

**MOREE PLAINS AND NARRABRI**

# Regional Drought Resilience Plan

### **Acknowledgement of Country**

Moree Plains and Narrabri Shire Councils acknowledge Traditional Owners of Country throughout Australia. We recognise the continuing connection to lands, waters, and communities of people of the Gamilaraay/Gamilaroi/Gomeroi/Kamilaroi Nation, and pay respect to their Elders past, present and emerging.

Moree Plains and Narrabri Shire Councils acknowledges the various spellings of 'Gamilaraay, Gamilaroi, Gomeroi, and Kamilaroi' and as valid and interchangeable, guided by the Shires' Local Aboriginal Land Councils.



We value the vital involvement of members of the primary production and broader communities of Moree Plains and Narrabri Shires to the formulation of this plan and extend our thanks to those who contributed.

This document was prepared for Moree Plains and Narrabri Shire Councils by Meridian Urban.



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# Glossary

Key terms used throughout this plan are defined below.

<b>ADAPTATION</b>	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.
<b>ADAPTIVE CAPACITY</b>	The ability of individuals and groups to adjust and respond to environmental and socio-economic changes.
<b>ADAPTIVE GOVERNANCE</b>	Coordinating iterative, flexible, and responsive interactions between systems when designing interventions and for their implementation and evaluation.
<b>COPING CAPACITY</b>	Communities that may be constrained in their capacity to use available resources to cope with adverse events and to prepare for, absorb and recover.
<b>DROUGHT</b>	Drought means acute water shortage. Drought is a prolonged, abnormally dry period when the amount of available water is insufficient to meet our normal use.
<b>ECONOMIC RESILIENCE</b>	The ability of the economy to absorb the economic impact of shocks and stressors without changing the economic status or outcomes.
<b>ENVIRONMENTAL RESILIENCE</b>	The ability of the natural environment to cope with a diverse range of shocks and stressors while maintaining natural processes and ecosystem services.
<b>GOVERNANCE</b>	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.
<b>INTERVENTION OPTIONS</b>	Alternative or complementary actions, projects, programs, policies, initiatives, and investments that are planned to bring about change in the system.
<b>LOCAL KNOWLEDGE</b>	Local knowledge and First Nations knowledge incorporates elements of lived experience within a landscape, bearing witness to the operation of systems. It includes aspects of people, landscape, culture – how people interact with surroundings and as part of communities and processes.
<b>RESILIENCE</b>	The ability of a system to absorb a disturbance and reorganise to maintain the existing functions, structure, and feedback. Also see general resilience, specified resilience, economic resilience, environmental resilience, and social resilience.
<b>RISK</b>	The potential for adverse consequences for human or ecological systems, recognising the diversity of values and objectives associated with such systems.
<b>SHOCK</b>	Sudden, short-term events that threaten a city (or region). Examples include major storms, floods, bush fires, heatwaves, disease outbreaks, terrorism, and cyber-attacks’.
<b>SOCIAL RESILIENCE</b>	The ability of the human society to cope with a diverse range of shocks and stressors while maintaining existing social and community functions.
<b>STRESSOR</b>	An event that occurs gradually over a timeframe that causes an adverse effect, e.g. drought.
<b>SYSTEMS</b>	The interaction of processes, networks, and inter-dependencies across a complex ‘whole’.
<b>THEORY OF CHANGE</b>	Refers to theories, causal mechanisms and assumptions that explain how and why outcomes and impacts will be achieved through use, implementation and production of proposed inputs, activities, and outputs.
<b>TRENDS</b>	Major global or regional influences that have driven change in the past and are expected to shape change into the future.
<b>THRESHOLD</b>	The point at which a change in a level or amount a controlling variable causes a system to shift to a qualitatively different regime. Also referred to as a tipping point.
<b>TRANSFORM</b>	The process of radically changing or building a new system with different structure, functions, feedback, and identity.
<b>TRIGGER POINT</b>	A pre-agreed situation or event, that when met, activates a management intervention. Trigger points are usually defined in the planning phase.



# Introduction

**This Regional Drought Resilience Plan is a collaboration between Moree Plains Shire Council and Narrabri Shire Council, and their communities, working together to advance the region's focus on its resilience to absorb, adapt or transform' the impacts of drought. Of all of the climate and weather-related conditions that affect Australia, drought is often the most challenging, not just on-farm but for entire communities and regions. The costs of drought are spread across economic, social and environmental factors. The toll is enormous, and the impacts can linger for decades.**

The Moree Plains and Narrabri region of New South Wales is prone to periods of persistent drought with downward trends in rainfall and soil moisture. Climate projections for the Moree Plains and Narrabri region indicate continued susceptibility to variable rainfall periods, reduced average rainfall and higher temperatures into the future.

We know drought will come again, and in a region that is dependent on the land for its prosperity, the most effective response to is to plan for greater resilience through a range of regionally informed actions to absorb, adapt or transform impacts of drought. Sustainable and diverse economies and connected communities responsive to drought signals provide a strong foundation to reduce vulnerability and mitigate potential impacts, with the benefit of enhancing natural environmental values.

The Regional Drought Resilience Plan program is one of five focus areas<sup>1</sup> of the Commonwealth Government's Future Drought Fund. These plans focus on locally relevant and targeted ways to build regional drought resilience, taking steps to plan now to stem the impact of future drought on our region. The NSW Regional Drought Resilience Plan program is jointly funded through the Commonwealth Government's Future Drought Fund and the NSW Government, supporting local governments to work together regionally to plan for drought resilience proactively and pragmatically.

The framework of the Moree Plains and Narrabri Regional Drought Resilience Plan is provided overleaf.

## Drought resilience, as described by the CSIRO (2022):

*'will ensure regional Australia can endure deeper, longer droughts, and recover from them sooner. This will help Australia's agricultural industries maintain national farm income, increase food security, and protect the regional jobs that rely on agriculture during the toughest years. Importantly, it will also increase the resilience of rural and regional communities and improve environmental outcomes.'*

Image: Boggabri mural

<sup>1</sup> Other focus areas under the Future Drought Fund include farm business resilience, roll-out of the Drought Resilience Self-Assessment Tool, and better land management practices that support landscape resilience.

# Moree Plains and Narrabri Drought Resilience Plan Framework

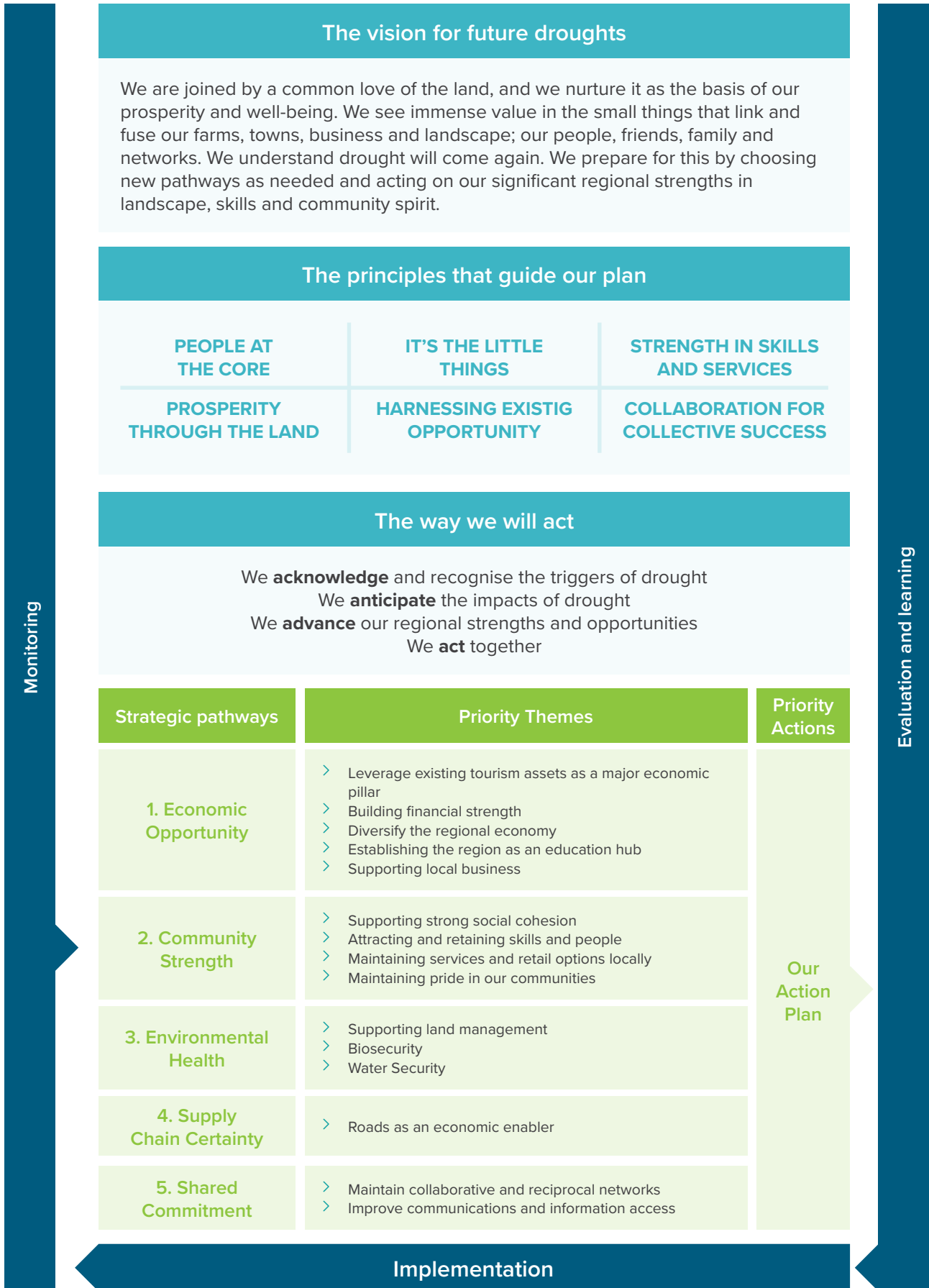


Figure 1 – The Moree Plains and Narrabri Regional Drought Resilience Plan Framework

# Purpose

The Moree Plains and Narrabri Regional Drought Resilience Plan is a regionally informed plan that provides relevant and targeted adaptation pathways and options to enhance existing local drought resilience within and through community networks to deal with the compounding and cascading effects of drought from the farm gate to small business, local land health and community cohesion. The Regional Drought Resilience Plan provides direction and options for how the local community, business and networks including Moree Plains and Narrabri Shire Councils can absorb, adapt or transform for greater resilience.

The purpose of this plan is to:

- increase the understanding of the region's current and future drought resilience, considering the region's unique economic, environmental and social characteristics
- recognise the interdependent nature of the local economy, community health and wellbeing and environmental sustainability through the drought cycle and across business types
- understand local signals and drought priorities in the community's voice and create stronger connectedness and greater social capital within communities, contributing to wellbeing and security
- empower communities to implement adaptive and transformative activities that improve their resilience to drought
- combine local knowledge with resilience and risk data and information to make informed decisions
- identify actions, pathways and opportunities to improve regional drought resilience, mitigate risks and adapt to change
- help Councils be in a stronger position to implement strategic actions and take advantage of opportunities as they arise; and
- develop concrete actions to address and mitigate short and long term drought impacts.

The Regional Drought Resilience Plan is supported by a Regional Drought Resilience Assessment that provides a technical evidence base to drought impacts, history of drought in the region and future climate trends. The core component of this Regional Drought Resilience Plan is the community contribution, which illuminates in detail and at township and local business scale, the impacts of drought, how they are dealt with currently and opportunities to improve and prosper through the next cycle.

For the purposes of this plan, references to regional businesses include farms and agricultural business, contractors, suppliers, industry, retail and commercial services and references to community includes all townships, irrespective of size.

## How does the plan help

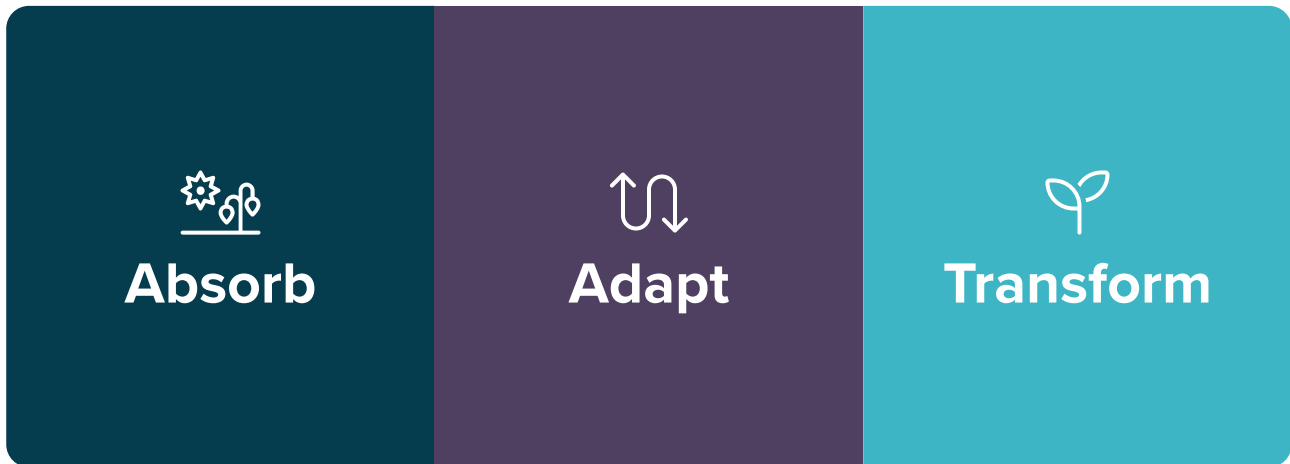
The Moree Plains and Narrabri Regional Drought Resilience Plan combines drought history, climate science and local input to understand the impacts and to anticipate and prepare for the next drought cycle. Whilst we don't have a crystal ball to predict the future, this plan addresses drought resilience by considering drought futures.

How drought has manifested in the past for social and community networks, local business and the landscape are a useful guidepost around what can be done to address drought periods before they become severe. This supports a focus on outcomes through:

- prevention of potential impacts
- increased preparedness and resilience through recognition of signals
- what is needed in response; and
- what is needed for recovery.

Characteristics of drought are slow, long and often insidious. It is important that we also understand and convey regionally, the warning signals of drought which can be evident a long time before a drought is upon the Moree Plains and Narrabri region. In this regard, a focus on prevention and an increased preparedness is paramount to avoid a long recovery.

**The Moree Plains and Narrabri Regional Drought Resilience Plan relies on collaborative implementation approaches involving a range of stakeholders. The action plan for drought resilience spans the prevention, preparedness, response and recovery (PPRR) cycle, providing the framework to embed implementation across the different functions of local government, as well as guide other stakeholders (including other levels of government, community and industry groups, service providers, not-for-profits, landowners, and local communities) with actions that can make a difference. This includes short, medium and long term opportunities.**







This Regional Drought Resilience Plan addresses the cycle and helps the region prevent and prepare for drought through:

- recognising drought triggers
- understanding the potential impacts
- proposing actions to increase preparedness
- proposing pathways to help:
  - absorb impacts where possible
  - adapt to new conditions; and
  - transform to meet the challenge.

This concept forms part of a resilience 'theory of change' model<sup>2</sup> which helps us to break down and consider the complex elements of drought resilience and links across issues. This makes clear both how and why its impacts run so deep. This approach also helps to inform decision-making for enhanced resilience and adaptation as conditions and circumstances change over time.

Having a plan enables us to think and act strategically, start planning now for prevention of impacts and putting programs in place for preparedness. Once the pressure of drought is upon us some of the impacts are already being felt with spending decreasing and employment losses. These are the small but vital impacts that we aim to lessen through this Plan. A drought resilience plan helps us coordinate and direct effort, resourcing, funding and investment to actions that offer maximum benefit.

How this plan will help the Moree Plains and Narrabri region is through the adoption of a drought resilience pose that:

-  **Acknowledges and recognises the triggers**
-  **Anticipates the impacts**
-  **Advances regional strengths and opportunities; and**
-  **Acts together**

The 2017-2019 'Tinderbox Drought' was NSW's worst drought on record. Future droughts may become more frequent and intense. We want to learn from the past to be better prepared for next time. The Moree Plains and Narrabri Regional Drought Resilience Plan is about taking a local view for local benefit. A plan can't bring rain, but it can work to make things a bit easier in its absence.

Implementation funding is available from the longer-term annual investment across Australia under the Commonwealth Government's Future Drought Fund, as well as other funding and grant assistance opportunities. This Regional Drought Resilience Plan provides the framework for implementation and identifies practical ways the community and businesses of the region can prepare for and respond to drought impacts.

<sup>2</sup> The Moree Plains and Narrabri drought resilience plan integrates the 'Resilience, Adaptation Pathways and Transformation Approach' (RAPTA) developed by CSIRO which provides a framework to map resilience interventions. For more information on RAPTA, visit <https://research.csiro.au/eap/rapta/>



# Vision and principles

## Vision

We are joined by a common love of the land, and we nurture it as the basis of our prosperity and well-being. We see immense value in the small things that link and fuse our farms, towns, business and landscape; our people, friends, family and networks. We understand drought will come again. We prepare for this by choosing new pathways as needed and acting on our significant regional strengths in landscape, skills and community spirit.

### Guiding principles



#### People at the core

Community connection and cohesion is strong. There are deep familial roots and commitment of business and residents to the history and foundation of this region. This strong fabric holds together through stresses and shocks.



#### It's the small things

The region already shows significant resilience and has endured the drought cycle through focus on the small things that make a big difference. This is a hallmark of the region's resilience.



#### Strength in skills and services

The region boasts impressive existing skill base through agriculture, mining, education, small business innovation and natural beauty that can be harnessed to sustain the economy through drought. They are at functional peak when supporting services remain accessible in all phases of the drought cycle.



#### Prosperity through the land

As caretakers of the land, we acknowledge it provides us with our economic base. Our industries and endeavours are based on its bounty. We understand its behaviours and accept its' sometimes harsh and cyclical nature. We value our lifestyle close to the land.



#### Harnessing existing opportunity

There is vast untapped opportunity when drawing together community strengths, technical skills, quality of local produce, landscape values, locational attributes and existing planned major projects and investment.



#### Collaboration for collective success

Together is always stronger. Whether this is together in a tiny village or together regionally. Seeking partners, merging resources and sharing knowledge a region that collaborates enhances its strength to combat stress and shocks.

## Outcomes

The outcomes sought from the Moree Plains and Narrabri Regional Drought Resilience Plan are outlined below. The monitoring, evaluation and learning framework to guide plan implementation sets out a range of criteria against which implementation can be measured against these outcomes in order to test growth in drought resilience attributes over time.

THEME	OUTCOME
<b>Community Strength</b>	Community cohesion and wellbeing is maintained
<b>Economic Opportunity</b>	<ul style="list-style-type: none"> <li>→ Gross regional product remains steady or grows relative to:</li> <li>→ Non-drought periods</li> <li>→ Previous drought periods</li> <li>→ Other regions in NSW, Victoria and South Australia</li> </ul>
<b>Environmental Health</b>	<p>Environmental degradation of landscapes and waterways is reduced throughout and emerging from drought.</p> <p>Regional water quality and quantity projects are continually underway</p>
<b>Supply Chain Certainty</b>	<p>Market accessibility has improved</p> <p>Regional road projects are continually underway</p>
<b>Shared Commitment</b>	Drought resilience priorities are embedded across Council's Integrated Planning and Reporting Framework and informs the plans, strategies and efforts of allied stakeholders

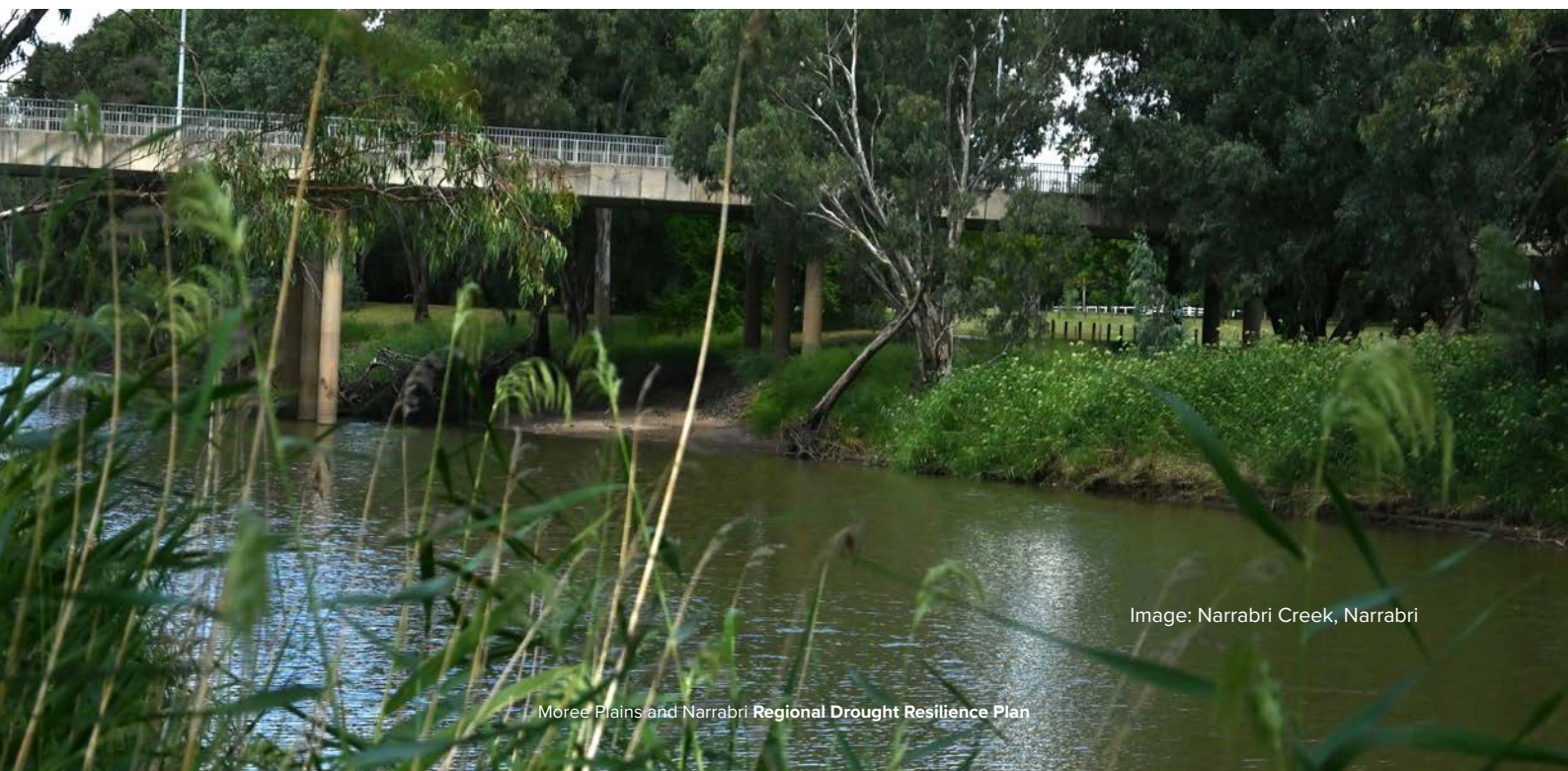


Image: Narrabri Creek, Narrabri

# Region snapshot

Information sourced from ABS 2021 Census data and Regional Development Australia\*



## 25,454

Population

(0.3% of NSW population)



Median age

## 39

(same as NSW average)



First Nations population

## 17.3%

(3.4% NSW average)



Gross Regional Product  
Moree Plains \$0.96bn  
Narrabri \$1.84bn



Unemployment

## 4%

(4.9% NSW average)

## Largest industries (by employment)

### MOREE PLAINS

- Agriculture, forestry and fisheries
- Education and training
- Health care and social assistance
- Retail trade; and
- Construction

### NARRABRI

- Mining
- Agriculture, forestry and fisheries
- Health care and social assistance
- Retail trade; and
- Education and training



Local businesses

## 3,700



Local jobs

## 19,919

#### Principal Agricultural Commodities

- ✓ Dryland and irrigated broadacre cropping for: Cotton, Grains & Legumes
- ✓ Beef cattle
- ✓ Sheep
- ✓ Fruit and nuts

#### Research facilities = 3

- ✓ University of Sydney Plant Breeding Institute
- ✓ International Centre of Crop and Digital Agriculture
- ✓ The Australian Cotton Research Institute

#### Sites of environmental importance = 3

- ✓ Pilliga State Forest and National Park
- ✓ Mount Kaputar National park
- ✓ Gwydir Wetlands (International RAMSAR site)

# About the Moree Plains and Narrabri Region

The region is a productive agricultural area with reliable summer-dominant rainfall and a climate that allows for crop and pasture growth most of the year. The region is home to natural artesian water, rivers, state forests and national parks, wetlands and protected parkland. It also bolsters significant natural resources including hard rock tin and other rare earth metals.

Key centres in the region include the administrative centres of Moree and Narrabri which are supported by a network of townships, villages, and localities. In the Moree Plains Shire, these townships include Mungindi and Boggabilla, Boomi, Biniguy and Pallamallawa, Mallawa, Ashley and Gurley. In Narrabri Shire, townships include Baan Baa, Bellata, Boggabri, Edgeroi, Gwabegar, Pilliga and Wee Waa.

Following European colonisation, land in the region was subject to pastoral expansion from the mid 1800's. Centres, townships and villages across the region provide important access to social and economic services, retail, medical services and infrastructure. They are destinations for residents, workers and visitors. They are also home to the majority of the region's non-agricultural enterprises. The rural main street character each township offers is unique and highly dependent on functional, flourishing trade and business activity.

The region has a strong association with bore water. Artesian mineral waters were discovered in 1895, acting as a significant tourism draw card to the region.

The region is home to industry-research collaborations such as the Australian Cotton Research Institute outside of Narrabri and educational facilities such as the recently announced University of New England regional study centre. Mining plays a strong role in the Narrabri economy along with the traditional agricultural backbone.

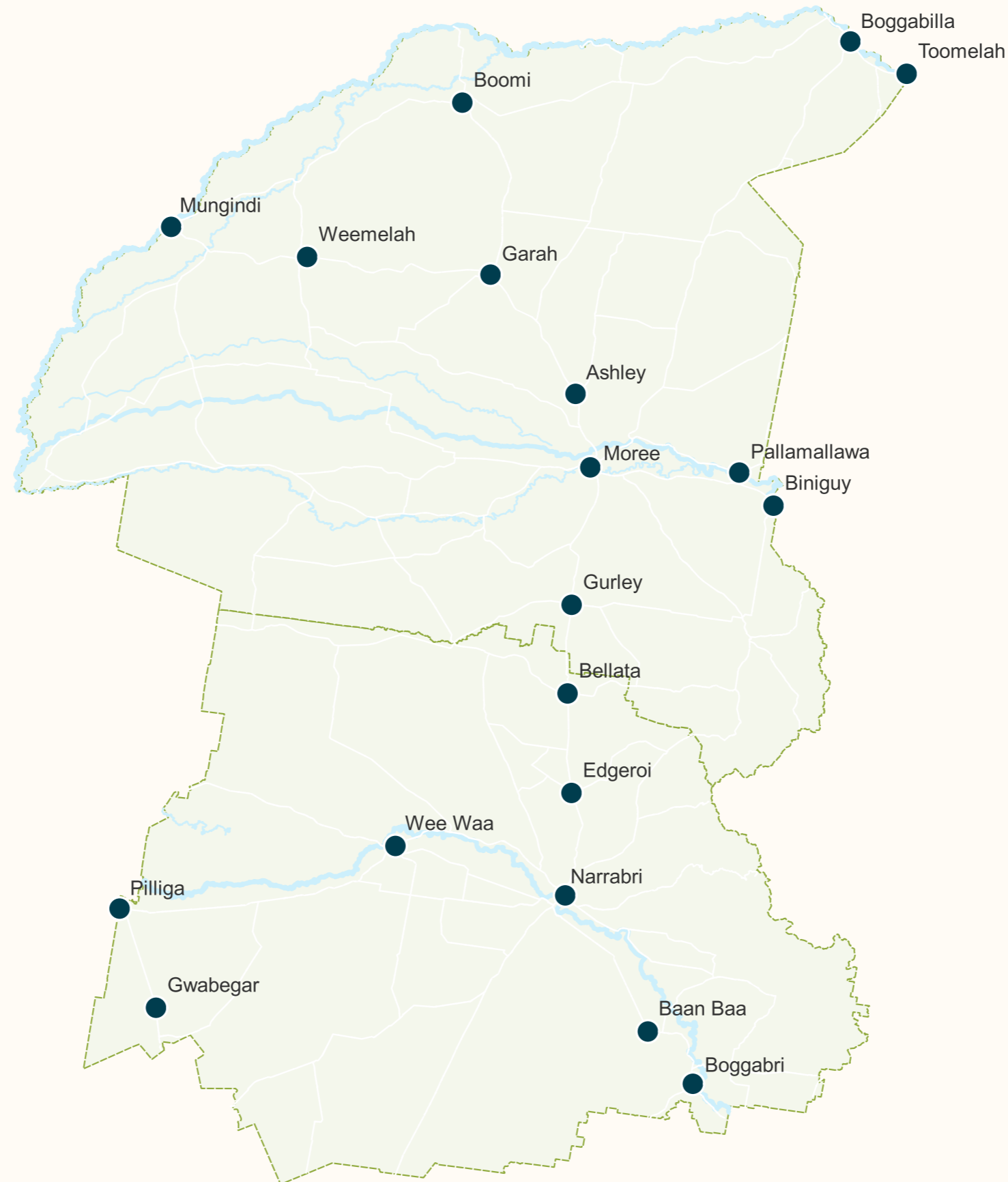


Figure 2 — Regional map



## The Kamilaroi Nation

The Kamilaroi/Gamilaroi/Gomeroi Nation has a deep historical connection to Moree Plains and Narrabri, encompassing about 30,000 square miles of land. However, colonisation drastically changed their way of life, leading to dispossession and cultural suppression.

European settlers moving westward in the early 1800s clashed with Aboriginal and Torres Strait Islander peoples, leading to conflicts known as the 'Frontier Wars'. Sadly, there were brutal encounters like the Waterloo Creek Massacre, where an estimated 40 to 50 Kamilaroi Gamilaroi/Gomeroi people lost their lives.

The history of colonisation has left a lasting impact on Aboriginal and Torres Strait Islander languages. However, there are ongoing efforts to revive and preserve the Gamilaraay/Yuwaalaraay language, with courses now available through institutions like the Australian National University.

Despite past injustices, the descendants of this nation continue to occupy and cherish their ancestral lands today.



## Water holds deep cultural, spiritual, and practical significance for Aboriginal and Torres Strait Islander Peoples in Australia.

Moree Plains and the Narrabri Shire Council's acknowledge the Traditional Owners of the land, the Kamilaroi/Gamilaroi/Gomeri People (also known as Gamilaraay). The Kamilaroi/Gamilaroi/Gomeri lands extend across New South Wales to southern Queensland. The Kamilaroi/Gamilaroi/Gomeri mob forms one of Australia's four largest Indigenous nations.

The relationship between Kamilaroi/Gamilaroi/Gomeri communities and water is intricately tied to their understanding of the environment, traditional knowledge systems, and spiritual beliefs. This connection spans thousands of years and is now severely challenged by modern environmental pressures, particularly drought. As climate change exacerbates the frequency and severity of droughts, the impact on Aboriginal communities and their deep affinity to water becomes more profound and urgent.

**For the Kamilaroi/Gamilaroi/Gomeri people, water is far more than just a physical resource; it is a vital element connecting them to their ancestors, culture, and land. Water sources such as rivers, lakes, and springs are considered sacred and often associated with creation stories, known as Dreaming or Dreamtime. These stories explain the origins of the land, its features, and the life it sustains. Water is seen as a living entity imbued with spiritual essence and is often central to rituals, ceremonies, and cultural practices.**

Aboriginal and Torres Strait Islander Peoples have developed a sophisticated understanding of water management grounded in thousands of years of observation and experience. This traditional ecological knowledge encompasses a holistic approach to managing water, ensuring its sustainability for future generations. Aboriginal and Torres Strait Islander water management practices include the careful monitoring of seasonal cycles, the protection of waterholes, and the maintenance of wetlands. Knowledge about the land, the weather patterns, and the behaviour of animals is passed down through generations, ensuring that water resources are respected and used sustainably.

These practices have enabled Kamilaroi/Gamilaroi/Gomeri communities to survive in some of the harshest environments on Earth, where water is often scarce. They understand that water is a shared resource that must be carefully managed to sustain human life and the plants and animals that are integral to the ecosystem.

Their approach to water management is not about domination or exploitation but about living in harmony with the environment.

However, this delicate balance is increasingly being disrupted by prolonged droughts, which are becoming more frequent and intense due to climate change. Droughts have a devastating impact on water availability and, by extension, on the cultural practices, livelihoods, and well-being of Aboriginal and Torres Strait Islander People. When water sources dry up, so too does the ability to conduct ceremonies, connect with ancestral lands, and maintain traditional ways of life.

The degradation of rivers and wetlands, often exacerbated by over-extraction of water for agricultural and industrial purposes, further compounds the problem. In many cases, Aboriginal communities are left with little or no access to clean water, impacting their health and their ability to sustain themselves. The destruction of sacred water sites is not just an environmental issue; it is a profound cultural loss, leading to a sense of displacement and disconnection from the Country.

Despite these challenges, the Kamilaroi/Gamilaroi/Gomeri people continue to demonstrate remarkable resilience. Aboriginal and Torres Strait Islander knowledge systems are being recognised as vital to the sustainable management of water resources, and there is a growing movement to incorporate traditional ecological knowledge into broader environmental and water policies.

### Boobera Lagoon

Boobera Lagoon is a permanent waterhole 13.5km west of Boggabilla. It is a sacred site for the Aboriginal People.

This tranquil body of water is deeply woven into the cultural fabric of Aboriginal people, representing a vital connection to their ancestors and the Dreamtime. Legend says the Lagoon was created by the Garriya (Rainbow Serpent), a powerful spiritual being.

The lagoon has been a place of ceremony, reflection, and sustenance for generations. However, threats from water extraction and droughts have endangered the Lagoon's fragile ecosystem, jeopardising the Kamilaroi/Gamilaroi/Gomeri spiritual practices and connection to this ancient, sacred waterway.



## People






The Moree Plains and Narrabri Shires are supported by a chain of communities which act as hubs, meeting places, and event venues, each with strong local identities from Boggabri in the south to Boggabilla in the north, and out west at Pilliga and Mungindi. Local venues in schools, halls, childcare, sport, golf, racing and business or pleasure are connections that are integral to providing opportunities to maintain and strengthen the existing deep commitment of business and residents to the history and foundation of this region. The region hosts a diverse community from generational farmers to First Nations and international researchers.

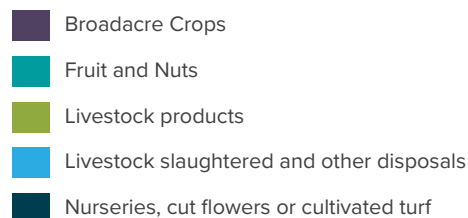
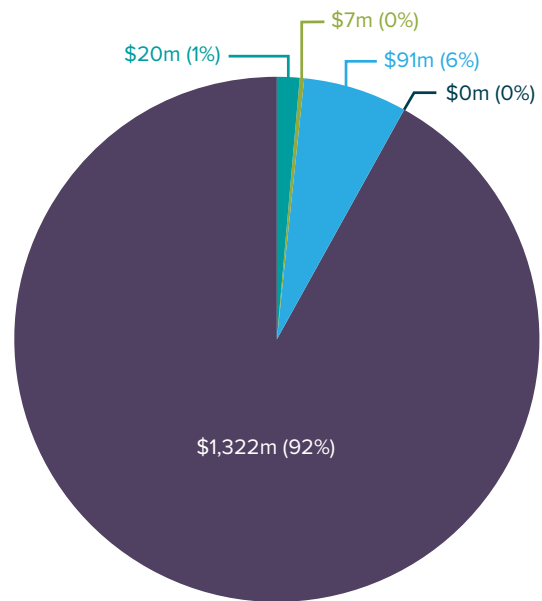
The region has a combined population of 25,454 persons based on 2021 census data (12,703 in Narrabri Shire and 12,751 in Moree Plains Shire) with a median age of 39. Both Shire's populations decreased slightly in the last intercensal period<sup>3</sup>.

Moree Plains Shire is anticipated to have a positive growth rate of 1.37% per annum, resulting in an additional ~4,000 people in the Shire by 2041<sup>4</sup>. Narrabri Shire is anticipated to have a negative growth rate of 0.36% per annum, resulting in approximately 900 less people than current in 2041. Both Shires have a very large Aboriginal population well in advance of the state average of 3.4% at 19.9% and 14.8% for Moree Plains and Narrabri respectively<sup>5</sup>.

## Economy

The Moree Plains Shire had a gross regional product (GRP) of \$966 million for the 2022-23 financial year. Narrabri Shire's GRP totalled \$1.84 billion. Combined, the region supports an estimated 19,919 local jobs (2020) and 3,700 local businesses<sup>6</sup>. The top five industries by employment for both Shires are:

-  Agriculture, forestry and fishing
-  Education and training
-  Health care and social assistance
-  Retail trade; and
-  Construction<sup>7 8</sup>.



**Figure 3** — Gross value product of agricultural commodities, 2021, for Moree Plains and Narrabri Shires<sup>9</sup>

The livelihoods of all residents of the region are dependent upon the landscape. The economic fortunes of businesses with direct and indirect contact with agriculture are strongly linked despite impacts being felt at different times and scales. Town based indirect businesses support farm based business and in reverse.

The agricultural industry is a significant economic driver for the region. Considering the commodities produced, broadacre crops (e.g. cereal and non-cereal crops) account for the vast majority of the region's agricultural Gross value product (GVP), at 92 percent. Livestock is a minor commodity comparatively (6 percent). The graph provides a breakdown by commodity subclass.

<sup>3</sup> Australian Bureau of Statistics, 2021, Moree Plains 2021 Census All persons QuickStats, Available online at <https://www.abs.gov.au/census/find-census-data/quickstats/2021/LGA15300>

<sup>4</sup> NSW Government, 2022, NSW Population Projections

<sup>5</sup> Australian Bureau of Statistics, 2022, Moree Plains 2021 Census All persons Regional profiles, Available online at <https://dbr.abs.gov.au/region.html?lga&rgn=15300>

<sup>6</sup> Australian Bureau of Statistics, 2022, Data by Region: Local Government Area: for Moree Plains and Narrabri, Available online at <https://dbr.abs.gov.au/compare.html?lga&rgn0=15750&rgn1=15300>

<sup>7</sup> Ibid

<sup>8</sup> Australian Bureau of Statistics, 2022, 2021 Census All persons Regional profiles, Available online at <https://www.abs.gov.au/census/find-census-data/quickstats/2021/LGA15750>.

<sup>9</sup> ABS 2022, Value of Agricultural Commodities Produced, Australia, 2020-21. Gross and local value estimates by 2021 Local Government Areas (LGA).

## Environment

Moree Plains and Narrabri are fed by multiple river systems including the Gwydir, Macintyre, Mehi and Namoi Rivers, collectively forming part of the wider Murray-Darling Basin. The Moree Plains and Narrabri Shires lie on the Border Rivers, Gwydir and Namoi Regional water catchments. Bore water from the Great Artesian Basin (GAB) is a major tourism attraction as well as an agricultural and community asset.

Moree Plains Shire and Narrabri Shire's historical development has been linked to the discovery of and use of water from the Great Artesian Basin. Across the region, communities rely on the Great Artesian Basin and the Murray Darling Basin for thriving agricultural production including intensive horticulture, irrigated crops and grazing along floodplains benefiting from riparian flows. Food production and tourism contribute significantly to Moree Plains and Narrabri region economies. Abundant and diverse animal and plant life rely on this complex system to survive.

Apart from the immensely fertile floodplains, the region boasts some impressive natural assets including the international listed RAMSAR wetlands of the Gwydir River, the outstanding rock formations of Kaputar National Park, the vast areas of the Pilliga and Timmallallie forests and conservation areas and Yarrie Lake formed by ancient meteor strike.



Image: Open plains north west of Narrabri



# How this plan was prepared

The Moree Plains and Narrabri Regional Drought Resilience Plan was prepared with the valued contribution of a broad cross section of community members, stakeholders, local government, resilience officers, health and counselling practitioners and local businesses and farmers. It is supported by an evidence-based resilience assessment. These inputs have drawn together technical analysis with local knowledge and insight. There are two primary components to preparing the Plan:



## Resilience Assessment, which includes:

- literature analysis
- plans, policies and strategies review
- regional characteristics
- trends and projections for drought impacts; and
- drought resilience indicators assessment



## Stakeholder engagement

- online community surveys
- community, industry and government workshops across both Shires
- community drop-in sessions at venues across both Shires; and
- targeted consultations, interviews and discussions with community, industry and services representatives.

The Moree Plains and Narrabri Regional Drought Resilience Plan focuses on the consideration of complex drought challenges from a systems-based perspective where economic, natural environment and social capacity to endure, respond and evolve through drought are enhanced.



Image: Community engagement techniques for the plan



## Alignment

This provides strategic alignment with international scale goals including the United Nations sustainable development goals, the Sendai Framework for Disaster Risk Reduction, with national-scale strategies and frameworks and state-level strategic instruments. This alignment demonstrates how working locally contributes to broader sustainability and resilience outcomes.

The regional drought resilience plans focus on the community as a system to enhance economic, built, environmental, and social capacity to endure, respond and evolve.

Key plans and strategies contributing to this alignment and the preparation of the Moree Plains and Narrabri Regional Drought Resilience Plan has included (but is not limited to):

- New England North West Regional Plan 2041
- Upper North West Regional Economic Development Strategy (2023 update)
- The Border Rivers, Gwydir and Namoi regional water strategies
- NSW Climate Change Adaptation Strategy
- NSW Government Department of Primary Industries Drought Hub
- The Moree Plains Special Activation Precinct Delivery Plan
- Department of Primary Industries and Regional NSW Drought Signals Dashboard; and
- Commonwealth Government's Drought Resilience Self-Assessment tool.

This is complemented by local knowledge and vision.

## Stakeholder engagement

Participation in the Plan and generous donation of time and insights was given by:

- local primary producers (dry land and irrigated crops including cotton and legumes, other grains and livestock)
- local town residents in public forums
- business owners including primary producers, café owners, retailers, contractors and agricultural suppliers
- community group representatives
- Rural Financial Counselling Service
- Grain Producers Australia (regional representative)
- NSW Farmers (regional representative)
- National Emergency Management Agency (regional representative)
- local flood recovery officers from both Councils
- Department of Primary Industries and Regional NSW
- Rural Adversity Mental Health Program (RAMHP)
- Salvation Army chaplains
- Anglicare counsellor
- Healthwise Primary Health Care provider
- Narrabri Chamber of Commerce
- South West Queensland and Northern NSW Drought Innovation and Resilience Hub
- Cotton Growers Association; and
- Local Land Services (natural resource management and livestock officers)

In person engagement was interactive and prompted participants to think about lived experience and pathways for action.



Images: Community consultation in action. Left: Balo Square, Moree and Right Pilga Community Hall





## “One Mungindi @ 2406”













The unique township of Mungindi on the NSW and Queensland border, straddles the border line of the Barwon River with services and businesses operating in both states presenting both opportunity and challenge. Cross border issues are topical in any conversation on climate policy and especially extended drought and how the various governance approaches can accentuate the border or unite a community.

Challenges include time zones during summer and differences in access to, availability and eligibility of drought funding or status. Opportunity works in the same way with business taking advantage of the two for one locations.

The people of Mungindi do not feel like they are any different from one side of the river to the other and the township (in both states) has only one postcode @ 2406. This is a *little thing* that has done wonders to cement the local identity of Mungindi and strengthen community cohesion.

Image: Mungindi mural

## Engagement Outcomes – Community Insights

-  Primary producer wellbeing is principally influenced by direct issues of animal welfare and financial stability, however the function of the town impacts farmer welfare too and farm businesses rely up on the skills and services of the towns for services at all phases of the cycle.
-  A functional local economy expedites recovery. Keeping everything 'open and normal' is paramount so that the region can hit the ground running as soon as conditions change.
-  Community fabric, cohesion and proactivity at the township scale drives success. 'It's the little things' is a constant theme across community feedback and insights.
-  Skills and services work both ways: the skills within the region support the strong local business resilience, capacity and innovation. Simultaneously, those businesses rely upon services to support their practices from health to financial services (e.g. Childcare).
-  Centralisation of essential services (health, financial etc.) can impact smaller communities twofold: directly through withdrawal of skills and people; and then indirectly as locals are forced to drive to other regional centres, all needs are satisfied outside the region, fully circumventing local business.
-  People need one on one support – but in a variety of ways (ad hoc, social, formal). Locals are more inclined to seek assistance, advice, support or whatever need arises when it is delivered in a personal manner. The variables and complexities are too great for blanket approaches.
-  Health goes by the wayside in tough times: everything from skin, dust, dehydration, mental and physical health issues. Health care needs to be highly accessible, especially to those more remote and delivered in innovative ways.
-  There is a need to better connect on-farm decisions to township businesses to help identify and anticipate any downturns and trigger points for resilience actions.
-  Farming is big business and the infrastructure and services to facilitate that are needed such as supply chain security and communications.
-  Economic uncertainty and direct job losses influence in-town wellbeing, as does the state of the built form and public spaces.
-  Middle income people and also middle-sized employers sustain the towns. Diversity in the economy but also diversity within business can be a hallmark of resilience.
-  Financial support options are not open to directly impacted businesses other than landowners, such as harvesting or spraying contractors.

## Engagement Actions – Key Statistics'



**17 in-person  
engagement sessions:**

5 workshops, 3 pop-up public events,  
9 drop in sessions



**10 communities  
8 days**



**2 research centre drought  
discussions and site visits**



**10 in-person and  
online interviews**



**53 drought impact  
survey responses**



**Over 140 one on one  
conversations with participants**



# How our region is impacted by drought

“Happier towns make happier lives”

Community member

“Loss of people is like the ‘leaky bucket’

Community member



## Environmental Impacts

- Drinking water quantity and quality
- Health side effects from dust and dust storms
- Sediment run off after drought – stream water quality and water course erosion
- Reduced root zone soil moisture
- Dealing with Hudson and Prickly Pear infestations
- Importation of weed species previously unknown to the region with stockfeed
- Stock route management
- Soil erosion from wind and dust storms
- Rodent outbreaks
- Dieback of large mature trees knock on affect to surrounding biodiversity



## People and Social Impacts

- Loss of, and irregular funding of baseline services in health, social support and education
- Decrease in school enrolments and loss of associated service professionals
- Young people move away to find work
- Physical and mental health matters are put aside
- Mental health and emotional burdens intensify with the strain
- Decrease in volunteering
- Decrease in social activities as everyone feels financially strained, without funds to spend leads to social isolation
- People need to feel busy and valued during drought



## Economic Impacts

- Price-cost squeeze for residents and business
- Loss of local discretionary spending
- Capital expenditure put on hold
- Loss of workers and their families has a spiralling effect
- The best workers tend to go first and are hard to keep taking with them skills and knowledge
- Impacts are across business directly and indirectly impacted, not just farms
- Uneven distribution of financial assistance across business types
- Difficult to attract people and skills for businesses that are operating well
- Non-payment of debts (especially rates)
- Road construction ceases due to lack of water
- Assistance starts to late in the drought cycle and takes too long to be approved



## Impacts from external trends

- Commodity prices
- Fuel prices
- Telecommunications
- Insurance access and certainty
- Funding certainty for baseline programs
- Loss of or reduction in baseline services





## The Pilliga “Meat Tray Index”

**A measure of social cohesion and wellbeing.**

Every Friday the Pilliga Pub raffles off meat trays for a different community group: the fishing club, the cricket club, the Pilliga Play group, community centre, schools and more.

Widely supported by the community the Friday meat trays exemplifies proactive action in community, for community character that is evident across the region. The Friday night meat tray raffles is a *little thing* that serves great purpose for the Pilliga community in a drought resilience context:

- attendance provides a measure of wellbeing on a scale of individual community members
- attendance provides an opportunity for spontaneous connection and emotional support where needed
- the meat tray purchase supports local butchers and business
- the meat tray proceeds supports local community group to keep providing the services and events to the locals, in turn maintaining community wellbeing; and
- it can provide much needed additional fare to share in financially stretched households for the price of a raffle ticket

The Pilliga Meat Tray Index is a vital metric for community cohesion and emotional wellbeing during drought.



Image: Cotton Road Train

## Interconnected nature of drought

The economy of Moree Plains and Narrabri Shires is underpinned by the landscape, whether this is through crops, livestock, mining or tourism. The value of agricultural and resource commodities to the regional economy is significant. Communities and industry are water dependent at different scales. Because of this, it is important to consider the projected impact of future climate changes, to help us plan now for potential increased rainfall uncertainty.

The landscape provides our wellbeing and our prosperity as reflected in our vision; thus, the three elements together sustain our region. When one is diminished, the others follow with cascading and compounding effects across the community.

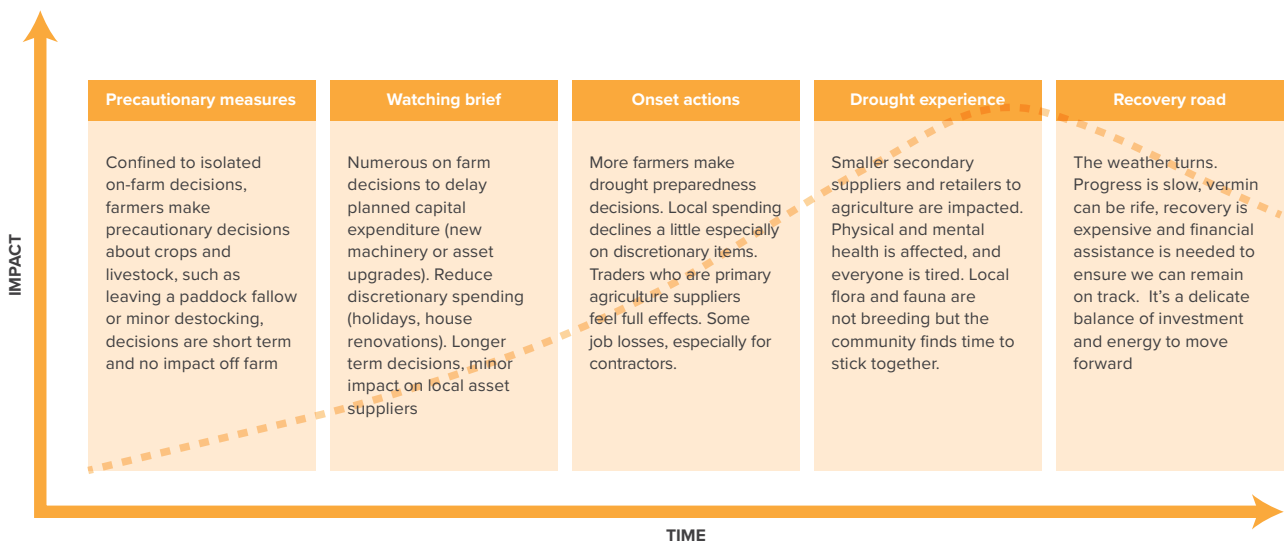
To hedge against cascading impacts, the further in advance we plan, build awareness and put in place redundancy measures, the more options we will likely have available to address issues down the

track. Conversely, opportunity narrows through time constraints.

The discussion with community highlighted the challenge to the well-documented question of **“When does the drought start?”**. While community members, business, farms and services were unanimous in the need to be better prepared with a great appreciation of impacts and solutions during drought. However, the goal of this resilience plan is to **increase our understanding** of local triggers and empower communities to implement transformative activities that **improve their resilience to drought**.

Businesses feel direct impacts and indirect impacts. The diagram reflects the locally observed cycle of drought, as described by the community. It shows when business may be affected along the decision and action progression. Staying connected to this progression will enable businesses indirectly affected to act earlier.

Farms are operated with a range of variables: location, crops, water access, size, soil moisture and with management styles that have equally wide ranges of variables such as conditions across one property, risk appetite, drought readiness, decision making power and more which means that no decisions are made across the region uniformly. Precautionary and watching-style decisions can be made on farms many many months before any open conversation on drought conditions occurs.



It is at the precautionary time that drought preparedness is paramount

Figure 4 — The time and impact progression

## Drought history

Both Moree Plains and Narrabri Shires form part of the headwaters of the Murray-Darling Basin and are situated west of the Great Dividing Range. While not as wet as locations east of the range, rainfall in these Shires is influenced by proximity to the range.

Precipitation (rainfall) and root zone soil moisture are considered as indicators of drought according to the Bureau of Meteorology’s Australian Water Resources Assessment Landscape (AWRA-L) service<sup>10</sup>. Root zone soil moisture is a calculation of the upper and lower soil layers in the AWRA-L, which represent the water-holding capacity of the top one metre of soil. Root zone soil moisture and precipitation rates are each useful indicators of future drought potential.

The projections below use the National Hydrological Projections dataset, a product of the (AWRA-L) service. There is year-to-year variability in rainfall amounts across both Shires. Notably, Narrabri appears to have a higher soil moisture carrying capacity than Moree Plains, with larger changes. This is consistent across the recorded timescale.

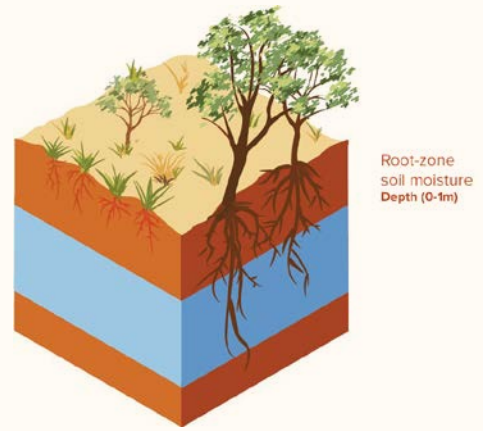


Figure 5 — Root-zone soil moisture

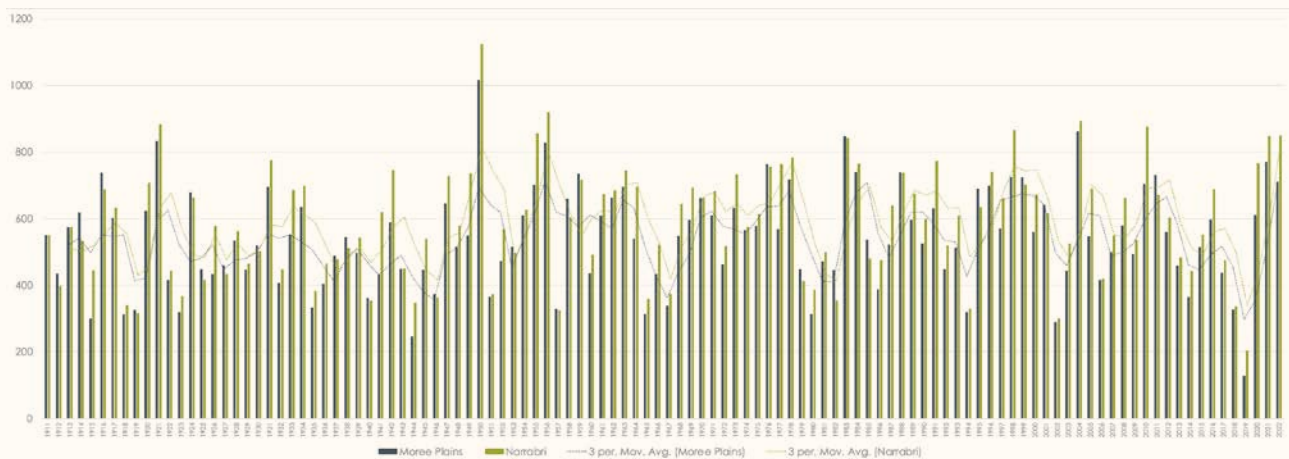


Figure 6 – Yearly total precipitation by LGA

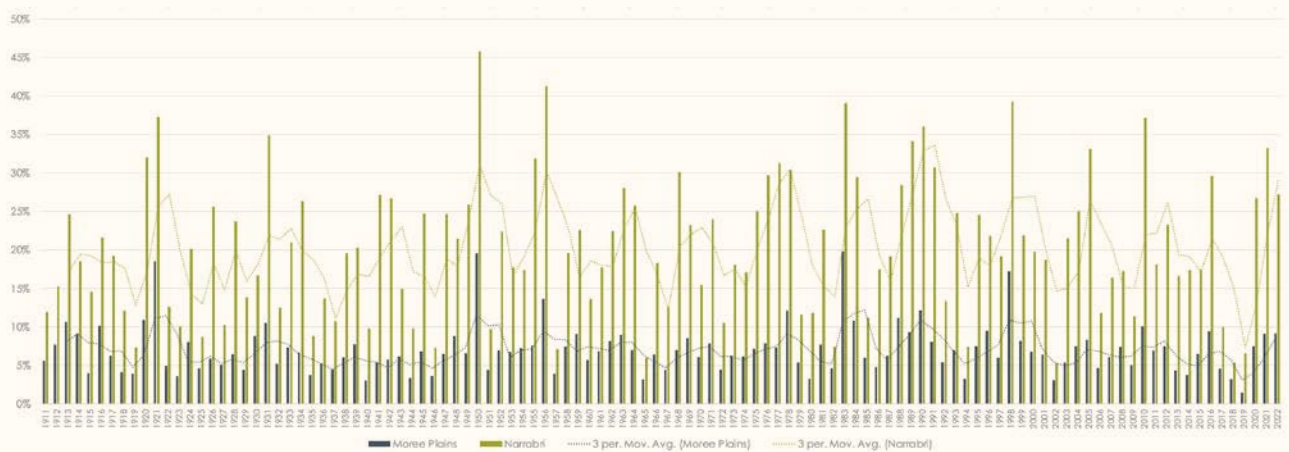


Figure 7 – Yearly mean precipitation by LGA

<sup>10</sup> Bureau of Meteorology 2021, The Bureau of Meteorology Australian Water Outlook Service Data Collection, National Computational Infrastructure, Available at: <https://dx.doi.org/10.25914/6130680dc5a51>



Some of the continent's most impactful droughts have affected the Moree Plains and Narrabri region. Significant Australian drought periods identified by the Bureau of Meteorology<sup>11</sup>:

- 1890 to 1902 (Federation drought)
- 1914 to 1915
- 1937 to 1945 (World War II drought)
- 1965 to 1968
- 1982 to 1983
- 1997 to 2009 (Millennium drought)
- 2017 to 2019 (Tinderbox drought)

In the Figure 8 below\*, these droughts are considered against a present-day baseline of 2022 to 2022.

\*Note that the data does not go back to the Federation drought of 1890-1902

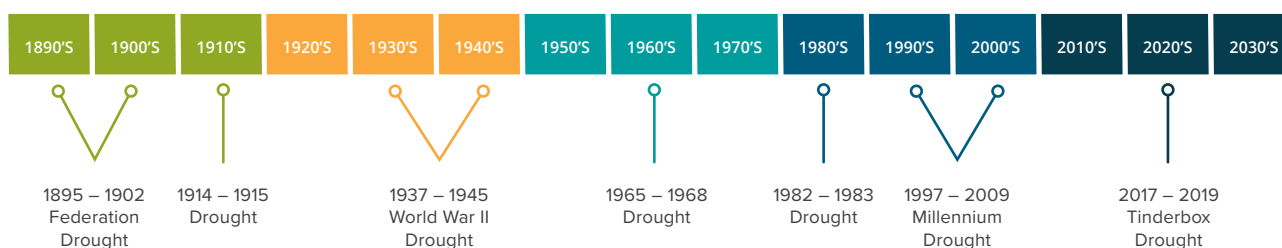


Figure 8 — Australian drought history timeline



## What a relief!

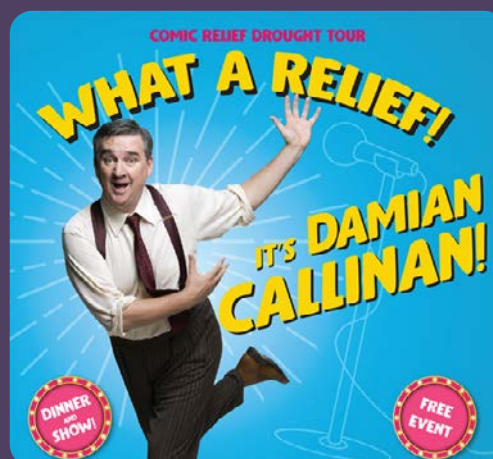
### Comic relief buoys the community

Across the region, one of the most outstanding memories of drought endurance was the community's appreciation of efforts to bring humour back to the region and allow community to shake off their troubles for a short period.

These gatherings have compounding benefits:

- allowing health and other practitioners spontaneous access to people in need for casual judgement-free social conversations; and
- attendance provides much needed social contact generally and emotional support; and
- providing temporary relief from physical and mental strain.

Continuing programs that bring light relief to the community are a *little thing* that remains a high priority with compounding benefits.



<sup>11</sup> Bureau of Meteorology n.d, Previous droughts, <http://www.bom.gov.au/climate/drought/knowledge-centre/previous-droughts.shtml>

### 1914 to 1915

Nationally, this drought was short but notable, primarily due to the failure of the national wheat crop. This drought was driven by a strong El Nino, with drought conditions first becoming evident in 1913. This drought period was most severe in southern Australia. For the Moree Plains and Narrabri region, records indicate that the 1914-1915 period was still relatively wet for both Shires, but particularly Moree Plains. Both LGAs instead experienced decreased rainfall and soil moisture in the period from 1918 to 1920 (illustrated in the graph below).

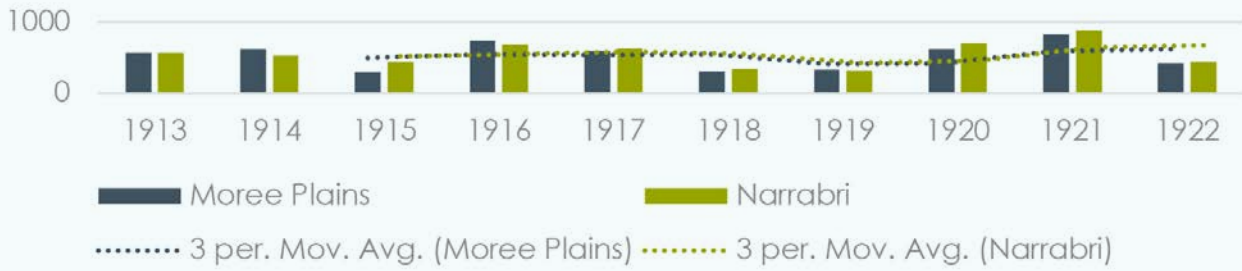
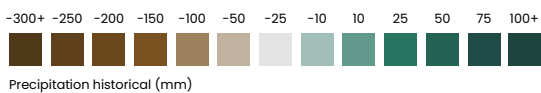
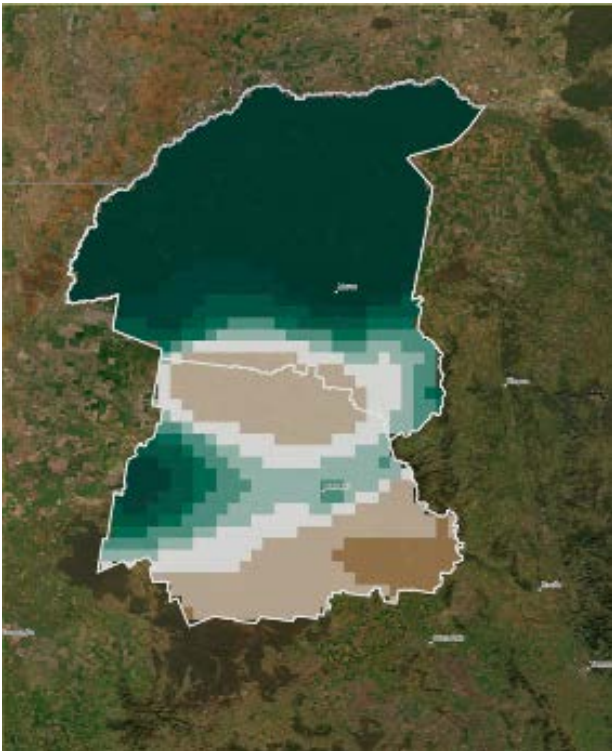
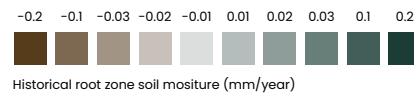
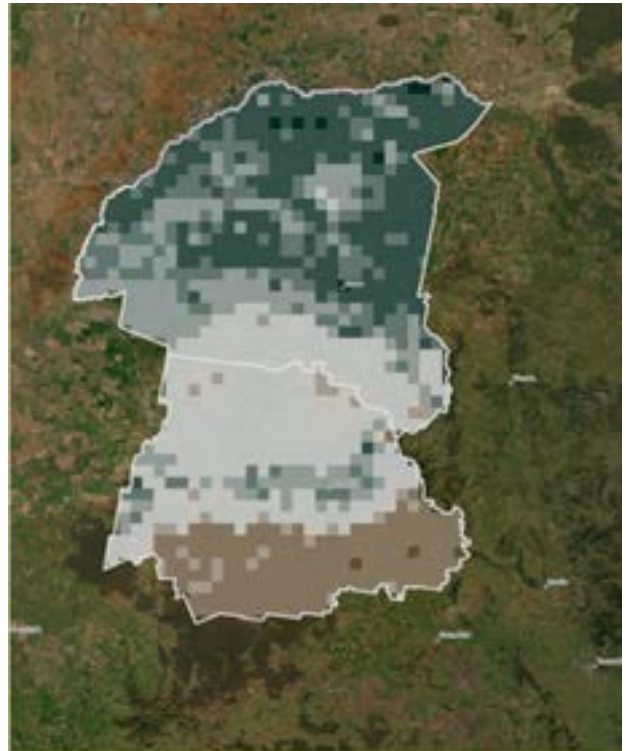


Figure 9 — Yearly precipitation (absolute), by LGA (1913 to 1922)

### Precipitation



### Soil moisture



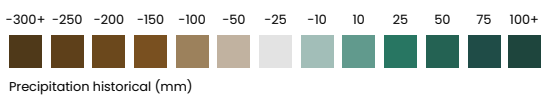
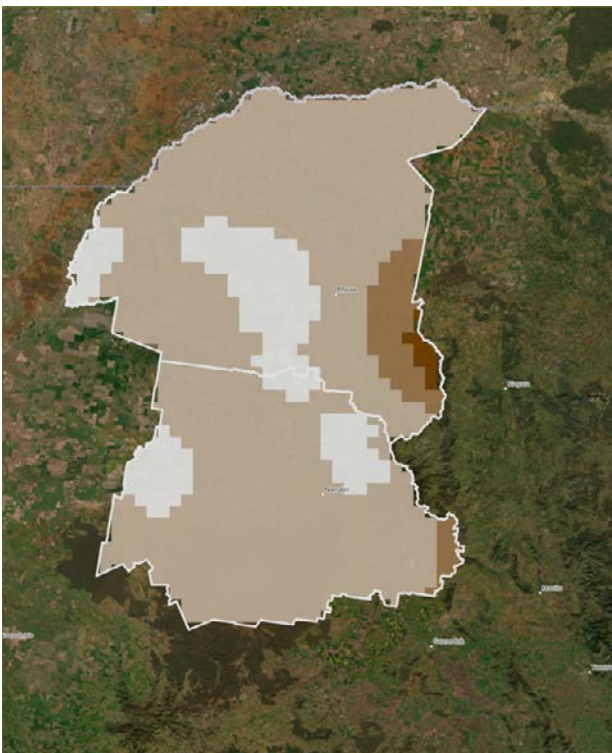
### 1937 to 1945 (World War II drought)

This drought period was characterised by several breaks, but intense periods of dryness. For this region, reduced rainfall was evident from 1935 to 1940. A reprieve came in 1941 and 1942 but following that there was period of dryness from 1943 to 1946. Across the entirety of 1937 to 1945, there is a reduction in rainfall across much of the region. Changes in the soil moisture were less pronounced, except for the southern portion of Narrabri.

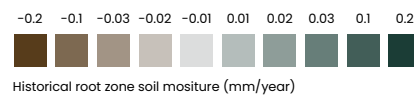
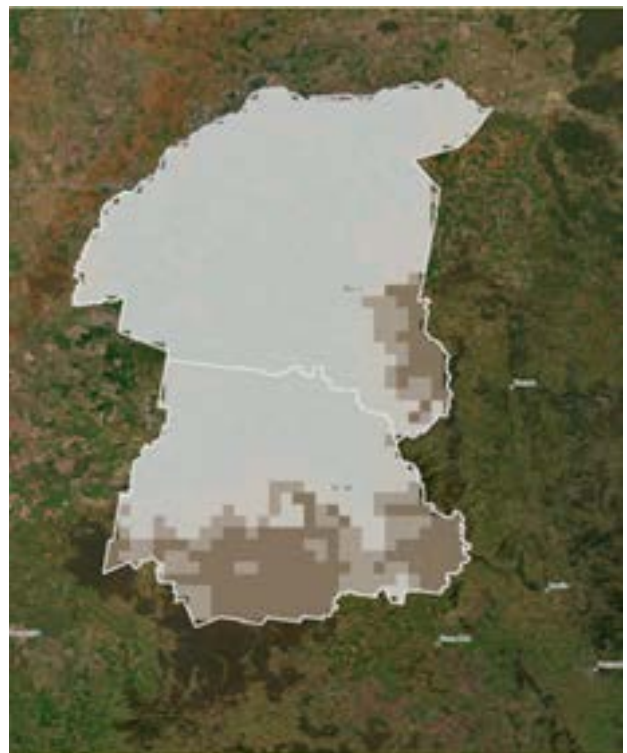


Figure 10 — Yearly precipitation (absolute), by LGA (1934 to 1948)

#### Precipitation



#### Soil moisture





### 1965 to 1968

The 1960s was generally dry across the continent. Drought developed in 1964 in northern New South Wales and extended across most of the country by the following year. This was evident across the region, with lower rainfall across both Shires and lower soil moisture in the south and southeastern extents.

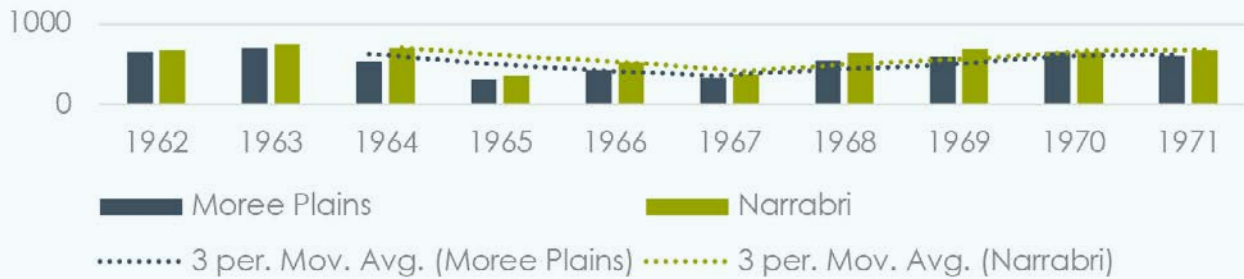
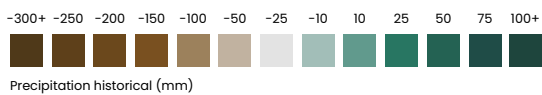
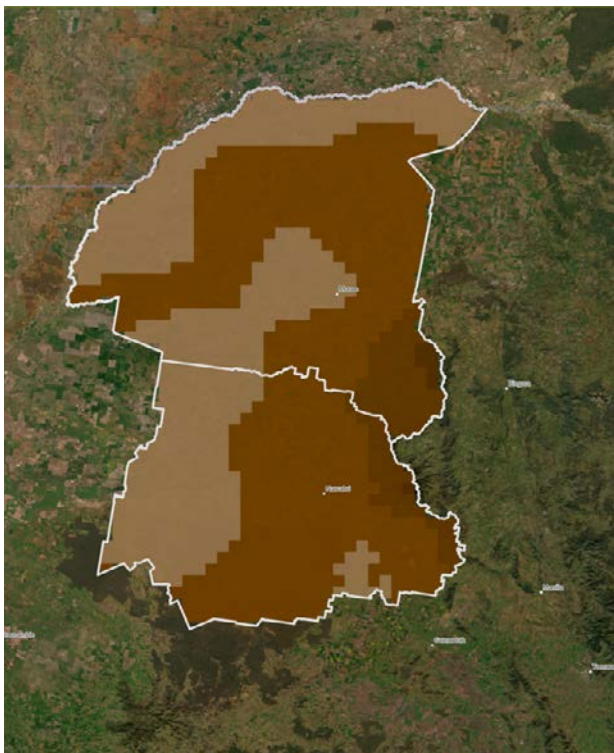
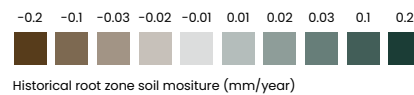
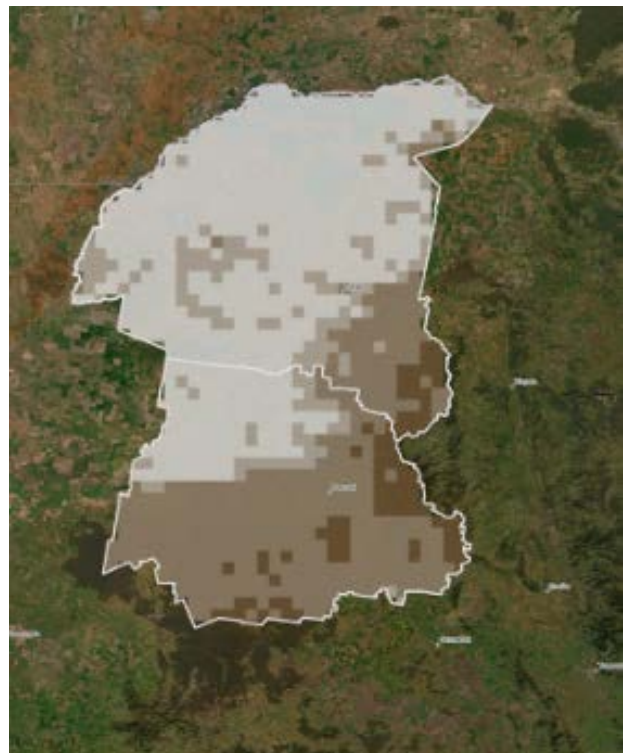


Figure 11 — Yearly precipitation (absolute), by LGA (1962 to 1971)

### Precipitation



### Soil moisture



### 1982 to 1983

Despite only being a yearlong, this was one of Australia’s most severe droughts of the 20<sup>th</sup> century. A very strong El Nino led to these drought conditions. The region was geographically on the cusp, between drought-unaffected south east Queensland and north eastern New South Wales, and the balance of south eastern Australia which was experiencing significant rainfall deficiencies. This split is demonstrated in the difference in rainfall and soil moisture between the LGAs (see right), where Narrabri is drier than Moree Plains.

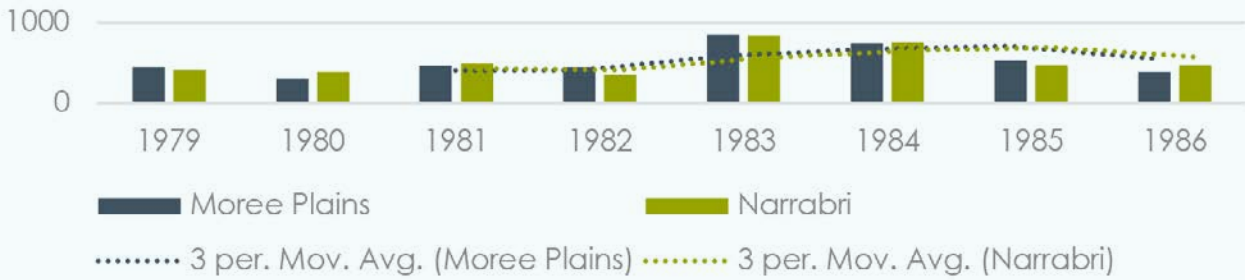
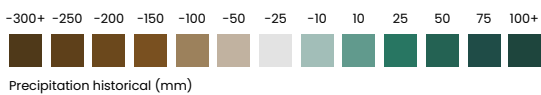
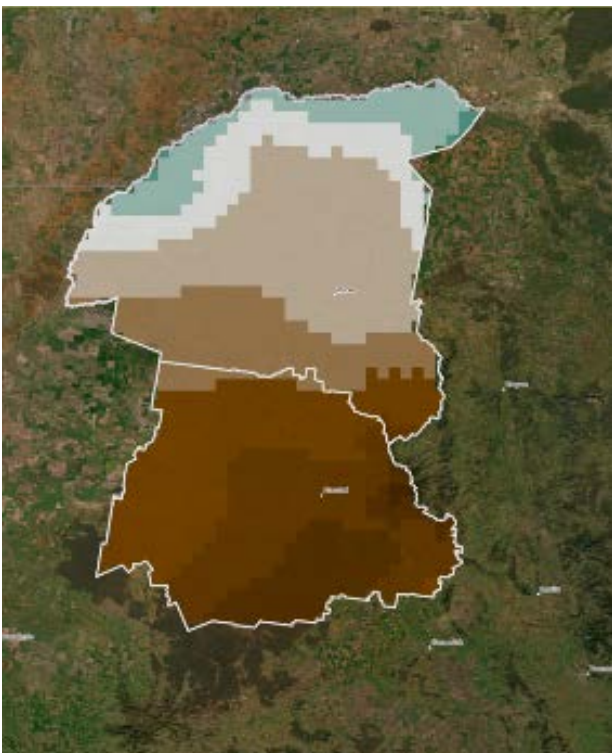
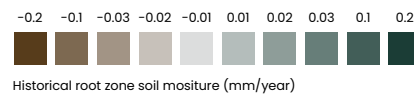
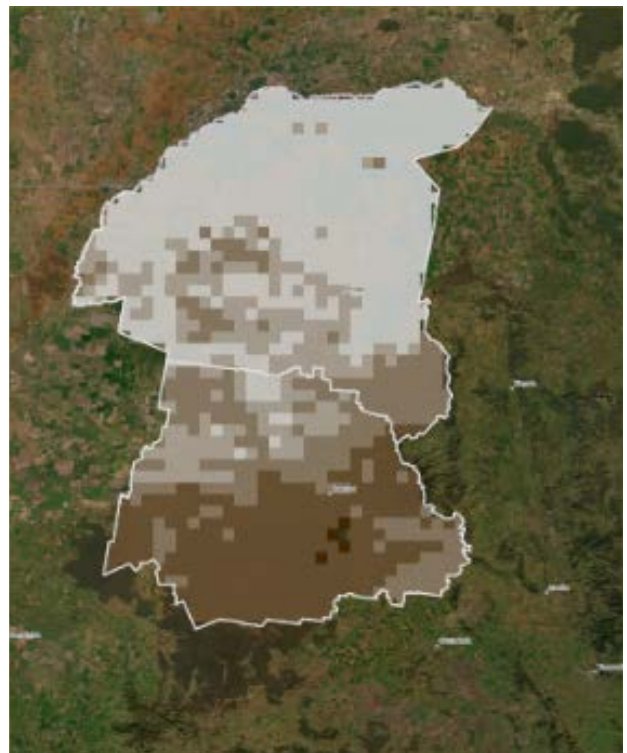


Figure 12 — Yearly precipitation (absolute), by LGA (1979 to 1986)

#### Precipitation



#### Soil moisture



### 1997 to 2009 (Millennium drought)

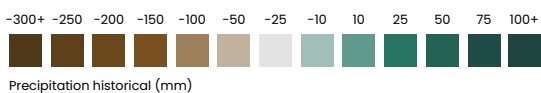
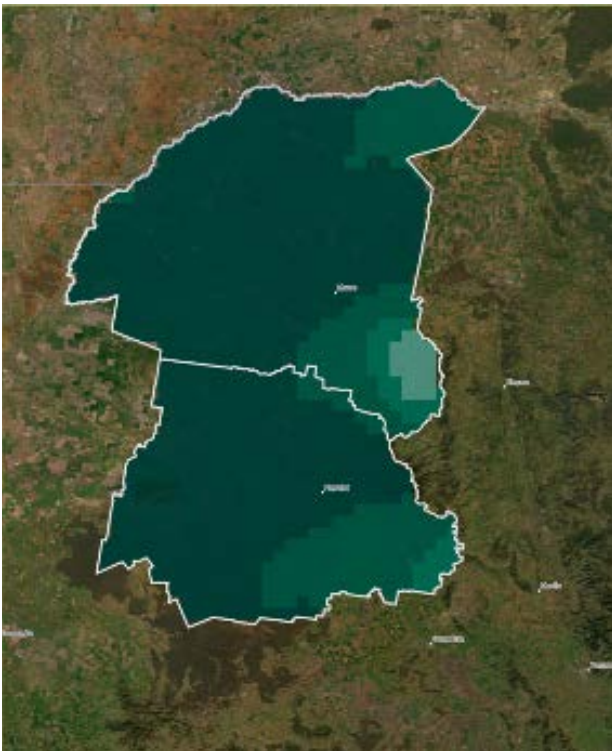
The Millennium drought was a long-lasting period of dryness, most severe in densely populated areas of the south-east and south-west of the country. For the Moree Plains and Narrabri region, the beginning of this period is relatively unimpactful based on rainfall and soil moisture figures. It is not until 2002 when there is a significant dry spell. Then again in 2006 to 2007.

*Editor's note: The maps to the right show significant rainfall and higher soil moisture over this period, despite it being identified as a drought. This discrepancy is likely due to the reference period used to produce these maps (2002 – 2022) and that there was significant dryness in the latter half of that period. This result is then compounded by the short-lasting periods of rainfall decline during this long drought period (1997 – 2009). Therefore, leading to the appearance of increased rainfall and soil moisture compared to the reference period.*

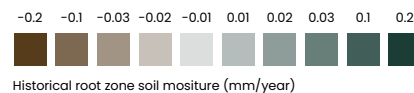
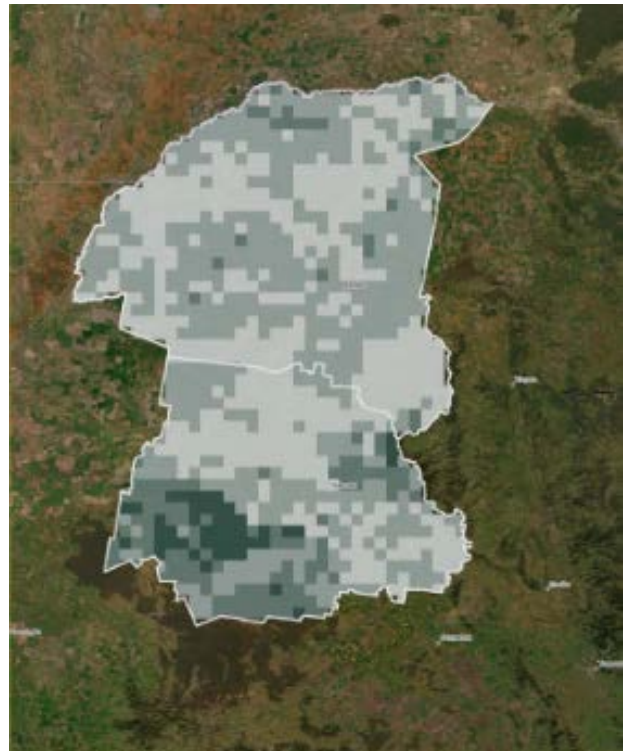


Figure 13 — Yearly precipitation (absolute), by LGA (1994 to 2012)

#### Precipitation



#### Soil moisture





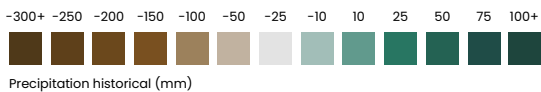
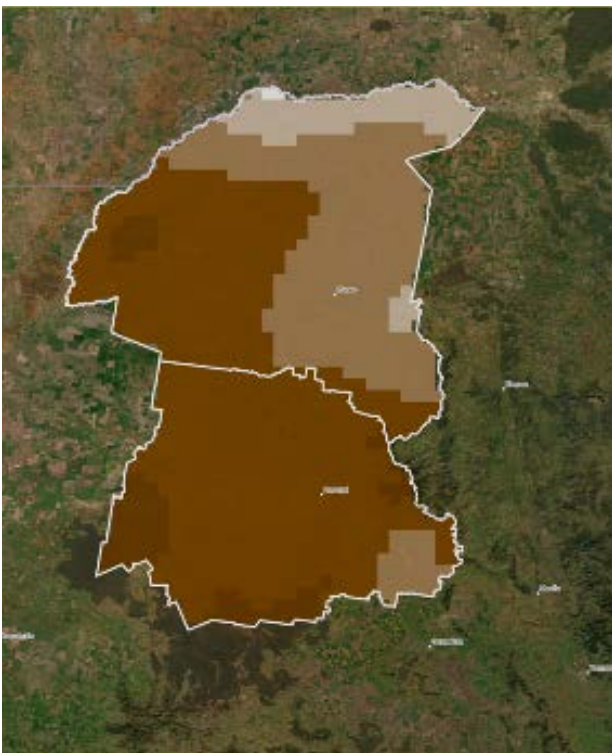
### 2017 to 2019

Following a wet 2016, dry conditions returned in 2017 across south and eastern Australia. This was a sustained multi-year period of dryness, unprecedented in recorded history<sup>12</sup>. A strong Indian Ocean Dipole was a significant contributor to dry conditions the second half of 2019, leading into significant 2019/2020 bushfire season. Both Shires were similarly affected during this period, with widespread low rainfall and low soil moisture.

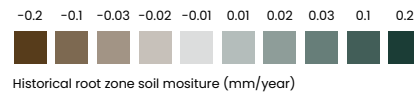
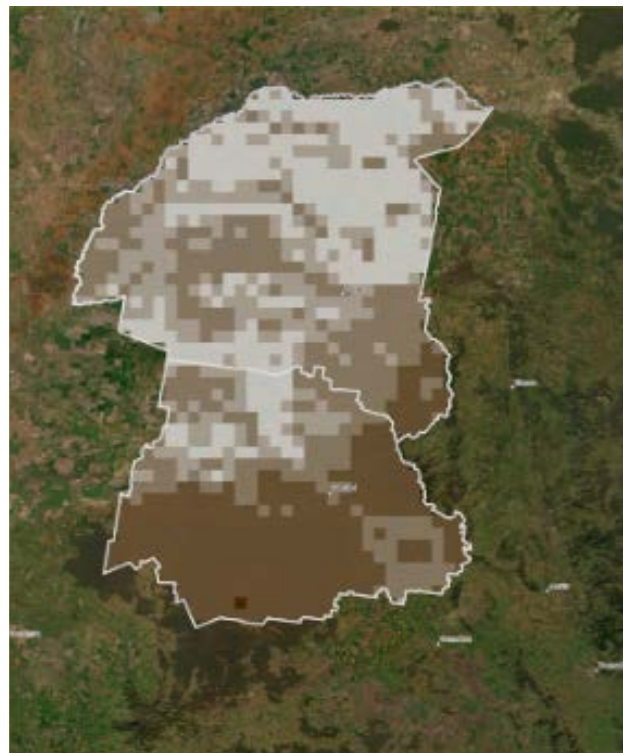


Figure 14 — Yearly precipitation (absolute), by LGA (1994 to 2022)

### Precipitation



### Soil moisture



12 Bureau of Meteorology 2020, *Special Climate Statement 70 update—drought conditions in Australia and impact on water resources in the Murray–Darling Basin*, 13 August 2020, <http://www.bom.gov.au/climate/current/statements/scs70.pdf>

## Future climate scenarios

The latest state-of-the-art climate science states that global surface temperature will continue to increase in the near term (2021 to 2040), irrespective of mitigation efforts due to cumulative CO<sub>2</sub> emissions within the climate system. It is projected that the mean global surface temperature change will reach 1.5°C in the first half of the 2030s. Every increment of global warming will intensify the risks of climate hazards, such as heatwaves and bushfire weather, and bring further climate instability.

Projections of drought and associated climate conditions over Moree Plains and Narrabri Shires are assessed over two possible future climate scenarios using regional climate model ensembles. These climate scenarios are designed to explore a range of possible futures relating to greenhouse gas emissions, land use, and air pollution.

The Intergovernmental Panel on Climate Change's (IPCC) Representative Concentration Pathways (RCP) 4.5 and 8.5 are the two future scenarios presented. RCP 4.5 models mean global warming of between 2 to 3°C and is the most likely future scenario based on current climate commitments. RCP 8.5 is a mean global warming of 4°C or more. This is considered a worst-case scenario. Despite RCP 8.5 not necessarily being likely, it is still important to consider 'worst-case' scenarios. It also provides an indicative view of possible futures where global climate tipping points are breached.

While days above 35°C and Forest Fire Danger Index (FFDI) are not direct indicators of drought, they describe weather conditions that often occur alongside drought or are exacerbated by drought. Below projections of these indices use an ensemble of CSIRO's Electricity Sector Climate Information (ESCI) datasets (days above 35°C and days above an FFDI of 25).

Both Moree Plains and Narrabri Shires are projected to experience reductions in root zone soil moisture and annual rainfall under both RCP scenarios, compared with the model baseline. These reductions will be slightly larger in Narrabri than Moree Plains. Each will also experience an increase in days above 35°C and days with an FFDI above 25. Under a 2050 RCP 8.5 scenario, each indicator almost doubles.

Despite an overall reduction in precipitation being projected, the south-west and west of Moree Plains and Narrabri respectively may see precipitation rates increase in the medium term (2050); and then decrease in Narrabri and south Moree Plains by 2070. Further, root zone soil moisture is projected to decrease annually, with reductions more severe in the Narrabri in 2070. Soil moisture decreases in Moree Plains may occur on a shorter timespan than those in Narrabri.

### Moree Plains Shire

Variable	Climate model reference period	2050		2070	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
Root soil moisture	16.27 percent#	↓ 0.012 mm/year <sup>^</sup>	↓ 0.026 mm/year <sup>^</sup>	↓ 0.016 mm/year <sup>^</sup>	↓ 0.027 mm/year <sup>^</sup>
Annual total precipitation (mm)	583.15 mm	↓ 13.41 mm/year	↓ 19.42 mm/year	↓ 9.88 mm/year	↓ 24.62 mm/year
Days above 35°C	47 days	75 days +28	89 days +42	Data unavailable	
Days with FFDI above 25	52 days	67 days +15	77 days +25		

# Mean water content as a percentage of capacity.

<sup>^</sup> Change in relative soil water content of the 1976-2005 reference period's relative soil water holding capacity.

Narrabri Shire

Variable	Climate model reference period	2050		2070	
		RCP4.5	RCP8.5	RCP4.5	RCP8.5
Root soil moisture	22.94 percent#	↓ 0.011^ mm/year	↓ 0.031^ mm/year	↓ 0.026^ mm/year	↓ 0.032^ mm/year
Annual total precipitation (mm)	627.93 mm	↓ 1.02 mm/year	↓ 15.74 mm/year	↓ 24.20 mm/year	↓ 32.53 mm/year
Days above 35	39 days	62 days +23	75 days +36	Data unavailable	
Days with FFDI above 25	39 days	53 days +14	60 days +21		

# Mean water content as a percentage of capacity.

^ Change in relative soil water content of the 1976-2005 reference period's relative soil water holding capacity.

The following three figures show the precipitation across the region using the reference period map and then two timescales 2036-2065 and 2056 to 2085 and coloured from dark brown (lower) to dark green (higher) precipitation.

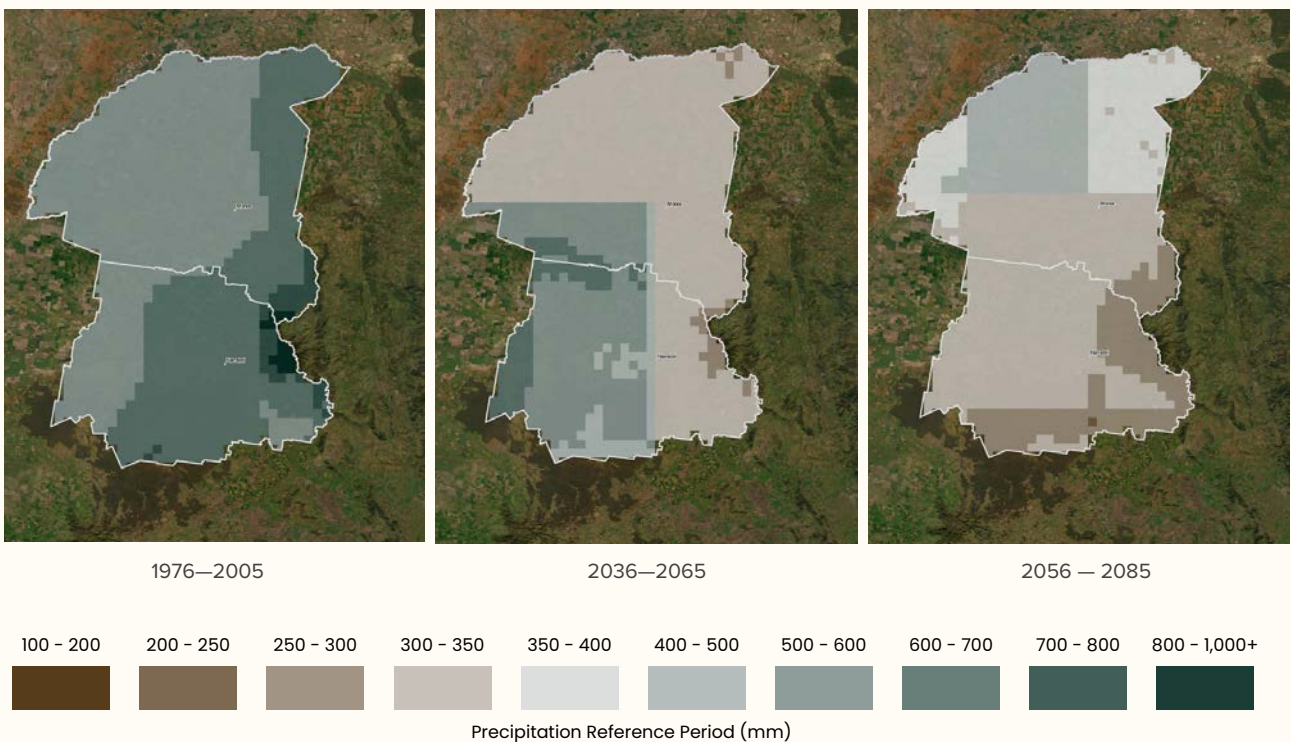


Image: Narrabri Farming





The following three figures show the root zone soil moisture across the region using the reference period map showing zero and then two timescales 2036-2065 and 2056 to 2085 and coloured from dark brown (change below zero baseline) to dark green (change above the zero baseline) soil moisture levels. Root zone soil moisture is presented as a percentage of total capacity during the baseline reference period and as a change of millimetres per year for the climate-adjusted scenarios. During the reference period, Moree Plains had a root zone soil moisture capacity of 16 percent, while Narrabri was 23 percent. This moisture indicator is projected to decrease annually into the future, with the magnitude of decrease to grow to the end of the century. These soil moisture reductions will be more severe in Narrabri come 2070, compared to Moree Plains. However, soil moisture decreases in Moree Plains may occur on a shorter timespan (more rapidly) than those in Narrabri.

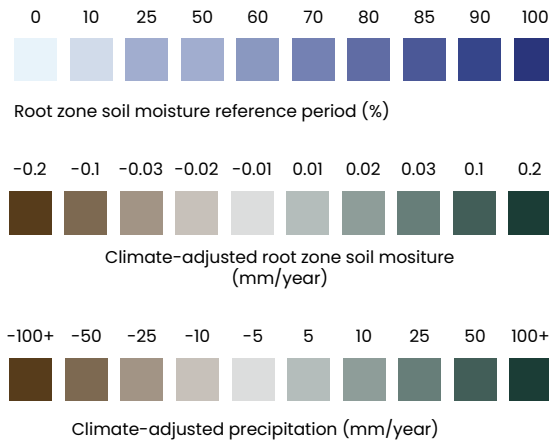
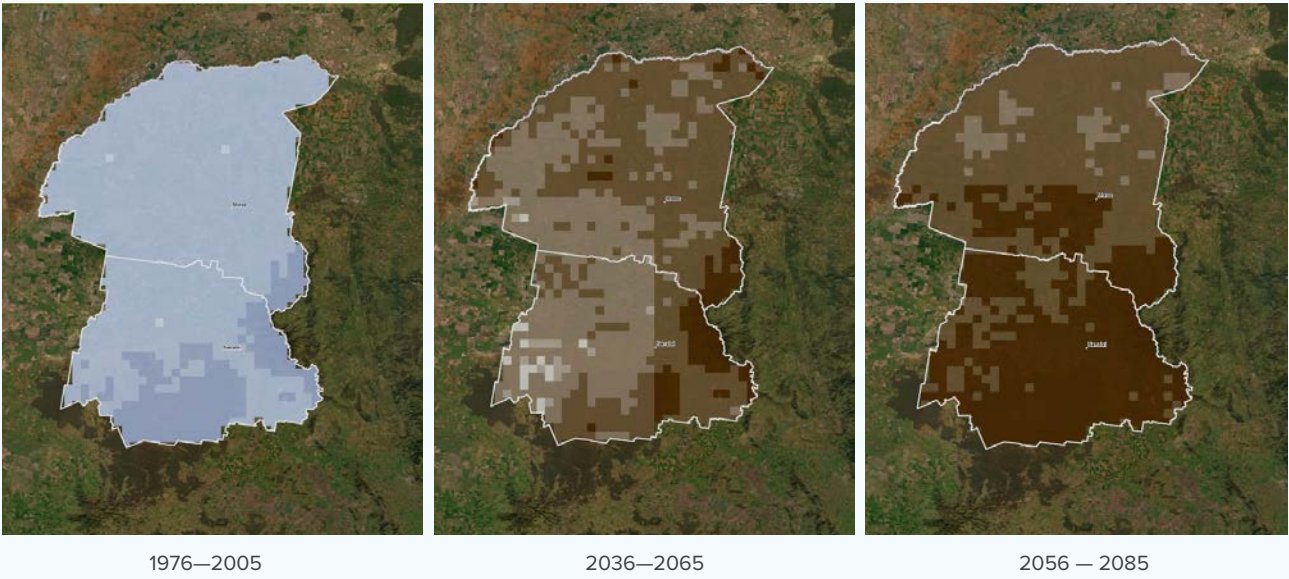


Image: Silos in the Lowlands area



## What does the climate data tell us?

Moree Plains and Narrabri Shires will continue to be susceptible to the impact of drought. Major historical droughts over the past 120 years have occurred in conjunction with low values of commonly used drought indicators including rainfall and soil moisture percentiles. Droughts can be protracted events spanning more than 10 years, such as the Millennial drought, or relatively shorter time periods, such as the recent Tinderbox drought.

Climate projections indicate an increase in drought risk by 2070 and beyond under both RCP4.5 and RCP8.5 scenarios due to changes in long term rainfall patterns and increasingly hot weather. Combined, these are the drivers of increased frequency and severity of drought conditions, especially towards the latter part of this century.

Our resilience to future drought impacts requires early planning and early intervention, which is the focus of this regional drought resilience plan. This will help us stand in good stead to deal with the impacts of a changing climate.

## In the future we can expect climate to influence:



### Our social networks

- Change in employment types and required skills
- Increased movement of people in and out of communities and employment changes
- Climate may interrupt our social structures more often



### Our economy

- Reliance upon the landscape will become more uncertain which will drive innovation in new economic pursuits
- Shift to a wider variety of agriculturally based products across the region and within farms and seasons
- Management models and practices that work in harmony with climate changes



### Our environment




- Maintaining local iconic environmental features that are water dependent may become harder
- Flora and fauna will feel the impacts and change habits and movements. This includes stock and particularly heat stress and access to water impacts
- Seasonal changes may be less pronounced.



Image: Barwon River Park, Mungindi

# Our drought resilience

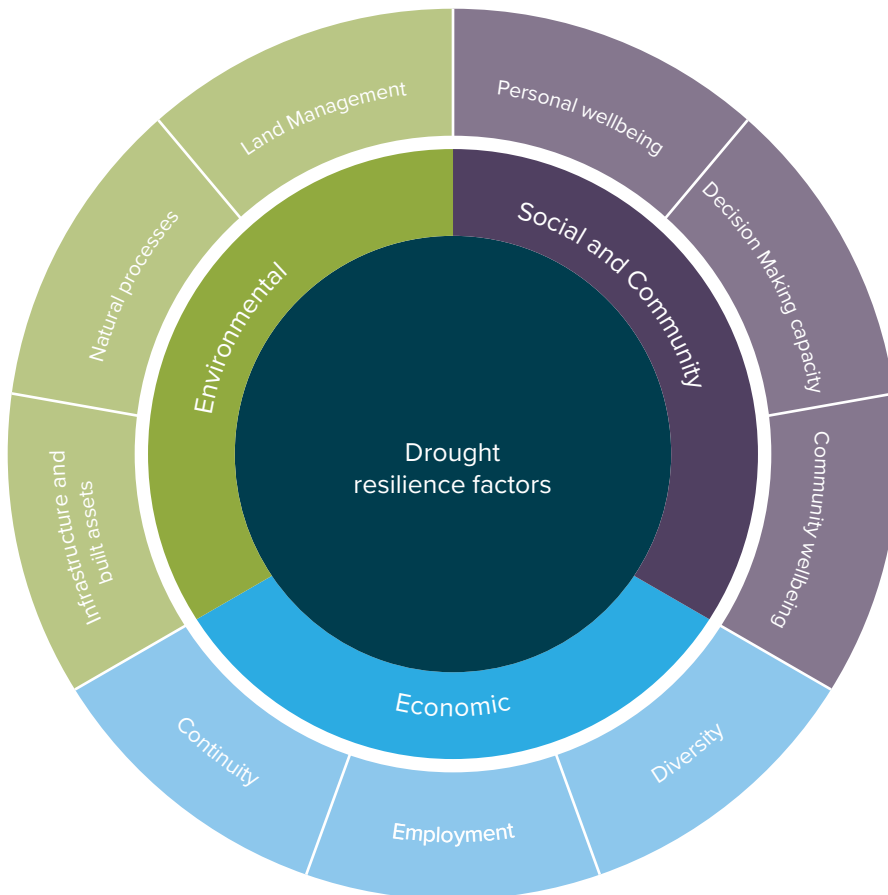
Drought resilience can be considered against three macro indicators:

-  economic resilience
-  environmental resilience; and
-  social resilience<sup>13</sup>

A series of drought resilience factors have been developed<sup>14</sup> (using these indicators) which inform how we consider vulnerability and resilience, as well as being a useful framing for the consideration of actions to ensure action planning absorb, adapt or transform all areas that contribute to and underpin drought resilience. This framework was used extensively for the engagement to explain the concepts and purpose of the project.

The Australian Bureau of Agricultural and Resource Economics and Sciences' (ABARES) Community Vulnerability and Resilience to Drought Index is the first stage of a comprehensive body of work to measure the potential impact of drought on communities.

ABARES has prepared a national index that ranks remote, rural or regional agriculturally dependent communities (at the local government level) according to their potential to be adversely affected by drought. These indicators account for both agriculture industry exposure and sensitivity and community sensitivity, using ABS Census of Population and Housing 2021 data to represent the level of community dependence on agriculture<sup>15</sup>.



**Figure 15** — Drought resilience factors

Source: DPIRD

<sup>13</sup> Department of Agriculture, Fisheries and Forestry, 2023, 'Drought Resilience', Available online at <https://www.agriculture.gov.au/abares/research-topics/climate/drought/resilience>

<sup>14</sup> Department of Primary Industries and Regional NSW

<sup>15</sup> ABARES, 2022, 'Community Vulnerability and Resilience to Drought Index – Stage 1', Available online at [https://www.agriculture.gov.au/abares/research-topics/climate/drought/resilience#community-vulnerability-and-resilience-to-drought-index-cvr-di\\_2](https://www.agriculture.gov.au/abares/research-topics/climate/drought/resilience#community-vulnerability-and-resilience-to-drought-index-cvr-di_2)



The index combines ABARES data for exposure and sensitivity (at the farm enterprise level), and data representing community sensitivity (agricultural dependence of a community), to initially produce an index of 'Potential drought impact' that can be applied consistently at LGA geography across Australia. The adaptive capacity concept is critical to understanding the likely resilience of a community to drought because it represents the positive resources and capacities available to a community to adapt or avoid loss and harm. The aim is to develop the index further by including indicators of potential adaptive capacity of communities to cope with and adapt to these circumstances.<sup>16</sup>

The table shows that the region has relatively high farm and drought sensitivity. It is encouraging to see that sensitivity declines for the community and economic sensitivity.

Measure	Regional Average
Farm Sensitivity	0.66
Community Sensitivity	0.30
Economic Diversity	0.35
Potential Drought Impact	0.65



**Whilst the region is susceptible to future drought impact, its diverse opportunities can improve capacity to manage and mitigate risks and reduce the overall susceptibility to drought impacts. The region's levels of community connection and social capital, along with diversified economic baseline through emerging and committed major projects, offer substantial prospects for to build long-term stability and strengthen drought resilience.**



Image: Grain silos, Bellata

16 Ibid

## Trends and stressors

There is a range of trends and stressors that may amplify or contribute to compounding drought impacts or provide challenges in resilience building, beyond the climate. This is an important consideration for our resilience to different conditions, circumstances and scenarios. It is also important to understand the trends which may originate or reside outside regional governance structures. Many of these trends and stressors were identified by the community as consequences of drought and downturn. Trends and stressors that may interface with drought resilience in Moree Plains and Narrabri include:



### Social & Community

- Centralisation of services to larger centre creating a spiralling effect of distance to access services and service availability
- Reduced spending in local centres, range of service available and proliferation of online spending
- Rising costs of living, especially fresh produce and fuel
- Social isolation and the need for personal contact



### Economic

- Commodity prices, market volatility and interest rates
- Water pricing and water security
- Input costs: energy, labour, fertiliser, feed and fuel
- Changing and evolving technologies which add efficiency but sometimes result in less labour need
- Rapid cycles between flood and drought
- Impacts of road quality on market access and supply chain reliability; and
- Unreliable telecommunications services



### Environmental

- Water management across water sources including quality and water levels from the Great Artesian Basin, access arrangements and sediment control for the Murray Darling Basin.
- Flow on health effects from dust cause increased respiratory issues for people and environmental issues with sediment run off.
- Increasing pest impacts, especially plant-based from imported feed
- Animal welfare through a changing climate

Resilience to drought is therefore not just about water and stretches beyond the farm gate in the systems at play which influence social, economic and environmental pressures and outcomes. Planning for our drought resilience requires a holistic and inclusive approach. This recognises and respects that different groups have different needs and aspirations when it comes to drought resilience, and that we all operate in different parts of the same systems.

# Pally Pub



## Community quality of life needs *provided by locals for locals*

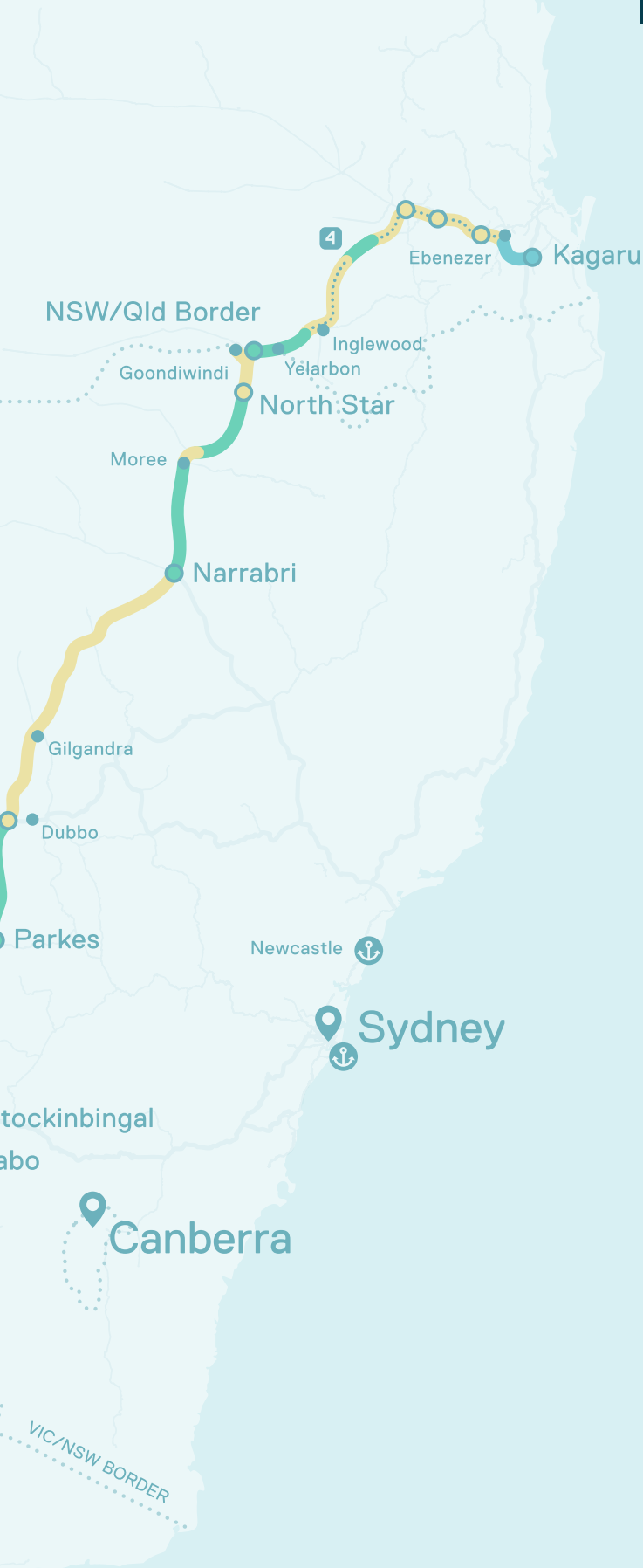
The people of Moree Plains and Narrabri are not afraid to step up and ensure their communities are provided with the *little things* that make a big difference

- to attracting and retaining staff who are looking for the little things that enhance quality of life
- providing opportunities to congregate and socialise
- providing essential services - which the locals have confirmed - good coffee is essential to community function!
- supporting and maintaining local economy and jobs.

Commitment to the region through investment in local business simply for the benefit of locals is exemplified in

- Flock Café Mungindi, the enterprise of a local group of women
- The Pallamallawa Hotel, or the 'Pally Pub' a joint venture by five local families, transformed into an elegant, warm and welcoming venue; and
- The Vicarage at Northstar, was inspired locals who acted on a story about a retaining a local doctor who missed the opportunity to have good coffee in the small town.





## Resilience into the future

### Regional major projects

Moree and Narrabri Shires are fortunate to have the benefit of a number of regional major projects which can provide long term economic stability through sector diversification and also augment existing industry through value add and attraction of adjacent and complementary economic activities.<sup>17 18 19 20 21</sup>

The NSW Government and NBN Co, agreement will see **enhanced connectivity** through fixed wireless internet for Mungindi, Moree, Wee Waa, Merah North and Narrabri by the end of 2025

The **Inland Rail** project is aimed at meeting Australia's growing freight tasks through a continuous route from Melbourne to Brisbane. The route passes through both Narrabri and Moree. Once complete the Inland rail will enhance national supply chain capabilities and link business to markets and create opportunities for regions.

**Santos' Narrabri Gas Project**, located in the Pilliga area would produce natural gas for domestic use via the existing nearby pipeline system

The **Narrabri Place Strategy** seeks to support residential development on flood-free land, south of the Narrabri township to accommodate housing for existing and future residents. It will support and attract new investment including light industries, warehouses and offices. The Place Strategy supports Council's investment in the Inland Port Precinct.

The **Moree Special Activation Precinct** will support diversification of Moree's agricultural economy by building on its strong Connection to Country and sustainable gali-water endowments. It will leverage transport connections, renewable energy, innovation and agricultural expertise for horticulture and diversified agricultural production and attract investment to boost regional economy.

17 [nbn-fixed-wireless#toc-map-of-communities-included](#)

18 <https://inlandrail.artc.com.au/what-is-inland-rail/>

19 [Santos Narrabri Gas Project factsheet v4.pdf](#)

20 [Moree SAP Delivery Plan](#)

21 Pers comm. Dept of Planning, NSW

Image: <https://Inlandrail.artc.com>

## A regional strength in education



A NEW ERA for agricultural research has germinated in Narrabri with the opening in 2023 of the \$15.2-million International **Centre of Crop and Digital Agriculture**. Featuring digital, genetic, agronomy and soil laboratories, plus teaching and industry-briefing spaces, the centre was delivered by the NSW Government in partnership with the University of Sydney, Australian Grain Technologies, the Grains Research and Development Corporation, and the NSW Wheat Research Foundation. This world-class facility enhances collaboration between researchers and growers to progress our knowledge and practical implementation of robotic farming and data-driven agriculture. The centre is an enticement for postgraduate students, national and international researchers and industry leaders to come together for the purpose of improving crop performance.<sup>22</sup>



The **Australian Cotton Research Institute (ACRI)** is located between Narrabri and Wee Waa in NSW's main cotton production areas. Research activities at the ACRI have played a key role in the development of cotton. Scientists at ACRI are assisting the cotton industry to develop a sustainable future based on productivity and best practice natural resource, disease and pest management. The site is 277 hectares with 183 irrigated hectares. It includes glasshouses, laboratories, cotton gin, controlled environment growth rooms, insectaries, workshops and conference rooms.<sup>23</sup>



The **Moree training organisations** offers practical training programs that provide skills and qualifications needed to enter the local workforce. Students learn in a training environment that closely mimics real workplaces with the latest technology and industry-standard equipment. This ensures graduates get the skills and knowledge they need to thrive in their chosen careers.

Outside the classroom, TAFE Moree has a strong connection with the region's industries. It provides courses in finance, contracting, languages and health to name a few. The campus is committed to the educational interests of Aboriginal students and recognises the importance of identity and culture. Whether students are looking to start a new career or enhance existing professional skills, TAFE Moree is committed to helping them achieve their goals.<sup>24</sup>



The **University of Sydney Plant Breeding Institute (PBI)** is committed to improving crop and horticultural species using the best that technology has to offer. The (PBI) was established in 1973 to ensure a continuing University commitment to crop breeding and research. The grains and horticultural industries require a continuum of new cultivars that maximize profitability and sustainability in a dynamic production and market environment. This requires a continuous flow of new genetic materials, knowledge, technologies and trained people; the core business of the PBI. Our research largely focuses on the genetic improvement of cereal, legume and horticultural crops, as well as cross-cutting themes on food quality, farming systems and digital agriculture in recognition of the changing nature of Australian agriculture.<sup>25</sup>



The **University of New England (UNE)** maintains a Regional Study Centres in both Moree and Narrabri. Students can access resources, access student devices and printing facilities, Edu roam Wi-Fi and access to the University network. The centres provide device workstations, direct phone link to UNE academic and professional staff and access to free study space.



The **North West Country University Centre (CUC)** operates across two sites located in Moree and Narrabri. The CUC provide student support and dedicated study spaces for students in regional and rural locations.

Each Centre is locally governed and driven by its community through an independent Board of Directors. The network approach of the model means that Centres and students are collectively represented by an aggregated body that assists in overcoming the inevitable thin numbers in regional education. Dedicated learning and study spaces in Narrabri and Moree are designed for regional people. Students have free access to high-speed internet, modern technology, and general academic support.

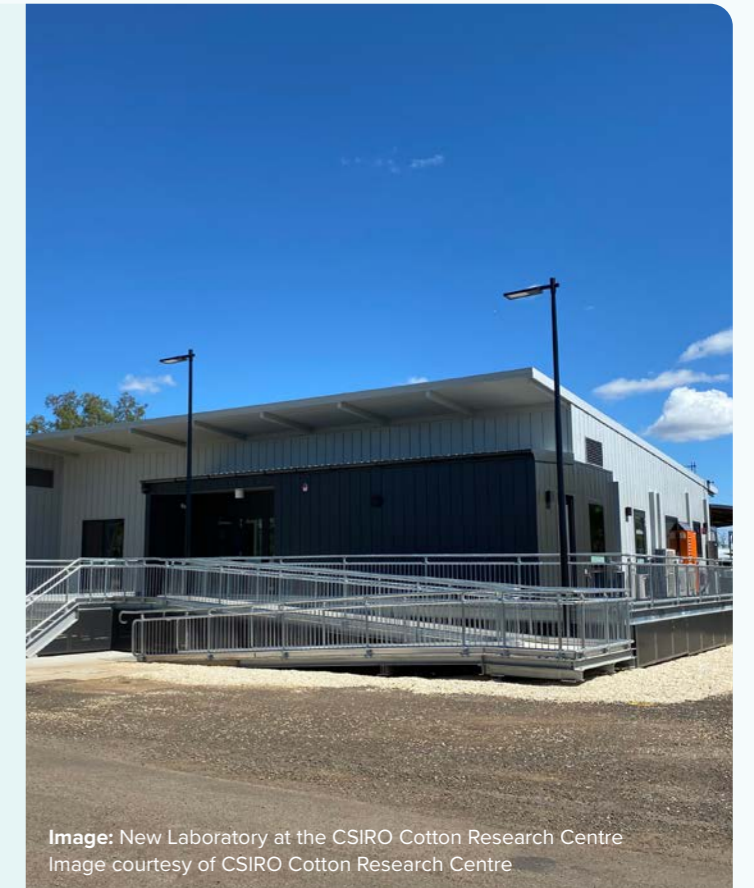


Image: New Laboratory at the CSIRO Cotton Research Centre  
Image courtesy of CSIRO Cotton Research Centre

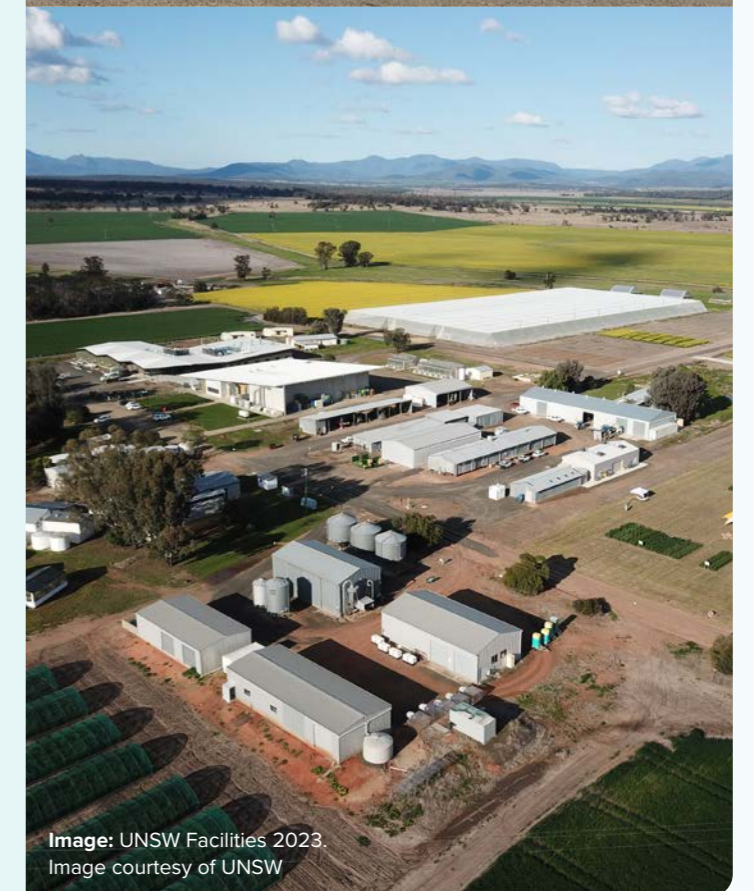


Image: UNSW Facilities 2023.  
Image courtesy of UNSW

<sup>22</sup> <https://www.graincentral.com/news/international-centre-of-crop-and-digital-ag-opens-at-narrabri/>

<sup>23</sup> <https://www.dpi.nsw.gov.au/dpi/about-us/research-and-development/centres/narrabri-australian-cotton-research-institute-acri>

<sup>24</sup> <https://www.tafensw.edu.au/locations/new-england/moree>

<sup>25</sup> <https://www.sydney.edu.au/science/our-research/research-centres/plant-breeding-institute.html>

# Drought action plan

The drought action plan for Moree Plains and Narrabri Shires incorporates priorities for drought resilience across the five pathways for action which include the three systems explored with the community: social, economic, and environmental. The action plan provides:

- a priority action theme
- details of specific actions against the theme
- anticipated stakeholders
- the alignment of the action to an implementation pathway; and
- potential funding options.

Each of the actions provide discernible and pragmatic steps that are drawn from local circumstances, existing initiatives and local knowledge insights. The action plan also provides a basis for anticipating, acting and advocating for drought resilience needs.

Many of the actions included were identified directly by community members as part of the engagement and consultation process to inform this plan, while others are a synthesis of gathered information. Timeframes are indicative and are dependent upon opportunities and timing for funding and other variables.

A program logic approach was used to match the drought resilience needs illuminated by the consultation and engagement feedback with pragmatic actions, and the degree to which the actions contribute to our movement along the resilience ‘theory of change’ journey. This is about whether the actions ‘absorb, adapt or transform’ how we collectively prepare for and grow our resilience to drought effects. This scale also helps us to understand the level of effort and the timeframes associated with each action.

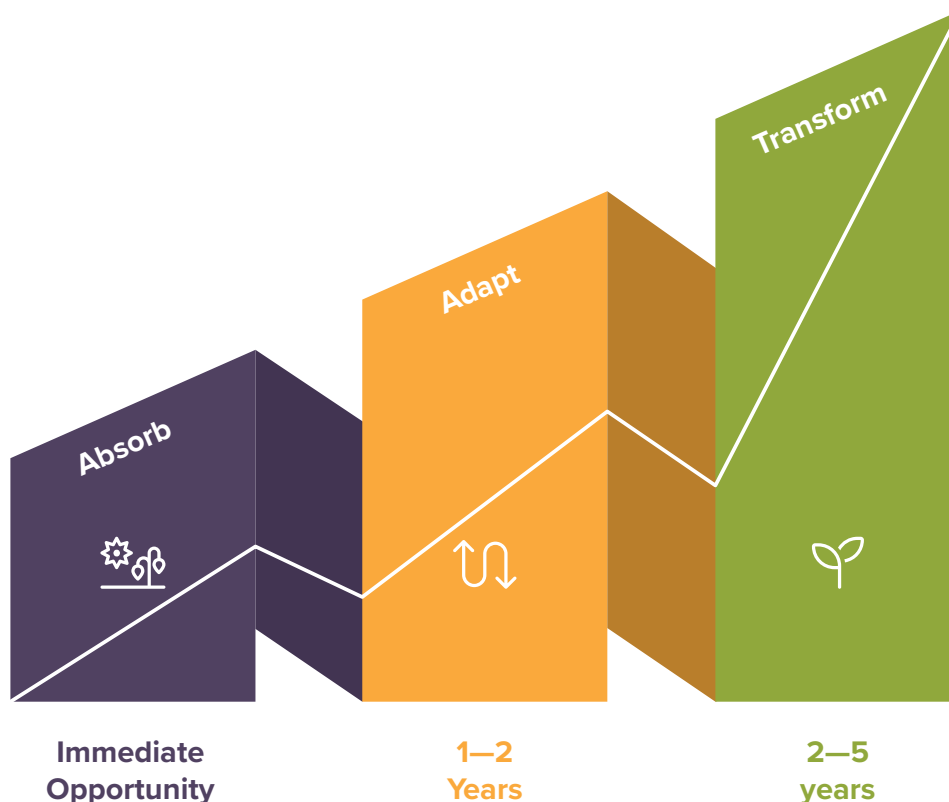


Figure 16 — Resilience theory of change



## Pathways for change

This drought action plan establishes a framework to guide focus and efforts in response to community need, highlighted by community engagement. Through the engagement, approaches to greater resilience stemming from existing community strengths will enable the region to absorb, adapt or transform in the face of drought.

The action plan spans five strategic pathways or themes, reflecting the three core elements of drought. These strategic pathways are:

-  **Economic Opportunity**
-  **Supply Chain Certainty; and**
-  **Community Strength**
-  **Shared commitment**
-  **Environmental Health**

These pathways can be approached at different scales, with or by different actors and through a range of mechanisms over time from transformative resilience actions at a large scale to proactive resilience actions by individuals and the more formal or common pathways.

## Resilience Tools

Together these draw together the actors, time frames, scales and structure needed for greater resilience over time.

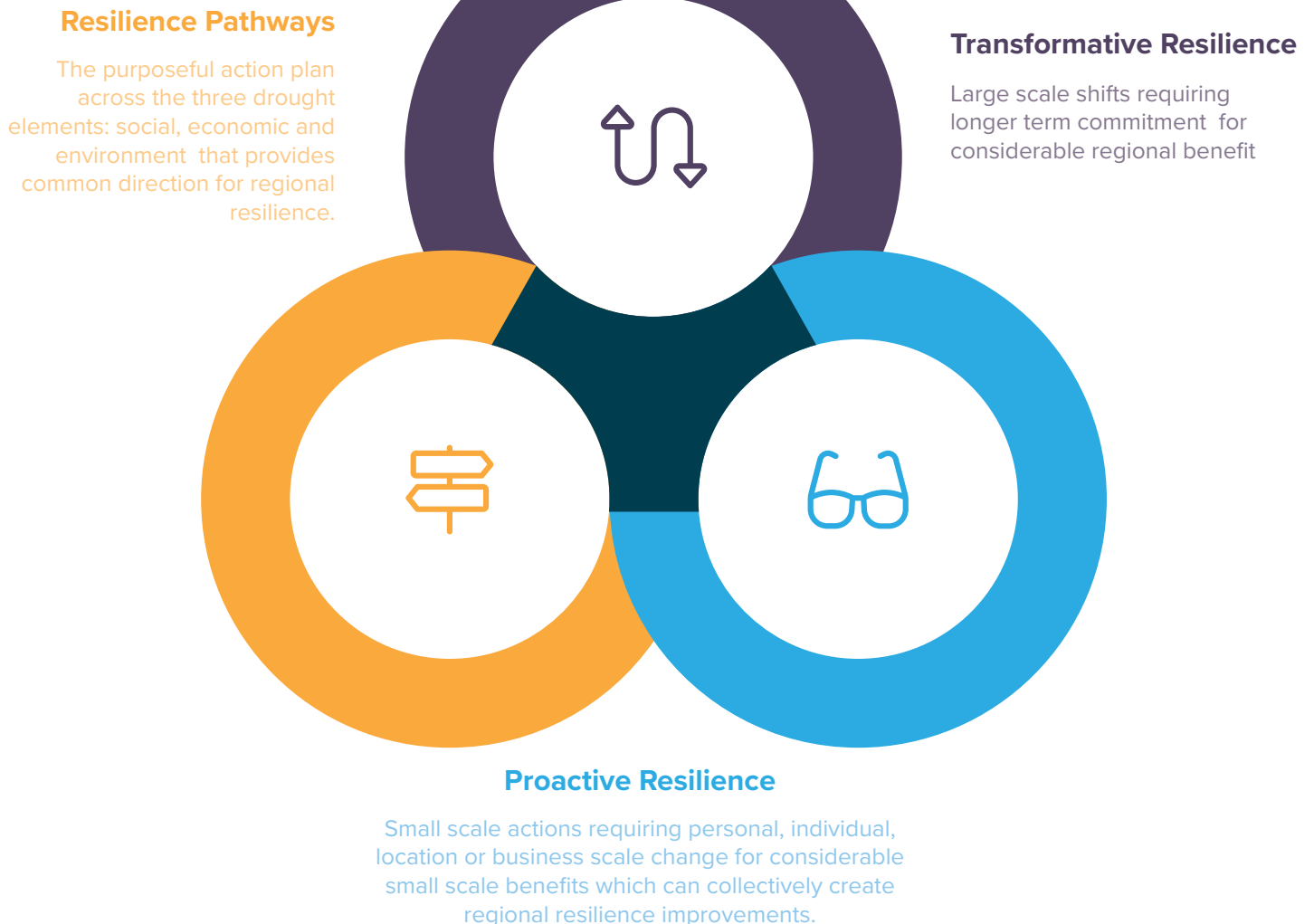


Figure 17 — Resilience Pathways

# Regional drought resilience plan

## – Top 5 priority actions

### 1 Regional First Nations voice to drive connection between landscape and Country (action SC3.1)

Understanding connection to country is vital in a region that generates its prosperity and lifestyle from the landscape. Engaging more thoroughly with the Kamileroi people across the region is imperative to understand how the actions identified by the broader community are fit for purpose for the Aboriginal community and how delivery can be improved through cultural awareness.

Actions must be scoped to ensure that the region learns from First Nations experiences, plans for actions that are culturally suitable and recognises particular needs of the local and regional Aboriginal community.

Detailed and comprehensive consultation is planned through the existing reconciliation networks and local land councils to embed First Nations voice in the Regional Drought Resilience Plan.

### 2 Regional drought resilience officers to drive actions (action SC1.1)

The Future Drought Fund program provides initial seed funding for implementation of priority actions. The region has identified the need for Resilience Officers to lead and drive change.

The primary responsibilities of a resilience officer include;

- socialise drought resilience concepts further with community and promote resilience actions at a variety of scales

- continue the engagement program with stakeholders, agencies and First Nations, creating partnerships and strengthening regional ties
- understand funding opportunities
- commence scoping actions over medium term

Proactively seek opportunities to strengthen resilience across the region and community through participation in on contributing to projects and programs with common resilience objectives. The structure of the role can be determined by the regional governance model.

### 3 Business resilience planning (action E2.2)

Promote financial planning for local small business through funding for a third party delivered program

### 4 Securing our supply chain (action SCC1.1 and 1.3)

Promote existing road private-public-partnership program and policies for road reconstruction and maintenance; and

Explore extension of policy for joint venture road upgrades across the region.

### 5 Regional education collaboration (action E4.1)

Assemble stakeholders from educational facilities and research facilities and develop some local strategic actions to:

- pinpoint regional education opportunities

- expand offerings by existing facilities
- identify upskilling and partnership arrangements during drought (e.g. JobKeeper)
- attract and maintain skilled researchers, complementary research avenues, workers and associated professionals



## Pathway 1 – Economic opportunity

The region's economic resilience to drought underpins almost all other activity. Businesses are inextricably linked through the landscape. Farming itself is varied in business model from families, generational holdings and corporate investors. In all cases operations are viewed and referred to as businesses.

Community consultation has identified that financial literacy and business planning for business is critical to being able to anticipate changing circumstances driven by drought, and the ability to act to avoid or prevent drought impacts.

The region boasts many economic development opportunities which over time, will offer varied income and productivity opportunities. Some of these are truly transformative and offer long term prospects for change, growth and stability.

As an agriculturally based economy, there is benefit in advancing:

- Leveraging existing tourism assets as a major economic pillar
- Building financial strength of all businesses regardless of sector or scale
- Diversifying the regional economy
- Advancing the region as an education hub; and
- Supporting local business for local prosperity.

PRIORITY ACTION AREA	SPECIFIC ACTION	STAKEHOLDERS	IMPLEMENTATION PATHWAY (TIMING)	FUNDING OPTIONS
<b>E1</b> <b>Leveraging existing tourism assets as a major economic pillar</b>	<p>E1.1 Develop a calendar of events from existing iconic experiences and extended itineraries that allow travellers to stay in the region for longer. Consider connecting the itinerary, to events just outside the region.</p> <p>E1.2 Develop a joint tourism strategy and involve local business, attractions and events. Identify facilities for upgrade and renewal and opportunities for ongoing improvement.</p> <p>E1.3 Maintain the core local services to townships: parks and gardens, services and ensure stability and welcoming feel for visitors and locals</p> <p>E1.4 Investment in local retail and product or services gaps to cater for and capture incoming tourism and promote longer stays</p>	<ul style="list-style-type: none"> <li>→ Narrabri Region Visitor Information Centre</li> <li>→ Moree Tourism</li> <li>→ Broader regional tourism stakeholders and event co-ordinators</li> <li>→ Moree Plains and Narrabri Shire Councils</li> <li>→ Chambers of commerce</li> <li>→ Destination NSW Country and Outback</li> </ul>	<p><b>Absorb</b> — diversification of economic base through increased visitor numbers and overnight stays</p> <p><b>Adapt</b> — local business offerings to ensure business remains local</p>	<ul style="list-style-type: none"> <li>→ Tourism external funding and grant programs; and</li> <li>→ Existing governance structures</li> </ul>
<b>E2</b> <b>Building financial strength of all businesses regardless of sector or scale</b>	<p>E2.1 Encourage retailers to expand their range to provide complementary goods lines that community is travelling away for or obtaining online such as basic apparel and children's wear.</p> <p>E2.2 Promote financial planning for local small business through funding for a third party delivered program</p> <p>E2.3.1 (Consider with Priority E4) Advocate for the design a 'JobKeeper' style program to retain skilled workers in the region through:</p> <ul style="list-style-type: none"> <li>→ wages subsidies for businesses with direct impact who are not landowners</li> <li>→ programs that enable staff to stay and supports continued study for topics such as: welding, hazardous chemicals, forklifts, etc. delivered by local educators</li> <li>→ programs that enable staff to be remunerated for assisting at a research facility program; or</li> <li>→ programs that enable staff to stay and supports tertiary upskilling through UNE or Country University Centres for local business, industry or emerging industry related course such as Agri-business, project management or business management</li> </ul> <p>E2.4 Advocate for support mechanisms for businesses directly impacted by agricultural downturn (who are not landowners) through drought such as contractors and farm staff.</p>	<ul style="list-style-type: none"> <li>→ Moree Plains and Narrabri Shire Councils</li> <li>→ Chambers of commerce</li> <li>→ Growers' associations or relevant employers and landowners</li> </ul>	<p><b>Absorb</b> using priority actions to amend business models now in readiness for the next event</p> <p><b>Adapt</b> through planning for changed economic circumstances</p> <p><b>Transform</b> through advocacy to change approaches during a drought</p>	<ul style="list-style-type: none"> <li>→ External funding and grant programs</li> <li>→ Drought funding and grants programs</li> </ul>





Pathway 1  
– Economic  
opportunity  
(continued)

PRIORITY ACTION AREA	SPECIFIC ACTION	STAKEHOLDERS	IMPLEMENTATION PATHWAY (TIMING)	FUNDING OPTIONS
<b>E3</b> Diversifying the regional economy	E3.1 Explore opportunities for stabilised income through renewable energy projects and carbon farming E3.2 Continue to maintain relationships with resource industry companies operating or investing in the region E3.3 Develop an investment prospectus for the Moree Plains SAP and Narrabri Place Strategy to attract new middle sized employers, including exploring preliminary feasibility or benefits of new industries to value add existing or generate new industries and identifies their operational needs. E3.4 Continue to work with stakeholders for delivery of the Moree Special Activation Precinct and the Narrabri Place Strategy	<ul style="list-style-type: none"> <li>→ Landowners and associated stakeholders</li> <li>→ Moree Plains and Narrabri Shire Councils</li> <li>→ Chambers of commerce</li> <li>→ Relevant government agencies</li> <li>→ Local resource industries</li> </ul>	<p><b>Adapt</b> through planning for changed economic circumstances</p> <p><b>Transform</b> the long-term economic stability through catalyst projects</p>	<ul style="list-style-type: none"> <li>→ Private capital</li> <li>→ External funding and grant programs</li> <li>→ Special projects and infrastructure funding</li> </ul>
<b>E4</b> Advancing the region as an education hub	E4.1 (see also priority E2) Assemble stakeholders from educational facilities and research facilities and develop some local strategic actions to: <ul style="list-style-type: none"> <li>→ pinpoint regional education opportunities</li> <li>→ expand offerings by existing facilities</li> <li>→ identify upskilling and partnership arrangements during drought (e.g. JobKeeper)</li> <li>→ attract and maintain skilled researchers, complementary research avenues, workers and associated professionals</li> </ul> E4.2 Promote employment of local apprenticeships (including advocating to the resources industry to continue their existing programs) to implement and continue school based traineeships and programs E4.3 Support and promote training opportunities with the University of New England 'bite courses' in agribusiness and agricultural science. These offer practical accreditations for the field E4.4 Support and promote opportunities at local TAFE centres within the Region	<ul style="list-style-type: none"> <li>→ Locally represented universities, researchers, institutes, research facilities,</li> <li>→ TAFE or Registered Training Organisations, higher education professionals and stakeholders</li> <li>→ Moree Plains and Narrabri Shire Councils</li> <li>→ Chambers of commerce</li> <li>→ Relevant government agencies</li> </ul>	<p><b>Adapt</b> through leveraging existing resources for different outcomes</p> <p><b>Transform</b> the long-term economic stability through catalyst projects and advocating for different approaches to dealing with drought</p>	<ul style="list-style-type: none"> <li>→ Stakeholder investment</li> <li>→ External funding and grant programs</li> <li>→ Drought funding and grants programs</li> </ul>



Pathway 1  
– Economic  
opportunity  
(continued)

PRIORITY ACTION AREA	SPECIFIC ACTION	STAKEHOLDERS	IMPLEMENTATION PATHWAY (TIMING)	FUNDING OPTIONS
<p><b>E5</b></p> <p><b>Supporting local business for local prosperity</b></p>	<p>E5.1 Maintain successful buy local programs and initiatives such as:</p> <ul style="list-style-type: none"> <li>→ ‘Why leave town’</li> <li>→ Promotional programs such as extra-long lunches for stably employed staff upon receipt of a local purchase &gt;\$50</li> <li>→ ‘Go without for the drought’ program where non-drought affected cities donate a coffee (\$5) which is spent in local outlets; and</li> <li>→ Vouchers useable only at local outlets.</li> </ul> <p>E5.2 Maintain or extend the shop front improvement programs such as the ‘Renew Moree’ and the Narrabri Street Frontage Activation Program and extend to other townships</p> <p>E5.3 Explore opportunities for public art or other point of interest projects in town centres</p> <p>E5.4 Explore opportunities to support businesses through third party business resilience and continuity planning training</p>	<ul style="list-style-type: none"> <li>→ Local business owners and organisations</li> <li>→ Chambers of commerce or trading associations</li> <li>→ Moree Plains and Narrabri Shire Councils</li> </ul>	<p><b>Absorb</b> immediate shocks through locally run successful projects</p> <p><b>Adapt</b> through continual improvement and reshaping local assets</p>	<ul style="list-style-type: none"> <li>→ Stakeholder investment</li> <li>→ External funding and grant programs</li> <li>→ Drought funding and grants programs</li> <li>→ Maintain business as usual approaches</li> </ul>



## Pathway 2 – Community strength

A key drought resilience opportunity is a deliberate program of public, local and community events of all types and scales. These events can be led by a myriad of community groups, businesses and local sporting or social organisations to maintain the existing community strength. Funding for community infrastructure and events of all scales and types, for different demographic cohorts and communities across the region bonds the community during drought.

This was one of the clearest priorities identified through the plan engagement process by the Moree Plains and Narrabri communities, was community connection, participation and identity are already strong resilience attributes of the region that need to be maintained and fostered.

Existing funding tends to be ad hoc and opportunistic in nature, but pre-planning for opportunities to utilise funding for this purpose is likely to meet a clear need in times when connection is even more valuable. These events have compounding benefits of combatting social isolation, providing access opportunities to financial, mental and physical health counselling or to simply have a yarn to the neighbour.

PRIORITY ACTION AREA	SPECIFIC ACTION	STAKEHOLDERS	IMPLEMENTATION PATHWAY (TIMING)	FUNDING OPTIONS
<b>C1</b> <b>Supporting strong social cohesion</b>	C1.1 Maintain a schedule of free community events bringing light relief and cultural activities to small and remote locations during drought times  C1.2 Support to upgrade community-owned centres and audit government owned facilities to identify upgrades to continue delivering local events such as disability access, air-conditioning, landscaping and the like.  C1.3 Empower community groups for continuous improvement of equipment, internal fit out, building painting or similar through ensuring all groups → understand and can access the Community Consultation Committee (CCC) funding; and → understand or have access to grant writing and preparation assistance  C1.4 Continue seeding celebrity and star power during drought times for emotional and stress relief for locals  C1.5 Consider smaller scale township-based plans (where townships are proactive) to pinpoint hyper-local needs such as particular facilities upgrades or economic opportunities or complementary infrastructure priorities	→ Broader regional tourism stakeholders and event co-ordinators  → Moree Plains and Narrabri Shire Councils  → Chambers of commerce  → Local community groups, associations and sporting clubs	<b>Absorb</b> through recognition of existing strengths  <b>Adapt</b> through targeted strengthening of existing networks	→ Tourism external funding and grant programs  → Drought funding programs  → Community (CCC) funding programs; and  → Existing governance structures
<b>C2</b> <b>Attracting and retaining skills and people</b>	C2.1 Promote the ‘Welcome to town’ programs with a one on one tour by a volunteer, (for example The Australian Greeters Association and Welcoming Cities Network) to provide ongoing personal support, and multicultural activities  C2.2 Proactively work with and leverage the needs of the research facilities and local employers to target and attract people and services to the region  C2.3 Consider development of a welcome and information brochure such as ‘Knowing the Namoi’ or ‘Paradise on the Plains’ that provides newcomers with friendly advice and information about living in the region.	→ Moree Plains and Narrabri Shire Councils  → Chambers of commerce  → Institutes, businesses, growers’ associations or relevant employers and landowners	<b>Absorb</b> through fortification of existing strengths  <b>Adapt</b> existing strengths for alternate purposes and reposition.	→ External funding and grant programs  → Drought funding and grants programs  → Merge into business as usual projects
<b>C3</b> <b>Maintaining services and retail options locally</b>	C3.1 Support local venues and opportunities for a chat and a cuppa through maintaining physical services in very small locations such as post offices and cafes  C3.2 Pilot a community facility design for multi-purpose, flexible building to be used as a hall, retail, business link services, childcare or as the community may require in townships in need of local infrastructure  C3.3 Advocate for consistent funding and certainty for baseline services provided by others to the region especially health	→ Community group and sporting associations  → Land and business owners and associated stakeholders  → Relevant government agencies Moree Plains and Narrabri Shire Councils	<b>Adapt</b> existing strengths for alternate purposes and reposition  <b>Transform</b> through commitment of others to foundational elements	→ Private capital  → External funding and grant programs  → Special projects and infrastructure funding





## Pathway 2 – Community strength (continued)

This pathway seeks to focus on the strength of Moree Plains and Narrabri communities, building on existing tangible and non-tangible assets as a routine activity to support social and community fabric and morale during drought times through:

- Supporting strong social cohesion
- Attracting and retaining skills and people
- Maintaining services and retail options locally
- Maintaining pride in our communities

### Community strength and tourism attractors through the events calendar.

#### The region is renowned for:

Moree on a Plate Food Festival  
 NarraBright Festival  
 Festival of Rugby: Reds vs Waratahs  
 Kev's Big Breakfast  
 Boggabri Drover's Campfire  
 CREATE Festival  
 Bellata Harvest Under the Stars  
 Local markets at Moree, Narrabri and Pallamallawa  
 Golden Triangle Racing Carnival: Moree, Mallowa and Talmoi  
 Narrabri and Moree Local Markets  
 Nosh on the Namoi  
 Light'n Moree Spring Street Festival  
 Moree, Narrabri and Mungindi Shows

PRIORITY ACTION AREA	SPECIFIC ACTION	STAKEHOLDERS	IMPLEMENTATION PATHWAY (TIMING)	FUNDING OPTIONS
<b>C4</b> Maintaining pride in our communities	C4.1 Maintaining heritage and walking trails	→ Moree Plains and Narrabri Shire Councils	<b>Absorb</b> through recognition of existing strengths  <b>Adapt</b> existing strengths for alternate purposes and reposition	→ External funding and grant programs  → Drought funding and grants programs  → Merge into business as usual
	C4.2 Engage with community to assist with beautification programs in slow times. For example, local councils provide specifications and funding opportunities, and community provides labour for tree planting or landscape rehabilitation works.	→ Chambers of commerce		
	C4.3 Develop a program of community lead project options as CCC candidates	→ Community groups and sporting associations		
	C4.4 Bolster confidence through programs such as messages from the city "Thank a farmer" programs during drought	→ Land and business owners and associated stakeholders		
	C4.5 Explore opportunities for communities that would like a community garden			



### Pathway 3 – Environmental health

The health of the landscape supports our economic and community wellbeing. Retaining soil moisture in the landscape, and topsoil retention are clear drought impact reduction pursuits, helping to mitigate erosion, protect soil health and prevent other events like dust storms. Pest and weed management offer further opportunities to stem landscape degradation.

Livestock health and animal welfare offers particular challenges in drought which can extend to farmer emotional stress where animal health cannot be saved. Hand feeding brings with pest species not seen in the region before.

Local Land Services, the South West Queensland and Northern NSW Drought Hub and the local research institutes offer significant technical assistance and innovation in dealing with these land, livestock and landscape issues. Land and stock route management, and biosecurity is everyone's business.

The region is exposed to potentially significant impacts depending on how water is used and managed. Moree Plains and Narrabri Shires are particularly concerned about the health of the Great Artesian Basin. For improved environmental connectivity, there is benefit in advancing:

- Supporting land management
- Maintaining and enhancing biosecurity; and
- Increasing water security

PRIORITY ACTION AREA	SPECIFIC ACTION	STAKEHOLDERS	IMPLEMENTATION PATHWAY (TIMING)	FUNDING OPTIONS
<b>EH1</b> <b>Supporting land management</b>	EH1.1 Maintain and continue the Rural Service Support Network (RSSN) of all agencies and service providers to strengthen ties and understanding of challenges and opportunities EH1.2 Explore regenerative agriculture in land management education programs and pilot studies EH1.3 Explore opportunities for programs to sustain flood corridors, and combat soil erosion	<ul style="list-style-type: none"> <li>→ Landowners, land management groups</li> <li>→ Local Land Services</li> <li>→ SWQNNSW Drought Hub</li> <li>→ Moree Plains and Narrabri Shire Councils</li> </ul>	<b>Absorb</b> through bolstering existing programs across multi purposes  <b>Adapt</b> programs to enhance preparedness	<ul style="list-style-type: none"> <li>→ External funding and grant programs</li> <li>→ Drought funding and grants programs</li> <li>→ Merge into business as usual projects</li> </ul>
<b>EH2</b> <b>Maintaining and enhancing biosecurity</b>	EH2.1 Explore opportunities for collaborative groups of farmers to engage in pest control and environmental programs during drought EH2.2 Ensure funding is available or programs during the slow times EH2.3 Ensure rodent control is part of the recovery solution	<ul style="list-style-type: none"> <li>→ Landowners, land management groups</li> <li>→ Local Land services</li> <li>→ SWQNNSW Drought Hub</li> </ul>	<b>Absorb</b> through utilisation of existing strengths and networks  <b>Adapt</b> programs to ensure they contribute or are available at the right time in the cycle	<ul style="list-style-type: none"> <li>→ External funding and grant programs</li> <li>→ Drought funding and grants programs</li> <li>→ Merge into business as usual projects</li> </ul>
<b>EH3</b> <b>Increasing water security</b>	EH3.1 Consider a local rainwater tank program to promote better quality residential water supply EH3.2 Ensure funding opportunities for continued improvement in town water quality and quantity and urban supply are taken up EH3.3 Support and partner with entities responsible for the , Murray Darling Basin, the Lower Gwydir Groundwater Sources and the Namoi Alluvial Groundwater Sources	<ul style="list-style-type: none"> <li>→ Moree Plains and Narrabri Shire Councils</li> </ul>	<b>Adapt</b> to maintain community within constraints  <b>Transform</b> the long-term economic stability through catalyst projects	<ul style="list-style-type: none"> <li>→ Private capital</li> <li>→ External funding and grant programs</li> <li>→ Special projects and infrastructure funding</li> </ul>



## Pathway 4 – Supply chain certainty

Roads are the lifeblood of rural and remote communities. They are the physical connection to friends, family, social interaction, household necessities, education, employment and regional access to markets and supply chains. Heavy vehicle access and the ability to transport agricultural products in varied weather circumstances is fundamental to the wellbeing of the region. The agriculturally productive land of the Moree Plains and Narrabri region are capital intensive, big business, that needs fit for purpose infrastructure to ensure valuable stock, seed and cotton can get onto freight routes.

PRIORITY ACTION AREA	SPECIFIC ACTION	STAKEHOLDERS	IMPLEMENTATION PATHWAY (TIMING)	FUNDING OPTIONS
<b>SCC1</b> Promoting roads as an economic enabler	SCC1.1 Promote existing road private-public-partnership program and policies for road reconstruction and maintenance SCC1.2 Ensure continuous funding is sought to maintain local roads for expected supply chain activity SCC1.3 Explore extension of policy for joint venture road upgrades across the region SCC1.4 Identify pinch points in the road network for condition and resilience and advocate for road upgrades which are integral to supply chain security	→ Moree Plains and Narrabri Shire Councils → Landowners	<b>Adapt</b> programs and approaches for common good outcomes <b>Transform</b> to ensure resources and recovery can contribute as intended	→ Private capital → External funding and grant programs → Special projects and infrastructure funding → Merge into business as usual





## Pathway 5 — Shared commitment

Communication and commitment to regional drought impacts flows in all directions, from community upwards and from higher levels of government downwards. Drought does not follow hierarchies, borders or administrative lines. Drought has some common solutions at regional scale (the drought scale) as well as at local scales. For the most resourceful use of funds, capacity and opportunity, resources can be pooled, and collaborative solutions found for greater benefit. Communications channels should be kept open and active relationships fostered at all levels.

PRIORITY ACTION AREA	SPECIFIC ACTION	STAKEHOLDERS	IMPLEMENTATION PATHWAY (TIMING)	FUNDING OPTIONS
<b>SC1</b> Maintain collaborative and reciprocal networks	SC1.1 Engage regional drought resilience officer (s) to <ul style="list-style-type: none"> <li>→ drive and embed resilience knowledge, socialise drought resilience concepts</li> <li>→ continue the engagement program with stakeholders, agencies and First Nations</li> <li>→ understand funding opportunities</li> <li>→ commence scoping actions over medium term</li> <li>→ proactively seek opportunities to strengthen resilience across</li> </ul> SC1.2 Participate in the Rural Service Support Network (RSSN) of all agencies and service providers to strengthen ties and understanding of challenges and opportunities SC1.3 Regenerate regional collaborative opportunities at local and regional governance levels in all directions	<ul style="list-style-type: none"> <li>→ Moree Plains and Narrabri Regional Drought Resilience Plan stakeholder group</li> </ul>	<p><b>Absorb</b> drought resilience actions into BAU and on going learning and exchange</p> <p><b>Adapt</b> existing actions to incorporate drought resilience as BAU</p>	<ul style="list-style-type: none"> <li>→ Merge into business as usual projects</li> </ul>
<b>SC2</b> Improve communications and information access	SC2.1 Maintain personal contact between communities and local government elected members and representatives SC2.2 Reinvigorate council committees under s335 of the Local Government Act for communication and transparency purposes SC2.3 Simplify the process of accessing assistance during drought - open a 'drought hub' that is manned with staff to assist with forms and program availability SC2.4 Advocate for programs to support rural and remote communities to maintain BAU to ensure assistance is not delivered too late SC2.5 Facilitate opportunities for 3, 6, and 12 month on-farm seasonal conditions and forecasts to be conveyed to local government, business, and other stakeholders to understand business outlooks. This may occur through the RSSN, Chambers of Commerce and Business eNewsletters	<ul style="list-style-type: none"> <li>→ Moree Plains and Narrabri Shire Councils</li> <li>→ Relevant drought assistance agencies</li> <li>→ Chambers of Commerce</li> </ul>	<p><b>Absorb</b> through common understanding</p> <p><b>Adapt</b> through transparency</p> <p><b>Transform</b> through advocacy for different approaches</p>	<ul style="list-style-type: none"> <li>→ Drought funding and grants programs</li> <li>→ Merge into business as usual projects</li> </ul>
<b>SC3</b> Undertake ongoing collaboration with the Kamilaroi People	SC3.1 Undertake detailed and comprehensive consultation through the existing reconciliation networks and Local Land Councils to embed First Nations voice in drought actions future iterations of the Regional Drought Resilience Plan.	<ul style="list-style-type: none"> <li>→ Local Land Councils</li> <li>→ All Stakeholders</li> <li>→ Moree Plains and Narrabri Shire Councils</li> </ul>	<p><b>Absorb</b> through common understanding</p> <p><b>Adapt</b> through ongoing learning and exchange</p>	<ul style="list-style-type: none"> <li>→ Merge into business as usual projects</li> <li>→ Embed in RDRP governance processes</li> </ul>

# Implementation

The Moree Plains and Narrabri Regional Drought Resilience Plan relies on collaborative implementation approaches involving a range of stakeholders. The action plan for drought resilience spans the prevention, preparedness, response and recovery (PPRR) cycle, providing the framework to embed implementation across the different functions of local government, as well as guide other stakeholders (including other levels of government, community and industry groups, service providers, not-for-profits, landowners, and local communities) with actions that can make a difference. This includes short, medium and long term opportunities.

## Resilience Pathways Implementation

The purpose of this action plan is to inform future drought funding and ongoing preparedness across the region. Stakeholders work together regionally to build drought resilience in the economy, environment and our communities, proactively and pragmatically.

The action plan has been drawn together through community expression, existing initiatives and background data. In developing this action plan, it is noted that:

- actions are purposefully listed with multiple stakeholders, and unspecified timeframes or funding to acknowledge that delivery is dependent on a range of variables
- implementation will occur through participation of all stakeholders over time as priorities, resources and funding arise
- as a regional plan, the actions are collective and collaborative
- roles and responsibilities are flexible, including for local government role: the plan is owned by the region, and any stakeholder can start an action within their capacity; and
- some actions are indeed underway by various stakeholders, the purpose of maintaining them in the action plan, is that the community has advised that the action is integral to drought resilience.

Learnings from the plan development for future iterations are provided in **Appendix A**.

### DESCRIPTION

An advocate actively supports a position, action or policy. The task is outside the advocate's jurisdiction, capacity or resourcing and advocacy is required to engage with those parties with capacity to deliver. For example, telecommunications advocacy.

A partner joins others in a common cause or action where roles and responsibilities are shared across areas of expertise. Each partner brings an element to the action for joint delivery. For example, region-wide strategic initiatives.

A lead is in control of an action. The action may still involve partners or other roles, but the action is reliant upon a lead party due to their technical or other expertise. For example, Health or counselling matters.

An owner is the only party that can undertake or permit the action. For example, local government as public asset owners.

A supporter is united with others in the need or benefits of the action but potentially does not have a major role. The action is led or owned by others. For example, a supporter may provide assistance in kind, technical advice or donations to action leaders.

A stakeholder is anyone who has an interest in the project, program or action. Stakeholders will have varying degrees of involvement from owner to advocate and all points between.

A deliverer is responsible for implementation and outcomes of an action or funded program. For example, community agency delivering social aid programs.

A funder provides the funding arrangements. The party is not involved with scoping, executing or delivering the program but may require some outcome reporting or evidence. For example, the government grant funding for a pest control program delivered by others.

## Governance structure

Implementation of the regional drought resilience plan is to be driven by a collaborative and multi-disciplined drought resilience project control group (PCG). Membership will be deliberately broad to provide an integrated and coordinated approach to drought resilience efforts.

The PCG will operate using a status system tied to the PPRR framework to transition priorities in lockstep with the transition of drought cycles. The PPRR status system is to be triggered by drought indicators. The NSW Government's 'Drought Signals', BoM, Farming Forecaster or other tools or indicators should be selected by the PCG for this purpose, in consultation with the Department of Primary Industries and Regional NSW. This will be supplemented by local knowledge described in action SC2.5.

This will enable the PCG to adopt agile approaches and change priorities as needed depending on changing circumstances. For example, when drought indicators suggest a dry period has commenced, the status of actions to be implemented will move from 'preparedness' to 'prevention' and likewise when drought conditions are experienced, the actions for 'response' become an area of focus. Despite this, all actions remain relevant in terms of maximising funding opportunities. This approach simply enables the PCG to consider those actions which will generate more immediate outcomes, when needed.

Both Councils should co-chair the PCG. A working group Terms of Reference is to be prepared for its membership to guide its function. This should include the key stakeholders involved in the actions for transformative change such as tourism bodies, business chambers, local research facilities and the voice of the Local Land Councils and Kamilaroi people. The ToR could include:

- Role and purpose and connection to the RDRP
- Stakeholder and membership lists
- Meeting arrangements, (potentially quarterly) and responsibilities of attendees
- The circumstances of a quorum and decision making protocols
- The election or rotation of a chair person
- An action plan for the first 60 days or 12 months including delivery of the priority actions with the implementation funding; and
- A process for reflection and nominating next priority actions

A Memorandum of Understanding may also be required.

## Monitoring, evaluation and learning framework

The Drought Action Plan incorporates a large suite of projects and actions, some offer immediate opportunity, some are medium-term items and others are longer-term transformational opportunities. Not all actions can be focused on or delivered at once. The PPRR framework and status system approach, which will guide the PCG in terms of its implementation and coordination of activities and funding pursuits, will enable a flexible and agile approach as drought conditions change, guiding the focus. This system will:

- Provide regular opportunities to define when conditions are changing locally; and
- Catalyse a change in focus to respond to the needs of the changing conditions.

This ensures a level of agility is adopted regarding the implementation approach.

The local government members may wish to apply more objective targets for immediate actions or further incorporate the outcomes of this plan into the local government reporting framework to ensure delivery. Optionally, monitoring can be incorporated into the PCG Terms of Reference for review and reflection on achievement of resilience actions.

As immediate efforts in response to the action plan are delivered, broader efforts across collaborators are guided in its approach, underpinned by this plan which enables stakeholders to work towards and contribute to regional drought resilience outcomes, including those at the local and property level.

The drought resilience action plan also requires that a 'lessons learned' posture is adopted, ensuring new information, knowledge, approaches and science is rolled into implementation delivery as a guiding principle. This will mean that over time, the drought resilience action plan may be adapted to reflect new learnings and the adjustment of intervention pathways as required. The PCG is responsible to conduct an annual 'lessons learned' review, with changes to inform action moving forward.

The Drought Resilience Action Plan has been thoughtfully designed to not only guide collective effort and action but to enable adaptation through ongoing monitoring, evaluation and learning. The Regional Drought Resilience Plan is a 10-year plan, to be reviewed after five years.



## Tracking progress and reporting

Action-based project tracking against the drought resilience action plan, the principles and objectives of the plan should be undertaken on an annual basis. This tracking and reporting shall be the responsibility of the implementation PCG chair, unless otherwise delegated. Likewise, an annual evaluation process will be conducted by the PCG, guided by the evaluation questions that follow.

### Key evaluation questions

These key evaluation questions are high level questions designed to frame the analysis of progress and performance of the Moree Plains and Narrabri Regional Drought Resilience Plan against the above framework. These key evaluation questions may help to structure annual tracking and reporting.

PROPERTY	EVALUATION
<b>Effectiveness and Outcomes</b>	What have been the outcomes (intended, unintended, positive and negative) of the plan implementation process and progress?
	To what extent has progress contributed to or furthered the principles and objectives of the regional drought resilience plan?
	Has the plan been used for or otherwise supported successful funding and grant applications?
	To what extent have stakeholders outside the PCG responded to the plan's content?
	Have any barriers or challenges been identified throughout the implementation of plan, and what solutions to address these have been identified?
<b>Drought resilience maturation</b>	To what extent has efforts in implementing the plan contributed to:
	→ Creating stronger connectedness and greater social capital within communities, contributing to well-being and security?
	→ Empowering communities and businesses to implement activities that improve their resilience to drought?
	→ Supporting more primary producers and land managers to adopt whole-of-system approaches to natural resource management to improve the natural resource base, for long-term productivity and landscape health?
<b>Stakeholder engagement</b>	In what ways are the PCG and other stakeholders collaborating and collectively contributing to efforts outlined by the action plan?
	In what ways has the plan provided inclusive involvement across sectors, disciplines and communities?
	In what ways has the plan been able to support individual stakeholder goals, objectives and aspirations regarding drought resilience?

The reporting may be undertaken using a range of tools to capture experiences and perspectives from across the PCG, allied stakeholders as well as the communities of Moree Plains and Narrabri Shires more broadly. These tools may include:

- Meetings and event data capture
- Targeted meeting / interviews with stakeholders
- Survey data
- Case studies and data from the PCG
- Media, including social media; and
- Funding and grant applications.

### Achieving the plan's outcomes

A further opportunity for the PCG to measure the contribution to or achievement of the plan's outcomes is by using local data to assess specific outcomes. The data sources or indicators will need to be selected by the PCG and can provide insights as to how the plan is tracking against the resilience theory of change. Outcomes include (but are not limited to):

THEME	OUTCOME
<b>Community Strength</b>	Community cohesion and wellbeing is maintained
<b>Economic Opportunity</b>	Gross regional product remains steady or grows relative to: Non-drought periods Previous drought periods Other regions in NSW and Qld
<b>Environmental Health</b>	Environmental degradation of landscapes and waterways is reduced throughout and emerging from drought. Regional water quality and quantity projects are continually underway
<b>Supply Chain Certainty</b>	Market accessibility has improved Regional road projects are continually underway
<b>Shared Commitment</b>	Drought resilience priorities are embedded across Council's Integrated Planning and Reporting Framework and informs the plans, strategies and efforts of allied stakeholders

### Learning

Regular (annual) monitoring provides the ability for reflection and learning. The progress tracking and reporting methodology, using key evaluation questions, will present specific insights in terms of those opportunities to build in 'lessons learned' through engagement across stakeholders with a role in drought resilience.

These lessons should, on an annual basis, be contemplated regarding the drought action plan to determine any relevant updates, new insights, intelligence and technologies that can be integrated to ensure the action plan keeps pace with a growing drought resilience maturation across systems and sectors.

This process will ensure the action plan remains a 'live document' that appropriately supports and services the needs of all stakeholders and importantly, those of the Moree Plains and Narrabri Shire communities in preparation for, endurance of, and recovery from drought.

# Appendix A

## Concepts to guide adaptative learning

This appendix provides key aspects for consideration as part of learning processes throughout implementation of this plan, to guide further iterations and amendments to this RDRP. As drought resilience processes mature, the ability for further robust adaptation pathways to be implemented will emerge. The table below captures specific items identified for integration as part of future plan iterations.

**Table 1 - Key aspects of consideration to guide future plan iteration**

NO	ASPECT FOR CONSIDERATION
1	<p><b>Definitions, vision, goals, outcomes</b></p> <p>Future plan updates could analyse the trends, stressors and challenges identified in the plan (p. 33) and in the resilience assessment (p. 25) to explore the impact of future change and uncertainty on its vision, guiding principles, and outcomes, and make revisions accordingly.</p> <p>Future updates could then go on to build on the identified potential future trends, stresses and shocks by further exploring whether the outcomes, guiding principles and vision could be realised if these future changes came about. The vision, guiding principles and outcomes could then be revised if such an assessment suggests a mismatch with these potential future changes.</p>
2	<p><b>Stakeholder Engagement, participation and partnerships</b></p> <p>Future plan updates could clarify how the community will be involved in the plan's evaluation (e.g. via the envisaged annual 'lessons learned' review mentioned on p. 55 and p. 57). Stakeholder engagement could be expanded to better include direct participation of different drought vulnerable groups (e.g. First Nations communities, the elderly, youth, etc.), including gauging their capacity to participate and how best to engage with them moving forward. This information could be used to better include vulnerable residents and ensure adequate supports are in place to involve different community segments.</p>
3	<p><b>Active learning and adaptive governance</b></p> <p>Future plan updates could include more details about structured processes to support active learning and ongoing adaptation of the plan and its actions. This could be incorporated as a set of structured monitoring, evaluation and learning (MEL) activities and processes for each pathway.</p> <p>Future plan updates could more explicitly link with governance arrangements across local, state and federal levels to address the following points:</p> <ul style="list-style-type: none"> <li>→ How will the governance arrangements ensure ongoing appropriate representation of groups with different vulnerabilities to drought, including First Nations communities?</li> <li>→ How will the governance be nested with other governance structures and ensure that decisions are made at the appropriate level, that is at the level closest to where they will have an effect (subsidiarity)?</li> </ul>
4	<p><b>System description and resilience assessment</b></p> <p>Future plan updates could do more to better understand the effects of drought on the livelihoods and wellbeing of different stakeholder groups and provide specific examples of 'local triggers' and supports that could bring forward open conversations about drought preparation (picking up on valuable insights in the 'Interconnected nature of drought' section, p. 18).</p>



## 5 Future Scenarios

Future plan updates could develop a suite of plausible future scenarios through a participatory process, and based on climate, drought and other drivers of change. The development of future scenarios could consider how trends, stresses or shocks (including drought) will interact with, and likely affect, the region's economic, social and environmental characteristics, as well as the implications for diverse stakeholder groups. This exercise will also assist these stakeholders to explore and identify actions and pathways that assist with building resilience under different plausible future scenarios.

## 6 Intervention options and pathways for building regional resilience

Future plan updates could more clearly outline how the proposed actions increase reserves, spare capacity and response options. Ideally, this should be informed by a resilience assessment of the current state of reserves, spare capacity and economic diversification. This would provide better insights on how effective the proposed actions are likely to be in building drought resilience in the region.

Future plan updates could also provide more explicit descriptions of what external support is required for successful implementation. More detail is needed about envisaged responsibilities, rights and resourcing arrangements across local, regional, state and national levels to ensure that the plan's implementation is not overly reliant on external sources. This could involve articulating how initial external investment might lead to reduced reliance on external support in the future.

Future plan updates could prioritise, sequence and link proposed actions into alternative and complementary pathways. Such pathways, along with clear triggers for changing pathways, would better enable the navigation of uncertainty and adaptation to future change. This exercise may also help with identifying missing actions critical to these pathways. The plan would benefit from the addition of a diagram characterising how actions are sequenced, and how pathways are interlinked.

## 7 Theory of change, Monitoring, evaluation and learning

Future plan updates could expand the theory of change to include more diverse mechanisms, and more evidence to substantiate the assumed mechanisms, by which its outcomes can be achieved. This evidence could be drawn from diverse knowledge sources (e.g. published research, government and industry experience, and community lived experience).

Future updates could include an expanded set of MEL indicators, including drawing on those suggested by the Future Drought Fund's MEL framework, the extensive indicators used in the resilience assessment, and other segment-specific measures (e.g. for youth, women and First Nations people) that could be tracked with Australian Bureau of Statistics (ABS) Census data (i.e. Socio-Economic Indexes for Areas (SEIFA) index and population change).

## 8 Integration between components

Future plan updates could explore the interactions and linkages among its different components more explicitly, and what this reveals about requirements for reducing vulnerabilities and building resilience to drought in the region. The system description and resilience assessment could be used to show how the plan's proposed actions intend to address the region's vulnerabilities as identified in the resilience assessment.

