North West Queensland Regional Drought Resilience Plan

2024–2030

Australian Government
Department of Agriculture, Fisheries and Forestry

Future Drought Fund

Queensland Government

Rural Economies
Centre of Excellence

The North West Queensland Regional Drought Resilience Plan has been developed as a partnership between the Rural Economies Centre of Excellence (RECoE) and the following organisations who will lead implementation of any actions: North West Queensland Regional Organisation of Councils, Cloncurry Shire Council, Mount Isa City Council, Burke Shire Council, Doomadgee Aboriginal Shire Council, Flinders Shire Council, Richmond Shire Council, McKinlay Shire Council, and Carpentaria Shire Council.

The Regional Drought Resilience Planning program is jointly funded through the Australian Government's Future Drought Fund and the Queensland Government. Development of the plan has been supported by the Australian Government (Department of Agriculture, Fisheries and Forestry) and the Queensland Government (Department of Primary Industries).

Acknowledgement of Country

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.

Contact us

drought@daf.qld.gov.au

Call

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Monday, Tuesday, Wednesday and Friday: 8am to 5pm
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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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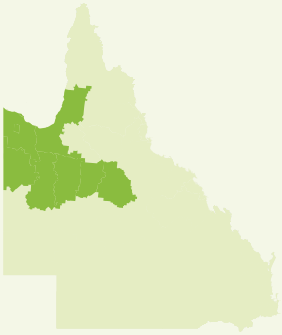


From rugged ochre landscapes to the sparkling waters of the Gulf of Carpentaria, North West Queensland is a place of natural beauty. It is also the home of bustling townships and strong hardy communities, businesses and industries.

Image: Lake Moondarra

The North West region is situated in the north west corner of Queensland with the Northern Territory and northern coastline forming part of our border. Around 30,000 people call our region home, across an area that covers close to 300,000 square kilometres with the main industries including agriculture, mining and tourism.

We are all used to the boom and bust cycles of flood and drought in the North West, but as our landscape, weather and climate continue to change, our drive towards continuous improvement and sustainability for our communities is being challenged.

The Regional Drought Resilience Plan for North West Queensland has been developed as a partnership between the Queensland Government, the North West Queensland Regional Organisation of Councils (NWQROC) and its following member councils: Burke Shire Council, Doomadgee Aboriginal Shire Council, Carpentaria Shire Council, Cloncurry Shire Council, Mount Isa City Council, Richmond Shire Council, Flinders Shire Council and McKinlay Shire Council. The NWQROC is a collaboration of councils with a key focus on delivering shared solutions to common challenges across the North West.

We're working together to make North West Queensland a region attractive for people to live, work and invest. The purpose of this Plan is to guide how we work together to proactively support drought resilience actions and planning across the North both now and into the future.

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

Together, we will build local and regional capacity to improve how we prepare for, recover from and build resilience to drought.

Barry Hughes

Chair

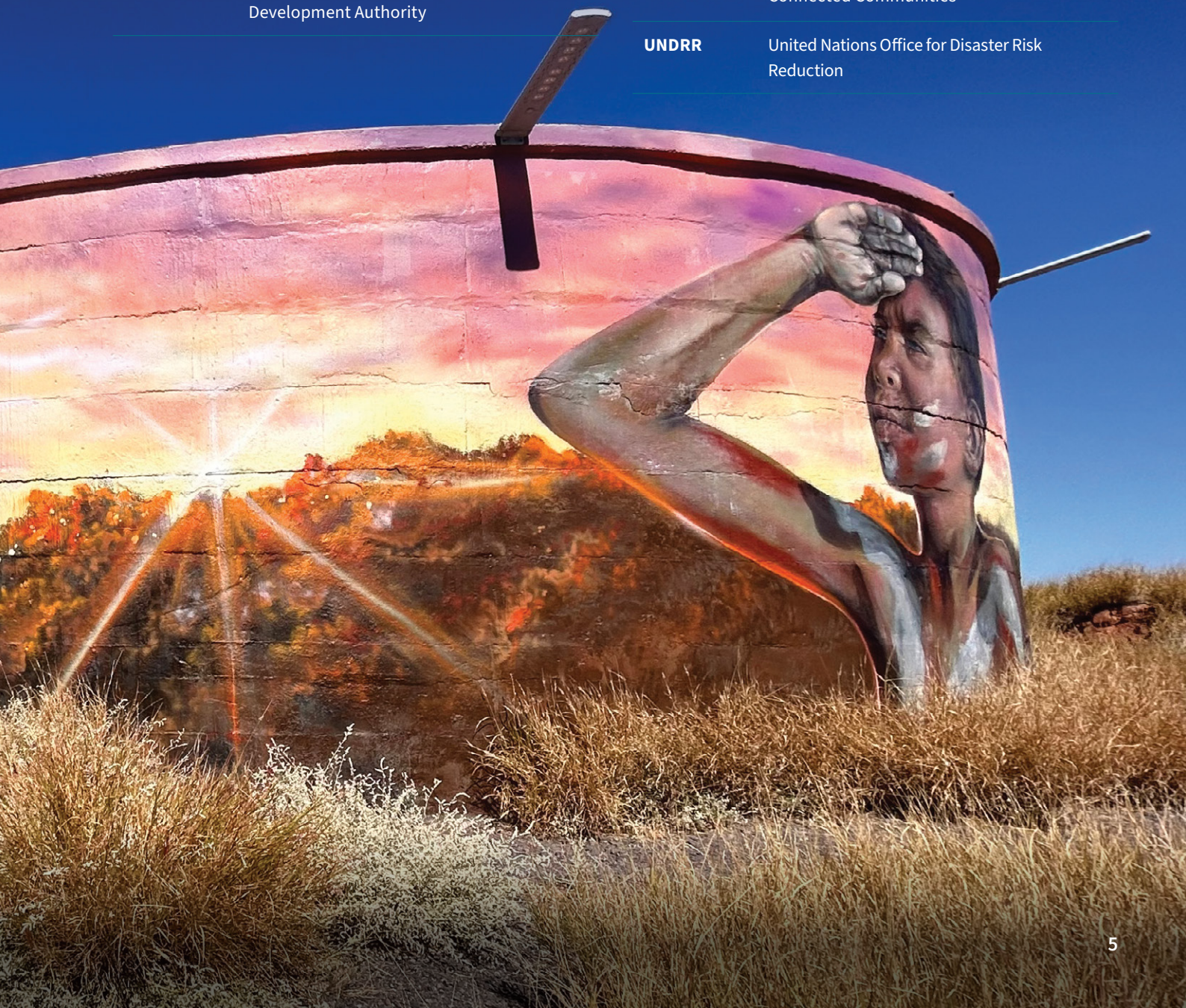
North West Queensland Regional Organisation of Councils

Acronyms

ABS	Australian Bureau of Statistics
ADII	Australian Digital Inclusion Index
ARC	Australian Red Cross
BoM	Bureau of Meteorology
CQU	Central Queensland University
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DNRMMRRD	Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development
DPI	Department of Primary Industries
DDMG	District Disaster Management Group
DETSI	Department of the Environment, Tourism, Science and Innovation
DTET	Department of Trade, Employment and Training
DRAMP	Drought Resilience, Adaptation and Management Policy
DLGWV	Department of Local Government, Water and Volunteers
DSDIP	Department of State Development, Infrastructure and Planning
FDF	Future Drought Fund
FRRR	Foundation for Rural and Regional Renewal
JCU	James Cook University
LDMG	Local Disaster Management Group
LGA	Local Government Area
LGAQ	Local Government Association of Queensland
MITEZ	Mount Isa to Townsville Economic Development Zone
MIWB	Mount Isa Water Board
NEMA	National Emergency Management Agency
NFP	Not for Profit
NRM	Natural Resource Management
NW	North West

Image: Water tank art by Australian artist Joel "The Zookeeper" Fergie, Cloncurry QLD. © Yellow (Kate Lavrencic), 2024.

NWQROC	North West Queensland Regional Organisation of Councils
PHN	Primary Health Network
QFD	Queensland Fire Department
QLD	Queensland
QPS	Queensland Police Service
QPWS	Queensland Parks and Wildlife Service
QRA	Queensland Reconstruction Authority
QRIDA	Queensland Rural and Industry Development Authority
QSDR	Queensland Strategy for Disaster Resilience
RDA	Regional Development Australia
RDRP	Regional Drought Resilience Plan
RECoE	Rural Economies Centre of Excellence
SEIFA	Socio-Economic Indexes for Areas
SGNRM	Southern Gulf Natural Resource Management
TNQ	Tropical North Queensland
TRACC	Tackling Regional Adversity Through Connected Communities
UNDRR	United Nations Office for Disaster Risk Reduction



Introduction

Background

The Regional Drought Resilience Planning (RDRP) program is jointly funded through the Australian Government's Future Drought Fund and the Queensland Government.

The Queensland Department of Primary Industries (DPI) has partnered with the Rural Economies Centre of Excellence (RECoE) with the purpose to have an impact on how regions can survive and thrive into the future.

The RDRP process will:

- foster learning and build social capital
- foster co-designed, community-led planning and collective
- ownership of the resulting plan and its implementation
- leverage existing local, regional and state strategic planning
- recognise the diversity of people, businesses and landscapes involved in agricultural production
- provide linkages with the FDF Drought Resilience Adoption and Innovation Hubs.

Five regions produced RDR plans in the foundational year. In the second round, the remaining nine regions developed RDR plans to prepare for future droughts, with a sharp focus on the agricultural sector and allied industries.

Each plan will build upon the Regional Resilience Strategy as part of the Queensland Government's Strategy for Disaster Resilience, led by the Queensland Reconstruction Authority. Based on evidence and collaboration through partnering with local councils, regional stakeholders and other organisations, the plans – led and owned by the community – aim to drive decisions, actions and investments to proactively manage drought risk.

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

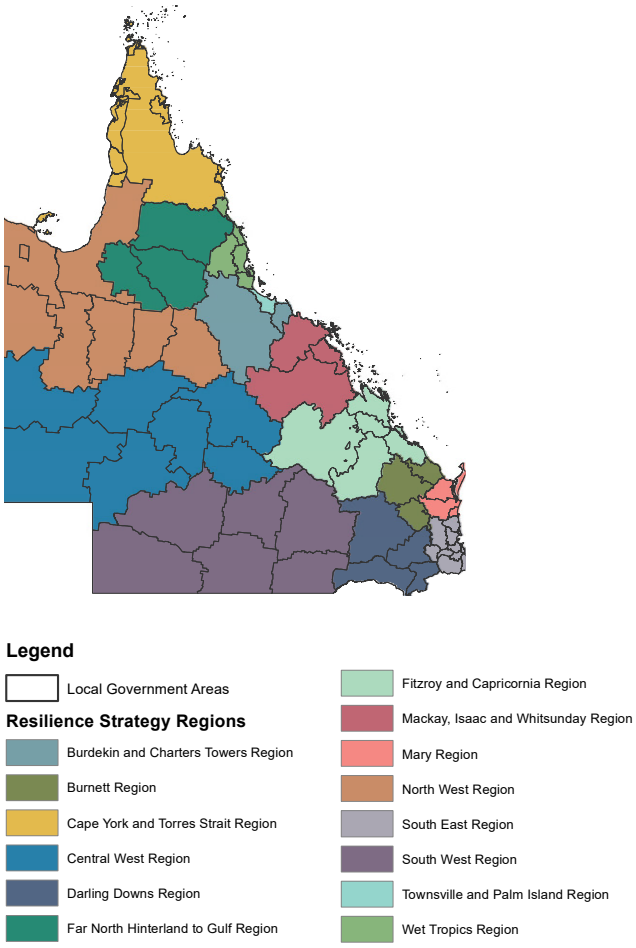
Queensland is the most disaster impacted state in Australia, and Queenslanders are susceptible to a variety of hazards. We are facing unprecedented change in both our current and future operating environment with a dynamic political, social, economic and policy landscape surrounding disaster risk reduction 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*.[12]



Regional planning and engagement

This RDR plan was developed through collaboration between RECoE, the North West Queensland Regional Organisation of Councils and key regional stakeholders.

The engagement model was developed from earlier work undertaken by RECoE, Red Cross Queensland[2], the Queensland Reconstruction Authority (QRA)[3], CSIRO[4] and was informed by international best practice from the World Bank[5] and the UNDRR[6]. 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 trust-building, building on existing networks, local co-design and commitment, risk-informed processes, place-based and regional strategies, locally-led and coordinated solutions and integrated multi-objective responses.

The RDR Plans were formulated through a strategic, **three-phased, co-design and engagement process**. This process involved:

Phase One

Initial consultation interviews with local and regional stakeholders across industries and organisations representing people, culture and community; local economy; natural environment; infrastructure and built environment; and governance. Together with a literature review, information was gathered on the regions profile; historical impacts of drought; future climate trends and existing initiatives; policies and strategies; preliminary insights on themes; and actions for resilience. Initial one-on-one interviews during this phase were based on a series of core engagement questions which sought to understand past impacts of drought on the region, gaps and vulnerabilities highlighted by past or ongoing impacts, and stories of practical or innovative solutions effective in reducing drought impacts for the region. Phase One engagement was delivered through online and in-person interviews, and an online survey.

Phase Two

The first round of engagement included the Regional Drought Resilience Forum. These facilitated workshops with key stakeholders explored preliminary findings and highlighted gaps and needs for resilience in the context of future climate scenarios. Key themes and initiatives raised during Phase One were categorised across the four resilience pillars in this plan:

- People, culture and community
- Economic
- Environmental
- Infrastructure and built environment.

The objective of Phase Two engagement was to build on Phase One by categorising feedback and experiences into key themes and identifying specific actions that could address key gaps and vulnerabilities in the region.

Phase Three

The final phase encompassed the Regional Drought Resilience Online Forum, where key stakeholders across various sectors convened to deliberate on the pathways and actions, offer feedback, and pledge support for the collaborative implementation of the identified actions. This phase of engagement aimed to categorise themes and actions into strategic pathways for resilience.

The NWQROC played an instrumental role in developing the RDR Plan pathways and actions. Representing the North West Queensland Government and non-government organisations, the ROC contributed to the review and feedback at all stages of plan development. Feedback was provided on gaps, needs and resilience actions.

Key stakeholders identified as leaders for the implementation of each pathway were pinpointed and engaged from the outset. Their involvement was instrumental in shaping the RDR Plan's pathways and actions, with a majority participating from the initial round of engagement. Key stakeholders include, but are not limited to, Southern Gulf NRM, Mount Isa Water Board, Sunwater, MITEZ, North Australia Beef Research Council, Regional Development Australia Townsville and North West Queensland, The Department of Local Government, Water and Volunteers, and others. The engagement process also involved key industry and community stakeholders including Queensland Farmers Federation, AgForce, Rural Aid, Drought Angels, the Australian Red Cross, and others.

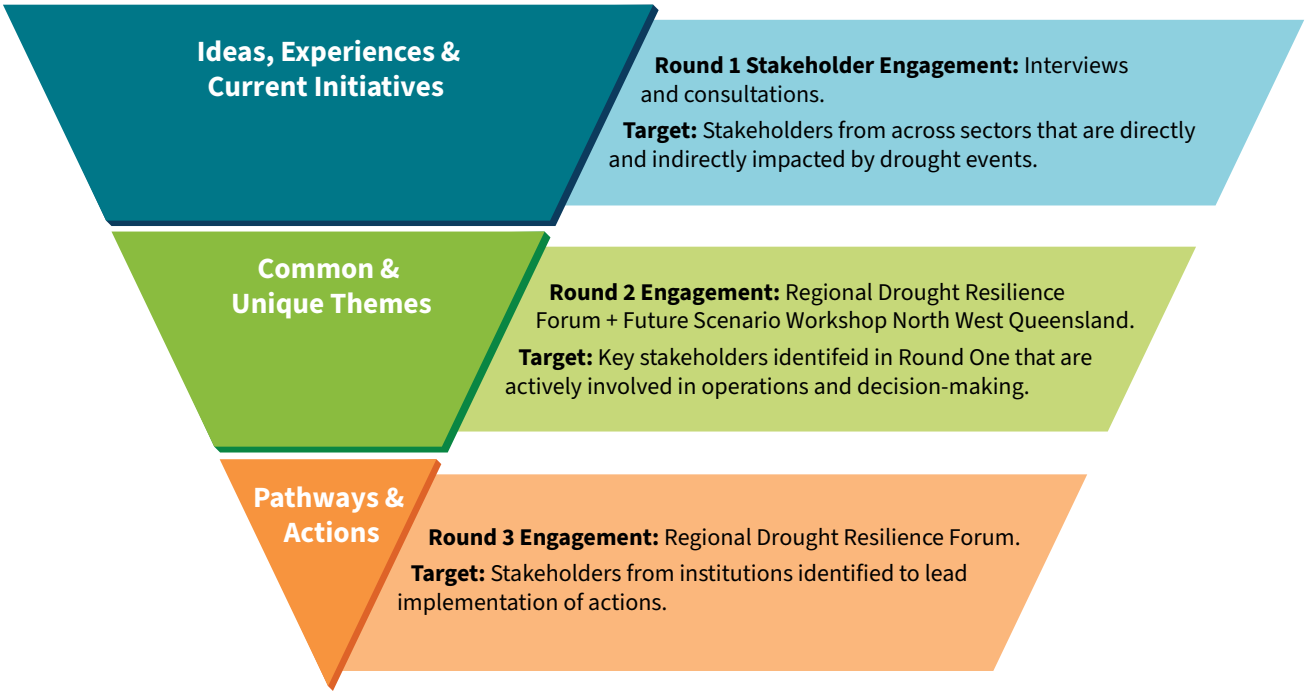
The engagement approach was sensitive to the high levels of reported 'engagement fatigue' in many of the drought-affected communities of the region; large physical distances between key locations; constraints on time for all stakeholders and participants and maximising opportunities to leverage existing partnerships and events where possible. Communities, council and industry in the North West are acutely aware of potential future impacts of drought, as well as gaps and vulnerabilities for the region (experienced during past droughts). The development of this plan involved identifying key themes during Phase One which were tested and prioritised by key stakeholders in Phase Two and Phase Three. These key themes included, but were not limited to, water security and storage; support for businesses and contractors; a need to prioritise proactive over reactive support; consistency and transparency in drought support; improved coordination of services; health and wellbeing; weed and pest management; connectivity and access to weather data. These themes were recurring throughout all phases of engagement.

The objective of Phase Two engagement was to categorise the high-level themes into the four resilience pillars. This was achieved through a prioritisation exercise undertaken by the NWQROC, via an in-person workshop. During the workshop, specific actions or activities were allocated to address gaps identified by the preliminary themes. This exercise undertaken by NWQROC built on the knowledge and experience of stakeholders who were engaged in Phase One.

Phase Three brought themes and activities together into strategic pathways to be included in the plan. These pathways were developed in consultation with the NWQROC, then tested during the Regional Forum with the targeted industry and community organisation representatives – engaged throughout Phase One, Two and Three. The Forum involved the presentation of a future drought scenario to attendees and discussion of the themes and actions defined in Phase Two. The outcome of the Regional Forum was an agreed list of actions and activities, with a final decision on strategic pathways residing with the NWQROC.

An engagement methodology diagram (Figure 2) illustrates the comprehensive engagement process employed. This visual representation aids in understanding the collaborative efforts underpinning the co-design of the RDR Plan pathways, actions, and identification of leading stakeholders.

Figure 2: Co-design engagement methodology with key stakeholders.



The RDRP engagement process was iterative and involved a systems approach that has enabled community reflection on issues, with combined data paying respect to local, traditional and scientific knowledge.

The plan was co-designed with over 60 local stakeholders. We used 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 leverage existing partnerships and events where possible.

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. This plan draws on the experience and feedback from a wide range of local partners and stakeholders including agricultural businesses and associations; Regional Development Australia (RDA); Natural Resource Management (NRM) groups; water authorities; Queensland state government agencies; local government authorities; Not for Profits (NFP) and charities; local businesses; health providers; religious leaders; and producers.

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"*.[7]

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"*.[8] 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"*.[9]

Australia's CSIRO perhaps more specifically states:

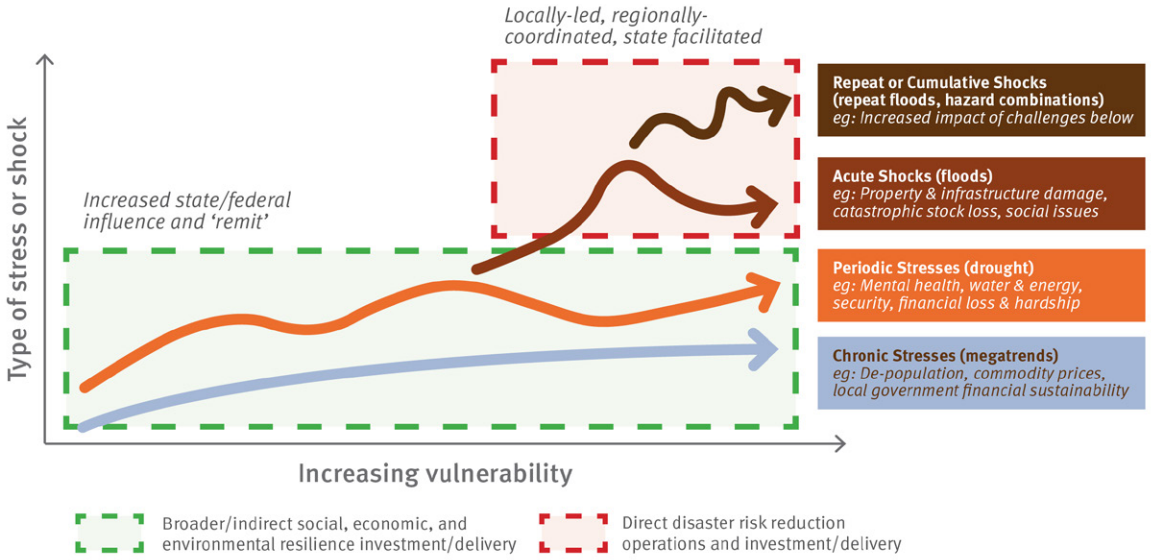
"drought resilience will result in a regional Australia that can endure deeper, longer droughts, and recover from them sooner. This will allow our food and agribusinesses to boost national farm income, increase food security, and protect the regional jobs that rely on agriculture. It will increase the resilience of rural and regional communities that depend on agriculture and improve environmental outcomes".[10]

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

Figure 3: Four key objectives of the *Queensland Strategy for Disaster Resilience 2022–2027*.[13]

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).

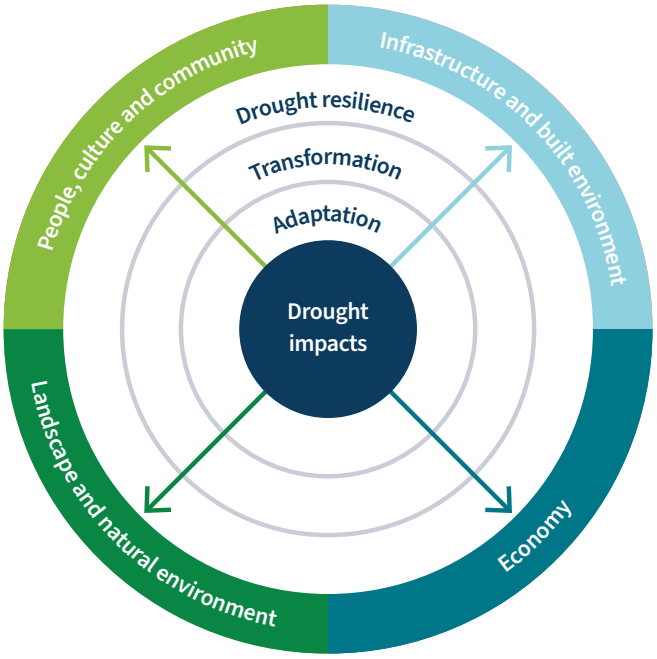
Figure 4: How resilience is affected by stresses and shocks, adapted from the Queensland Strategy for Disaster Resilience 2022–2027.[14]



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".[11]

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 5: Queensland RDRP elements of drought resilience.[15]



How to use this plan

Purpose of this plan

The North West 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 people living, working and servicing the region.

The purpose of this RDRP is to:

- Express the outcomes of the RDRP process and the aspirations and commitments of the region's people.
- Identify and establish critical networks and partnerships to inform and support drought resilience planning and actions.
- Combine the best of local and traditional knowledge with best practice data and information to make informed decisions.
- Clearly identify and plan for the ongoing and future impacts of drought across the region.
- Highlight pathways the region can use to adapt to changes and build drought resilience.
- 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 and builds upon many important works. Some key plans, projects and studies used to inform the development of this plan include:

- *Queensland Strategy for Disaster Resilience*
- *Resilient Queensland*
- *North West Queensland Regional Resilience Strategy*
- *Drought Resilience, Adaptation and Management Policy Framework 2018*
- *Rural and Remote Health and Wellbeing Strategy 2022–2027* (Queensland Government).

Other important linkages

This plan is intended to be considered and factored into a range of other strategies and plans - including (but not limited to):

- 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.

The plan could be considered relevant to charities, non-government organisations, not-for-profits, businesses, and government agencies with an interest in responding to the effects of drought in the region.

Regional profile

The North West Queensland region is made up of eight Local Government Areas of Burke Shire Council, Carpentaria Shire Council, Cloncurry Shire Council, Doomadgee Aboriginal Shire Council, Flinders Shire Council, McKinlay Shire Council, Mount Isa City Council and Richmond Shire Council. The region spans 307,082.2km^2, which occupies approximately 12% of Queensland's land area but is home to less than 1% of the State's population.

The Australian Bureau of Statistics develops the Remoteness Area classification each Census period. In the NW region, 29% of the population were classified as being in very remote Australia and 71% were in the remote Australia category. This is compared to 1.0% very remote and 1.4% remote for Queensland.[16]

The total population of the region is 30,105 people with the largest population residing in Mount Isa and the smallest population in Burke. The median age of the population is 34 years, younger than the statewide median age of 38.4 years. However, while Queensland's population is projected to grow from 5.3 million in 2021 to 7.2 million in 2046, the North West's population is projected to marginally decline by 324 people in the same timeframe. North West Queensland's workforce is made up of 16,851 residents and an additional 3,554 workers from other regions. 7,400 persons (or 25.2%) identified as Aboriginal and/or Torres Strait Islander with 89% of the population of Doomadgee identifying as Indigenous.[17]

Figure 6: North West Queensland regional map.[22]

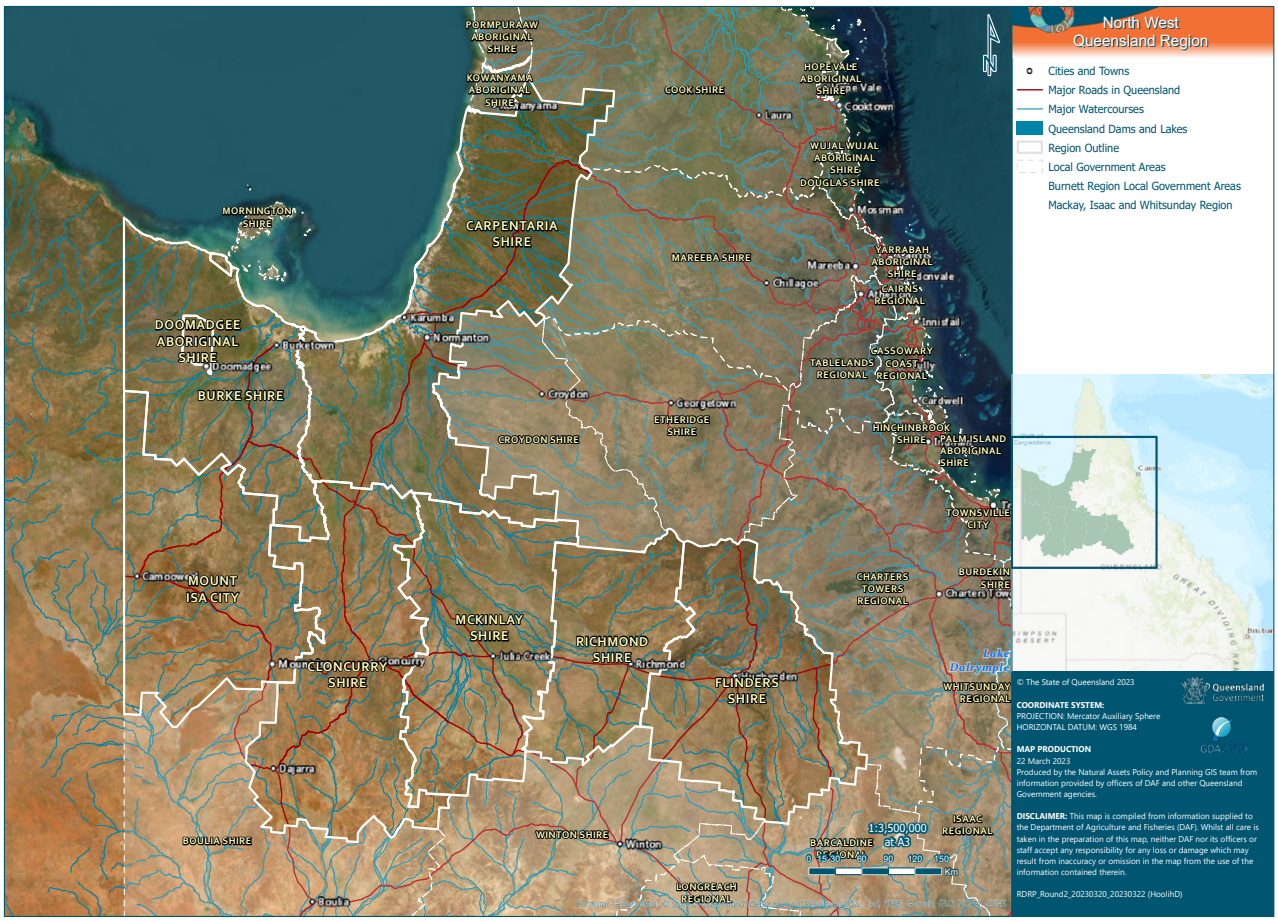


Figure 7: Regional socioeconomic profile.[23]

Burke	Carpentaria	Cloncurry	Doomadgee	Region-wide
Flinders	McKinlay	Mount Isa	Richmond	Queensland
Population (2022)				
432	2,177	3,793	1,445	30,105
1,540	848	19,092	778	5,326,622
Projected population (2046)				
520	2,618	3,958	1,472	29,781
1,133	626	18,760	693	7,299,934
Median age of residents (2021)				
36.3	34.1	34.7	26.5	34
39.5	36.6	31.6	37	38.4
Number of Aboriginal or Torres Strait Islander Peoples				
136	871	868	1,238	7,400
169	43	4,020	55	237,303
People who speak a language other than English at home (2021)				
4.10%	4.20%	4.20%	3.20%	3.81%
2.30%	1.20%	9.70%	1.60%	13.20%
Median total personal income (excl. Government pensions & allowances) ($) (2019)				
$52,393	–	$64,803	$31,278	$53,712
$46,138	$56,084	$70,720	$54,570	$50,298
Australian Digital Inclusion Index (2021)				
45.70%	0.61%	70%	54.10%	66.23%
71.20%	75.30%	79.80%	72.60%	83.70%
Unemployment rate (2021)				
2%	6.70%	4%	17.60%	4.89%
2.40%	0.90%	4.30%	1.20%	5.40%
SEIFA 2016 Socio Economic Index of Social Disadvantage				
921	858	958	548	903
963	1,010	988	978	N/A
Number of registered businesses				
40	179	334	7	2,377
364	246	984	223	485,971
Persons who have need for assistance with core activities				
0.031%	0.026%	2.6%	2.5%	35.19%
4.30%	2.80%	3.30%	2.90%	6%
Protected area – parks, forests, reserves area (ha)				
314,063	388,037	188,205	27,249	702,145
136,347	45	254,317	6,567	15,061,088

Socio-Economic Indexes for Areas (SEIFA)

The Socio-Economic Indexes for Areas combines Census data such as income, education, employment, occupation, housing and family structure to summarise the socioeconomic characteristics of an area. Each area receives a SEIFA score indicating how relatively advantaged or disadvantaged that area is compared with other areas. The digital connectivity of a region is very critical. The Australian Digital Inclusion Index (ADII) measure digital inclusion across three dimensions of Access, Affordability and Digital Ability.[18]

The following table shows the SEIFA and ADII indexes for the North-West LGAs, compared with the Queensland average.

Figure 8: SEIFA and ADII indexes for the North-West LGAs, compared with the Queensland average, 2021 and 2023.[24]

Socio Economic Index of Social Disadvantage (SEIFA)

Burke	941	Carpentaria	850
Cloncurry	965	Doomadgee	534
Flinders	970	McKinlay	1,014
Mount Isa	972	Richmond	1,009
Queensland			996

Australian Digital Inclusion Index (ADII)

Burke	65%	Carpentaria	62%
Cloncurry	67.8%	Doomadgee	57.7%
Flinders	64.6%	McKinlay	70.5%
Mount Isa	69.5%	Richmond	67.6%
Queensland			73%

The data shows a higher level of disadvantage across the different LGAs compared to the Queensland average of 996. Only two LGAs (McKinlay and Richmond) have a SEIFA index above the Queensland average. All LGAs within the North West region are below the Queensland average score for ADII, indicating challenges with digital connectivity. These have implications for resilience and adaptation.

Culture

The North West Region has a rich cultural heritage and recognises the Gangalidda Garawa, Waanyi, Gkuthaarn, Kukatj, Kurtijar, Mitakoodi, Kalkadoon, Pitta Pitta, Tagalaka, Ewamian as the Traditional Owners of respective land across the region. 25.2% of the NW region's population identified as Aboriginal and/or Torres Strait Islander person in the 2021 Census.

Employment, Unemployment and Education

The employment by industry data for 2021 shows the largest industries by employment are mining, agriculture, health care and public administration and safety. Key examples are 23.7% of employed persons worked in Mining industry, 10.5% of employed persons worked in Health care and social assistance industry, and 8.7% in agriculture, forestry and fishing, as illustrated in Figure 7.

The largest employed persons worked as Technicians and trades workers (18.6%) while 15.3% of employed persons worked in the Professionals occupation.

The unemployment in the region was double Queensland at 7.0% (for the June Quarter 2023) compared to Queensland's 3.7%. Within the region, the Burke LGA had the highest unemployment rate of 24.5% while McKinlay and Richmond LGAs had the lowest unemployment rate of 2.2%.[19]

Figure 9: Employment by industry NW, 2021.[25]

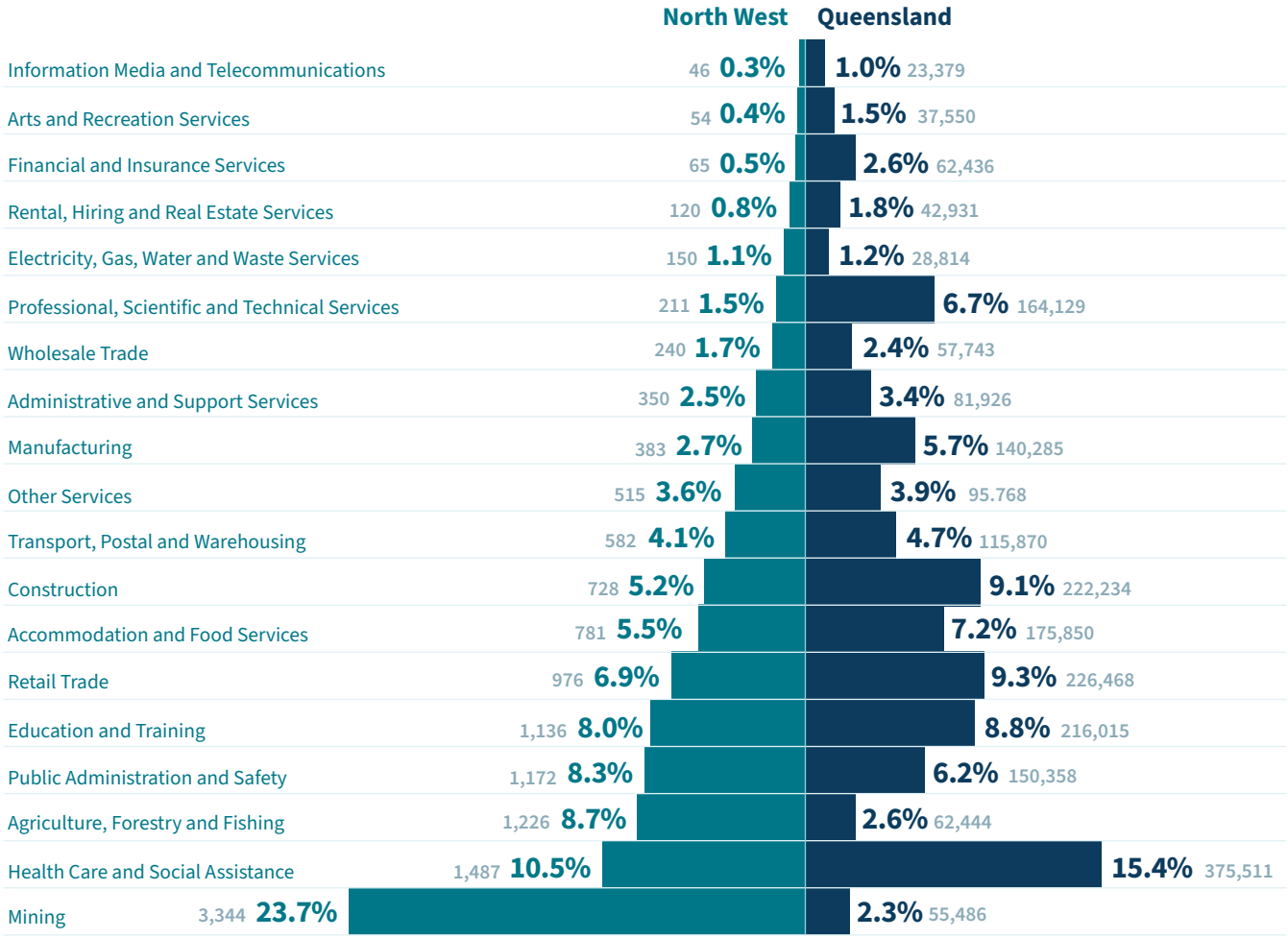
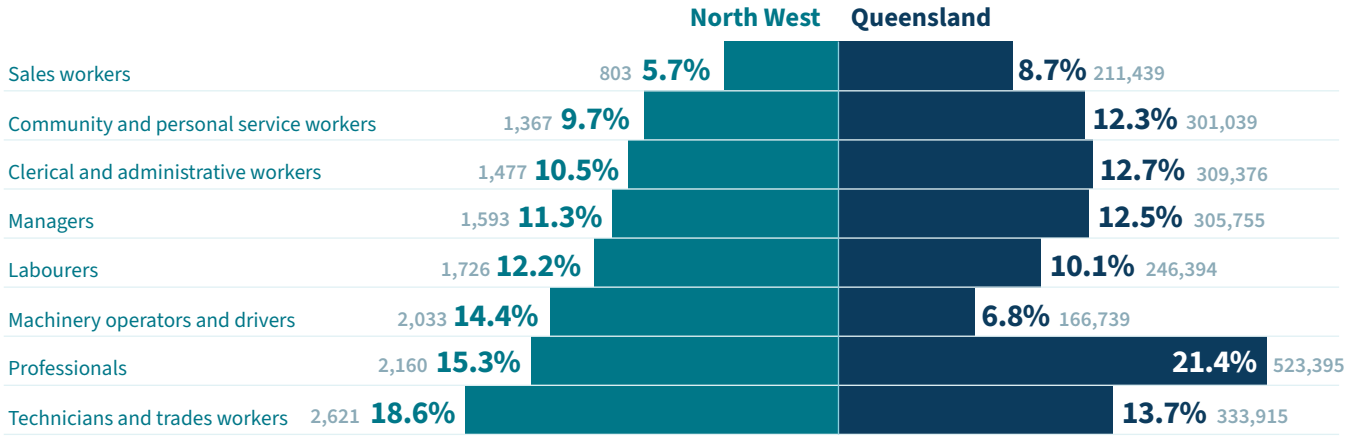
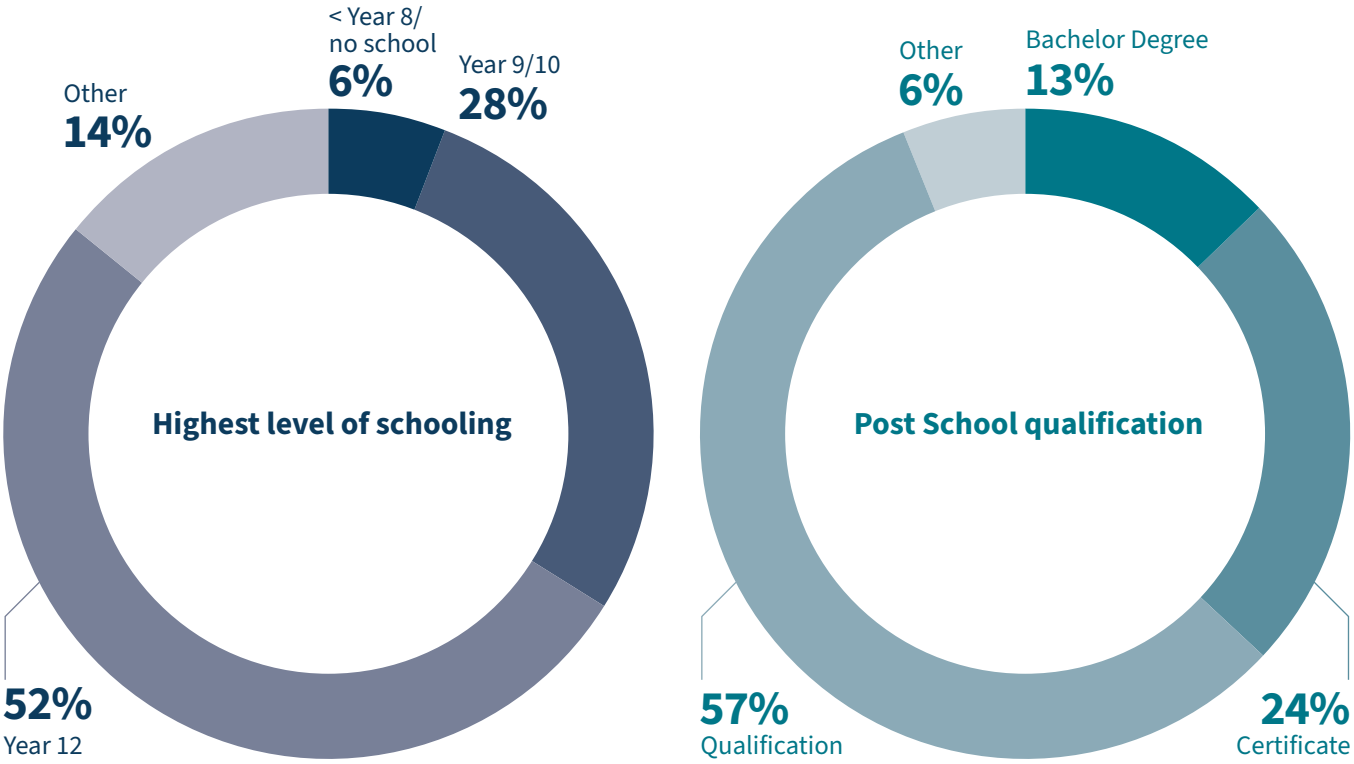


Figure 10: Employment by Occupation, 2021.[26]



The school and post school qualifications are shown in the following diagram.

Figure 11: School and post school education, 2021.[27]



The table below provides the NW region, LGA and Queensland data for school and post school education and qualification.

Table 1: School and post school education, 2021.[28]

	Did not go to school, Year 8/below	Year 9/10	Year 12	Bachelor degree or higher	Certificate	Had a qualification
Burke	4.5	25.3	47.4	8.2	19.8	58.2
Carpentaria	8.6	39.7	39.2	8.1	22.0	49.4
Cloncurry	5.7	26.2	49.4	11.2	24.4	60.0
Doomadgee	12.3	53.5	29.0	7.1	12.3	29.7
Flinders	9.2	30.3	45.1	9.9	19.7	51.2
McKinlay	4.9	26.7	46.2	8.6	22.9	62.1
Mt Isa	5.1	25.9	56.9	14.3	25.9	59.5
Richmond	7.1	30.7	43.3	7.9	21.7	57.3
North West region	**6.0**	**28.5**	**51.9**	**12.5**	**24.2**	**57.2**
Queensland	**4.4**	**24.6**	**63.6**	**21.9**	**22.1**	**62.5**

Overall, the NQ region had a higher percentage of people who were below Year 8 or did not complete school, as well as educating at Years 9 or 10. The NW region was below the Queensland average for completing Year 12. The region scored better with a higher percentage than the Queensland average completing certificates, reflecting the industry profile and employment opportunities. Within the region, Mount Isa had the largest percentage of highest level schooling at Year 11 or 12 (or equivalent) at 56.9%, while Doomadgee had the highest percentage for a level of schooling at Year 8 or below (or did not go to school) at 2.3%. The NW region had 57.2% with a non-school qualification compared to Queensland's 63.5%. Within the region, McKinlay had the largest percentage of persons with a non-school qualification with 62.1% and Doomadgee had the lowest percentage of persons with a non-school qualification with 29.7%. Mt Isa had the highest percentage of people with certificates at 25.9%, which is higher than the Queensland average of 22.1%.

Industries

The North West region is largely driven by three industries:

- **Resources –** mining and mineral processing.
- **Agriculture –** beef cattle production, cropping, fisheries and aquaculture.
- **Tourism –** predominately drive tourism, strong focus on outback experience business and industry – small business/ supply chain and emerging industry sectors.

Resources

Mining and minerals processing is the central source of employment and a significant contributor to the North West Queensland economy. The North West region is identified as one of the world's richest mineral producing areas, containing copper, iron-oxide, gold, uranium, lead and zinc as well as major silver and phosphate deposits and strong rare earth potential. The gross value production (GVP) in 2014–15 of agricultural commodities in the Southern Gulf region was $538 million, 5% of the state GVP for agricultural commodities totalling $11.9 billion in 2016.

Agriculture

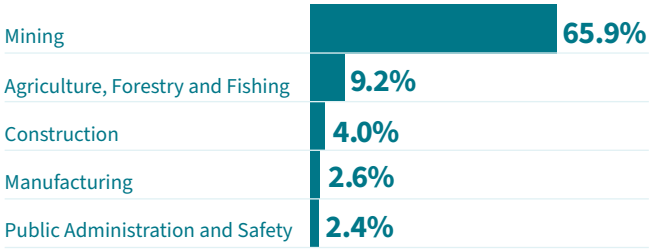
Most of the land tenure in the North West is pastoral leasehold and the region has a long history of pastoral beef, sheep and wool production. According to the North West Queensland Economic Diversification Strategy, Queensland accounted for around 16% of the state's entire herd prior to the floods in 2019. Beef is considered the most profitable farming activity compared to broadacre cropping and other livestock such as sheep. NWQ beef businesses include breeding, backgrounding and finishing beef systems. Many businesses combine all three providing cattle to a variety of different domestic and export to 11 markets throughout the year.

Tourism

The tourism industry is also a key contributor to the economy. Events such as the iconic Julia Creek Dirt 'n' Dust Festival and MIM Rotary Rodeo, carnivals and race days have also been attracting more and more national and international attention. Further, the region's prehistoric history, natural environment, heritage buildings and abundance of wildlife are key attractions for tourists.

The key industries for the North West are summarised in Figure 12.

Figure 12: Key industries in the North West Region.[29]



While the table highlights mining as the major industry, some of the Shires are more dependent on agriculture as their main industry – for example Flinders, Carpentaria, Richmond, Doomadgee and Burke have key industries such as Public Administration and Safety.

Gross Regional Product

North West Queensland's Gross Regional Product was $8.84 billion in 2022, with the highest production coming from Mount Isa, Cloncurry and McKinlay.[20]

NWQROC region councils are reliant on external grant funding, with the average reliance between 2011–12 and 2016–17 ranging from 14.3% in Mount Isa to 57.5% in Carpentaria. However, North West Queensland contributes meaningfully to state and national economic and employment outcomes. The NWQROC economy featured a Gross Regional Product of $5.1 billion in 2016–17, with the region's mining sector accounting for nearly two-thirds of this value in addition to accounting for around 10% of Queensland's total mining sector activity. The broader outback Queensland region also accounted for approximately $2.1 billion or 17% of Queensland's gross value of agricultural production in 2014–15. The region's products have flow on benefits for other regions such as Townsville, Cairns and South East Queensland through processing, port and employment linkages.

Economic challenges and priorities

Water infrastructure is a key priority for the region, with particular focus on improving the provision of assistance through droughts as well as investment in new and affordable water supplies. In 2019, the NWQROC published a Six Point Plan for a Better Deal for NWQ which outlined six key priorities including:

- Fair funding for beef, freight, tourism, roads and railways.
- Power policy for the real world including remote Australia.
- Investing in water infrastructure and dams.
- Build and sustain our productive regions with sustainable populations.
- First world telecommunications and connectivity.
- Funding and delivering community service in a way that works for remote areas.

Regional challenges

Despite the significant natural advantages and opportunities presented across several sectors, the region faces some significant challenges, including:

- eavy reliance on the mining sector and exposure to external influences and decision-making
- limited (and reducing) population base
- severe and prolonged drought
- isolated towns
- local jobs being taken up by non-residents (equating to more than 50% of total available jobs in some Council areas)
- a deteriorating labour market
- ageing infrastructure
- limited access to appropriate education and training
- reliance on external funding and risks associated with government decision making.

Water in North West Queensland

In Queensland, water used for agriculture, forestry and fishing accounts for around 65% of the state's total water use. NWQROC councils provide water supply to 12,190 connections servicing 19 different communities via 26 different water sources (including rivers, bores and dams), 12 Water Treatment Plants and three disinfection schemes. NWQROC councils also provide sewerage services to 11,624 connections in 10 different communities via 10 Sewage Treatment Plants. There are four catchments in the region including Cooper Creek, Diamantina, Georgina, and the Lake Eyre Basin.

SunWater and the Mount Isa Water Board (MIWB) are the main water providers to the region. SunWater operates 19 major dams, 66 weirs and barrages, 82 major pumping stations, 730 kilometres of irrigation drains and 3155 kilometres of pipelines and channels including the North West Queensland Pipeline. MIWB was established in 1974 to carry out water activities in the Mount Isa region. MIWB maintains $135.6 million of water supply and treatment infrastructure, including 86 kilometres of transmission pipeline from Lake Julius to Mount Isa. Each year, MIWB supplies nearly 20,000ML from Lake Moondarra (the city's primary water source) and Lake Julius (the city's secondary water source) to customers. MIWB is responsible for the supply of bulk water to industrial customers and drinking water to Mount Isa City Council, which reticulates drinking water to approximately 20,000 people.

"The most effective way to reduce water consumption is to introduce water restrictions. Water restrictions theoretically allow the water source to last longer under a variety of usages and drought scenarios."

– Mt Isa City Council

Climate

Climate plays a large role in dictating the way of life in the region. North West Queensland has a semi-arid climate with hot humid summers and dry warm winters. It ranges from semi-arid in the south and southwest to tropical monsoonal in the north. Monsoonal rains and cyclones in the summer months can result in prolonged wet periods with many parts of our region becoming isolated, sometimes for several months.

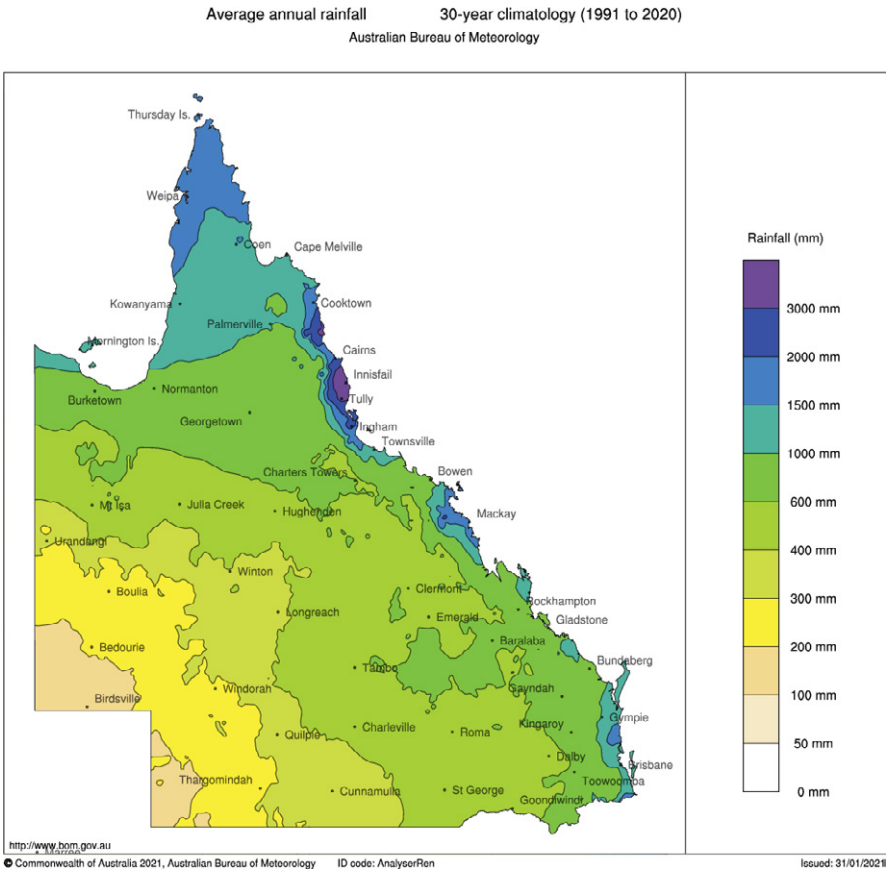
The Southern Gulf region encompasses the southern districts of the Gulf of Carpentaria and the North West Queensland districts. This region experiences a climatic contrast – the North West Queensland district is characterised by a semi-arid climate while the Gulf of Carpentaria experiences a tropical monsoonal climate, yet both areas are typically marked by distinct wet and dry seasons.

Rainfall

Typically, most rain falls between December and March. The rainfall in the region is highly variable year-to-year and within the region – in the Mount Isa region, the mean annual rainfall is 427mm compared to 827mm for the Carpentaria region. The annual rainfall received is strongly linked to the monsoonal systems and tropical lows travelling through the region. Monsoonal rainfall can be sporadic and at times can lead to substantial flooding across the region.

The rainfall in the region shows variability on average is 400–600mm per annum. The rainfall is affected by local factors such as topography and vegetation, and broader scale weather patterns. The following figure illustrated the rainfall patterns in the region.

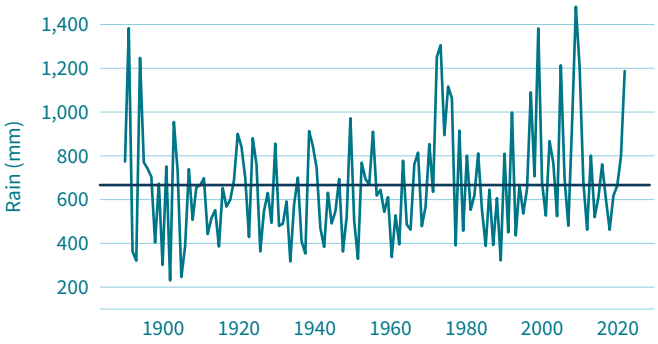
Figure 13: Average annual rainfall, Queensland.[30]



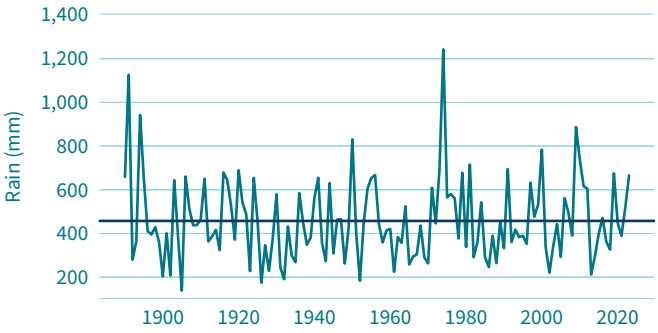
The different rainfall patterns across LGAs in 1900–2020 are illustrated below in Figure 14. These graphs show variability across the seasons and varying rainfall across the North West.

Figure 14: Average rainfall by LGA 1900 to 2020.[31]

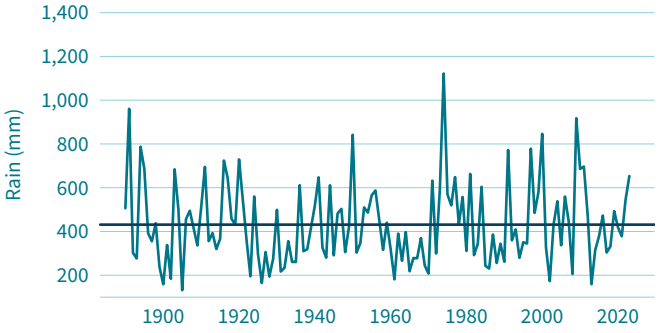
Burke Annual total rainfall (avg = 666.5mm)



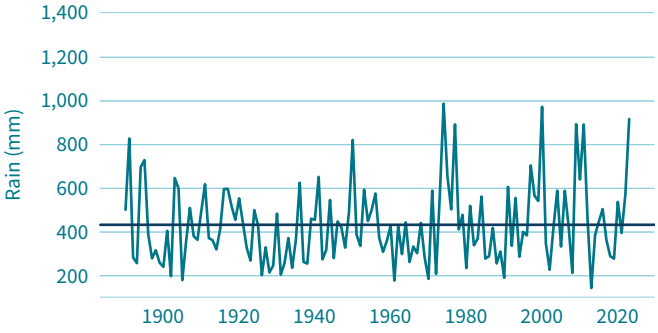
Mckinlay Annual total rainfall (avg = 457.3mm)



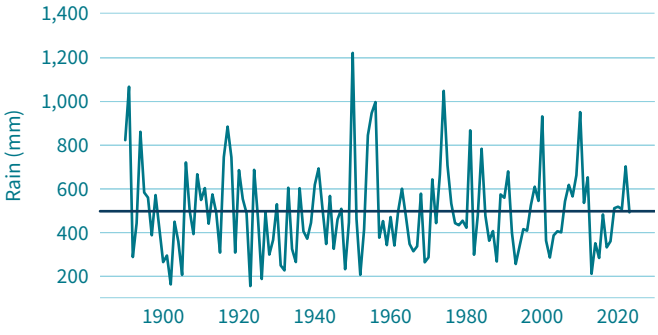
Cloncurry Annual total rainfall (avg = 431.6mm)



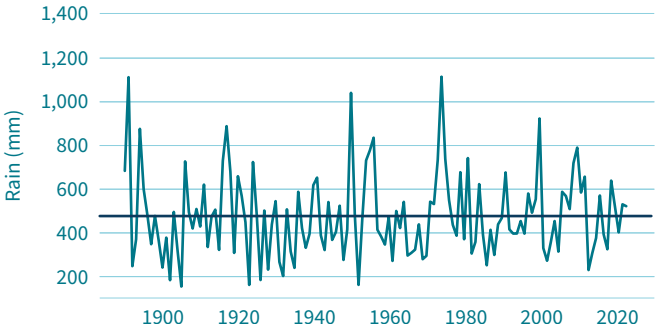
Mount Isa Annual total rainfall (avg = 430.7mm)



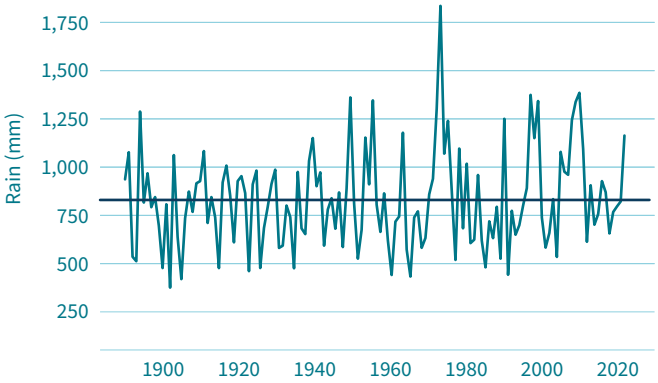
Flinders Annual total rainfall (avg = 497.9mm)



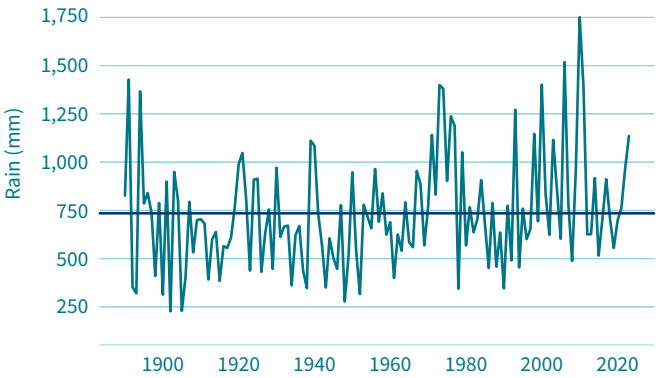
Richmond Annual total rainfall (avg = 477.1mm)



Carpentaria Annual total rainfall (avg = 829.9mm)



Doomadgee Annual total rainfall (avg = 734.8mm)



Temperatures

The Southern Gulf region experiences a dramatic swing in temperatures throughout the year. The average temperatures are a comfortable 24 – 30 degrees but can be extreme at each end of the spectrum.

During winter, particularly in the southern areas such as Mount Isa and Hughenden, the temperatures can plummet to below zero. In contrast, the summer can bring scorching heatwaves with temperatures soaring to 46.9 degrees, as recorded in Cloncurry in 2006.

Examples of minimum and maximum temperatures are provided from two LGAs to demonstrate the range of temperatures in the region, with similar ranges in the other LGAs.

Figure 15: Temperature ranges for the Southern Gulf.[32]

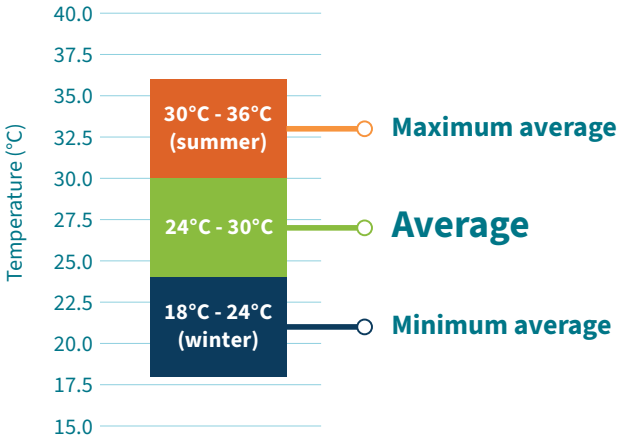
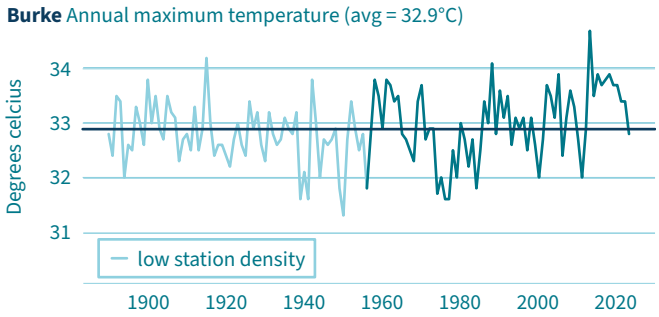
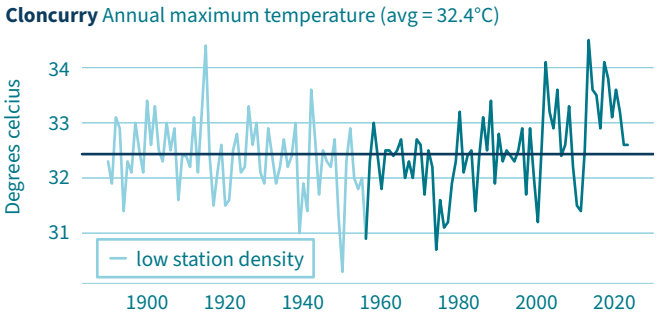
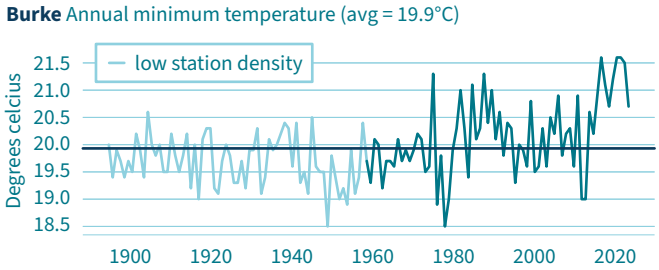
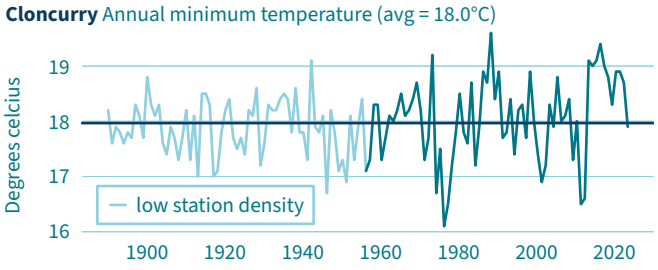


Figure 16: Maximum and Minimum Temperatures 1900–2020.[33]





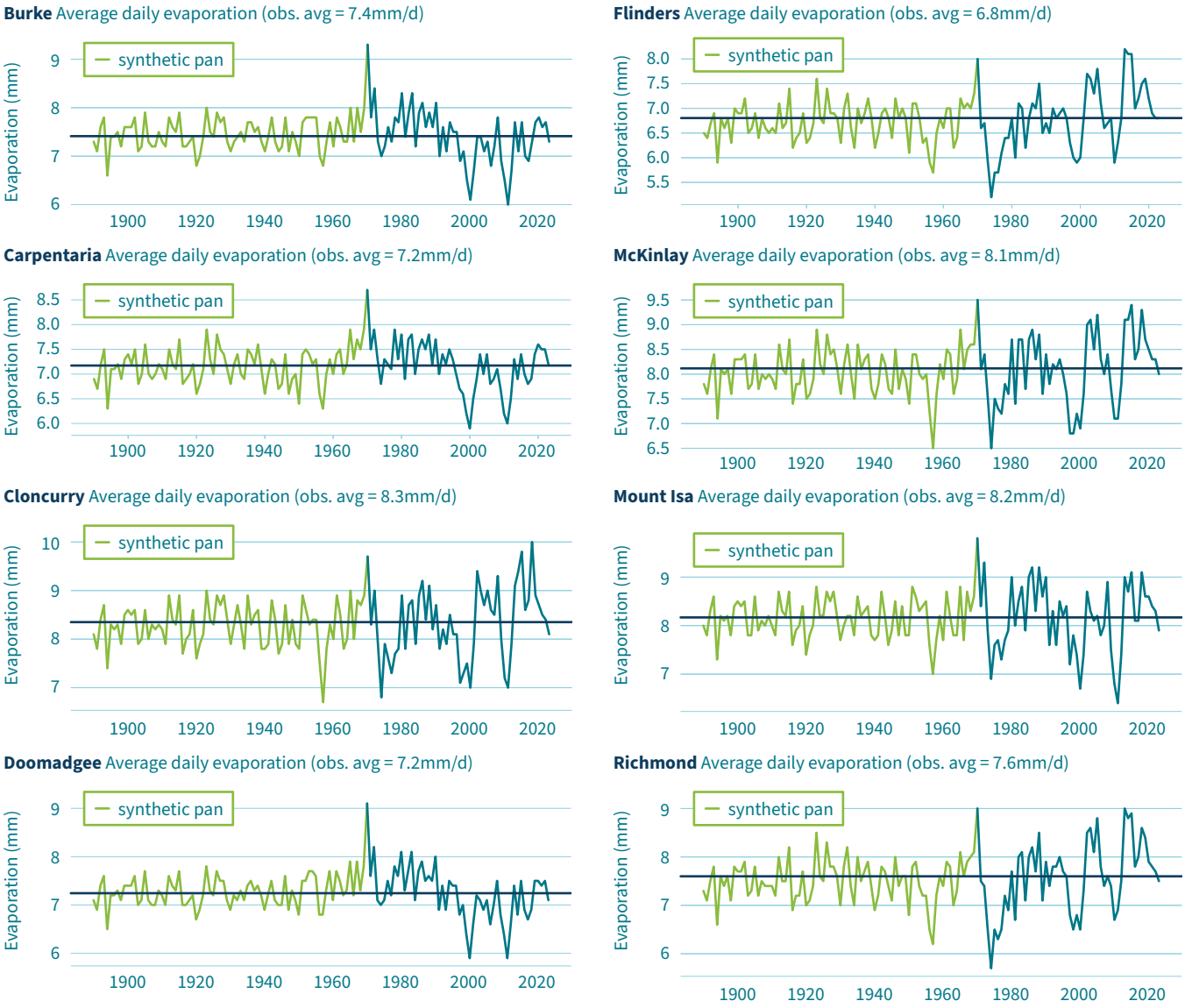




Evaporation

Rates of evaporation tend to become higher further from a coastline due to hotter and drier conditions generally experienced in inland areas. In northern areas such as Burketown, the mean daily evaporation level is 6.5mm compared to 8.4mm in Mount Isa. On a more long-term regional scale, this equates to an average loss of about 2400-3200mm per year. The evaporation rate increases across all locations between September through December during warmer weather and high daily solar exposure levels – depleting surface water reservoirs but also soil moisture – impacting growth and productivity of pastures. The region's annual average potential evaporation is approximately four times the annual average rainfall[21], with flow on impacts from dams, depletion of soil moisture, fire risks and impacts on flora/fauna ecosystems.

Figure 17: Annual daily evaporation by LGA, 1900–2020.[34]



History of drought in this region

Drought is a feature of Australia's landscape with large impacts. The Queensland Drought Duration Report shows since 1964, local government areas in the North West region have had drought declared for anywhere between 5% and 50% of the time.

While this metric provides an insight into the time spent in drought, it does not provide an insight to the severity of drought. According to Figure 18, McKinlay, Richmond and Flinders spend more time in drought than any of the other North West Queensland LGAs.

Notable drought events in the North West include the:

- Federation Drought 1895–1902
- 1914–1915 drought
- World War II drought 1937–1945
- 1982–1983 drought
- Millenium Drought
- 2017–2019 drought.

Each year shows considerable variability across the local government areas. The following figure illustrates the drought declarations for the NW region.

During engagement, communities reported the past two wet seasons have been successful for the region. Rainfall and flooding in the region between 2019–2022 has created profitable conditions for producers. June 2023 marked the first month in more than a decade where the region did not have at least one drought declared local government area. While communities were positive about the recent successful wet seasons, many were concerned about drier times to come, particularly following the Bureau of Meteorology's El Nino declaration in September 2023.

Figure 18: Time drought declared since 1964.[35]

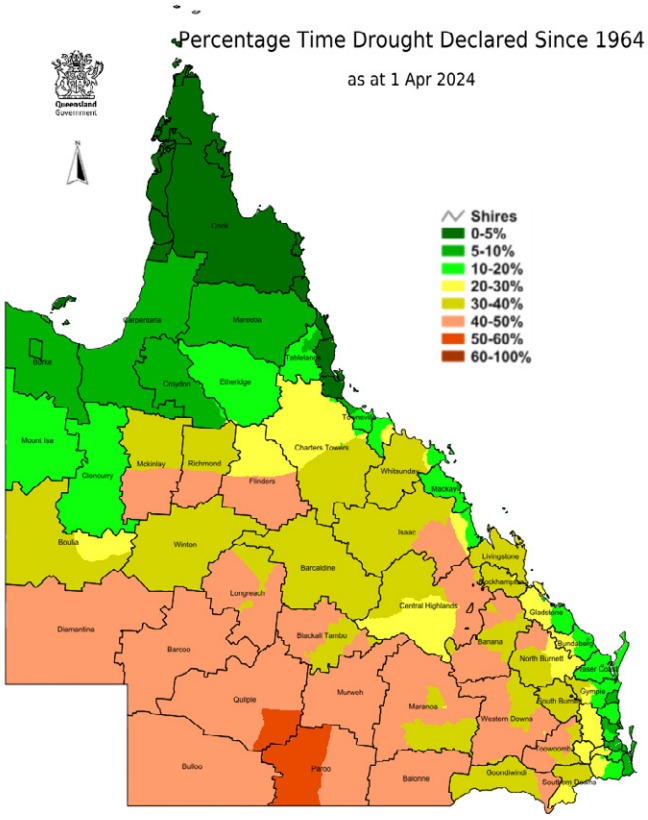
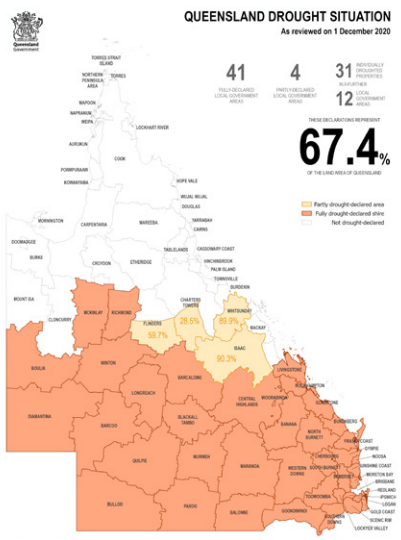


Figure 19: Drought declaration, 2020–2026.[36]

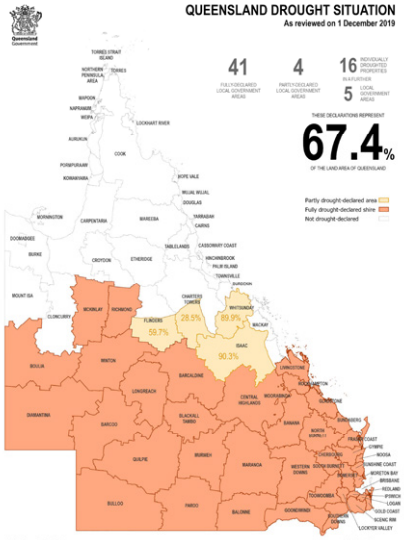
2020

McKinlay and Richmond fully drought declared, Richmond 60% declared



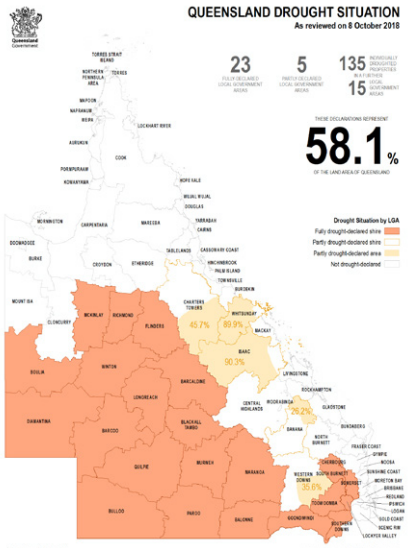
2019

McKinlay and Richmond fully drought declared, Richmond 60% declared



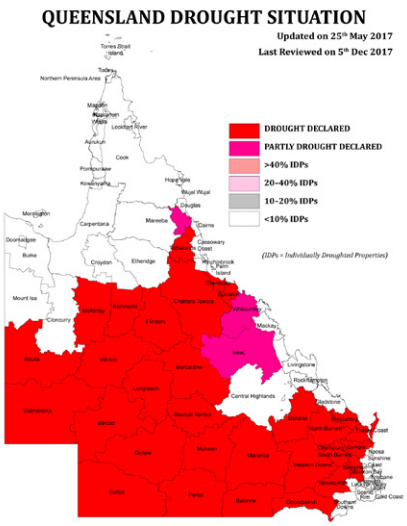
2018

McKinlay, Richmond, Flinders drought declared



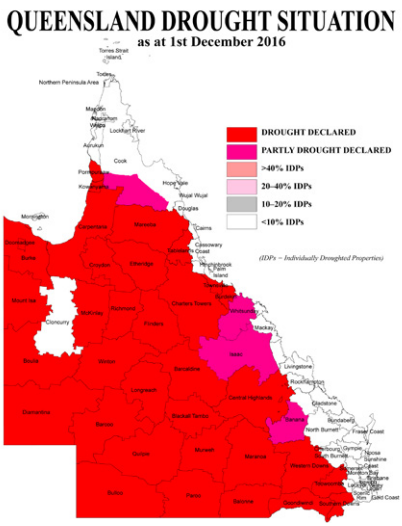
2017

McKinlay, Richmond, Flinders drought declared



2016

Most of NW drought declared



Past impacts of drought in this region

The North West region has a sound understanding of the impacts of drought through lived experience. The understanding of drought in the North West is linked with weather conditions that are strongly correlated with higher temperatures, increased evaporation, heatwave, and reductions in rainfall. As outlined previously, several LGAs have been drought declared or partially drought declared over the last several decades.

In a region built on cattle production and mineral mining, the impacts of drought are felt across many industries. The pastoral industry has experienced the financial stress when faced with reduced pasture availability and left with no options but to supplement feeds, relocate cattle or risk losing them to the extreme drought conditions further degrading the remaining pastures for future herds. These severe events have also been connected to the mental health of pastoral holders as they can struggle to deal with the aftermath of the effects of drought on their cattle and finances.

In communities, the effects of drought have seen families leave the region. The extreme temperatures can be unbearable, the dry and dusty conditions exacerbate chronic health conditions such as asthma and eczema (especially in the young) and the lack of water resources for recreation reduces liveability, forcing many to seek more habitable areas. In the region, this has created a ripple effect from the droughts experienced as the communities have lost critical community roles such as doctors, teachers, and other specialists, leaving gaps in vital services and increasing the challenges for those remaining.

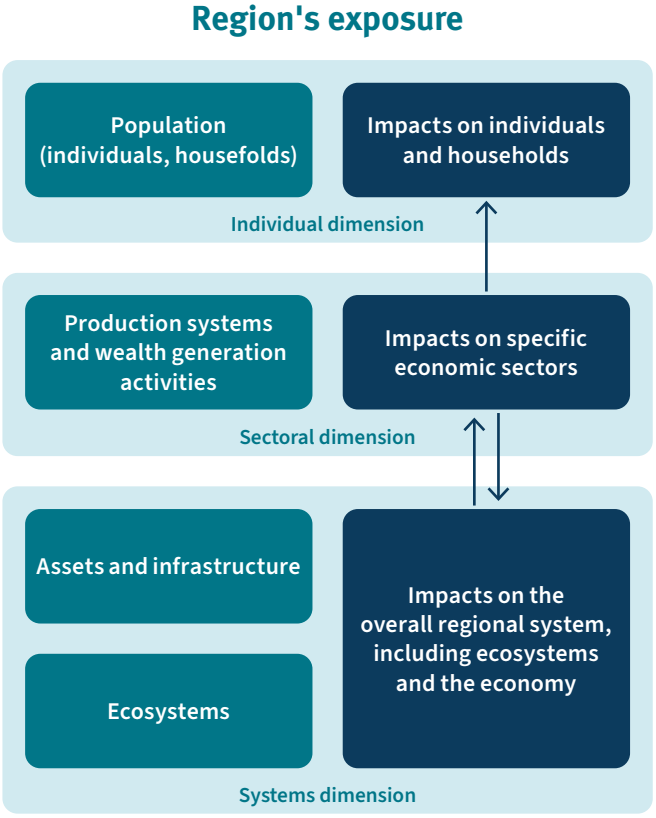
The hot and dry conditions experienced by drought have also led to devastating wildfires across vast areas of land that can have detrimental effects on the sensitive species of flora and fauna. The dry conditions and high fuel loads of highly flammable vegetation have seen thousands of hectares of pasture burnt out for weeks at a time. These uncontrolled wildfires, such as those which travelled across the region in 2011 and 2012, destroyed critical habitats for species such as the Carpentarian Grasswren (Amytornis dorotheae), later listed as endangered in 2016. The loss of vital vegetation over extensive areas led to a notable decrease in biodiversity due to a loss of habitat and valuable pasture, and exacerbated soil erosion potential.

"You have no control. Drought is insidious. You know it's there, but it's the unknown."

– Resident, Mount Isa

Drought is difficult to define for this region because of its nuanced impacts where neighbours can be impacted at different times and in vastly different ways. For some, drought is prescribed as one or two failed wets, for others, it's manifestation in their business practices shows reduced grass, feed and capacity to run cattle. For all, early decision making is a key contributor to managing dry periods. Some producers have their own strategies for ensuring they act as quickly as possible. Locals know to prepare to make tough decisions between March and May if there's been a failed wet by February.

Figure 20: Dimensions of cost of drought.[43]



"The faster you can make a decision, the better."

– Resident, Cloncurry

"You know it's drought when you're starting to change your practices."

– Resident, Cloncurry

While a single unified definition of drought was not identified in the region, engagement in the region found the impacts of drought are felt broadly across the community, economy, environment and infrastructure, with communities conceptualising drought in real terms.

In considering the impacts of drought across different pillars, CSIRO[37] argues we must understand all potential factors. It is critical to note there are compounding factors and events with multiple effects across the social, environmental and economic aspects – in considering the impacts of drought across different pillars. For this reason, CSIRO[38] proposes a model to cost all potential individual sectoral and systems dimensions.

Based on the multiple facets of nature, the different impacts of drought are outlined based on findings from extensive consultations.

People, culture and community

North West Queenslanders identify as being resilient and enduring in the face of relentless weather cycles. Severe weather has always been part of life in the region and is expected to continue into the future.

"We would not still be here if we are not already resilient."

Disasters, particularly cumulative events, can erode even highly resilient people and communities over time. During shock events like floods, communities report a higher sense of unity and mateship, banding together to support each other in the clean-up and recovery efforts. Figure 21 adapted by the Australian Institute for Disaster Resilience from Cohen and Ahearn (1980) and DeWolfe (2000) shows some common reactions, experiences and emotions that may be experienced by individuals and communities following disasters and before they feel they are able to get 'back on their feet'. The timeframes in the figure are notional and may vary depending on a range of factors including past experiences and capacity to respond and recover[39].

In the North West, agricultural support agencies such as Drought Angels and Rural Aid have reported when it comes to managing the impacts of drought, it's usually the combination of impacts – not the drought or single disaster event itself – tipping them over the edge to seek help.

"People can usually deal with one thing but when it's multiple things, their health starts to decline."

Communities talk about the emotional drain associated with drought which is linked to its effects on all areas of life.

"A drought is overwhelming sadness because all of the things are dying – trees, animals, birds fall out of the sky."

– Resident, Mount Isa

During prolonged droughts, farmers are consumed by managing their property and spend less time off the farm. When producers are facing their second or third year in drought, the stress can leave them mentally and physically drained.

For the broader community, drought can also impact their general liveability and lifestyle. Water is central to recreation in parts of the North West and past dry periods have reduced the community's ability to enjoy water sports which contribute to connectedness, mental and physical wellbeing.

Past droughts have also impacted the 'oasis effect' of public spaces. One Cloncurry resident reported during the 2014 dry season, it became so dry, the planting throughout the town's nature strips died under the conditions.

"There is an oasis effect from having lush green spaces for community and dry conditions reduce the positive impact of those spaces."

Water is central to the cultural practices and wellbeing of Traditional Owners and First Nations communities. Drought impacts family, land and water which means that during dry periods, cultural and recreational practices such as fishing and camping are impacted.

"Our water is our life."

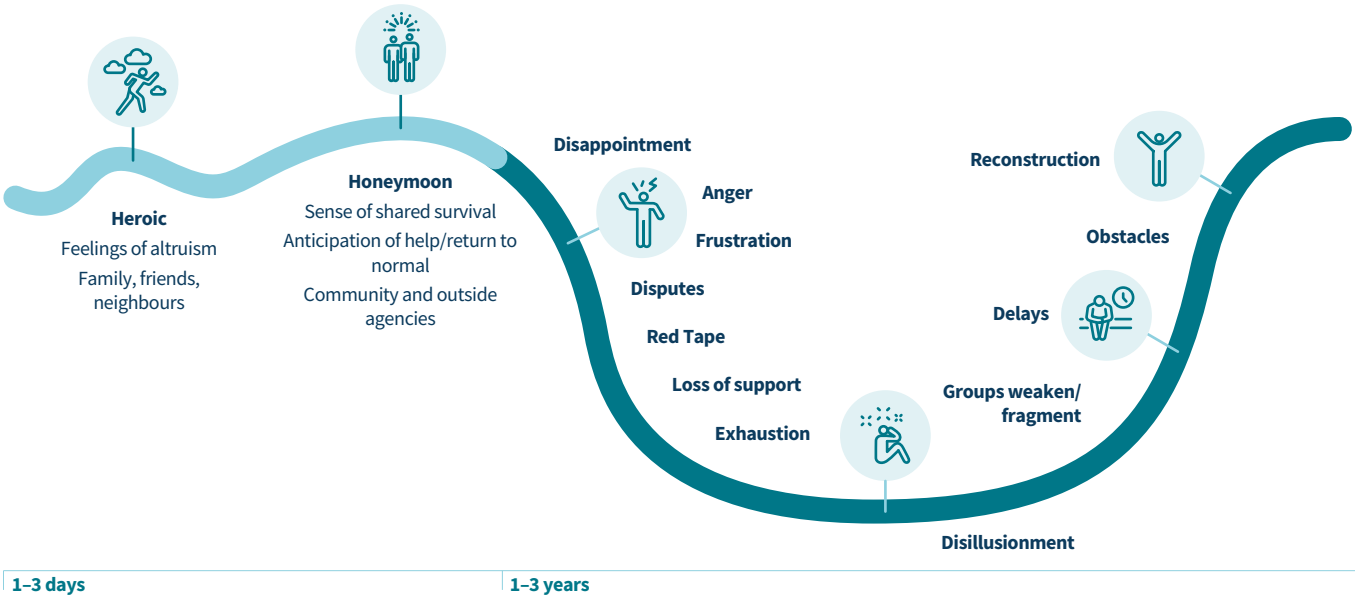
– Traditional Owner, Kalkadoon

Drought can also exacerbate existing underlying issues and inequalities. Due to the highly personal impacts of drought, there are several factors influencing a person's ability to prepare for, respond and recover from drought. An individual's resilience could be influenced by their past investment in on-farm infrastructure, financial status, level of preparation and access to information and support. Prolonged droughts could magnify underlying health conditions, socioeconomic status, access to information and contacts and ability to attend community events.

Due to the sheer land area of the North West region, community connectedness plays an essential role in supporting the ongoing mental and physical wellbeing of the community. During prolonged dry periods, it's difficult to convince producers to step off the farm for a break. This means events held in town which provide support – in the form of community connectedness and professional services – may not be accessed by producers significantly impacted by drought, due to their dedication to the property.

"Drought is like boiling a frog. You just slowly become immersed into the drought and sometimes you do not realise how bad it is until your stock is badly impacted. Your positivity is slowly eroded as the impact of the drought becomes a waking nightmare."

Figure 21: Recovery timeframes.[44]



Other impacts identified include:

- Heat stress – people's capacity to endure heat, especially during long periods. Additional pressures on power due to demands on energy for air conditioners. Lack of access by some to air-conditioned heat safe places.
- Health impacts from increased dust (roads breaking up), quality of drinking water (e.g. algal blooms) and mental health issues. The pressures on health and social service providers and ongoing access to services (before, after and during drought).
- Drying up of public green spaces and lack of facilities for recreational activities.
- Population impacts, with people potentially leaving the region.

Economic

The economic impacts of drought in the North West have been reported as different from those in other regions. It was noted drought in the region impacts livelihoods in a very direct way and can have flow on repercussions to areas outside the region. Key economic impacts identified were to agriculture, mining and tourism in the region. Small business is also impacted due to reliance on the main industries of the region such as retail. Other regions in Queensland rely on the productivity in the North West and any impacts to the region can be felt in other parts of the state, such as Townsville.

Droughts have significant impacts on beef cattle prices due to pressure on producers to destock. Many producers are not able to buy back into the market and these impacts have flow-on effects where the cost of meat shortages is passed on to consumers at the supermarket.

Live cattle leaving the port of Townsville or Brisbane represent 21% of the total annual volume exported each season at around 220,000 head. In Queensland, the Central North and Cape York/ Gulf zone are the live cattle export hotspots with 17.7% and 16.4% of total cattle sales within these regions earmarked for the live trade, respectively[40].

When drought arrives, Australian cattle farmers become extremely vulnerable and are often faced with a must sell scenario. The live export sector contributes to the effective management of the resulting de-stocking program. Over the long term, live exports as a percentage of slaughter rests between 8 - 12%. During the severe drought of 2014–15, Australian cattle farmers aggressively de-stocked the herd. While slaughter levels increased to maximum capacity, live export also played its part, increasing to 15.4% as a percentage of cattle slaughtered. As a competitive buyer within the beef supply chain, the live export industry can support domestic cattle prices at times when the market is saturated with stock, providing an alternative sales outlet for Australian farmers liquidating their herd.

During times of extreme drought and elevated cattle slaughter, the live cattle trade allows Australian cattle farmers an alternative avenue for cattle turnoff, alleviating some of the supply pressure and protecting against severe price decline as Australian processing capacity becomes saturated.

Saleyard prices are down by 40% on average compared to last year, in line with prices seen in 2019 during the last drought, according to Meat and Livestock Australia (MLA)[41].

Growing fears of drought have prompted farmers to reduce livestock numbers, which, combined with slowing consumer demand and meat processing bottlenecks, has sent sheep and cattle prices plummeting in Australia.

When it doesn't rain in the North West, the economic impacts are felt immediately. The impacts are directly on producers and it flows on to the rest of the region, impacting industries and livelihoods. Locals report when times are tough for producers, times are tough for everyone. Businesses rely on producers to spend money in town at the local stores, restaurants and pubs.

"In our region, drought means tightening up the purse strings and that can mean impacts to small business and employment of contractors."

"In drought, producers tighten up and cut back on everything to make it through."

– Mayor, Richmond Shire Council

Australians are known for their generosity and during prolonged droughts, the North West receives regular donations of goods including food, feed and household goods. While the generosity is greatly appreciated by locals, donations can divert income for small businesses in town.

Tourism is a key industry for the North West region and can provide income during periods of low agricultural productivity. However during dry periods, media reporting can influence tourism to the region due to the representation of perceived or actual droughts. Locals report past representation of drought in the media has discouraged potential visitors, rather than encouraged the tourism needed to provide income for the region.

On a property level, the size of the drought is also a factor in the scale of impact. Producers have reported local droughts are easier to manage than widespread droughts which bring broader flow-on effects to other regions. The bigger the drought, the less control and options available to manage the impacts. Farming advisors in the region have recommended all agricultural businesses to have a plan in place and inventories to support early and fast decision making, reducing the impact of drought on their financial situation. While these practices are in place for large corporations, the services are too expensive, unknown or unavailable to small-scale producers.

Some producers take proactive steps to reduce the impact of drought on their livelihoods by diversifying their income. One business owner in the region runs a cattle property and opened a clothing and goods store in town to provide additional revenue. However, during previous droughts the owner felt the impacts were felt twice as hard with reduced productivity on the farm and reduced revenue through the business. The owner felt the impacts were also magnified by limited access to government grants and support due to their off-farm income.

"The primary effect of drought has been to push marginal systems closer to, or beyond, their resilient limits."

Other issues impacting the economy were:

- The failure of infrastructure on business (e.g. power, digital connectivity and roads).
- Intergenerational impacts such as second generations not staying on farms and family businesses.
- Difficulty of attracting and retaining a workforce due to liveability and weather factors.

Environmental

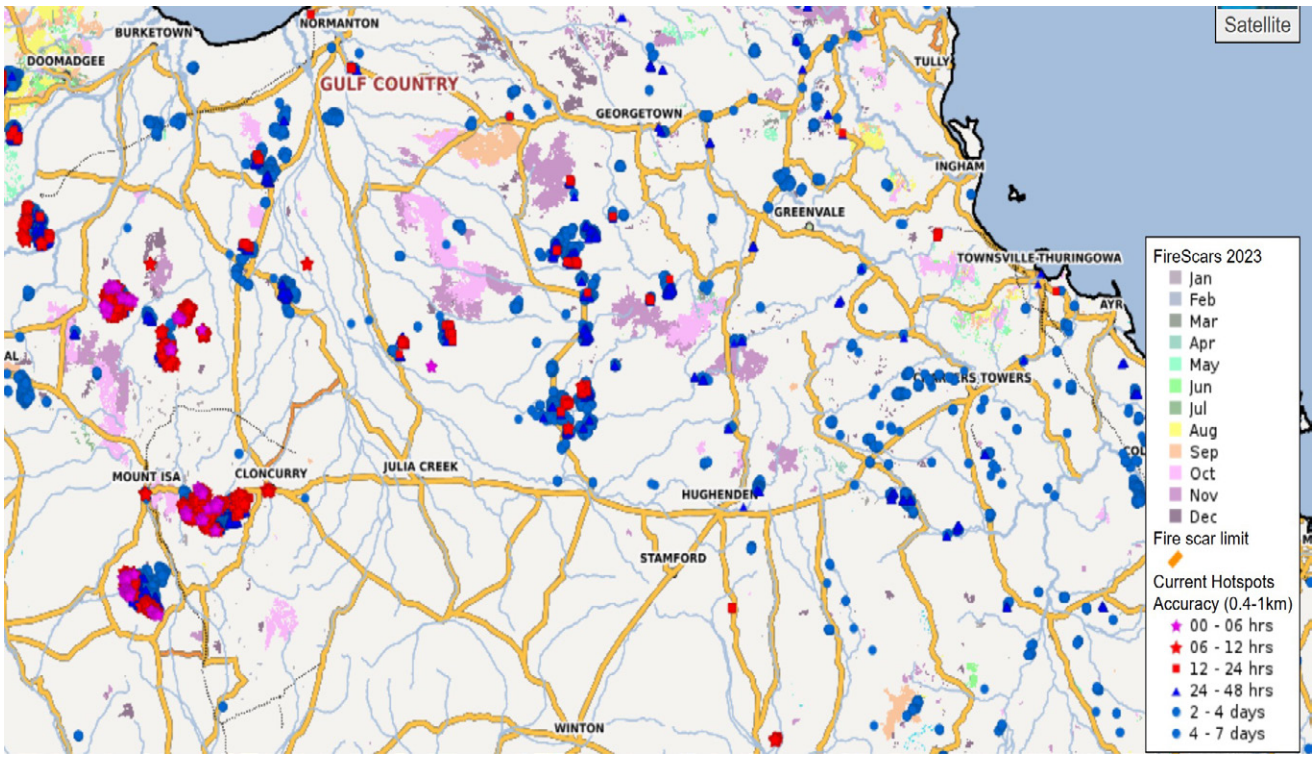
A major environmental impact identified were the growth and expansion of weeds and pests. Weeds and pests are a major source of frustration for the region. There are reports the region has received good rainfall for the past few seasons however the weeds, which can't be used as fodder, have proliferated. When land becomes bare and soil quality decreases, weeds tend to increase. During past droughts, hay has been brought in from outside Queensland at an additional expense. Sometimes, hay from outside the region has brought in foreign pests and weeds, degrading local supply and stock.

Another key impact was the increased risks of fires due to heat waves and extremely dry conditions. Many areas were identified as fire hotspots as shown in figure 22, with different duration of fire.

Locals rely on accurate weather data and predictions to make decisions for their property. However, engagement in the region has captured confusion or frustration about the accuracy of predictions or accessible language and advice. Locals have reported in previous droughts, it has been difficult to interpret weather predictions and use advice to prepare their property. On the other hand, other producers rely solely on record keeping and knowledge of their property to make decisions based on changes in their data, rather than predictions.

The growth and reproduction rates of species critical to the environment and economically for the fishery industries – such as the barramundi, prawns, and mud crab – are intrinsically linked to water runoff from the land and river flows into the Gulf of Carpentaria. Freshwater flows from the inland waterways are necessary to maintain water temperatures and salinity levels while providing breeding habitats these species rely upon. Likewise, the water runoff from the land brings valuable nutrients such as nitrogen and phosphorus, increasing the phytoplankton populations available in the food web for these species to consume and support the quantity and quality of the produce for the fishery industries[42].

Figure 22: Fire risk hotspots 2023.[45]



"A drought on land is a drought in the sea."

– Mayor, Carpentaria Shire Council

"For ecosystems that have been disturbed and are already finding it difficult to return to a homeostatic balance, drought has been the driver to push them into a new cycle of instability. At the least, this makes it much easier for disturbance specialists (weeds and ferals) to take hold. In extreme cases, drought is pushing these disturbed, stressed ecosystems toward collapse."

Other environmental impacts identified included:

- Biodiversity impacts with shrinking habitats for native animals and flora with the drying up of water and food sources, and limited refuges for animals.
- Pests are increasing and native species are decreasing.
- Sediment builds up in rivers and waterways.
- Lack of traditional food supplies for First Nations peoples.
- Stress of heat on animal welfare.
- Soil erosion and depletion of soil quality inclusion loss of moisture and salinity.

Infrastructure

Water storage and water security was a key issue raised by multiple stakeholders. Many landholders held licenses for water storage however the license restricted the use of the water for personal use. Other stakeholders reported there are missed opportunities to store rainfall for use during droughts. For example during the 2019 floods, there was significant rainfall but none in the catchment. Rainfall during the 2019 floods could have been captured and stored for use during a future drought. In some areas such as Flinders, locals report access to water is not an issue, it's storing water the area has access to, as the major issue. This has also been reported as a problem on properties where producers have a desire to store excess water captured during wet seasons to use on growing hay and feed during the dry times.

"We could use that water to support our property during a drought and avoid shipping hay in. Water gives you another asset and if we had a storage facility, we wouldn't have to rely on bore."

– Resident

The Hughenden Offstream Water Storage project has been identified as a priority for Flinders Shire Council, as an enabling project to support the ongoing development of the 15 Mile Irrigation Development Project and the proposed Hughenden meatworks and feedlot.

Key benefits:

- Regional economic growth at 7% discount rate, Net Present Value return of $5 million and a cost benefit ratio of 1.09.
- Increased regional employment opportunities.
- Optimised use of existing natural resource base.
- Improved financial sustainability and rate base.
- Community resilience and sustainability.

Drought also impacts the road network in the region. Unsealed roads degrade quickly during drought where normal rainfall maintains the condition of roads. During dry periods, roads turn to dust which impacts access to the community and has flow-on effects for producers agisting livestock, or drive tourism throughout the region. Long periods without rain are often followed by flooding rains, which washes away road pavement destabilised during the dry.

Other infrastructure impacts identified included:

- Impact of heat on assets including roads, bridges, digital connectivity assets with increased maintenance and repair costs.
- Impacts on recreational areas, e.g. sports fields, parks and water parks.
- Damage to digital connectivity and disruption of service, e.g. fire, heat.
- Increased maintenance and repair costs of existing infrastructure.
- Potable water supplies.
- Overuse of air conditioning and challenged power supply.
- Increased precipitation in water sources and dams.

Likely future impacts (risks) of drought in this region

Communities of the North West are regularly exposed to extreme weather and therefore are generally more prepared and have a greater ability to cope with changing circumstances. However in the years to come, our climate is predicted to change with extreme conditions becoming more frequent and for greater periods of time.

The erratic nature of weather in the North West region generally erodes confidence for investment in our agricultural industries. This reduced confidence can have a domino effect that could lead to lower investments, higher regional unemployment, and a decline in populations of our small and remote communities that many of our pastoral producers rely upon for access to health facilities, community connectedness and services.

"Always expect the next drought. It is more certain than expecting the next flood. Always expect a flood to break the drought. This almost always occurs. It is the weather cycle of Australia and once you understand that then you are better equipped to manage the next drought."

The Queensland Regional Climate Change Impact Summaries provide climate change projections for the years 2030 and 2070.

In future, the North West region can expect to experience:

- higher temperatures
- hotter and more frequent hot days
- harsher fire weather
- more intense downpours[46].

With coastal areas in the North West also predicted to experience:

- less frequent but more intense tropical cyclones
- rising sea level
- more frequent sea level extremes.

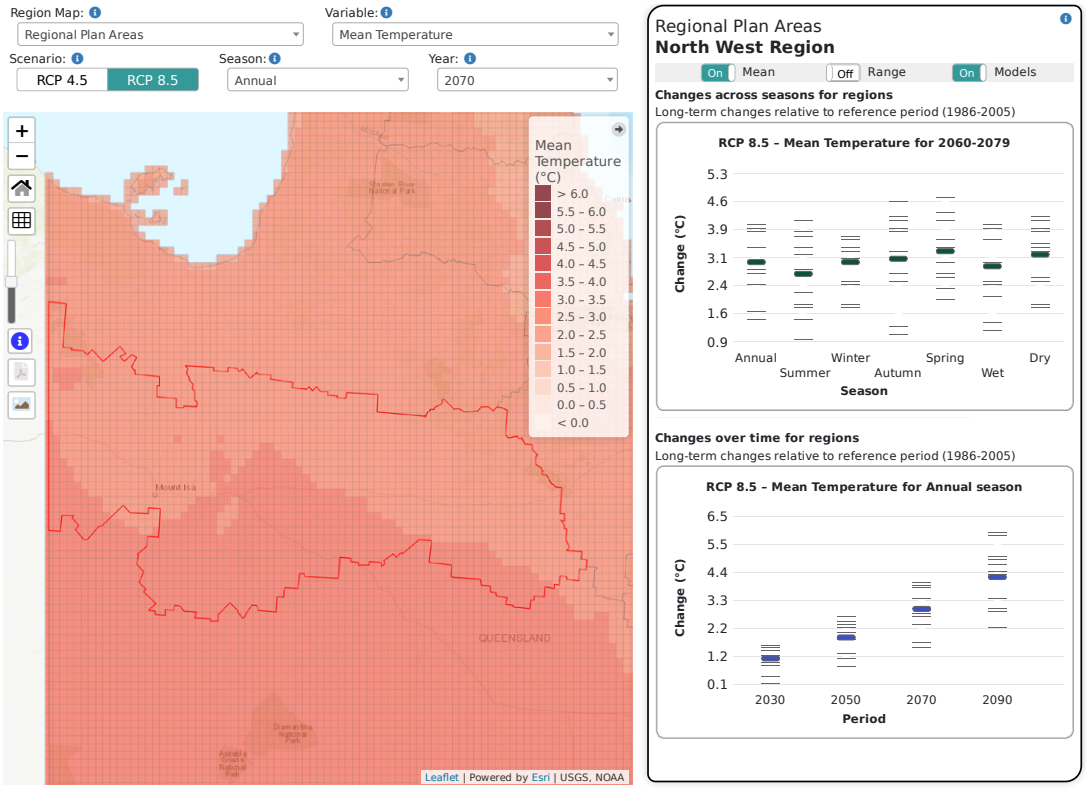
These likely changes to the climate of the North West will bring both opportunities and risks for which the region will need to prepare.

Temperature

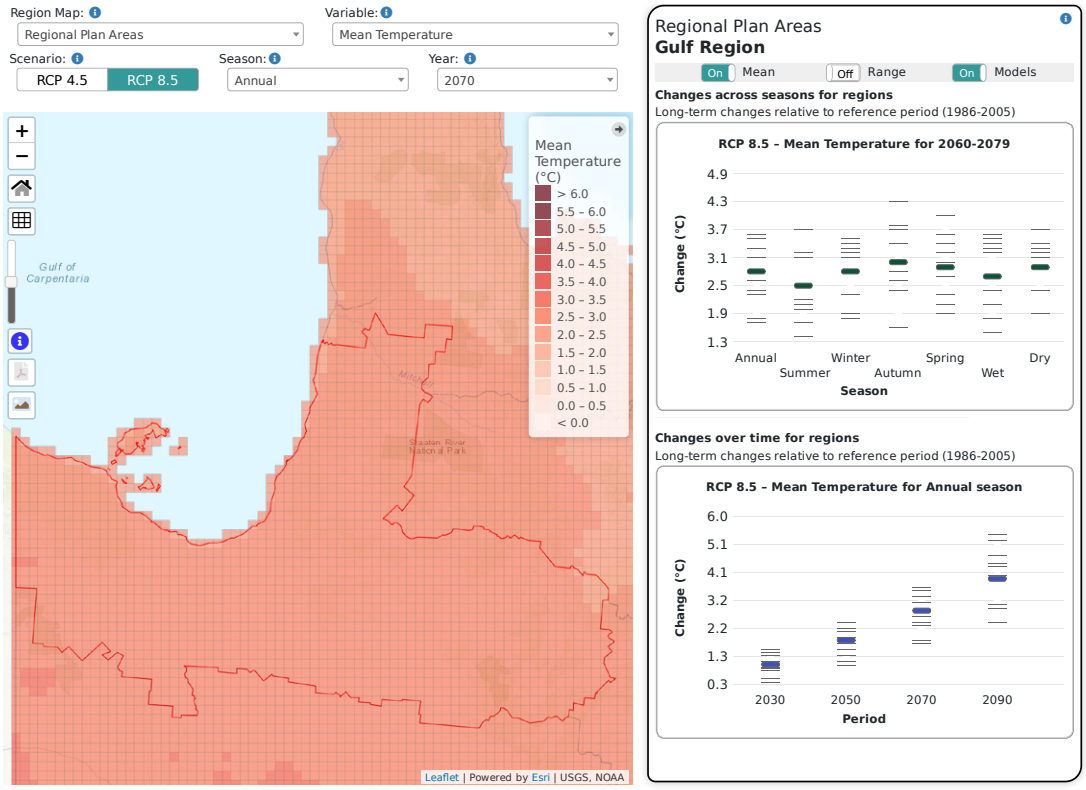
The average annual temperature in the Gulf region has increased 0.2°C over the last decade, from 26.6°C to 26.8°C. Projections indicate an increase of up to 4.4°C by 2070, leading to annual temperatures well beyond those experienced over the last 50 years. By 2070, Burketown may have more than twice the number of days over 35°C – increasing from an average of 102 per year to an average of 222 per year by 2070.

Figure 23: Mean temperatures under various climate scenarios.[47]

Mean temperature under a RCP 8.5 scenario in the North West region.



Mean temperature under a RCP 8.5 scenario in the Gulf region.

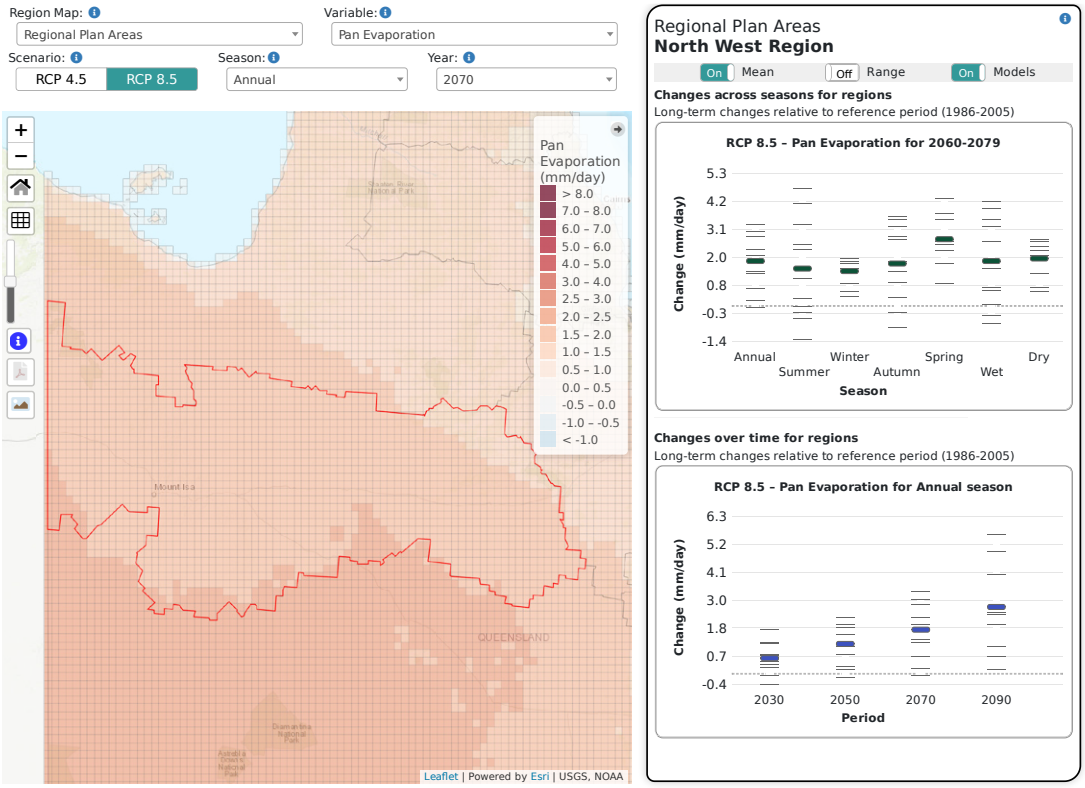


Evaporation

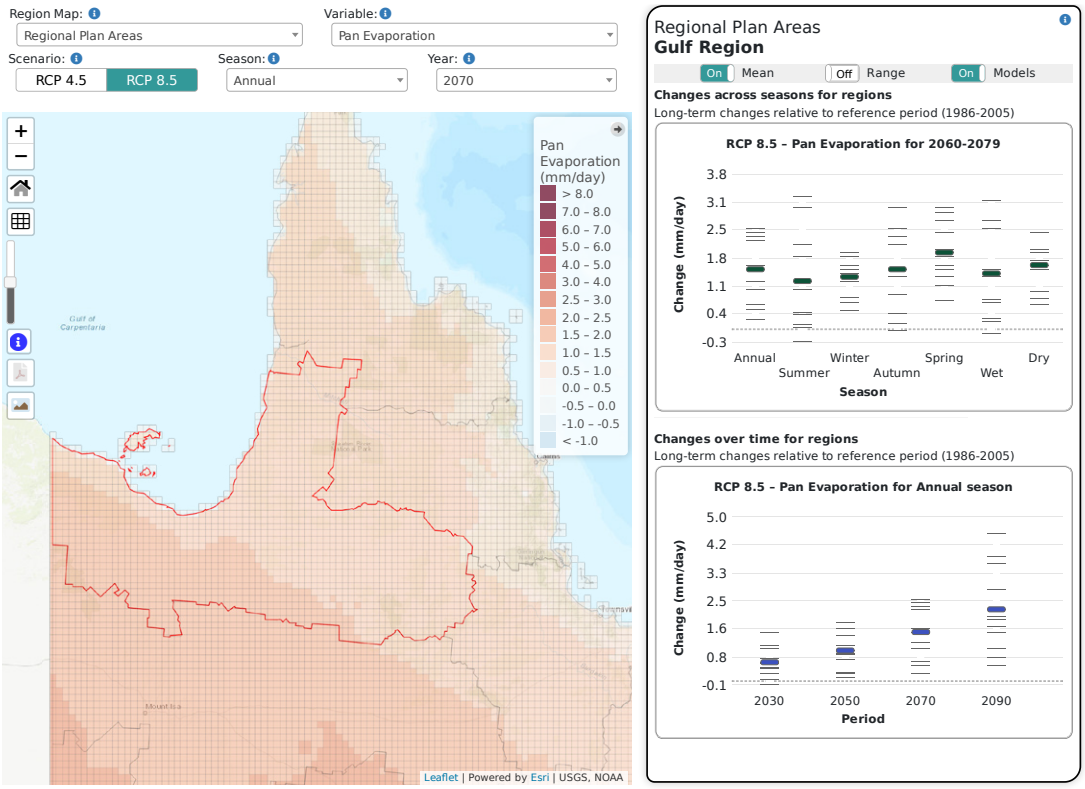
Projections indicate annual potential evaporation could increase 7–14 percent by 2070.

Figure 24: Future evaporation under various climate scenarios.[48]

Pan evaporation under a RCP 8.5 scenario in the North West region.



Pan evaporation under a RCP 8.5 scenario in the Gulf region.



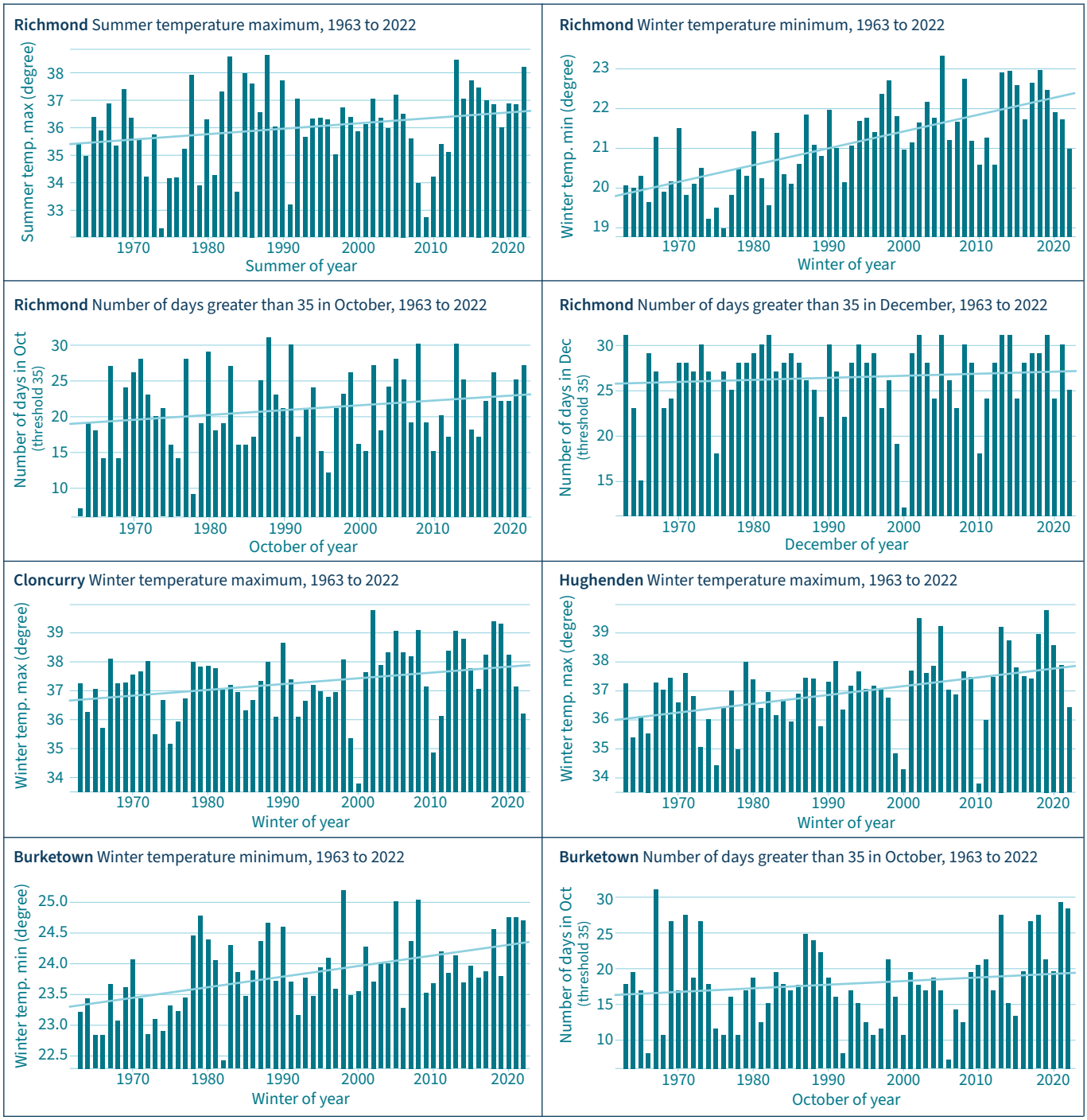
Climate change projections

Queensland climate change projections were produced by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the Bureau of Meteorology (BoM) based on the results from 23 Global Climate Models. Projections were provided for 2030, 2050 and 2070. However, as the climate can vary significantly from one year to the next, these projections show changes in average climate for three future 30-year periods centred on 2030, 2050 and 2070. Sea-level rise is also considered.

Analysis of current actual weather data from the last 60 years shows trends toward these climate change predictions. James Cook University Tropical North Queensland Drought Hub has undertaken the following trend analysis.

In the last 60 years we have already experienced trends in temperature, including as demonstrated by the graphs in Figure 25.

Figure 25 : Temperature trends by LGA, 1963 to 2022.[51]



These recent trends are based on real data and indicate options for future climate change forecasts. They are clear signals temperature is becoming a key driver of drought conditions and will continue to impact on living conditions, agriculture and other industries across North West Queensland.

Future impacts

North West Queenslanders are well-versed in the response and recovery from regular acute shocks like floods, severe storms, cyclones and bushfires. However, current climate projections show producers and communities will be increasingly exposed to cumulative impacts of shock events in combination with periodic stressors like droughts.

North West Queensland locals are resilient due to past lived experience. However, prolonged and cumulative exposure to stressors and shocks could impact communities' ability to recover and build resilience to future events. The effects of increased weather variability can also exacerbate existing challenges for producers including debt and profitability, forage production, surface cover, livestock carrying capacity, animal production and weeds and pests. The broader community could also experience increased pressure on health services due to impacts on physical and mental health, decreased tourism to the region, and reduced income for local business. In extreme cases of prolonged drought combined with cumulative shock events, the region may also face migration due to reduced capacity and resilience to respond to ongoing weather variability.

Figure 26: Climate Trend QLD.[52]

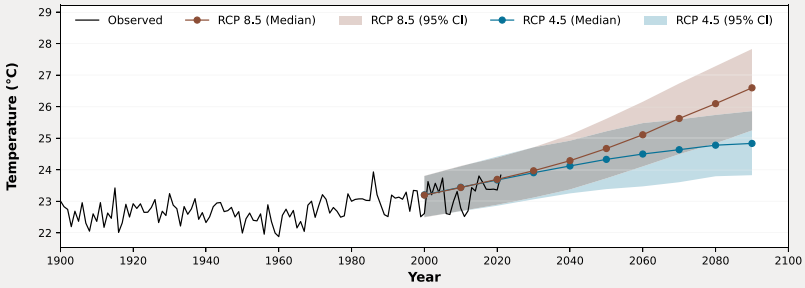
Observed annual climate trends:

- Temperature: medium increase emerged in the 1980s (strong confidence).
- Evaporation (PET): no trend observed.
- Rainfall: no trend observed.

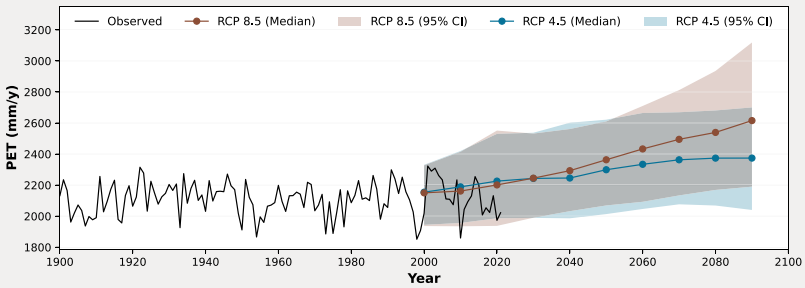
Projected annual climate trends:

- Temperature: large increase projected (strong confidence).
- Evaporation (PET): medium increase projected (strong confidence).
- Rainfall: no trend projected amongst large uncertainty.

Average daily temperature (°C/year)



Average annual potential evapotranspiration (PET) (mm/year)



Average annual rainfall (mm/year)

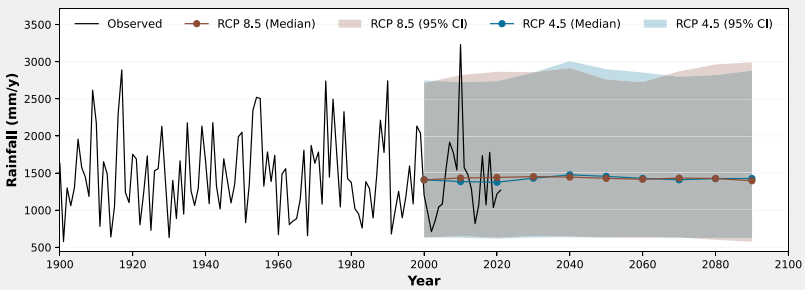
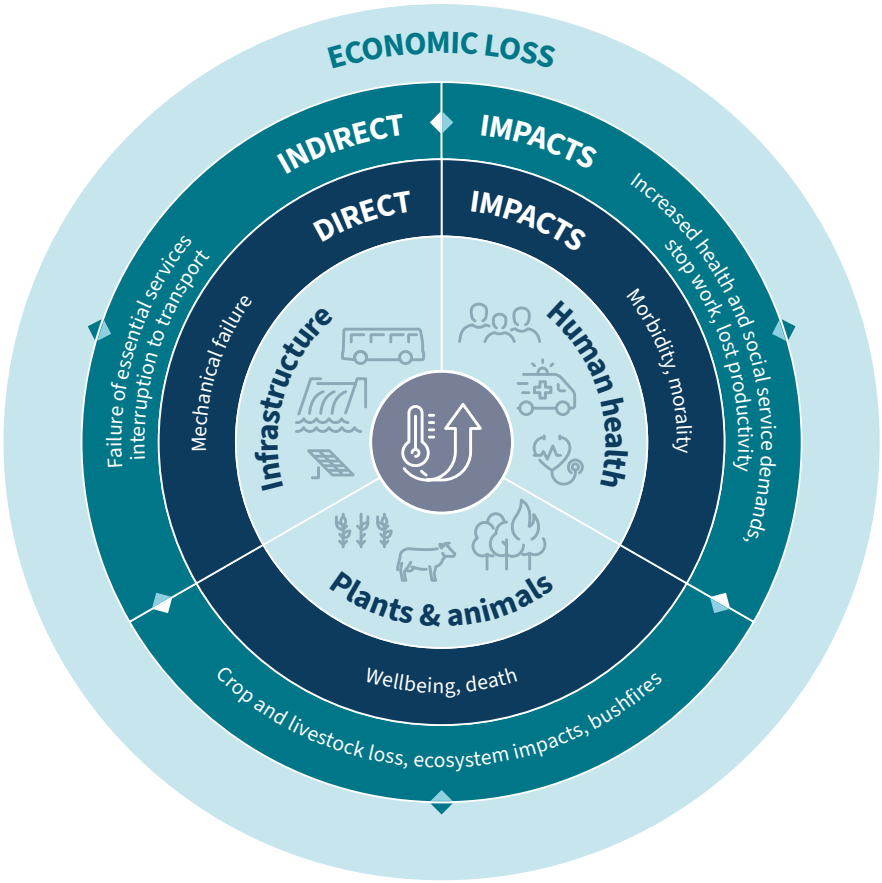


Figure 27: Heatwave impacts.[53]



During engagement in the region, producers reported in the face of a prolonged, severe drought, greater investment is required to build social, infrastructure, economic and environmental resilience to maintain and build capacity for the region, its communities and industries – to respond to and recover from events.

DLGWV identifies climate change as:

- hotter, dryer weather – resulting in higher evaporation, drying landscapes and reducing river flows, dam levels and groundwater recharge
- more frequent and longer dry periods, making water resources scarcer
- more frequent and intense fires that can damage plants, increase erosion, and reduce water availability and quality in rivers and dams
- changes in cropping zones, cycles, and plant and animal distributions including biodiversity loss impacted by changing temperatures, evaporation and rainfall
- heavier, more intense rain increasing the likelihood of flooding, erosion and overtopping of dams
- higher average and peak sea levels, exposing fresh surface water and groundwater sources in low-lying areas to saltwater intrusion[49].

There will be multiple impacts of higher temperatures, low rainfall and precipitation deficit. The future impacts of heatwave on economies, human health, plants and wildlife are illustrated in the following diagram.

Future impacts of drought and climate change are both direct and indirect. It will affect health, well-being, life outcomes for animals and humans, ecosystem impacts and challenged infrastructure. There are multiple scenarios of what change in climate may occur, which were explored through future drought scenarios.

Future drought scenarios

Key stakeholders across the region participated in drought scenario planning to understand the potential impacts if the region were to be exposed to longer, harsher droughts.

Stakeholders were asked what impacts the community, economy, infrastructure and environment in the event of a major heatwave, precipitation deficit and compounding shock events like floods and cyclones during a drought.

Below is an overview of feedback about impacts related to the three scenarios from key stakeholders.

Scenario 1: Major heatwave

While the event of a major heatwave in the North West has several impacts to the environment, community, economy and infrastructure, heatwaves do not equate to drought in the region. Stakeholders reported for the North West, drought is dependent on water being available and is not necessarily linked to temperature. Drought conditions can be brought on by failed wet seasons because communities rely on surface water to fill the dams.

The region anticipated several negative impacts from a major heatwave event. One of the biggest impacts of heatwave for the region is to communities' health and wellbeing. Heat can be isolating for the community where locals are more likely to stay inside and therefore minimise social interaction. This is reported to exacerbate other issues where there are increased reports of domestic violence during heatwaves.

Heat also increases safety risks for workers and contractors where staff working outdoors, in factories or mines are more likely to be stressed and tired on hot days which can reduce their capacity to concentrate. In some industries, intense heat can affect workers required to wear PPE and on days of extreme temperatures, some worksites may change their operating hours or close early which can impact income for businesses and workers. Similarly, increased use of air conditioning means the community is paying to stay cool. Those who cannot afford to keep their air conditioning on are more susceptible to health impacts of intense heat. Heatwaves have also been reported to cause power outages and so the health impacts of heat can spread across the entire community, regardless of personal access to an air conditioner.

Intense heat also degrades local infrastructure like sealed roads which has flow-on effects to town access by locals and tourism.

Scenario 2: Precipitation deficit

In the event of a major precipitation deficit, impacts would be felt across community, economy, environment and infrastructure. Stakeholders emphasised the cultural and recreational significance of water for Aboriginal and Torres Strait Islander communities. The impact of precipitation deficit impacts not only the land, but also the water ecosystems where cultural fishing practices are impacted. Impacts also extend to the aquaculture industry in the Gulf which contributes to the economy of the region through tourism and retail. During a precipitation deficit, the rivers wouldn't be flushed properly, which impacts ecosystem health. Stakeholders reported it is vital for the government to be planning for this scenario by ensuring adequate water storage and water security initiatives are in place. Residents in the region reported a record-breaking drought that brings dryer, harsher conditions for longer would drive producers to sell-up and move away from the region. Water security is a significant priority for the region, and has been for a long time, however an enhanced and coordinated approach is required now if the region will be facing significant deficits in the future.

Scenario 3: Compounding impacts of other disasters

The North West region is no stranger to compounding effects of natural hazards, however predictions show increased intensity of events like cyclones, storms and flooding which can have significant impacts when they take place during or following severe droughts. There has been significant research into the future climate of the region but stakeholders reported a greater need to understand, plan for and communicate the impacts of the changing climate on the economy, communities, environment and infrastructure. After a drought, floods can be devastating where the water runs off the dry ground rather than soaking in. Floods can also wash pastures away. Furthermore, there can be significant impacts to mental health for producers, community members and businesses who are forced to manage the impacts of a flood following a prolonged drought. Navigating funding programs and support can be a time-consuming and confusing task for many producers, individuals and business owners. Compounding disasters can exacerbate confusion about available support and eligibility.

Lessons from Scenarios: water, health and diversity

The exploration of potential impacts from future droughts allowed stakeholders to consider concurrent disaster events and revealed insights for drought resilience. Drought events alone create an increased risk of loss and damage throughout multiple sectors. However when combined with other hazardous weather events, the risk exacerbates with impacts rippling across communities, culture, ecosystems, and the local economy.

Across three scenario tests, stakeholders identified:

- Impacts of prolonged drought and water security for both consumption and industry.
- Viability of water infrastructure and water storage options.
- Effects of heatwaves drought events on human health, outdoor workforce, wildlife and animal health.
- Community education water efficiency.
- Improved land use practices.
- Adequate information and knowledge sharing for effective decision-making during droughts.
- The risks of mental health and impacts on social cohesion.
- Business resilience and the need to diversify economic options.
- Town vitality and liveability, loss of population impacts.
- Governance and the need for regional strategies and partnerships.

Six strategies were developed, addressing key challenges emerging from aspects including water security, information and decision making, governance, environmental sustainability and land use, economic adaptation and diversification and health and mental health.

Building drought resilience in our region

A vision of our resilient region

The following is a vision for resilience in the North West region, based on engagement with key stakeholders and other resilience plans.

The North West communities take pride in their strengths of self-sufficiency and ingenuity. We thrive on our own brand of innovation. We bring this innovation to all aspects of our lives, to help us develop unique ways to prepare and endure the serious weather we know will come each year.

Some years are harsher than others. We live in a land of flood, wind, heat, storms and fire. As tough as these conditions can be at times, we rely on these natural processes to sustain our communities, livelihoods and landscapes. From Camooweal to Karumba, Kynuna to Cloncurry, we know our land and its systems like the back of our hand.

We work together in the face of adversity. We share our skills, knowledge and time for the benefit of others and our communities. We know how to live with isolation, but relish connection and the connectivity networks that conquer our distance. We work hard to enhance our economic base as one of Queensland's richest minerals, primary production, fishing and tourism regions. We value our wealth of First Nations knowledge and culture, and work to sustain these vital connections. We work together towards a healthy Country and the prosperity it brings.

Values guiding our resilient pathways

The Plan reflects our values in the North West which are unique and make us who we are.

There are five underpinning values guiding our resilience pathway.

- Identity – We draw from a long pioneering history and much longer First Nations history which characterises our culture and the way we do things.
- Inter-generational legacy – Our knowledge and love of the land will be passed onto future generations. Our skills and capacity have and will continue to build an independent region and a bright future for emerging generations. We value the health of our natural assets, soils and river systems.
- Camaraderie and teamwork – Our sense of community and mateship are among our greatest assets. We will not hesitate to pitch-in and help each other when the need arises.
- Innovation and ingenuity – Finding pragmatic solutions to complex challenges is a hallmark of our high level of leadership, self-capability and efficiency as a community.
- Staying power – We go the distance. Times may not always be easy, but commitment to seeing things through and deriving positive outcomes gives us great pride. A focus on our physical and mental wellbeing is a key factor.

"To live here, properly, means that we put country first."

"Being more drought resilient in this region could mean encouraging diversity, new ideas and new technologies."

RDRP Conceptual framework

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 North West Queensland communities. It establishes the context, identifies impacts and confirms 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 ongoing impacts of drought are managed appropriately to reduce its impacts on regional communities.

This plan draws on and adapts the 'D-RAMP' model[50] for Drought Resilience, Adaptation and Management – chosen by stakeholders during early 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.

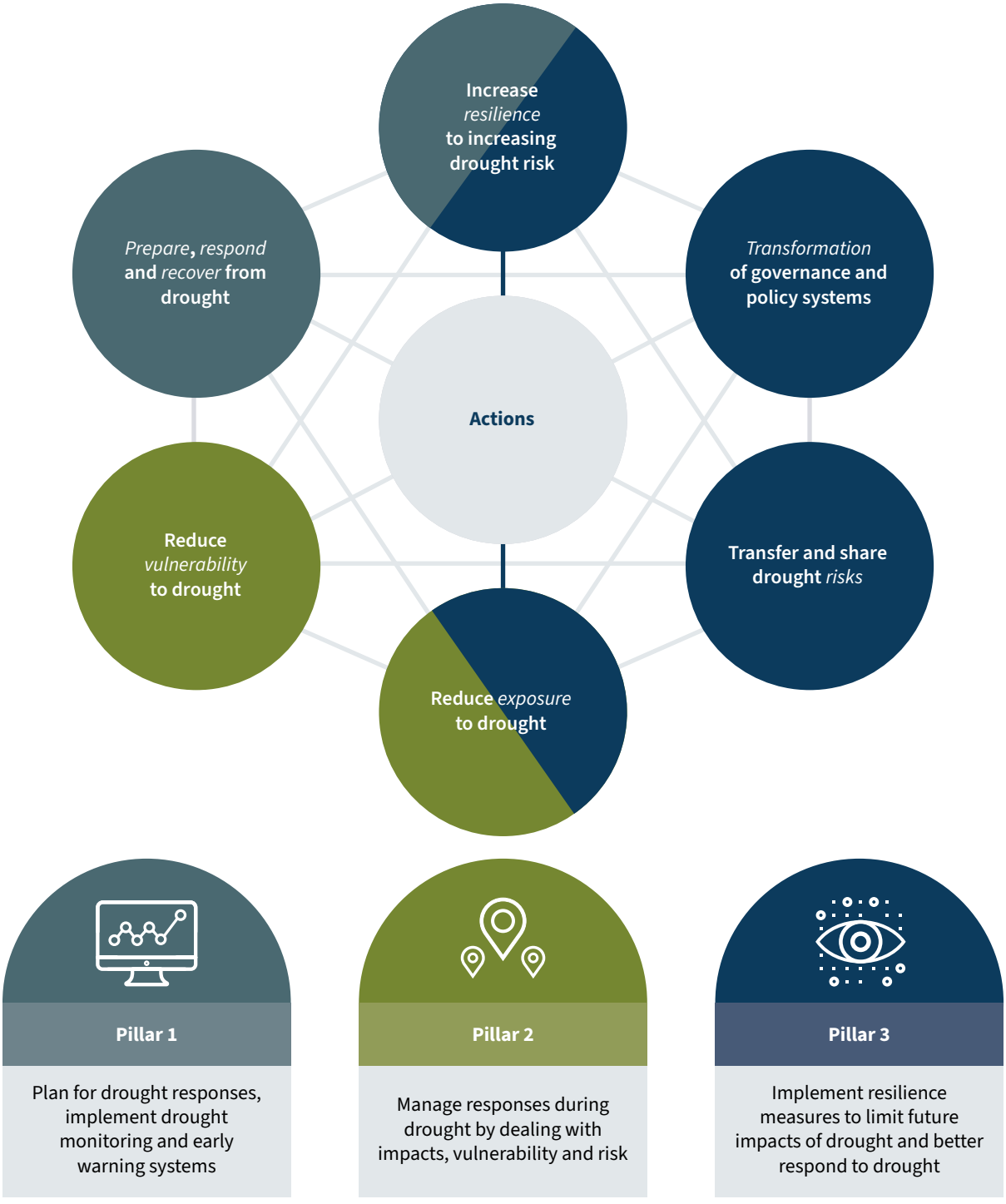
b) Identify and address those vulnerable and at risk of droughts.

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 North West Queensland region have been summarised under each pillar to develop a unique plan for the region that is consistent with national planning frameworks and complements other state and regional planning programs.

Image: "Camooweal Billabong" Lake Canellan, Camooweal, QLD. © Chris Fithall 2022. Shared under Creative Commons Licence — Attribution (CC BY 2.0)

Figure 28: Key pillars and actions of the Drought Resilience, Adaptation and Management Policy (DRAMP) framework.[54]



The Regional Strategy

This Regional Drought Resilience Plan is a locally-led and regionally-coordinated plan with actions driven from a regional level. It is acknowledged some actions require the consultation and involvement of additional stakeholders – including but not limited to state or federal agencies, regional governance, local stakeholder groups, First Nations groups, charities, NRM bodies, local businesses 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.

Regional actions and initiatives

The first part of this document summarised significant research and analysis which supported engagement within the region. Key priorities have been identified through the consultation process where six regional drought resilience pathways were identified within the North West Queensland region. The pathways and associated actions are central to the drought resilience strategy for the period 2023–2030.

To ensure a balanced quadruple bottom line approach, each pathway and supporting actions are notated to reflect their influence on economic, environmental, social and cultural and governance priorities. The strategy also includes how each pathway reflects the Drought Resilience, Adaptation and Management Policy (DRAMP) Framework[55] – summarising practical actions to prepare for and manage drought through three key pillars[56]: planning and monitoring, respond to drought events, build future resilience. The North West Queensland Drought Resilience Strategy has been developed to reflect the globally recognised DRAMP Framework and to address economic, ecological, social and cultural, and governance benefits through a series of defined pathways.

The following matrix identifies and maps the pathways and actions to the key pillars, to prepare for and manage the impacts of drought. Projected outcomes for each pathway are included in the following.

Pillar 1	Pillar 2	Pillar 3
Implement drought monitoring and early warning systems.	Assess drought vulnerability and risk.	Implement measures to limit impacts and better respond to drought.
Pathway 1: Take a whole of region approach to mitigating risks of water insecurity.		
1.6	1.2 1.3 1.4 1.5	1.1 1.2 1.6
Pathway 2: Support early and accurate decisions before and during drought.		
2.1 2.2 2.3 2.4 2.5	2.3 2.5 2.6	2.4
Pathway 3: Strengthen partnerships and integrate drought resilience priorities with strategic regional priorities		
3.1 3.2	3.1 3.4 3.5	3.1 3.2 3.3 3.4 3.6
Pathway 4: Improve land management practices for healthy land and water.		
4.5	4.3 4.4 4.5	4.1 4.2 4.3 4.4 4.5 4.6
Pathway 5: Build economic resilience by supporting diversification and adapting to drought conditions.		
5.1 5.7	5.1 5.6 5.7 5.8	5.1 5.2 5.3 5.4 5.5 5.6 5.7 5.8 5.9
Pathway 6: Enhance community connectedness, health and wellbeing.		
	6.2	6.1 6.3 6.4

Pathway 1: Take a whole of region approach to mitigating risks of water insecurity.

Key regional actions

1.1	Conduct an options analysis and feasibility study to diversify water sources across the region (for example, irrigation for landholders to access water for small crop areas).
1.2	Undertake consultation and needs analyses to improve water storage capability across the region and on property.
1.3	Audit water licenses held in the region and audit processes for obtaining and updating licenses.
1.4	Conduct an options analysis to reduce costs of delivering water during extended dry periods.
1.5	Conduct an audit of water infrastructure, equipment and monitoring systems to identify repairs or upgrades.
1.6	Advocate for the delivery of a Regional Water Assessment in North West Queensland.

Lead institutions

- NWQROC
- Water authorities
- Local governments

Key partners and stakeholders

- DLGWV
- DETSI
- DSDIP
- Regional communities
- Aboriginal and Torres Strait Islander groups
- Conservation groups
- Industry bodies
- JCU

Investment targets

- National Water Grid Fund
- Preparing Australia Fund
- Future Drought Fund
- Building regions funds
- Regional precincts funds

Economic outcomes

Water security for businesses and viable businesses in the region. TR

Environmental outcomes

Improved water quality across the region and increased protection of water through sustainable water practices. MO

Social and cultural outcomes

Improved accessibility to clean water, electricity and the telecommunication network – thereby improving health outcomes. MO

Governance outcomes

Improved coordination and collaboration across governments to achieve water security. TR

Outcomes to: MA (maintain), MO (modify), TR (transform).

Pathway 2: Support early and accurate decisions before and during drought.

Key regional actions

2.1	Design participatory, tailored drought monitoring and early warning systems/tools which integrate multi-scale climate, soil and water information.
2.2	Deliver community information and education on weather variability, on-farm information capturing and using data to plan for drought and early decision making.
2.3	Develop a regional water strategy including an examination of demands for urban, industrial and agricultural water supply, projections for regional growth, climate variability, trigger points for safe-guarding and prioritising water supply, and communications to stakeholders.
2.4	Review and update local and district disaster management plans to incorporate drought planning, recovery and response.
2.5	Conduct an audit on hard and soft infrastructure in place to capture and disseminate early warning indicators. Include an assessment of how accessible the information is to producers, communities and businesses with opportunities to improve communication of predictions, data and recommendations to manage drought.
2.6	Capture local knowledge about the landscape, weather patterns, drought impacts and future risks to inform regional drought planning.

Lead institutions

- NWQROC
- LDMGs and DDMGs
- Local Drought Committees

Key partners and stakeholders

- DLGWV
- Councils
- QPS
- BoM
- DSDIP
- First Nations groups
- Carpentaria Land Council Aboriginal Corporation
- ARC
- Neighbourhood centres
- Disaster response groups (State, regional, local)
- TNQ Drought Hub
- SGNRM
- NEMA
- QRA

Investment targets

- Disaster funding
- Future Drought Fund
- Community development funds
- QRIDA grants

Economic outcomes

Thriving economy as businesses and industry will be able to make timely decisions for business viability. MO

Environmental outcomes

Improved sustainable resource use and biodiversity protection. TR

Social and cultural outcomes

Improved information, preparedness and recovery. MO

Governance outcomes

Improved coordination and collaboration across governments to achieve water security. TR

Outcomes to: MA (maintain), MO (modify), TR (transform).

Pathway 3: Strengthen partnerships and integrate drought resilience priorities with strategic regional priorities.

Key regional actions

3.1	Develop a region-wide drought management plan. Incorporate strategies to mitigate, respond and support recovery from the impact of drought on the economy, environment, infrastructure and communities – using a multi-hazards approach.
3.2	Review the role of Local Drought Committees and consider options to expand their role to provide strategic advice; collect, monitor and share data; and share resources before, during and after drought across all areas of resilience. Consider options to define the committee's role under new drought arrangements, maintain transparency and expand membership to organisations involved in local drought preparedness and response initiatives.
3.3	Establish clear roles/responsibilities for individuals, First Nations groups, producers, businesses, organisations, not-for-profits, health organisations and governments during drought response and recovery.
3.4	Establish links between health organisations, charities and not-for-profits to improve coordination of consistent and relevant mental health and wellbeing information and support for communities and producers. Align events and opportunities with local governments and other attractions in the region to increase awareness of support pathways.
3.5	Develop local government planning and partnerships to ensure assets are maintained during drought. Identify opportunities to invest in or upgrade local and regional infrastructure and capital works to improve resilience to prolonged dry periods.
3.6	Ensure major industries and projects consider drought and implications on water supply in their business continuity plans.
3.7	Support consistency across and between government departments about drought responsiveness in relation to water, land management and infrastructure.

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Lead institutions

- NWQROC
- Chambers of commerce
- Regional Development Australia Tropical North
- LDMG/DDMG
- Health services
- Local Drought Committees

Key partners and stakeholders

- DSDIP
- DPI
- DLGWV
- DNRMMRRD
- BoM
- NEMA
- Red Cross
- Rural Aid
- Drought Angels
- GIVIT
- AgForce
- QFD
- Queensland Health (TRACC)
- Royal Flying Doctors Service
- Northern Australian Beef Research Council
- Glencore
- Stanbroke
- MITEZ
- Australian Agricultural Company
- Northern Australia Agricultural Company
- SGNRM
- QRA

Investment targets

- Future Drought Fund
- DPI
- QRIDA
- Philanthropic grants
- Infrastructure funds e.g. digital connectivity, roads and bridges

Economic outcomes

Business continuity and viable businesses in the region. MO

Environmental outcomes

Improved biodiversity conservation and natural environments. MO

Social and cultural outcomes

Improved accessibility to information, health outcomes and quick recovery periods from drought. MO

Governance outcomes

Improved coordination and collaboration across governments to achieve water security. TR

Outcomes to: MA (maintain), MO (modify), TR (transform).

Pathway 4: Improve land management practices for healthy land and water.

Key regional actions

4.1	Establish and promote land management options to increase soil hydration and rainfall use.
4.2	Establish on and off farm business diversification opportunities by conducting an analysis of opportunities, risks and blockers for business.
4.3	Support landowner knowledge about resilience and land management for diversification of primary production.
4.4	Improve land management practices through collaborative learning and information sharing. For example training and information workshops for landholders to obtain advice on latest practices, policies and technologies; improve landholder understanding of drought risks and impacts to landscapes.
4.5	Support opportunities and partnerships to combine scientific weather and land management with Traditional Owner cultural knowledge and practices.
4.6	Training and information sessions about weed and pest management for landholders including on-property visits such as inspections and consultations tailored to landholder needs.
4.7	Incorporate the impact of drought events on natural ecosystems in regional climate risk assessment on ecosystems and vulnerable species.
4.8	Investigate incentive payments for implementation of land management practices that create resilience.

Lead institutions

- SGNRM
- Agforce
- Industry groups
- NWQROC

Key partners and stakeholders

- Landcare groups
- TNQ Drought Hub
- DPI
- DETSI
- QPWS
- Biosecurity Queensland
- First Nations groups
- Traditional Owners
- Ranger groups
- BoM

Investment targets

- DETSI funding
- Federal government environment grants
- Philanthropic grants

Economic outcomes

Productive industries and minimised risks for producers. TR

Environmental outcomes

Improved land management, ecosystem and wildlife resilience. TR

Social and cultural outcomes

Improved community cohesion, supporting healthy country and healthy people outcomes. MO

Governance outcomes

Improved coordination and collaboration across governments to achieve water security. TR

Outcomes to: MA (maintain), MO (modify), TR (transform).

Pathway 5: Build economic resilience by supporting diversification and adapting to drought conditions.

Key regional actions

5.1	Identify and research business level vulnerabilities to drought across different industries and strategies for de-risking across different industries.
5.2	Identify opportunities to incorporate drought resilience with broader economic development opportunities, priorities and policies.
5.3	Provide information and training sessions prior to dry seasons which provide pathways to assistance such as Rural Financial Counsellors, funding programs, funding application support and mental and physical wellbeing services.
5.4	Develop a shared calendar of region-wide community and industry development events and promote to producers.
5.5	Develop a business case to allow landholders to use funding during drought response to upgrade and invest in on-farm infrastructure to improve resilience to future droughts.
5.6	Develop drought preparedness plan templates and resources for businesses, producers and contract suppliers to allied industries.
5.7	Consult with energy providers to ensure universal guarantee of energy supply.
5.8	Establish sustainable options for producers, businesses, individuals and contractors for allied industries to diversify income. Conduct consultation on and off-farm diversification in the region and with the state government to understand risks, blockers and establishment costs associated with diversifying income and primary production.
5.9	Undertake consultation and a feasibility study to establish key infrastructure to service the region such as a local abattoir and cotton ginnery.
5.10	Support businesses to capitalise on new emerging ecosystems markets, decarbonisation opportunities and circular economy.
5.11	Develop workforce skills and capacity for the jobs of the future.

Lead institutions

- Regional Development Australia Tropical North
- Regional economic development bodies
- Economic officers of councils
- Industry groups

Key partners and stakeholders

- DSDIP
- DLGWV
- DPI
- Energy infrastructure owners and providers
- Energy providers
- Outback Tourism (on-farm diversification and business support)
- Councils
- NWQROC
- Trade and Investment Qld (diversification, processing plants)
- NEMA

Investment targets

- Advancing Queensland
- Innovation Grants
- Industry and business grants
- Ausindustry
- DTET
- Workforce and skills grants
- Other economic development grants
- Research grants

Economic outcomes

Improved resilience of local businesses and industry to the impacts of drought. TR

Environmental outcomes

More efficient use of natural resources and investment into new sustainable industries. MO

Social and cultural outcomes

Viable communities linked with a healthy economy and reduction in the decline in population. MO

Governance outcomes

Improved coordination and collaboration across governments to achieve water security. TR

Outcomes to: MA (maintain), MO (modify), TR (transform).

Pathway 6: Enhance community connectedness, health and wellbeing.

Key regional actions

6.1	Fund delivery of mental health and other social initiatives including training, across regional communities to enhance capacity of individuals and services to support each other during response and recovery to drought events.
6.2	Develop and implement a heatwave-drought response framework mapping out key roles and responsibilities across sectors to understand and deliver actions supporting community resilience and places of refuge.
6.3	Deliver proactive drought risk management plans for vulnerable population groups.
6.4	Promote opportunities for communities to connect, including existing or new events. Develop a year-round regional calendar of events and identify opportunities to embed drought information and support. For example, a gardening event with information about drought resilient plants, embedded with advice on managing stress during drought; multi-agency drought information tents at campdrafts; sponsor community days, functions, musters and other events.
6.5	Conduct a regional needs gap analysis related to the delivery of drought assistance – such as financial, mental and physical health services, information and social support.
6.6	Develop a 'respite' program for impacted producers (e.g. small grants program or travel subsidies for short off-property breaks). Undertake consultation to ensure the program is accessible to producers and businesses (i.e. consider eligibility for additional short-term staff costs or find opportunities to partner with charity organisations to provide staff or other necessary resources to increase engagement with the program).
6.7	Provide consistent mental and physical wellbeing outreach and information. Provision of health and wellbeing services should be tailored to preferences of communities to increase engagement such as on-farm visits, letterbox drops, or smaller local events to reduce travel time.

Lead institutions

- ARC
- Community and mental health services
- PHN

Key partners and stakeholders

- NWQROC
- Queensland Health (TRACC)
- Rural Aid
- Drought Angels
- AgForce
- Royal Flying Doctor Service
- Mental health services
- Neighbourhood and community centres
- Church groups
- Local governments
- Local health services

Investment targets

- Mental health funding
- FDF
- PHN funding
- State and Federal government social and health funding
- Philanthropic grants

Economic outcomes

Reduced costs of preventative health approaches. MO

Environmental outcomes

Natural environments conducive to quicker recovery from drought. TR

Social and cultural outcomes

Improved access to mental and physical health services during drought events and increase in individual and community capacity to support one another. Needs of vulnerable populations identified and addressed. TR

Governance outcomes

Improved coordination and collaboration across governments to achieve water security. TR

Outcomes to: MA (maintain), MO (modify), TR (transform).

Community partnerships and communication strategy

North West Queenslanders are characterised by their strong mateship, community and trust. Drought initiatives in the region must be delivered with community values and need in mind to achieve high engagement and positive outcomes. No single engagement or community approach will work for all communities in the region and plans to deliver drought initiatives should consider this as part of the launch strategy. Key engagement challenges exist for the region including distance and a dispersed population, internet coverage, road, and connectivity. All actions and initiatives in this plan must be accompanied by a comprehensive, practical and targeted communications and engagement strategy.

Locals report confusion navigating drought assistance and others are unaware of services available to them. A 'less is more' approach to community engagement will support streamlined, consistent messaging about support services and opportunities in the region.

Some strategies for engaging the region include:

- Smaller, localised events to reduce travel.
- Leverage existing events and opportunities. Use popular community events to expose locals to support services and information as so-called 'hidden vegetables' in non-disaster events.
- Multi-media promotion of services including online and out of home channels such as mailbox drops.
- Leverage existing resources in the community before introducing new temporary roles or functions.

Regional partnerships

Active coordination of drought resilience strategy development and delivery is building through cooperation across several key regional institutions that will partner with NWQROC to support the implementation of actions and strategies in the Plan.

The North West region's landholders, producers and businesses are the key players most directly affected by drought and water shortage. Hence, raising the capacity of the NWQROC is crucial to ensure effective delivery of RDRP objectives and actions.

The below table lists key regional partnerships vital to supporting the NWQROC with implementing actions and priorities in this plan.

Figure 29: Potential partnerships for RDRP.[58]

Partnerships with key federal and state agencies

Federal and state agencies are critical to progressing policy and bilateral budgetary and program solutions to the long-term drought related issues facing the region. Combined Federal interest in broader resilience building (both drought, flood, and other natural disasters) is led through the National Emergency Management Agency (NEMA). The Australian Department of Agriculture, Fisheries and Forestry holds responsibility for dispersal of the Future Drought Fund. Other key Australian Government agencies that need to be drawn into implementation include the National Water Grid Authority, CSIRO, and the Department of Infrastructure, Transport, Regional Development, Communications and the Arts. At the State Government level, the NWQROC and its member councils have strong relationships with QRA and the Queensland Fire Department (QFD), and are collaborating to build and implement the region's broad Resilience Strategy, of which, this RDRP is a component. The region's capacity to drive these partnerships, however, is funding dependent. Queensland's DPI as the State lead on drought response and recovery, will need to increasingly partner the region in supporting responses to, and long-term monitoring of, this RDRP. Other key Queensland Government Departments that need to be drawn into this response include Local Government, Water and Volunteers; Trade, Employment and Training; Environment, Tourism, Science and Innovation; Transport and Main Roads; Housing and Public Works.

The below table lists key state and federal partners who should be involved in the implementation of activities in this plan, led by the NWQROC and key regional partners.

Table 2: Potential government partnerships for RDRP.[57]

Federal Government	Commonwealth Scientific and Industrial Research Organisation	Department of Agriculture, Fisheries and Forestry	Department of Infrastructure, Transport, Regional Development, Communications and the Arts
	National Water Grid Authority	National Emergency Management Agency	
State Government	Department of Primary Industries	Queensland Fire Department	Transport and Main Roads
	Queensland Reconstruction Authority	Department of Sport, Racing and Olympic and Paralympic Games	Department of Local Government, Water and Volunteers
	Queensland Treasury	Department of Trade, Employment and Training	Department of the Environment, Tourism, Science and Innovation
	Department of State Development, Infrastructure and Planning	Department of Women, Aboriginal and Torres Strait Islander Partnerships and Multiculturalism	Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development

Monitoring, evaluation and learning (MEL)

The FDF represents the Australian Government's ongoing commitment to strengthen drought preparedness and resilience. Development and publication of Regional Drought Resilience Plans (such as this one) aim to identify and guide actions to build the region's resilience to future droughts.

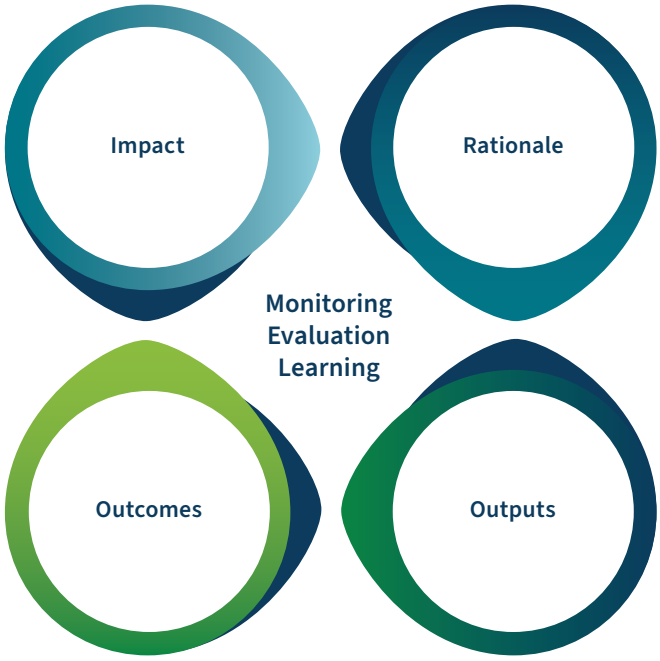
The overall benefits of regional planning are aimed to:

- empower communities to identify the impacts of drought and develop regional drought resilience and response management plans
- support communities to consider the incremental, transitional and transformational opportunities needed
- to strengthen drought resilience and encourage innovative initiatives at the regional level facilitate increased community understanding of their resilience to drought, including encouraging communities to share their learnings with each other and encourage improved natural resource management capability through planning.

Any planning process, however, requires a strong monitoring, evaluation and learning cycle. For the purposes of this plan, we adopt the framework of FDF for evaluation with a focus on impact, effectiveness, appropriateness and efficiency as shown in Figure 30.

Figure 30: Approaches to Monitoring, Evaluation and Learning (MEL).[66]

Impact
What signs of progress are there towards long-term drought resilience? What priorities and opportunities do the Fund and programs reveal for drought resilience policy, funding and programs?



Appropriateness
To what extent are the programs aligned with the strategic objectives of the Fund, and targeted at important needs? What can be done to improve the appropriateness of the investments?

Effectiveness
To what extent are programs achieving their intended outcomes (and any unintended outcomes)? What could be done to improve the outcomes of the investments?

Efficiency
To what extent are the Fund and program outputs being administered and delivered efficiently, and to the expected quality? What can be done to improve efficiency of the investments?

Theory of Change

The core underpinning our rationale is that building regional resilience will improve capacities to respond and adapt to the impact of drought. Resilience is a multifaceted concept involving a range of views combining resistance in the face of adversity, rebounding and transformation[59],[60]. Three common conceptualisations of resilience include an engineering resilience return to a point of stability following a disturbing event[61]; the amount of disturbance a system can absorb before changing to another stable state of equilibrium[62]; and a characteristic allowing members to thrive in an environment characterised by change, uncertainty, unpredictability, and surprise[63]. The theory of change adopted for this project incorporates dimensions of the wider context for drought and increased community capacity for planning and transformation in the face of drought.

Drought resilience is more than susceptibility and vulnerability[64]. Resilience thinking addresses the dynamics and development of complex social–ecological systems[65]. Our theory of change commences with consideration of the wider context and addresses social and economic resilience as well as the resilience of agricultural and environmental systems.

The theory of change will enable development of program outcomes and program logic. An overview of how the theory of change flows into key components of program outcomes and logic are presented below. A detailed MEL framework will be developed if resources are appropriately implemented as outlined in the following.

Overall program outcomes

While our pathways and strategies are derived from the above theory of change, the North West Queensland RDRP sets the quadruple-bottom line regional outcomes intended from these – including economic, environmental, social and governance and cultural outcomes.

Table 3: Dimensions of RDRP program outcomes.[67]

	**Economic** Reduced economic cost arising from drought.
	**Environment** Reduced environmental decline emerging from drought.
	**Social and cultural** Increased general community and cultural health as a key resilience factor.
	**Infrastructure** Increased resilience of infrastructure.

Program logic

The program logic of the RDRP identifies the outcomes from each of the activities in the Plan, based on the theory of change and overall program outcomes.

RDRP Drought Resilience Vision

Activity	Outcomes	Measures/indicators
Enhance water security	• Improved access to water during drought. • Water quality and availability is maintained during drought. • Landholders manage personal water use to improve resilience. • Improved water storage capability. • Water infrastructure is in good condition and uses the latest technology.	• Water plans, policies, strategies and infrastructure revised and amended. • Water quality testing and monitoring processes in place. • Landholder capacity to store and manage water use for on-property resilience activities increased.
Early decision making	• LDMGs, DDMGs, landholders, producers and businesses have improved ability to make early and informed decisions to respond to drought. • Producers, landholders and businesses understand their drought risk and have plans in place to reduce impact. • Local infrastructure captures climate information and data. • Weather data and information is clearly and regularly communicated to local communities. • Disaster management arrangements encompass all hazards across preparedness, response and recovery. • Disaster management arrangements are informed by local knowledge and experience.	• Early warning system with multi-scale climate, soil and water information accessed by industry, government and community. • Regional water strategy. • Early warning information and communication pathways. • Clear roles and responsibilities for early decision making. • Knowledge capture system. • Disaster management arrangements incorporate drought.
Strong partnerships	• Roles and responsibilities in drought resilience, response and recovery are clearly defined and understood by governments, businesses, landholders, industry, charities and communities. • Drought and water support programs, initiatives, policies and organisations are aligned and complement the broader resilience vision for the region. • Drought support is informed by local needs and knowledge.	• Regional drought management plan. • Knowledge sharing between industry, government, community and drought support organisations. • Opportunities to align priorities and initiatives between drought agencies and organisations. • Feedback pathways for community to all levels of government. • Industries engaged in drought and water supply planning.
Healthy land and water	• Improved land, water and ecosystem health. • Landholders use their land to build personal resilience. • Landholders understand how to care for the land and the consequences of poor land management. • Land management practices are informed by cultural knowledge and practices.	• Land condition monitoring. • Water supply and condition monitoring. • Traditional Owners engaged in land and water management across the region. • Landholder engagement in diversification of crops and primary production. • Landholders engaged in improved land and water management practices.

Activity	Outcomes	Measures/indicators
Proactive economic resilience	• Disaster management arrangements support information sharing across all communities and industries. • Landholders, producers and businesses have individualised plans to reduce the impact of drought and build resilience to future drought. • Drought resilience is ongoing and interlinked with all-hazards resilience. • Local infrastructure reduces the costs during drought and time to recover following drought.	• Drought resilience is integrated in economic development initiatives across the region. • Landholders, businesses and producers have drought resilience plans with actions and time frames for decision making based on personal circumstances. • Key economic industries are engaged in local and regional resilience planning. • Landholders and businesses diversify income.
Health and wellbeing	• Communities maintain strong connections and partnerships before, during and after drought. • Communities understand resources available to them. • Cultural practices and wellbeing are maintained during drought. • Communities understand the impact of drought on mental and physical wellbeing. • Communities know who to go to for support before, during and after drought.	• Events and attractions across the region integrate health and wellbeing information and support. • Partnerships between health and wellbeing programs and organisations. • Information and data from health practitioners and hospitals. • Feedback and information from Traditional Owners. • Uptake of health and wellbeing initiatives. • Cultural practices maintained.

Data Collection Methods

Data will be collected at established points in implementation of the RDRP. Collecting and collating data will interweave collaborative planning meetings, ongoing desktop analysis, review of existing data, surveys, interviews and focus groups, and case studies. The data collection process will balance qualitative and quantitative methods to enable deep data capture change and overall program outcomes.

Overseeing implementation of the RDR Plan, MEL framework and shared learning

The Future Drought Fund MEL plan identifies the need for strong monitoring, evaluation and learning processes. Through existing regional governance arrangements, project outcomes and indicators can undergo a review and reporting process – which in turn provides the platform for structured learning. The established North West Regional Organisation of Councils will provide a platform for external stakeholders and lead institutions identified under strategic pathways, to review the FDF MEL (if resourced appropriately). The outcomes of the review will allow for ongoing structured learning across the various regional stakeholders. The NWQROC (if resourced appropriately) will host this plan, requiring participation from the identified lead agencies during the implementation phase – dependent on funding and in relation to the category or type of learning required. Technical groups may develop during implementation, similar to the existing Regional Roads and Transport Group.

For this to take effect, the RDR Plan assumes regional stakeholders will have the capacity and capability to participate in the MEL process, and can share information to assist with implementation. Resourcing governance arrangements and implementation will significantly support the coordination of the FDF MEL long-term implementation.

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Appendices

Appendix 1: Australian droughts

Primary location | Key causes | Key impacts

Federation Drought | 1895–1901

- All Australia, particularly Queensland Coast.
- Below average to record-low rainfall central/ eastern Australia.
- Sheep/cattle losses.
- National wheat crop at lowest yields of century.

World War II Drought | 1937–1945

- New South Wales, Victoria, Most of Queensland, parts of Western Australia.
- Below average rainfall.
- Intense dry weather.
- Black Friday bushfires.
- Water shortages.
- Dust storms.

The El Nino Drought | Apr 1982 – Feb 1983

- Australia; WA less affected
- Strong El Nino.
- Rainfall deficiencies for up to a year.
- Clear skies and low atmospheric moisture levels cause intense dry conditions.
- Failed wet season in the North.
- Ash Wednesday bushfires.

The 2017– 2019 Drought | 2017–2019

- All Australia
- Western Queensland, Dry conditions from 2012–15.
- Record low rainfall across Murray-Darling Basin.
- Extreme dry conditions: consecutive dry, cool seasons.
- Devastating and long-lived bushfires.
- Spring 2019: Highest fire weather danger as measured on the Forest Fire Danger Index.

1895
1900
1905
1910
1915
1920
1925
1930
1935
1940
1945
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1955
1960
1965
1970
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1980
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1990
1995
2000
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2010
2015
2020

1914 Drought | May 1914 – Mar 1915

- Western Australia, South-eastern Australia, Tasmania
- Strong El Nino brought intense dry conditions.
- Failure of national wheat crop.
- Murray River stopped flowing.

1965–1985 Drought | 1965–1968

- All Australia, Queensland greatly affected.
- Eastern Australia see-saws between intense wet and dry conditions.
- Record dry conditions in Southeast.
- Severe Spring bushfires.

The Millennium Drought | 1997–2009

- Southern Australia.
- First drought that significantly interacted with climate change effects.
- Acute dry periods with little relief.
- Long period without wet episodes.
- Murray Darling Basin significantly affected.
- Cropping zones severely affected.
- Long-term drying of vegetation.
- Significant water storage drops.

Image: Lawn Hill Gorge, Boodjamulla National Park (Aboriginal Land), QLD. Photographed by Mark Nemeth ©Queensland Government, 2009.