

Darling Downs Regional Drought Resilience Plan 2022–2030



Australian Government
Department of Agriculture,
Fisheries and Forestry



Future
Drought
Fund



Queensland Government



Rural Economies
Centre of Excellence

The Darling Downs Regional Drought Resilience Plan has been developed as a partnership between the Rural Economies Centre of Excellence and the following organisations who will lead implementation of any actions: Regional Development Australia – Darling Downs and South West, Goondiwindi Regional Council, Southern Downs Regional Council, Toowoomba Regional Council and Western Downs Regional Council.

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While every care has been taken in preparing this publication, neither the Australian Government nor the Queensland Government accepts responsibility for the decisions or actions contained herein, or any decisions or actions taken as a result of any data, information, statement or advice, expressed or implied.

Acknowledgement

We pay our respects to the Aboriginal and Torres Strait Islander ancestors of this land, their spirits and their legacy. The foundations laid by these ancestors – our first Australians – give strength, inspiration and courage to current and future generations, both Indigenous and non-Indigenous, towards creating a better Queensland.

We recognise it is our collective efforts and responsibility as individuals, communities and governments to ensure equality, recognition and advancement of Aboriginal and Torres Strait Islander Queenslanders across all aspects of society and everyday life.

On behalf of the Queensland Government, we offer a genuine commitment to fearlessly represent, advocate for, and promote, the needs of Aboriginal and Torres Strait Islander Queenslanders with unwavering determination, passion and persistence.

As we reflect on the past and give hope for the future, we walk together on our shared journey to reconciliation where all Queenslanders are equal.

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Interpreter statement

The Queensland Government is committed to providing accessible services to Queenslanders from all culturally and linguistically diverse backgrounds. If you have difficulty in understanding the regional drought resilience plan, you can contact us for assistance and we will arrange an interpreter to effectively communicate the plan to you.

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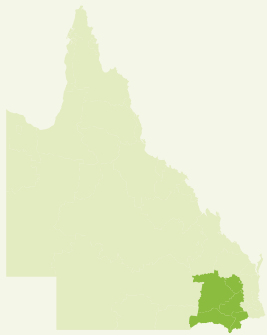


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Foreword and acknowledgements



Regional Development Australia Darling Downs and South West (RDA-DDSW), along with our partner LGAs, proudly acknowledges the Aboriginal peoples and Torres Strait Islander peoples as the Traditional Owners and Custodians of this Country. We recognise and honour their ancient cultures, and their connection to country and community. We pay our respect to them, their cultures, and to their Elders, past, present and emerging.

Disruptions and uncertainty in our world have become the norm in our ever-changing environment. Recent climatic events have reinforced the importance of building sustainability and resilience in our communities. Preparedness has never been more important for our communities to continue to thrive. Preparation, we believe, is critical to investment and employment attraction, the wellbeing of our people and the liveability of our region.

With this plan, we aim to strengthen, advance and transform the Darling Downs region during the dry times. This plan has been built together through engagement across the region with key stakeholders and the wider community. Their advice and expressions of lived experience, along with the best of resilience, science and practice, have been combined to create this shared plan for the region.

Our region and our communities are no strangers to hardship, shocks and natural disasters – floods, droughts and economic shifts have been regular events throughout our history and have served to create a resilient and adaptable culture. We have always worked together in our community and alongside our neighbours to prepare for and overcome such adversity. Drought has been an especially focused topic for our region, with recent droughts exacting a heavy toll on many of our rural communities. The RDRP acknowledges the changes in our climate and the potential for longer, hotter, and drier seasons and the need to proactively nurture resilience to drought economically, socially, and environmentally.

The Darling Downs Regional Drought resilience Plan (RDRP) has been developed through a partnership between RDA-DDSW and the following local government areas: Goondiwindi Regional Council, Southern Downs Regional Council, Toowoomba Regional Council, Western Downs Regional Council.

Our local governments are connected by history and commerce, and, with their wealth of social capital. This plan further illustrates our shared values and partnership.

The Darling Downs region is a unique and diverse area that extends over 144,500 square kilometres, and includes the majestic Bunya Mountains, the regional city of Toowoomba, the fertile plains of the Eastern and Western Downs along with the diverse and rich agricultural areas of Stanthorpe, Warwick and Goondiwindi. While traditionally known for a variety of agricultural production, broad acre cropping, horticulture and livestock grazing, and more recently natural resources, the region is building on its natural and built environments and human assets, encouraging innovation, and developing economic strength, productivity, and diversity.

The second range crossing, Wellcamp airport and the upcoming Inland Rail project are some examples of our region's ability to deliver and utilise significant private and public investment.

We are also an energy corridor with both traditional and renewable energy generation that exhibits an unparalleled diversity on the national landscape. A reliable and consistent supply of water, along with building our resilience to drought, is critical to our future.

The potential of our region is enormous and inspiring, and we share a vision for the future where our region is proud of its vibrant economy and enabling infrastructure, its strong and resilient community, and its stunning natural landscapes. A reliable and consistent supply of water, along with building our resilience to drought, is critical to our future, and the legacy we create for future generations.

We are committed to working collaboratively with the Department of Agriculture and Fisheries, other tiers of government, and our industry and community partners in the development and implementation of this Regional Drought Resilience Plan.

We thank our partners and the numerous people and organisations who have invested their time and knowledge and contributed to the development of this plan – their support of our region and its resilience is what paves the way forward to our shared future, and a vibrant thriving legacy for future generations.



Fiona Gaske
Chair
Regional Development Australia –
Darling Downs and South West

Introduction

Regional Drought Resilience Planning

Australia, and particularly the State of Queensland, is no stranger to drought. First Nations traditional stories of drought go back thousands of years and European settlers have officially recorded drought in Australia since the late 1700s. Droughts have been officially ‘declared’ in Queensland since 1897.¹

The economic, social and environmental costs of drought in Queensland are immeasurable. The toll taken on regions and their communities is high and the impacts often linger for decades. So, in recent years there has been a growing emphasis on the importance of drought resilience planning. This means planning now for the next drought and considering how to do things better or differently to make our communities more resilient.

Alignment with the Queensland Strategy for Disaster Resilience and Regional Resilience Strategies

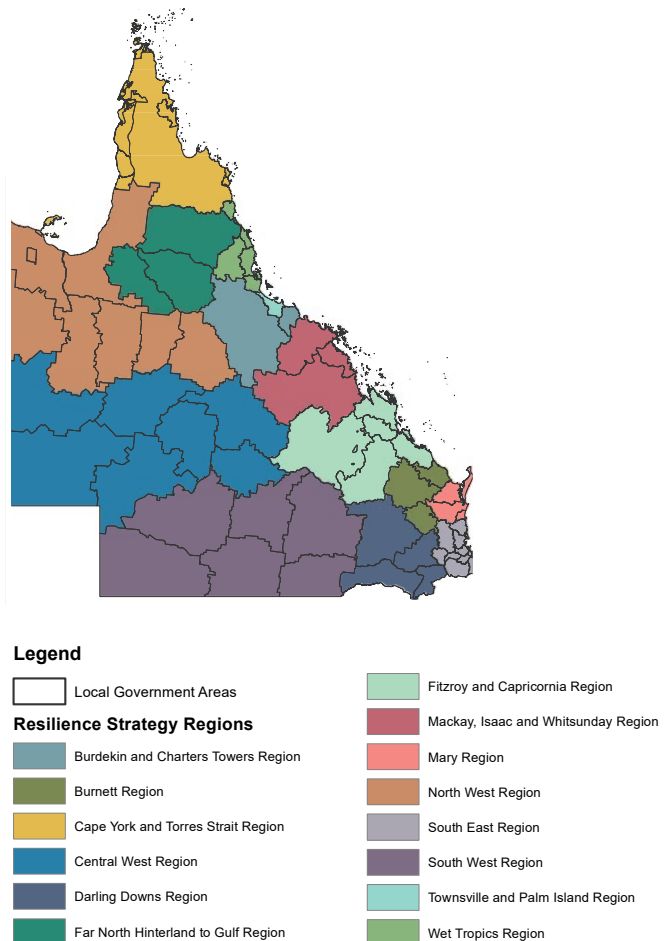
Queensland is the most disaster impacted state in Australia, and Queenslanders are susceptible to a variety of hazards. We are facing unprecedented change in both our current and future operating environment with a dynamic political, social, economic and policy landscape surrounding disaster risk reduction and resilience. This is being amplified by natural hazards becoming more frequent and intense due to a changing climate.

The *Queensland Strategy for Disaster Resilience 2022–2027* (QSDR) promotes a systems approach to resilience that connects with a range of agencies and sectors to deliver improved outcomes for Queensland.

Queensland’s suite of Regional Resilience Strategies ensure every region across Queensland is now part of a locally-led, regionally-coordinated and state-facilitated blueprint to strengthen disaster resilience.

It is often agreed that resilience planning for disasters and resilience planning for drought should be aligned. The Queensland RDRP program builds on the work completed under the QSDR, led by the Queensland Reconstruction Authority (QRA). The RDRP program provides the opportunity to have a clear focus on drought risk in the context of regional resilience, addressing the unique challenges it poses and the need for setting out drought-specific priorities and actions at a regional and local level.

Figure 1: Queensland’s Regional Resilience Strategies (Regions and Local Government Areas), Queensland Strategy for Disaster Resilience 2022–2027. Source: Queensland Reconstruction Authority.



Regional planning and approach

This plan was developed and produced through a collaborative partnership between DAF, RECoE, QRA, RDA-DDSW and its member LGAs, the local facilitator (Julia Spicer) and key regional, community and industry stakeholders. Partners and stakeholders The regional engagement model was developed from earlier work undertaken by RECoE, Red Cross Queensland², the Queensland Reconstruction Authority (QRA)³, and was informed by international best practice from the World Bank and the UNDRR⁴, as well as recent work by CSIRO.⁵ The plan has been reviewed by an independent assessor appointed by the Australian Government, and their feedback has been incorporated in the final plan.

The plan was co-designed with local stakeholders, using an approach that emphasised: initial trust-building; building on existing networks; local co-design of process; commitment and agreement; risk-informed adaptation of processes; place-based and regional strategies; locally led and coordinated solutions and integrated multi-objective responses. The approach was sensitive to the high levels of well-recognised ‘engagement fatigue’ in many of the drought-affected communities of the region; large physical distances between key locations; constraints on time for all stakeholders and participants and maximising opportunities to ‘piggyback’ with important regional events. Hence the plan was developed through practical and effective processes that maximised active participation, recognised and respected a diverse range of knowledge, values and views, and above all, were ethical and fair.

Regional engagement process

The RDRP engagement process was reiterative and involved a systems approach that highlighted local voices and ownership and encouraged people to describe important information in their own words. It also combined both subjective and objective perspectives by using local, traditional (including First Nations) as well as ‘scientific’ knowledge.

The plan was co-designed with a wide range of local partners and stakeholders that included: agricultural businesses and associations; RDA members; NRM groups; First Nations groups and elders; QLD state government agencies; QFES; local government (councils, mayors, staff and groups); CSOs, NFPs and charities; local (town) businesses; educational providers; young people; health providers; banks and finance advisers; religious leaders; and consultants and advisers.

Key principles and concepts: drought and resilience

Whilst there is no universally accepted definition of drought, in Australia, the Bureau of Meteorology (BOM) states, “drought, in general, means acute water shortage”.⁶

In Queensland, drought is ‘declared’ for a local drought area and/or individual properties. Local drought areas are drought declared “when the rainfall recorded during the previous 12 months (minimum) is in the lowest (or driest) decile or below the 10th percentile when compared to the long-term historical rainfall”.⁷ This is the technical definition of drought utilised in this plan.

‘Resilience’ is harder to define. The World Bank has defined resilience as the ability “... to anticipate, absorb, accommodate or recover from the effects of a hazardous event in a timely and efficient manner”.⁸

Australia's CSIRO perhaps more specifically states:

“drought resilience will result in a regional Australia that can endure deeper, longer droughts, and recover from them sooner. This will allow our food and agribusinesses to boost national farm income, increase food security, and protect the regional jobs that rely on agriculture. It will increase the resilience of rural and regional communities that depend on agriculture and improve environmental outcomes”.⁹

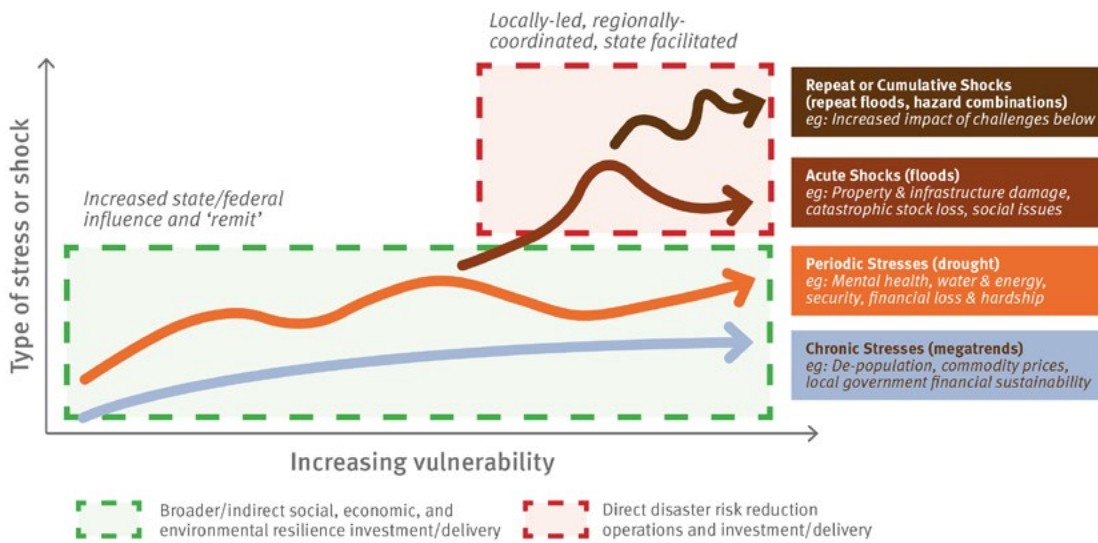
This plan utilises drought resilience objectives that broadly align with the four key objectives underpinning the *Queensland Strategy for Disaster Resilience*.

Figure 2: Four key objectives of the *Queensland Strategy for Disaster Resilience 2022–2027*. Source: Queensland Reconstruction Authority.



Experience from earlier works on resilience has highlighted the crucial importance of community and regional resilience, sometimes referred to as ‘societal’ resilience. For instance, work by QRA has revealed that community stakeholders report that their ‘societal resilience’ is significantly affected by chronic and enduring stresses (long-term megatrends such as ageing populations, fluctuating commodity prices), periodic stresses (such as drought) that are often cyclical, acute shocks (such as rapid-onset disasters), cumulative shocks (often a rapid succession of shocks or the increased impacts of the combined stresses and shocks).

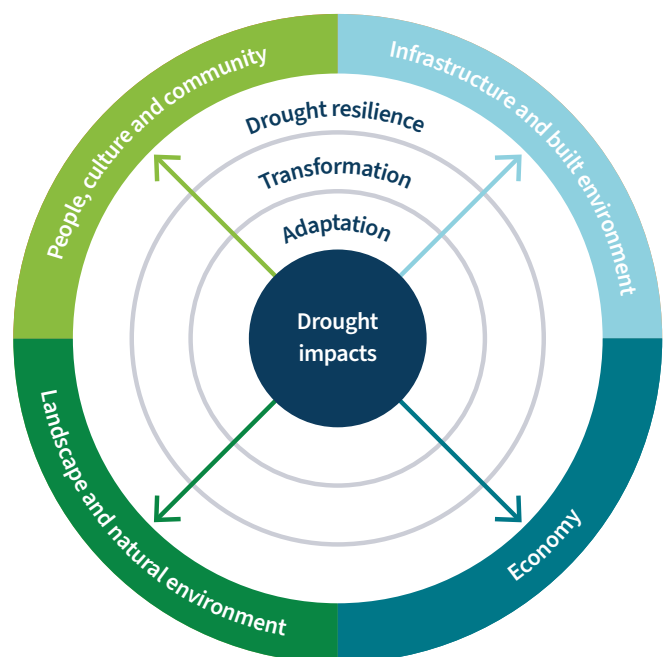
Figure 3: How resilience is affected by stresses and shocks. *Source: Queensland Reconstruction Authority.*



Whilst drought has been often referred to as “an enduring feature of the Australian landscape”, when viewed in this context of community resilience, drought is also understood as a periodic stress that comes and goes. However, it is now evident that the warming caused by climate change has added to the variability in Queensland’s weather and “increased the severity of drought conditions during periods of below-average rainfall”.¹⁰

Importantly, our approach and engagement processes encouraged community and regional stakeholders to express their own observations of ‘drought’ and ‘resilience’. We have combined the ‘local’ with ‘outside’ definitions to produce the regional understanding that underpins this plan and identifies drought impacts, risks and pathways to resilience.

Figure 4: Queensland RDRP elements of drought resilience. *Source: Queensland Regional Drought Resilience Planning.*



How to use this plan

The purpose of the plan

The Darling Downs Regional Drought Resilience Plan (RDRP) has been developed in accordance with the guidelines distributed by the Australian Government's Future Drought Fund (FDF) program. It also has been shaped by the inputs from key stakeholders along with the voices and experiences of the region's people.

Accordingly, the purpose of this RDRP is to contribute towards the following objectives:

- Growing the self-reliance and performance (productivity and profitability) of the agricultural sector.
- Improving the natural capital of the agricultural landscape for better environmental outcomes.
- Strengthen the wellbeing and social capital of rural, regional and remote communities.
- Specify key actions (regional and local) that can be implemented to build drought resilience in the region.

The RDRP process is intended to be practical, implementable and ongoing. As the region undertakes the specified actions, this plan will assist with monitoring progress and future learning.

Key inputs

This plan draws from, complements and builds upon many important works, such as:

- Queensland Strategy for Disaster Resilience
- Resilient Queensland
- Darling Downs Regional Resilience Strategy
- South Queensland Landscapes NRM Strategy
- Murray Darling Basin Plan and associated documents
- Rural and Remote Health and Wellbeing Strategy 2022–2027 (Queensland Government)
- University of Canberra Wellbeing Survey 2013–20
- Native Fish Management and Recovery Strategy
- Drought Resilience, Adaptation and Management Policy Framework 2018
- Infrastructure Australia’s Regional Strengths and Infrastructure Gaps Regional Analysis Queensland Report 2022
- Stocktake of Megatrends Shaping Australian Agriculture (ABARES 2021)
- State Heatwave Risk Assessment (Queensland Government)
- Australian Government Natural Resource Management Monitoring, Evaluation, Reporting and Improvement Framework Guidelines.

The most critical input was gained from talking to a cross section of individuals and organisational representatives from the Darling Downs region.

Other important linkages

It is the intention of this Plan that it is considered and factored into a range of other strategies and plans – including (but not limited to) the following list. We also hope it will be closely considered by charities; non-government organisations; not-for-profits; businesses; and government agencies with an interest in the region.

- regional plans
- regional economic development strategies
- regional transport and infrastructure plans
- natural resource management plans
- water resource plans
- local and district disaster management plans
- local asset management and capital works plans
- local corporate and community development plans
- land use planning schemes
- local and regional health strategies.

Regional profile

Figure 5: Darling Downs regional map. Source: Department of Agriculture and Fisheries, Queensland Government.

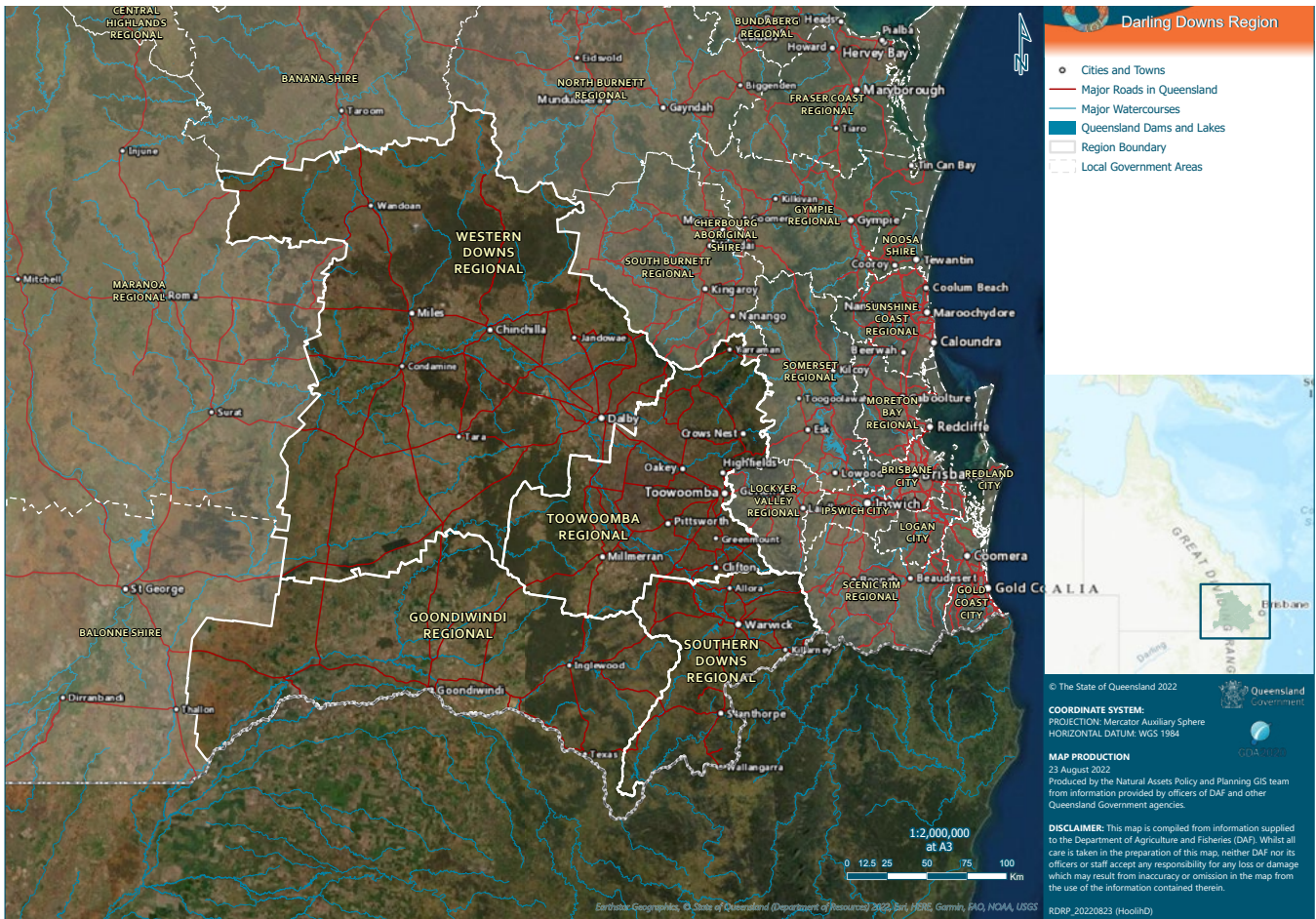














Figure 6: Regional socioeconomic profile.

Goondiwindi	Southern Downs	Toowoomba	Western Downs	Queensland
Population 			Australian Digital Inclusion Index 	
10,777	171,135	4,476,778	63%	67%
35,433	34,560		65%	63%
Projected population as at 30/06/2041 			Unemployment rate 	
10,652	204,332	7,161,661	5.4%	4.7%
38,969	39,797		8.5%	7.7%
Median age 			SEIFA 2016 Socio Economic Index of Social Disadvantage 	
38.9 yrs	38.4 yrs	36.4 yrs	974	989
46.5 yrs	37.7 yrs		937	957
% Aboriginal or Torres Strait Islander Peoples 			Number of local businesses 	
5.4%	4.0%	4.0%	1,902	16,071
4.5%	5.6%		4,131	4,744
% people who speak a language other than English at home 			Population that need assistance due to disability 	
3.3%	6.7%	12%	4.6%	5.9%
4.7%	3.7%		7.2%	5.2%
Median total personal income \$/year 			Protected area (km²) 	
\$45,561	\$48,971	\$50,901	1,936 km ²	1,371 km ²
\$40,153	\$52,975		657 km ²	5,550 km ²
				130,322 km ²

Source: Australian Bureau of Statistics – Data by region.

What makes the Darling Downs region unique?

What we now call 'The Darling Downs' was the traditional home to the First Nations people of the Keinjan, Giabal, Bigambul, Jarowair and Barunggam tribes – a subset of the Wakka Wakka language speakers. This land has always been fertile, and its bounties were enjoyed by First Nations owners even before the arrival of Europeans. The Jarowair people are custodians of the Bunya Mountains and in the past, they regularly invited indigenous peoples from southern Queensland and northern New South Wales to take part in ceremonies involving mass feasting on the protein-rich Bunya nuts. Immigrant squatters and 'selectors' began slowly establishing farms and communities built around dairy farming, grazing and cropping. Their early struggles – including with drought – were often described by Arthur Howey Davis (Steele Rudd) in his iconic series of Dad and Dave stories in print and radio. Over time the region became so wealthy from agriculture it was once described as "the jewel in the diadem of squatterdom".

These days, the Darling Downs regional economies are still heavily reliant on agriculture. As can be seen from Figures 7 and 8, the Gross Value of Products (GVP) from agriculture is significant, with 'livestock disposals' and 'crops' yielding the highest percentage of returns. The types of agriculture are varied, with a large horticultural sector generally in the south and east, grain and grazing throughout and irrigated and dryland cotton in the river valleys. Due to the large array of crops (extensive and intensive) grown in the region, at any time of the year there is a crop in the ground which requires rain.

In the last 20 years 'Health Care and Social Assistance' has become the region's largest employer (nearly 15% of jobs in 2021). This is followed by agriculture, extractive industries (coal and coal seam gas), and manufacturing as the largest employers and generators of regional production. There are two major gas pipelines – the Queensland Gas Pipeline oil pipeline and the Roma to Brisbane Pipeline – that both cross the region from west to east. There are two coal mines (New Acland Mine and Cameby Downs mine) that also supply a number of coal-fired power stations in the region. Mining exploration leases cover more than 90% of the Darling Downs.

Regional manufacturing traditionally focused on food and beverages, as well as services to agricultural businesses, and also the production of machinery, equipment and metal products. In recent decades, heavy and civil engineering construction and associated construction services have accounted a large percentage of the workforce in the western part of the region. The region is also popular with tourists because of its many natural and heritage attractions, cool climate, and proximity to Brisbane. Since the 1960s, the 'Granite Belt' area, near Stanthorpe has been cultivating wine grapes and these days there are more than sixty cellar doors/ wineries which also attract tourists – supporting the growing sector of 'boutique' accommodation, 'food and wine' tourism and 'artisan' foodstuffs.

The Darling Downs region comprises of the following LGAs: Goondiwindi Regional Council; Southern Downs Regional Council; Toowoomba Regional Council; Western Downs Regional Council. Significant population centres and Towns include Toowoomba, Goondiwindi, Stanthorpe, Warwick, Dalby, Moonie, Chinchilla, Esk and Kilcoy.

Figures 7 and 8: Queensland Department of Agriculture and Forestry forecasts for agricultural production (excluding forestry and fisheries) and Australian Bureau of Statistics data at the Statistical Area 2 level to estimate the gross value of production (GVP) for Queensland’s regions.

Figure 7: 2021 LGA Gross value of production

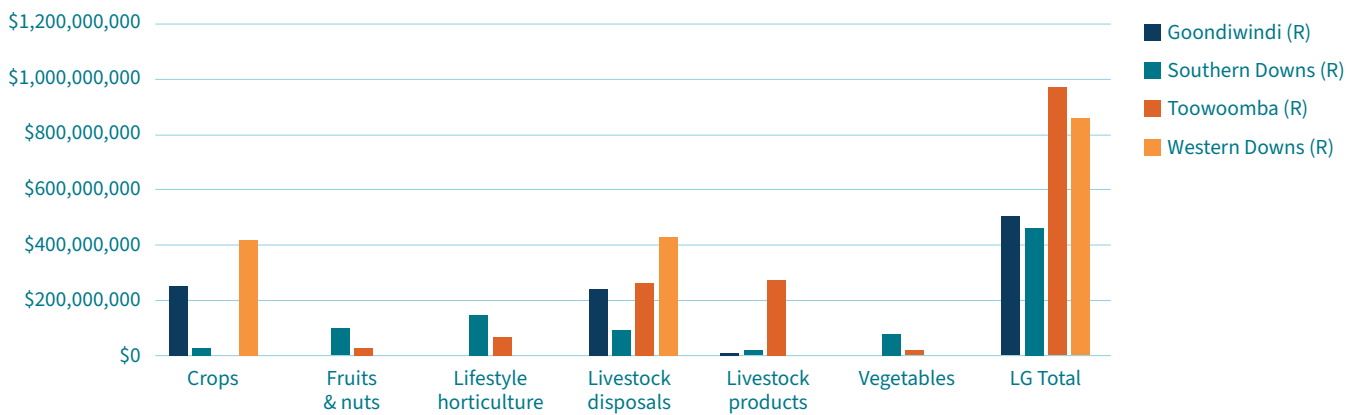
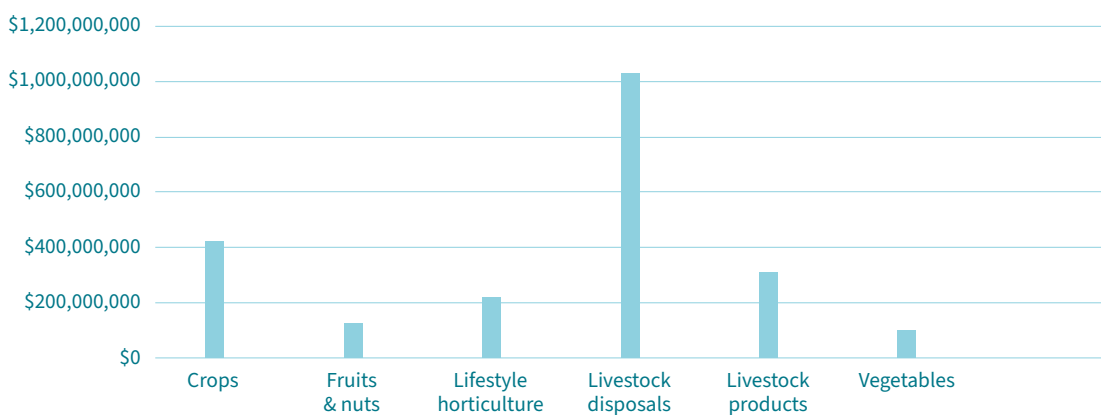


Figure 8: 2020–21 Regional gross value of production



History of drought in this region

“We have gone through this before!”

Local Aboriginal Elder

The Darling Downs region has a long relationship with drought.

As with most of Australia, there is a strong link between water – the waterways, waterholes and the patterns of rain and flood – in this region and the cultural practices of the Aboriginal/ First Nations people. Connolly, Williams and Williams¹¹ (2017) describe the importance of having sufficient ‘cultural water’ in the following statement:

“Water is integral to Aboriginal culture and belief systems. We define cultural water as having four distinctive components, that are associated with (1) healthy rivers, (2) resource availability, such as bush tucker and medicine, (3) cultural practices that form custom and belief systems, and (4) the contemporary economic and social requirements of Aboriginal people, such as formal water allocation for economic advancement.”

Figure 9: Map of 1901–1902 Australian rainfall. Source: Australian Bureau of Meteorology.

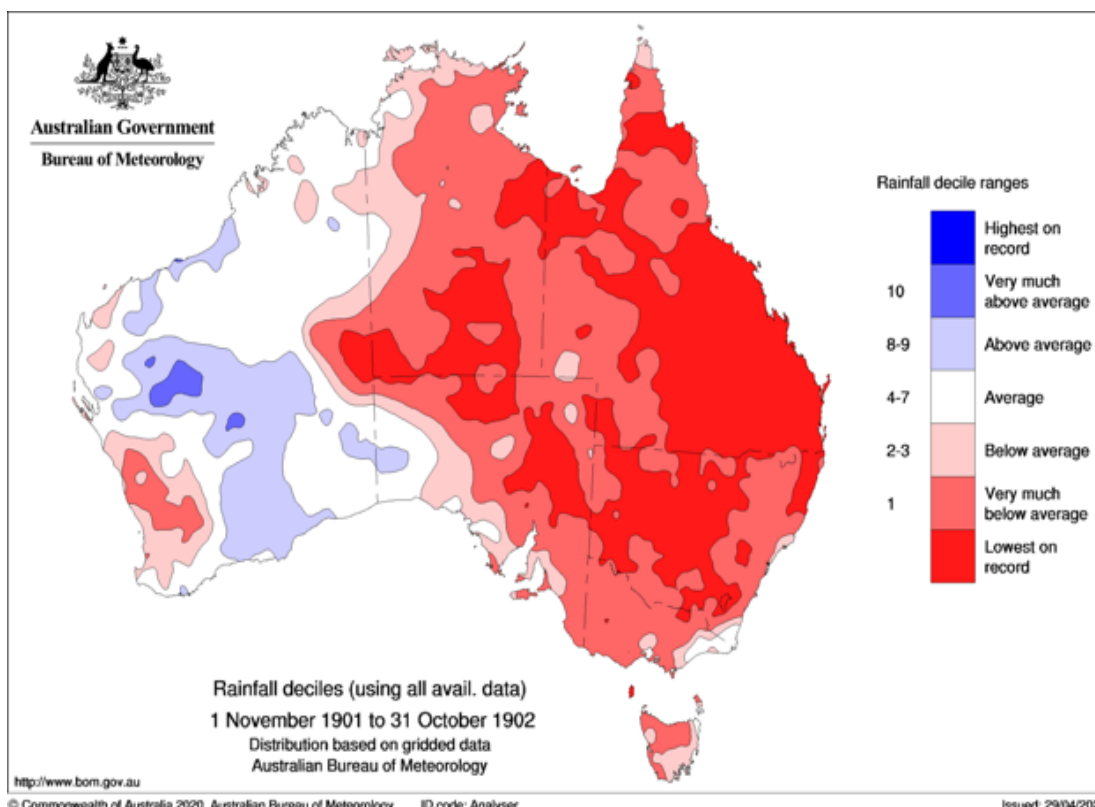
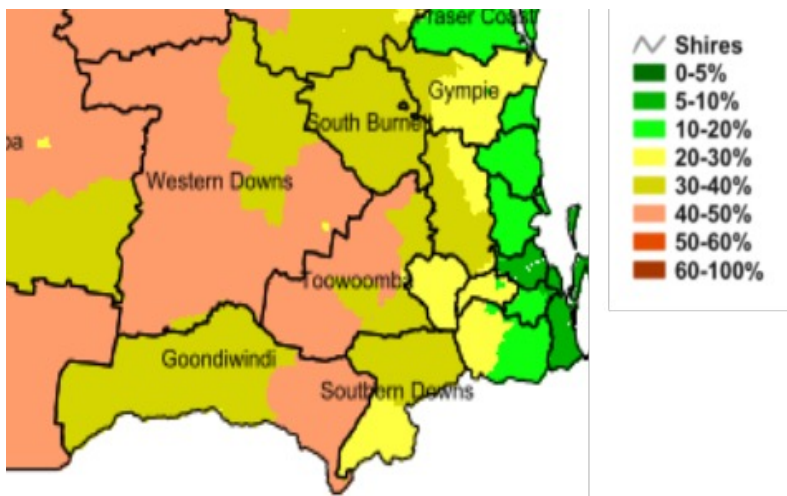


Figure 10: Percentage of time drought declared since 1964 as at 4 March 2022. *Source: The Long Paddock.*



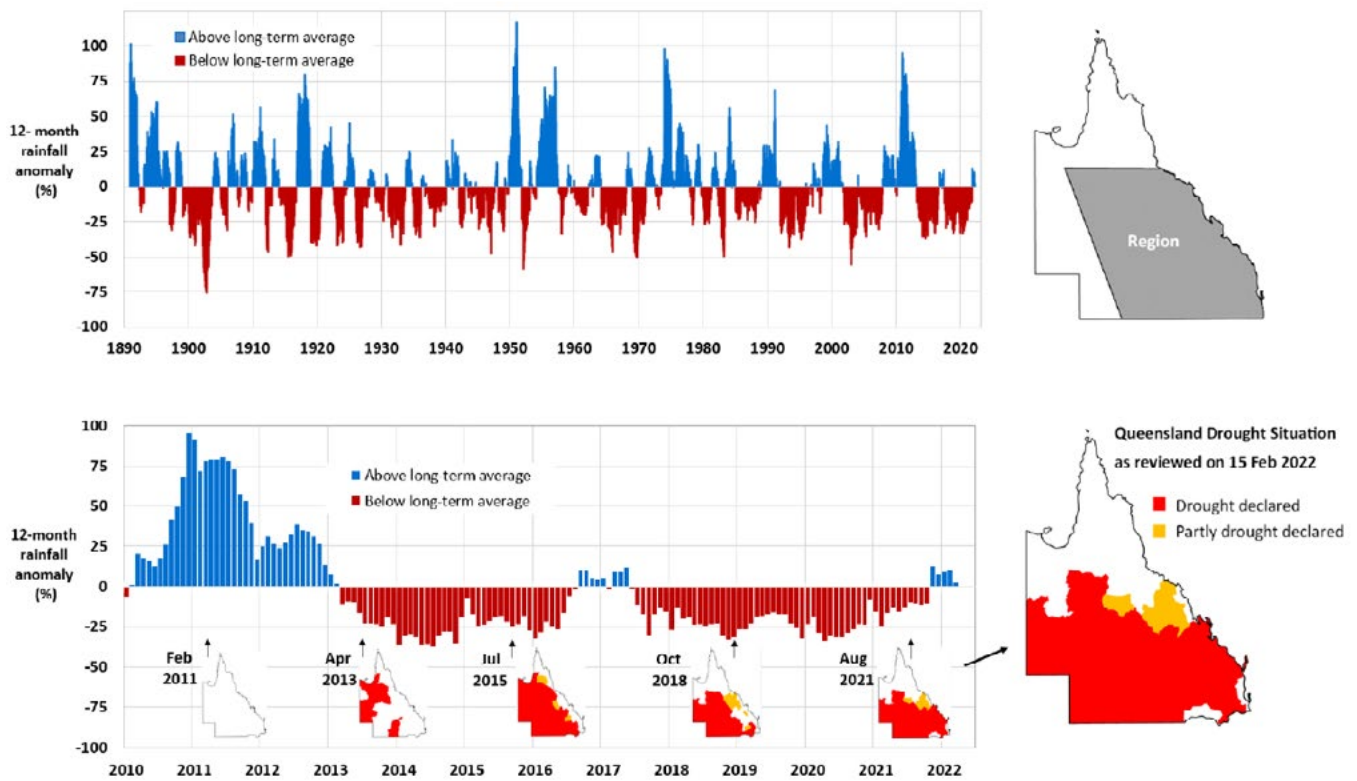
Early European settler records illustrate the struggles to secure water supply and manage droughts and the Federation Drought of 1895–1902 was one of the most devastating for the region. By the time of the First World War, the region had earned a justified reputation as a prosperous ‘food bowl’. State-financed infrastructure such as the extensive branch railway network helped bring produce quickly to an eager market. The advent of refrigeration helped protect valuable foodstuffs, and the landscape was dotted with the iconic Toowoomba-built Southern Cross windmills pumping agricultural water from aquifers, rivers and creeks.

The region suffered heavily again during the 1943–1944 drought and has continued to battle with drought and water management issues to the present day. The issues related to ‘cultural water’ and drought also persist to this day. The effects of droughts (both past and current) and the historical effects of water-related policies combine to have significant impact

on the flow regime of the region’s rivers and thus the availability of cultural water in the rivers. In the regulation systems, water allocation for cultural purposes has been included in the basin and jurisdiction’s water plans. However, there is some contention between water users (including First Nations people) as to the adequacy of these allocations. The environmental flow allocation does contribute to the protection of culturally significant sites and values along the rivers.

The variety and scope of agricultural practices across the whole region have seen a growing dependence on reliable rainfall throughout the whole year. However, the map in Figure 10 shows that the Local Government Areas (LGAs) in the Darling Downs region have been drought declared between 30 to 50% of the time in the last 58 years. All of the region’s LGAs have been ‘fully’ or ‘partially’ drought declared 19 of the last 23 years. Figure 11 clearly shows that the region often endures periods of below-average rainfall.

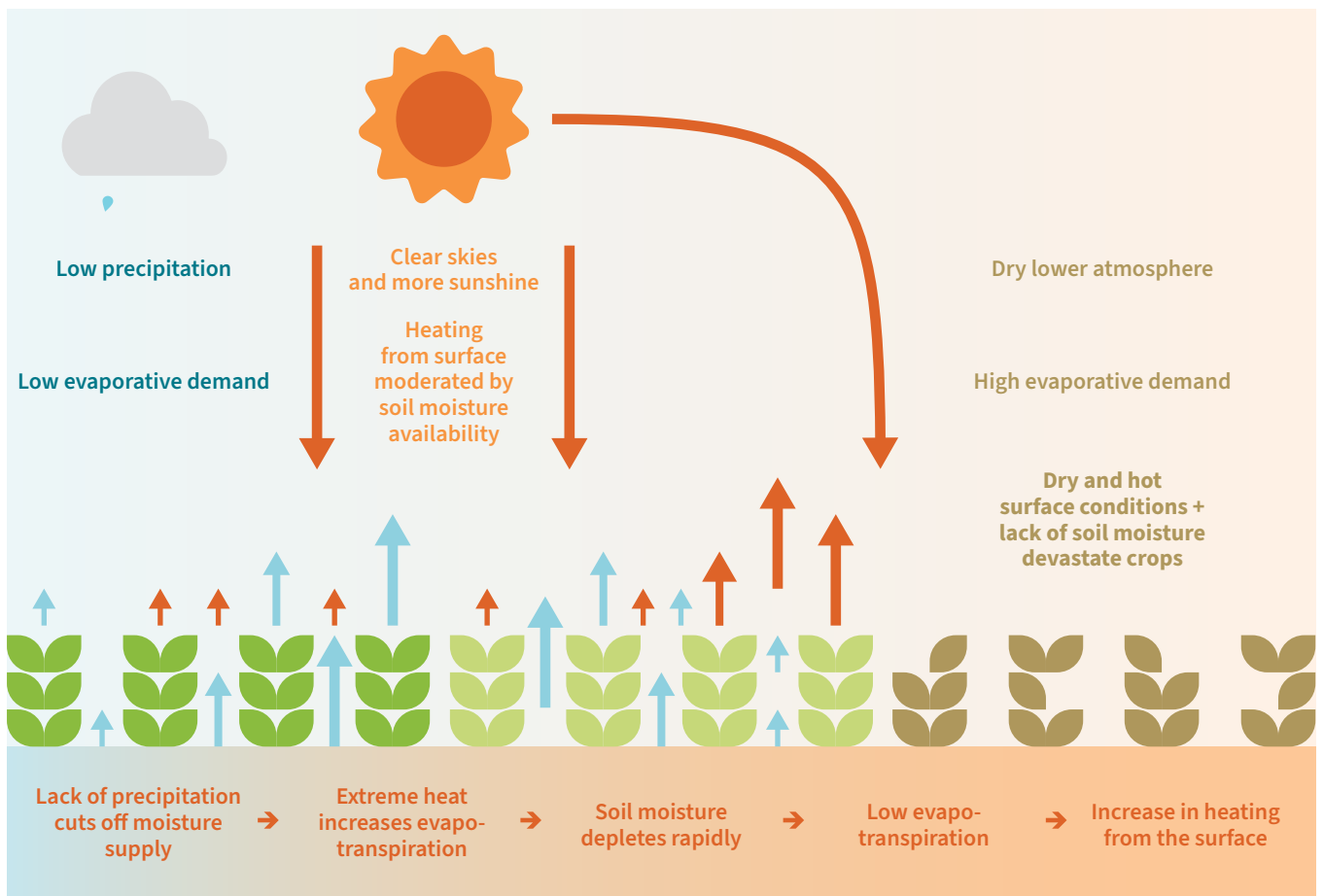
Figure 11: Historical 12-month rainfall anomalies. *Source: Department of Environment and Science, Climate Risk Assessment Report.*



The predominance of agriculture (and agricultural supply-chain industries) as a major source of income and employment, makes the region highly vulnerable to the impacts of unseasonal dry periods and droughts. In fact, the records for the region indicate that the Darling Downs region is one of the most likely regions in Australia to experience both prolonged and so-called ‘flash’ droughts. Whilst prolonged droughts can last as long as 12–13 years (e.g. the ‘Millennium Drought’) a ‘flash drought’ typically lasts for as little as a month or as long as six months.

Figure 12 shows the climatic conditions and soil and plant responses to those conditions which cause a flash drought. Blue arrows from the surface indicate evapotranspiration and the orange arrows indicate heat. The larger the arrow the bigger the flux from the surface to the lower atmosphere.

Figure 12: Climatic Conditions and soil and plant responses which cause flash droughts. *Source: Adapted from Earth Systems and Climate Change Hub, National Environmental Science Program.*



Past impacts of drought in this region

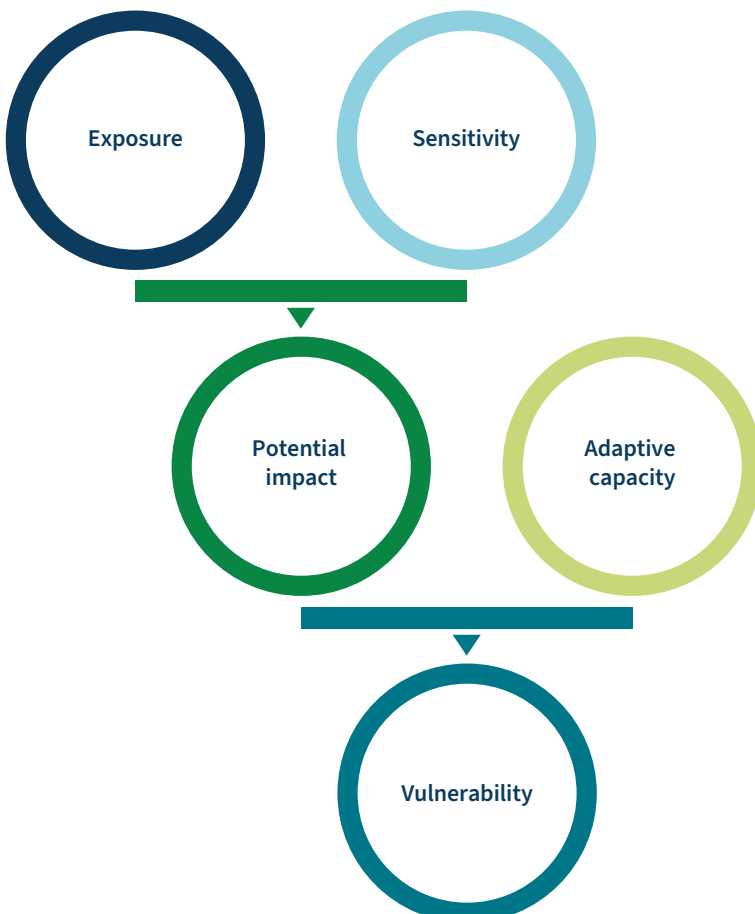
People, culture and community

Having strong, 'healthy' and 'vital' communities is central to building drought resilience in the Darling Downs. The strength and health of the economy and landscape is intrinsically linked to that of the people and their communities. Community feedback, government reports and statistical evidence all point to a decline in the health and vitality of people and their communities during times of drought.

In a 2012 report (2012) to the Murray-Darling Basin Authority, ABARES proposed the following framework as a useful way to understand community drought vulnerability and drought resilience.

The exposure is the level of stress or change that may be faced by a community (such as a drought) and their sensitivity relates to their dependence on the factor that is changing (e.g. rainfall or water supplies) – these combined determine the level of impact. However, the community's adaptive capacity or resilience can mitigate some of the impacts and hence reduce their level of vulnerability. Community feedback, government reports and statistical evidence all suggest that that the 'vitality' of the community is a critical factor in their capacity for local drought resilience.

Figure 13: Drought Vulnerability Framework. *Source: Adapted from Allen Consulting Group, based on Schröter & ATEAM consortium 2004.*



Whilst there is no definitive list of the factors that contribute to community vitality, there is general consensus that it includes such indicators as: growth/decline in population; availability/diversity of local employment; ‘connectedness’ and participation in community groups/events; access to knowledge, ideas and advice; evidence of community ‘pride; community health (physical/mental); local investment; availability of affordable housing; ‘liveability’ and ‘local amenity’; community governance and leadership; cultural identity; subjective levels of ‘wellbeing’; and levels of security crime and conflict. The McConnell Foundation¹² (2017), summarises community vitality as: “Creative Placemaking; Fostering ‘Local’; Future Readiness; Active Lifestyles and Civic Engagement.”

All of these factors affect the ‘adaptive capacity’ of communities and hence their drought resilience. Many of these factors were highlighted through our review of outside ‘expert’ knowledge (data and reports) and through our engagement in the region (interviews, meetings and comments). Some may be considered ‘chronic stresses’ that increase the impacts of drought, and in turn, there is clear evidence that drought has had a negative effect on many of these factors. Hence, strong action should be taken to address factors and build drought resilience for the future.

Broad findings from the Regional Wellbeing Survey¹³ undertaken for the MDBA¹⁴ (Schirmer et al, 2019) revealed that for Murray-Darling Basin communities (including Darling Downs), the top issues that had a negative impact on their “wellbeing or quality of life” were poor quality services and infrastructure (13%); the negative impacts of drought (13%); poor quality governance and institutions (12%); high cost of living (12%); poor work conditions and employment opportunities outside agriculture (8%); anti-social behaviour, security and safety (7%), lack of social connection (5%); and poor work conditions in agriculture/farming (5%).

Our engagements in this region clearly support the suggestion that these issues were exacerbated during periods of drought.

“People have general tendency to mix less due to being busier but also depressed and/or stressed.”

Community service organisation member

“There is less participation in support of community activities.”

Community service organisation member

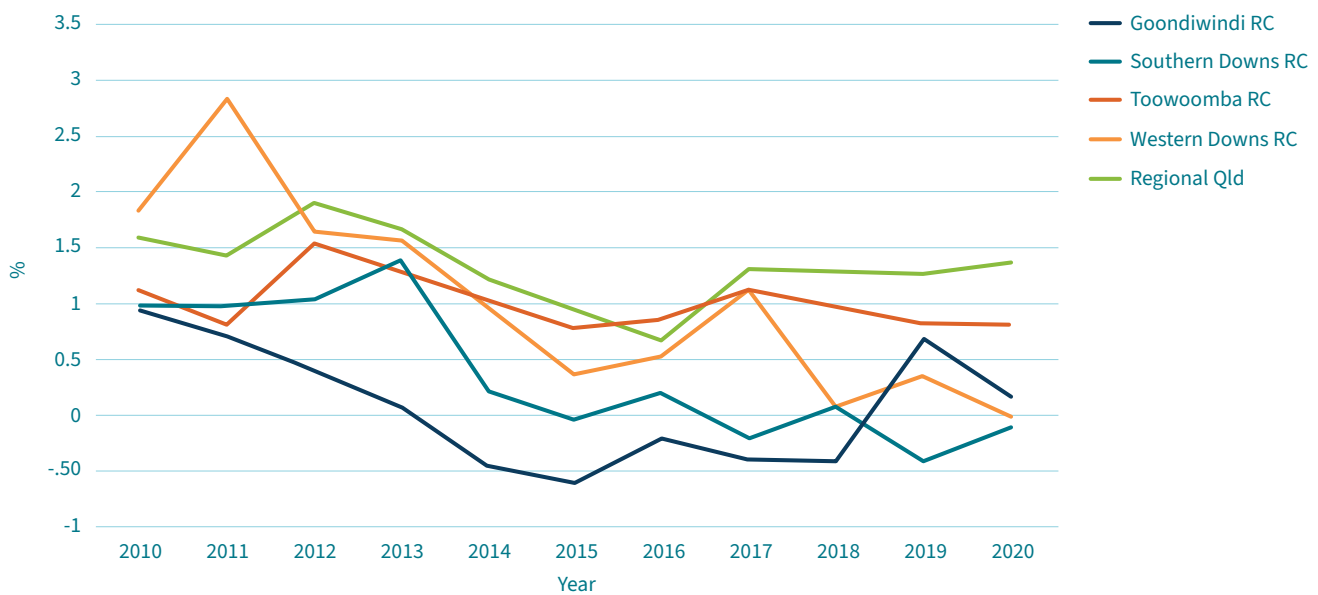
It is undoubted that drought has had a negative effect on population figures in the region. The Queensland Government Statistician’s Office¹⁵ reports that in the ten years to 2019, Toowoomba and the surrounding areas had the lowest population growth of any regional centre in all of Queensland. In the same period, the Darling Downs and Maranoa region had the second-lowest population increase in the state – 650 people overall – and negative growth since 2018.

The graph in Figure 14 indicates a decline in population in all local government areas in Darling Downs during the drought years of 2014–2020. All LGAs experienced population growth below the average for regional Queensland. These statistics align with the observations provided by community, that people leave the region during drought which leaves a variety of adverse flow-on effects and the region’s population is rapidly ageing (Figure 15). The relationship between drought impacts and this aging demographic is varied: (a) they are more prone to heat related illnesses that may be associated with drought (b) they are less likely to use internet-based technology and information (c) they are less physically capable of undertaking

increased heavy work themselves (particularly on farms and agricultural enterprises) that may be required during drought conditions. In recent years, the ‘Health Care and Social Assistance’ sector (including an increasing large number and variety of aged care positions) has become the region’s largest employer.

Rural and Remote Mental Health-Queensland reported in 2008 that “Due to the reliance on primary industries in rural and remote areas, climate variability is the factor that has the greatest influence on the stress levels of individuals in rural and remote areas”. Drought exacerbates chronic stresses and

Figure 14: Darling Downs Region’s Annual Population Change by Local Government Area for the 2010–2020 period.
Source: Australian Bureau of Statistics.

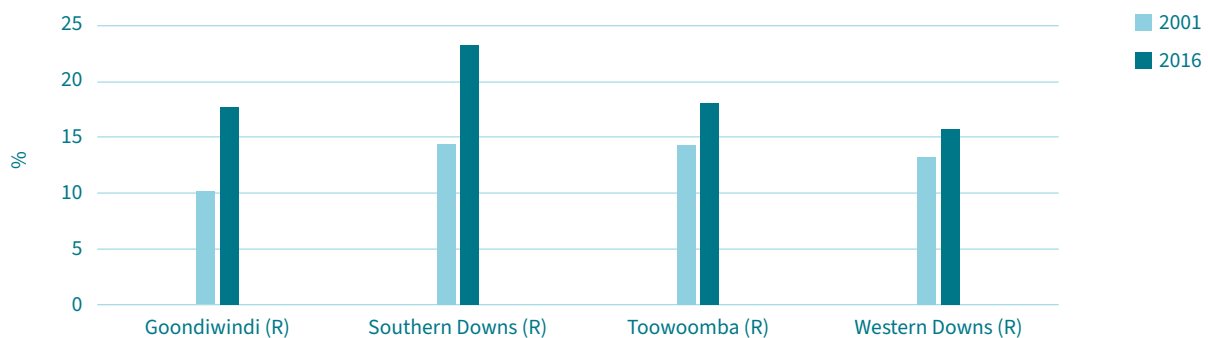


underlying issues such as legal and financial problems; medical and health problems; alcohol and substance abuse; isolation and social withdrawal; breakdown of relationships and in the worse cases, self-harm and suicide. This has been indicated by suicide statistics where 21.4 suicide deaths per 100,000 people occurred in the Darling Downs and West Moreton health region in 2019, compared to the national average of just above 10. Whilst the uptake on government support services such as the Rural Financial Counsellors has been very positive, the uptake on mental health services still suffers due to a community stigma – mostly amongst men.

“When older farmers walk past me, they lower their head and don’t look me in the eye.”

Mental health worker

Figure 15: Percentage of Darling Downs Region’s population 65+ by Local Government Area for the 2001–2016 period. *Source: Australian Bureau of Statistics.*



The Queensland Government's Rural and Remote Health and Wellbeing Strategy 2022–2027 identified harsh natural environment (drought, flood, fires and tropical cyclones) causing economic stress as a major challenge, threat and risk to the health and wellbeing of rural and remote Queenslanders. Specifically, the University of Canberra Wellbeing Survey 2013–20: Drought found that 85.4% of people surveyed in the Darling Downs and South West RDA area, reported the level of drought impact on their wellbeing, as '5' or higher on a scale of 1–7. This is significantly more than the 77.7% for rural and regional Queensland overall.

“My old Uncle use to come and sit with me and work me through it.”

Aboriginal Elder

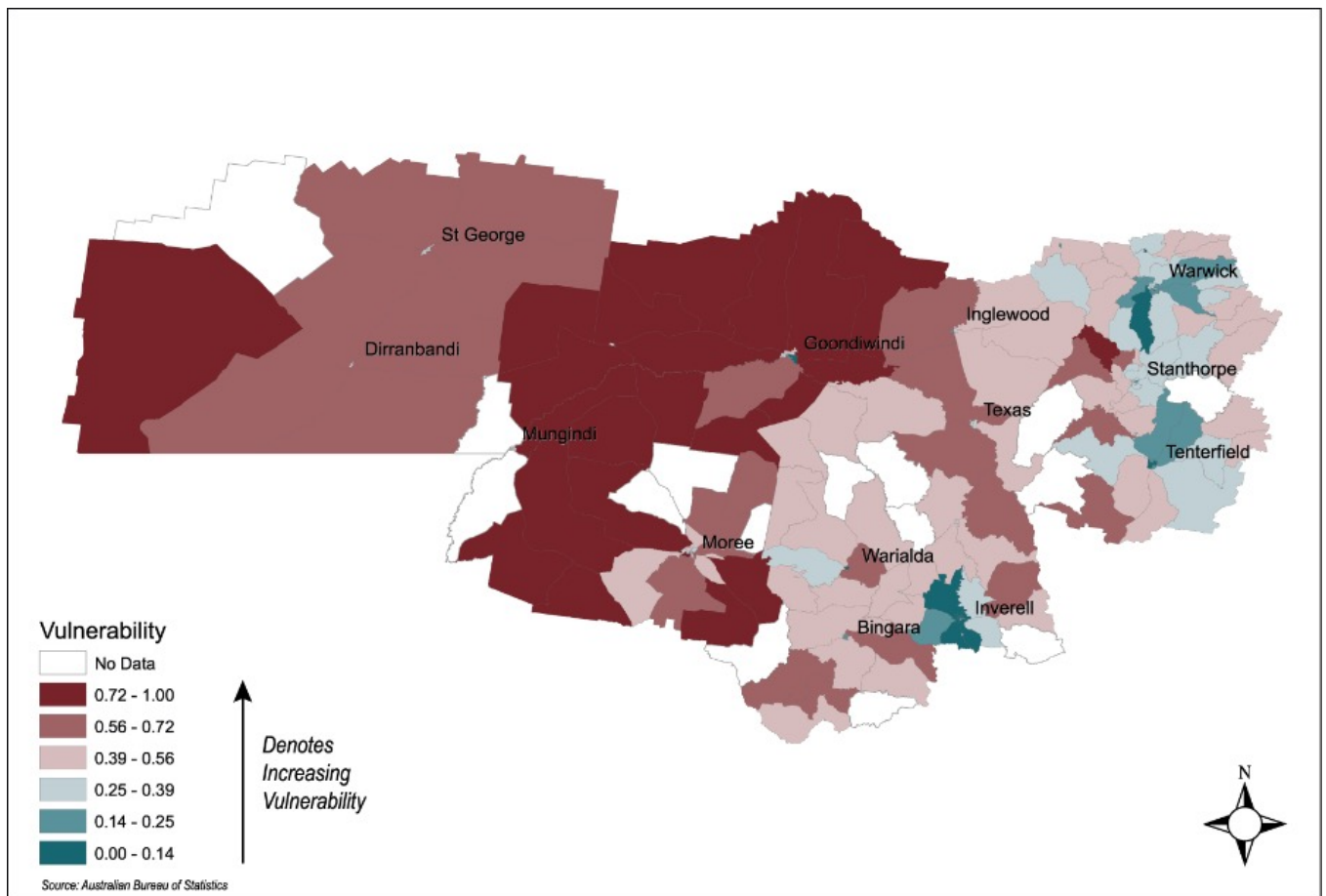
Aboriginal/First Nations people make up a small (approximately 5%) but important section of the region's population. The exposure to the adverse social, health and economic impacts of the region's population is the same if not elevated for the Aboriginal people of the region. The mean total income for the whole population of the Goondiwindi LGA fell from \$57,713 in 2016 to \$49,315 in 2019. (ABS). It is reasonable to deduce that the Aboriginal component of the Goondiwindi LGA communities was impacted significantly more during this period when the total unemployment rate for the LGA in 2016 was 3.7% but for the Aboriginal component of the same LGA for the same period was 13.2%.

Economy

The European history of the Darling Downs region has been traditionally focused on the economics of agriculture and hence the impacts of drought on farming and agricultural supply-chain businesses. In recent decades, farming practices have changed to deal with drought and climatic impacts, new agricultural 'industries' have emerged, and farm businesses and households have diversified their incomes – however the region still remains critically vulnerable to drought and a lack of water. The Australian Institute of Company Directors reports that, on average “... over the past 50 years, Australia's real gross farm product has declined by 27.5% during droughts, measured from the peak quarter prior to the onset of drought to the lowest point during or after the drought”¹⁶ (2018). Adaptive measures and changes in farming practices continue to mitigate some of the impacts during drought, and also increase farm yields in 'non-drought' periods, but much of the Darling Downs region remains particularly economically vulnerable to drought.

The MDBA conducted an assessment of social and economic conditions throughout in the Murr-Darling basin in 2020. Their map (Figure 16) represents the economic vulnerability of communities resulting from both climate and policy-induced reductions of available water. The map clearly shows that the Darling Downs region has eight out of 10 of most economically vulnerable survey districts in the Murray-Darling basin. 'Vulnerability' in this context, inversely implies a lack of resilience, and reflects both the severity of drought impacts and lower levels of adaptive capacity in these communities.

Figure 16: Sensitivity of the Goondiwindi Regional Council and Parts of the BROC Region to a Reduction in Water Availability. *Source: Institute for Rural Futures, University of New England; and Tim Cummins and Associates, Armidale and Rosebank.*



“Financial support payments to any part of the community does not affect the economic viability during drought, it is actually far less than what would be spent in a normal year.”

Community Member

“Government low interest loans process is slow, painful and felt to be judgmental.”

Community Member

“The rural residential residents felt particularly the majority of drought support funding is targeted at the farming sector.”

Community Member

“Clearly less income and debts to shops paid less infrequently puts businesses under strain, so we have to shed staff which can move away – so hard to backfill in a regional centre.”

Community Member

“The local economy becomes very depressed, even those who are receiving some form of income support do not have the extra dollars to spend.”

Community Member

In the face of these economic impacts, the region’s communities and agricultural businesses have slowly begun to transform and make changes in practice to adapt to the mitigate impacts of recent droughts, reduce vulnerability and hence become more resilient to future droughts. The Australian agricultural sector has begun to implement changed practices to deal with the effects of variable climate (especially drought) and farm productivity (the output from a given amount of land and other inputs) has climbed around 28% since 1989 – with a much larger 68% gain in the cropping sector (*Economy.ID.2022*).¹⁷ Recent productivity gains have been the result of changes in practice and adapting to drier and hotter conditions.

In 2021, ABARES conducted a nationwide survey¹⁸ of farm practices related to natural resource management (NRM) and drought resilience and preparedness. The survey included questions on management practices relating to farm financial diversification, farm planning and management, and the use of NRM and other farming practices. From 478 farms surveyed in Queensland (including from the region) the results indicate that recent drought has driven financial and land management practice change in many farming enterprises. Many farms and properties have been forced to decrease their reliance on a single source of agricultural income through the diversification of income streams. This is being achieved through seeking off-farm income as well as introducing a wider range of agricultural activities on farm.

The ABARES 2021 survey found:

- “Over the last 3 years, an estimated **34% of farms diversified their agricultural enterprises** to increase their resilience to drought, while 38% increased their non-farm income.
- Around **64% of farms had some non-farm income**, on average over the last 3 years. Of those farms, the average proportion of household income from non-farm sources was 41%, making many farms well placed to deal with a short-term downturn in farm income.
- Approximately **4% of farms received payments for environmental services**.
- However, **only an estimated 36% of farmers had a written farm plan with business objectives**. Of those plans 79% included drought strategies and 88% included other farm risks.”

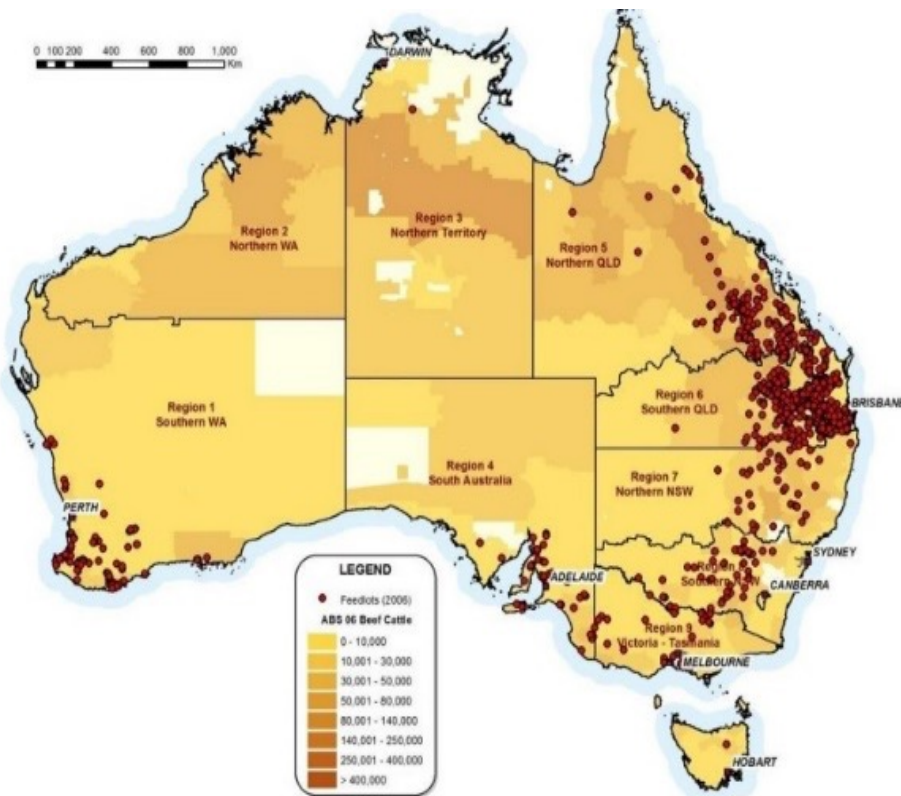


Image: Darling Downs paddock.

In recent decades, agricultural areas of the region have become the site of increasing and profitable activities related to the extraction of Coal Seam Gas (CSG). The Darling Downs region are part of the ‘Surat Basin’ and Western Downs LGA has the majority of CSG wells in the region. The local economies of Dalby, Chinchilla and Miles benefit significantly from the CSG industry to the extent where heavy and civil engineering construction and associated construction services accounted for 18% of the Western Downs LGA workforce in 20/21 – agriculture, forestry and fisheries accounted for 13.8% in the same period. The economic benefits of the CSG industry – through employment, local investment and spending, and potential for off-farm income – have clearly helped to mitigate some of the impacts of drought. However, the CSG industry is also controversial and is believed by some to be having detrimental effects on the region’s groundwater supplies due to extensive CSG extraction processes.

Similarly, the growth of the ‘feedlot industry’ has increased rapidly during drought years as a way of both mitigating drought impacts for pastoralists and also as an alternative livestock-raising model in the region. In the Darling Downs and South West region, ‘Livestock Slaughter’, accounted for almost 50% of agricultural output and approximately \$3.8 billion revenue in 2016. In 2021, grain-fed cattle accounted for more than 50% of Australian beef production. Feedlot expansion in the Darling Downs region continues at a high rate, with capacity increasing from an estimated 375,899 to 581,247 head in the 15 years between 2006 and 2021. This will take the form of new feedlots as well as the increasing capacity of existing feedlots.

Figure 17: Map of Australian feedlot distribution. Source: ALFA, Beef Central & ABC News, 2022.



The Western Downs LGA now has 68 cattle feedlots according to council statistics and refers to itself as the “goldilocks” region for intensive beef production: “the land is a reasonable price, ... water available, not too hot nor cold, reliable and inexpensive energy, far enough away from high density urban centres but close enough to access them, immediate vicinity of four large beef processors” (Beef Central, 2020).

Feedlot operations concurrently offer both benefits and problems when viewed in terms of drought impacts and mitigation. In recent years it has been suggested that feedlots can be used as “drought proofing”. As reliable employers during drought years they have offered opportunities for off-farm income and are viewed positively by LGA leaders within the region. One local deputy mayor suggested “*The local rugby team would not exist without the feedlots... Coal Seam Gas can be much more itinerant but cattle feed lots are operating 365 days a year and are at fuller capacity in times of drought*”.¹⁹

However, barriers exist to future expansion in the form of labour shortages in both skilled and unskilled workers – industry figures estimate there is 1.6 jobs generated per 1000 head of cattle in a feedlot operation (ALFA, 2016). Also, the rising cost of water, potential water trading and water use caps may negatively impact on the capacity of feedlots to operate, as ability to compete for water may be limited.²⁰

Inland Rail project

The Inland Rail project running from Melbourne to Brisbane and through the Goondiwindi and Toowoomba local government areas is due for completion in 2028 (or latest pre-2030). Owing to the demand for feed grain from Darling Downs-located beef feedlots for both existing and future feedlot production. A significant factor in improving drought resilience will be the reliance on readily accessible grain and the efficiency in transport for southern states to the Darling Downs via rail. Regional economies will also have an economic benefit from the operation of Inland Rail going forward and the new rail capability will bring longer term and unplanned benefits in new commercial and economic activities.

“One of the key issues for future growth surrounds access to water, and the availability of water for new intensive agriculture developments. At a State level, Queensland’s groundwater allocation plan introduced in recent years provides new water allocations for coal seam gas or mining projects but very little for future intensive agriculture developments. Buying existing water entitlements from other users, or collaborating with energy companies to reuse extracted groundwater, are the main options for new agricultural developments to access the water they need, but, as previous experience has shown, the latter is not always a smooth or easy process.”

Western Downs Mayor, April 2020²¹

Landscape and natural environment

Traditional owners of this region managed the country by living with the landscape and this included their understanding and management of the impacts of drought. First Nations people have survived and thrived in this landscape for thousands of years. Kerwin (2006) states, “As with all societies, technology, development, and land management systems were used to harness local environmental conditions so as to provide and enhance a way of life”.²¹ In recent times it has been recognised that stemming the loss of traditional land management practice knowledge and sharing this knowledge in a culturally appropriate manner is key in building more drought resilient landscapes and communities of this region.

Since 1999, modelled annual pasture growth has been used as a primary indicator of the severity of drought conditions. Annual pasture growth is influenced by rainfall (amount, timing, and intensity), temperature, radiation and soil condition moisture and condition. This combination of factors makes pasture growth a reliable indicator of drought severity and impact not only for grazing country but also for farming/horticultural country.

Figure 18 shows a 6 to 13% (average 12%) decline in the average annual pasture growth for the 1999–2021 period compared to 1890–2021 period for the same LGA. Management regimes may reduce or magnify the impacts of climatic conditions on annual pasture growth.

Figure 18: Annual pasture growth for region’s local government areas.
Source: AussieGrass – Longpaddock.

Annual Growth (kg / ha / yr)				
	GRC	SDRC	TRC	WDRC
1890–2021	2184	2513	3232	2552
1999–2021	1892	2350	2873	2063

The impacts of the most recent prolonged droughts are driving ‘on-farm’ land management practice change. The ABARES Natural Resource Management and Drought Resilience survey (2021) measured the uptake extent of 20 progressive land management related practices on 478 Queensland farms and properties.

The drought preparation practices with the highest uptake were:

- de-stocking early in low rainfall periods to preserve groundcover (68% of farms)
- improving soil water retention (64% of farms)
- increasing fodder and grain storage (58% of farms).

However, whilst 68% of the surveyed Queensland primary producers self-reported they are de-stocking earlier, other sources of information do not offer such a conclusive picture. The high rate of fodder subsidies during the drought could possibly be interpreted as producers holding onto their stock and feeding, rather than destocking. Sale numbers through the Roma saleyards indicate the highest annual throughput for the last decade occurred in 2012/13 when the regional rainfall was at its lowest. This would seem to indicate producers were moving stock off their properties, but throughput for the 2015–19 period was consistent and does not follow the rainfall trend. Similarly, analysis of the DRAS expenditure for the area shows a relatively low number of producers accessed road transport stock freight subsidies at the end of the drought period, but this does not necessarily indicate a lack of re-stocking activity. This is an area that needs further investigation.

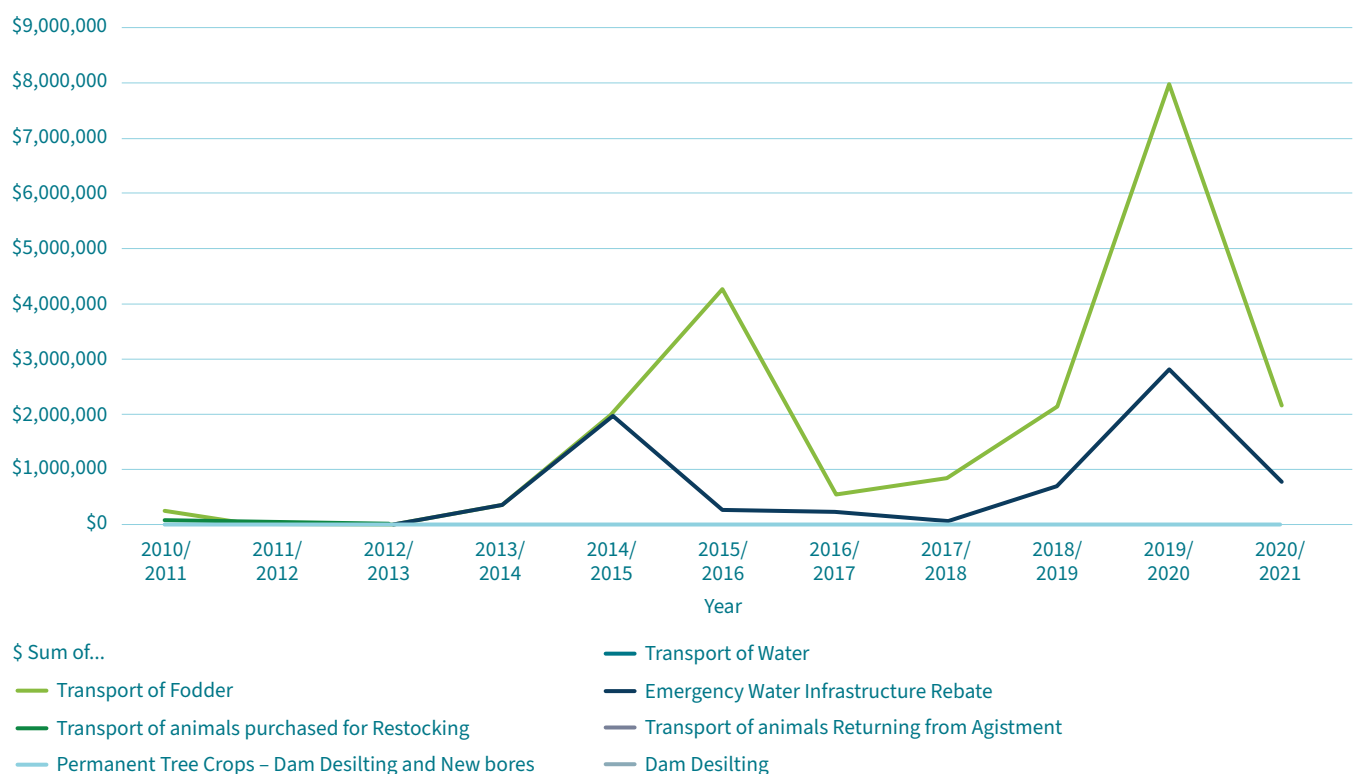
“Prolonged drought caused death of old-growth timber in shade lines (noticeable on public roadsides), loss of environmental habitat/variety, loss of soil biota that takes time to restore... awareness of this is becoming more widespread.”

NRM Spokesperson

Since the establishment of the Murray–Darling Basin Authority (MDBA) in 2012, the climatic patterns for many of the ensuing years have been similar to the conditions during the Millennium Drought. This has impacted significantly on the native fauna and flora of the region.

The effects of prolonged drought on native fish populations have been recognised by the Murray–Darling Basin Authority as a major threat to the ecology of the river system. *The Native Fish Management and Recovery Strategy (2020)*²² has been developed to help mitigate the effects of drought and other climate change impacts on fish in the system. Many species are now restricted in their range and have been reduced to small, fragmented populations (often genetically distinct from each other) that are vulnerable to extreme events. The once plentiful, but now rare, Black Fish of the Upper Condamine is an example of a vulnerable species.

Figure 19: 2010–2020 Drought subsidies total by subsidy type for the Darling Downs and South Burnett regions. *Source: Department of Agriculture and Fisheries, Queensland Government.*



“Some plant pests were allowed to spread as farmers didn’t have time or money to control them. This latest drought has seen the decimation of trees both young and old, leaving the fauna at a disadvantage. The koalas were dying of thirst and approaching house water points, baby birds died from excessive heat.”

Community Member

The ability of native terrestrial fauna to survive the impacts of drought is dependent on their access to healthy and diverse refuge areas sufficient in both size and connectivity. The total areas of remnant woody vegetation (trees and shrubs) for the Darling Downs in 2012 was 42%.²³ Although there have been many improvements due to legislation, voluntary uptake of carbon and environmental offset markets, and funded NRM programs, the biodiversity health improvements achieved through the increased revegetation of the landscape have been constrained by extensive tree deaths resulting from extended periods of drought as seen in the image below.



Image: Drought impacted brigalow tree shade line near Meandarra. *Source: Libby McLean (2022).*

Infrastructure and built environment

Infrastructure takes many forms including physical infrastructure such as roads, rail lines, water storages/ structures, buildings, weather stations and communication towers and other utility services infrastructure and non-physical infrastructure such as that to allow digital connectivity.

For some physical infrastructure, increased heat and little or no moisture can have significant impact on their condition (i.e. road surfaces, wooden and metal structures, painted surfaces, earthen-based structures etc). For most infrastructure, the most significant impacts of drought come from: increasing lack of funds for infrastructure investment and/or maintenance; decrease in available (or able) personnel to carry out construction and/or maintenance. On-farm improvements or maintenance are often neglected, avoided or postponed and the upkeep of ‘in-town’ community infrastructure is sometime neglected or abandoned. Drought frequently causes a reduction in investment (both public and private) in new infrastructure ‘in town’ – in particular, the availability of affordable housing (new or existing) declines.

Drought may also result in increased use of some infrastructure such as roads and rail. This is particularly relevant to the Darling Downs roads which have two of the country’s biggest cattle saleyards (Roma and Dalby) and large feedlots. Stock transport increases to these facilities significantly at the onset of drought and after drought for saleyards. There have been reports that government programs that supported on-farm infrastructure improvements were successful – for those who had enough resources to government grants and loans.

Community feedback regarding on-farm water facilities and other improvements varied with some saying empty dams provided an ideal opportunity to desilt them whilst others stated this wasn’t possible due to little or no income. The uptake of state and commonwealth subsidies to allow for desilting of dams and installation of emergency water infrastructure for animal welfare needs, indicate that some primary producers were taking the opportunity to work on water infrastructure during drought.

“Drought provides an opportunity to clean out dams and improve water storage.”

Community Member

“Inland rail will be one of the biggest, if not the biggest contributors to building drought resilience in the region.”

Community Member

However, for others, finances were not sufficient, and/or they were not able to access affordable labour (or were too elderly to do it themselves) and on-farm improvements, which may have contributed to drought resilience, were not possible.

“During drought, carrying out improvements on properties and infrastructure were not possible.”

Community Member

Clearly for agricultural producers (‘farmers’) the shortage of water has a significant effect of their businesses and lives. However, water available from storage infrastructure (dams and bores) was also a tangible issue for many people in the towns and urban areas. Urban water storages throughout the region were significantly below normal storage levels, water restrictions were imposed in most communities, and the stress of having unreliable water security had a palpable effect on people’s lives. The ability of adequate water storage to reduce the impact of drought on regional economies, people and communities and aquatic ecosystems is potentially very high.

“Not enough catchments (dams), when the rains come the water is wasted overflow and unusable.”

Community Member

Some communities in the Eastern Darling Downs relied on water being transported into their town by road from late 2018 to 2022. Water restrictions were sometimes mentioned as the source of local conflict, and the lack of water for watering gardens and supporting ‘greenery’ often had a tangible, debilitating effect on peoples’ dispositions.

“Council supported landholders by carting free rainwater for domestic on-farm use. Other councils had elaborate water arrangements, so towns didn’t run out of water.”

Community Member

“In towns, private gardens and lawns decline due to restrictions – as do sporting fields – so no green sanctuaries for people.”

Community Member

The impact of this most recent drought has highlighted a number of critical water infrastructure issues in the region:

Local Government Area (LGA)	Issue(s)
Southern Downs	<ul style="list-style-type: none"> Emu Swamp Dam – significant challenges for agriculture as well as lengthy timeframes around construction approvals. Toowoomba to Warwick pipeline – proposed by state government but not necessarily supported by local communities.
Goondiwindi	<ul style="list-style-type: none"> Studies highlighting its susceptibility to water insecurity for agricultural usage.
Toowoomba	<ul style="list-style-type: none"> A recent history of household water usage being restricted. Ground water contamination in Oakey was a significant issue 2016–2020. Competitive rights to water in the New Hope Acland coal mine.
Western Downs	<ul style="list-style-type: none"> Some strong support of Nathan Dam being developed for the region’s improved water.

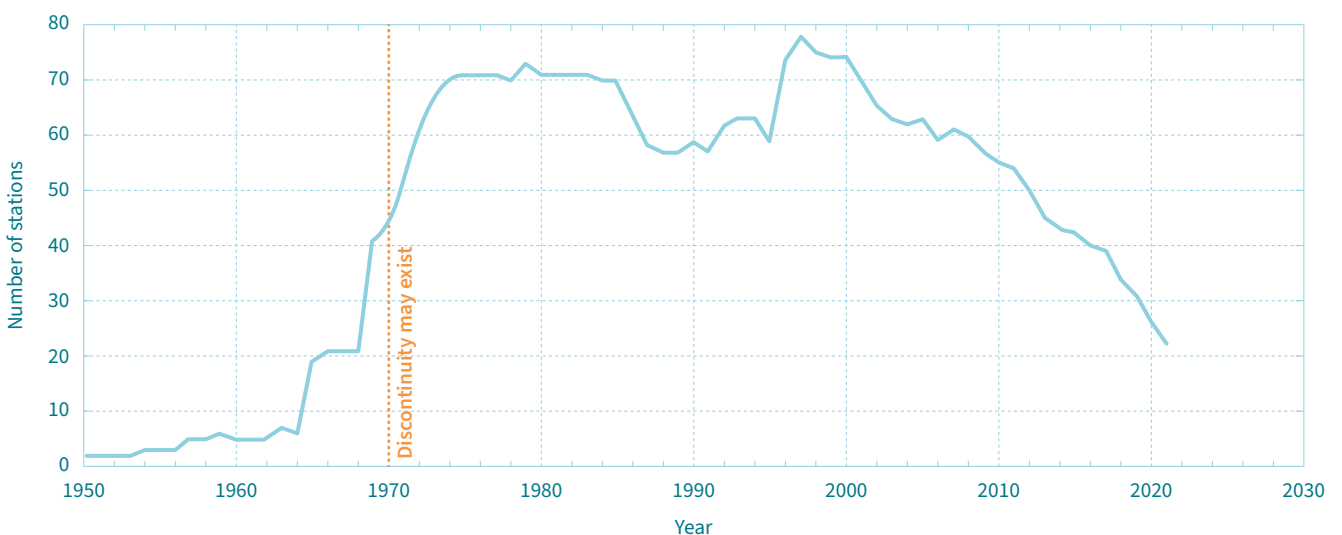
While drought has little or no direct impact on digital connectivity, the most recent drought highlighted the lack of digital connectivity and the flow-on effects on other drought impacts. Many government support or relief programs often require on-line applications and/or the proficient use of computers to access form or information. Even many mental health and counselling services were forced to implement ‘telehealth’ sessions via the internet as their first option. During our engagements, many people remarked how their general ‘community connectivity’ and their access to services decreased during the drought as they were faced with either having to access online (sometimes impossible and often problematic) or faced a long drive to the nearest regional service centre.

The importance of good digital connectivity is critical to reduce some of the impacts of drought. Community feedback regarding the importance of digital connectivity is supported by government reports²⁴, one of which states high quality digital connectivity facilitates social inclusion and connects industries to their markets. The Darling Downs and South West RDA produced a Digital Connectivity Audit and Strategy which

identified the eastern parts of the region are reasonably well serviced in terms of network coverage. Mobile blackspots are more frequent in the western, less populated areas and there are a number of mobile black spots for rural and remote areas within the region.

It has also been identified that having infrastructure associated with measuring climatic conditions is essential for building the capacity of primary producers, and community more generally, to take pre-emptive action leading into drought.²⁵ An example of this essential infrastructure is the Australian Government’s Bureau of Meteorology Weather Watch Radar network that consists of 60 radars across Australia. All of the Darling Downs region have radar coverage. However, infrastructure for measuring evaporation (class A pan evaporation stations) has declined in Queensland from a high of nearly 80 stations in the mid-1990s to a few more than 20 in 2021. The ability to accurately measure evaporation is required to allow the modelling of such things as soil moisture levels. Therefore, grid estimates of evaporation in the Darling Downs region have been less reliable since 2010 due to the decline in the number of stations.

Figure 20: Number of stations in Queensland which reported class A pan evaporation: 1950–2022 (as at 01 March 2022). *Source: Adapted from The Long Paddock – Silo.*



Likely future impacts (risks) of drought in this region

During the engagement period, various stakeholders described the systems at play in the Darling Downs region. Allowing people to explore, share and articulate these complex issues in their own words was critical to developing and working with a common understanding. We then used systems analysis – local, traditional and historical knowledge was ‘blended’ with ‘outside’, ‘expert’/scientific data and information – in order to understand the likely future impacts and scenarios of drought. This meant frankly considering where we are most vulnerable and understanding and highlighting potential risks. Stakeholders were asked to prioritise key findings, and this highlighted a recognition of the diverse range of understanding, values, and perspectives.

The future likely impacts of drought will also be shaped by the compound effects of a range of extreme shocks. The Darling Downs region is affected by national and global ‘megatrends’²⁶, which may exacerbate and compound the effects of drought yet also present opportunities for action and improved drought resilience. Such ‘megatrends’ include: ‘global warming’; climate change and increased climate variability (and costs to humans and infrastructure); an overall ageing population and an ageing (and diminishing) agricultural workforce; decreasing availability of productive agricultural land; increasing global demand for (safe) food; an escalating risk from viruses and antibiotic-resistant bacteria; increasing concerns about global human migration; concerns about the geopolitical status and regional and global security; decreasing rural populations; decline in housing affordability; and increasing infrastructure maintenance costs – to name but a few. A critical megatrend directly affecting agriculture and rural and regional communities is the global transition to low carbon economies and the consequent uptake of low greenhouse gas (GHG) emission technologies for commodities, on-farm energy and supply chain logistics.

The Queensland Government publication ‘Climate Change in the Eastern Downs’²⁷ uses best-practice available data to predict climatic futures. Based on continued high emissions (assuming low GHG emissions will take some time to achieve), it is predicted that in 2030 the Darling Downs region can expect: higher temperatures; hotter and more frequent hot days; harsher fire weather and chance of bushfires; fewer frosts; less rainfall in winter and spring; more intense downpours (and flooding)... and “it is likely that the region will experience more time in drought”.

At the time of writing (May 2022), 61.1% of Queensland, was still drought-declared. In this region, the Western Downs LGA is still drought-declared. In examining the likely future impacts – and in doing so, exploring our risks and vulnerabilities, we have assumed another ‘prolonged’ drought will commence in the region, within 8–12 years. The following likely impacts of the next drought in the region are based on knowledge (traditional, local and ‘outside’) and patterns from the past; trends and future predictions/forecasts from ‘best practice science’ and data sources. They also take into account adaptation pathways already in place, but not the intervention options and alternative adaptation pathways described later in this regional Drought Resilience Plan.



Image: Chinchilla landscape.

People, culture and community

General trends and likely / possible impacts related to drought

Regional population will only increase minimally – mostly in Toowoomba.

	2016	2021	2031
Goondiwindi (R)	10,837	10,660	10,175
Southern Downs (R)	35,622	35,615	36,051
Toowoomba (R)	164,595	169,373	179,132
Western Downs (R)	34,197	34,461	35,065
Queensland	4,848,877	5,224,822	5,901,905

- Fewer people in rural towns and villages.
- Less people in local workforces.
- Drought-affected communities will become more isolated and more ‘remote’.
- Less government services available locally.
- Decreases in social capital, ‘connectedness’ and declines in membership of social institutions/groups.

“Drought will impact the economy, those who can move, will, which leaves lower socio-economic demographic... with this councils reduce services vital to these areas and towns do in some cases dry up.”

Increase in ageing – both ‘on-farm’ and in regional centres and towns/villages.

- Population will be ageing (less capable of heavy manual work, more prone to heat-related illness, and less technically capable of using ‘Ag Tech’ for agricultural practices.

“Exodus of young people from agriculture.”

“Increasing heatwave occurrence in regions already experiencing water stress and/or prolonged drought conditions will exacerbate issues currently facing many rural Queensland communities.”

- Increased heat-related health issues.
- Increased difficulty in (locally) recruiting and retaining capable professional staff to meet health, ‘wellbeing’ and social support needs.
- Increased demand for health support services – especially mental health, drug and alcohol support, suicide prevention.
- Possible increase in crime and social disorder problems.

Economy

General trends and likely / possible impacts related to drought

‘Increase in livestock, fish stock, and crop losses as a result of the exacerbation of drought conditions may result in significant consequences for already strained business owners and communities.’

‘Substantial impacts to the agricultural community and wider sector are almost certain due to the impact of sustained elevated temperatures on crops, livestock, and the exacerbation of pre-existing drought conditions and underlying bushfire risk.’

‘Where the heatwave leads to extended periods of disruption and greater impacts to infrastructure, recovery costs for damage to infrastructure and non-supply periods are likely to be high.’

Source: Queensland State Heatwave Risk Assessment (2021).

“Rural economies will contract without income sources which are ‘drought proof.’”

“Need for rural industries that require little/less water... or those that use recycled water.”

“Higher prices at the supermarket.”

“There will be more volatility of markets.”

“Will there be capacity to ‘fill the cupboards’ during the good seasons to provide for the hard seasons?”

“Droughts lead to less production therefore less money and the flow on affect will continue to affect our small communities.”

“Closure of small towns due to unemployment.”

“Tougher operating conditions lead to financial demise of those unwilling or unable to adapt.”

“There will be diminished equity as the period between drought and rebuild horizon spans generations, not three to five year cycles.”

“Reduced agricultural productivity, reduced profitability, reduced standard of living, degradation of natural assets, reduced quality of life for people currently living in drought prone areas.”

“Spiralling rural debt will deflate the property market.”

Local producers will pass on costs of drought to consumers – increased focus on export markets = higher local prices.

Landscape and natural environment

General trends and likely / possible impacts related to drought

- More hot days and warm spells are projected with very high confidence.
- Fewer frosts are projected with high confidence.
- Average winter rainfall is projected to decrease with high confidence. There is only medium confidence in spring decrease. Changes in summer and autumn are possible but unclear.
- Increased intensity of extreme rainfall events is projected, with high confidence.
- A harsher fire-weather climate in the future (high confidence).
- On annual and decadal basis, natural variability in the climate system can act to either mask or enhance any long-term human induced trend, particularly in the next 20 years and for rainfall.
- The time in drought is projected to increase over the course of the century (medium confidence).

Annual Heat Risk (days over 35°C)

Centre	1991–2020	2030	
		Medium Emissions	High Emissions
Goondiwindi	44.7	54.8	58.5
Dalby	26.3	31.8	36.5
Toowoomba	6.9	7.8	9
Warwick	11.9	12.0	15.0

‘The future impacts of drought on weed extent and density are expected to remain much the same as they are now, thus managing weeds is likely to remain a constant for the foreseeable future.’

Source: CSIRO (2022).

“Under a scenario of more and longer droughts, a number of species will increasingly be threatened particularly where there is poor connectivity between tracts of natural vegetation such as in the Brigalow Belt. In the western areas of the plan area where grazing of natural pastures is dominant, more frequent and severe droughts would be detrimental to ground cover and possibly grassland composition. Increased deep soil cracking with more frequent or intense droughts may particularly affect perennial grasses”.

Source: Queensland State Heatwave Risk Assessment (2021).

Stock routes will continue to play an important role in reducing the impacts of future droughts. These corridors of native vegetation will continue to provide feed for traveling stock whilst also providing intact habitat to support native fauna and flora during times of drought and protection of significant First Nations’ cultural areas. The future extent, purpose and management of stock routes has been under review in Queensland for the past decade.

Infrastructure and built environment

General trends and likely / possible impacts related to drought

‘If continued investments are not made to maintain current water infrastructure, this could pose water security issues for the region and decrease the region’s liveability, as well as affect agricultural capacity.’

Source: Queensland State Heatwave Risk Assessment (2021).

“Decrease in resources for communities due to decrease in local government.”

“We can live with the existing water allocation levels (although we would like more). What we can’t live with is the constant shifting of the ‘line in the sand’ regarding water allocation levels.”

While the condition of soft infrastructure assets such as that associated with digital connectivity, may not be adversely affected by drought climatic conditions, the use of this infrastructure may significantly increase thus putting pressure on the network.

- Increase demand (and use of) online health services (telehealth) – especially mental and physical health support during drought
- Connectivity is also critical in the use of telematics, which is growing in use through innovative agricultural practices.

- Changing climatic conditions will influence the volume, variability and location of crop and livestock production thereby influencing the nature and distance of transportation.
- The extent of stock movements increase as drought starts to take grip and for the medium term after drought has broken.
- The transportation of fodder increases during drought with much of this occurring by road transport. This increase in infrastructure use (rail and road) places increase pressure on the condition of the asset. With the prediction of more and longer droughts, the stress on rail and road infrastructure may increase.
- The cost of freight is a major input cost for primary producers during drought. The predicted increase cost of fuel will impact significantly on farm viability.

‘With the prediction of more and longer droughts and hotter days water supply for urban and rural use will continue to be placed under stress. Lower rainfall and increasing evaporation will cause increase depletion of soil moisture leading to reduced groundwater and surface water supplies.’

Source: The Long Paddock

“Unless our road infrastructure improves, we won’t be able to increase the number of feedlots and size of existing feedlots in this area.”

Building drought resilience in our region

Lessons learnt from the past – stories of resilience

“Hand up and not a handout, look at ways of addressing these issues beforehand, shift in mind sets of water, cropping and farm management, utilising more ag tech for optimising efficiencies, more debt is NOT the answer.”

Community Member

“Prepare for drought because it will come again, water management, drought resilient cropping, returning to small livestock (more conducive to the area), keep building the infrastructure and don't get complacent because times are very good now... diversification of the shire and regional economy for industry sectors that are “immune” to drought.”

Community Member

“Education, farm diversification, industries where tyranny of distance is of benefit, energy investment (need the infrastructure), connecting the region – mobile and internet services, cropping and livestock more conducive to the region and lower environmental impacts, water saving, storage and treatment technologies (bore – heat and pH), scope/develop and awareness of opportunities to investors, and key catalyst investments.”

Community Member

“People need to know what is available. A local extension officer is vital. People need to know them and trust them. They are the eyes and the ears of a community. Must be grass roots and funding allocation must be driven by grass roots.”

Community Member

“Structural adjustments around the what and the how for agricultural land use. What commodities demonstrate adaptive capacity to withstand variability and drought – how can we shift fixed capital to change the mix of on farm commodities away from less suitable commodities... use a risk matrix approach to compare options.”

Community Member

“Drought is not going to be something we will stop in Australia, but what we need to do is look at better ways in managing the land to rely less on water supplies and ensure that we are utilising what we have to its full potential.”

Community Member

“There is a lack of professional, social and emotional support for health workforce in rural and remote areas.”

Community Member

Our vision statement

Strong and healthy people living with the land and resilient to drought.

In examining a range of possible futures, we have contemplated three scenarios:

- one where we **Do Nothing** – where we make little change and we continue on thinking, behaving, and making decisions in the region, much the same as we have in the past
- one where we **Do More** – where we learn, adapt and modify; where we increase the intensity, scope, size or frequency of our actions. This could mean more people; more money, more often, etc
- one where we **Do Things Differently** – where we undertake transformative change and where we move towards making systemic changes.

Key aims and objectives

The objectives guide a set of strategic actions for which investment cases will be developed. Development of both the objectives and priorities have been informed by community feedback and tested with stakeholders.

- A regional drought surveillance program in place that monitors and analyses key indicators of current and emerging environmental (meteorological and landscape), social and economic conditions, which are markers of drought.
- There is widely shared and well-informed regional engagement with managing drought risk for long-term community resilience.
- The region comes together to build drought resilience.
- Widespread enterprise level drought risk management is established across the region.
- Implement measures to limit impacts of drought and better respond to drought.
- Adequate and appropriate drought risk management essential infrastructure in place and stress tested for times of drought.

Establishing priorities

The priority-setting criteria used the overarching and regionally agreed goals of:

- **Infrastructure** that collects, reports and builds knowledge of the cause, impacts and likelihood of occurrence of drought. This knowledge base is essential in taking pre-emptive action to reduce the impacts of drought.
- **Knowledge** of those sections of the community who are most vulnerable and why, to the risks associated with drought.
- **Strategic actions** that build communities capacity to better prepare for, manage and minimize existing impacts and recover from drought.
- **Systems and frameworks** that measure, evaluate and report the community's drought resilience capacity.

This plan also builds on and complements existing regional planning undertaken by the Darling Downs and South West RDA (2019–2020), which identified “five key issues” for the region, namely:

- Population attraction including decentralisation of government services and the settlement of migrants and refugees in regional areas.
- Improving transport and logistics including maintaining road infrastructure, reducing freight costs and improving access to markets.
- Progressing zonal tax incentives.
- Access to energy including meshing the grid i.e. connection to the South Australian power grid.
- Improving digital connectivity.

After reviewing and reflecting on the ideas and issues generated through the analysis from the initial engagements, stakeholders were asked to prioritise the issues from two perspectives: (1) the priority of the issue in terms of its relative importance to the region (2) the priority in terms of the importance of taking action to increase drought resilience.

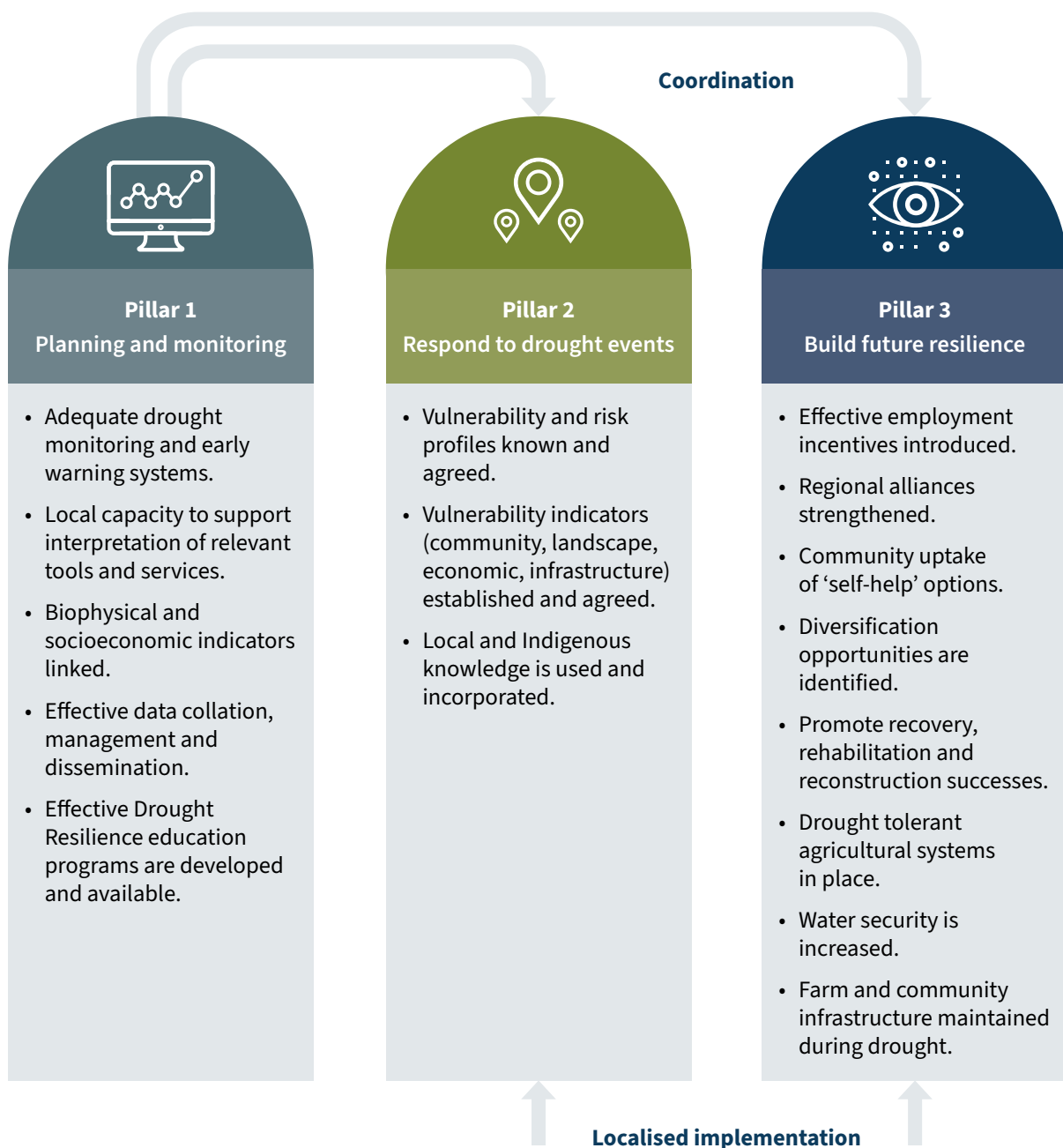
Later, as part of a deliberative and reflective model of co-design, regional stakeholders further prioritised and sequenced pathways and actions prior to development of the final draft of this RDRP. This final review process was informed by additional requested information requested by stakeholders.

The engagement and co-designed planning processes highlighted two significant issues requiring ongoing priority and attention. The need to:

- develop more effective governance structures and arrangements to develop and deliver sustainable drought resilience initiatives – this includes resolving the issue of ‘ownership’ of the RDRPs
- ensure all drought support programs utilise a ‘tiered support’ approach that requires – at its foundation – both enterprises and communities develop a multi-faceted drought resilience plan in order to be eligible for further support.

Key priorities

Figure 21: Three pillars for the Darling Downs Regional Drought Resilience Plan.



RDRP conceptual framework

Drought poses a significant risk to regional communities' economies, health, landscapes and infrastructure. Managing drought to reduce its impacts, needs to follow a simple risk management framework. This plan provides a pathway for establishing a risk management approach to building drought resilience for the Darling Downs communities. It establishes the context, identifies impacts and confirming related risk management activities and requirements, such as risk assessment, management, recording, reporting, monitoring and review. This approach establishes the current risk drought presents and what action is required in future to ensure that ongoing impacts of drought are managed appropriately to reduce its impacts on regional communities.

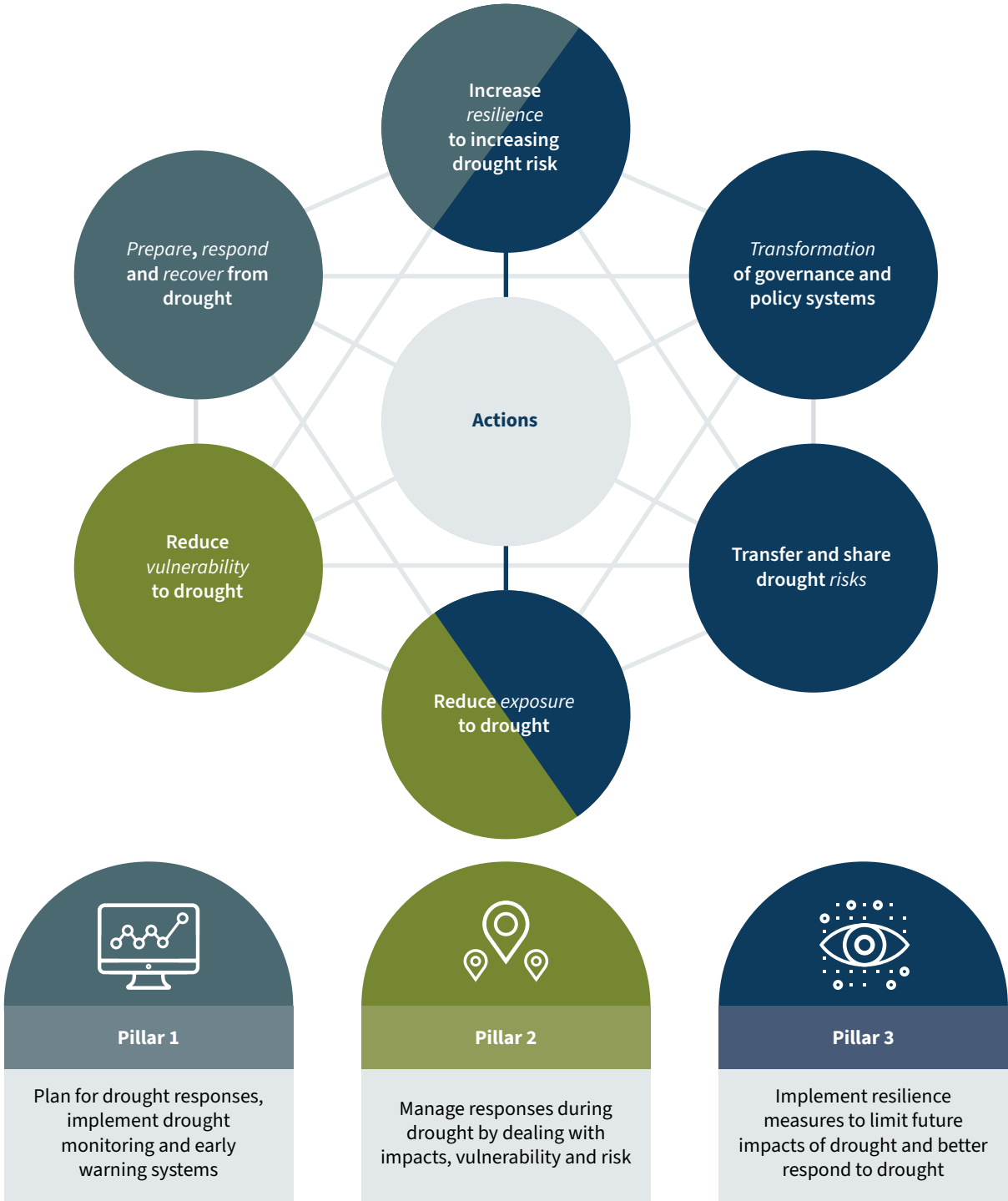
This plan draws on and adapts the 'D-RAMP' model²⁸ (Crossman, 2018) for Drought Resilience, Adaptation and Management that was chosen by stakeholders during early stakeholder engagements for its practical logic and ease-of-use.

The model outlines three pillars to prepare, respond and limit:

- a) Implement drought monitoring, early warning systems and plans for responses
- b) Identify and address those vulnerable and at risk of droughts
- c) Implement measures to limit the impacts of and respond better to drought.

The prioritised strategic pathways and key actions generated by the stakeholders and decision agencies in the Darling Downs region have been summarised under each pillar to develop a unique plan for the region that is consistent with national planning frameworks and also complements other state and regional planning programs. Further details on the underlying framework and key pillars are shown in Figure 22.

Figure 22: Key pillars and actions of the DRAMP framework. Source: Adapted from Crossman, 2018.



Regional Strategy: actions and initiatives

This Regional Drought Resilience Plan is a locally led and regionally coordinated plan and actions will be driven from a regional level. It is acknowledged that some actions require involvement of additional stakeholders such as state or federal agencies, regional governance, local stakeholder groups, charities, NRM bodies and community groups. Where this is the case, actions will be driven through local leadership and while stakeholders may work together to deliver the actions, this plan does not commit these additional stakeholders to any responsibility, resourcing or funding.

The regional actions in this plan most commonly fit one of three categories:

- single actions or initiatives producing a drought resilience outcome across most or all of the region
- actions and initiatives ‘rolled out’ consistently in communities across the region
- actions and initiatives with uniform regional objectives, allowing flexibility in how they are implemented in individual communities.

Although all actions are designed to produce long-term drought resilience outcomes, it is understood some actions may only be ‘triggered’ by the next drought declaration. It is intended the practical implementation of this RDRP will commence with the co-design and development of a detailed Implementation Plan.

→ ACTION PLAN

People, culture and community



Pillar 1 – Planning and monitoring

Projected outcome: A regional drought surveillance program in place that monitors and analyses key indicators of current and emerging environmental (meteorological and landscape), social and economic conditions, which are markers of drought.

Priority	Resilience activity	Priority action
Adequate drought monitoring and early warning systems.	Design effective drought monitoring and early warning systems, integrating climate, soil, water and socioeconomic indicators, along with real time drought assessment products that provide timely information to support decisions. Key stakeholders: Federal and State governments.	Undertake an analysis of what is needed, what is here, what are the gaps of monitoring and early warning systems.
	Invest in developing and maintaining weather and other early warning infrastructure to ensure there is coverage for all Darling Downs at a local scale. Key stakeholder: Regional Development Australia (RDA).	Establish new A pan evaporation measurement stations in the DD region.
Local capacity to support interpretation of relevant tools and services.	Build local teams in the Darling Downs region to provide effective interpretation and usage of drought monitoring, early warning and short time forecasting products. Key stakeholders: Federal and State governments.	Place more climate information dissemination officers – such as Climate Mates – in the region by 2025 to deliver capacity building workshops.



Pillar 2 – Respond to drought events

Projected outcome: A drought risk and vulnerability assessment framework is updated annually to identify and rate the anticipated exposure and sensitivity to harm of the region's communities generally and recognised more vulnerable demographic groups specifically.

Priority	Resilience activity	Priority action
Agreed vulnerability and risk profiles known.	Develop risk profiles of vulnerable groups, including women, children, the elderly, farmers, pastoralists, marginalised communities and Indigenous groups. Key stakeholders: Federal and State governments.	Establish vulnerability indicators for different demographic groups.
	Establish trends in key health indicators of individuals and communities including well-being, population trends and health service provision for Darling Downs. Key stakeholders: Federal and State governments.	Carry out a literature review of existing indicator trends and test these with focus groups.
	Establish 'tipping points' for key health indicators moving through the risk scale of low, medium and high. Key stakeholders: Federal and State governments.	Carry out a literature review of existing 'tipping points' and test these with focus groups.



Pillar 3 – Build future resilience

Projected outcome: There is widely shared and well-informed regional engagement with managing drought risk for long-term community resilience.

Priority	Resilience activity	Priority action
Effective employment incentives introduced.	Introduce employment incentives and opportunities for affected communities in Darling Downs. Key stakeholders: Federal and State governments.	Run six 'think tank' forums around the region to identify potential employment opportunities.
Community uptake of 'self-help' options.	Enhance community's capacity for self-help through having health and financial support workers to be locally based and not only prioritised to areas of greatest need but also to communities that have taken efforts to reduce their vulnerability. Key stakeholder: RDA.	Establish and educate people on how to use local support services to deliver government emergency relief funding for those areas where these do not exist.
Regional alliances strengthened.	Promote social networking/community events in droughts so that "a problem shared is a problem halved". Key stakeholder: RDA.	Run a regional small grants program to encourage social networking events.
Effective Drought Resilience education programs are developed and available.	Develop and implement a comprehensive framework of Drought Resilience education programs, including school education programs, vocational and tertiary programs, 'professional' training programs, training for agricultural enterprises and local businesses, academic programs and research. Key stakeholders: Education providers, businesses, peak associations, Federal and State governments.	Carry out a review of existing available 'drought-related' education. Identify gaps and key lessons learned, as well as recommend a draft framework.

Projected outcome: The region comes together to build drought resilience.

Priority	Resilience activity	Priority action
Regional alliance strengthened.	Increase regional capacity to share drought risk and coordinate drought resilience as a priority for the whole region. Key stakeholders: RDA, Darling Downs and South West Council of Mayors (DDSWCOM), Western Queensland Alliance of Councils (WQAC).	Establish peer to peer learning networks inviting credible local and respected early adopter producers and where possible, laggard adopters supported by knowledge experts as required. Connect the not-for-profit service providers (physical health, education, finance and commerce, NRM and mental health) to each other and the community to develop holistic support programs.

→ ACTION PLAN

Economy



Pillar 1 – Planning and monitoring

Projected outcome: A regional drought surveillance program is implemented that monitors and analyses key indicators of current and emerging environmental (meteorological and landscape), social and economic conditions, which are markers of drought.

Priority	Resilience activity	Priority action
Adequate drought monitoring and early warning systems.	Further develop and fund monitoring frameworks to track farm and town business viability. Key stakeholders: Federal and State governments.	Carry out a desk top analysis of existing monitoring frameworks that track business viability and assess them for appropriateness and currency for this region.
Biophysical and socioeconomic indicators linked.	Establish the link between biophysical, economic and social early warning indicators and that there is regional and local capacity to disseminate these early warnings. Key stakeholders: Federal and State governments, Universities.	Contract a study to establish the links between biophysical and socioeconomic early warning indicators.
Effective data collation, management and dissemination.	Investigate initiatives that focus on improving data collation, management and dissemination for community sustainability priorities. Key Stakeholders: Federal and State governments.	Establish a data users focus group to analyse the practicality of existing data collation, management and dissemination.



Pillar 2 – Respond to drought events

Projected outcome: A drought risk and vulnerability assessment framework is annually updated to identify and rate the anticipated exposure and sensitivity to harm of the region's economy generally and recognised more vulnerable enterprise types, supply chains and financial arrangements specifically.

Priority	Resilience activity	Priority action
Vulnerability and risk profiles known and agreed.	Analyse agricultural enterprise types under medium- and long-term climate change, land condition and market prediction scenarios to establish viability risk profile. Key Stakeholders: Federal and State governments, Universities.	Contract an analysis of enterprise types and their vulnerability to drought impacts.
Vulnerability indicators (community, landscape, economic, infrastructure) established and agreed.	Establish the critical economic inputs that drive business viability in drought and establish trends in those key economic input costs for farming and town businesses. Key Stakeholders: Federal and State governments, Universities.	Contract an analysis of business inputs over a 15-year time frame.
	Establish 'tipping points' for key viability indicators moving through the risk scale of low, medium and high. Key Stakeholders: Federal and State governments, Universities.	Carry out a literature review of existing 'tipping points' and test these with focus groups



Pillar 3 – Build future resilience

Projected outcome: A widespread enterprise level drought risk management is established across the region.

Priority	Resilience activity	Priority action
Promote recovery, rehabilitation and reconstruction successes.	Support free/ low-cost Business Mentoring programs, such as Rural Financial Counsellors, to better prepare farming and town businesses, and to assist them in preparing and planning for and managing their businesses during drought. Key stakeholders: Federal and State governments.	Four extra business mentoring officers to be appointed to regional towns in the region.
Diversification opportunities are identified.	Establish on and off farm business diversification opportunities along with analysis of opportunities, risks, blockers to uptake and establishment costs associated with these diversification opportunities. Key stakeholder: RDA.	Fund four business forums across the region focusing on identifying business diversification options.
Promote recovery, rehabilitation and reconstruction successes.	Design “build back better” approach that reduces risk to viability and enhances preparedness to future droughts by utilizing effective and targeted investments during the recovery, rehabilitation and reconstruction phases. Key stakeholders: Federal and State governments.	Fund two priority projects in the region that focus on improving digital connectivity across the region.

→ ACTION PLAN

Landscape and natural environment



Pillar 1 – Planning and monitoring

Projected outcome: A regional drought surveillance program is implemented that monitors and analyses key indicators of current and emerging environmental (meteorological and landscape), social and economic conditions, which are markers of drought.

Priority	Resilience activity	Priority action
Adequate drought monitoring and early warning systems.	Continue to design participatory, tailored and comprehensive drought monitoring and early warning systems, integrating multi-scale climate, soil and water information. Key stakeholders: Federal and State governments.	Carry out a 'stock take' of existing drought monitoring and early warning systems and identify where opportunities exist to improve coverage and uptake.
	Ensure appropriate hard and soft infrastructure is in place to capture and disseminate early warning indicators. Key stakeholders: Federal and State governments.	
Local capacity to support interpretation of relevant tools and services.	Increase local capacity for effective interpretation and usage of drought monitoring, early warning and short time forecasting products. Key stakeholders: Federal and State governments.	Place more climate information dissemination officers – such as Climate Mates – in the region by 2025 to deliver capacity building workshops.



Pillar 2 – Respond to drought events

Projected outcome: A drought risk and vulnerability assessment framework that is updated each 5 years to identify and rate the anticipated exposure and sensitivity to harm of the region's landscapes generally and recognised more vulnerable waters, lands and ecosystems specifically.

Priority	Resilience activity	Priority action
Vulnerability indicators (community, landscape, economic, infrastructure) established and agreed.	Establish agreed landscape vulnerability and risk indicators for landscapes and natural environment. Key stakeholder: Queensland Department of Environment and Science (DES).	Work with NRM bodies to establish appropriate landscape and natural environment vulnerability and risk indicators.
Local and Indigenous knowledge is being used.	Use local and Indigenous knowledge on drought characteristics, impacts and risks on landscape and natural environment wherever feasible. Key stakeholder: Local Indigenous group.	Establish an Indigenous focus group to identify traditional land management practices they believe will reduce drought impacts on landscapes.

Priority	Resilience activity	Priority action
Promote recovery, rehabilitation and reconstruction successes.	<p>Improve communication and information-sharing processes to increase awareness of risks to landscapes and natural environment associated with drought.</p> <p>Key stakeholders: Climate Centre, Natural Resource Management Bodies (NRM Bodies).</p>	Run five information sharing workshops in region.



Pillar 3 – Build future resilience

Projected outcome: Implement measures to limit impacts of drought and better respond to drought.

Priority	Resilience activity	Priority action
Drought tolerant agricultural systems in place.	<p>Implement land use planning at landscape scale to encourage sustainable land use in drought-prone areas.</p> <p>Key stakeholders: Local and State governments.</p>	Identify what parts of the region are considered highly drought prone.
	<p>Promote agricultural production systems that are drought resistant.</p> <p>Key stakeholders: Industry, NRM Bodies.</p>	<p>Establish a grants program that subsidises the development and implementation of on farm sustainability plans.</p> <p>Establish animal nutrition requirement workshops and services to allow for better animal and pasture management decisions.</p>
	<p>Encourage the cultivation of drought-resistant species and varieties in drought-prone areas to improve crop, meat and fibre yields during drought.</p> <p>Key stakeholders: RDA, DES.</p>	Contribute to existing crop, meat and fibre yield trials.
	<p>Design “build back better” approach that reduces risk to landscape health and enhances preparedness to future droughts by utilising effective and targeted investments during the recovery, rehabilitation and reconstruction phases.</p> <p>Key stakeholders: NRM Bodies, Industry Bodies.</p>	Fund a drought planning program which build producers knowledge of the essential elements required to achieve drought recovery, rehabilitation and reconstruction.

→ ACTION PLAN

Infrastructure and built environment



Pillar 1 – Planning and monitoring

Projected outcome: A regional drought surveillance program in place that monitors and analyses key indicators of current and emerging environmental (meteorological and landscape), social and economic conditions, which are markers of drought.

Priority	Resilience activity	Priority action
Adequate drought monitoring and early warning systems.	Funding infrastructure that provides and/or informs early warning systems is a priority of governments. Key stakeholders: Federal and State governments.	Establish new A pan evaporation measurement stations in the Darling Downs.



Pillar 2 – Respond to drought events

Projected outcome: A drought risk and vulnerability assessment framework is updated each 10 years to identify and rate the anticipated exposure and sensitivity to harm of the region's built infrastructure.

Priority	Resilience activity	Priority action
Vulnerability and risk profiles known and agreed.	The level of infrastructure required to service rural communities is known. Key stakeholders: Local and State governments.	Carry out an analysis of existing drought related infrastructure and whether it meets needs to increase drought resilience.
Vulnerability indicators (community, landscape, economic, infrastructure) established and agreed.	Regular assessment of infrastructure condition and adequacy is carried out. Key stakeholders: Local and State governments.	Carry out an audit of the condition of existing drought related infrastructure.
	Ensure that adequate resources are available to build and maintain essential infrastructure. Key stakeholders: Federal and State governments.	Develop a drought infrastructure maintenance and capital development plan.



Pillar 3 – Build future resilience

Projected outcome: Adequate and appropriate drought risk management for essential infrastructure is in place and stress tested for times of drought.

Priority	Resilience activity	Priority action
Water security is increased.	<p>Increase water supply options through investment in sustainable approaches to water harvesting, locating new potential resources, building new storages and groundwater recharge.</p> <p>Key stakeholders: Federal and State governments.</p>	Establish further options to build water security in the region.
	<p>Implement principles of Integrated Water Resource Management to reduce pressure on water resources and increase availability of water to reduce the number of people exposed to drought impacts.</p> <p>Key stakeholders: NRM Bodies, Local Government.</p>	
Farm and community infrastructure maintained during drought.	<p>Build financial capacity in farm enterprises to allow for the maintenance of property infrastructure during drought.</p> <p>Key stakeholders: Federal and State governments.</p>	Continue the water infrastructure related subsidy schemes.



Image: Desert Paddock. *Source: Scott Bridle.*

Monitoring, evaluation and learning (MEL)

Key Evaluation Questions

The Key Evaluation Questions for the Regional Drought Resilience Plan (the Plan) are:

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

Assumptions underpinning the implementation of the Plan

The FDF MEL plan identified the following assumptions for the plan to be effectively implemented:

Key assumptions affecting outputs to 1–2 year outcomes

- Regional stakeholders have the capacity and capability to participate in strategic planning
- Regional stakeholders are willing to cooperate with each other on regional planning
- Program design is sufficient to give regional stakeholders opportunities to identify and communicate regional drought resilience needs
- Relevant planning at other scales can be aligned
- Regional communities are motivated to take ownership of completed plans and actively seek to implement them
- Communities are willing to share learnings with other regions
- There are sufficient learnings to inform future program design

Key assumptions affecting outcomes from 2+ years

- Supporting consortia of local governments/stakeholders representing a region will result in changes in practice through those regions
- There are sufficient opportunities for regions to implement elements of plans
- Plans contain implementable activities to build drought resilience across Australia
- Regions continue to review, update and implement their plans

These assumptions will need to be monitored during the implementation phase to provide feedback and highlight areas that require further intervention.

Monitoring progress and evaluating outcomes

The following table is based on the relevant FDF MEL framework indicators and the actions developed in this Regional Drought Resilience Plan. The Plan includes a number of indicators against identified actions.

FDF Standard Indicators	Specific Regional Indicators	Evaluation Approach
Outcome level: Impacts 4+ years		
<ul style="list-style-type: none"> • Agricultural landscapes are functional and sustainable, with healthy natural capital (environmental resilience). • Agricultural businesses are self-reliant, productive, and profitable (economic resilience). • Agricultural communities are resourceful, adaptable, and thriving (social resilience). 	<p>Strong and healthy people living with the land and resilient to drought.</p> <ul style="list-style-type: none"> • People, culture and communities: Communities' drought resilience has improved • Economy: Business owners are pursuing opportunities to increase financial security of their business before, during and after drought. • Landscape and natural environment: Land managers are implementing land management practice change to improve the resilience of the landscape and the natural environment to drought. • Infrastructure and built environment: Investing in building, maintaining and improving infrastructure has contributed to increasing the communities' drought resilience. <p>Note 2030 indicators in Action Plan tables.</p>	<p>These longer-term impacts are best captured at a national level by the federal Government through ABARES surveys and other national statistics based on a benchmark and taking into account climate, market and other influences impacting on this outcome.</p>

FDF Standard Indicators	Specific Regional Indicators	Evaluation Approach
Outcome level: Long-term outcomes 4+ years		
<ul style="list-style-type: none"> • Stronger connectedness and greater social capital within communities, contributing to wellbeing and security. • Communities implement transformative activities that improve their resilience to drought. • More primary producers preserve natural capital while also improving productivity and profitability. 	<p>Key Aims and Objectives</p> <ul style="list-style-type: none"> • A regional drought surveillance program is in place that monitors and analyses key indicators of current and emerging environmental (meteorological and landscape), social and economic conditions, which are markers of drought. • There is widely shared and well-informed regional engagement with managing drought risk for long-term community resilience. • The region comes together to build drought resilience. • Widespread enterprise level drought risk management is established across the region. • Measures are implemented to limit impacts of drought and better respond to drought. • Adequate and appropriate drought risk management essential infrastructure in place and stress tested for times of drought. 	<p><i>Critical to regional-level monitoring of, and improvement to, the Plan will be an on-going regional oversight group (ROG) comprising of the Plan ‘owner(s) and key stakeholder representatives. This group would have the role of initiating actions in line with the plan, reviewing progress against the plan objectives and making changes to the Plan as needed to maintain its relevance and usefulness.</i></p> <p>While some of these indicators will be captured in national surveys and statistics as above, monitoring actions that should be taken at regional level by the ROG would include:</p> <ul style="list-style-type: none"> • Monitoring and reporting of regional level indicators that are captured as part of Local Government surveillance, surveys and annual reporting. • Liaising with the regional Drought and Innovation Hub to ensure that key indicators for the region are captured and provided over time. • Recording case studies of changes made and benefits evident as a result of actions taken from the implementation of the Plan.

FDF Standard Indicators	Specific Regional Indicators	Evaluation Approach
Outcome level: Success measures and intermediate outcomes 2–4 years		
<p>Actions have been taken based on the plans</p> <ul style="list-style-type: none"> The majority of plans have had elements implemented. Primary producers and businesses supported to improve their sustainability and resilience. <p>Decisions have been made to implement</p> <ul style="list-style-type: none"> Regional representatives have considered and planned incremental, transitional and transformational opportunities to strengthen resilience. Identified actions, pathways and opportunities (including innovative and transformative) to improve regional drought resilience, mitigate risks and adapt to change. Communities use relevant data and information to better understand their resilience to plan for drought. <p>Capacity has been developed</p> <ul style="list-style-type: none"> Regional leaders are in a stronger position to implement strategic actions, adapt to change and take advantage of opportunities to build economic resilience as they arise. Partnerships, networks and engagement are built between stakeholders managing natural resources. 	<p>The achievement of Key Pillars to underpin the achievement of objectives are:</p> <ol style="list-style-type: none"> Drought monitoring, early warning systems and plans for responses are being developed and refined. Those most vulnerable and at risk of droughts have been identified and steps taken to address their vulnerability. Measures have been initiated to limit the impacts of and respond better to drought. <p>Action steps have been taken in line with the Action Plan tables around the key outcome areas of:</p> <ul style="list-style-type: none"> People, culture and community Economy Landscape and natural environment Infrastructure and built environment <p>Implementation steps have been undertaken as per the Communication engagement table.</p>	<p>Monitoring actions that should be taken at a regional level by the ROG include:</p> <ul style="list-style-type: none"> Recording of steps taken, actions initiated, and resources gained that have been triggered by the Plan framework, strategies and planned actions. Annual reporting and review of plan implementation, engagement, participation, actions, barriers and opportunities to regional stakeholder organisations and government – and changes to the Plan made as needed to best meet regional needs. <p>Should external evaluation be undertaken, as well as taking the national data, above information and annual review into account (against planned actions), a range of regional stakeholders should be interviewed / surveyed to gauge their understanding, engagement and actions they have taken as a result of Plan guidance and initiatives.</p> <p>Types of questions should include:</p> <ul style="list-style-type: none"> Their level of awareness and understanding of the Plan – and how aware they think others are. How invested they are in engaging with other stakeholders around the Plan implementation. How confident they are that they have the skills and resources to make changes highlighted.

FDF Standard Indicators	Specific Regional Indicators	Evaluation Approach
Outcome level: Success measures and intermediate outcomes 2–4 years <i>Continued</i>		
<ul style="list-style-type: none"> Increased community understanding of the region’s current and future drought resilience, considering the region’s unique economic, environmental and social characteristics. Natural resource management capability is improved across region. <p>Regional Stakeholders are involved</p> <ul style="list-style-type: none"> Plans have buy-in from key stakeholders in the region. The number of, and participation in, local networks and programs to enhance drought resilience increases. Communities share knowledge, collaborate and partner with government more often to build drought resilience. Greater sharing of learnings related to drought resilience between communities. 		<ul style="list-style-type: none"> What decisions and/actions they have taken – or aware of – that have been initiated as a result of the Plan. How the Plan has impacted on extra resourcing or support to the region to improve drought resilience. How they think the Plan has added value and made a difference in increasing drought resilience in the region. What is working and what needs to change with respect to the Plan and its effective on-going implementation. Organisations nominated for actions in the Plan including for the communication engagement activities, should also be interviewed to review what was undertaken, how it was done, what response was gained and, if not, why not. Case studies should be further captured/developed to understand/ demonstrate the program logic / the theory of change and inform recommendations for changes / support needed to maximise the Plan effectiveness.
		<p>A critical part of an external review would be find an on-going ROG who were invested in using the Plan as a framework towards improved resilience, outputs and actions arising and how well this was working towards the Plan’s objective.</p> <p>Such external reviewing should be taken annually for the first three years (pilot regions) to provide lessons for plan development and implementation in other regions, then every three years.</p>

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