

Mary 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 Mary Regional Drought Resilience Plan has been developed as a partnership between the Rural Economies Centre of Excellence and Regional Development Australia – Wide Bay Burnett.

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).

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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.

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Interpreter statement

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

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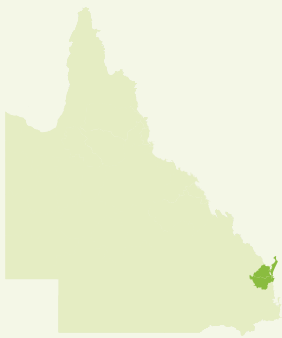


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Foreword



Regional Development Australia Wide Bay Burnett (RDA WBB) is proud to be a regional partner of the Rural Economies Centre of Excellence to support the development of this Mary Regional Drought Resilience Plan.

Drought is an enduring feature of Australia's landscape with significant economic, social and environmental impacts on people and local communities. The importance of a Regional Drought Resilience Plan that reflects the Mary region's unique regional landscapes and which draws on local knowledge of our communities cannot be overstated.

This plan is truly community-owned and led with its development involving local governments, regional organisations, the agricultural sector and the community. The plan aims to empower individuals and communities to better manage future dry seasonal conditions, including droughts and other natural disasters, and inform governments about our region's needs and priorities to leverage future support and investment.

Importantly these plans recognise that the Mary's most important resources are its people. Within the plans are a number of actions to ensure that people get the mental health and wellbeing support they need during periods of drought and natural disasters.

RDA WBB is dedicated to strengthening its role as a regional partner of this Regional Drought Resilience Plan and I invite you to collectively work within your community to address the impacts of drought to build resilience in our region for future generations.

**Chair
Regional Development Australia Wide Bay Burnett**

Acronyms

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences	LIDAR	Light Detection and Ranging
ABS	Australian Bureau of Statistics	MRCCC	Mary River Catchment Coordinating Committee
AIHW	Australian Institute of Health and Welfare	NRM	Natural Resource Management
BMRG	Burnett Mary Regional Group	PHN	Primary Health Network
BoM	Bureau of Meteorology	QDMA	Queensland Disaster Management Arrangements
CASS	Cairns Alliance of Social Services	QRA	Queensland Reconstruction Authority
CQU	Central Queensland University	QSDR	Queensland Strategy for Disaster Resilience
CSIRO	Commonwealth Scientific and Industrial Research Organisation	RDA	Regional Development Australia
DPI	Department of Primary Industries	RDRP	Regional Drought Resilience Planning
FDF	Future Drought Fund	RECoE	Rural Economies Centre of Excellence
FRRR	Foundation for Rural and Regional Renewal	RFCS	Rural Financial Counselling Service
GDP	Gross Regional Product	ROG	Regional Oversight Group
GVP	Gross Value of Production	TAFE	Technical and Further Education
LGA	Local Government Area	UNDRR	United Nations Office for Disaster Risk Reduction
		UniSQ	University of Southern Queensland



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 1897¹.

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

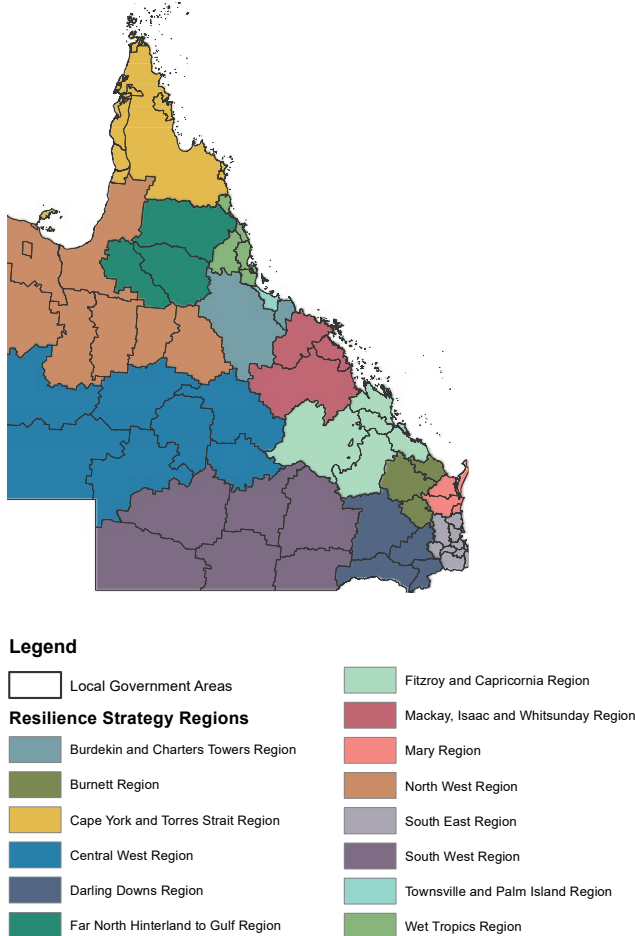
Queensland is the most disaster impacted state in Australia, and Queenslanders are susceptible to a variety of hazards. We are facing unprecedented change in both our current and future operating environment with a dynamic political, social, economic and policy landscape surrounding disaster risk reduction 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 2022–2027.⁴¹



Regional planning and engagement

This RDR plan was developed through a collaboration between RECoE, Regional Development Australia Wide Bay Burnett and key regional stakeholders.

The engagement model was developed from earlier work undertaken by RECoE, Red Cross Queensland², the Queensland Reconstruction Authority (QRA)³, CSIRO⁴ and was informed by international best practice from the World Bank and the UNDRR⁵. The plan has been reviewed by the CSIRO – appointed as an independent assessor by the Australian Government – and their feedback has been incorporated in the final plan.

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 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.

Unique stakeholders	Number
LGAs	9
Formalised conglomerations of LGAs	1
Farming groups	2
Farming businesses	22
Regional Development Australia Committees	8
Regional NRM organisations	5
Indigenous groups/ organisations	3
Agricultural industry representative groups (peak bodies)	6
Development commissions	0
Emergency services	0
Community service organisations	9
Research organisations	10
Water authorities	0
Utility organisations	2
Financial institutions	3
Farm Advisers/ Consultants	3
Drought Resilience Adoption and Innovation Hubs	7
* Chambers of Commerce	7
* Agribusinesses	13
* Other businesses	4
* State Government agencies	9
* Federal Government agencies	4
* Other FDF programs	9
* Individual / community member	0
* Governance Groups	0
Total engagements	
Formal network meetings	25
Consultation/information forums	20
Workshops and other interactive activities (including online)	25
Communication activities	7
One on one consultation	77

Key principles and concepts: drought and resilience

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

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

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

The Sendai Framework for Disaster Risk Reduction: 2015-2030⁹ defines resilience as:

“the ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management”.

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 2).

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).

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”⁴¹.

Figure 2: Four key objectives of the Queensland Strategy for Disaster Resilience 2022–2027.⁴²



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

Figure 4: Queensland RDRP elements of drought resilience.⁴⁴

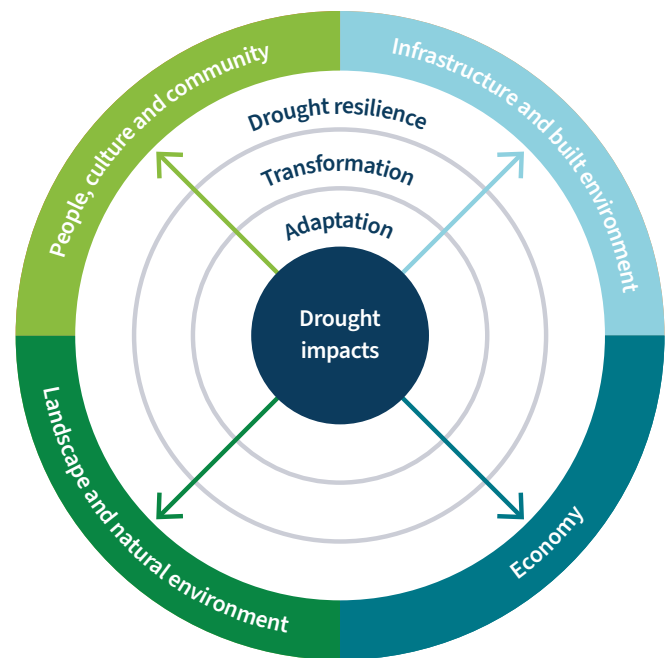
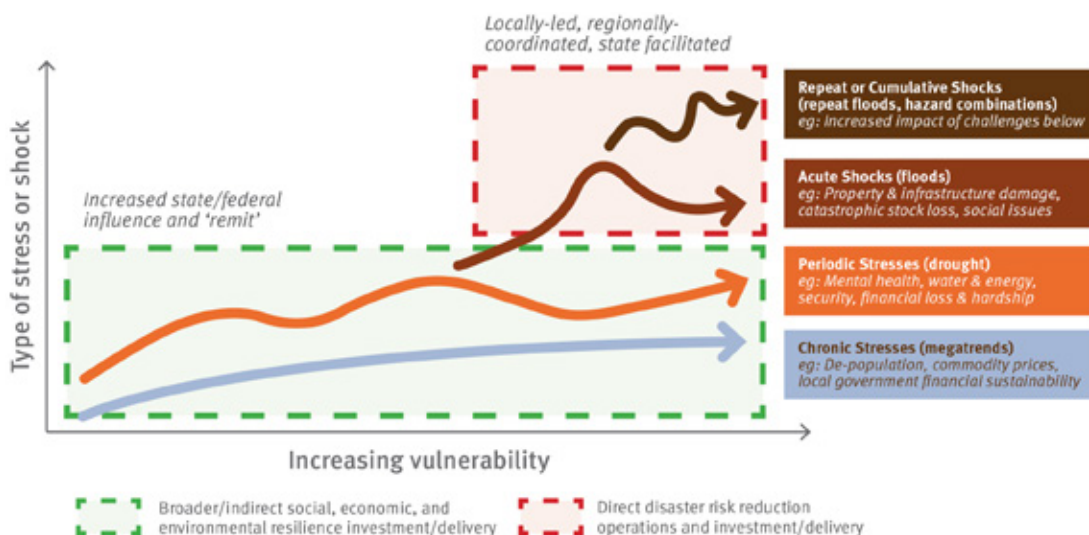


Figure 3: How resilience is affected by stresses and shocks, adapted from the Queensland Strategy for Disaster Resilience 2022–2027.⁴³



How to use this plan

The purpose of the plan

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

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 that 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:

- National Disaster Risk Reduction Framework
- Profiling Australia's Vulnerability
- Queensland Strategy for Disaster Resilience 2022–2027
- Queensland Climate Adaptation Strategy
- Mary Regional Disaster Resilience Strategy
- Water Plan (Mary Basin) 2023
- Wide Bay Burnett Regional Plan
- Wide Bay Burnett Climate Change Impact Summary
- Conserving Nature – a Biodiversity Conservation Strategy for Queensland 2022 (the Biodiversity Strategy).

Other important linkages

This plan should 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 Mary region covered by this Regional Drought Resilience Plan encompasses all of the Mary River Catchment and also coastal areas to the east (see map). Land areas range from the tip of K’Gari (Fraser Island) and Hervey Bay in the north; to Imbil in the south and extending as far west as Goomeri. At its heart is the Mary River, known as *Moocooboola* by the indigenous *Gabi Gabi* people. This was originally named the *Wide Bay River* by early European explorers, before being officially re-named the *Mary River* in 1847, in honour of the Governor’s wife. The *Mary RDRP* region primarily includes areas of the *Fraser Coast*, along with the *Gympie*, and *Noosa* Local Government Areas (LGAs).

The Mary region is rich and fertile, and always has been a place of varied and abundant food. Before European arrival it was the home of many First Nations language groups – the Kabi Kabi, Wakka Wakka, Goreng Goreng, Taribelang Bunda, and Badjala peoples. For countless generations, First Nations peoples had gathered every three years to feast on the nutty cones of the towering ‘Bonye Bonye’ or Bunya pines. The cultural significance of these massive gatherings was recognised by the Queensland Governor in 1842, who declared that no licence for European occupation or timber-felling would be granted for lands where these trees grew and that the lands be effectively designated to Aboriginal people.

Figure 5: Mary regional map.⁴⁵

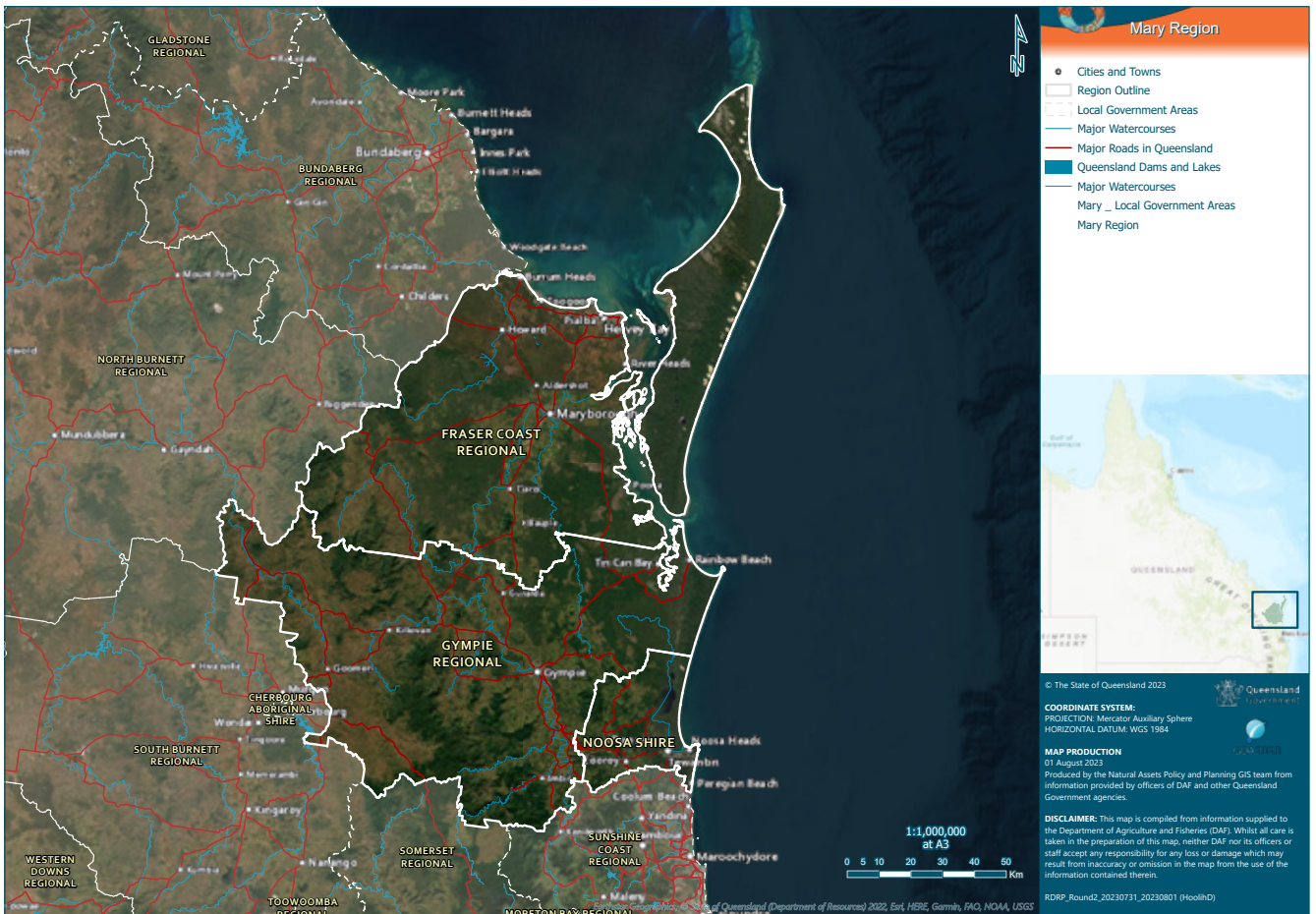
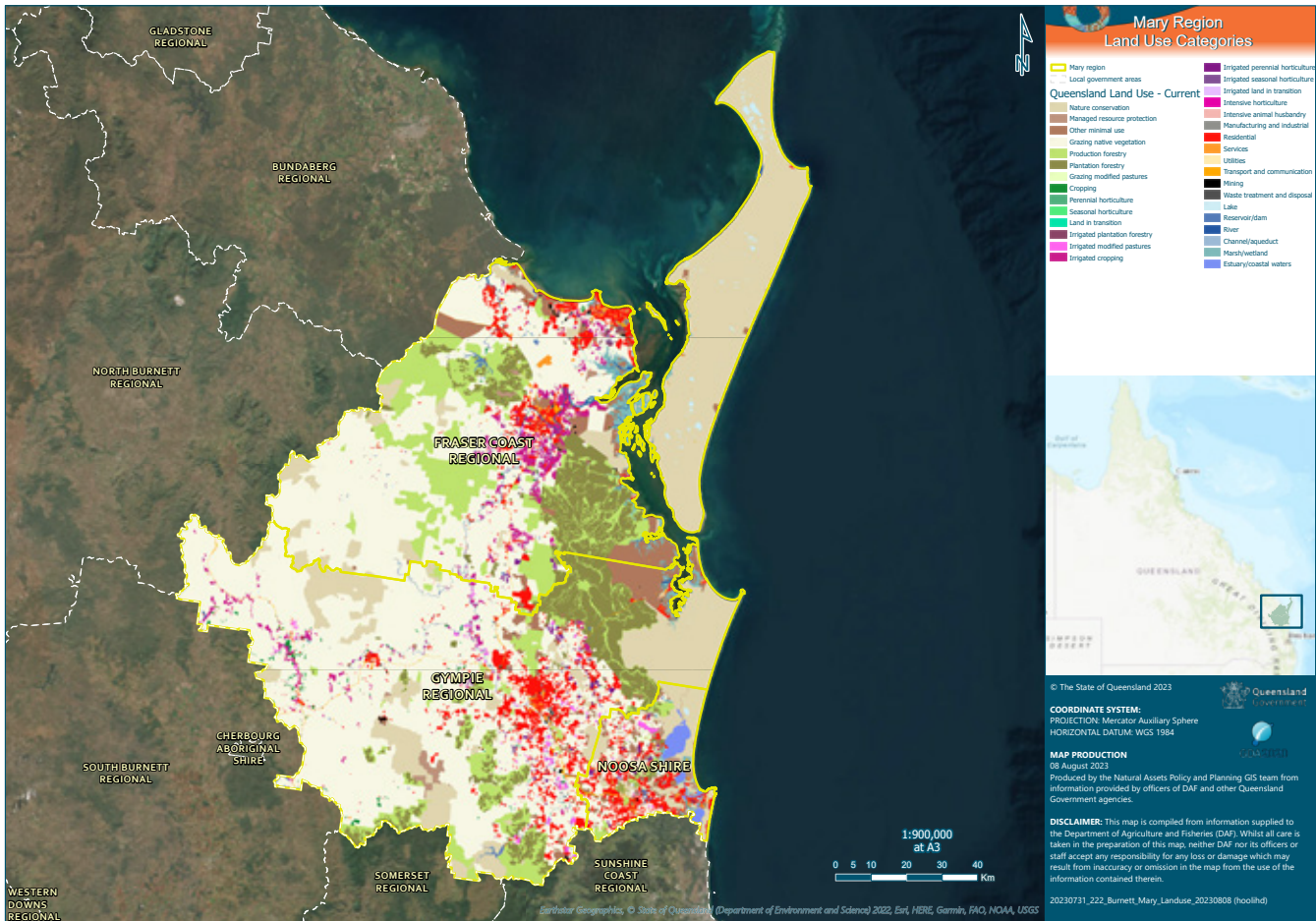


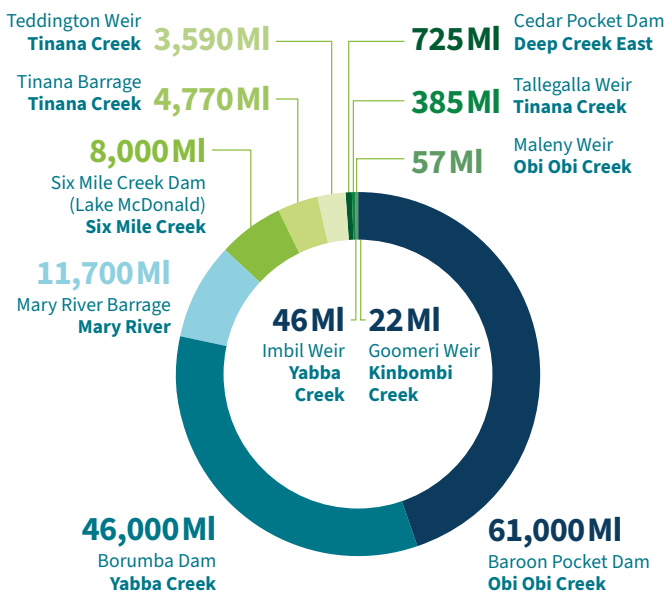
Figure 6: Mary region land use map. Figure 6: Burnett region land use map.⁴⁶



However, by the late 1840s both the upper and lower Mary valley were under pastoral occupation, with early ‘runs’ being established for wool production and Maryborough already established as the port for export of this product. The timber-getters arrived at the same time and the ban on timber felling was revoked. Timber became a major industry in the region and by the 1860s most graziers around the region began to utilise the rich pastures for raising cattle. Agriculture in the Mary Valley had its origins in the garden plots of the pastoral runs. Maize and potatoes were the most commonly grown crops, along with some wheat, barley, and small amounts of vegetables and a few fruit trees. Gympie often markets itself as “the Town that saved the Colony”, as in 1867 James Nash found gold near the Mary and started a gold rush in the area. Small towns sprang up to service the prospectors and the goldrush became the catalyst for accelerated development with timber and agricultural produce required by mines and miners. The many smaller ‘blocks’ created by halving pastoral runs under the Crown Lands Alienation Act of 1868 now produced mainly horticultural products for local food, chicken farming and the raising of sheep, pigs and cattle (mainly for meat).

By the turn of the century, gold mining was beginning to dwindle, forestry (including timber-cutting) was booming but other forms of agriculture throughout the region were sporadic. Queensland’s first State Forest was established at Brooloo (1907) and Imbil (1909) and as well as harvesting natural stands of forest timbers, the newly-formed Department of Public Lands established nurseries for re-forestation which has led to the current significance of modern forestry and timber processing as a major part of the agricultural sector in the Mary. Dairy production in the region was strongly encouraged by the government, and development of the railway lines for transporting produce and investment in infrastructure such as the butter factory in Cooroy, meant by 1927 dairying was worth more than gold¹². Nestle established a powdered milk processing factory in the 1950s which still exists today as a major employer, now manufacturing instant coffee.

Figure 7: Impoundments in the Mary River catchment.⁴⁷



The Mary region continues to be an important agricultural production area with forestry (predominantly plantation) still prevalent. There are areas of irrigated cropping and horticulture in the Maryborough region, and in pockets of land dotted along the river systems. The main livestock raised are cattle (beef and dairy), pork and chicken. The main crops are fruit and vegetables, ginger, macadamias, sugarcane and plant nurseries. The region’s agriculture has experienced three significant, and interlinked, pressures in the last decade¹³:

- (1) The reduction in financial viability for small-scale farmers and the subsequent amalgamation into larger (more viable) properties by corporations.
- (2) The development of peri-urban agricultural land for increased residential development; and increased land prices.
- (3) An increased demand for water (particularly for increasing residential and urban business needs) and subsequent reduction in water allocations for irrigation.

Water for residential, agricultural and industrial/business use is supplied by a combination of dams, weirs and barrages on the Mary River and its tributaries¹⁴.













The region is well-serviced with transport connections and has a regional airport at Hervey Bay. Major highways run north to south and east to west. The North Coast railway line runs through the region connecting it to Brisbane. Maryborough Port, once a port of entry for thousands of European migrants as well as indentured ‘Kanaka’ labourers from the South Pacific, is now used for recreational vessels only.

In the last decade, there has been increased population growth. This is mainly due to internal migration, particularly around the residential coastal areas of the Noosa LGA (population of 57,397) and Fraser Coast LGA (population of 115,173), as well as the urban areas in the Gympie Regional LGA (population of 55,170). All Mary region LGAs experienced population growth higher than the Queensland state average of 15 years. However, the Mary region’s population contains 41.2% of people considered ‘most disadvantaged’¹⁵ -more than double the state average. The number of homeless people (50.7 per 10,000 persons) is far higher than the State average. Across the Mary region, only 51% of adults have finished year 12, compared to 63.6% of Queenslanders. The median personal income is \$30,297 per annum with over 26% of households earning less than \$33,800 per year; more than \$10,000 lower than the Queensland average. The unemployment rate is 11.1%, compared to a State average of 7.3%¹⁶.

A recent government report¹⁷ shows the major employers (percentage of overall regional employees) in 2021 were Health Care and Social Assistance (17.2%); Retail Trade (10.8%); Accommodation & Food Services (8.9%); Construction (10.1%); and Education & Training (8.5%). Agriculture, Forestry and Fishing was responsible for only 3.6% of total jobs in 2021. The same report shows there were more employees classified as ‘Technicians and Trades Workers’ (14.7%) and ‘Community and Personal Service workers’ (14.8%) than the Queensland average. There were slightly more people classified as ‘Labourers’ (12.2%) and generally less ‘Professional’ employees. Annual employment growth in the region has averaged 8.9 % in 2022–23 and is expected to rise even further with the recent announcement¹⁸ of 800 new jobs in railway carriage construction in Maryborough. Despite this, there is likely to be a continued decline in agricultural employment in the region.

There are 24 hospitals in the region with major hospitals in Hervey Bay (including a new mental health facility), Maryborough, Gympie, Noosa, Caloundra, and Sunshine Coast University – as well as a network of health centres and clinics throughout the region. University of the Sunshine Coast (USC) maintains three campuses in the region, and TAFE has campuses in Nambour, Mooloolaba, and Hervey Bay. The region is well serviced with primary and high schools.

Figure 8: Regional socioeconomic profile.⁴⁸

Fraser Coast		Gympie		Noosa		Queensland	
Population (2021) 				Australian Digital Inclusion Index (2021) 			
112,078	53,851	56,873	5,217,653	67.1	67.9	71.4	73.2
Projected population as at 30 June 2041 				Unemployment rate (2021) 			
130,630	60,085	64,999	7,161,661	8.1	5.9	4.5	5.4
Median age of residents (2021) 				SEIFA 2016 Socio Economic Index of Social Disadvantage (mean score is 1,000) 			
51	48.2	50.5	38.4	915	930	1,030	–
% Aboriginal or Torres Strait Islander Peoples (2021) 				Number of local businesses (2021) 			
5.1	4.4	1.7	4.6	6,002	4,608	7,234	48,5971
Population who speak a language other than English at home (2016) 				Population that need assistance with core activities (2021) 			
3.9	2.8	5.8	13.2	10.8	9.7	5.6	6.0
Median total personal income (2021) 				Protected area – parks, forests, reserves area (km ²) (2021) 			
45,000	42,380	41,316	50,925	193,684	108,996	23,672	1,214,000

Climate trends

The NRM & Climate Resilience Plan 2030⁴⁹ states for the last 30 years, the observed trends provided by the Bureau of Meteorology for the Burnett and Mary regions are:

- Annual rainfall has been relatively stable.
- Dry years have occurred 13 times and wet years five times.
- Rainfall has decreased in the summer months on the coast.
- Rainfall has decreased in the winter, spring and summer months in the inland parts of the region.
- Wet season rainfall is reliable, dry season rainfall is unreliable.
- On average, heavy rain events have occurred twice a year.
- There have been more hot days, with more consecutive days above 35°C.
- Severe heat stress days for livestock are increasing.

Figure 9: 2000 to 2001 Annual rainfall.⁴⁹

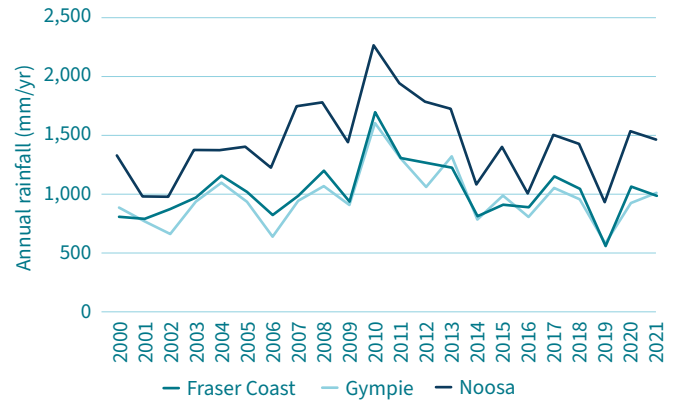


Figure 10: Mary region historic rainfall.⁵⁰

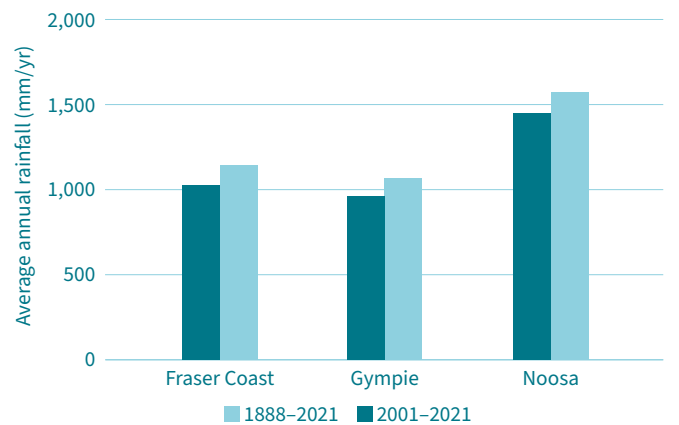


Image: Humpback Whale underwater in Hervey Bay, Queensland.

History of drought in this region

The Mary region consists of a diverse mixture of land use with:

- two biospheres – Noosa Reserve and Great Sandy Reserve
- large population areas – Harvey Bay, Noosa, Sunshine Coast cities
- smaller population areas dotted throughout
- large forestry reserves
- national parks
- extensive areas of farming land.

All these land uses are impacted by drought events – some of which are consistent across the land uses, with other impacts specific to particular land uses. This diverse range of land use and complex interaction of drought impacts isn't unique to this region but shapes the profile of drought impacts for the Mary region.

As with most of Australia, there is a strong link between water – the waterways, waterholes and the patterns of rain and flood – in this region and the cultural practices of the Aboriginal and First Nations people. Connolly, Williams and Williams²⁰ describe the importance of having sufficient 'cultural water' in the following statement:

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

The early records of European agriculture in the Mary are filled with the stories of what is now known as the typical weather patterns for the region. These are an extreme cycle of prolonged wet weather and significant flooding, followed by very dry spells and droughts. Like much of eastern Australia, the region was ravaged by the Federation Drought of 1895–1902. Nevertheless, it should be noted from examining the historic drought declarations since 1964, Fraser Coast and Noosa LGAs have spent relatively little time (10–20%) under drought conditions. The Gympie LGA (particularly the western areas) have been under drought conditions for up to 40% of that period. While the 2019 annual rainfall for the Gympie LGA didn't drop as low as the 1901 annual rainfall, it got very close. Figure 11 shows average maximum temperatures for the LGA trending upwards.

Figure 11: Annual total rainfall and annual maximum temperature for the Gympie LGA.⁵¹

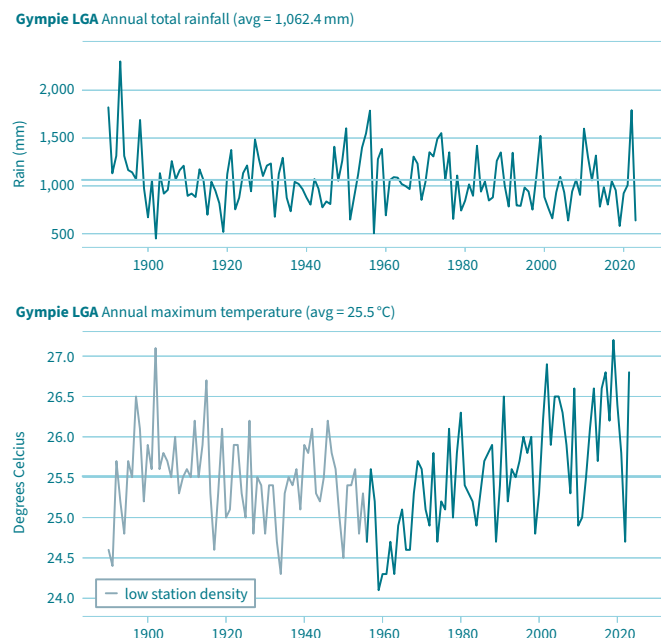
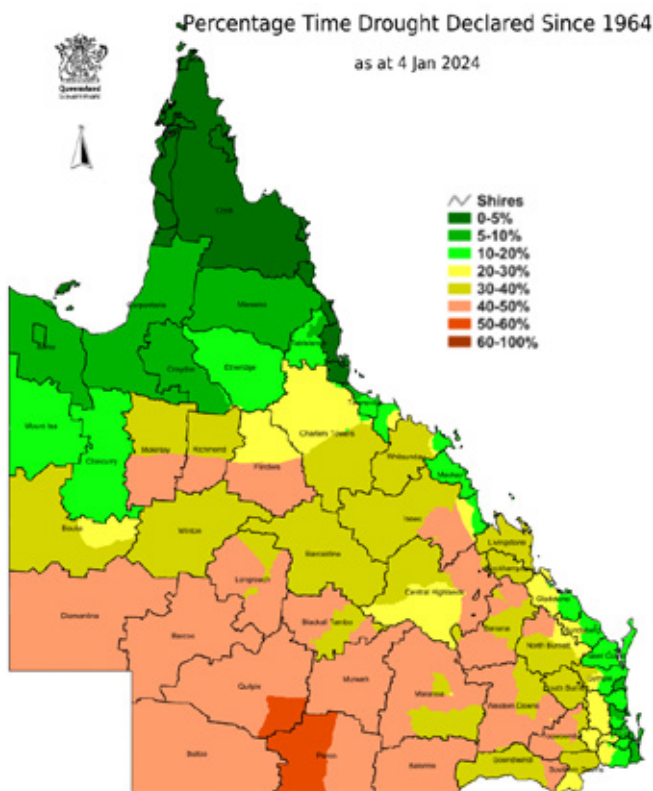


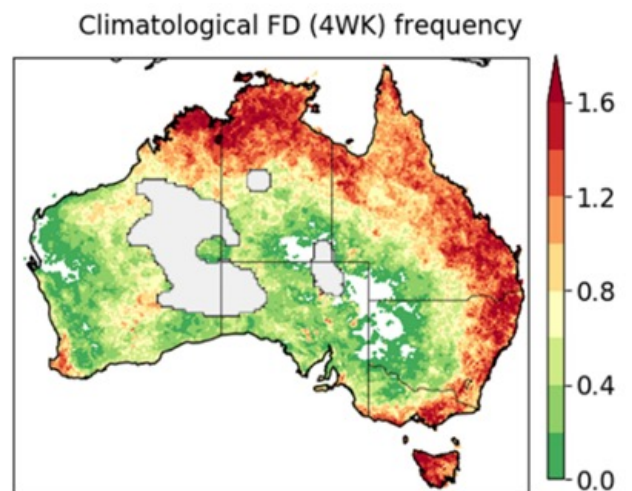
Figure 12: Percentage of time in drought since 1964.⁵²



“Drought just isn’t a big deal on the eastern side of the Mary – it is coastal system and different ecosystem to the western side – they’ve really not experienced drought at all. The western side’s more aligned to the South Burnett systems.”

– Government Officer

Figure 13: Annual frequency of flash droughts.⁵³

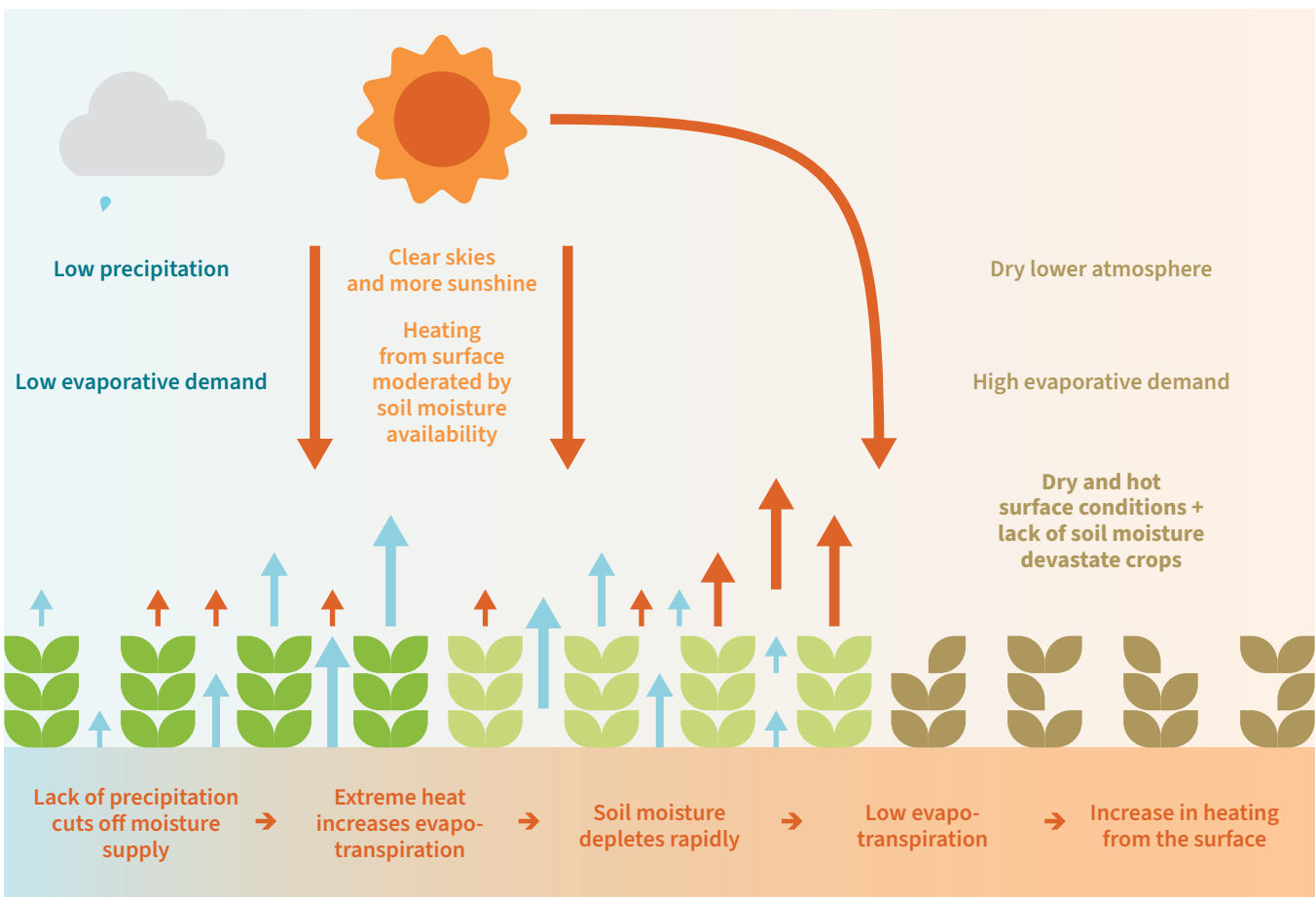


“The region is highly susceptible to flash droughts that typically last for as little as a month and as long as six months. The diagram shows the climatic conditions and soil and plant responses to those conditions which cause a flash drought. Blue arrows from the surface indicate evapotranspiration and the red arrows indicate heat. The larger the arrow the bigger the flux from the surface to the lower atmosphere.”²¹

“The Mary region is highly prone to bush fires. Research has identified that there is a high correlation between indicators of flash drought likelihood (ESI) and bushfire likelihood (KBDI). Other factors other than climatic conditions such as levels of biomass also factor into the likelihood of bush fires occurring.”

– Assoc. Professor David Coburn, Centre for Applied Climate Modelling

Figure 14: Climatic conditions and soil and plant responses which cause flash droughts.⁵⁴





Past impacts of drought in this region

People, culture and community

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

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

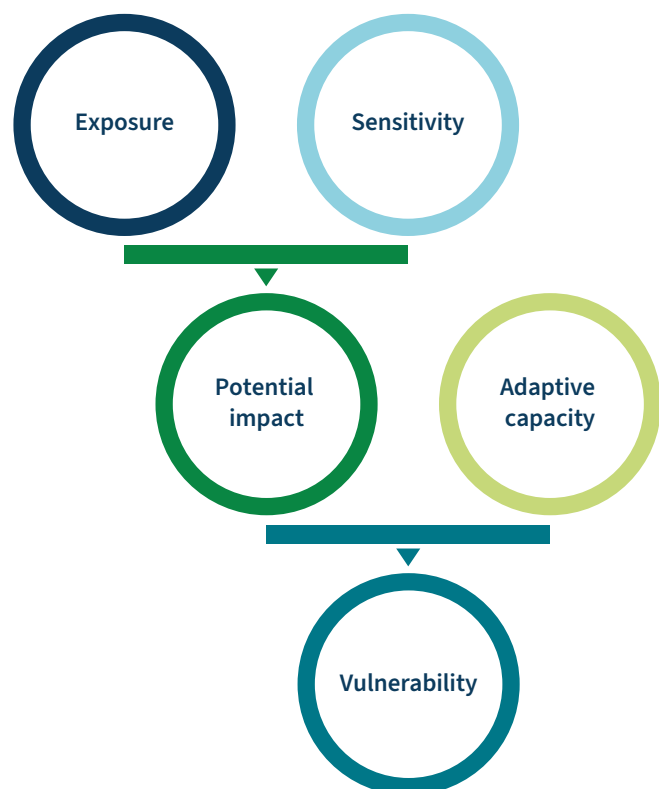
Their 'Exposure' is best understood as: *"the presence of people; livelihoods; species or ecosystems; environmental functions, services, and resources; infrastructure; or economic, social, or cultural assets in places and settings that could be adversely affected"*.²²

Their 'Sensitivity' relates to their dependence on the factor that is changing (e.g. rainfall or water supplies) – these combined determine the level of 'Impact'.

However, the community's 'Adaptive Capacity' or resilience can mitigate some of the impacts and hence reduce their level of 'Vulnerability'.

Community feedback, government reports and statistical evidence all suggest the vitality of the community is a critical factor in their capacity for local drought resilience.

Figure 15: Drought Vulnerability Framework.⁵⁵



Community feedback, government reports and statistical evidence all suggest the ‘vitality’ of the community is a critical factor in their capacity for local drought resilience. While there is no definitive list of the factors contributing to community vitality, there is general consensus it includes such indicators as:

- growth or decline in population
- availability or diversity of local employment
- ‘connectedness’ and participation in community groups/events
- access to knowledge, ideas and advice
- evidence of community ‘pride’
- community health (physical and mental)
- local investment
- availability of affordable housing
- ‘liveability’ and ‘local amenity’
- community governance and leadership
- cultural identity
- subjective levels of wellbeing
- levels of security, crime and conflict.

The McConnell Foundation²³ summarises community vitality as: *“Creative Placemaking; Fostering ‘Local’; Future Readiness; Active Lifestyles and Civic Engagement.”*

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

It is worth noting that scale matters – while annual rainfall appears to have little impact on regional population levels, it is clear to see it had significant impact at a township level, as seen in Kilkivan.

Figure 16: Regional total population and annual rainfall.⁵⁶

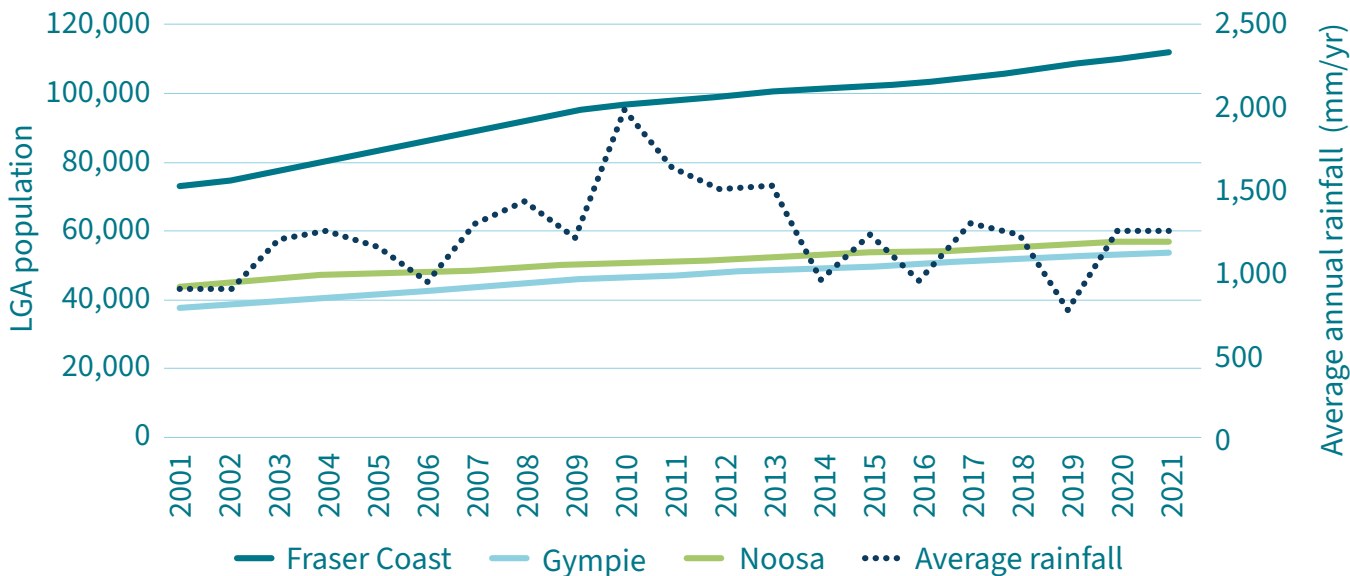


Figure 17: Kilkivan population and annual rainfall.⁵⁷

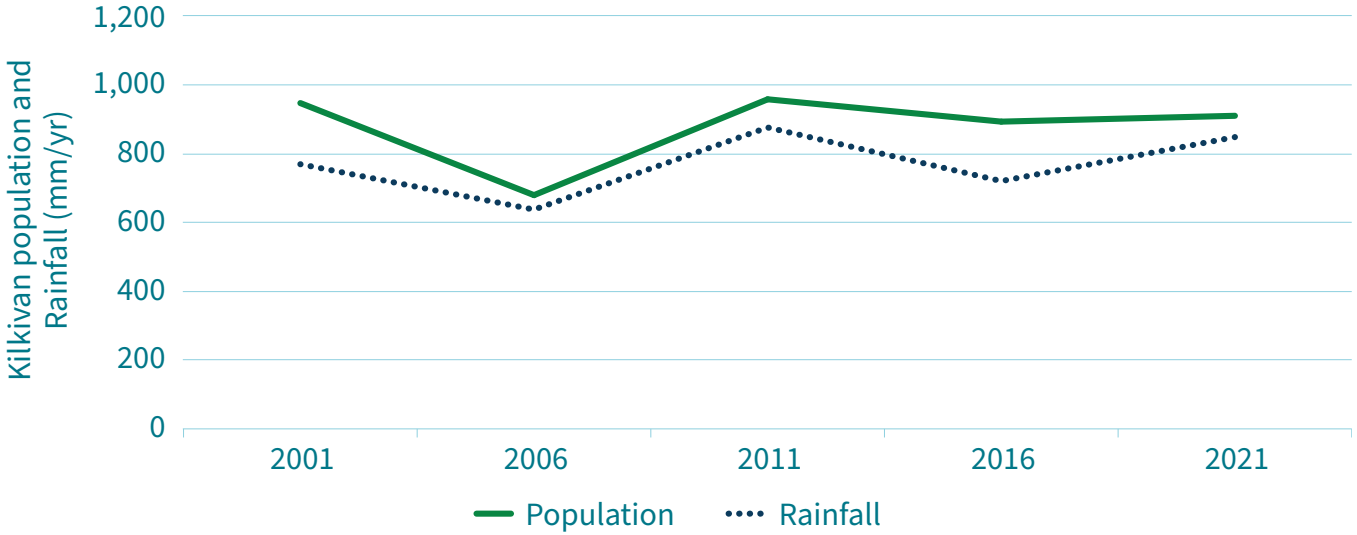


Figure 18: Wide Bay Region unemployment and annual rainfall.⁵⁸

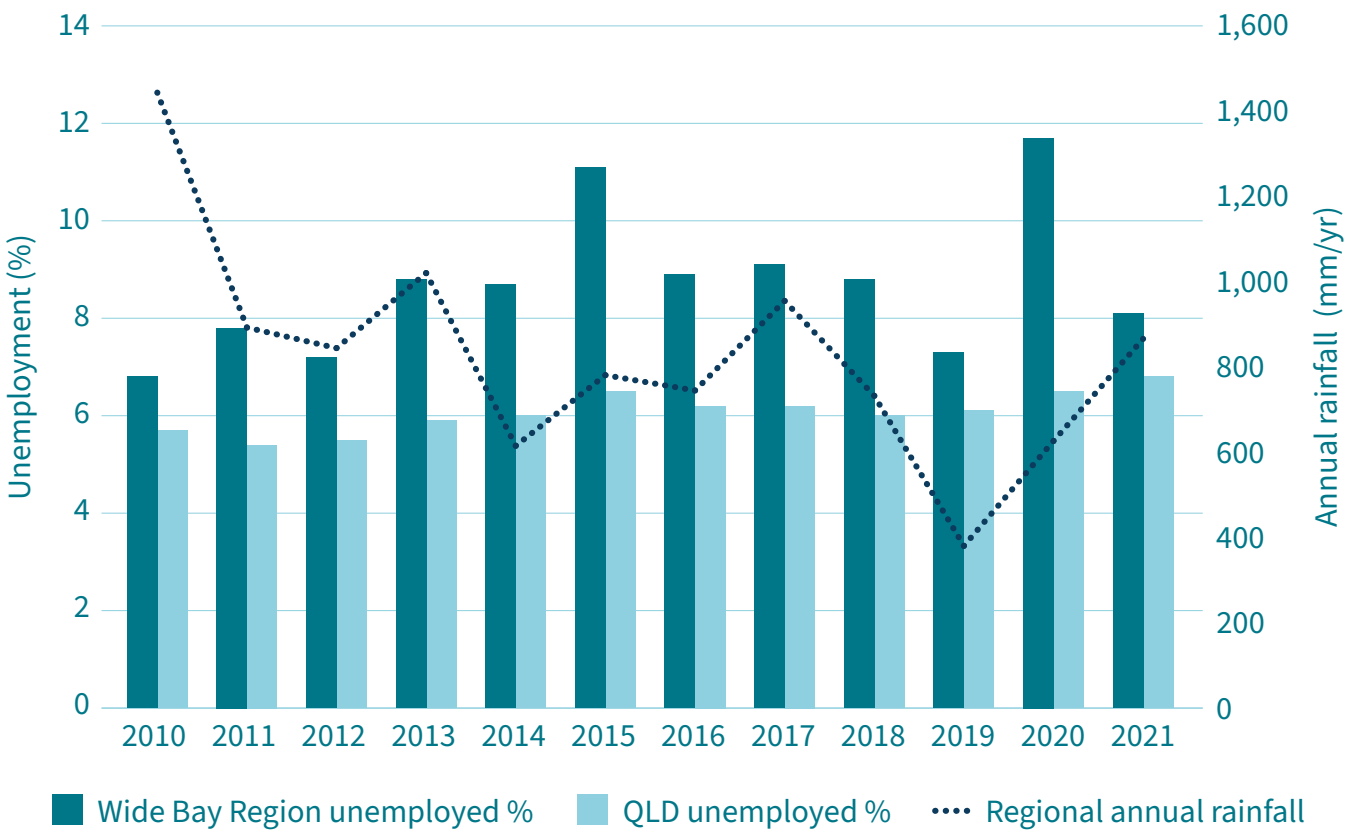
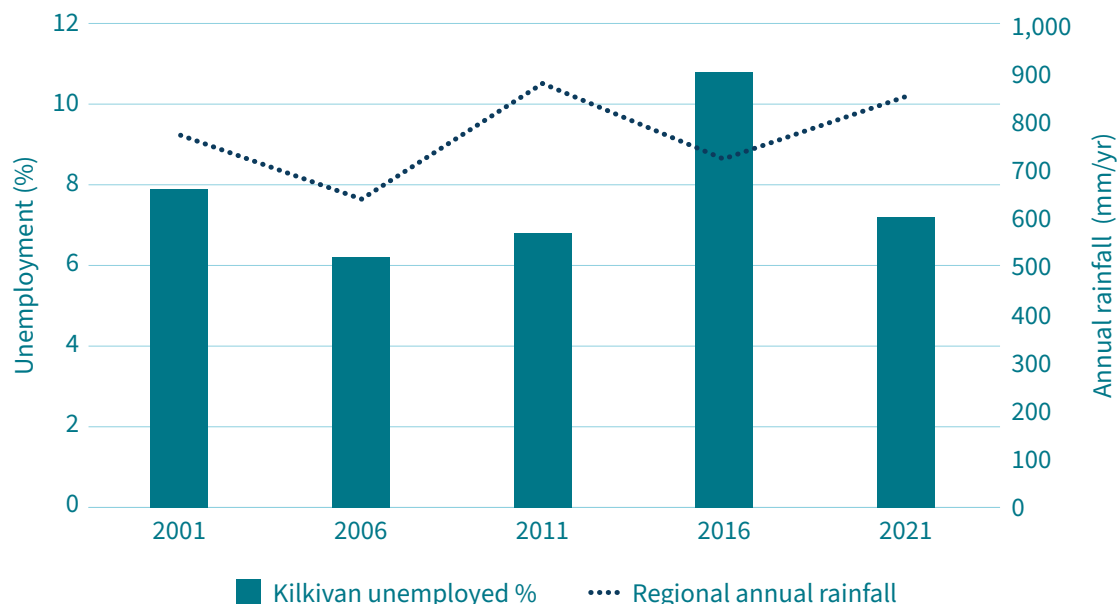


Figure 19: Kilkivan unemployment and annual rainfall.⁵⁹



“It totally brings people down, and it affects their mental health. They go into survival mode and cut back on everything... like a vortex of survival. They just stop spending money and going out.”

– Local business facilitator

Examining four sets of results from the Regional Wellbeing Survey²⁴ (Figure 20), shows a noticeable decline in the overall (self-reported) ‘Wellbeing’ score for the Wide Bay/Burnett region during the period 2017–2019. This was the most recent period of drought when rainfalls in the region were deemed ‘lowest on record’²⁵.

A closer examination reveals respondents rated the following local factors lower during the drought:

- Community Economic Wellbeing – e.g. local businesses are doing well.
- Community Wellbeing – “my community is a great place to live”.
- Access to, and availability of, support services – particularly mental health services.
- The state of Natural Capital – including man-made and natural landscapes.

However, in most other aspects of wellbeing, the results were in line with years that had higher rainfall.

The Centre for Rural and Remote Mental Health²⁶– Queensland reported in 2008 “Due to the reliance on primary industries in rural and remote areas, climate variability is the factor that has the greatest influence on the stress levels of individuals in rural and remote areas”. Drought exacerbates chronic stresses and underlying issues such as:

- legal and financial problems
- medical and health problems
- alcohol and substance abuse
- isolation and social withdrawal
- breakdown of relationships and in the worse cases, self-harm and suicide.

These individual stresses, in turn also influence (and are influenced by) the collective wellbeing effects on communities and landscapes – in effect, drought can create a ‘vicious cycle’ of stress and decline in mental health. Nevertheless, amongst mental health experts and practitioners²⁷, it has also been discussed that ‘de-stigmatising’ mental health issues and increased availability of services can have the effect of increasing the number of people self-identifying with mental health issues and seeking services.

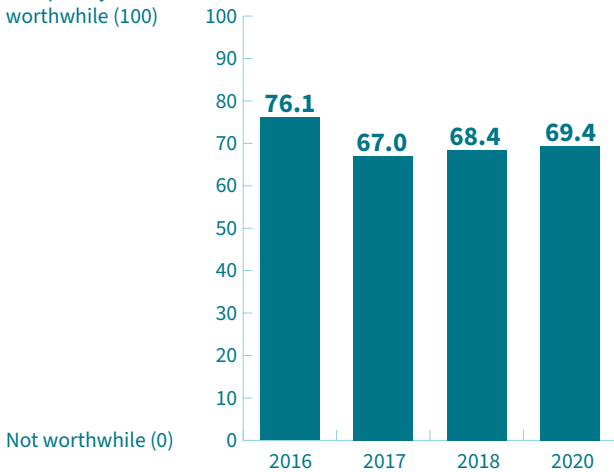
Figure 20: Sample of results from the Regional Wellbeing Survey.⁶⁰

Individual Wellbeing

Feeling life is worthwhile.

ANSWER SCALE

Completely worthwhile (100)

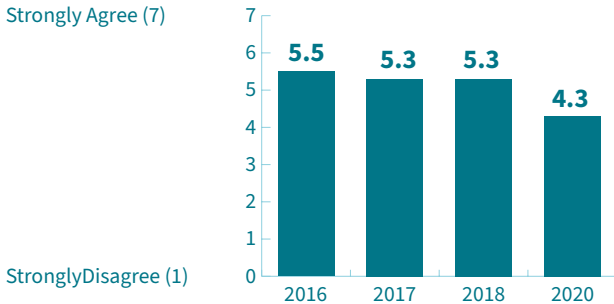


Community Wellbeing

- (i) My community is a great place to live.
- (ii) This community copes pretty well when faced with challenges.
- (iii) I feel proud to live in this community.
- (iv) This community has a bright future.
- (v) There's good community spirit around here.

ANSWER SCALE

Strongly Agree (7)

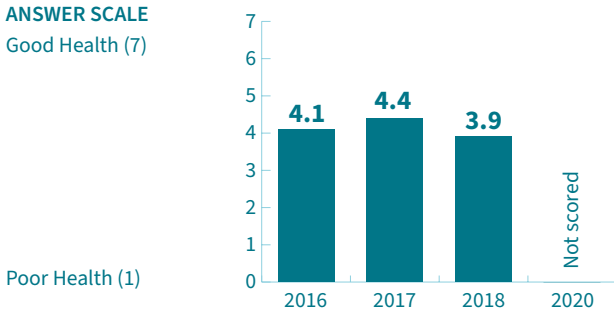


Natural Capital

Perceived environmental health.

ANSWER SCALE

Good Health (7)



The engagements for this RDR Plan often raised the issue of drought and increased suicide – and the perceived link between the two. It has already been recognised the region has high levels of self-harm and suicide and this has led to the implementation of locally-developed and well-supported programs such as Greater Whitsunday Council of Mayors Taskforce Suicide Prevention Project (2021). The most recent Local Area Needs Assessment (2022) for the region, conducted by Queensland Health²⁸ notes “...the rates of suicide in Wide Bay were higher than the state average (15 per 100,000) in every SA2”. When examining the national AIHW ‘Death by Suicide’²⁹ reported figures for the Mary region (SA4-Wide Bay) had a very slight increase from 2014–2018 (average 21.8 per 100,000 population) to 2016–2020 (average 22.7 per 100,000 population). While the second reporting period contains the last period (2018/19) of severe drought in the Mary region, this increase is not significant and was relatively short-lived. During this period more dramatic peaks were experienced in other parts of the country – including in areas that experienced no drought. While there is continued debate about the proven causal links specifically between drought and levels of suicide, there is no debate in the Mary region that many people’s recollections and personal experiences highlight a collective perception – drought intensifies stress and triggers mental health problems, which in turn leads to an increase in suicides.

Economy

“It’s the not knowing. Not knowing when it is going to end, not knowing if you have enough water and food for livestock and not knowing if you have enough money to keep going.”

– Community worker

“To be viable here, you need at least 5000 acres for grazing.... We have a lot of smaller holdings with labour intensive things such as chooks / pigs.”

– Business advisor

The Gross Regional Product (GRP) of the Wide Bay RDA for the year ending June 2022 is \$14,893 million. Since 2010, the region has experienced seven years where the annual GDP grew and five years where the annual GDP fell. The biggest decline was in the 2019/20 year where a decline of 2.5% on the previous year’s GDP was experienced. This correlates with the end of the 2016–2019 drought period.

For the 2021/22 period, construction, agriculture (including forestry and fishing) and manufacturing had the largest output – accounting for 47.2% of the regions total. The regions agricultural output makes up 16% of the total, whereas agriculture accounts for 5% of Queensland’s total output for the same period. While agriculture accounts for 16% of the outputs from the Wide Bay region, it accounts for less than 8% of employment by industry sector. At a regional scale, adverse impacts on agriculture may have relatively little impact on regional employment. However, at a local scale where agriculture is the primary employer, the impacts may be significantly greater.

Figure 21: Wide Bay Burnett region output by industry.⁶¹

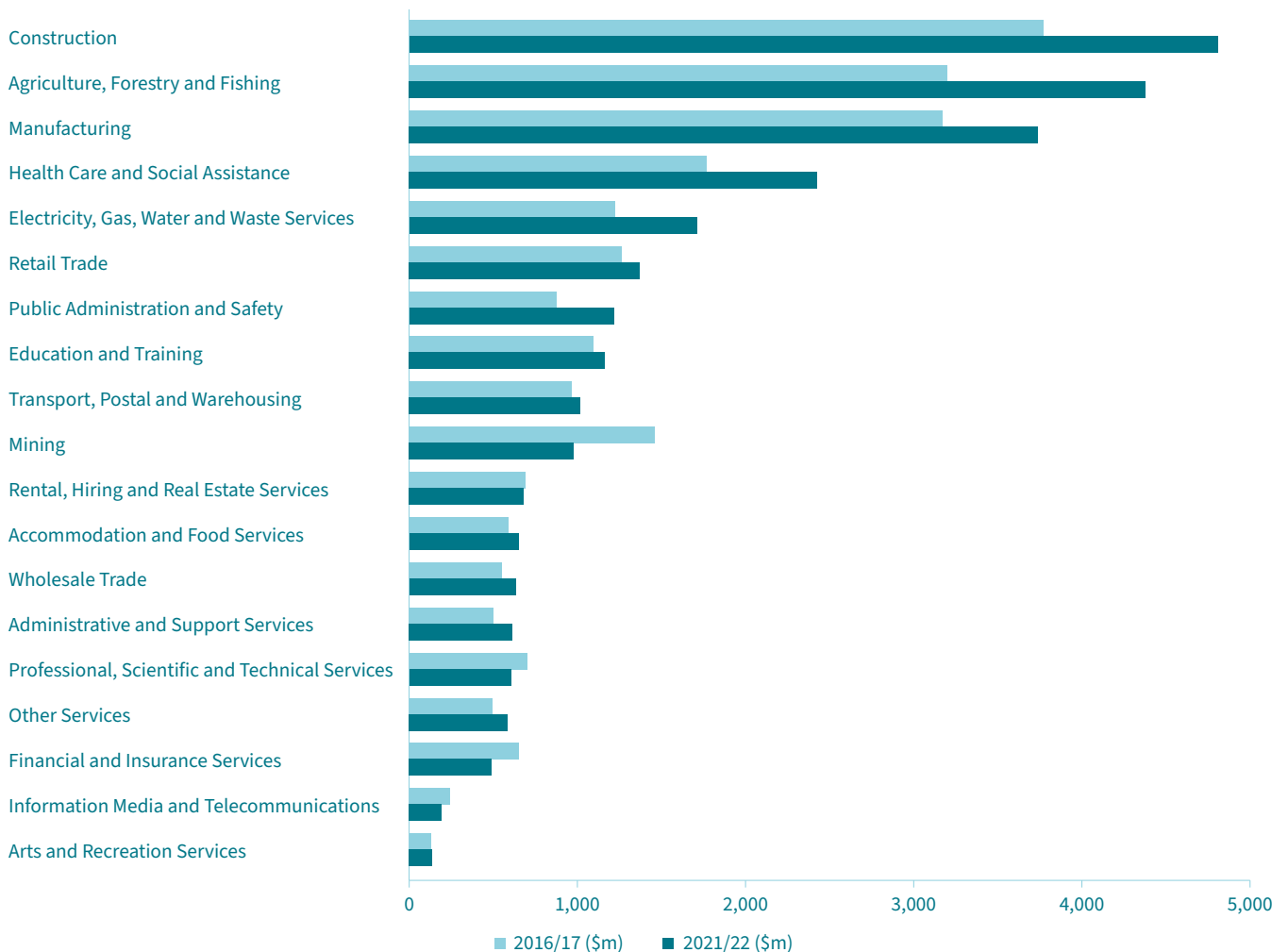


Figure 22: Forecasted 2023-24 gross value of product for the Mary Region.⁵²

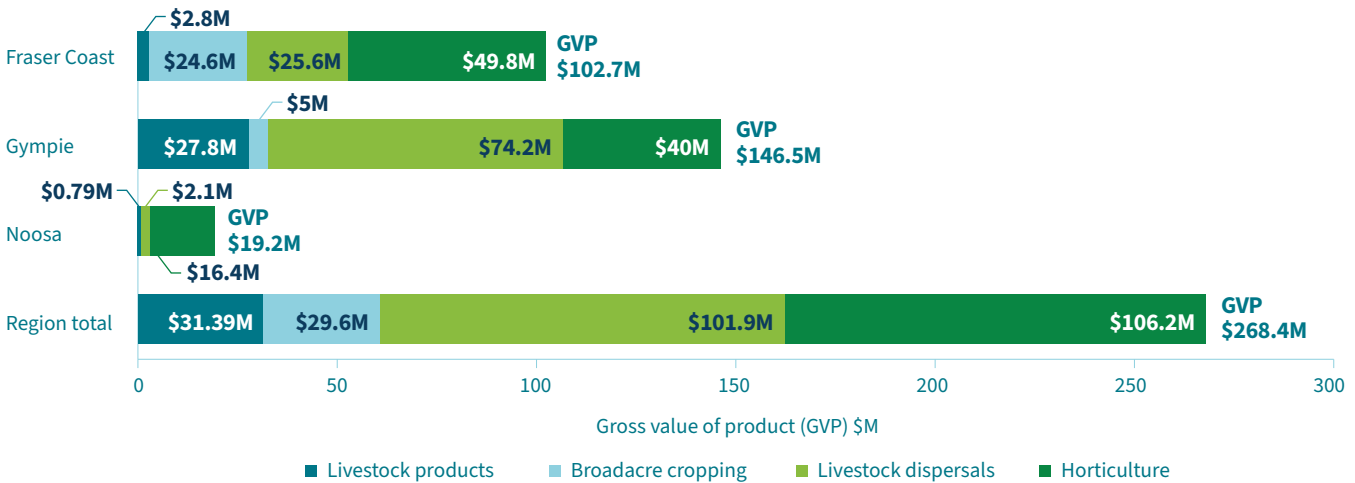


Figure 23: Livestock disposals and fruit and nut industries contribute the greatest portion to the region's GVP.⁶³

	2010–11 Wide Bay Region	2020–21 Burnett Mary NRM Region	Percentage Change from 2010–11
Grazing (ha)	3,646,949 ha	2,812,507 ha	-22%
Broad acre crops including sugar (ha)	82,875 ha	93,632 ha	+12.9%
Fruit and nut orchards (number of trees)	4,138,214	6,381,352	+54.2%

The forecasted Gross Value of Product provides a summary of the different agricultural enterprise contribution to the region. Data in Figure 22 supports the theory that *land use is, and will continue to, adjust in response to changing climatic conditions*³⁰:

- *Cropping is predicted to contract and shift from the west to the east under the worst scenario, but with a less pronounced eastwards shift under the better cooler-wetter Global Climate Models (GCM) scenario.*
- *Areas suitable for grazing are predicted to contract in the east, and, in the wetter-cooler GCM expand in the west.*
- *Avocado farming is predicted to contract and shift eastwards, but remain suitable in much of its current eastern range.*

“As dam levels go down, farmers have lost water allocations... not the same level of growth without water – loss of productivity – they might get 10 tonne instead of 20. Such a substantial loss of cane land productivity and cane supply in the southern district so it doesn’t take much for the mills to fall over. Maryborough mill closing really saved Isis as the cane all has to go there now – I guess it’s some kind of consolidation.”

– Sugar Council representative

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

The ABARES 2021 survey found:

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

Engagement in the Mary region captured several relevant comments regarding the importance of off-farm income, and in particular, the economic gains brought to the region from the power stations and mines. Of note in this region is the number of smaller properties, especially those historically created because of 1860s ‘Closer Settlement’ legislation. Owners of these properties often noted off-farm income was an essential part of their “recipe for survival”.

Despite the perceptions and comments from some local stakeholders, in reality commodity prices were high for sugar and beef and it would be unlikely for people to have to “... sell for next to nothing”. However, some comments from local saleyards suggested some graziers left de-stocking “way too late” and brought in feeble and underweight stock that were “practically worthless”. Reuters³¹ reported export wheat prices were low due to a market oversupply from South America. Figure x indicates that commodity prices for sugar, wheat and beef for the last decade had little correlation to drought or seasonal conditions for the same period – given the large amount of production destined for export, it is doubtful that any shortage of Australian production would be likely to force up international commodity prices due to scarcity.

“We sold our cattle early, we had money in the bank and kept our groundcover.”

– Grazier and Small Business Owner

Figure 24: Commodity prices 2010 to 2020.⁶⁴

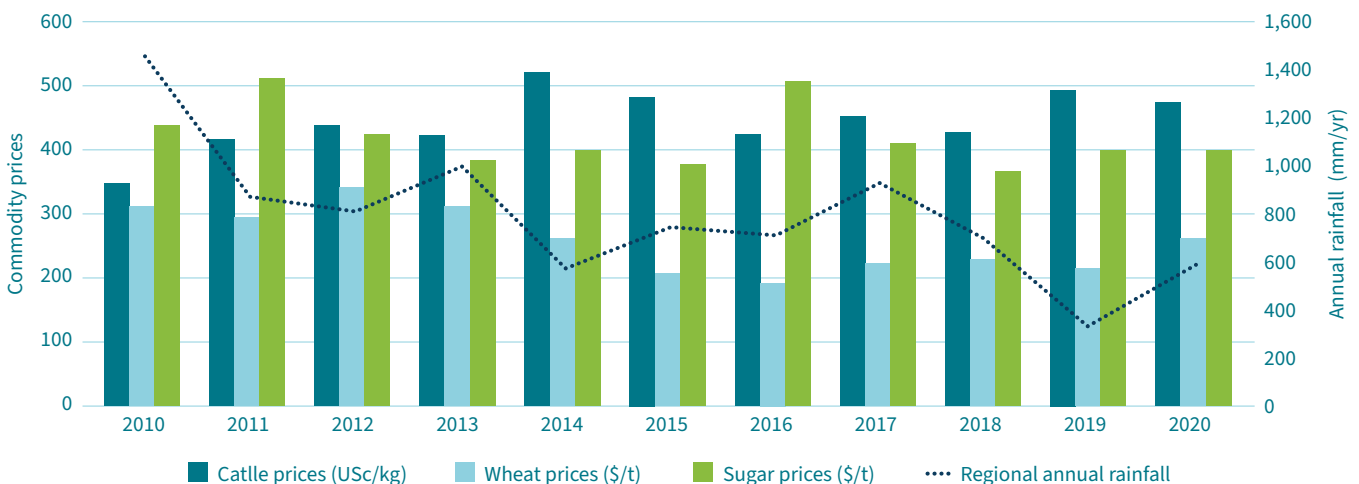


Figure 25: Farm business profit, Moreton to Curtis region.⁶⁵

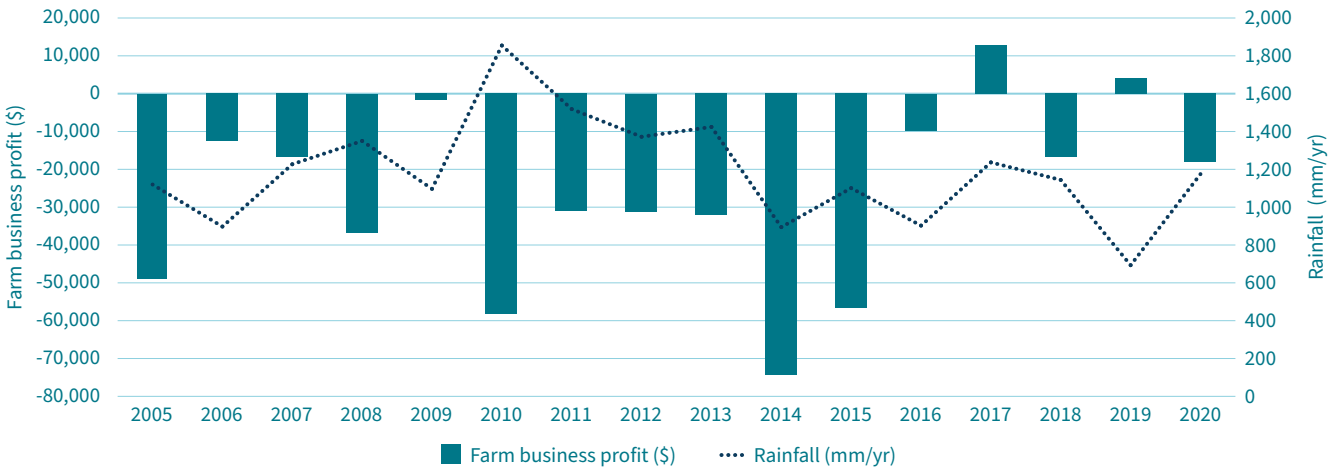


Figure 26: Farm business debt and income, Moreton to Curtis region.⁶⁶

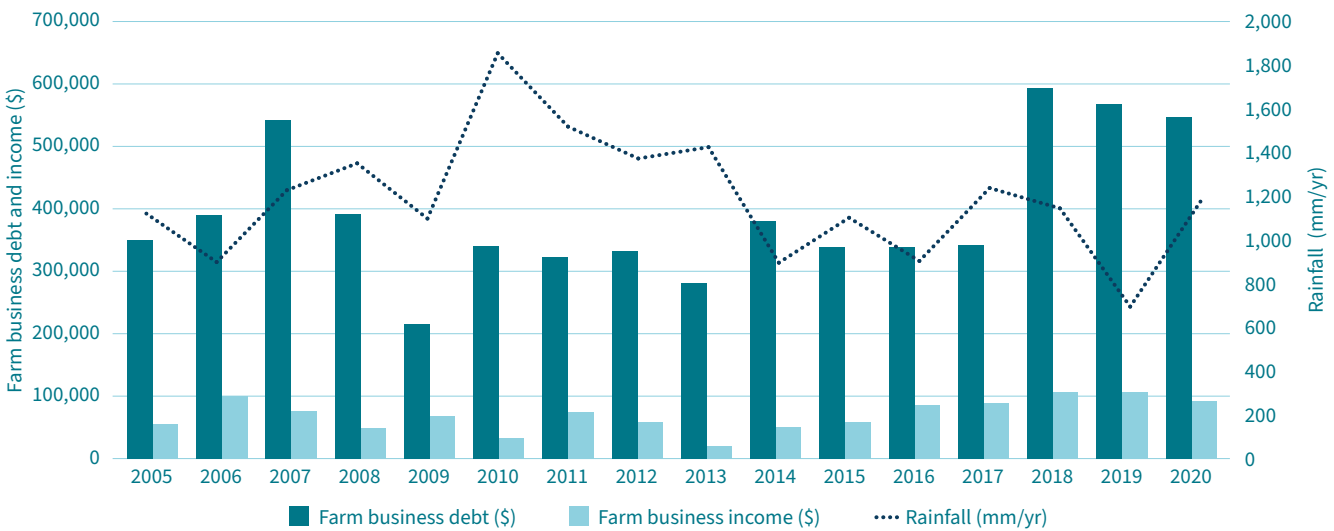


Table 1: Average percentage change in profit by farm size group relative to historical (1950 to 2000).⁶⁷

Farm size	Historical (\$)	Recent	Future (RCP4.5 2050)			Future (RCP8.5 2050)		
			Minimum	Mean	Maximum	Minimum	Mean	Maximum
Small farm	17,688	-96	-130.9	-52.8	-9.4	-197.9	-100.4	-41.5
Medium farms	171,877	-22.6	-32.2	-14.6	-4.1	-49.6	-26.8	-12.2
Large farms	661,259	-11.9	-19.4	-9.1	-2.6	-29.7	-16.2	-7.8

While the patterns of farm profit do not directly correlate to high or low rainfall periods, the ABARES data highlights a number of concerning issues for farms in the Morton to Curtis region (which encompasses the Mary region):

- (a) for only two years from 2005–2020 were farms in the region recorded as making a profit
- (b) farms in the region consistently hold high levels of debt compared to their reported income
- (c) farms typically take on more debt to ‘get through’ periods of drought and this carries on for some years after the drought may have broken.

Given the proven (and increasing) variability of intense weather in the region, droughts may ‘break’ with periods of heavy rain and flooding – which only further exacerbates the damage done to landscape, crops and livestock (and communities) during the drought. This pattern significantly weakens peoples adaptive capacity to ‘bounce back’ after the drought.

“The Region’s grazing industry comprises mostly small-scale operations. The local industry has been seriously impacted by drought and by an observed shortening of the growing season, that may reflect a shift in the regional climate regime in response to climate change.”³²

Farm/property size in the Mary region has been cited as a significant issue. Several producers and business support professionals commented that often farms were too small to allow for long term viability and off-farm income was essential to keeping the farm. The observations and experience of Mary primary producers (regarding small farm size being a major issue) is supported by the ABARES analysis where farm size groupings are based on farm capital holdings, relative to farms in the same industry and region group. In general, smaller farms tend to have lower profit margins than larger farms³³ – as a result, they show significantly higher percentage change in profits under future climate scenarios. However, the Western Burnett Agricultural Strategy³⁴ states while larger farms may allow increased turnover, understanding key business factors such as production cost and making sound business decisions around these factors, would have much greater influence on profitability rather than just economies of scale.



Image: Dingo, K'gari (Fraser Island), Queensland.

Landscape and natural environment

“Traditional owners still use the waterways for subsistence, education, general life – fish for crabs, mullet, fish. Spend time in river to reconnect with spirit and teach young people – dry rivers have spiritual & mental health impacts. Waterholes dry up. Drought impacts their medicine plants and other native plants they eat. When [First Nations] people get to their country and see it in a degraded state it has a great impact on them.”

– NRM Manager

“Old people would have story around it – there are indicators on country for the next season coming up and when we need to burn. The fire timing would be around the emu and the possum...when the young possums are able to move and the emu eggs have hatched - then we’re able to burn. We traditionally burned the country to produce the most food for the mob. Drought applies much more pressure to country – it reduces windows of when you can act. We need to be agile enough that we can act in small windows -eg. a cool burn can happen when there’s a heavy dew. When we are too inactive, we end up with heaps of fuel ... and that equals heaps of bushfire risk.”

– Aboriginal Elder

These first two comments highlight the ancient and enduring relationship First Nations people have to country. Traditional owners talk of the multi-faceted impacts of drought on the landscape of the Mary Burnett region and the effect it still has on their communities. So too, do many the people that live and work on the land. Sometimes their stories contain dramatic images, but sometimes the changes are subtle and happen over time.

“We can have green droughts here where we have lots of grass but the creeks are dry.”

– Local business person

“Weeds – giant rats tails and parthenium and doda vine....we have had such outbreaks and it is really getting people down in a good season...it’s expensive to control and labour intensive. It comes from poor management of grazing land – overstocking over dry times has resulted in lack of grass coverage resulting in these weed outbreaks.”

– Farmer, Kilkivan

Annual cover is ground cover from standing grass and forbs. The blue shaded period in Figure 28 includes the modelling of pasture growth and resultant total biomass takes into consideration presence of fire – i.e. removal of plant material³⁵.

The previous diagrams from Long Paddock (2023), provide average monthly pasture growth and a time-series picture of a number of indicators for LGAs in the Mary region. There are many factors influencing these indicators which affect the ability to draw wider conclusions from the LGA-based data:

- When you use the data for a large area, the data will be ‘dampened’ – i.e. averaged for the area.
- There will be higher and lower values that may affect land processes.
- The data includes forestry, conservation as well as grazing properties.

Figure 27: Average pasture growth and annual rainfall.⁶⁸

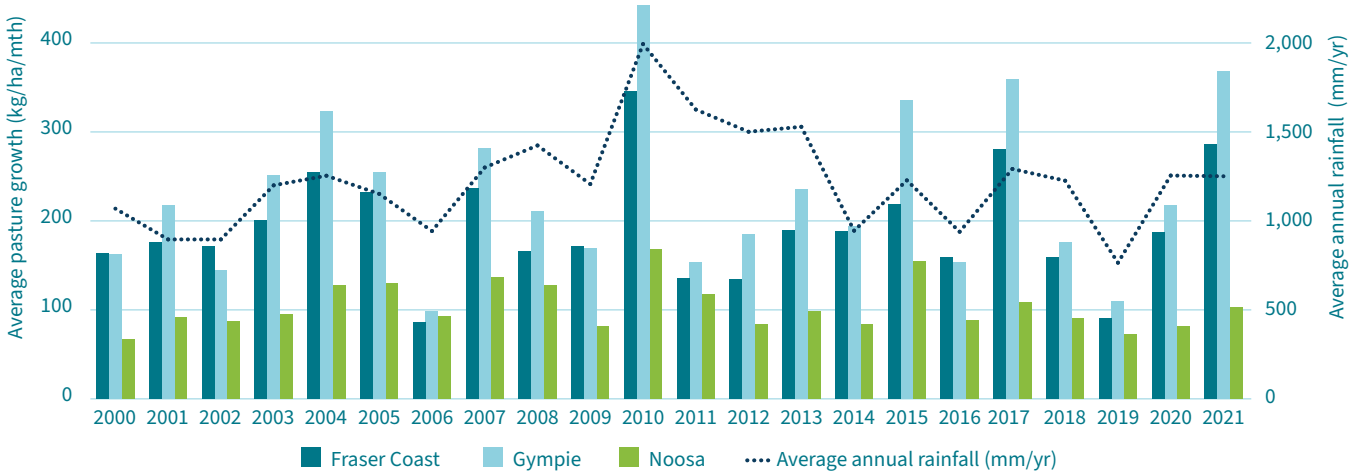
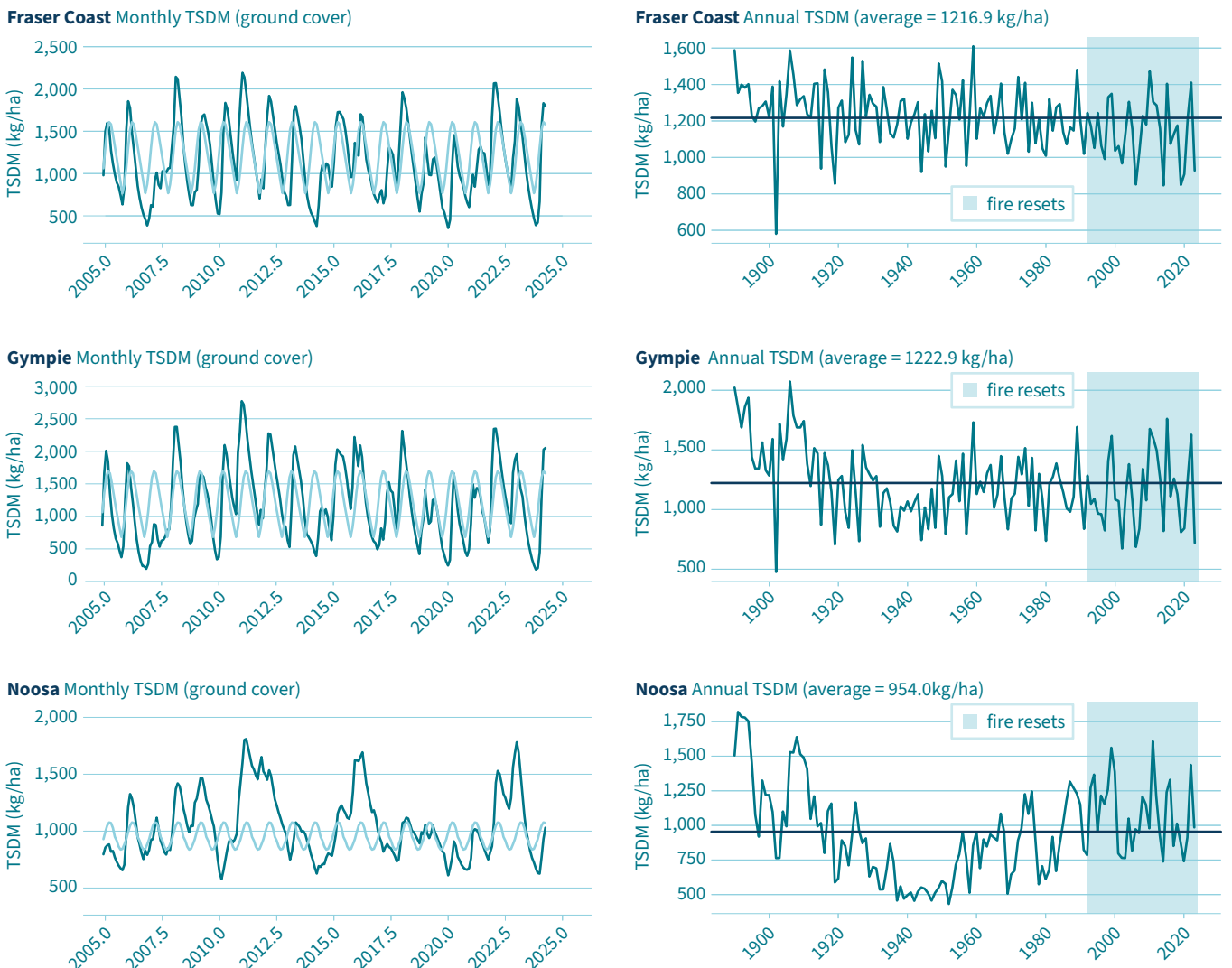


Figure 28: Monthly and Annual Total Standing Dry Matter (TSDM) for LGA. Annual cover is ground cover from standing grass and forbs. The blue shaded period include the modelling of pasture growth and resultant total biomass takes into consideration presence of fire – ie removal of plant material.⁶⁹



There are large drops in the monthly and annual pasture cover across the period. While some values are not what may be expected, it is a weighted average, so there are areas of the LGA well above and well below. *“This would also include well-managed properties with better cover and not so well-managed properties with low cover”³⁶.*

“There areas of significant overgrazing to a point where it is questionable if that country will ever recover – pure rest won’t fix it now – not without significant intervention.”

– Growers Group

Both published research and land manager’s observations identify that drought results in mobilisation of sediment (topsoil) from paddocks to water ways. This has a negative impact on both land and wetland condition. Mary catchment is identified as a hotspot for contributions of fine sediment to the GBR lagoon. The grazing industry in the Mary catchment attracts significant effort and investment to modify grazing practices to reduce soil loss. Initial estimates indicated that ~30% of eroded fine sediment reached the end of the catchment. However, this estimate has been revised in 2021 to a figure of 67% effective delivery of eroded fine sediment to the GBR lagoon from the Mary catchment³⁷.

Figure 29 indicates areas of the Burnett Mary region’s wetlands sediment input hazard. Most of the region has either a high or very high hazard sediment score. There are several factors which influence this score including topography (much of the region is undulating), soil properties, grazing management and seasonal variability (long dry periods often followed by high intensity or flooding rain). As pasture agronomist Damian O’Sullivan identified, keeping ground cover above 50% at all times will reduce the loss of topsoil and the mobilisation of sediment.

“Really worried – expansion of the feedlots upstream might have a devastating impact on water use – who monitors if there will be enough for all of us when it is dry – many farmers rely on this water downstream and the township does too.”

– Community leader, Kilkivan

The BCCA Community Needs Analysis (2018) identified a range of environmental issues that required addressing, highlighting the need to build the expertise and knowledge of producers in a number of environmental management areas.

Producers in the Wide Bay Burnett identified they are already pursuing drought resilience and sustainability by utilising technology and professional assistance to implement various management practices, such as:

- rotational grazing practices
- integrated pest management
- erosion management and top soil retention
- drought mitigation and water storage management
- protection of riparian zones
- reducing sediment run off to waterways and the Great Barrier Reef
- pasture improvement
- investing in farm infrastructure.

The Burnett and Mary regions have five threatened ecological communities and about 100 listed threatened species. The impacts of drought on terrestrial and aquatic flora and fauna populations are well documented for some species and evolving for others. The Burnett River has drier sections in the Boyne / Stuart and upper Burnett. These riverine areas and associated impoundments can dry out earlier than other areas. These dry outs lead to large fish and turtle kills. For aquatic dependent species, both water quantity and quality are integral to their survival. High levels of water extraction leading into and during dry times potentially reduces water quality (e.g. increases salinity levels) thus placing further stress on aquatic ecosystems. Also, climactic conditions associated with drought, such as prolonged very hot weather can also lead to elevated water temperatures.

The Australian Lungfish is an iconic species native to the Burnett and Mary River systems. Lungfish have significant drought resilience while their habitat is not damaged. However, the region’s freshwater turtles tend to lose condition and their habitat deteriorates during drought, resulting in reduced numbers of offspring. Lengthy periods of hot days are also impacting on species such as the Mary River Cod when river warming isn’t producing the appropriate conditions required for breeding.

Figure 29: Hazard from sediment inputs across the greater Burnett region catchment.⁷⁰

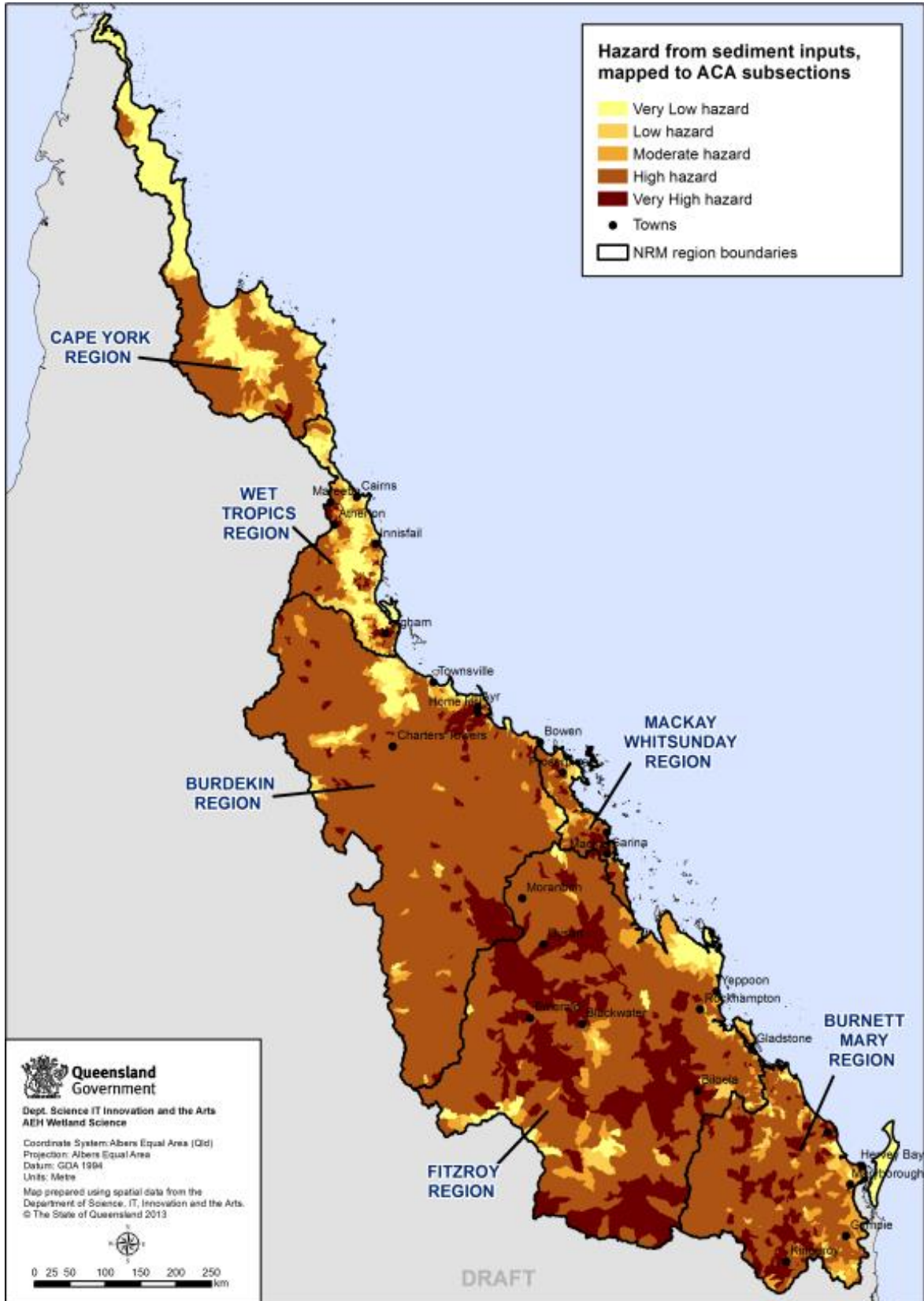


Table 2: Burnett and Mary flora and fauna species.³⁸

Kingdom	Introduced species	Rare/threatened species	All species
Birds	13	48	535
Reptiles	1	21	197
Amphibians	1	13	59
Lobe-finned fishes	0	1	1
Ray-finned fishes	8	4	86
Cartilaginous fishes	0	3	10
Lampreys	0	0	1
Insects	3	5	213
Malacostracans	0	3	11
Snails	0	0	1
Bacteria	0	0	22
Chromists	0	0	34
Fungi	1	0	1272
Plants	788	202	5034
Protozoans	0	0	5
TOTAL	815	300	7481

A study of koala populations in southern inland Queensland found there was an 80% reduction in populations between 1995 and 2009³⁹. Seabrook states “Although this decline was primarily attributed to climate change, the authors also noted that the effect of climate change on trailing edge populations may interact with habitat loss and fragmentation to increase extinction risks, with tree-clearing in the eastern part of the region reducing the ability of koalas to move between habitats.”

Figure 30: Extent of remnant native vegetation.⁷¹

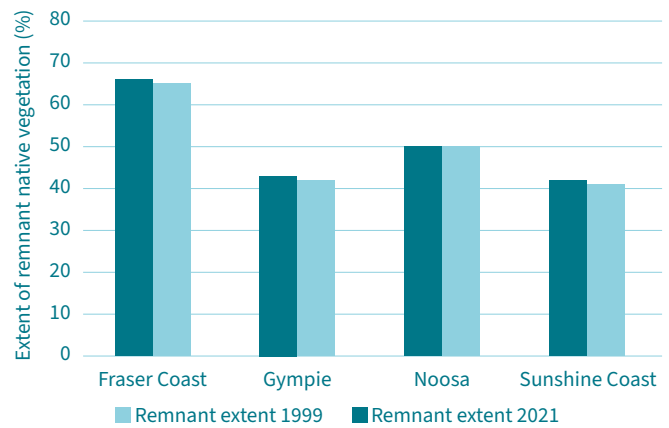
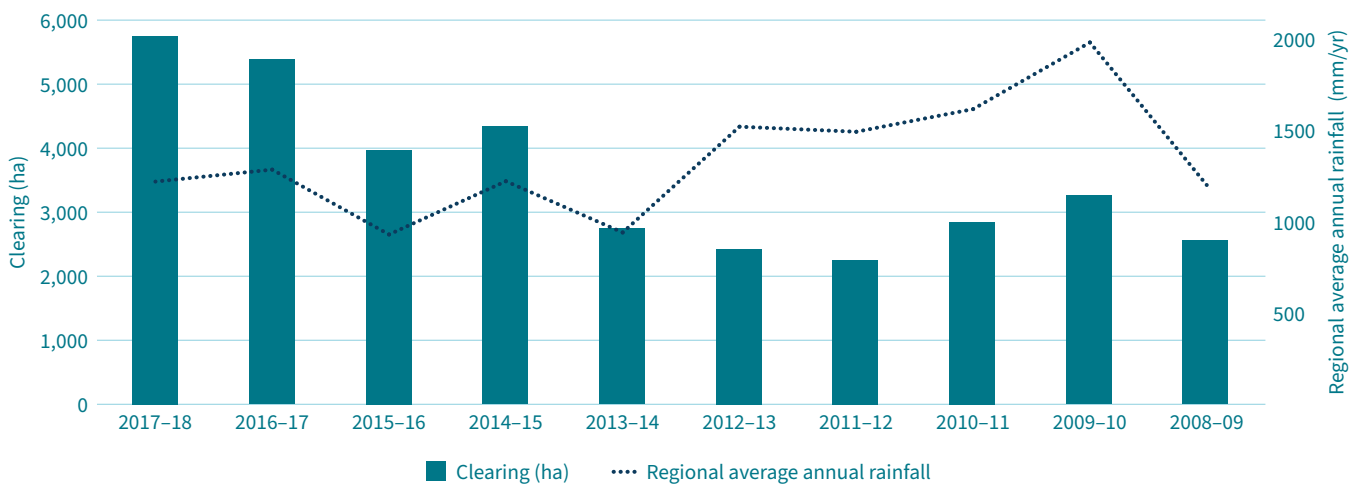


Figure 31: Extent of remnant native vegetation.⁷²



Figures from the DESI Statewide Landcover and Trees Study (SLATS) Reports⁴⁰ show an increasing trend in the rate of remnant vegetation clearing in the Mary region. The primary activity responsible for vegetation clearing is forestry, which is 65% greater than the next highest activity (thinning) and 30% higher than clearing for pasture establishment. Clearing for pasture and cropping accounted for 22% of vegetation clearing. In other regions there is an apparent correlation between the rate of clearing for fodder feeding and seasonal conditions (i.e. more clearing in low rainfall years) however this does not appear to be the case for the Mary region. Maintaining and re-establishing native vegetation and habitats is critical to supporting the geographical movement of species. Protecting connectivity and climate refuges in the landscape are critical for natural climate adaptation including drought impacts.

Infrastructure and built environment

“They didn’t have infrastructure...didn’t have bores.... They’re reliant on surface water – dams and creeks – and when they dried up they had big issues. They didn’t have the financial backing to be able to drill for bores... the ones that got through it were the ones who were able to self-fund the infrastructure. Lots of the producers just aren’t big enough to be financially viable in that area.”

– Government Officer

Infrastructure and the built environment can take many forms. Often people only think of ‘hard’ infrastructure such as roads, railways, dams, power lines and buildings. While these are all essential infrastructure there are other less obvious ‘soft’ forms such as digital connectivity, technical support networks and professional services (‘soft infrastructure’). These are equally as important and are all affected by drought.

The Mary region has an extensive road network. Effective road access to farms, properties, feedlots and saleyards is cited by primary producers as being critical to building their ability to manage and reduce the impacts of drought and build on opportunities to build enterprise resilience through accessing new markets. This need has been supported and identified through the Wide Bay Regional Transport Plan (2019) which states *“Improvements are required on first and last mile connection roads (typically local government roads but also lower order state-controlled roads) to enable complete origin to destination freight journeys in the desired heavy vehicle class.”* Figure 32 identifies priority works for the Burnett and Mary regions.

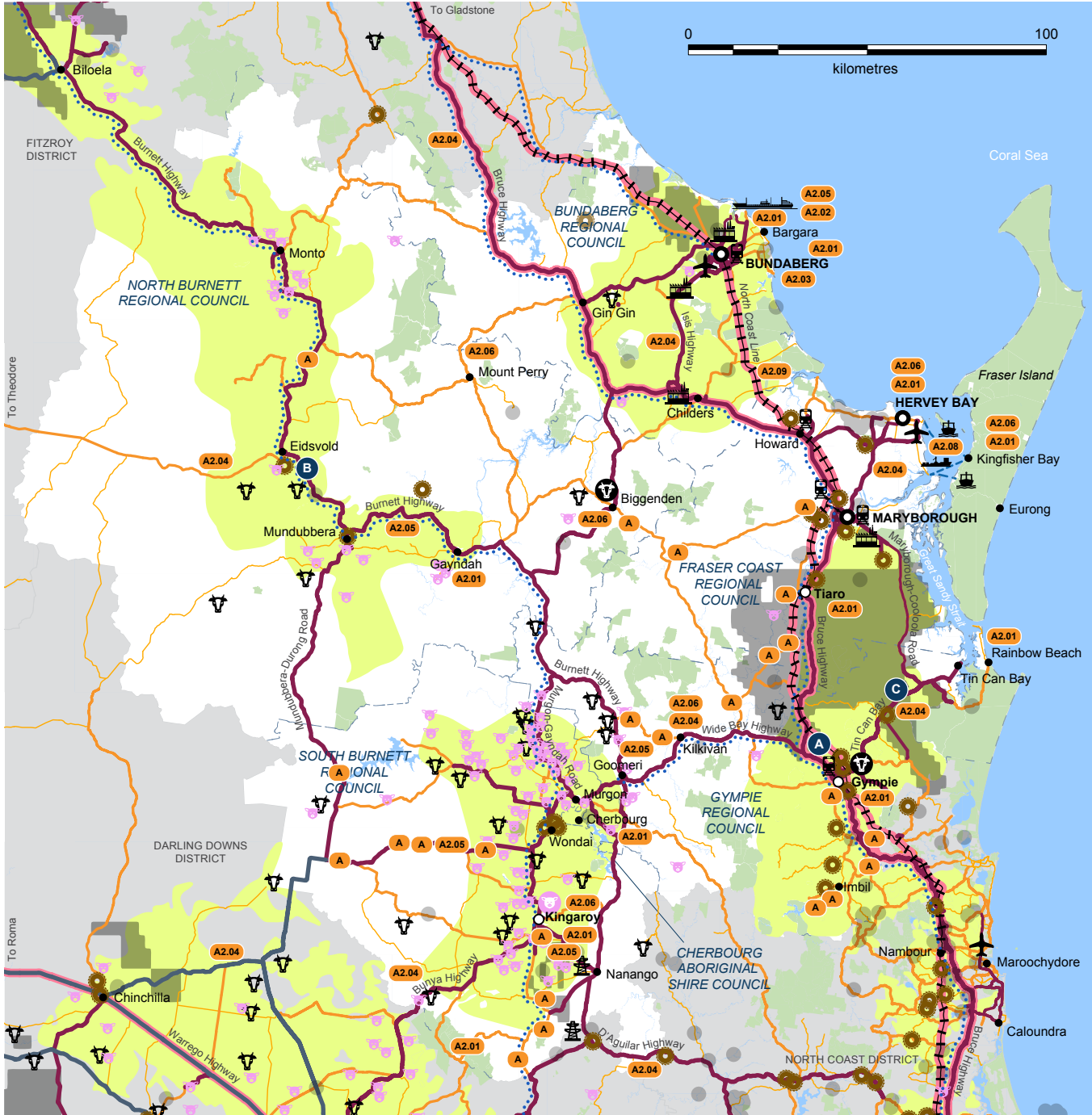
On projected population growth and climate forecast, FCRC has identified the existing water storages (Figure 33) will provide safe water supply until at least 2046. Projected Gympie water demand shows that under dry period water demand the existing water allocation will be reached by 2028.

For regions which are linked to the SEQ Water Grid, a drought response is triggered when the SEQ Water Grid reaches 60%. At 50% capacity, mandatory water restrictions are introduced. The lowest level of total storage capacity was 40.8% in July 2008. Southeast Queensland’s water security program has estimated there will be enough water for southeast Queensland until 2040 – unless there is a severe drought or specific change in supply and demand. High demand (instigated by drought) may see this decrease to 2031.

“Effective telecommunication networks are important, not just for keeping in touch and doing business, but during times of disruption. Our network of townships need reliable telecommunication infrastructure and back-up power supplies to prepare, respond and recovery from disruptions. Quality communication sets us up for success at other times too, creating opportunities for new, digital business ventures and remote working.”

– Burnett Regional Resilience Strategy (2023)

Figure 32: Priority 2 region map.⁷³



Legend

National Key Freight Routes

- Road
- |-|- Rail line

Multicomination vehicle routes (State-controlled roads)

- B-double
- |-|- B-double and Type 1 road train
- .-.- State Strategic Touring Routes

- Actions
- A Priority bridges and structures (A2.05)
- Train station
- Cattle feedlot
- Cattle processing
- Piggery

- Pork processing
- Power station
- Sugar processing
- Saw mill
- Coal bearing areas
- Other mining sites
- Agricultural areas
- National park
- Ocean, lakes, rivers

Committed projects

- A Bruce Highway Upgrade Section D (Woodum to Curra)
- B Replace Lochaber Creek Bridge on Burnett Highway
- C Replace Coondoo Creek Bridge on Tin Can Bay Road



Figure 33: Major water storages in the Mary region.⁷⁴

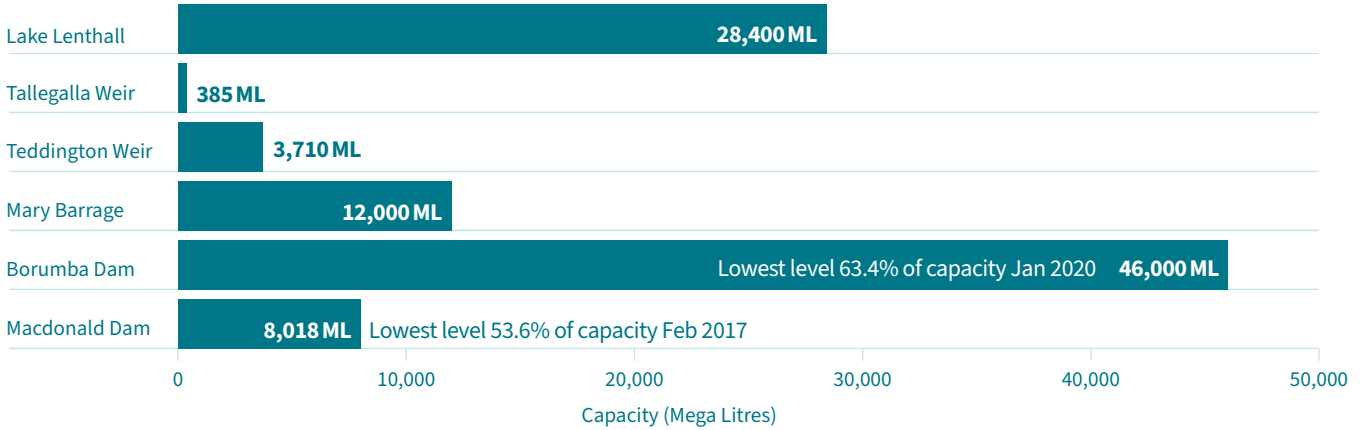
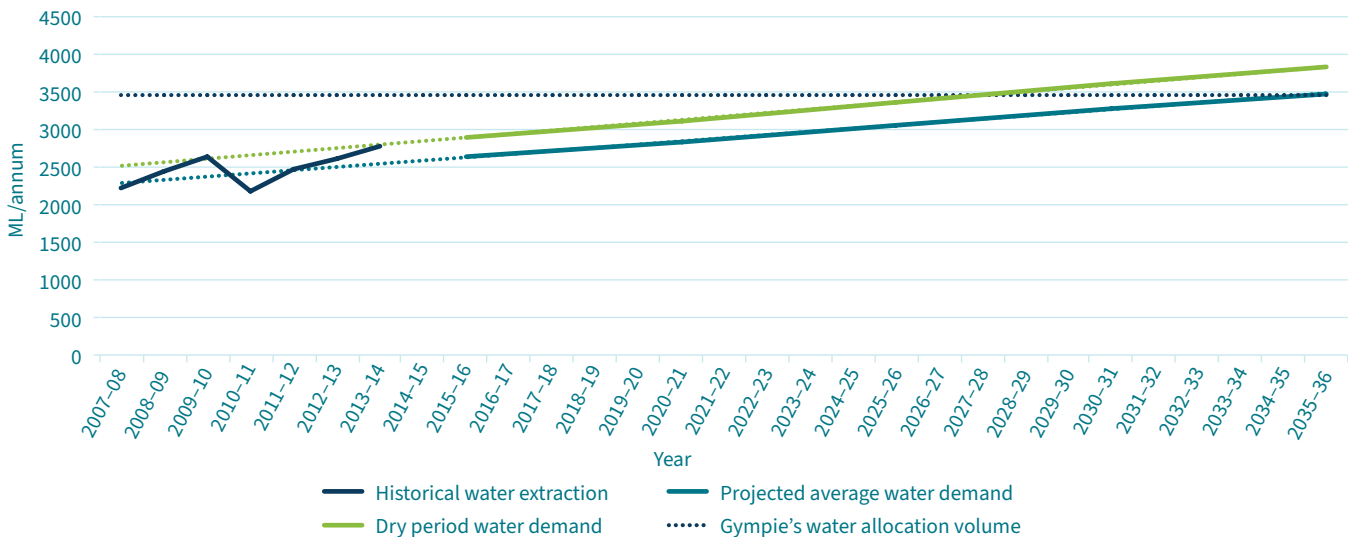


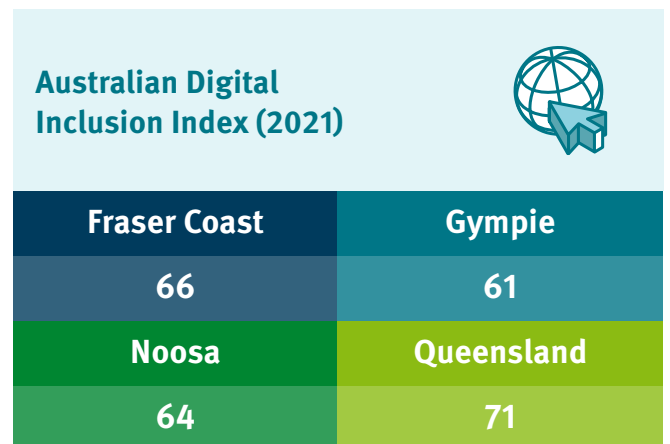
Figure 34: Gympie historical and projected water supply and demand.⁷⁵



The Australian Digital Inclusion Index (Figure 35) uses survey data to measure digital inclusion across three dimensions of Access, Affordability and Digital Ability. The following are scores for 2021. Note the three LGAs in the Mary region have scores lower than the Queensland average.

Access to digital services is equally important for building and maintaining drought resilience as it is for dealing with disaster and disruptions. Even in locations with internet connectivity, reliability remains an issue. A majority of agricultural producers state their connection is unreliable and they depend on expensive satellite services. A telecommunications provider noted a major issue is the current reliance on computer delivery for many professional and government-funded services. This disadvantages those who have little or no capacity to use computers, in particular, the elderly and lower socio-economic sections of the community.

Figure 35: Australian Digital Inclusion Index (2021)



Likely future impacts (risks) of drought in this region

An analysis of future drought impacts (under a climate change scenario) on People, Economies, Landscapes and Infrastructure has been carried out by the Burnett Mary Regional Group. A Risk Rating Matrix has been developed to provide generalised meaning to the way the risks are characterised.

The three risk categories reflecting increasing severity of consequence are:

Management risk

Anticipates management within Business as Usual or ecological natural variation. For example, adjusted hot weather working patterns, local business downturn, or supplementary feeding of stock.

Disturbance risk

Anticipates a significant adjustment to established operational responses or ecological function. For example, infrastructure damage, local business hardship, crop loss, or destocking to core breeder herd/flock.

Disruption risk

Anticipates the transformation of established patterns of activity, settlement or ecological function. For example, infrastructure loss, local business failures, repeated or unreplaceable crop or stock loss.

The Assessment’s Risk Rating Matrix uses three levels of likelihood of occurrence during the next 10–year risk horizon (~2030): ‘Unlikely’, ‘As likely as not’, or ‘Likely’. They also use three categories of consequence: ‘Recovery’, ‘Adjustment’, and ‘Transformation’. This produces a suite of nine risk sub-categories – high, medium and low within each of the three categories.

For the first pass of risk rating, all risks have been assigned a default rating of medium for the Management risk. By default, all identified risks are assumed to be as *likely* as they are *unlikely*. It is also assumed recovery from consequential harm/ impact can be achieved within established management responses, or within ecological natural variation. The risk rating is adjusted where there is material evidence or supported reasoning that the likelihood or consequence of an identified risk occurring is greater than the default. Management risks that are unlikely to occur in the 10-year risk outlook are not included.

In the following table, the level of confidence attributed to each risk rating reflects the type of knowledge applied. *Published* knowledge is information published in the public domain, primarily on authoritative websites (generally Government). *Expert* knowledge is the view of a person or persons who have recognised specialist knowledge of the subject being risk rated. *Practitioner* knowledge is the view of a person or persons (who may not also have expert knowledge personally) who is/are recognised as integrating specialist, strategic and experiential knowledge of the subject being risk rated.

Figure 36: Risk rating matrix.⁷⁶

		PROBABILITY OR LIKELIHOOD					
		Unlikely		As likely as not		Likely	
RECOVERY	MANAGEMENT RISK	LOW	MANAGEMENT RISK	MEDIUM	MANAGEMENT RISK	HIGH	
ADJUSTMENT	DISTURBANCE RISK	LOW	DISTURBANCE RISK	MEDIUM	DISTURBANCE RISK	HIGH	
TRANSFORMATION	DISRUPTION RISK	LOW	DISRUPTION RISK	MEDIUM	DISRUPTION RISK	HIGH	

Figure 37: Projected climate indicators for the Burnett Mary Region under high and low greenhouse gas emissions scenarios.⁷⁷

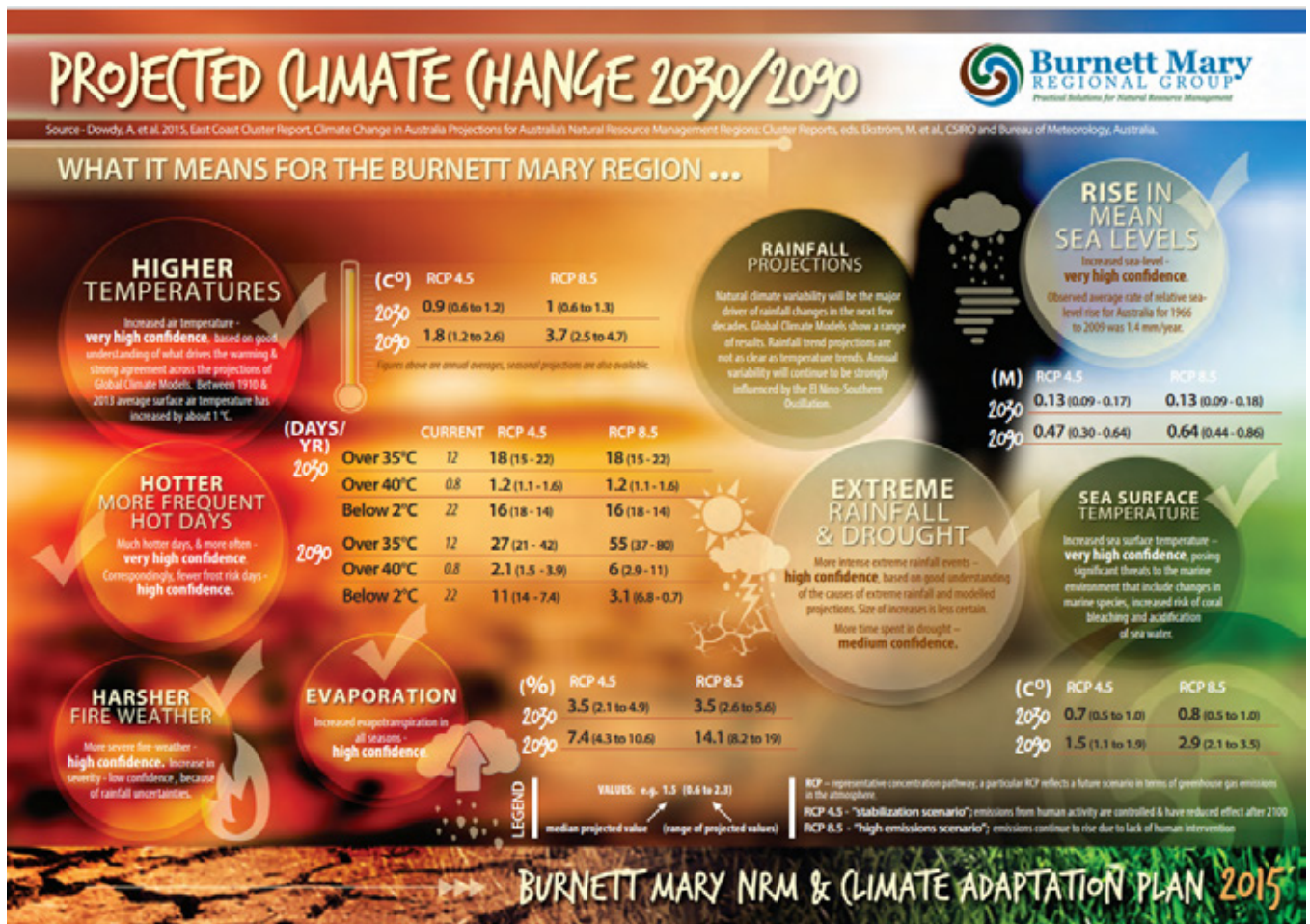


Table 3: Assessment of risks from future droughts

At-risk asset (component or process)	Risks		Confidence (Practitioner/ Expert/ Published)
People, Culture and Community			
Local community and networks (including vulnerable groups and individuals)	Prolonged drought: Local out migration.	MEDIUM	Practitioner/ Expert
	Prolonged drought: Exacerbated local issues.	MEDIUM	Practitioner/ Expert
	Prolonged drought: Mental health issues and suicide.	MEDIUM	Published
Agricultural knowledge and practice	Prolonged drought: Loss of expertise and experience	MEDIUM	Practitioner
Landscape care knowledge and practice	Prolonged drought: Loss of expertise and experience	MEDIUM	Practitioner/ Expert
Community events	Dry Years and Prolonged drought: Loss of volunteers and desire to attend	MEDIUM	Practitioner/ Expert
Economy			
Jobs and employment	Dry years and prolonged droughts: Reduced availability/ diversity of local employment	MEDIUM	Practitioner
Equity – Business, assets, capital and cashflow	Dry years and prolonged droughts: Decreased investment	MEDIUM	Published
Borrowing capacity	Dry years and prolonged droughts: Diminished borrowing capacity	MEDIUM	Published
Environmental Credits – payments and accrued liabilities	Prolonged drought and bushfires: Loss of sequestered carbon stock	MEDIUM	Published
Insurance	Dry years and prolonged droughts: Increased premiums	MEDIUM	Published
Landscapes and Natural Environment			
Crops	Heavy rain ending drought (overland flood): Damage or loss	MEDIUM	Practitioner/ Expert
	Increasing evapotranspiration: Permanent wilting point exceedance	MEDIUM	Published
	Flash drought: Crop failure	MEDIUM	Published
	Dry years and prolonged drought: Crop failure	MEDIUM	Published
Infrastructure and Built Environment			
ICT and data	Drought (all): Increased load on services	MEDIUM	Expert
Water infrastructure	Dry years and prolonged drought: Increased demand	MEDIUM	Published



Building drought resilience in our region

Lessons learnt from the past – stories of resilience

“Plans are brilliant – forcing them to do some planning that they may not have done before.”

– Local Business Facilitator

“Everything we are doing today we need to do differently... it just doesn't work... it produces food but creates drought. Managing water/loss of fertility/ground cover in the period before drought...that minimizes the impact of drought ... it benefits the landscape to minimise the impacts of droughts.”

– Farm Educator

“Education is key... but also action on the ground. The government should fund the action on the ground not just the education... not just fences and sheds.”

– Farmer

“2006 and 2007 we had a dust bowl, fed molasses and it was awful... so stressful. We had no tools... we hung onto cattle, we were reactive, did everything too late... put cattle into feedlots too late, kept thinking it would rain and hung on and hung on living in fearful hope... when it did rain, the ground was so hard that the rain just ran off. But then we changed our practices in between the two droughts. We sold our cattle early, we had money in the bank and we kept our groundcover. We had three years in a row with 50% of our average rain and were still able to achieve our goals.”

– Farmer, Tiaro

A vision of our drought resilient region

Our vision statement

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

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

- **Do The Same** – where we make little change and continue thinking, behaving, and making decisions in the region much the same as we have in the past.
- **Do More** – where we learn, adapt and modify. Where we increase the intensity, scope, size or frequency of our actions. This could mean more people, more money, more often, etc.
- **Do Things Differently** – where we undertake transformative change and move towards making systemic changes

Figure 38: Key pillars and actions of the Drought Resilience, Adaptation and Mangement Policy (DRAMP) framework.⁷⁸

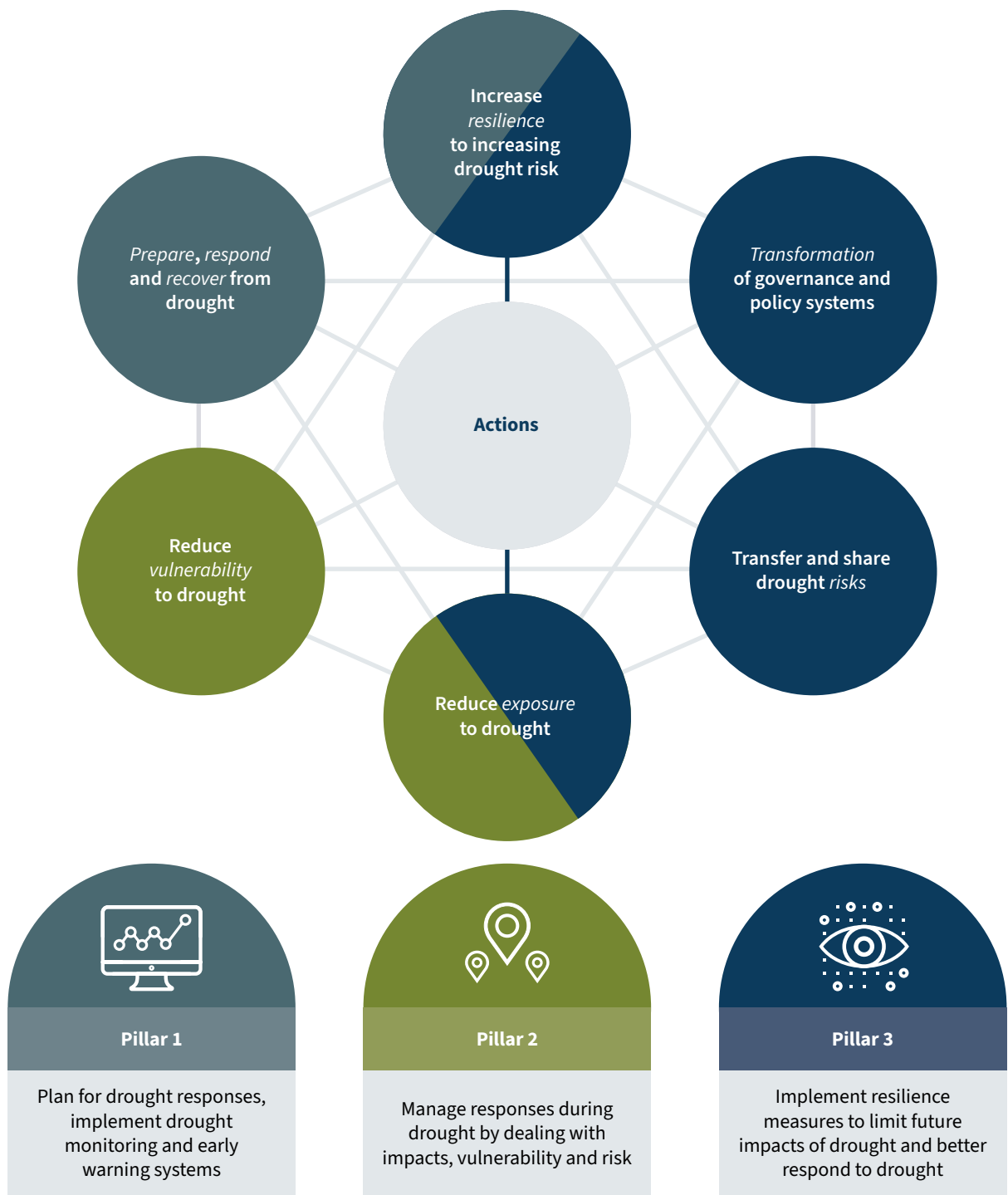
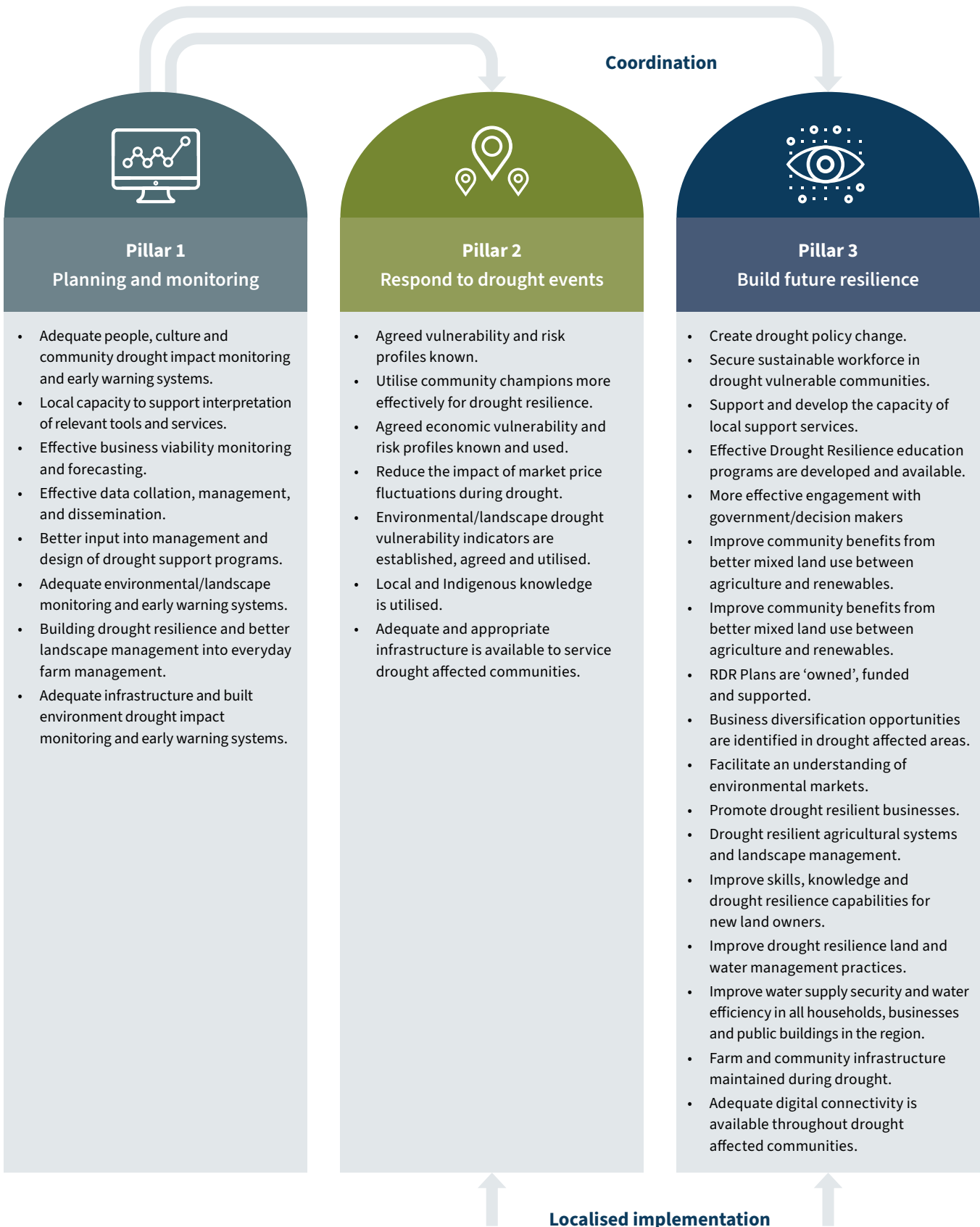


Figure 39: Three pillars for the Mary Regional Drought Resilience Plan.



Key aims and objectives

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

- The RDRP is ‘owned’ and promoted by an appropriate regional organisation/s.
- Appropriate policy and governance platforms are in place to support the implementation of the RDR Plan.
- A collaborative approach to implementing the RDR Plan is in place and funded.
- Widespread enterprise level drought risk management is established across the region.
- Implement measures to limit impacts of drought and better respond to drought.
- Adequate and appropriate drought risk management essential infrastructure in place and stress tested for times of drought.

Establishing priorities

After reviewing and reflecting on the ideas and issues generated through the analysis from the initial engagements, stakeholders were asked to prioritise the issues from two perspectives:

- (1) the priority of the issue in terms of its relative importance to the region
- (2) the priority in terms of the importance of taking action to increase drought resilience.

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

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

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

This plan also builds on and complements existing regional planning undertaken by QRA to develop the Mary Regional Resilience Strategy 2020, which identified the following objectives as critical for coordinated resilience action:

- sharing, leveraging and coordinating resilience efforts across the region
- adopting a place-based approach to resilience action, tailored to the varied characteristics of the region and its communities
- aligning sustainable development with disaster risk reduction
- telling our unique resilience story, recognising that one size does not fit all
- recognising the role of disaster resilience to our local and regional economy and social (or community) resilience.

The Regional Strategy

→ ACTION PLAN

People, culture and community



Pillar 1 – Planning and monitoring

Projected outcome: Plan for drought responses, implement drought monitoring and early warning systems.

Priority	Resilience activity	Priority action
Adequate people, culture and community drought impact monitoring and early warning systems.	Design effective drought monitoring and early warning systems – integrating climate, soil, water and socioeconomic indicators, along with real time drought assessment products – that provide timely information to support decisions.	Undertake an analysis of what is needed, what is here, what are the gaps of monitoring and early warning systems and community capacity to use the systems. Develop and pilot education programs that build an understanding of, and capacity to use, the drought monitoring and early warning systems.
Local capacity to support interpretation of relevant tools and services.	Build local teams in the Mary region to provide effective interpretation and usage of drought monitoring, early warning and short time forecasting products.	Place more climate information dissemination officers – such as Climate Mates – in the Mary region by 2025 to deliver capacity building workshops.
	Continue to develop model regional Drought Response plans (similar to current QDMA emergency/disaster response plans).	Project to produce model Drought Response plan. Pilot in three areas of Mary region. Develop Framework and model plan template.



Pillar 2 – Respond to drought events

Projected outcome: Manage responses during drought by dealing with impacts, vulnerability and risk..

Priority	Resilience activity	Priority action
Agreed vulnerability and risk profiles known.	Develop drought risk profiles of vulnerable groups – including women, children, elderly, farmers, pastoralists, marginalised communities and Indigenous groups.	Identify priority vulnerable demographic groups. Conduct a project to develop drought vulnerability indicators for the identified priority groups.
	Develop key community resilience indicators (individuals and communities) to measure the impacts of drought.	Carry out a literature review of existing indicators and resilience frameworks; test these with stakeholders. Identify gaps and areas for further development. Test model indicators in the Mary region – conduct a baseline study using identified indicators. Identify impacts, vulnerabilities and potential solutions in each location (or regionally). Evaluate, report and distribute widely. Deliver educational workshops to disseminate results.
Utilise community champions more effectively for drought resilience.	Local champions – both individual and organisations – are identified and sustained so they can lead and support their communities through ‘hard times’.	Commission research or consultation to identify community ‘best practice’ champions and explore different methodologies to involve them most effectively. Publish appropriately via a discussion paper. Conduct pilot activities involving various champions for community, economy, landscape and infrastructure. Develop and share case studies – for example through field days, written and web-based information. Establish peer-to-peer learning networks inviting credible local and respected early adopter producers and where possible, laggard adopters supported by knowledge experts as required.



Pillar 3 – Build future resilience

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

Priority	Resilience activity	Priority action
Create drought policy change.	Review and analyse common themes from Queensland RDR Plans and use these insights to develop recommendations for policy change and better design and manage drought resilience initiatives.	Collate key themes from Queensland RDR Plans and prepare a discussion paper with recommendations for change. Develop a core group of key stakeholders to advocate for change.
Secure sustainable workforce in drought vulnerable communities.	Continue to identify employment incentives and opportunities for drought vulnerable communities in the Mary region.	In collaboration with key stakeholders, run 'think tank' forums around the Mary region to identify potential employment opportunities.
Support and develop the capacity of local support services.	Enhance the community's capacity for self-help through locally-based appropriate support workers and services.	Develop business cases for locally based support workers and services. Develop and fund programs to educate people on accessing local support services. Look for opportunities to strengthen local and regional alliances between support services (e.g. not-for-profit and government agencies).
Effective Drought Resilience education programs are developed and available.	Develop and implement a comprehensive framework of Drought Resilience education programs – including school education programs, vocational and tertiary programs, professional training programs, training for agricultural enterprises and local businesses, academic programs and research.	Carry out a review of existing 'drought-related' education. Identify gaps and key lessons learned. Develop a draft framework and pilot various education programs and resources in the Mary region.
More effective engagement with government/decision makers <i>(Continued on next page)</i>	Understand barriers and or incentives for improving engagement with government and decision makers.	Engage with project partners (e.g. UniSQ) to scope and deliver a research program on the impact of government in rural and regional communities, with a focus on: (a) Local barriers/incentives to engaging with government/decision makers. (b) Engagement and local decision making. (c) Community empowerment to influence change. (d) Emerging trends (e.g. impact on drought communities when there is change imposed on them). (e) Recommendations and learnings which can be used to capacity build in communities. Seek funding to conduct the project (e.g. from FRRR, RDA, or other sources).

Priority	Resilience activity	Priority action
<p>More effective engagement with government/decision makers</p> <p><i>(Continued from previous page)</i></p>	<p>Build community capacity to shape opportunities in response to local issues, mobilise community support and engage with Governments/Decision Makers to effect change.</p>	<p>Develop and deliver two pilot workshops within the Mary region, specifically working with communities experiencing changes due to government policy (e.g. regional energy transition).</p> <ol style="list-style-type: none"> (1) Establish a steering committee. (2) Co-design an engagement process in conjunction with the steering committee. (3) Develop an engagement plan. (4) Deliver pilot capacity building workshops and activities identified in the design phase. (5) Evaluate and report.
<p>Improve community benefits from better mixed land use between agriculture and renewables.</p>	<p>Develop model Community Benefit Agreements for mixed land use and large-scale renewables projects.</p>	<p>Undertake a robust study (Australian and world best practice) on the:</p> <ul style="list-style-type: none"> • potential benefits of renewable energy in agricultural and drought-affected areas • viability of implementing Community Benefit Agreements (e.g. as used in the mining industry) to encourage better outcomes for local communities from mixed land use and large-scale renewables projects. <p>Produce a discussion paper to advocate for necessary changes and recommend model tools to pilot. Seek projects and partners to pilot in the region. Carry out pilot, evaluate, report and share findings.</p>
<p>RDR Plans are ‘owned’, funded and supported.</p>	<p>Negotiate with Queensland and Australian governments to identify appropriate ‘owners’ of the RDR Plans in Queensland.</p>	<p>Work with Queensland and Australian governments to identify ‘owners’ of the RDR Plans in Queensland. Work with local owners to identify what support they need and want to further implement the RDR Plan in the Mary region.</p>

➔ ACTION PLAN

Economy



Pillar 1 – Planning and monitoring

Projected outcome: Plan for drought responses, implement drought monitoring and early warning systems.

Priority	Resilience activity	Priority action
Effective business viability monitoring and forecasting.	Further develop and fund monitoring and forecasting frameworks to support farm and town business viability.	<p>Undertake a desktop analysis of existing monitoring and forecasting frameworks that support business viability.</p> <p>Assess these for appropriateness and currency for the Mary region.</p> <p>Engage stakeholders and develop a draft framework – pilot with three locations in the Mary region.</p>
Effective data collation, management, and dissemination.	Improve data collation, management and dissemination for community sustainability priorities.	<p>Establish a stakeholder focus group to analyse the practicality of existing data collation, management and dissemination.</p> <p>Develop a model framework for better data collation, management and dissemination.</p>
Better input into management and design of drought support programs.	Seek opportunities to provide input into the review and management of current and future drought support programs.	<p>Seek opportunities to pursue the following initiatives:</p> <ul style="list-style-type: none"> • Review and revise the definition of ‘primary producers’ (noting this may differ across regions). • Review the current eligibility for drought support – e.g. farm incomes and sub-categories, small rural landholder, off farm incomes. • Promote Farm Business Resilience planning as a minimum requirement for all drought support (except for emergency).



Pillar 2 – Respond to drought events

Projected outcome: Manage responses during drought by dealing with impacts, vulnerability, and risk.

Priority	Resilience activity	Priority action
Agreed economic vulnerability and risk profiles known and used.	Analyse agricultural enterprise types under medium- and long-term climate change, land condition and market prediction scenarios to establish viability risk profiles and develop appropriate responses.	<p>Conduct an analysis of enterprise types and their vulnerability to drought impacts.</p> <p>Identify key issues and vulnerability factors. Establish a stakeholder group with local knowledge and expert advisors – develop model responses, test models, record and share results.</p>
Reduce the impact of market price fluctuations during drought.	Review and explore ways to reduce the impact of market price fluctuation during drought for cattle, vegetable, cropping and horticulture.	<p>Conduct a review and study to explore ways of reducing market price fluctuation.</p> <p>Develop and implement an awareness program.</p>



Pillar 3 – Build future resilience

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

Priority	Resilience activity	Priority action
Business diversification opportunities are identified in drought affected areas.	Investigate and identify business diversification opportunities (on and off-farm, town businesses) to support drought resilience.	<p>Review existing work and analyse gaps, opportunities, risks and barriers to uptake and establish costs associated with diversification opportunities.</p> <p>Hold three business stakeholder forums across the Mary region to explore business diversification options.</p> <p>Develop and disseminate case studies of successful diversification within drought impacted areas.</p>
Facilitate an understanding of environmental markets. <i>(Continued on next page)</i>	Ensure independent and unbiased information is available.	Develop an independent and unbiased discussion paper with several diverse stakeholders, to ensure a balanced opinion.

Priority	Resilience activity	Priority action
Facilitate an understanding of environmental markets. <i>(Continued from previous page)</i>	Ensure (more) practical information is available.	Develop available online education products for download. Work with key industry and stakeholder groups to strive for balanced information.
	Develop a model program to raise awareness and understanding of opportunities and challenges of participating in environmental markets.	Develop and trial two workshop programs in the Mary region, sharing independent and unbiased information; providing access to information tools.
Promote drought resilient businesses.	Support programs that better prepare farming and town businesses for drought.	Support education programs aimed specifically at small-block, peri-urban, ‘blockies’ and ‘hobby farmers’ who have purchased viable rural properties but do not have the knowledge and skills to run them effectively.
	Review the Rural Financial Counselling operations and charter to offer services aiming to ensure new farmers are set up for success.	Rural Financial Counsellors to deliver a proactive education program to producers, prior to hardship. Additional Rural Financial Counsellors to be appointed in two towns in the Mary region.



➔ ACTION PLAN

Landscape and natural environment



Pillar 1 – Planning and monitoring

Projected outcome: Plan for drought responses, implement drought monitoring and early warning systems.

Priority	Resilience activity	Priority action
Adequate environmental/landscape monitoring and early warning systems.	Continue the development of existing, and design of new, environmental/landscape monitoring and early warning systems.	Carry out a stocktake of existing drought monitoring and early warning systems, hard and soft infrastructure, and identify where opportunities exist to improve coverage and uptake – integrating multi-scale climate, soil and water information.
Building drought resilience and better landscape management into everyday farm management.	Build on the foundation of existing and previous capacity building programs.	<p>Review and analyse current and previous programs – e.g. farm business resilience program (FARMBIZ). Identify key success factors and areas for improvement and/or expansion.</p> <p>Design and develop an affordable integrated suite of best practice programs (including existing programs) of farm management education around topics such as income diversification, land management, business planning, etc.</p> <p>Develop an incentivised professional development program for farmers.</p>



Pillar 2 – Respond to drought events

Projected outcome: Manage responses during drought by dealing with impacts, vulnerability and risk.

Priority	Resilience activity	Priority action
Environmental/landscape drought vulnerability indicators are established, agreed and utilised.	Agreed environmental/landscape drought vulnerability and risk indicators are identified and utilised in responsive program design and delivery.	<p>Work with experts and stakeholders to develop and establish appropriate landscape and natural environment vulnerability and risk indicators.</p> <p>Undertake three pilot projects in the Mary region to trial and assess drought vulnerability and risk indicators.</p> <p>Identify critical habitats for threatened species and identify actions required to protect and enhance those critical habitats.</p> <p>Establish five projects enhancing critical habitats that are most threatened by the impacts of drought.</p>

Priority	Resilience activity	Priority action
Local and Indigenous knowledge is utilised.	Traditional wisdom and First Nations skills and knowledge are incorporated into a range of practical land care/land management education and skills programs.	<p>Conduct an audit of currently offered programs and courses (e.g. BMRG) including traditional wisdom and First Nations skills and knowledge.</p> <p>Undertake a pilot research program identifying gaps and areas for improvement through engagement with Elders, educators and key stakeholders.</p> <p>Ensure the design for improved overall program and specific inclusions in capacity-building programs is developed and widely distributed.</p> <p>Seek funding to trial new education initiatives that include traditional wisdom and First Nations skills and knowledge, in the Mary region.</p> <p>Develop and trial specific programs that address the cultural effects of drought impacts on landscapes and country for Indigenous and First Nations people.</p> <p>Incorporate native plants/foods and traditional land care practices in land regulation programs – e.g. reef catchment, vegetation.</p>



Pillar 3 – Build future resilience

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

Priority	Resilience activity	Priority action
Drought resilient agricultural systems and landscape management.	Implement appropriate planning at a regional level to encourage sustainable land use in drought-prone areas.	<p>Identify what parts of the region are considered highly drought prone.</p> <p>Develop model land management customised for the region.</p>
	Promote agricultural production systems that are drought resistant.	Extend the Farm Business Resilience Plan program to include natural resource management.

Priority	Resilience activity	Priority action
<p>Improve skills, knowledge and drought resilience capabilities for new land owners.</p>	<p>Develop education programs for new landowners who have purchased viable rural properties but do not have the knowledge and skills to run them effectively.</p>	<p>Review current education programs (government and non-government) available for new landowners. Conduct research with representative groups to determine what works well and what they want; work with ‘experts’ to design a model curriculum.</p> <p>Hold a series of education days (for new and existing producers) through existing stakeholder groups – e.g. Gympie District Beef Liaison Group, MRCCC, BMRG etc.</p> <p>Follow-up with further consultation and on-farm implementation workshops.</p> <p>Hold two to three education events per year, for three to four years.</p>
<p>Improve drought resilience land and water management practices.</p> <p><i>(Continued on next page)</i></p>	<p>Explore, share and disseminate best practices in land/water management for drought resilience.</p>	<p>Develop a practical model for land water management planning. Use a variety of models – e.g. Natural Sequence Farming model, regen to slow water flow over land, improve ground cover/pasture, reducing topsoil/silt loss.</p> <p>Review incentive programs to support proactive land and water management for drought affected areas.</p>
	<p>Assess water management practices across the Mary region and develop appropriate responses.</p>	<p>Extend assessments that link economic development with water management – e.g. Burnett river assessment.</p> <ul style="list-style-type: none"> • Commence a study on water efficiency and water harvesting measures, including: • demand side requirements • water efficiencies • economic value • cost of implementing • expected outcomes for community, business and agriculture. <p>Design and implement a pilot education program on drought resilient water management practices for the Mary region.</p>
	<p>Promote further uptake of water recycling options.</p>	<p>Commence a study on water recycling – domestic, on-farm, industrial, business – to determine economic value, cost of implementing, expected outcomes for community, business and agriculture.</p> <p>Research viability of controls and regulations to reduce over-extraction of groundwater and encourage recycling/re-use of water. Consult with stakeholder groups.</p>

Priority	Resilience activity	Priority action
Improve drought resilience land and water management practices <i>(Continued from previous page)</i>	Develop an information program to build skills in better on-farm sediment control practices.	Develop a practical model course (online, in-person and field visit) on best-practice on-farm sediment control. Pilot and test in three locations in the Mary region.
	Map groundcover and sediment load in the Mary region.	Access LIDAR data (and fund where not available) to assess and map groundcover and sediment load in the Mary region. Analyse and produce a plain English discussion paper.



→ ACTION PLAN

Infrastructure and built environment



Pillar 1 – Planning and monitoring

Projected outcome: Plan for drought responses, implement drought monitoring and early warning systems.

Priority	Resilience activity	Priority action
Adequate infrastructure and built environment drought impact monitoring and early warning systems.	Design effective drought monitoring and early warning systems, integrating climate, soil, water and socioeconomic indicators, along with real time drought assessment products that provide timely information to support decisions.	Undertake an analysis of what is needed, what exists, and what are the gaps of monitoring and early warning systems.
	Invest in developing and maintaining weather and other early warning infrastructure to ensure there is coverage for all of the Mary region, at a local scale.	Establish new A pan evaporation measurement stations in the Mary region.
	Build water efficiency into regulatory and planning systems in Queensland.	Work with expert groups, universities, Local Government Association of Queensland, professional bodies, government agencies and others – to review current inclusion of water efficiency into planning schemes. Identify areas for improvement in both content and public knowledge (awareness) of water use efficiency measures.



Pillar 2 – Respond to drought events

Projected outcome: Manage responses during drought by dealing with impacts, vulnerability and risk.

Priority	Resilience activity	Priority action
Adequate and appropriate infrastructure is available to service drought affected communities. <i>(Continued on next page)</i>	Establish the level and types of infrastructure required to respond to drought.	Undertake an analysis of existing drought related infrastructure and whether it meets needs to increase drought resilience.
	Undertake regular assessment of infrastructure condition and adequacy.	Carry out an audit of the condition of existing drought related infrastructure.

Priority	Resilience activity	Priority action
Adequate and appropriate infrastructure is available to service drought affected communities. <i>(Continued from previous page)</i>	Ensure adequate resources are available to build and maintain essential infrastructure.	Develop a drought infrastructure maintenance and capital development plan, e.g. AAS27. Ensure continued resources and support for key projects, e.g. Paradise Dam. Ensure community meeting spaces are resourced.



Pillar 3 – Build future resilience

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

Priority	Resilience activity	Priority action
Improve water supply security and water efficiency in all households, businesses and public buildings in the region.	Implement a program to improve potable water supply connectivity to as many households as possible.	Develop a business case to improve potable water supply connectivity to as many households as possible – with indigenous communities as a priority.
	Implement a program to fund and support on-site water harvesting, recycling and water efficiency for as many users as possible.	Plan and seek funding for a program providing and/or subsidising water harvesting and recycling hardware – e.g. tanks, pumps, pipes, etc – including education and advice. Target unconnected households and buildings first, then connected public buildings (including sporting clubs, churches, etc.), businesses and households.
Farm and community infrastructure maintained during drought.	Build financial capacity in farm enterprises to allow for the maintenance of property infrastructure during drought.	Continue the water infrastructure related subsidy schemes.
Adequate digital connectivity is available throughout drought affected communities.	Undertake projects that improve digital connectivity in drought affected communities.	Undertake two priority projects in the Mary region that focus on improving digital connectivity across the region.

Image: Champagne Pools, K'Gari (Fraser Island), Queensland.



Community partnerships and communication strategy

Following the endorsement of this RDR Plan by Regional Development Australia – Wide Bay Burnett, a process will be established to engage and communicate with the community on the progress of activity implementation. This Communication Framework has been co-designed by key stakeholders and is deemed appropriate and feasible at the time of development. It is expected the Framework and its component activities will be modified over time, as issues and opportunities arise during implementation and as lessons are learned from experience.

Table 4: Key engagement activities

Communication event(s)	Timing	Key audience
Ministerial announcements	Within 2 months of sign-off	General public
Media releases – National/State	Within 2 months of sign-off	General public
Media releases – Local	Within 1 months of sign-off	Regional and local communities
Media stories – National and regional	As required	General public
RDR Plan – inclusion on websites	Within 1 month of sign-off	General public
Community/Sector engagement	As required	General public, business representatives, agriculture representatives, community representatives.
Presentation to Community Groups	Within 2 months of sign-off; as required, annually	General public and members
Presentation to Non-government Organisations/Charities	Within 2 months of sign-off, as required	
Project implementation/Monitoring, Evaluation and Learning reports	As per MER Plan, as agreed with funders	Regional Development Australia (RDA), Department of Primary Industries (DPI), funding bodies.
Project updates – media releases	As required	General public
Annual Report – general distribution	Annually at end of year	General public, Department of Agriculture, Fisheries and Forestry (DAFF), DPI, government agencies, non-government agencies.
Annual Report – inclusion on websites	Annually at end of year	General public, DAFF, DPI, government agencies, non-government agencies.
Project completion reports	At completion of project	RDA, DPI, funding bodies.
Project completion media releases	At completion of project	General public, DAFF, DPI, government agencies, non-government agencies, funding bodies

Monitoring, Evaluation and Learning (MEL)

Key Evaluation Questions

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

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

Assumptions underpinning the implementation of the Plan

The FDF Monitoring, Evaluating and Reporting Plan identified the following assumptions for effective implementation:

Key assumptions affecting outcomes from 1–2 years

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

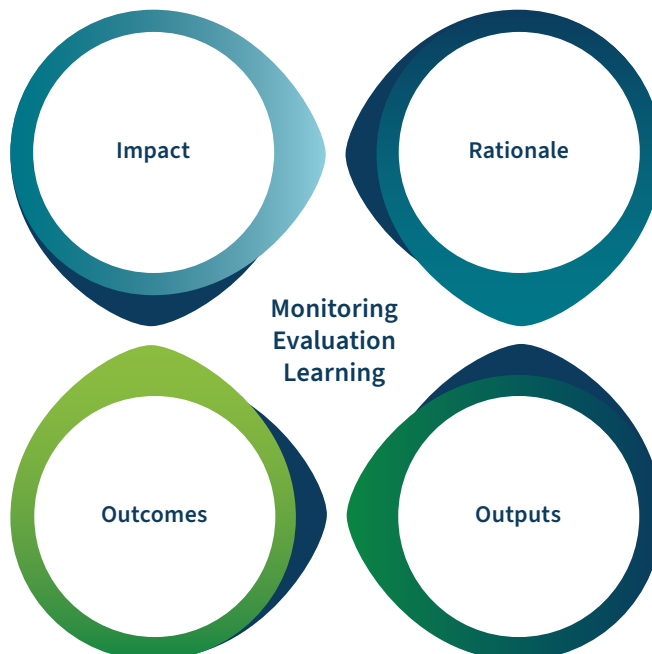
Figure 40: Adapted from Future Drought Fund (FDF) approach to Monitoring, Evaluation and Learning (MEL).

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?

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?



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?

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?

Key assumptions affecting outcomes from 2+ years

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

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

Monitoring progress and evaluating outcomes

The following table is based on the relevant FDF Monitoring, Evaluation and Reporting Framework indicators and the actions developed in this Regional Drought Resilience Plan. The Plan includes several indicators against identified actions.

Table 5: Key monitoring indicators

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

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

	<p>Outcome level: Success measures and intermediate outcomes 2–4 years</p> <p>Actions have been taken based on this Plan</p> <ul style="list-style-type: none"> • The Plan has had elements implemented. • Primary producers and businesses supported to improve their sustainability and resilience. <p>Decisions have been made to implement</p> <ul style="list-style-type: none"> • Regional representatives have considered and planned incremental, transitional and transformational opportunities to strengthen resilience. • Identified actions, pathways and opportunities (including innovative and transformative) to improve regional drought resilience, mitigate risks and adapt to change. • Communities use relevant data and information to better understand their resilience to plan for drought. <p>Capacity has been developed</p> <ul style="list-style-type: none"> • Regional leaders are in a stronger position to implement strategic actions, adapt to change and take advantage of opportunities to build economic resilience as they arise. • Partnerships, networks and engagement are built between stakeholders managing natural resources. • Increased community understanding of the region’s current and future drought resilience, considering the region’s unique economic, environmental and social characteristics. • Natural resource management capability is improved across region. <p>Regional Stakeholders are involved</p> <ul style="list-style-type: none"> • Plans have buy-in from key stakeholders in the region. • The number of, and participation in, local networks and programs to enhance drought resilience increases. • Communities share knowledge, collaborate and partner with government more often to build drought resilience. • Greater sharing of learnings related to drought resilience between communities. <p><i>Continued on next page</i></p>
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The achievement of Key Pillars to underpin the achievement of objectives are:

- (a) Drought monitoring, early warning systems and plans for responses are being developed and refined.
- (b) Those most vulnerable and at risk of droughts have been identified and steps taken to address their vulnerability.
- (c) Measures have been initiated to limit the impacts of and respond better to drought.

Action steps have been taken in line with the Action Plan tables around the key outcome areas of:

- People, culture and community
- Economy
- Landscape and natural environment
- Infrastructure and built environment

Implementation steps have been undertaken as per the Communication engagement table.

Monitoring actions that should be taken at a regional level by the ROG include:

- Recording of steps taken, actions initiated, and resources gained that have been triggered by the Plan framework, strategies and planned actions.
- Annual reporting and review of plan implementation, engagement, participation, actions, barriers and opportunities to regional stakeholder organisations and government – and changes to the Plan made as needed to best meet regional needs.

Should external evaluation be undertaken, as well as taking the national data, above information and annual review into account (against planned actions), a range of regional stakeholders should be interviewed/surveyed to gauge their understanding, engagement and actions they have taken because of Plan guidance and initiatives.

Types of questions should include:

- Their level of awareness and understanding of the Plan – and how aware they think others are.
- How invested they are in engaging with other stakeholders around the Plan implementation.
- How confident they are that they have the skills and resources to make changes highlighted.
- What decisions and/actions they have taken – or aware of – that have been initiated because of the Plan.
- How the Plan has impacted on extra resourcing or support to the region to improve drought resilience.
- How they think the Plan has added value and made a difference in increasing drought resilience in the region.
- What is working and what needs to change with respect to the Plan and its effective on-going implementation.
- Organisations nominated for actions in the Plan including for the communication engagement activities, should also be interviewed to review what was undertaken, how it was done, what response was gained and, if not, why not.
- Case studies should be further captured/developed to understand/demonstrate the program logic/the theory of change and inform recommendations for changes/support needed to maximise the Plan effectiveness.

A critical part of an external review would be to find an on-going ROG who were invested in using the Plan as a framework towards improved resilience, outputs and actions arising and how well this was working towards the Plan's objective.

Such external reviewing should be taken annually for the first three years to provide lessons for plan development and implementation in other regions, then every three years.

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**Resource document was published under this department name. Department names may have since changed. For more information, please refer to [A summary of changes to departments of government](#).*

