 2022, including recommendations to strengthen the Agreement to ensure that farm businesses, farming families and farming communities across the country are appropriately supported in advance of, during, and post drought events. Recommendation 25 describes proposed updated principles for the next iteration of the Agreement, including that 'support needs are highly

variable, and eligibility should be based on need, not activated by drought declarations (Drought Agreement 2022).

The development of this Plan is consistent with the Agreement's objectives to prioritise objectives and outcomes that enhance long-term preparedness, sustainability, resilience and risk management for farming businesses and farming communities in Australia. A key feature of the agreement is a greater focus on enhancing drought resilience before drought, to enable farms, people, businesses and the environment to minimise the impact of drought rather than waiting until drought hits to act.

3.2 Causes of drought

Drought on the Eyre Peninsula is caused by a number of natural atmospheric conditions including the Positive Indian Ocean Dipole, El Niño-Southern Oscillation and Southern Annular Mode. Anthropogenic climate change is also projected to impact on drought conditions. The following descriptions have been adapted from the Bureau of Meteorology website.

3.2.1 El Niño

The El Niño and La Niña are part of one of the strongest climate drivers for the Eyre Peninsula (Bureau of Meteorology 2021b). They are a part of a natural cycle known as the El Niño–Southern Oscillation (ENSO) and are associated with many months of warming (El Niño) or cooling (La Niña) in the central and eastern tropical Pacific. The ENSO cycle loosely operates over timescales from one to eight years.

El Niño typically results in:

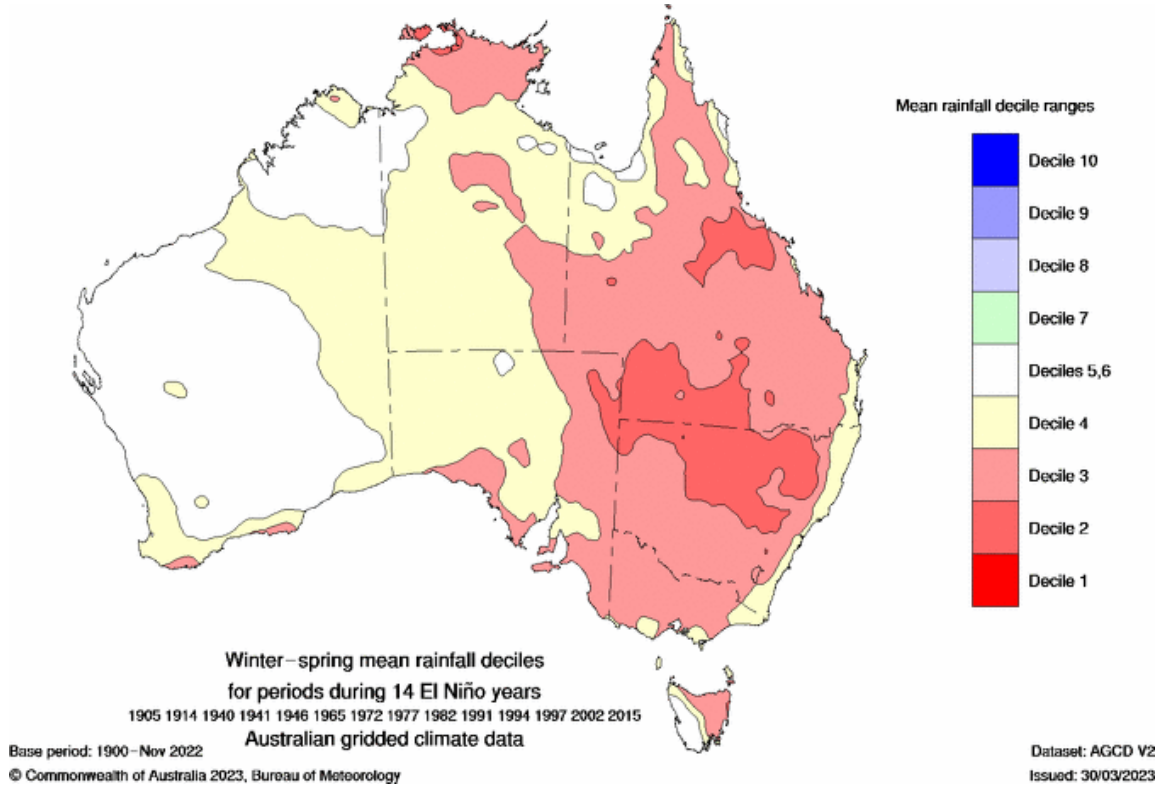
- Reduced rainfall across most of the region (refer Figure 13)
- Warmer temperatures
- Shift in temperature extremes
- Increased frost risk
- Reduced tropical cyclone numbers
- Later monsoon onset
- Increased fire danger in southeast Australia.

An El Niño occurs when sea surface temperatures in the central and eastern tropical Pacific Ocean become substantially warmer than average, which causes a shift in atmospheric circulation. Typically, the equatorial trade winds blow from east to west across the Pacific Ocean. El Niño events are associated with a weakening, or even reversal, of the prevailing trade winds.

The shift in rainfall away from the western Pacific, associated with El Niño, means that Australian rainfall is *usually* reduced through winter–spring, particularly across the eastern and northern parts of the continent.

Although most major Australian droughts have been associated with El Niño, analysis of past El Niño events shows that widespread drought does not occur with every event, and the strength of an El Niño is not directly proportional to the rainfall impacts.

Figure 13 Winter-spring mean rainfall deciles during El Niño years (Bureau of Meteorology, 2021a)



3.2.2 Positive Indian Ocean Dipole

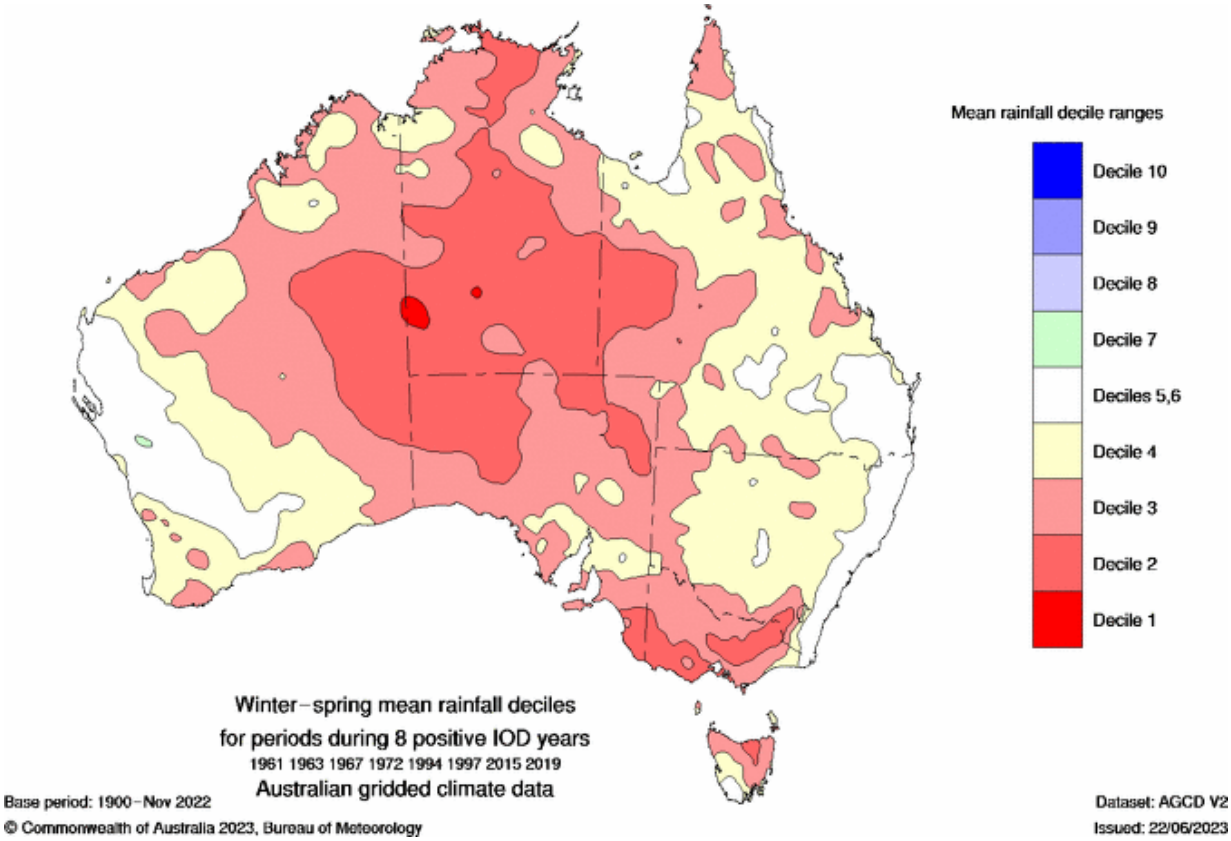
The Indian Ocean Dipole is another major influencer of drought conditions on the Eyre Peninsula. The Indian Ocean Dipole refers to sustained changes in the difference between sea surface temperatures of the tropical western and eastern Indian Ocean (Bureau of Meteorology 2021a). The Indian Ocean Dipole has three phases: neutral, positive, and negative.

During the positive Indian Ocean Dipole phase, westerly winds weaken along the equator allowing warm water to shift towards Africa. Changes in the winds also allow cool water to rise up from the deep ocean in the east. This sets up a temperature difference across the tropical Indian Ocean with cooler than normal water in the east and warmer than normal water in the west. Generally, this means there is less moisture than normal in the atmosphere to the northwest of Australia. This changes the path of weather systems coming from Australia's west, often resulting in less rainfall and higher than normal temperatures over parts of Australia during winter and spring.

A positive Indian Ocean Dipole typically means:

- Less rainfall across most of the region (see Figure 14)
- Higher than normal temperatures during winter and spring.

Figure 14 Winter-spring mean rainfall deciles during positive Indian Ocean Dipole years (Bureau of Meteorology, 2021a)

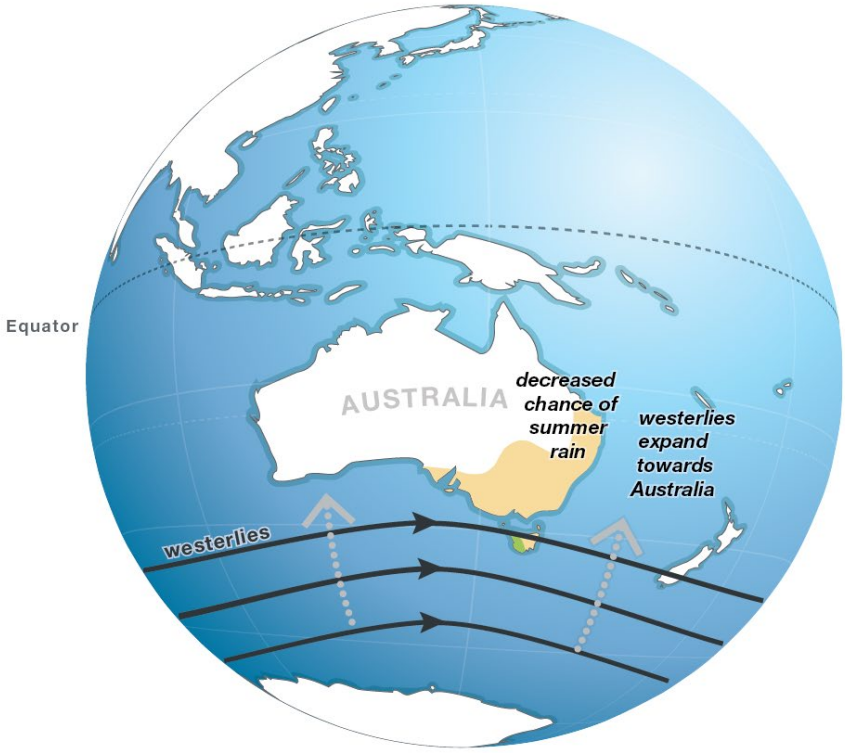


3.2.3 Southern Annular Mode

The Southern Annular Mode, or SAM, is another climate driver that can influence rainfall and temperature in southern Australia (Bureau of Meteorology 2024b). The SAM refers to the north/south movement of the strong westerly winds that blow almost continuously in the mid- to high-latitudes of the southern hemisphere. This belt of westerly winds is also associated with storms and cold fronts that move from west to east, bringing rainfall to southern Australia.

The SAM phase that influences rainfall on the Eyre Peninsula is the SAM summer negative phase which, when active, decreases chance of summer rain in the region (see Figure 15). This occurs when there is an increased dry air flow from the interior of Australia during summer. Positive or negative phases can last from a week to several months.

Figure 15 Negative summer phase of Southern Annual Mode (SAM) (Bureau of Meteorology, 2024b)



Southern Annular Mode (SAM): **Negative phase (summer)**

3.3 Previous droughts

Before European colonisation, Aboriginal people across the Eyre Peninsula would have experienced numerous drought periods. Since then, the region has experienced a number of significant droughts including (Bureau of Meteorology 2020):

- The Federation drought: 1895 to 1902
- The 1914 to 1915 drought
- The World War II drought: 1937 to 1945
- The 1965 to 1968 drought
- The 1982 to 1983 drought
- The Millennium drought: 1997 to 2009
- The 2017 to 2019 drought (the Tinderbox drought)

3.3.1 Impacts of droughts

The impacts of drought on the Eyre Peninsula are profound. The literature and stakeholders have identified the following key impacts (Lehmann 2023; Fleming-Muñoz, Whitten & Bonnett 2023; Appendix A – Regional Engagement Summary Report).

Social impacts

- Reduced mental health and wellbeing:
  - Increased hard and emotional decision making, with significant associated stakes.
  - Social isolation and a lack of desire to engage in social activities.
  - Increased feelings of stress, panic, anxiety, depression, loss of purpose and hope.
  - Personal pride impact and feelings of shame.
  - Change in amount of time working – increased workload for some and less workload and more time to worry for others.
  - When farmers are forced to shoot and bury their stock because it is too costly to send them to market, this takes a major mental toll.
  - Loss of crops, stock, trees, native fauna and greenery has a significant mental wellbeing impact.
  - Increased substance abuse.
  - These mental health and wellbeing impacts can lead to suicide in extreme cases.
  - Impacts on wellbeing are felt across the community – no one is spared during a long drought.

    > "There's a slow, grinding, wears-you-down effect, mentally, financially and physically."

- Stress and wellbeing impacts for family and friends:
  - Stress and mental health impacts can lead to relationship breakdowns, divorce and domestic violence.
  - Impact on children as they observe their parent's stress, miss out on sport, school camps, boarding school, university etc. due to a lack of money.
  - Withdrawal from friends and taking out personal stress on others.
  - Poor mindsets ripple into the community more broadly – "loss of community morale".
- Population shrinkage as people move away for job opportunities elsewhere:
  - Some farms are forced to sell up, with farmers and their families leaving the region. These are usually bought by neighbours, resulting in bigger farms with less people to contribute to community life in the long-term.
  - Some businesses are forced to sell up as less money is spent in the region, with business owners and their families moving elsewhere to find work.
  - Farms and businesses lay off workers who are forced to leave the region to find work elsewhere.

  - Young people move elsewhere for better work and lifestyle opportunities, and may be less inclined to come back due to their experience of drought.
  - This decrease in population has many flow-on effects including reduced social fabric and township vibrancy, less volunteers, less local business and services including people with specialist technical skills, less school enrolments which result in quality of school facilities reducing, and fewer members in sporting clubs. This is very hard to rebuild following drought.
  - "When we moved here 30 years ago, there were 16 other farms and farming families. Today, there are two other farms, and they're both managed remotely / absentee owners."
- Loss of income, and therefore less money to spend on things that provide fulfilment, medical treatment, or sponsorship of volunteer organisations and clubs.

While minimal in comparison to the negative social impacts of drought, participants identified that drought can occasionally cause positive social impacts:

- Community closeness – community initiatives proliferate to bring people together, sporting clubs become a more important lifeline than ever, families and friends support becomes vital, innovation from passionate people creates a sense of town pride.
- Increased time – those who have less workload due to less economic activity have more time for family, recreation, volunteering and education (if funds and mental wellbeing allow).
- Increased awareness of drought and how to respond – those who have experienced a drought reflected that this experience helps them during the next droughts – "what doesn't kill you makes your stronger".

Financial and business impacts

The immediate major impact of drought is on crop yields and pasture production, resulting in a decline in profit with many businesses incurring significant financial losses and erosion of financial reserves and assets (Pearson and Foster 2008).

- Financial hardship on farms:
  - Farm productivity suffers, resulting in reduced cash flow particularly in subsequent years of drought. This makes it hard for farming families to continue to make ends meet.
  - High input costs remain, placing farmers in greater and greater debt.
  - Destocking at low prices, followed by restocking at high prices. Some farmers are forced to shoot their own stock when it is more costly to send them to market.
  - Prices for freight and grain for seeding and feed increase due to undersupply and high demand. Sometimes Eyre Peninsula farmers are not able to access feed due to lack of supply or extremely high price.
  - Some farms are forced to sell.
  - Workers are laid off.
  - Loss of income restricts capital improvement and the ability to invest in or adopt the best farming practices., creating a negative spiral.

  - Young farmers who have had a drought in their first year are particularly affected, with a major impact on their finances and willingness to stay in the industry.
  - If they are not making a profit, farmers are not able to get tax deductions on Super contributions, impacting on their ability to retire.

> "I've stitched old sheets together and prayed for new shoes for my kids in drought years".

- Financial hardship for other businesses/industries:
  - Farmers "tighten their belts" and stop spending as much in communities, which reduces income for other businesses, particularly agricultural allied industries and businesses that supply 'luxury' goods and services such as hairdressers, cafes, car dealerships etc.
  - Some businesses are forced to sell.
  - Workers are laid off.
  - Lack of water for industries such as mining, fish production etc. with subsequent impact on jobs and the economy.
  - Less ability to pay rates which impacts Councils' ability to continue to provide services and infrastructure.
- Agricultural plan derailment:
  - Otherwise well strategically planned farming operations have to "thrown out" their plans.
  - Succession plans get tested as it becomes more appealing to sell to corporates / large farms than to children.
  - Off-farm income needs pursuing (which hurts the farm).
  - Farmers become more risk averse in following years.
- Changed farming practises:
  - Destocking.
  - Planting of different crops which are less reliant on rainfall.
  - Crops not planted particularly in marginal country, or only half of the land planted as a risk management strategy.
- Loss of workers:
  - Loss of farm workers, other skilled workers and young people which are difficult to get back after drought.

While the negative impacts on businesses and finances are profound, some participants identified that as a result of drought they and their business became much better at forward planning and risk management and would better understand what actions to take during the next drought.

Environmental impacts

- Soil erosion:

  - Loss of soil due to lack of vegetation and dry conditions exacerbating wind and water erosion. Soil impacts increase in subsequent years of drought and can take many years to recover.
  - Dust and dust storms.
- Reduction in water availability:
  - Rainwater tanks and other surface water catchments run dry.
  - Increased groundwater use leads to a reduction in aquifer levels.
  - Lack of rainwater recharge to aquifers.
  - Water restrictions.
  - Some properties are forced to truck in water for stock and personal use in if they are not connected to mains water.
  - Pest and native animals compete with stock for water.
- Reduced crop yield.
- Heat and water stress in livestock, and less stock feed available.
- Loss of native vegetation:
  - Loss of native vegetation due to lack of water.
  - Overgrazing by stock and native animals (primary producers occasionally release their livestock into native vegetation when there is not enough feed on farms to sustain them, although this has become less prevalent over time).
  - Subsequent impact on amenity, tourism, habitat availability and soil condition.
- Pressure from pest plants and animals:
  - Pest plant and animal abundance increases in good years, meaning that in the bad years that follow pests have a bigger impact.
  - Fox baiting reduces as there are less sheep on farms, which means fox numbers increase.
  - Goats and deer migrate from the north in search for water and vegetation.
- Impact on native animals:
  - Native wildlife dies due to a lack of vegetation and water.
  - Kangaroos, emus (from conservation areas) and dingoes migrate from the north in search of water and vegetation.
- Increased bushfire risk.
- Loss of gardens and green space.
- Bringing in feed for stock from other districts can introduce new weeds.
- Illegal dumping increases as people cannot afford to pay dumping fees.

Service and infrastructure impacts

Participants identified the following impacts of drought on infrastructure:

- Loss of local services as businesses are forced to close.
- SA Water mains restrictions.
- Soil erosion causes soil to accumulate on roads, causing driving hazards and in some cases cutting properties off until roads can be cleared.
- Lack of water for personal use such as showers and home gardens.

3.4 Future climate and drought projections

Climate projections describe what the future climate could be like, sourced from multiple climate models, and based on numerous assumptions about the factors that influence climate and the trajectory of change in greenhouse gas emissions in the atmosphere.

The CSIRO and Bureau of Meteorology have used up to 40 global climate models to develop projections for different parts of Australia. Each model uses different assumptions and algorithms to project how climate variables such as temperature, rainfall and evapotranspiration will respond in different emissions scenarios over different time frames. The projections presented in online tools and viewers each use a different combination of global climate models and so show slightly different results. Three of the projections tools most commonly used in South Australia are described in the following sections:

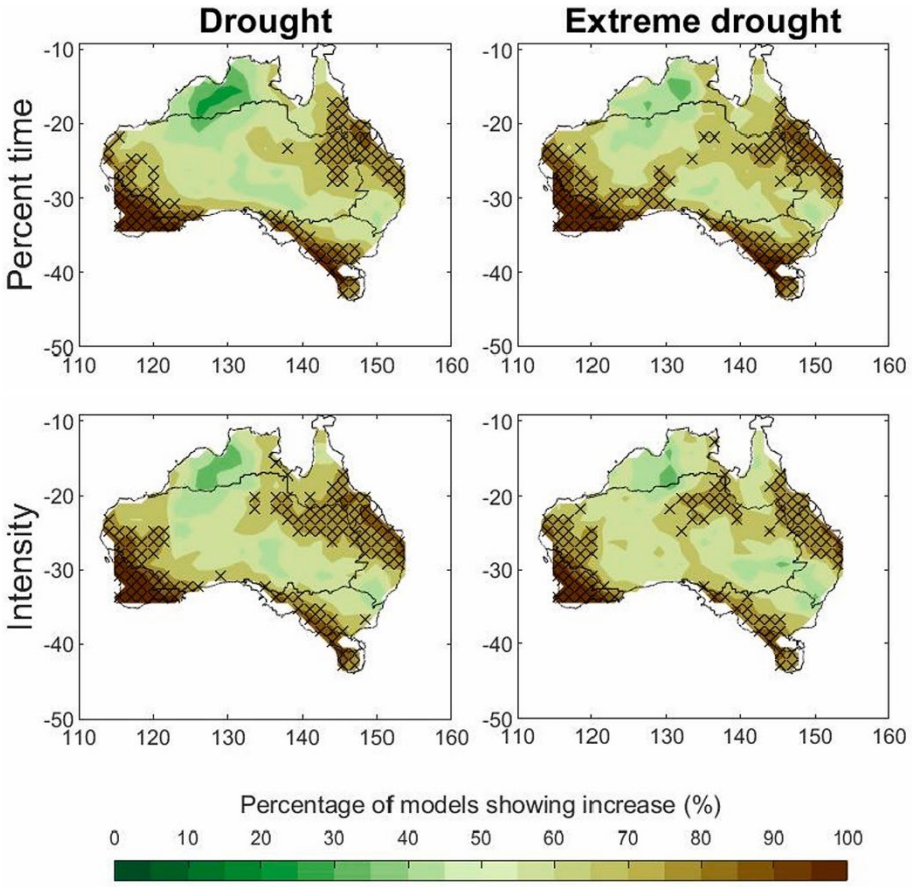
1. My Climate View (national focus)
2. Climate Change in Australia (national focus)
3. DEW South Australian Climate Projections Viewer (SA focus).

Analysis of multiple global climate model simulations of rainfall and soil moisture for the historical (1900–2005) and future (2006–2100) climates undertaken by Kirono et al (2020) indicated that under climate change, Australia will spend more time under drought conditions, with longer drought duration and more intense drought, particularly across southern and eastern Australia. Kirono et al defined drought as when the Standardised Precipitation Index (SPI) and Standardised Soil Moisture Index (SSM) were negative for a period of 3 months or more, and reached a value of -1.0 to define drought and -2.0 to define extreme drought. Drought intensity is defined by the cumulative SPI or SSMI from all events, with the more negative the value, the more intense the event.

Figure 16 shows the percentage of models showing a projected increase in percentage of time spent in drought and extreme drought, and the intensity of drought and extreme drought in the 21st century (2006–2100) under a high emissions scenario (Representative Concentration Pathway 8.5 (RCP8.5)), relative to the 20th century (1900–2005).

Model results in southern Australia showed lower levels of uncertainty than the rest of Australia with high model agreement on the increase in time spent in drought.

Figure 16 Increase in percentage of time spent in drought and intensity of drought (from Kirono et al., 2020).



3.4.1 My Climate View (myclimateview.com.au)

My Climate View is a collaboration between Australia's national science agency CSIRO and the Bureau of Meteorology and has been designed together with Australian farmers as part of the Climate Services for Agriculture program with funding from the Australian Government's Future Drought Fund. Climate trends for specific commodities at a local scale are presented to support decision making.

My Climate View presents projected future rainfall, temperature, and relative humidity data from Climate Change in Australia (see following section), using its Application-Ready dataset. It also presents seasonal forecast data from the Bureau of Meteorology.

My Climate View allows users to select a location and if desired, a commodity (for example wheat or sheep). Projections include key commodity climate factors, for example for wheat it will include growing season rainfall, frost at flowering and heat damage at flowering and grain fill. For sheep it will include winter rainfall for pasture growth and cold exposure at lambing. A default growing season is defined for each location but can be altered in the tool.

Data is presented for each location and commodity at 2050 for a medium emissions scenario (RCP 4.5) as a default, with users able to explore 2030, 2050 and 2070 at a medium or high (RCP 8.5) emissions scenario,

Data is not mapped across the region. Rainfall and temperature projections for three locations at 2050 using RCP 8.5 are shown in Table 9.

Table 9 Selected climate projections for three Eyre Peninsula region locations (myclimateview.com.au)

	Ceduna		**Cummins**		**Kimba**	
	Recent (1994 – 2023)	2050s average	(1994 – 2023)	2050s average	(1994 – 2023)	2050s average
Total annual rainfall	268 mm	241 mm	424 mm	381 mm	326 mm	290 mm
Summer rainfall	47 mm	35 mm	58 mm	46 mm	67 mm	58 mm
Autumn rainfall	61 mm	51 mm	87 mm	80 mm	65 mm	62 mm
Winter rainfall	98 mm	94 mm	189 mm	173 mm	114 mm	105 mm
Spring rainfall	62 mm	59 mm	91 mm	81 mm	81 mm	74 mm
Average maximum temperature	24.0ºC	25.3 ºC	22.0 ºC	23.2 ºC	23.7 ºC	25.2 ºC
Annual hot days (over 35ºC)	30 days	38 days	13 days	18 days	31 days	45 days

3.4.2 Climate Change in Australia (climatechangeinaustralia.gov.au)

Climate Change in Australia was developed by the CSIRO and the Bureau of Meteorology and provides a number of data products and tools that present projections at different scales for four timescales (centred on 2030, 2050, 2070 and 2090) and three emissions scenarios (RCPs 2.5, 4.5 and 8.5).

The Regional Climate Change Explorer provides a summary of projections across large "cluster" areas. The Eyre Peninsula region is within the Southern and South-Western Flatlands East sub-cluster as shown in Figure 17.

Figure 17 Southern and South-Western Flatlands East Cluster area

Key messages for the cluster are described below:

- Time spent in drought is projected (with *high confidence*) to increase over the course of the century.
- Average temperatures will continue to increase in all seasons (*very high confidence*).
- More hot days and warm spells are projected with *very high confidence*. Fewer frosts are projected with *high confidence*.
- A continuation of the trend of decreasing winter rainfall is projected with *high confidence*. Spring rainfall decreases are also projected with *high confidence*. Changes in other seasons unclear, although downscaling results suggest a continuation of the observed autumn declines.
- Increased intensity of extreme rainfall events is projected, with *high confidence*.
- A harsher fire-weather climate in the future (*high confidence*).
- Potential evapotranspiration is projected to increase in all seasons as warming progresses (*high confidence*).
- A tendency for a decline in relative humidity is projected for winter and spring although changes in the near term will be small (*high confidence*).

On annual and decadal basis, natural variability in the climate system can act to either mask or enhance any long-term human induced trend, particularly in the next 20 years and for rainfall.

3.4.3 DEW South Australian Climate Projections and Viewer

The *Guide to climate projections for risk assessment and planning in South Australia* (DEW 2022) provides a summary of the changes in climate and sea levels likely to occur in South Australia, together with guidance on the use of climate projections for risk assessment and planning. Projections are presented for landscape management regions including the Eyre Peninsula Landscape Region.

The guide identifies that by 2030, time spent in drought (over a 20-year period) is projected to nearly double in the Eyre Peninsula Landscape Region which means that up to 65% of time could be in drought. Additionally, the frequency of extreme drought will more than double by 2030. Looking further ahead, by 2050, time spend in drought is projected to more than double, potentially reaching up to 70%.

By 2030, the Eyre Peninsula Landscape Region's mean daily spring maximum temperatures are projected to increase by 1.3 °C compared to 1.0 °C for mean daily winter maximums. By 2030 the Eyre Peninsula's annual rainfall is projected to decline by 4.6%. The region will also experience an increase in annual potential evapotranspiration of 2.7% by 2030 and 4.6% by 2050.

3.5 Impacts of drought on water availability

Drought can lead to a range of changes to the availability of water over shorter timeframes and can be better characterised by factors such as (Fowler et al. 2023):

- Increasingly less run-off for a given rainfall.
- Changes in rainfall seasonality.
- Increased time spent in spells of little or no rainfall.
- Decreases in frequency of high-rainfall events.
- Increases in evaporative demand.

A reduction in cool-season rainfall is likely to reduce recharge to groundwater systems. Recharge to the Quaternary limestone aquifer is likely to occur when there are more than 10 days of rainfall of more than 10 mm between the months of May and October (DEW, 2022b).

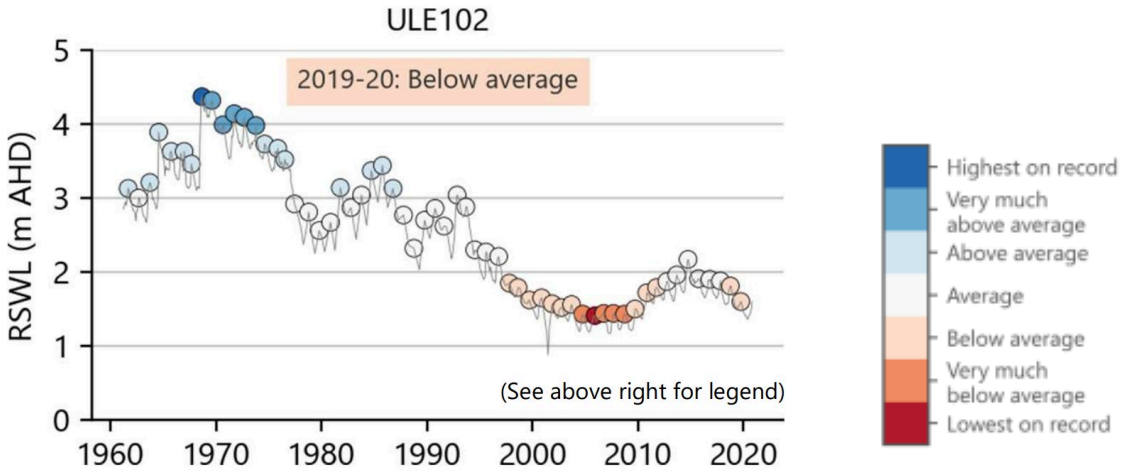
Higher temperatures and lower rainfall will lead to higher potential evapotranspiration, which may affect groundwater demand and evaporative discharge.

The availability of groundwater has declined significantly over the past several years across Eyre Peninsula with declining rainfall (and declining recharge) coupled with continued extraction and increasing demand. This is most prominently seen at Uley-South Public Water Supply (PWS) where SA Water extracts water to feed into its reticulated system. Water levels are declining and ongoing extraction is increasing the risk of salinisation of groundwater. It is likely that SA Water's access to these groundwater supplies will be restricted to preserve the aquifers.

Several smaller freshwater lenses are no longer able to provide water for use. For example, licensed extraction from the Polda consumptive pool (around 35 km northeast of Elliston) was zero in 2021-22 due to lack of groundwater storage.

Figure 18 shows an example of long-term decline in groundwater levels in the Uley-South PWS (DEW, 2022b). Note this decline is influenced by both reductions in rainfall and increases in use.

Figure 18 Hydrograph for well ULE102 in the Uley South PWS (DEW, 2022b)



3.5.1 Implications for agriculture

The impact of drought on agriculture is varied and depends on many factors including (but not limited to) (Department of Environment, Water and Natural Resources 2013):

- Climate regime (e.g. drier climates are usually more susceptible).
- Type of crop/stock.
- Soil type and ability to retain moisture.
- Type of water source and availability of alternatives (e.g. groundwater resources can be more resilient than surface water resources in extended dry periods).

- The condition of the farming enterprise leading into drought, including the availability of grain reserves and financial position.

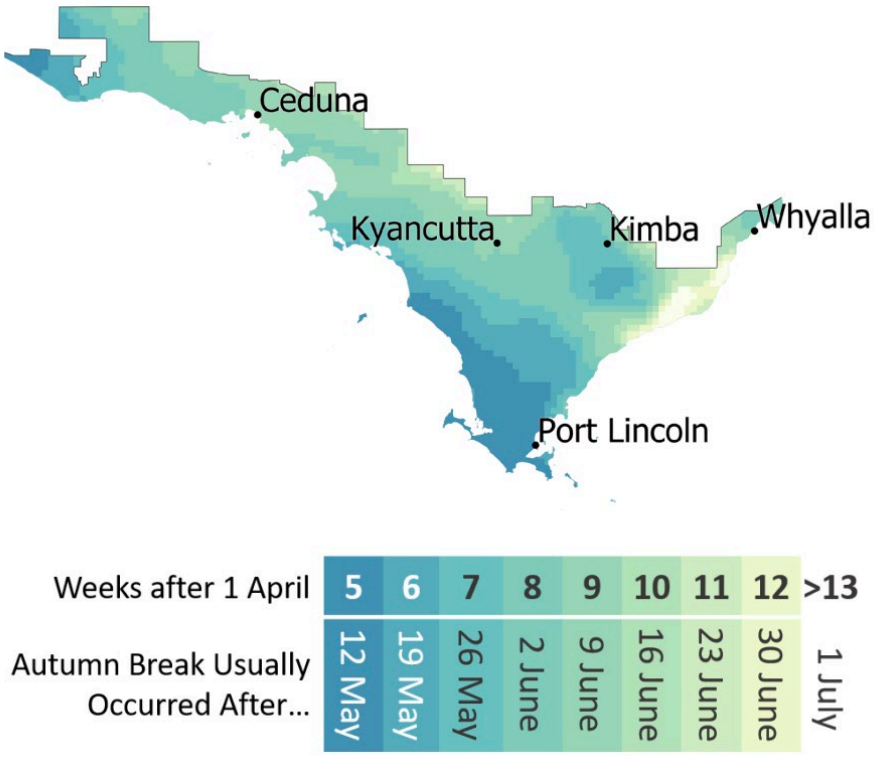
Extended or seasonal dry conditions in dryland agricultural areas can deplete soil moisture storage leading to lack of production of crops, and reduction in feed for stock and livestock which causes loss of condition where feed cannot be imported and destocking is not undertaken (Department of Environment, Water and Natural Resources 2013). Drought also reduces the availability of sources of water for stock watering. Declining growing-season rainfall results in less profitable and reliable crop production and less crop and stock feed biomass.

Soil health can deteriorate during drought making production following a drought more difficult. Lack of cover on dry soils increases erosion potential, causes compaction (creating problems for root penetration) and potentially leads to increased water repellence.

The impact of drought is likely to be felt most where rainfall is less, and less reliable (see Figure 19 below). This map complied by BOM and CSIRO shows that timing of autumn breaks is variable across the region, based on data over the last 30 years (1989-2018). The autumn break is generally designed as at least 15mm of rainfall over three days.

It would be expected that the northern and western areas of Eyre Peninsula will be more sensitive to dry autumns.

Figure 19 Timing of the autumn outbreak on the Eyre Peninsula (BOM, 2019)



3.5.2 Planning for a changing climate

The potential impacts of climate change on Australian agriculture are well documented and include increased invasion of weeds, pests and diseases and changes in crop yields, pasture growth, animal health, carrying capacity and soil condition (Siebentritt, Halsey and Stafford-Smith 2014).

Of primary concern for farmers on the Eyre Peninsula is how a warming and drying climate could influence broadacre cropping yields and production of pasture for grazing. In the northern parts of the Eyre Peninsula greater areas of farming land may become marginal for cropping (Nidumolu et al. 2012). Increased use of livestock in areas that become marginal for cropping will increase the need for livestock water supplies, which are also affected by climate change.

The region has been proactively planning for climate change for many years through supporting research projects and industry and community work into climate change impacts and potential adaptation options.

Various agricultural practices that are considered leading edge will provide some measure of adaptation in the short term. However, long term adaptation may require more transformational responses.

4. Drivers of change

A number of broad economic, social and environmental trends, challenges and opportunities directly or indirectly influence the resilience of the Eyre Peninsula to drought. These are occurring at different scales and have different implications for the region. These are identified in Table 10 (RDAEP, EPLGA and EPLB 2022; CSIRO 2022; PwC 2022; Australian Bureau of Statistics 2021; Eyre Peninsula Landscape Board 2021c, engagement summary report (Appendix A)).

Table 10 Drivers of change on the Eyre Peninsula

Trend, challenge or opportunity	How this is experienced on the Eyre Peninsula
Improvements in farming practises	Eyre Peninsula farmers have always been renowned for being on the forefront of innovative agricultural practise. Improvements in technology and machinery, changes in practises such as no-till farming, improvements in crop varieties, improvements in pest control and other advances have increased crop yield enormously over the past few decades. In particular, improvements in soil moisture retention and erosion prevention have helped to address the challenging soil conditions and lack of rainfall.
Increased agricultural input costs and lack of local supply of inputs	Over the last four years, the cost of agricultural inputs including seed, chemicals and machinery has spiked. This has had major impacts on the profitability of Eyre Peninsula farms, and makes them more financially vulnerable if a crop fails due to drought, frost, pests, disease or other impacts. The distance of the Eyre Peninsula farms from many providers of agricultural inputs results in increased transport costs, reduced choice, and a need to order supplies so far in advance that this cannot be informed by the year's conditions. Increasing local production of agricultural inputs could help to address this challenge.
Market volatility	Sudden and unexpected widespread trade disruptions brought through global pandemics, conflict, geopolitical tensions, disease, or similar events can have significant impacts on supply chains, demand, and commodity prices. The agricultural sector in particular is influenced by fluctuating market prices for agricultural goods, upon which they have little control.
Lack of local agricultural value-add opportunities	Due to a lack of local agricultural value-add opportunities on the Eyre Peninsula, farmers are forced to bulk export only. There are significant opportunities to increase value-add services which would increase economic generation in the region and move the Eyre Peninsula agricultural sector from price-takers to price-makers. This could include a local abattoir, mill, oil press, pelletising feed, protein powder etc. A containerised port service would be required to effectively facilitate many of these value-add options.
Interest rates	As interest rates rise, this has a major impact given high debt levels for farmers. The extremely high interest rates of the 1990's are still recognised as a time that changed the course of the agricultural sector on the Eyre Peninsula as many farmers unable to service their loans were forced to sell their farms.

Trend, challenge or opportunity	How this is experienced on the Eyre Peninsula
Market competition	Until recently, Viterra had a monopoly over the crop market. The introduction of T-Ports has introduced competition and significantly improved market conditions for Eyre Peninsula farmers.
Changing crop types and stocking rates	Recent changes in market conditions and agricultural practise have led to changes in crop types and stocking rates. Many farmers are reducing their sheep stocking rates or getting out of sheep all together due to low profit margins and recent bans on live sheep exports. Others are shifting from merinos to dorpers and other meat sheep. Many farmers are planting less traditional crops such as lentils and canola, which have high start-up costs but can provide significantly higher profitability than other commodities once established. Increasing food demand from developing countries such as India will continue strong demand for lentils.
Consolidation of agricultural interests	Farms on the Eyre Peninsula have become bigger and bigger over the past few decades. As farms have been sold, neighbours or commercial entities have purchased these and amalgamated them into bigger properties. This improves economies-of-scale. However, as people leave the region due to less demand for labour, this has implications for community vibrancy and viability in the long run.
Decreasing population in small towns	Larger towns and cities and high amenity areas continue to draw population growth and economic activity away from smaller towns. It can be challenging for small towns to retain population numbers and compete with the economic, education and social opportunities available in urban areas and regional centres. Conglomeration of farms and increasing mechanisation of work on farms has further exacerbated this. Younger generations are often seen leaving the regions, resulting in ageing populations. This reducing population in small towns has significant flow on effects, often resulting in less community diversity, vibrancy, resources, services and a reduction in skilled labour which can impact productivity.
Tight regional labour markets	Regional areas including the Eyre Peninsula are experiencing greater difficulty in attracting and retaining labour. There is an opportunity to target new groups including backpackers, grey nomads and migrants to meet workforce shortages.
Lack of childcare	A lack of childcare capacity on the Eyre Peninsula presents a major challenge. This often means parents must stay at home to look after their children, influencing their ability to re-enter the workforce.
Lack of housing supply	The Eyre Peninsula has traditionally benefitted from ample housing and accommodation. For various reasons this supply is now unavailable, with rental properties and short-term accommodation vacancy rates at unprecedented low levels. The demand for accommodation is at all levels – community, affordable, family-style, executive; (one to four-bedroom) and quality.

Trend, challenge or opportunity	How this is experienced on the Eyre Peninsula
Lack of higher education including senior school and tertiary education	Lack of senior and tertiary education opportunities on the Eyre Peninsula means many young people leave the region for study. This has impacts on family connection and financial savings, and some young people do not return to the Eyre Peninsula at the competition of their studies. The lack of local educational opportunities prevents some residents from accessing the education they would otherwise acquire, with consequences for the skill levels of the local workforce.
Lack of medical services	The Eyre Peninsula is suffering from a lack of medical services, including for mental health, and a lack of consistency in medical practitioners. The research and engagement for this project highlighted the significant adverse impacts on the mental health of the people and communities experiencing drought and the need for increased health services in rural areas and for primary producers. The increase in availability of tele-health (consultation with a healthcare provider by phone or video call) post COVID-19 is beneficial for rural communities, but cannot replace face-to-face healthcare.
Ageing population	The Eyre Peninsula's population is ageing. This has consequences for economic growth, labour force participation and demand for services including medical services.
High reliance on volunteers	Volunteers play a critical role in the vitality of the Eyre Peninsula. However, an overdependence on these volunteers can lead to burnout. Volunteering rates are falling across the region, particularly in young age groups. This has implications for the future viability of sporting and other clubs which play such an important role in the region.
Digitalisation	A new digital world is filled with opportunities for improved farming practises and business management, online work and study, telehealth, online shopping, and digital currency. With technology and automation come consequences for jobs and security.
Water security challenges	Decreasing groundwater levels on the Eyre Peninsula is posing a major water security challenge for the region. Alternative water sources including a desalination plant are necessary to construct as soon as possible to limit water restrictions and long-term negative impacts on local groundwater systems. Industrial expansion including mining will expand demand for secure water supplies into the future.
Growth in new markets	Eyre Peninsula is well positioned to capitalise on recent growth in emerging markets. This includes wind and solar energy, hydrogen, mining for minerals critical for the net-zero transition, space technology, seaweed and local processing and manufacturing.

Trend, challenge or opportunity	How this is experienced on the Eyre Peninsula
Climate change and decarbonisation	Rising greenhouse gas levels in the atmosphere are causing temperatures to rise, rainfall to reduce, and extreme weather events to become more frequent and more severe. Responding to climate change requires a shift in the global economy to reduce carbon emissions and action to adapt to a new and changing climate. The primary production sector on the Eyre Peninsula will need to adapt to a changing climate. Mining, manufacturing and transport industries are key sources of greenhouse gas emissions and will require transformation change to reduce these. This transition will present opportunities particularly in the renewable energy (solar, wind and hydrogen) and green manufacturing sectors.
Decline in biodiversity and ecosystem health	The abundance and diversity of biodiversity and ecosystems globally are in rapid decline. Many species have become extinct, and more are highly threatened. The continued effects of climate change, land clearing, pollution, invasive species and direct exploitation (e.g. wild fishing) will result in further biodiversity loss.

5. Drought resilience

5.1 A definition of resilience

The term 'resilience' is commonly used in a number of subject areas from health and wellbeing to natural resources and the economy. A range of Regional Drought Resilience Plans and literature were analysed to compare their definitions of 'drought resilience'. These are presented in Table 11. From this analysis, the following definition of drought was prepared to reflect what drought resilience means for the Eyre Peninsula:

> *The ability of communities, economies and environments to withstand the impacts of drought and adapt and find new and potentially transformational ways of doing things, enabling functions and values to be sustained over the longer term.*

Resilience is more than just bouncing back. In many cases, the intent is to use disruption as an opportunity to move in a new direction, not just recover back to a previous state. It is about changing proactively in order not to be changed involuntarily.

Building resilience will help the Eyre Peninsula region to endure droughts with less negative impacts and recover from them sooner.

Table 11 Definitions of resilience from various drought plans

Source		Definition of resilience/excerpt
Future Drought Fund (Drought Resilience Funding Plan 2020 to 2024) Determination 2020 (Department of Agriculture, Water and the Environment 2020)		Drought resilience means the ability to adapt, reorganise or transform in response to changing temperature, increasing variability and scarcity of rainfall and changed seasonality of rainfall, for improved economic, environmental and social wellbeing.
Regional Drought Resilience Plans (Department of Agriculture, Fisheries and Forestry 2024b)	South West Queensland	'Resilience' is harder to define. The World Bank has defined resilience as the ability "… to anticipate, absorb, accommodate or recover from the effects of a hazardous event in a timely and efficient manner". Australia's CSIRO perhaps more specifically states: "drought resilience will result in a regional Australia that can endure deeper, longer droughts, and recover from them sooner. This will allow our food and agribusinesses to boost national farm income, increase food security, and protect the regional jobs that rely on agriculture. It will increase the resilience of rural and regional communities that depend on agriculture and improve environmental outcomes
	Murraylands & Riverlands	Resilience is more than just bouncing back. In many cases, we want to use disruption as an opportunity to move in a new direction, not just recover back to exactly where we were.
	Northern & Yorke	Resilience has multiple definitions; common traits of resilience include the ability of a system, organisation or individual to withstand adversity and bounce back. For the purpose of the NYRDRP, the definition of resilience has been taken from the Drought Resilience Funding Plan 2020 to 2024 and is described as: "the ability to adapt, reorganise or transform in response to

Source		Definition of resilience/excerpt
		changing temperature, increasing variability and scarcity of rainfall and changed seasonality of rainfall, for improved economic, environmental and social wellbeing". (Australian Government, 2019). Also includes a quote from a participant: Resilience is the ability to withstand bad times or disasters – not to just get back up, but figure out how to move forward, progress and grow in capacity to prevent it from happening again. Must be able to adapt to prevent. - Anita Kuss, Unihub Spencer Gulf
	ACT	While resilience can be defined as "The capacity of a system to absorb disturbance and reorganise so as to retain essentially the same function, structure and feedbacks", rather than framing resilience as "bouncing back", it could be more accurately described as adapting or transforming as needed in response to change.
	Gippsland Victoria	Walker (2020) defines resilience as the capacity of a system to absorb a disturbance and reorganise so as to keep functioning in the same kind of way. Rather than just 'bouncing back,' resilience is all about changing and adapting to circumstances, rather than having them change you. For the purpose of this document, *resilience* is used to describe the ability to respond positively to the known impacts of drought and maintain business functions. It is about being able to adapt, thrive and take advantage of opportunities when encountering change. Rather than 'persistent maintenance' of the current situation, or being stoic, resilience includes the ability to adapt and be decisive during uncertainty and change.
	Wimmera Victoria	For the purpose of this document, resilience is defined as the ability of a system to effectively respond to disruptions, like drought, while maintaining function. It is about being able to consistently and collectively develop, hone and create the tools to adapt, thrive and take advantage of opportunities when encountering change. Rather than 'persistent maintenance' of the current situation resilience includes the ability to adapt and potentially transform the way things are done during periods of uncertainty and change.
	Mid West WA	The capacity of a rural community and landscape as a social-ecological system to absorb disturbance, reorganize, maintain or change functions and feedbacks so as to continue to deliver values.
	Southern Wheatbelt WA	The capacity of a rural community and landscape as a social-ecological system to absorb disturbance, reorganize, maintain or change functions and feedbacks so as to continue to deliver values.
Maru et al. 2017		The capacity of a linked social-ecological system to absorb disturbance and reorganize so as to retain essentially the same function, structure, and feedbacks – to have the same identity. Resilience thinking embraces the ideas of adaptation of the current system, and also transformation to a different kind of system when the existing one is in an irreversibly undesirable state, or on a trajectory towards such a state.
Walker 2020		The simplest definition of resilience is the ability to cope with shocks and to keep functioning in much the same kind of way. It is a measure of how much

Source	Definition of resilience/excerpt
	an ecosystem, a business, a society can change before it crosses a tipping point into some other kind of state that it then tends to stay in. Possibly the most common misinterpretation of resilience is "bouncing back." Resilience is in fact the ability to adapt and change, to reorganize, while coping with disturbance. It is all about changing in order not to be changed. A resilient system responds to a disturbance by changing the relative amounts of its different parts and how they interact, thereby changing the way it functions. It stays the same kind of system by learning from a disturbance, to be able to better cope with a similar disturbance in the future. It does not bounce back to look and behave exactly like it did before. Resilient systems are learning systems. Resilience is largely about learning *how* to change in order not to *be* changed. Trying to protect a system by keeping it in a constant state reduces its resilience.
Carpenter et al. 2012	Resilience, in the context of environmental management and sustainability, is the capacity of a social-ecological system to absorb disturbance, reorganize, and thereby retain essential functions, structures and feedbacks.
South Australian Fire and Emergency Services Commission, 2019	The ability to survive, adapt and grow, no matter what happens.
Macbeth, 2024	"Resilience is the capacity to really build your future on your own terms and to get on the front foot… The whole notion of resilience depends on adaptive capacity - the ability to adapt to new conditions as the world changes. We've come to realise that drought is a reality of life in Australia - so it shouldn't be a shock." – Professor John Cole, former Executive Director of the University of Southern Queensland's Institute for Resilient Regions. Resilience is not just about how a community responds to a shock or a challenge such as drought. It also involves a community that's stronger for the everyday - that is socially connected and inclusive, and that is capable of working together in good times to prepare for tougher times. This involves developing a shared awareness of what future challenges might be, and planning and adapting accordingly so that infrastructure and services can withstand future shocks.
Arbon 2024	How people, communities, and businesses cope in the face of change and uncertainty and build capacity to survive better through (often unexpected and cascading) consequences of disruptions that threaten our complex and interconnected social systems.

The Eyre Peninsula Drought Resilience Plan is focused on drought resilience. However, enhancing drought resilience will help the region respond to and recover from other stresses or pressures such as bushfires, flooding rains, pandemics, and economic market changes.

5.2 The importance of drought resilience

In the past, droughts have had serious impacts on the Eyre Peninsula. It has had major consequences on the ability to grow crops and feed livestock, jobs and income, mental health and wellbeing, the size of regional populations, and the health of the environment.

Resilience is about taking action to try to avoid or minimise these negative impacts before they happen rather than waiting until they do occur to act, or just focusing on recovery. Building resilience can help to create economic, social, and environmental development opportunities. By having good business, financial and technical skills and having a plan developed before drought, the decision-making load and much of the stress of primary producers can be reduced when drought hits. This can help them to weather the drought until rains break.

It is important to recognise that drought resilience is also important for the wider community, economy and environment beyond primary producers. The impacts of drought on farms are also felt across the wider region.

5.3 Characteristics of drought resilient individuals, communities, and regions

Eyre Peninsula farmers and other community members are continually faced with a wide range of challenges which has enhanced their resilience and problem-solving skills through generations.

Particular characteristics of resilience are summarised in Table 12. These have been identified though the engagement and literature (SA Drought Hub 2021, Pearson and Foster 2008, Council of Australian Governments 2011; South Australian Fire and Emergency Services Commission 2019; Walker 2020, Appendix A – Engagement Summary Report)

Table 12 Characteristics of resilient individuals, communities and regions

Theme	Key characteristics
Social characteristics	• Strong social connections with family, friends, and the wider community facilitated through formal and informal networks. • Past experience and learnings of drought or other adversity. • A community that helps each other out in times of need. • Sharing of knowledge, experiences and expertise with others including friends and younger generations. • Good stress management and decision making including when under high pressure. • Good mental mindset, maintaining optimism where possible and accepting that you cannot control the weather. • Having involved and diverse community groups, sporting clubs and other community spaces that support community connection and cohesion and where people can look out for and support each other. This involves having a strong volunteer base who are willing and able to put in the work for the benefit of their community. • Good population base. • A desire to stay farming on the Eyre Peninsula.

Theme	Key characteristics
Economic characteristics	• Good business and financial management skills, including through formal education. • Having a financial buffer, which could include money in the bank or stockpiles of feed and which allows for flexibility in decision making. • Being prepared for drought – understanding that drought will happen and having a plan prepared in advance to assist with decision making, identifying key trigger points and implementing associated actions. • Good decision making in responding to drought, noting that luck can play a role given no one can control the weather. • Personal/household income diversification including off-farm income streams not reliant on rainfall, and/or on-farm diversification (stock, different grain varieties, farms in different locations). • Implementing good farming practices such as improving soil quality, crop rotation, new crop varieties, managing sustainable levels of total grazing pressure etc. to maximise profitability in the long term. • Having a good relationship with bank managers or other financial institutions, especially when they have a good understanding of agricultural business on the Eyre Peninsula. • Being flexible and adaptable and waiting for the right time with the weather to sow and harvest, planting different crop varieties etc. – "nimble farmers can make better practical choices during drought". • Regional economic diversity with both on-farm and off-farm jobs available for local people. • Local spending in the local economy. • Good succession planning.
Environmental characteristics	• Implementing farming techniques that maintain and enhance soil health and minimise soil erosion. • Maintaining vegetation cover. • Planting more drought-tolerant species and varieties. • Integrated, widespread, preventative pest plant and animal control with a focus in good years when these species proliferate. • Changing farming practises when drought begins, such as destocking or hand feeding stock to minimise overgrazing.
Infrastructure and service characteristics	• Water infrastructure that provides water security and affordability, including access to mains water as well as personal water storage such as water tanks, sheeted catchments, dams, bores and stock watering infrastructure. • Local services including childcare, healthcare, shops, housing and banks that are not just located in regional centres. • Regular and ongoing social and wellbeing services (including in times outside of drought). • Local accurate weather stations and weather predictions which support farmers to make the right decisions early.

Theme	Key characteristics
	• Local, reliable and affordable supply of feed, fuel, fertiliser, seed etc. • Competition between local services which improve market conditions (eg T-Ports and Viterra, multiple local fertiliser/machinery suppliers etc.). • Stores of feed (either on farm storage, standing perennial fodder, or in the system). • Good port access and facilities.
Innovation, research and development characteristics	• Continually learning and being receptive to new technologies, techniques, varieties, chemicals etc. • Continual research and development into more effective farming practises, seed varieties etc. with good dissemination of this information out into the broader agricultural community. • Locally specific research and development. • Good access to relevant information and knowledge.

6. Approaches to drought resilience planning

6.1 Learnings from other planning regions

Many other regions across Australia have already prepared draft or final Regional Drought Resilience Plans through the Regional Drought Resilience Planning program. A desktop review of these plans and online meetings with a number of plan leaders has helped to:

- Understand what has worked well or not worked well in the process of preparing Regional Drought Resilience Plans in other regions around Australia, including in engagement, research, reporting and review phases.
- Identify the types of strategies and actions proposed for other regions and the collated evidence that suggests they will be successful in building drought resilience.

The key findings of this review and engagement are summarised in Table 13.

Table 13 Key learnings from other planning regions

Planning element	Key findings
Structure of plan	• Short, simple, easy to read plans with lots of graphics are more effective than long, context-heavy plans. • Having a Background Paper to accompany the plan and host background information is an effective way to provide more detail about the plan while keeping the plan itself user-friendly. • Ensure the plan is written for the target audience (ie the people who make decisions about what to do about drought, from community based organisations and local business owners through to local, state and federal agencies). • Drought resilience plans should enable flexibility in implementation and can be considered as a 'prospectus'. • Including some tools such as My Climate View can be useful for those who want something more tangible from the plan. • Plans differ in their allocation of responsibilities. Some plans identify particular lead organisations for each strategy/action. Others provide a list of potential partners to enable flexibility. • Preparing a 'plan on a page' summary of the plan is a useful approach for those who do not want to read the entire plan. • Some content on implementation, governance, monitoring and evaluation of the plan should be included.
Strategies and actions	• Strategies and actions should be grouped by themes. • For agricultural areas, the plan should have a strong agricultural focus. • However plans should also have an emphasis on social impacts and opportunities given the significant social impact of drought on communities and individuals. Other aspects of the systems should also be considered.

Planning element	Key findings
	• Supporting community clubs/organisations to deliver their own community programs is a very successful approach and helps to ensure the community can continue to implement the plan themselves, and that actions are led by and designed for the community. This should be managed appropriately to minimise overloading local volunteers. • Actions should be considered across a range of change types (eg incremental, transitional and transformational) with some in each category. • Actions for preparing for, responding to and recovering from drought should be identified. • Identifying a number of key priorities in the plan can help with implementation of early actions.
Engagement	• Leverage existing relationships and networks to increase engagement, including for First Nations engagement. • Tailor engagement messaging to ensure you reach all parts of the community. • Recognise diversity across the region – use stakeholder engagement to identify what is unique about each part of the region and reflect this in the plan. • Online engagement can work well, but face to face should be the focus. • Invest in up front engagement to inform the development of the draft plan. • Including key quotes and case studies in plans can help stakeholders and community to 'see themselves' in the plan.
Approach	• A systems-thinking approach is effective. • A risk assessment framework approach is effective. • Using the Drought Resilience, Adaptation and Management Policy (DRAMP) Framework (Crossman, 2018) is an effective approach.

Pinnaroo Project

Through the engagement, the Pinnaroo Project was identified as an example of what could be applied on Eyre Peninsula through this Plan.

The Pinnaroo Project was a three year arts and health initiative that aimed to improve the health and wellbeing of the Pinnaroo community. This project encompassed a variety of creative activities designed to celebrate the rich heritage and culture of the region. Through workshops, performances and community art installations, residents of all ages were encouraged to engage in artistic expression, fostering a sense of connection and community spirit. The project not only highlighted the unique cultural identity of Pinnaroo but also promoted mental wellbeing and physical health by providing an outlet for creativity and social interaction. By integrating arts into everyday life, the Pinnaroo Project successfully enhanced the overall quality of life for its participants, leaving a lasting impact on the community (The Pinnaroo Project n.d.).

In order to evaluate both the physical and mental aspects of health, residents completed a health and lifestyle questionnaire and brief set of clinical measurements such as blood pressure, height, weight, and a finger-prick test for blood sugar and cholesterol. This collection of data will be evaluated to hopefully prove a

correlation between the participation in art and wellbeing events and the positive impact on health within the community.

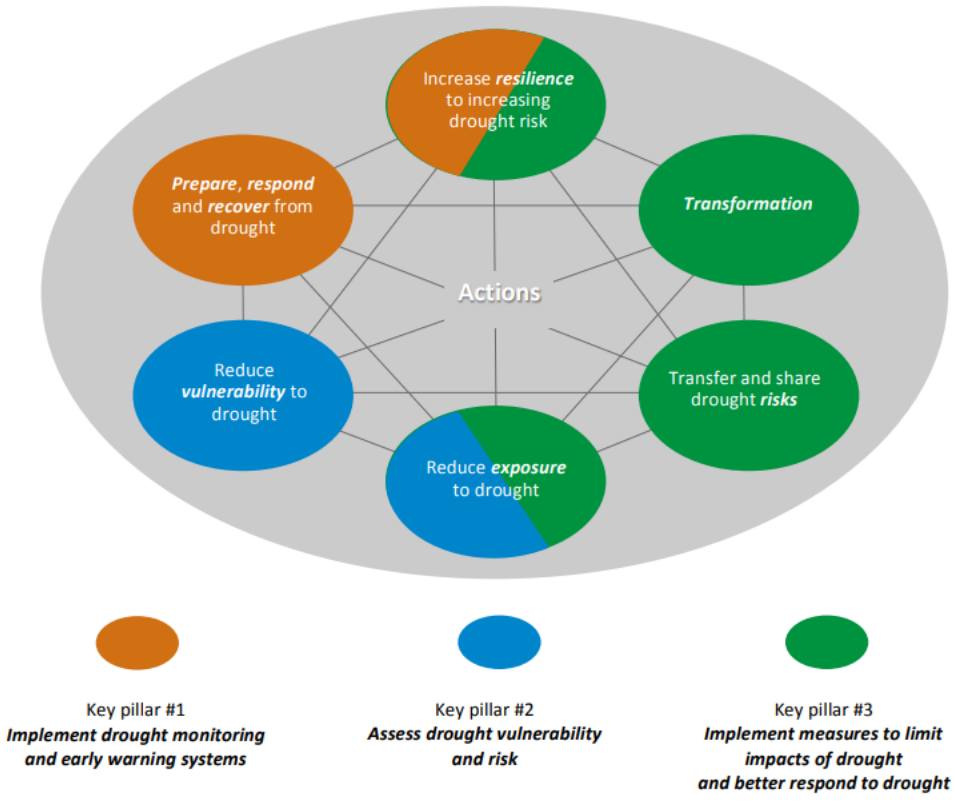
Key takeaways from this project include:

- Community health and social connectedness can be improved through arts and culture.
- Ensuring the project was community led and co-designed contributed to its success.
- Art can be an alternative to other social activities like sports, pubs, clubs, etc.
- The project changed the culture of the community – less smoking, less drinking days, more exercise, more consumption of fruit, etc.
- The project was about bringing a town/community together, contributing to community resilience.
- This project or something similar could be integrated in various towns across the Eyre Peninsula – ensuring that it is catered to the individual area/community and their needs.

6.2 The Drought Resilience, Adaptation and Management Policy (DRAMP) Framework

The Drought Resilience, Adaptation and Management Policy (DRAMP) Framework (Crossman, 2018) published by the United Nations Convention to Combat Desertification (UNCCD) takes an integrated, multi-pronged approach to reduce risks and impacts of drought. The Framework includes six goals, aligned with three pillars of drought risk reduction illustrated in Figure 20.

Figure 20 The Drought Resilience, Adaptation and Management Policy (DRAMP) Framework (Crossman, 2018)



The six goals of the DRAMP Framework are:

1. Reduce exposure to drought: reduce the potential for loss of people, livelihoods, ecosystem services and resources, infrastructure, as well as economic, social or cultural assets in places that could be adversely affected by drought.
2. Reduce vulnerability to drought: reduce tendency to be adversely affected by drought.
3. Increase resilience to drought risk: strengthen the ability of communities, ecosystems and economies to anticipate, absorb, accommodate or recover from the effects of drought quickly and efficiently by ensuring the preservation, restoration or improvement of natural capital.
4. Transformation: alter fundamental attributes of social, economic and ecological systems, including value systems; regulatory, legislative, or bureaucratic regimes; financial institutions; and technological or biological systems.
5. Prepare, respond, and recover from drought: the backbone of management and planning approaches to reduce drought risk, including development of comprehensive drought monitoring and early warning systems.
6. Transfer and share drought risks: distribute risks among wider section of society to include those who benefit directly and indirectly from robust drought risk management.

6.3 South Australia's Disaster Resilience Strategy

South Australia's Disaster Resilience Strategy was prepared to provide a foundation upon which state and local government, non-government organisations, businesses, and communities can work together to make a safer, more resilient South Australia. The Strategy includes eight guiding principles described in Figure 21 for building disaster resilience that are applicable to drought resilience planning.

Figure 21 Guiding principles for building disaster resilience (Government of South Australia, 2019)

6.4 Types of change

Continuing to build the resilience of the Eyre Peninsula to drought will require various changes in practices and processes. There are many ways and scales in which change can be approached. Three types of change often referred to in resilience planning are described below (Roggema et al, 2012):

- Incremental change – associated with slow processes and small adjustments, which modify the landscape only slightly. They are often associated with ongoing improvements in current practice. An example of this change type on the Eyre Peninsula would be continuing to use improved fertilisers to support crop growth.
- Transitional change – associated with moving from one way of doing things to another in a deliberate way. An example of this change type on the Eyre Peninsula would be the move from sheep to cropping in many parts of the region.
- Transformational change – associated with a fundamental shift in the system. They are usually multi-actor, multi-scale processes, where the change is highly non-linear. Examples may be initially controversial or cause wide-spread apprehension, for example if there was no further extraction of groundwater in the region or if marginal parts of the region could no longer be viably used for primary production (NOTE – this is not proposed, it is provided as an example of something that would be transformational).

7. Opportunities for increasing drought resilience on the Eyre Peninsula

The following strategies and opportunities have been identified through the engagement (see Appendix A – Regional Engagement Summary Report) and the literature review. Where opportunities align with key strategies and plans of the Advisory Group this has been identified in the tables below (Eyre Peninsula Landscape Board 2024g, AIR EP, SARDI Minnipa Agricultural Centre & Eyre Peninsula Landscape Board 2023, AIR EP 2021, Eyre Peninsula Landscape Board 2021a, SA Drought Hub 2021, Siebentritt 2014). Relevant strategies from the Southern Wheatbelt Regional Drought Resilience Plan (similar agricultural and social setting) have also been reviewed and correlation identified (Wheatbelt Development Commission 2022). Other opportunities have been drawn from other references through the literature review (including Luke et al. 2020, Pearson & Foster 2008) which are not identified individually in the table below.

7.1 Financial and business opportunities

Table 14 Financial and business opportunities to build drought resilience

Opportunity	Source
• Deliver farmer/business owner financial and business education and training: – Education to increase financial and business management skills, forward planning skills, succession planning, farm business models, digital literacy, data management skills and technical skills. – Acknowledge that a one size fits all approach does not work. – Support successful existing initiatives such as Rural Business Support and Next Gen. – Establish communities of practice and network approaches to continually learning, sharing and updating skills serves both educational and social purposes. – "Financial literacy and supporting programs to develop it is the number one thing – farming isn't a lifestyle now, it's a business"	Engagement EP Ag Vision 2050 Southern Wheatbelt RDRP
• Provide financial incentives to plan ahead and save money in good years: – It was commonly acknowledged that supporting farmers to save their own money in good years to get through bad years is a better approach than encouraging reliance on financial handouts during droughts (noting that it is hard to save for very extended droughts and financial support may be required in these circumstances). – Promote and enhance existing vehicles including Farm Management Deposits (FMDs) – "Farm Management Deposits (FMDs) are an excellent drought proofing tool". – Consider whether improvements to FMDs could be made to ensure they are accessed during drought rather than treated as a retirement fund, and are available to all farms regardless of their business structure. Consider whether greater tax concessions could be made when farmers access FMDs during drought. – Explore taxation system supports beyond FMDs	Engagement SA Drought Hub Node Workshop EP Drought Taskforce Regional Climate Change Adaptation Plan for the EP Southern Wheatbelt RDRP

Opportunity	Source
• Provide financial, business and social support for local non-farming businesses in farming regions. – Allow other rural businesses in farming regions to access FMDs or other mechanisms to put money away in good times to employ in drought times without undue tax stresses.	Engagement SA Drought Hub Node Workshop
• Support farms to plan in advance for drought: – Provide support (eg training, resources, money to hire a consultant, scenario planning workshops etc.) for farmers to prepare a Farm Drought Plan or Water Plan including with trigger points and associated decisions, strategies and procedures. – "It's vital to have a roadmap that tells you what you'll do when tough times come, allows you to have a vision and a sense of some control during difficult years, reminds you to remember that we planned for this and we're getting through."	Engagement SA Drought Hub Node Workshop Southern Wheatbelt RDRP
• Provide funding for local infrastructure programs to keep locals employed and stimulate local economic activity during drought: – Scope opportunities in advance for infrastructure programs that should be delivered once drought hits, to ensure funding is delivered quickly in the right places during drought. – During drought, implement these infrastructure programs to stimulate local economic activity, provide jobs and income to local workers who may be out of work, source local materials from local businesses etc. – Prioritise projects that "give people a sense of pride in where they are, provides some relief from seeing dryness and dirt everywhere they look, boosts morale and confidence".	Engagement
• Diversify the economy at a regional scale: – Advocate for and deliver new industries on the Eyre Peninsula which are not reliant on rainfall, to decrease community reliance on agricultural income. – Participants suggested that this could include renewable energy (in particular wind farms), Northern Water, new ports including with containerisation capacity, mining, desalination plant, hydrogen production, ammonia production, transport hubs for trucks (food, showers, accommodation, mechanic – eg Eyre Hub at Kimba), online businesses, technology, space, Workshop26, earthworks/road building, recycling and seaweed. • In particular explore opportunities for local agricultural value add (eg mill, abattoir, oil press, pelletising feed, protein powder etc.)	Engagement SA Drought Hub Node Workshop EP Strategic Regional Plan EP Drought Taskforce EG Ag Vision 2050
• Support diversification of income at an individual/household scale: – Diversification on-farm: eg different crops, sheep, saltbush, carbon sequestration, agritourism, farms in different regions. – Diversification off-farm: shares, property, online businesses, jobs in town, online jobs, trucking company. – This could include mentoring/business support to set up new businesses, subsidies during drought for educational improvement etc.	Engagement SA Drought Hub Node Workshop Southern Wheatbelt RDRP

Opportunity	Source
• Provide additional agricultural value add opportunities. • Provide trade and market development assistance, creating some true value adding opportunity that, over time, provides alternatives to the bulk production of a commodity where there is little market control. • Continue to support development of export markets and explore additional domestic value-add markets.	Engagement EP Strategic Regional Plan EP Drought Taskforce
• Investigate and advocate for opportunities to influence farming input prices: – Participants commonly identified the extreme increase in the cost of inputs over the past few years, as well as the uncertainty of supply of inputs at times, as a major challenge. To address this, the following suggestions were made: – Continue diversification of suppliers to support competition eg T-Ports and Viterra, multiple chemical companies etc. • Support local production of inputs. In particular, explore the opportunity for a local ammonia production facility to produce a local supply of fertiliser for the Eyre Peninsula to reduce reliance on global markets, provide security of supply, reduce travel costs and reduce emissions.	Engagement
• Work with banks to increase their understanding of agricultural business and how to provide appropriate support that acknowledge the social, emotional, business and financial impacts of drought.	Engagement
• Provide direct financial support for those in need: – For example Centrelink, Regional Investment Corporation (RIC) low interest loans, tax subsidies, council rate subsidies, Job Keeper type programs, interest rate subsidies, Farm Household Support, PIRSA farmers assistance packages, freight and feed subsidies etc. "The RIC loans that were made available in 2020 were a saviour. It bought us some time to work our way through it."' "The Council Rate rebate was extremely easy to apply for and the funding very helpful". – Ensure that financial support and incentives support the right people – for example if someone is working a second job on the weekend to put food on the table, this shouldn't mean they are ineligible for financial support. Consider how financial support can promote good decision making (those who have prepared well for drought should not be penalised for this). – Ensure financial support available is well promoted, easy to access and minimises paperwork/red tape. Provide direct financial counselling to help people access financial support and understand what is available. – Provide financial support for other rural businesses in farming areas, not just for farmers. – Provide an easily accessible, central information source to identify where hay or grain can be bought from. Support hay donations (eg Rural Aid), ensuring that this is done in an equitable way, does not bring in weeds, and provides an opportunity for farmers to get together and support each other.	Engagement
• Support young farmers, financially and through knowledge acquisition.	Engagement EG Ag Vision 2050

Opportunity	Source
• Implement shop local schemes: – For example, shop-local vouchers for local small businesses.	Engagement

7.2 Social and community opportunities

Table 15 Social and community opportunities to build drought resilience

Opportunity	Source
• Provide mental health and wellbeing services: – Mental health and wellbeing support delivered in a range of ways to meet differing needs. For example, private counselling, mental health talks/events/workshops run by experts, inspirational speakers or farmers sharing their experiences (eg Beautiful Bogan, Kate Burke, Lain Montgomery, Sarah Prime, Dennis Hoiberg), bringing in counselling dogs. – Ensure mental health support: – Considers the differing needs of men, women and children. – Is delivered at appropriate times and locations to ensure they are accessible. – Provides opportunity for people to seek help confidentially. – Support existing services and programs to deliver mental health support where possible to avoid saturation/ duplication. Many successful programs were identified, including Mentally Fit EP, Our Town groups, Fat Farmers, local sporting clubs, Rural Business Support, Comedy, Beer & BBQ, FaB mentors, council programs, local Suicide Prevention Boards, Community Support Hubs, Ceduna Wellbeing Group, Beacon of Hope, IFarmWell, Lock Community Centre, Streaky Bay Wellbeing Hub and FRRR.	Engagement SA Drought Hub Node Workshop EP Strategic Regional Plan EG Ag Vision 2050 Southern Wheatbelt RDRP
• Deliver mental health first aid training: – Provide training to the community to assist them in being able to support others who they notice are suffering mental health issues, and connect them to the right services. – In particular, focus on training on those who interact with large numbers of community members such as sports coaches, agronomists and community leaders. – Tap into, support and/or expand existing initiatives such as the Are You Ok campaign, Movember, suicide prevention week, Red Cross Drought Resilience Program etc. – Encourage people to "check in with their mates" in an informal way.	Engagement
• Facilitate community connection:	Engagement

Opportunity	Source
– Deliver initiatives that bring the community together, for example community events, workshops, presenters with appropriate skills and messages, comedians, family fun day, sport, art. Enable the community to play an active role in selecting which initiatives best suit their town/needs. – Deliver diverse initiatives to suit different needs, including for men, women and children. – Ensure these events are free/accessible. Consider providing fuel vouchers for those in need to support them to attend.	SA Drought Hub Node Workshop Southern Wheatbelt RDRP
• Encourage farmer-to-farmer experience transfer: – Provide formal and informal opportunities for people with experience of drought to share what helped them through it, and acknowledge that farmers are not alone in doing it tough.	Engagement SA Drought Hub Node Workshop Southern Wheatbelt RDRP
• Support local sport, interest and service clubs to continue to play their important role in the community: – The importance of sports and other clubs on the EP was emphasised again and again. – Support these clubs to run their day-to-day programs as well as one-off events that facilitate community connection and wellbeing. – Provide funding to pay sporting club fees to enable those without an income to retain membership. – Support volunteer participation	Engagement SA Drought Hub Node Workshop Southern Wheatbelt RDRP
• Raise awareness of what support is available: – Raise awareness of mental health and financial support available through a range of formats to suit different needs. For example, a central website for information, or workshops/events that bring community together to hear from Centrelink, rural financial assistance, tools for wellbeing, to hear from a farmer who shares their own lived experience etc.	Engagement Southern Wheatbelt RDRP
• Consider providing people from outside the region to help farmers to shoot their stock, as this is extremely mentally challenging for farmers to do themselves.	Engagement
• Retain and attract people to the Eyre Peninsula, for research, to farm and to live and work in local communities. Attract, develop and utilise specialist skill sets.	Engagement EP Strategic Regional Plan EP Ag Vision 2050 AirEP Strategic Plan Southern Wheatbelt RDRP

Opportunity	Source
• Support local community leaders to continue to play their important role.	Engagement EP Ag Vision 2050 Southern Wheatbelt RDRP

7.3 Innovation, research and development opportunities

Table 16 Innovation, research and development opportunities to build drought resilience

Opportunity	Source
• Invest in agricultural research and development: – Develop new farming techniques, varieties, technologies and chemicals that increase profitability and climate resilience in the long-term. This includes approaches to maintain soil health and moisture, maintain vegetation cover, increase crop yield, minimize the impact of pest plants and animals, minimize input costs and volumes, increase capture and use of data etc. – Research and development needs to be locally specific – Ensure information is affordable/free to access.	Engagement SA Drought Hub Node Workshop Regional Climate Change Adaptation Plan for the EP EP Drought Taskforce AirEP Strategic Plan EP Ag Vision 2050 SARDI Strategic Plan Southern Wheatbelt RDRP
• Encourage uptake of new, best practise farming techniques in the wider community: – Regularly communicate research & development findings and encourage uptake in the community to increase efficiency and effectiveness of farm practices including during drought. – Support the extension and application of already-undertaken R&D projects that have clearly demonstrated benefits to drought-resilient farming. – Use a diversity of platforms to disseminate information, for example, Stickybeak days, Field days, SARDI Minnipa Agricultural Centre Farmer meetings, SARDI Eyre Peninsula Farming Systems Summary workshops, podcasts, YouTube videos, case studies, articles in Stock Journal, webinars, Minnipa Agricultural Centre research staff, extension officers, FaB mentors, Rural Business Support, Ag Bureau groups, agronomists, demonstration farms etc. – Have options for in-person attendance as well as being able to access the information on demand at a time that suits.	Engagement SA Drought Hub Node Workshop EP Drought Taskforce AirEP Strategic Plan EP Ag Vision 2050 SARDI Strategic Plan Southern Wheatbelt RDRP

Opportunity	Source
– Support the Minnipa Agricultural Centre to undertake their research and extend information into the community.	
• Provide funding for farmers to trial new techniques, varieties etc. on their own farms given the importance of locally specific research and development.	Engagement Southern Wheatbelt RDRP
• Ensure there is an appropriate supply of trusted, credible agronomists on the Eyre Peninsula.	Engagement AirEP Strategic Plan SARDI Strategic Plan
• Facilitate sharing of farmer-to-farmer knowledge. • Encourage farmers to reflect on their experiences following a drought, noting what worked, what didn't work and what they could try next time to get through drought better.	Engagement SA Drought Hub Node Workshop Southern Wheatbelt RDRP

7.4 Farming operations opportunities

Table 17 Farming operations opportunities to build drought resilience

Opportunity	Source
• Support farmers to always implement sustainable, best practise cropping, pasture/fodder and livestock management practises more adaptable to conditions. Encourage approaches that maintain soil moisture and condition, maintain vegetation cover, minimise use of chemicals, maintain sustainable grazing pressure, increase data capture and management to inform decision making on farms etc.	Engagement SA Drought Hub Node Workshop EP Strategic Regional Plan EPLB Emergency Plan and Landscape Plan EP Ag Vision 2050 SARDI Strategic Plan Regional Climate Change Adaptation Plan for the EP Southern Wheatbelt RDRP
• Identify and promote mechanisms to increase landowner capacity to implement programs to manage pest plants and animals. – Innovation of best practise, integrated weed and pest control techniques, tools and chemicals. – Promote modern agricultural weed and pest management practices that are selective and integrated while minimising impacts to surrounding natural environments.	Engagement SA Drought Hub Node Workshop EP Strategic Regional Plan EPLB Landscape Plan

Opportunity	Source
	EP Ag Vision 2050 SARDI Strategic Plan

7.5 Services and infrastructure opportunities

Table 18 Service and infrastructure opportunities to build drought resilience

Opportunity	Source
• Provide regional mains water security for Eyre Peninsula: – Deliver the desalination plant at Billy Lights Point as soon as possible to provide mains water security for Eyre Peninsula. – Notify farmers as soon as possible about any upcoming water restrictions before the desalination plant is completed, so that they can undertake appropriate forward planning.	Engagement SA Drought Hub Node Workshop EP Strategic Regional Plan Regional Climate Change Adaptation Plan for the EP Southern Wheatbelt RDRP
• Explore options for increasing town water security: – Ceduna: investigate build a water tank at the area in town where water naturally accumulates. SA Water to take over Council managed pipeline. – Smoky Bay: build a more effective wastewater treatment plant. – Kimba: upgrade or build a new SA Water rainwater tank or other community water storage infrastructure. – General: increase wastewater reuse in towns to maintain irrigation of cool, green spaces.	Engagement Southern Wheatbelt RDRP
• Increase capacity of farm/household scale water harvesting and storage infrastructure – Provide a water infrastructure rebate scheme for water tanks, sheeted catchments, dams, solar pumps, troughs, pipes and bores on personal properties (on farms and in town). Ensure this is delivered before drought so that households have the financial ability to fund the remaining cost. "Even if it's a small subsidy, it makes us feel like you care". – Educate and raise awareness of how to install personal water infrastructure including through case studies and cost-benefit analysis.	Engagement Regional Climate Change Adaptation Plan for the EP Southern Wheatbelt RDRP
• Build more localised weather stations and provide more short- and long-term weather forecasts: – Install a doppler Radar System for eastern Eyre Peninsula.	Engagement SA Drought Hub Node Workshop

Opportunity	Source
– Investigate development of a mesonet automatic weather station network for the Eyre Peninsula – Improve media reporting on rainfall received in rural areas, including via nightly TV weather reports – Bring back Dale Grey (or similar) who provided a predictive fortnightly and monthly forecast regarding weather patterns, wind direction, rainfall, climate indicators etc. – Ensure BOM climate scientists in Adelaide have a comprehensive understanding of the agricultural system on the Eyre Peninsula. – Support early detection of drought in the Eyre Peninsula context. – Support the installation of on-farm weather stations (eg AgByte) on individual farming properties to deliver the most accurate and hyper-local weather information to support better decisions.	Southern Wheatbelt RDRP
• Increase local crop storage capacity: – Support farmers to build on-farm storage for harvested crop and seed, to enable them to store feed for stock or save crop to sell when market conditions are stronger, and to enable flexibility in sowing programs respectively. – Consider opportunities for community owned and run grain storage facilities to reduce double handling, transport costs and management fees. – Encourage farmers to store grain in the system, eg in Viterra or T-Ports silos.	Engagement SA Drought Hub Node Workshop EP Ag Vision 2050
• Increase childcare capacity of the Eyre Peninsula: – Advocate for more commercial childcares and increased caps of government run Rural Cares to provide more childcare places and free up partners to re-enter the workforce and provide households with a source of off-farm income.	Engagement EP Strategic Regional Plan EP Ag Vision 2050
• Support construction and implementation of other farm infrastructure and technology: – Provide rebates for containment feedlots which helps farmers to maintain good paddock vegetation cover and avoid erosion. – Support uptake of technology such as remote water monitoring, automated feeding, drones, virtual fencing, soil moisture probes etc. – Stock water shading infrastructure to minimise evaporation – Better collection of quality data on farm.	Engagement SA Drought Hub Node Workshop EPLB Emergency Plan EP Ag Vision 2050
• Provide local education, training and employment opportunities to keep people in the region, with a focus on the agricultural sector and allied industries.	Engagement EP Strategic Regional Plan Southern Wheatbelt RDRP

Opportunity	Source
• Invest in the places where community gather such as sporting clubs and other community spaces.	Engagement SA Drought Hub Node Workshop Southern Wheatbelt RDRP
• Continue to provide good transport options for export of agricultural goods: – Continue competition between Viterra and T-Ports – Explore opportunities to build a new multi-purpose sea port with containerised capacity – Improve road quality – Reducing freight costs (road, rail, ports)	Engagement EP Strategic Regional Plan EG Ag Vision 2050
• Monitor for early warning signs of drought.	SA Drought Hub Node Workshop EPLB Emergency Plan
• Progress opportunities for energy transformation, reducing reliance on fossil fuels, and delivering more localised generation and distribution.	EP Strategic Regional Plan EG Ag Vision 2050
• Encourage community cooperatives and other collaborative farming such as bulk buys, community storage solutions etc.	Engagement EG Ag Vision 2050
• Enhance local infrastructure for manufacturing, processing, storage and shipping.	Engagement EP Strategic Regional Plan EG Ag Vision 2050

7.6 Governance and advocacy opportunities

Table 19 Governance and advocacy opportunities to build drought resilience

Opportunity	Source
• Coordinate delivery of drought programs to maximise efficiency and effectiveness.	Engagement EP Ag Vision 2050
• Deliver programs and funding in a way that suits the local communities – understand what people need and how to deliver in a way that suits them. Use a bottom-up, community-driven approach where possible. • Have farmers and agricultural groups engaged and involved at all levels when it comes to decision-making, future planning and critically assessing outcomes of relevant initiatives.	Engagement SA Drought Hub Node Workshop EP Strategic Regional Plan EPLB Landscape Plan

Opportunity	Source
	EP Ag Vision 2050 Southern Wheatbelt RDRP
• Ensure proactive communication when droughts are projected, encourage farmers to act early and help them to make decisions. • Improve communication of what drought support and other support is available.	Engagement SA Drought Hub Node Workshop Southern Wheatbelt RDRP
• Improve public perception in metropolitan areas of agriculture and farmers and the important role they play in South Australia's food security and economy, and increase appreciation for their hard work. • Enhance social license through better storytelling and demystifying agriculture.	Engagement EP Ag Vision 2050
• Ensure drought resilience programs minimise paperwork and red tape for regional organisations and individuals.	Engagement Southern Wheatbelt RDRP
• Work with the media to help to promote grants, share good stories, support public perception of farmers, and avoid promotion of the wrong things (eg dramatising weather predictions etc.).	Engagement
• Engage and collaborate with Aboriginal individuals and groups.	EP Strategic Regional Plan Southern Wheatbelt RDRP
• Scope projects prior to funding becoming available, to ensure the Eyre Peninsula is funding and project ready.	Engagement AirEP Strategic Plan SARDI Strategic Plan
• Progressively evolve Eyre Peninsula farmers from price-takers to price-makers by de-commoditising offerings wherever possible via collective marking and other strategies to build brand strength and market appetite for Eyre Peninsula grain and value-added agricultural products.	EP Ag Vision 2050
• Ensure drought programs are locally relevant to the Eyre Peninsula and to particular regions within the Eyre Peninsula.	Engagement Southern Wheatbelt RDRP

7.7 Environmental opportunities

Table 20 Environmental opportunities to build drought resilience

Opportunity	Source
• Identify and promote mechanisms to increase landowner capacity to implement programs to manage pest plants and animals: – Continue to support landholders to control pest plants and animals including through provision of bait for pest animals and culling of overabundant native animals. – Continue to monitor for new incursions of pest animals and plants (eg Buffel Grass) and control/eradicate as required.	Engagement SA Drought Hub Node Workshop EP Strategic Regional Plan EPLB Landscape Plan EP Ag Vision 2050
• Effectively manage water allocation planning and water affecting activities in prescribed water areas. • Monitor groundwater and other natural resource condition.	Engagement EP Strategic Regional Plan EPLB Landscape Plan
• Work with SA Water to implement interim water resource efficiency program and any water restrictions that may occur to protect the condition of local groundwater aquifers. Ensure the agricultural sector and community are notified of any upcoming water restrictions well in advance, and support them to put in place measures to reduce their water use or secure other water supplies.	Engagement
• Protect high value agricultural areas from development.	Engagement
• Maintain township green space – "having just a little oasis of green can really bolster spirits".	Engagement Southern Wheatbelt RDRP
• Support bushfire preparedness, including water availability for fighting fires.	Engagement
• Work with Aboriginal individuals, communities and organisations to learn from their knowledge of native vegetation cover to maintain soil moisture.	Engagement Southern Wheatbelt RDRP
• Investigate and support the uptake of agricultural practises that increase biodiversity such as regenerative agricultural practises, quantifying the value of biodiversity on-farm. • Improve the quality of existing biodiversity/revegetation programs and develop income streams to support activities/programs/incentives.	SA Drought Hub Node Workshop
• Promote opportunities for carbon sequestration into soils via contemporary farming practices and perennial vegetation. • Build carbon farming literacy through delivery of workshops and accessible information.	EP Strategic Regional Plan SARDI Strategic Plan Regional Climate Change Adaptation Plan for the EP

Opportunity	Source
	EP Drought Taskforce
• Own and adapt to the challenge of net zero emissions targets locally through diverse initiatives (eg hydrogen powered machinery, slow-release fertilisers, decreased livestock, increased legumes).	EP Ag Vision 2050 SARDI Strategic Plan
• Investigate opportunities to build Eyre Peninsula's agricultural brand with low emissions grain / ESG supporting products as a brand tenet.	EP Ag Vision 2050

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8.1 Tools and resources

Through the research and engagement, tools and resources to support landholders and stakeholders have been identified and shared:

- IFarmWell https://ifarmwell.com.au/
- Kondinin Group case studies and research reports https://www.droughtinfo.com.au/drought-reports
- Drought Hub Knowledge Base https://sadroughthub.com.au/resources/knowledge-base/
- AirEP projects https://airep.com.au/research-project-list/
- SARDI - Eyre Peninsula Farming Systems Summary 2023 SARDI - Minnipa Agricultural Centre https://www.pir.sa.gov.au/__data/assets/pdf_file/0009/465939/epfs-summary-2023.pdf
- Landscape Boards links to tools and resources https://www.landscape.sa.gov.au/ep/sustainable-agriculture/sustainable-agriculture/farming-hard-times
- Landscape Board case studies https://www.landscape.sa.gov.au/ep/sustainable-agriculture/regenerative-agriculture
- PIRSA's drought support page https://www.pir.sa.gov.au/emergencies_and_recovery/drought
- The Future Drought Fund's Farm Business Resilience Program https://pir.sa.gov.au/emergencies_and_recovery/drought/future_drought_fund_programs
- All Future Drought Fund programs https://www.agriculture.gov.au/agriculture-land/farm-food-drought/drought/future-drought-fund
- The Future Drought Fund's Helping Regional Communities Prepare for Drought Initiative https://www.agriculture.gov.au/agriculture-land/farm-food-drought/drought/future-drought-fund/helping-regional-communities-prepare-for-drought-initiative

Appendix A – Regional Engagement Summary Report

Eyre Peninsula Drought Resilience Advisory Group
24ADL-0635
August 2024

Eyre Peninsula Regional Drought Resilience Plan – Engagement Summary Report

Eyre Peninsula Regional Drought Resilience Plan – Engagement Summary Report

August 2024

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V2	15/08/24	E. Mansfield	Advisory Group	Updated report following Advisory Group review

We acknowledge the Kaurna People as the Traditional Custodians of the land on which we work and pay respect to their Elders past, present and emerging.

https://urpsau.sharepoint.com/sites/Synergy/Shared Documents/Projects/24ADL/24ADL-0635 - EP Regional Drought Resilience Plan/Reports/241205_R6_v2_Engagement Summary Report.docx

DROUGHT RESILIENT EYRE PENINSULA

Contents

Acknowledgement of Country

We acknowledge the Traditional Custodians of the land on which we work, live and play and their continuing connection to land, sea, culture and community. We pay respect to Elders past and present, and extend that respect to all Aboriginal and Torres Strait Islander peoples in our community.

In particular, we acknowledge the Aboriginal peoples of the Eyre Peninsula region covered by this Plan, including the Barngala, Nauo, Wirangu, Kokatha and Mirning peoples.

Executive Summary

The Eyre Peninsula Drought Resilience Advisory Group is currently preparing a Regional Drought Resilience Plan for the Eyre Peninsula.

Regional forums were held with stakeholders and community in each of the 11 council areas in the region to gather insights to inform the preparation of the plan. Two First Nations workshops were held in Port Lincoln and Ceduna, to bring together leaders and representatives of First Nations groups and organisations. Opportunities for online engagement were provided through an online survey and online workshop. Key informant interviews were also held with 12 selected individuals across the region to gather deep insights into their experiences with drought and ideas about building drought resilience on the Eyre Peninsula. In total, 98 individuals took part in the engagement.

The regional engagement helped the project team to understand:

- What makes individuals, communities and regions resilient to drought?
- How is the Eyre Peninsula impacted by drought?
- How can the resilience of the Eyre Peninsula to drought be maintained and enhanced?

Community members and stakeholders shared a wide diversity of perspectives, experiences and priorities. These have been summarised in this report and will be used to inform the draft Regional Drought Resilience Plan.

Some of the comments which were raised most frequently through the engagement included the following:

What makes people, communities and regions resilient to drought?

- Social connection and good relationships/support.
- Experience from previous droughts or other hardships.
- Good stress management and decision making including when under high pressure.
- Long term financial and business planning that accounts for good and bad years.
- Water infrastructure that provides water security.
- Implementation of good farming practices that maintain and enhance soil health and maximise profitability in the long term.
- Continually innovating, learning and being receptive to new technologies, techniques, varieties, chemicals, etc.
- Diverse sources of household and region income, including through avenues that are not reliant on rainfall.

How does drought impact the Eyre Peninsula?

- The impacts of drought on mental health and wellbeing were highlighted again and again. The loss of crops, stock and income, and the mental toll of big decision making can lead to stress, depression, social withdrawal, loss of purpose and hope, shame and in the most devastating of circumstances, suicide. Mental health and wellbeing impacts are felt by farmers and business owners but also their family, friends and the wider community.

- Loss of income and high and ongoing input costs leads to financial hardship for farms and other business, increasing their debt, and can cause some to sell if they are no longer viable.
- Loss of jobs and difficult conditions can cause people to leave the region in search of better economic and lifestyle opportunities, and many of these people will not return following the drought. This has significant flow on effects for towns and the community.
- Rainwater tanks and dams dry up, increasing demand for mains water with associated impacts on water security.
- Soil and vegetation condition decline, leading to soil erosion which can take many years to recover.

How can resilience to drought be enhanced on the Eyre Peninsula?

- Deliver financial and business management education and training for farmers and other business owners.
- Provide mental health and wellbeing counselling, support and training.
- Invest in agricultural research and development and disseminate findings to the broader agricultural community effectively.
- Provide regional mains water security for the Eyre Peninsula.
- Encourage use of financial incentives to plan ahead and save money in good years, including through Farm Management Deposits.
- Support farms to plan in advance of drought.
- Support increasing household and farm scale water infrastructure.
- Provide funding for local infrastructure programs to keep locals employed and stimulate local economic activity during drought.
- Build more localised weather stations/doppler radar sites and provide more short- and long-term weather forecasts, especially for central and eastern Eyre Peninsula.
- Diversify the economy at a regional and household scale.
- Facilitate community connection through events, sports or other initiatives.
- Deliver programs and funding in a way that suits the local communities – understand what people need and how to deliver this locally in a way that suits them.

1. Introduction

1.1 What we wanted to know

The Eyre Peninsula Drought Resilience Advisory Group is currently preparing a Regional Drought Resilience Plan for the Eyre Peninsula. The Regional Drought Resilience Plan will identify opportunities to enhance the region's ability to prepare for, respond to and recover from drought, which will also help them be more resilient to other stresses or pressures.

The regional engagement helped the project team to understand:

- What makes individuals, communities and regions resilient?
- How is the Eyre Peninsula impacted by drought?
- How can the resilience of the Eyre Peninsula to drought be maintained and enhanced?

Community members and stakeholders shared a wide diversity of perspectives, experiences and priorities. These have been summarised in this report and will be used as the foundation of the draft Regional Drought Resilience Plan.

1.2 How we engaged

11 regional forums were held through early July 2024 with stakeholders and community members in each of the 11 council areas in the region to gather insights for the preparation of the plan. 56 people participated in the workshops.

These workshops were held in the following locations:

- Whyalla
- Kimba
- Ceduna
- Streaky Bay
- Elliston
- Port Lincoln
- Cummins
- Wudinna
- Cleve
- Cowell
- Tumby Bay

Two First Nations workshops were held in Port Lincoln and Ceduna in early July, to bring together leaders and representatives of First Nations groups and organisations and gather their input to the plan. Three people attended these workshops.

Opportunities for online engagement were provided through an online survey and online workshop. 26 responses to the survey were provided.

Key informant interviews were also held with 12 selected individuals across the region to gather deep insights into their experiences with drought and ideas about building drought resilience on the Eyre Peninsula. Key informants included the following community members:

- Bill Long: farmer and farm consultant, current AIR EP Chair
- Brett Klau: Landowner Information Services Officer, Rural Business Solutions, former ABB Grain, Australian Wheat Board, Ag Engineer
- Brian and Tim Wibberley: accountants and agricultural scientists
- Bryan Smith: farmer, former SAGIT Board member and former AIR EP and EPARF Chair
- Chris Fitzgerald: farmer, Rural Financial Counsellor, Rural Business Solutions
- Chris Miller: Senior Agribusiness Relationship Manager Bendigo Bank Cummins
- Heather Baldock: farmer, RDA Board Member, Founding Member Workshop 26, former Chair EP Landscape Board
- Issac Gill: farmer
- Karen Baines: farmer, Board Member and Executive Officer EP Cooperative Bulk Handling
- Peter Kuhlmann: farmer, Former SAGIT and EPARF Board member
- Tim Scholz: farmer, Managing Director EP Cooperative Bulk Handling, former Wudinna Mayor, former President South Australian Farmers Federation (SAFF) and former Vice President National Farmers Federation (NFF)
- Tristan Baldock: farmer

In total, 98 individuals took part in the engagement. Participants included representatives from the following groups:

- Farmers (farm owners, families of farm owners, and employees)
- Staff and Board Members from the Advisory Group organisations including Regional Development Australia Eyre Peninsula, Eyre Peninsula Landscape Board, SA Drought Hub, PIRSA (Primary Industries and Resources South Australia) and AIR EP
- First Nations groups including Far West Coast Aboriginal Partnership and Eyre Plus
- Members of local sporting and community organisations/clubs
- Elected Members
- Other government staff including council staff, SARDI (South Australian Research and Development Institute) Minnipa Agricultural Centre, and PIRSA Family and Business (FaB) mentors
- Workers of agricultural allied industries including farm machinery and chemicals, grain brokers and grain storage and transport
- Agronomists, agricultural scientists, farm consultants

- Rural Business Support staff
- Members of peak bodies
- Bankers and accountants
- Not-for-profit organisations
- SA Police
- ABC Radio
- General community members

1.3 Our key findings

The following report summarises the key themes of the workshops, key informant interviews and survey. Detailed workshop notes, survey responses and key informant interview notes can be provided on request from the RDA EP.

2. What makes individuals, communities, and regions resilient to drought?

Community and stakeholders were invited to explore the characteristics which make individuals, communities and regions resilient to drought.

We heard again and again that Eyre Peninsula farmers are inherently resilient. Participants noted that "our farmers are not strangers to lean years and tough times". They are continually faced with a wide suite of challenges which has enhanced their resilience and problem-solving skills through generations.

Particular characteristics that were commonly identified through the engagement as core aspects of resilience are summarised below.

2.1 Social characteristics

- Strong social connections with family, friends, and the wider community facilitated through formal and informal networks.
- Past experience and learnings of drought or other adversity.
- A community that helps each other out in times of need.
- Sharing of knowledge, experiences and expertise with others including friends and younger generations.
- Good stress management and decision making including when under high pressure.
- Good mental mindset, maintaining optimism where possible and accepting that you cannot control the weather.
- Having involved and diverse community groups, sporting clubs and other community spaces that support community connection and cohesion and where people can look out for and support each other. This involves having a strong volunteer base who are willing and able to put in the work for the benefit of their community.
- Good population base.
- A desire to stay farming on the Eyre Peninsula.

2.2 Financial and business characteristics

- Good business and financial management skills, including through formal education.
- Having a financial buffer, which could include money in the bank or stockpiles of feed and which allows for flexibility in decision making.
- Being prepared for drought – understanding that drought will happen and having a plan prepared in advance to assist with decision making, identifying key trigger points and implementing associated actions.
- Good decision making in responding to drought, noting that luck can play a role given no one can control the weather.
- Personal/household income diversification including off-farm income streams not reliant on rainfall, and/or on-farm diversification (stock, different grain varieties, farms in different locations).

- Implementing good farming practices such as improving soil quality, crop rotation, new crop varieties, managing sustainable levels of total grazing pressure etc. to maximise profitability in the long term.
- Having a good relationship with bank managers or other financial institutions, especially when they have a good understanding of agricultural business on the Eyre Peninsula.
- Being flexible, knowledgeable and adaptable and waiting for the right time with the weather to sow and harvest, planting different crop varieties etc. – "nimble farmers can make better practical choices during drought".
- Regional economic diversity with both on-farm and off-farm jobs available for local people.
- Local spending in the local economy.
- Good succession planning.

2.3 Environmental characteristics

- Implementing farming techniques that maintain and enhance soil health and minimise soil erosion.
- Maintaining vegetation cover.
- Planting more drought-tolerant species and varieties.
- Integrated, widespread, preventative pest plant and animal control with a focus in good years when these species proliferate.
- Changing farming practises when drought begins, such as destocking, feed lotting or hand feeding stock to minimise overgrazing.

2.4 Infrastructure and services characteristics

- Water infrastructure that provides water security and affordability, including access to mains water as well as personal water storage such as water tanks, sheeted catchments, dams, bores and stock watering infrastructure.
- Local services including childcare, healthcare, shops, housing and banks that are not just located in regional centres.
- Regular and ongoing social and wellbeing services (including in times outside of drought).
- Local accurate weather stations and weather predictions which support farmers to make the right decisions early.
- Local, reliable and affordable supply of feed, fuel, fertiliser, seed etc.
- Competition between local services which improve market conditions (eg T-Ports and Viterra, multiple local fertiliser/machinery suppliers, etc.).
- Stores of feed (either on farm storage or in the silo delivery system).
- Good port access and facilities.

2.5 Innovation, research and development characteristics

- Continually learning and being receptive to new technologies, techniques, varieties, chemicals, etc.

- Continual research and development into more effective farming practices, seed varieties, herbicides, etc. with good dissemination of this information out into the broader agricultural community.
- Locally specific research and development.
- Good access to relevant information and knowledge.

3. How does drought impact the Eyre Peninsula?

Community and stakeholders were asked how drought impacts the Eyre Peninsula. A wide range of impacts on the community, economy, environment, services and infrastructure were identified.

Community and stakeholders consistently noted that the mental health impacts of drought are significant. This was the first impact to be raised at many of the workshops. Drought is a mentally trying time for all. High pressure, a loss of crop, stock and income, a dying landscape, soil erosion and stress lead to significant mental health and wellbeing impacts, leading to suicide in the most devastating of circumstances.

It was commonly recognised that the impacts of drought differ widely across the Eyre Peninsula. Drought is felt particularly deeply in the drier, more marginal regions of the upper Eyre Peninsula. Lower Eyre Peninsula regions including around Cummins still feel the impacts of drought, but generally receive a higher rainfall. These southern regions are also challenged by other factors including higher input costs and "wet droughts".

Participants emphasised that when drought occurs at the same time as low commodity prices and high interest rates, this confluence of events causes much more significant impacts than any of these factors alone. Many noted that the recent increase in input costs has made many farmers more financially vulnerable to drought.

It was commonly identified that extended periods of drought are much more difficult to weather, with impacts increasing in subsequent years of drought. It was emphasised that the impacts of drought continue well after the first rains as people begin to rebuild their finances, soil condition and wellbeing.

Key impacts identified through the engagement have been summarised by theme below.

3.1 Social impacts

Participants identified the following impacts of drought on the community and individuals:

- Reduced mental health and wellbeing:
  - Increased difficulty in decision making – hard, emotional decisions to make, uncertainty as to what the right decision is, associated regret if the decision doesn't pay off. High levels of uncertainty as to whether a drought is starting and how long it will be – "hardest thing is not knowing how long it will last". Can lead to "decision paralysis", exhaustion and impact on income. Risk appetites and confidence in decision making erodes.
  - Social isolation – reduced spending capacity and lower self-esteem results in self-isolation, a lot of facades are put up to save face (but few know what people's actual situation is), people "go to ground" and retract from community life and events.
  - When farmers are forced to shoot and bury their stock because it is too costly to feed them or send them to market, this takes a major mental tool. The loss of a flock that was built up and bred over many years can be devastating and stressful.
  - Increased feelings of stress, panic, anxiety, depression, loss of purpose and hope. "There's a slow, grinding, wears-you-down effect, mentally, financially and physically."
  - Personal pride impact and feelings of shame – people feel that they have "failed".

  - Change in amount of time working – those who have an increased workload with hand watering and feeding stock or working a second job to make ends meet become overworked and have less time for themselves and their family and friends. Those who have a decreased workload if they are only cropping have more time to worry.
  - Loss of crops, stock, trees, native fauna, gardens and greenery has a significant mental wellbeing impact – "when everything around you is dying that's really tough", "it's soul destroying".
  - Increased substance abuse – "my generation turned to tobacco and booze, younger farmers turn to other drugs".
  - These mental health and wellbeing impacts can lead to suicide in extreme cases.
- Stress and wellbeing impacts for family and friends:
  - Stress and mental health impacts can lead to relationship breakdowns, divorce and domestic violence.
  - Impact on children as they observe their parent's stress, miss out on sport, school camps, boarding school, university etc. due to a lack of money.
  - Withdrawal from friends and taking out personal stress on others.
  - Poor mindsets ripple into the community more broadly – "loss of community moral".
- Population shrinkage as people move away for job opportunities elsewhere:
  - Some farms are forced to sell up, with farmers and their families leaving the region. These are usually bought by neighbours, resulting in bigger farms with less people to contribute to community life in the long-term.
  - Some businesses are forced to sell up as less money is spent in the region, with business owners and their families moving elsewhere to find work.
  - Farms and businesses lay off workers who are forced to leave the region to find work elsewhere.
  - Young people move elsewhere for better work and lifestyle opportunities, and may be less inclined to come back due to their experience of drought.
  - This decrease in population has many flow-on effects including reduced social fabric and township vibrancy, less volunteers, less local business and services, less school enrolments which result in quality of school facilities reducing, fewer members in sporting clubs and increased volunteer workload on less people. This is very hard to rebuild following drought.
  - "When we moved here 30 years ago, there were 16 other farms and farming families. Today, there are two other farms, and they're both managed remotely / absentee owners."
- Loss of income, and therefore less money to spend on things that provide fulfilment, medical treatment, or sponsorship of volunteer organisations and clubs.

While minimal in comparison to the negative social impacts of drought, participants identified that drought can occasionally cause positive social impacts:

- Community closeness – community initiatives proliferate to bring people together, sporting clubs become a more important lifeline than ever, families and friends support becomes vital, innovation from

passionate people creates a sense of town / region pride and genuine human upsides (but needs drivers and supporters which is harder as populations decline)

- Increased time – those who have less workload due to less economic activity have more time for family, recreation, volunteering and education (if funds and mental wellbeing allow).
- Increased awareness of drought and how to respond – those who have experienced a drought reflected that this experience helps them during the next droughts – "what doesn't kill you makes your stronger".

3.2 Financial and business impacts

Participants identified the following impacts of drought on the economy:

- Financial hardship on farms:
  - Farm productivity suffers, resulting in a loss of income particularly in subsequent years of drought. This makes it hard for farming families to continue to make ends meet – "I've stitched old sheets together and prayed for new shoes for my kids in drought years".
  - High input costs remain, placing farmers in greater and greater debt. This has become more extreme in recent years, with farmers needing to spend more and more money upfront in modern farming, meaning they have "all their chips on the table" and there are less exit points.
  - Destocking at low prices, followed by restocking at high prices. Some farmers are forced to shoot their own stock when it is more costly to feed or send them to market– this is "gut wrenching".
  - Prices for freight and grain for seeding and feed increase due to undersupply and high demand. Sometimes Eyre Peninsula farmers are not able to access feed due to lack of supply or extremely high price (hay is often bought and donated to farmers on the East Coast, reducing supply for the Eyre Peninsula).
  - Some farms are forced to sell.
  - Workers are laid off.
  - Loss of income restricts capital improvement.
  - Young farmers who have had a drought in their first year are particularly affected, with a major impact on their finances and willingness to stay in the industry.
  - If they are not making a profit, farmers are not able to get tax deductions on Super contributions, impacting on their ability to retire.
- Financial hardship for other businesses/industries:
  - Farmers "tighten their belts" and stop spending as much in communities, which reduces income for other businesses such as car and machinery dealerships, chemical suppliers, grain brokers, local shops, etc. This is particularly true for agricultural allied industries and businesses that supply 'luxury' goods and services such as hairdressers, cafes, car dealerships, etc.
  - Workers are laid off and some businesses are forced to sell.
  - Lack of water for industries such as mining, fish production, etc. with subsequent impact on jobs and the economy.

  - Less ability to pay rates which impacts Councils' ability to continue to provide services and infrastructure.

- Agricultural plan derailment:
  - Otherwise well strategically planned farming operations have to recalibrate. Farming program is "thrown out" regarding what was planned to be planted and when, which has a flow-on effect to subsequent months/years.
  - Succession plans get tested as it becomes more appealing to sell to corporates / large farms than to children.
  - Off-farm income needs pursuing (which hurts the farm business).
  - Farmers become more risk averse in following years.
- Changed farming practises:
  - Destocking (some agist, most sell, some have to shoot stock if they have left destocking too late).
  - Planting of different crops which are less reliant on rainfall.
  - Crops not planted particularly in marginal country or a smaller portion of planned cropping program planted as a risk management strategy.
- Loss of workers:
  - Loss of farm workers, other skilled workers and young people which are difficult to get back after drought.

While the negative impacts on businesses and finances are profound, some participants identified that as a result of drought they and their business became much better at forward planning and risk management, and would better understand what actions to take during the next drought.

3.3 Environmental impacts

Participants identified the following impacts of drought on the environment:

- Soil erosion:
  - Loss of soil due to lack of vegetation, overgrazing and dry conditions exacerbating wind and water erosion. Soil impacts increase in subsequent years of drought and can take many years to recover.
  - Dust storms and the impact on living with constant dust.
- Reduction in water availability:
  - Rainwater tanks and other surface water catchments run dry.
  - Increased groundwater use leads to a reduction in aquifer levels.
  - Lack of rainwater recharge to aquifers.
  - Water restrictions.

  - Some properties are forced to truck in water for stock and personal use in if they are not connected to mains water.
  - Pest and native animals compete with stock for water.
- Reduced crop yield and less feed for stock.
- Loss of native vegetation:
  - Loss of native vegetation due to lack of water.
  - Overgrazing by stock and native animals (primary producers occasionally release their livestock into native vegetation when there is not enough feed on farms to sustain them, although this has become less prevalent over time).
  - Subsequent impact on amenity, tourism, habitat availability and soil condition.
- Pressure from pest plants and animals:
  - Pest plant and animal abundance increases in good years, meaning that in the bad years that follow pests have a bigger impact.
  - Fox baiting reduces as there are less sheep on farms, which means fox numbers increase.
  - Goats and deer migrate from the north in search of water and vegetation.
- Impact on native animals:
  - Native wildlife dies due to a lack of vegetation and water.
  - Kangaroos, emus and dingoes migrate from the north (from conservation areas) in search of water and vegetation.
- Increased bushfire risk.
- Loss of gardens and green space.
- Bringing in feed for stock from other districts can introduce new weeds.
- Illegal dumping increases as people cannot afford to pay dumping fees.

3.4 Service and infrastructure impacts

Participants identified the following impacts of drought on infrastructure:

- Loss of local services as businesses are forced to close.
- SA Water mains restrictions.
- Soil erosion causes soil to accumulate on roads, causing driving hazards and in some cases cutting properties off until roads can be cleared.
- Lack of water for personal use such as showers and gardens.

4. What would help enhance drought resilience?

Community and stakeholders were asked to identify opportunities for enhancing drought resilience on the Eyre Peninsula. Opportunities to implement before, during and after drought were identified.

The focus of this plan is on actions that can be taken at an organisational level (from sporting or community clubs through to state and federal government organisations) to support the Eyre Peninsula's resilience to drought. Therefore, the opportunities below have been framed as actions that can be taken at an organisational level.

However, there are many actions farmers and others in the region can take individually to enhance their and their community's resilience to drought. Farmers are usually at the forefront of best practise, and already know of many of the actions they can take to enhance their drought resilience. Many of the actions identified below can also be initiated at an individual level, without the need to wait for a particular program or incentive to be delivered. These type of opportunities will be identified in the draft Regional Drought Resilience Plan.

Commonly raised opportunities have been summarised by theme below.

4.1 Financial and business opportunities

Participants identified the following financial and business-based opportunities for enhancing drought resilience:

Opportunity
• Deliver farmer and business owner education and training: – Education to increase financial and business management skills, forward planning skills, succession planning, tax management strategies, digital literacy and technical skills. – Acknowledge that a one size fits all approach does not work. – Support successful existing initiatives such as Rural Business Support and Next Gen. – "Financial literacy and supporting programs to develop it is the number one thing – farming isn't a lifestyle now, it's a business"
• Provide financial incentives to plan ahead and save money in good years: – It was commonly acknowledged that supporting farmers to save their own money in good years to get through bad years is a better approach than encouraging reliance on financial handouts during droughts (noting that it is hard to save for very extended droughts and financial support may be required in these circumstances). – Promote and enhance existing vehicles including Farm Management Deposits (FMDs) – "Farm Management Deposits (FMDs) are an excellent drought proofing tool". – Consider whether improvements to FMDs could be made to ensure they are accessed during drought rather than treated as a retirement fund, and are available to all farms regardless of

Opportunity
their business structure. Consider whether greater tax concessions could be made when farmers access FMDs during drought. – Allow other rural businesses in farming regions to access FMDs.
• Support farms to plan in advance for drought: – Provide support (eg training, resources, money to hire a consultant, scenario planning workshops etc.) for farmers to prepare a Farm Drought Plan including with trigger points and associated decisions, strategies and procedures. – "It's vital to have a roadmap that tells you what you'll do when tough times come, allows you to have a vision and a sense of some control during difficult years, reminds you to remember that we planned for this and we're getting through."
• Provide funding for local infrastructure programs to keep locals employed and stimulate local economic activity during drought: – Scope opportunities in advance for infrastructure programs that should be delivered once drought hits, to ensure funding is delivered quickly in the right places during drought. – During drought, implement these infrastructure programs to stimulate local economic activity, provide jobs and income to local workers who may be out of work, source local materials from local businesses, etc. – Prioritise projects that "give people a sense of pride in where they are, provides some relief from seeing dryness and dirt everywhere they look, boosts morale and confidence".
• Diversify the economy at a regional scale: – Advocate for and deliver new industries on the Eyre Peninsula which are not reliant on rainfall, to decrease community reliance on agricultural income. – Participants suggested that this could include renewable energy (in particular wind farms), Northern Water, new ports including with containerisation capacity, local agricultural value add (eg mill, abattoir, oil press, pelletising feed, protein powder etc.), mining, desalination plant, hydrogen production, ammonia production, transport hubs for trucks (food, showers, accommodation, mechanic – eg Eyre Hub at Kimba), online businesses, technology, space, Workshop26, earthworks/road building and seaweed.
• Support diversification of income at an individual/household scale: – Diversification on-farm: eg different crops, sheep, saltbush, carbon sequestration, agritourism, farms in different regions. – Diversification off-farm: shares, property, online businesses, regional employment opportunities, jobs in town, online jobs, trucking company.

Opportunity
– This could include mentoring/business support to set up new businesses, subsidies during drought for educational improvement, etc.
• Work with banks to increase their understanding of agricultural business and how to provide appropriate support.
• Provide direct financial support for those in need: – For example Centrelink, Regional Investment Corporation (RIC) low interest loans, tax subsidies, council rate subsidies, Job Keeper type programs, interest rate subsidies, Farm Household Support, PIRSA farmers assistance packages, freight and feed subsidies etc. "The RIC loans that were made available in 2020 were a saviour. It bought us some time to work our way through it."' "The Council Rate rebate was extremely easy to apply for and the funding very helpful". – Ensure that financial support and incentives support the right people – for example if someone is working a second job on the weekend to put food on the table, this shouldn't mean they are ineligible for financial support. Consider how financial support can promote good decision making (those who have prepared well for drought should not be penalised for this). – Ensure financial support available is well promoted, easy to access and minimises paperwork/red tape. Provide direct financial counselling to help people access financial support and understand what is available. – Provide financial support for other rural businesses in farming areas, not just for farmers.
• Implement shop local schemes: – For example shop-local vouchers for local small businesses.
• Support farmers to access feed for stock during drought: – Provide an easily accessible, central information source to identify where hay or grain can be bought from. – Support hay donations (eg Rural Aid), ensuring that this is done in an equitable way, does not bring in weeds, and provides an opportunity for farmers to get together and support each other.

4.2 Social and community opportunities

Community focused drought resilience opportunities identified by participants included:

Opportunity
• Provide mental health and wellbeing counselling: – Mental health and wellbeing support delivered in a range of ways to meet differing needs. For example, private counselling, mental health talks/events/workshops run by experts, inspirational speakers or farmers sharing their experiences (eg Beautiful Bogan, Kate Burke, Lain Montgomery, Sarah Prime, Dennis Hoiberg), bringing in counselling dogs. – Ensure mental health support: – Considers the differing needs of men, women and children. – Is delivered at appropriate times and locations to ensure they are accessible. – Provides opportunity for people to seek help confidentially. – Support existing services and programs to deliver mental health support where possible to avoid saturation/ duplication. Many successful programs were identified, including Mentally Fit EP, Our Town groups, Fat Farmers, local sporting clubs, Rural Business Support, Comedy, Beer & BBQ, FaB mentors, council programs, local Suicide Prevention Boards, Community Support Hubs, Ceduna Wellbeing Group, Beacon of Hope, IFarmWell, Lock Community Centre, Streaky Bay Wellbeing Hub and FRRR.
• Deliver mental health first aid training: – Provide training to the community to assist them in being able to support others who they notice are suffering mental health issues, and connect them to the right services. – In particular, focus on training on those who interact with large numbers of community members such as sports coaches, agronomists and community leaders. – Tap into, support and/or expand existing initiatives such as the Are You Ok campaign, Movember, and suicide prevention week. – Encourage people to "check in with their mates" in an informal way.
• Facilitate community connection: – Deliver initiatives that bring the community together, for example community events, workshops, presenters with appropriate skills and messages, comedians, family fun day, sport. Enable the community to play an active role in selecting which initiatives best suit their local town/needs. – Deliver diverse initiatives to suit different needs, including for men, women and children. – Ensure these events are free/accessible. Consider providing fuel vouchers for those in need to support them to attend.

Opportunity
• Encourage cross-generational experience transfer: – Provide formal and informal opportunities for people with experience of drought to share what worked and what didn't work with others including young farmers.
• Support local sport, interest and service clubs to continue to play their important role in the community: – The importance of sports and other clubs on the EP was emphasised again and again. – Support these clubs to run their day-to-day programs as well as one-off events that facilitate community connection and wellbeing. – Provide funding to pay sporting club fees to enable those without an income to retain membership.
• Raise awareness of what support is available: – Raise awareness of mental health and financial support available through a range of formats to suit different needs. For example, a central website for information, or workshops/events that bring community together to hear from Centrelink, rural financial assistance, tools for wellbeing, to hear from a farmer who shares their own lived experience, etc.
• Consider providing people from outside the region to help farmers to shoot their stock, as this is extremely mentally challenging for farmers to do themselves.

4.3 Innovation, research and development opportunities

Engagement participants identified the following opportunities for enhancing drought resilience:

Opportunity
• Invest in agricultural research and development: – Develop new farming techniques, varieties, technologies and chemicals that increase profitability and increase climate resilience. – Research and development needs to be locally specific. – Ensure information is affordable/free to access.
• Raise awareness about best practise farming techniques in the wider community: – Regularly communicate research & development findings and encourage uptake in the community to increase efficiency and effectiveness of farm practices including during drought.

Opportunity
– Use a diversity of platforms to disseminate information, for example Stickybeak days. Field days, workshops, podcasts, YouTube videos, case studies, articles in Stock Journal, webinars, field days, extension officers, FaB mentors, Rural Business Support, Ag Bureau groups etc. – Support the Minnipa Agricultural Centre (MAC) undertake their research and extend their findings into the farming community including through Extension Officer roles.
• Encourage farmers to reflect on their experiences following a drought, noting what worked, what didn't work and what they could try next time to get through drought better including sharing learnings with others.
• Provide funding for accountants or other business advisors to help farmers to work through the economic benefits of trying new techniques, approaches or business models, to help with educated decision making.
• Provide funding and support for farmers to trial new techniques, varieties etc. on their own farms given the importance of locally specific research and development.
• Ensure there is an appropriate supply of trusted, credible agronomists on the Eyre Peninsula.

4.4 Services and infrastructure opportunities

Participants identified the following infrastructure-based opportunities for enhancing drought resilience:

Opportunity
• Provide regional mains water security for Eyre Peninsula: – Deliver the desalination plant at Billy Lights Point as soon as possible to provide mains water security for Eyre Peninsula. – Notify farmers as soon as possible about any upcoming water restrictions before the desalination plant is completed, so that they can undertake appropriate forward planning.
• Explore options for increasing town water security: – Ceduna: investigate build a water tank at the area in town where water naturally accumulates. SA Water to take over Council managed pipeline. – Smoky Bay: build a more effective wastewater treatment plant. – Kimba: upgrade or build a new SA Water rainwater tank or other community water storage infrastructure. – General: increase wastewater reuse in towns to maintain irrigation of cool, green spaces.

Opportunity
• Increase capacity of farm/household scale water storage infrastructure – Provide a water infrastructure rebate scheme for water tanks, sheeted catchments, dams, solar pumps, troughs, pipes, bores and water monitoring systems on personal properties (on farms and in town). Ensure this is delivered before drought so that households have the financial ability to fund the remaining cost. "Even if it's a small subsidy, it makes us feel like you care". – Educate and raise awareness of how to install personal water infrastructure including through case studies and cost-benefit analysis.
• Build more localised weather stations and provide more short- and long-term weather forecasts: – Establish a doppler radar site to ensure contiguous coverage across Eyre Peninsula. This will enable better monitoring of rainfall events, allowing for more timely herbicide applications, reduction of herbicide losses, and improved grower time management. – Bring back Dale Grey (or similar) who provided a predictive fortnightly and monthly forecast regarding weather patterns, wind direction, rainfall, climate indicators, etc. – Ensure BOM climate scientists in Adelaide have a comprehensive understanding of the agricultural systems on the Eyre Peninsula.
• Increase local crop storage capacity: – Support farmers to build on-farm storage for harvested crop, to enable them to store feed for stock or save crop to sell when market conditions are stronger. – Consider opportunities for community owned and run grain storage facilities to reduce double handling, transport costs and management fees. – Encourage farmers to store grain in the system, eg in Viterra or T-Ports silos.
• Where possible, control and minimise farming input prices: – Participants commonly identified the extreme increase in the cost of inputs over the past few years, as well as the uncertainty of supply of inputs at times, as a major challenge. To address this, the following suggestions were made: – Continue diversification of suppliers to support competition eg T-Ports and Viterra, multiple chemical companies, etc. – Support local production of inputs. In particular, explore the opportunity for a local ammonia production facility to produce a local supply of fertiliser for the Eyre Peninsula to reduce reliance on global markets, provide security of supply, reduce travel costs and reduce emissions.
• Increase childcare capacity of the Eyre Peninsula:

Opportunity
– Advocate for more commercial childcares and increased caps of government run Rural Cares to provide more childcare places and free up partners to re-enter the workforce and provide households with a source of off-farm income.
• Support construction of feedlots – Provide rebates for containment feedlots which helps farmers to maintain good paddock vegetation cover and avoid erosion.
• Provide local education, training and employment opportunities to keep people in the region.
• Invest in the places where community gather such as sporting clubs and pubs.

4.5 Governance and advocacy opportunities

Participants identified the following governance and advocacy-based opportunities for enhancing drought resilience:

Opportunity
• Coordinate delivery of drought programs to maximise efficiency and effectiveness.
• Deliver programs and funding in a way that suits the local communities – understand what people need and how to deliver in a way that suits them.
• Ensure proactive communication when droughts are projected, encourage farmers to act early and help them to make decisions.
• Improve public perception in metropolitan areas of agriculture and farmers and the important role they play in South Australia's food security and economy, and increase appreciation for their hard work.
• Ensure drought resilience programs minimise paperwork and red tape for regional organisations and individuals.
• Improve communication of what drought support is available.
• Work with the media to help to promote grants, share good stories, support public perception of farmers, and avoid promotion of the wrong things (eg dramatising weather predictions etc.).

4.6 Environmental opportunities

Participants identified the following environment-based opportunities for enhancing drought resilience:

Opportunity
• Deliver widespread pest plant and animal control: – Continue to support landholders to control pest plants and animals including through provision of bait for pest animals and culling of overabundant native animals. – Key pest animals include mice, snails, locusts, foxes and rabbits. Overabundant native species include kangaroos and emus.
• Support land owners to implement farm management systems/approaches that maintain soil moisture and condition, minimise use of chemicals etc.
• Monitor groundwater and other natural resource condition.
• Protect high value agricultural areas from development.
• Maintain township green space – "having just a little oasis of green can really bolster spirits".
• Support bushfire preparedness, including water availability for fighting fires.
• Implement the Eyre Peninsula Landscape Board Disaster Resilience Strategy.
• Work with First Nations peoples to learn from their knowledge of native vegetation cover to maintain soil moisture.

5. Principles

A number of comments were made by participants which relate to 'principles' of best practise drought resilience support. These have been summarised below.

- Focus effort and investment at the preparation phase. "It is better to manage and minimise risk than to try to rebuild after a tough blow".
- Timing of delivery of programs during drought is critical. Ensure government policy intervention is mobilised quickly.
- Recognise that drought support needs to continue past the end of the drought to help people recover their land, stock and wellbeing. "The first rain doesn't stop the drought".
- Ensure investment is focused on locally driven projects (what locals need, planned for and implemented by local people). "Listen to the people on the ground and then take action to what they say". Engage with each community at a local level, understand what they want and need, and work with the community to deliver this. "Connect to where people are, rather than asking them to come to you".
- Drive action through regional organisations where possible as opposed to delivering programs from Adelaide.
- Support existing successful local groups and initiative to deliver programs where possible.
- Ensure consistency of government programs that work well – do not reinvent the wheel every time if this is not necessary.
- Avoid building overreliance on financial handouts – focus on resilience building financial savings before drought.
- Ensure financial support helps the right people.
- Ensure support is easily accessible and well communicated.
- Use local trades, businesses and people to help deliver projects to generate local economic activity and employment.
- Ensure drought programs recognise the variability of drought across the region – drawing boundaries on a map is problematic as one farm can receive rain and the neighbours may not have received any.

6. Other challenges and opportunities

While not a focus of the engagement, a number of broad challenges, opportunities and trends experienced on the Eyre Peninsula were identified by participants. While not directly related to drought, these challenges and opportunities are part of the Eyre Peninsula system and have a flow on effect to the agricultural system and allied industries. These challenges and opportunities can either exacerbate or alleviate the impacts of drought.

Identified challenges and opportunities are summarised below.

Prices

- Sharply increasing input costs.
- Fluctuating commodity prices.
- High interest rates, when they occur.

Services, housing and employment

- Lack of childcare, which influences the ability for parents to re-enter the workforce.
- Lack of skilled workforce for full time and part time/seasonal roles.
- Lack of higher education including senior school and tertiary education.
- Lack of diverse employment options.
- Lack of housing.
- Lack of medical services, including for mental health, and a lack of consistency in medical practitioners.
- Opportunity to target backpackers, grey nomads and migrants to meet workforce shortages.

Community

- Reducing population in townships outside of regional centres.
- Reduction in volunteering particularly in younger age groups.
- Volunteer burn-out.
- Increasing proportion of lower socio-economic classes drawn by low-cost housing.

Regional infrastructure

- Water security challenges on the Eyre Peninsula, including the need for a desalination plant and advance warning about any upcoming water restrictions.
- Distance from good and services increases transport costs, reduces choice, and forces farmers to order in supplies so far in advance they cannot adapt their purchases based on the year's conditions.
- Lack of a local abattoir, containerised port services, or other local agricultural value-add opportunities.
- Lack of mobile signal in some areas.
- Common electrical outages in some areas.

Agriculture

- Reduction in sheep for many farmers due to lack of strong market conditions in recent years, as well as a shift from merinos to dorpers/other meat sheep.
- Increasing planting of lentils, which have high start-up costs but can provide significantly higher profitability than other commodities once established.

7. Regional characteristics

Going to every Council on the Eyre Peninsula highlighted the diversity of Eyre Peninsula. Some characteristics such as close-knit community atmosphere, reliance on agriculture and a strong sporting culture are consistent across the region. However, other factors vary. Each town has their own characteristics, perspectives, priorities, challenges and needs.

It is important that the Eyre Peninsula Regional Drought Resilience Plan considers and works with the regional characteristics that are consistent across the region, while also acknowledging and catering to regional differences where possible.

Key unique features identified through the engagement are summarised below.

Rainfall

Upper Eyre Peninsula experiences lower, more variable rainfall while lower Eyre Peninsula experiences higher, more consistent rainfall.

Agriculture

Upper Eyre Peninsula is more marginal for farming. As a result, this region focuses on traditional agriculture such as wheat and sheep. Weeds are less prolific, which lowers input costs.

Lower Eyre Peninsula enjoys higher productivity. Its higher rainfall means higher value crops such as canola and lentils can be planted. Cropping on lower Eyre Peninsula has higher input costs with higher value seed and greater need for fertiliser, pesticide and herbicides. Higher rainfall makes them more vulnerable to water logging and disease. Higher input costs result in higher losses if crops are lost to events such as frost.

Along the coast from Streaky Bay to Port Lincoln there is a higher proportion of sheep pastoralism than cropping due to rocky ground conditions.

Soil

Soil types differ across the region. The Eyre Peninsula region has 15 main soil groups. These present a variety of challenges including soil acidification, calcareous soils with lower nutrition due to phosphorus tie-up, sandy soils, dryland salinity, soil structure decline, wind erosion, water repellent soils and soil borne root diseases. This influences the productivity of the soil, what crops can be sown, and what techniques should be used. Generally, the upper Eyre Peninsula suffers from lower soil nutrition, less adaptable rotational options and greater soil erosion.

Population

Regional centres including Port Lincoln and Whyalla are experiencing population growth. These centres have greater access to services. Outside these centres, townships are experiencing a decreasing population and have less access to services.