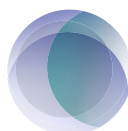


Greater Whitsunday Regional Drought Resilience Plan 2024–2030



Australian Government
Department of Agriculture,
Fisheries and Forestry



Future
Drought
Fund



Queensland Government



Rural Economies
Centre of Excellence

The Greater Whitsunday Regional Drought Resilience Plan has been developed as a partnership between the Rural Economies Centre of Excellence and the following organisations: Greater Whitsunday Council of Mayors, CQUniversity, Greater Whitsunday Alliance, Greater Whitsunday Communities, Fitzroy Basin Association, North Queensland Dry Tropics, and Reef Catchments.

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).

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

Acknowledgement 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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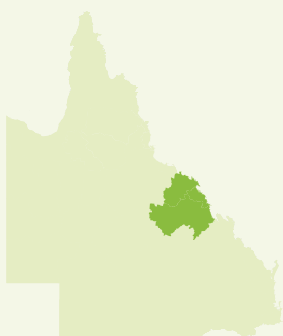


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Foreword



The Greater Whitsunday Council of Mayors along with our member LGAs, proudly acknowledges the Aboriginal peoples and Torres Strait Islander peoples as the Traditional Owners and Custodians of this Country. We recognise and honour their ancient cultures, and their connection to country and community. We pay our respect to them, their cultures, and to their Elders, past, present and emerging.



Image: Whitehaven Beach, Whitsundays, Queensland.

The Greater Whitsunday region covers 90,354 square km and is bounded by St Lawrence in the south, Gumlu in the north, out to Clermont in the west and the Great Barrier Reef Whitsunday's group of 74 islands to the east. The region is home to just under 190,000 people spread across a number of key regional centres, islands and rural communities. Considered one of the most resource-rich areas in Australia, the Greater Whitsunday region has become an economic powerhouse across key industry sectors such as mining, manufacturing, agriculture, health care and social assistance, tourism and construction. It is recognised as a major part of Queensland's economy as well as a world-renowned tourist destination.

Agriculture has been a traditional mainstay of the regional economy, with sugarcane in the wetter areas along the coast and beef cattle production further inland, supplemented in more recent times by horticulture, aquaculture and forestry. Those industries support a number of communities and population centres throughout the region. There are strong crossovers between the agricultural and rural heritage of the region and the workforce in sectors such as mining, manufacturing and construction, as well as in the social fabric of the region.

Our region and our communities are no strangers to the changes of climatic forces, with natural disasters such as floods, cyclones and droughts a common occurrence. Learning to adapt and survive natural events and setbacks has been a feature of the region's history and has contributed to a robust and resilient culture. Supportive communities, strong institutional and support frameworks and robust independence of small businesses and agricultural enterprises have been a key feature of the regional area. Our local governments are connected by history and commerce, and their wealth of social capital.

Drought has been a recurring pressure on many of our communities, particularly in the western parts. Major droughts take a toll on our people and our communities, particularly when periods of drought combine with other social and economic pressures to create tipping points for enterprises to change or people to relocate. Planning to anticipate these pressures so that our enterprises and communities are more resilient is important, as it allows people in the region to be more in charge of their own destinies and changes. Looking forward, this may become particularly important as changes to our climate and the potential for hotter and drier seasons increase the risks of drought and associated impacts on the economic, social and environmental assets of the region.

The Greater Whitsunday Regional Drought Resilience Plan (RDRP) has been designed to reduce these risks and anticipate the pressures that future droughts may place on our communities. The plan has been developed through a partnership between CQUniversity, Greater Whitsunday Communities, Greater Whitsunday Enterprise, Fitzroy Basin Association, North Queensland Dry Tropics and Reef Catchments, and supported by the Mackay Regional Council, Isaac Regional Council and the Whitsunday Regional Council.

A notable feature of the process has been a focus on the views of individuals, communities and stakeholders in the region about what should be done. Many of the detailed actions in the plan come from consultations with people in the region. With this plan, we aim to strengthen, advance and transform the Greater Whitsunday region during the dry times.

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

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

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



Mayor Greg Williamson, Mayor Kelly Vea Vea, Mayor Ry Collins
Greater Whitsunday Council of Mayors

Acronyms

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ABS	Australian Bureau of Statistics
BoM	Bureau of Meteorology
CQU	Central Queensland University
CRCNA	Cooperative Research Centre for Developing Northern Australia
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSO	Community Service Organisation
DLGWV	Department of Local Government, Water and Volunteers
DPI	Department of Primary Industries

FBA	Fitzroy Basin Association
FDF	Future Drought Fund
GW	Greater Whitsunday
GW3	Greater Whitsunday Alliance
GWC	Greater Whitsunday Communities
GWCOM	Greater Whitsunday Council of Mayors
LGA	Local Government Area
MIW	Mackay, Isaac, Whitsunday
NFP	Not-for-profit
NRM	Natural Resource Management
NQDT	North Queensland Dry Tropics

NQPHN	North Queensland Public Health Network
QRA	Queensland Reconstruction Authority
QSDR	Queensland Strategy for Disaster Resilience
RDRP	Regional Drought Resilience Planning
RECoE	Rural Economies Centre of Excellence
RDA	Regional Development Australia
RDRP	Regional Drought Resilience Planning
SEIFA	Socio-Economic Indexes for Areas
UNDRR	United Nations Office for Disaster Risk Reduction
WSS	Water Supply Scheme

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 of having 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 very significant and diverse. 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

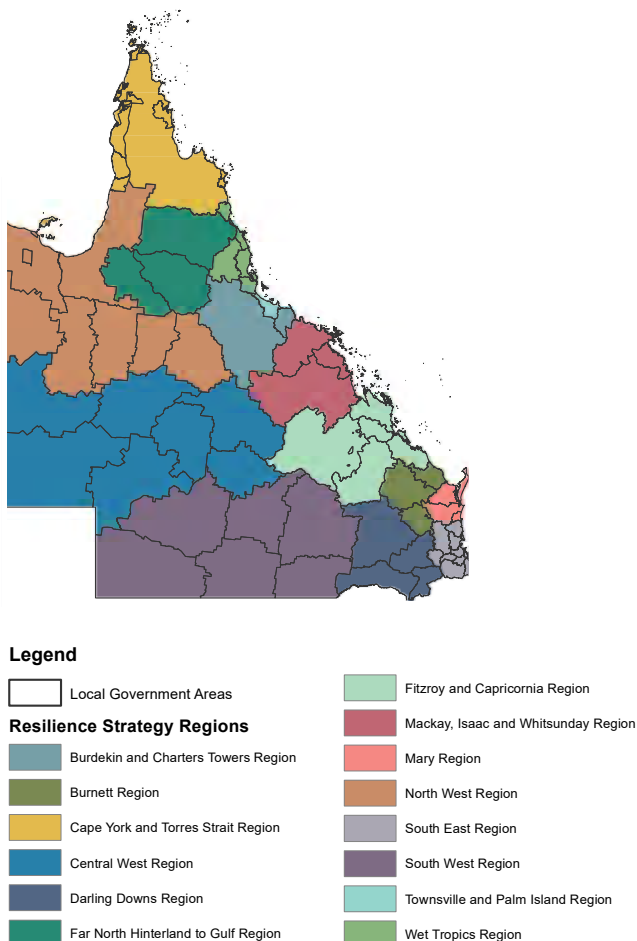
Queensland is the most disaster impacted state in Australia, and Queenslanders are susceptible to a variety of hazards. We are facing unprecedented change in both our current and future operating environment with a dynamic political, social, economic and policy landscape surrounding disaster risk reduction 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 ensures 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 2022–2027.³⁶



Regional planning and engagement

This RDR plan was developed through collaboration between

- Department of Primary Industries (DPI),
- Rural Economies Centre of Excellence (RECoE),
- Queensland Reconstruction Authority (QRA),
- Greater Whitsunday Council of Mayors (GWCOM),
- Central Queensland University (CQU),
- Greater Whitsunday Alliance (GW3),
- Greater Whitsunday Communities (GWC),
- Reef Catchments, North Queensland Dry Tropics (NQDT),
- Fitzroy Basin Association (FBA), and
- key regional, community and industry 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 Bank⁵ and the UNDRR⁶. The plan has been reviewed by an independent assessor appointed by the Australian Government, and their feedback has been incorporated into the final plan.

The plan was co-designed with local stakeholders, using an approach that emphasised initial trust-building, building on existing networks, local co-design of process, commitment and agreement, risk-informed adaptation of processes, place-based and regional strategies, locally led and coordinated solutions, and integrated multi-objective responses.

The approach was sensitive to the high levels of well-recognised 'engagement fatigue' in many of the drought-affected communities of the region; large physical distances between key locations; constraints on time for all stakeholders and participants; and maximising opportunities to 'piggyback' with important regional events. Hence, the plan was developed through practical and effective processes that maximised active participation, recognised and respected a diverse range of knowledge, values and views, and above all, were ethical and fair.

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

The plan was co-designed with a wide range of local partners and stakeholders including agricultural businesses and associations, Regional Development Australia (RDA) members, Natural Resource Management (NRM) groups, First Nations groups and elders, Queensland Government agencies, Queensland Fire Department, local government (councils, mayors, staff and groups), Community Service Organisations (CSOs), not-for-profit (NFPs) and charities; local (town) businesses, educational providers, young people, health providers, banks and finance advisers, religious leaders, consultants and advisers.

Key principles and concepts: drought and resilience

Whilst there is no universally accepted definition of drought, in Australia, the Bureau of Meteorology (BoM) states, “*drought, in general, means acute water shortage*”.⁷

In Queensland, drought is ‘declared’ for a local drought area and/or individual properties. Local drought areas are drought declared “*when the rainfall recorded during the previous 12 months (minimum) is in the lowest (or driest) decile or below the 10th percentile when compared to the long-term historical rainfall*”.⁸ This is the technical definition of drought utilised in this plan.

“Resilience’ is harder to define. The World Bank has defined resilience as the ability “... *to anticipate, absorb, accommodate or recover from the effects of a hazardous event in a timely and efficient manner*”.⁹

Australia’s CSIRO perhaps more specifically states:

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

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

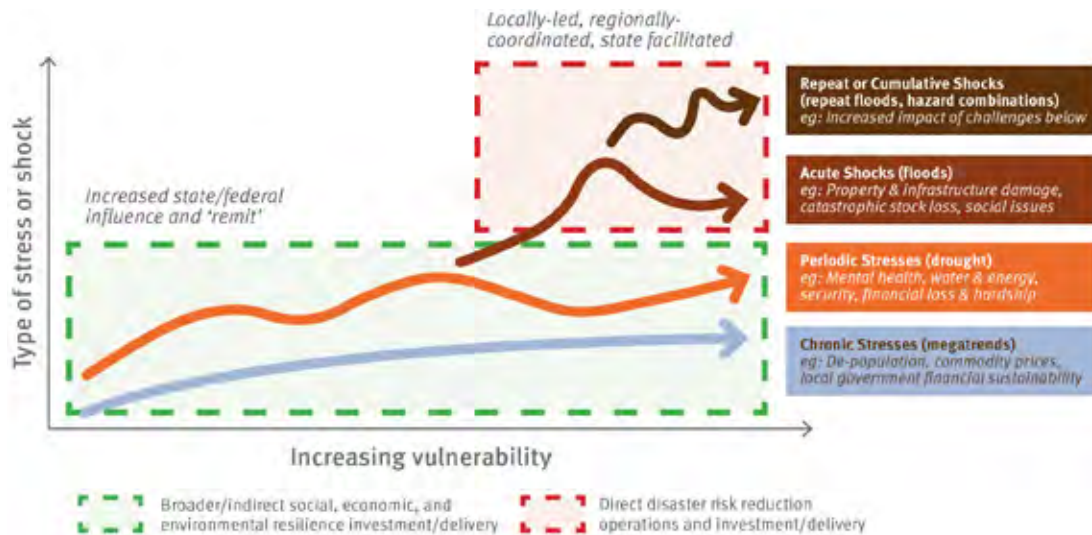
Figure 2: Four key objectives of the Queensland Strategy for Disaster Resilience 2022–2027.³⁷



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*”.¹¹

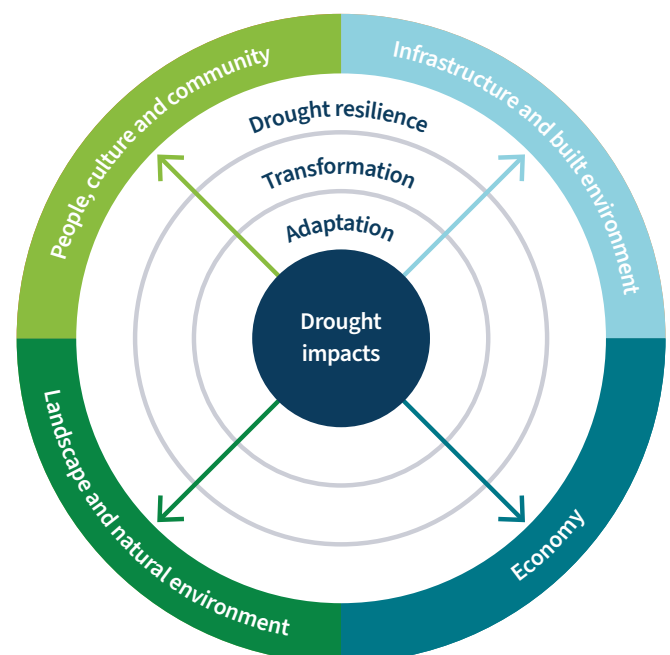
Figure 3: How resilience is affected by stresses and shocks, adapted from the Queensland Strategy for Disaster Resilience 2022–2027.³⁹



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.

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Figure 4: Queensland RDRP elements of drought resilience.³⁸



How to use this plan

The purpose of the plan

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

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

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

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

Key inputs

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

- Queensland Strategy for Disaster Resilience
- Greater Whitsunday Alliance Future Employment Strategy
- Rural and Remote Health and Wellbeing Strategy 2022–2027 (Queensland Government)
- Mackay, Isaac, Whitsunday Regional Water Strategy
- Queensland Climate Adaptation Strategy 2017–2030
- Greater Whitsunday Future Skills Roadmap
- Greater Whitsunday Agribusiness Supply Chain Baseline Study
- Drought Resilience, Adaptation and Management Policy Framework 2018
- Infrastructure Australia's Regional Strengths and Infrastructure Gaps Regional Analysis Queensland Report 2022

- Stocktake of Megatrends Shaping Australian Agriculture¹²
- Queensland Drought Management Framework 2019–2024
- Australian Government Natural Resource Management Monitoring, Evaluation, Reporting and Improvement Framework Guidelines.

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

Other important linkages

It is the intention of this plan that it is considered and factored into a range of other strategies and plans, including (but not limited to):

- 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

This Greater Whitsunday RDRP region comprises three local government areas (LGAs) managed by the Mackay Regional Council, Isaac Regional Council, and Whitsunday Regional Council. The region has a total land area of 90,354 km², approximately 5.2% of the Queensland land area (Figure 5).

The region contains three Natural Resource Management areas, and is serviced by the Dry Tropics NRM, Reef Catchments NRM, and Fitzroy Basin Association NRM (Figure 6).

The Greater Whitsunday RDRP region is one that celebrates its unique diversity. The Greater Whitsunday region covers is bounded by St Lawrence in the south, Gumlu in the north to Clermont in the west, and the Great Barrier Reef Whitsunday's group of 74 islands to the east.

Figure 5: Greater Whitsunday regional map.⁴⁰

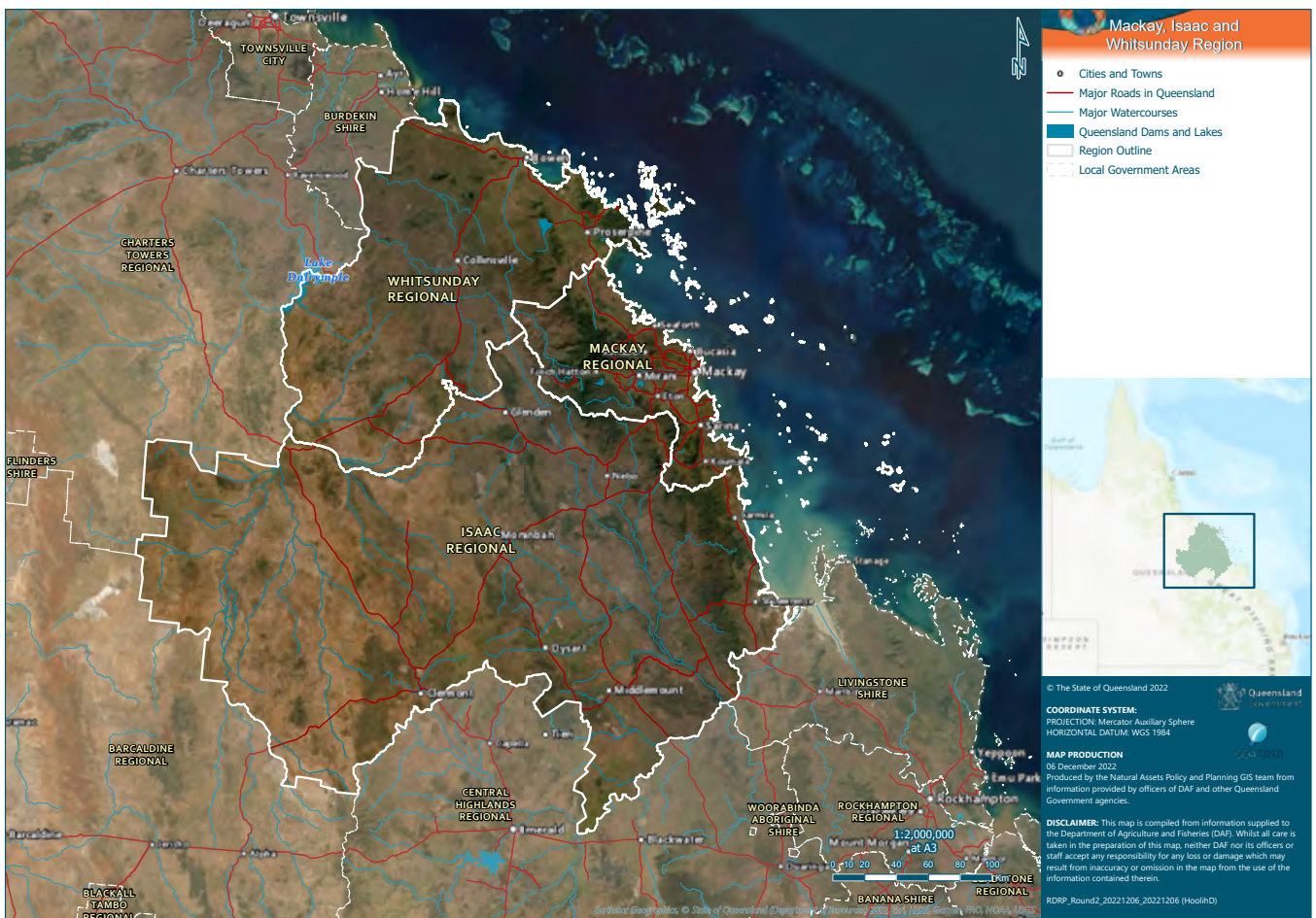
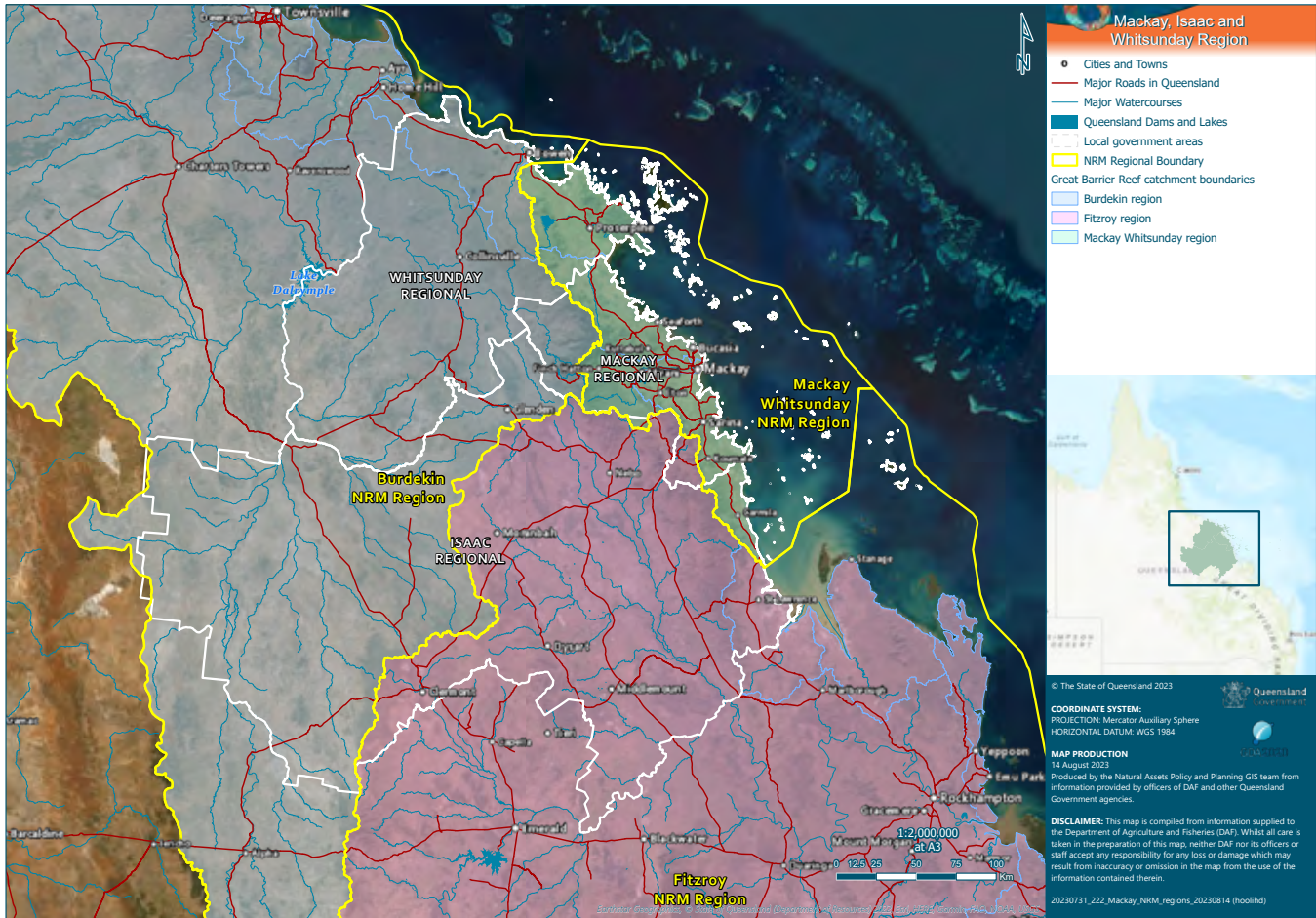


Figure 6: Greater Whitsunday NRM map.⁴¹



The Traditional Owners of the Greater Whitsundays Region include the Juru, Gia, Ngaro, Yuwibara, Koinmerburra, Barada and Wiri and Widi People. The Mackay, Whitsunday Isaac Traditional Owner Reference Group consists of the following:

- Juru peoples whose Country includes lands north of Bowen.
- Gia peoples whose Country includes the mainland adjacent to the Whitsunday Islands, north to Bowen, south to O'Connell River and east to the Clarke Connor Ranges.
- Ngaro peoples whose Country includes the Whitsunday Islands and the mainland coastlines where they traded with Gia people.
- Yuwibara peoples whose boundary is north to Midge Point, south to Cape Palmerston, west to the Clarke Connor Range and 10 nautical miles east of the coastline.
- Koinmerburra peoples whose Country includes Pine Mountain (Normanby Range) across to Styx River, north along the coast to Cape Palmerston, west to the Clarke Connor Range.

- Barada boundary is west of the Clarke Connor Ranges, south of Homevale National Park.
- Wiri peoples whose boundary is west of the Clarke Connor Ranges, north of Homevale National Park.
- Widi peoples whose Country stretches from Mount Crompton in the north, south to Nebo and west to Glenden, and includes part of the Eungella National Park.

In addition to the Reference Group are the Traditional Owners of Jangga Country around Mount Coolon and surrounds, Birriah Country around Collinsville and surrounds, Wangan Country around the area of Cappella, and Jagalingou Country in the Galilee Basin.

These days, the region is home to an estimated 186,512 people¹³ spread across several key regional centres, islands and rural communities. Considered one of the most resource-rich locations in Australia – contributing more than \$57.999 billion in economic output to the Australian economy¹⁴ – the Greater Whitsunday region has become an economic powerhouse across key industry sectors such as mining, manufacturing, agriculture, health care and social assistance, tourism and construction. It is recognised as a major part of Queensland’s economy as well as a world-renowned tourist destination. With relatively low unemployment of 2.7% the local population provides an estimated resident workforce of over 11,000 people¹⁵ who are joined on a daily basis by thousands of ‘fly-in-fly-out (FIFO)’ and short-term casual workers from around the country and overseas.

The Greater Whitsunday Region is a tourist hot spot in Queensland, attracting both domestic and international visitors keen to explore the Great Barrier Reef and dramatic Queensland coastline. Tourism attracts approximately two million domestic and international overnight visitors annually¹⁶.

As well as the more well-known tourism products in and around the Great Barrier reef and the Whitsunday islands, areas like the Finch Hatton Gorge, Eungella National Park and Cape Hillsborough are major attractions. The marine environment is not just for tourists, and the region has become well-known as a centre for marine research and biotechnical/biomedical research.

The population of the three Local Government Areas (LGAs) are depicted in Figure 7. The 2021 population of the region was 183,269 people, with Mackay LGA accounting for 67% of the regional population and Isaac and Whitsunday accounting for 12% and 21% respectively. The Mackay and Whitsunday LGAs have experienced approximately a 37% increase in population in the 20-year period while Isaac has experienced a 23% increase, including a small decline between 2010 and 2021.

Employment by industry indicates the predominant employer across the three regions varies, with mining the biggest employer for Isaac and Mackay, accommodation and food services (tourism) for the Whitsunday. On average, agriculture is the smallest employer of the six industries analysed.

The region holds the largest coal mining deposits in Australia – in the Bowen and Galilee Basins – where the majority of Queensland’s prime coking coal is mined. This generates thousands of jobs as well as business for service and supply industries. In Mackay, the largest mining services industrial precinct in the southern hemisphere, the Page Industrial Estate is home to over 500 mining and manufacturing businesses alone. Mining projects in the Greater Whitsunday region were valued at \$17.7 billion in 2023.

Population and employment

Figure 7: Demographics of the Greater Whitsunday Region by Local Government areas.⁴²

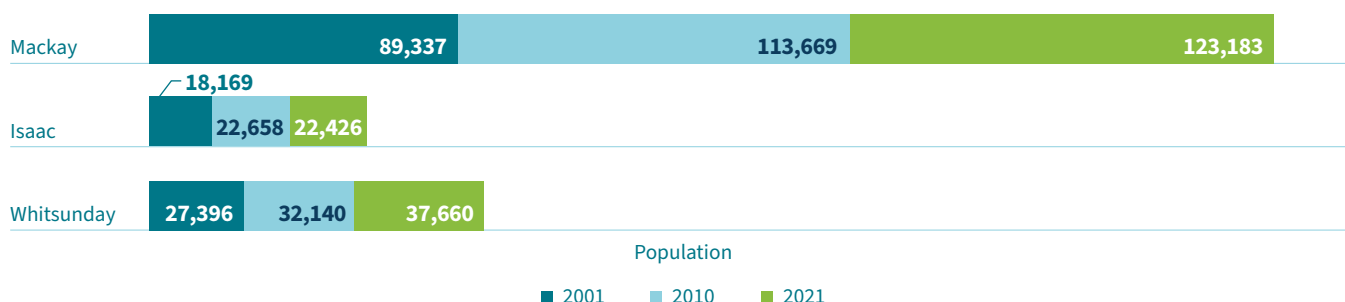


Figure 8: Employment by different industries in the three LGAs of Greater Whitsunday region.⁴³

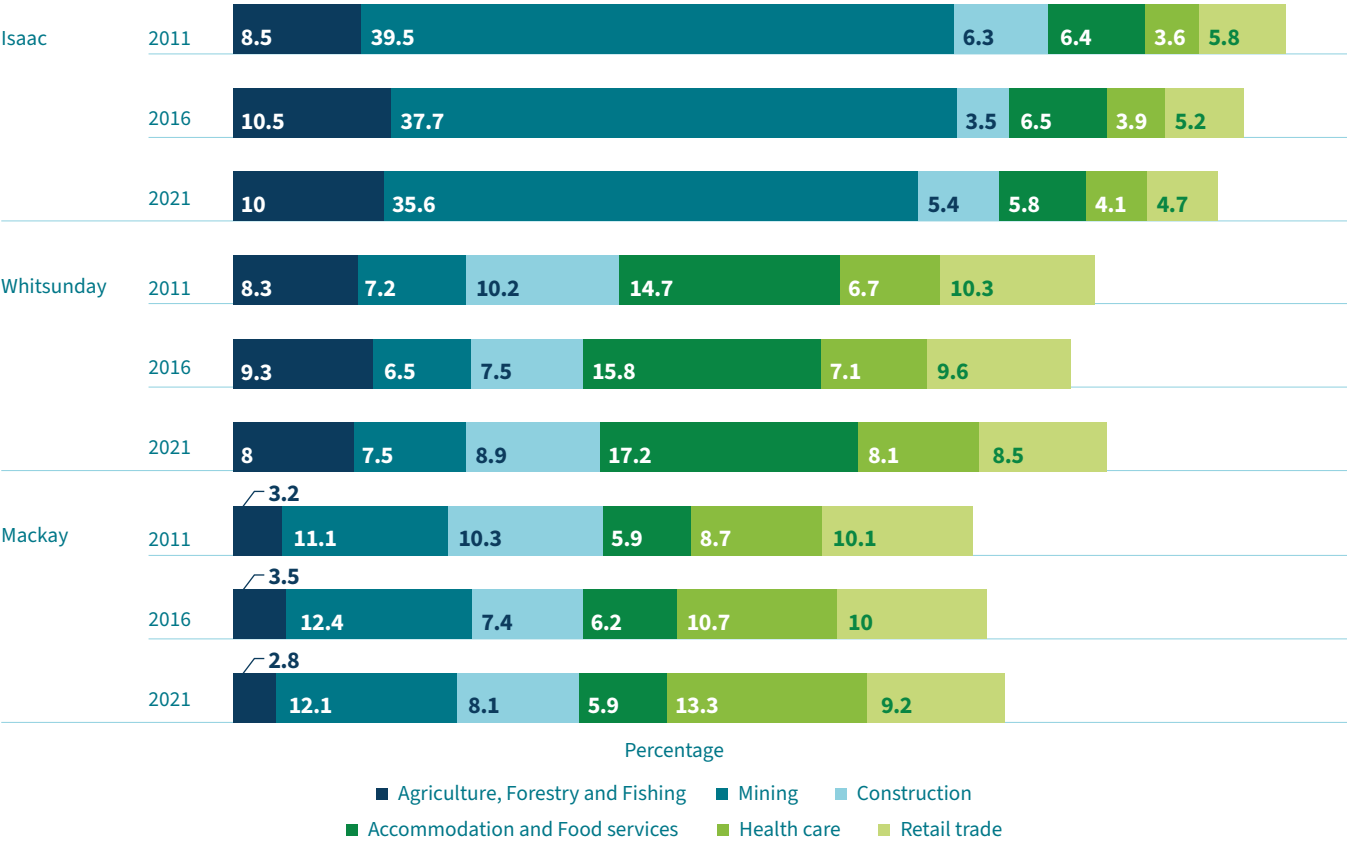


Figure 9: Rural scenes (clockwise from top left: Solar pump, Ironbark woodland, property gate). Source: John Rolfe.



As the global energy system shifts to renewables, the Greater Whitsunday Region has shown significant potential for new renewable energy projects, renewable hydrogen industries, and the electrification and decarbonisation of mining and other existing industries. Investment in region since 2015 has established more than \$1 billion in renewable energy projects. There are now several large-scale and emerging energy projects across the Greater Whitsunday with several existing projects and more in the pipeline. To help coordinate and streamline renewable energy development in the region, the Queensland Government identified the potential Collinsville REZ in the REZ Roadmap. A REZ Readiness Assessment will be undertaken to help maximise opportunities and minimise any potential cumulative impacts associated with the energy transformation. The area already has several completed or under construction projects representing some of Queensland’s largest solar energy producers, including:

- Lotus Creek Wind Farm
- Clarke Creek Wind and Solar Farm
- Collinsville Solar Power Station
- Daydream Solar Farm
- Middlemount Sun Farm
- Whitsunday Solar Farm.

Farleigh, Marian, Plane Creek, Proserpine and Racecourse mills produce electricity from cane fibre, while there are two waste coal mine gas projects at German Creek and Moranbah North.

Regional Agricultural Profile

The region hosts a long-standing and diverse agricultural sector which provides over \$1.6 billion to the Queensland economy each year. The Greater Whitsunday (GW) region is forecast to produce 8.6% of Queensland’s Gross Value of Production (primary) for the 2023-24 FY.

The region is also known as the ‘cane capital’ of Queensland, with Mackay maintaining a long history of cane production and being home to Australia’s largest producer of sugar-based ethanol. Sugar cane contributes an estimated \$329.3 million a year to the economy. There is also a large horticultural winter produce growing region producing more than \$233 million in annual output. The grazing pastures of the Isaac region are the historical heartlands of the beef cattle industry, contributing an estimated annual value of \$627 million. Recently, there has also been strong growth in the prawn aquaculture sector with annual production rates forecast to grow from 5,000 tonnes in 2020 to 20,000 tonnes by 2030¹⁷ with total production value at this stage reaching an estimated \$116 million in annual production value.

Figure 10: Agriculture gross value of product estimate for the 2023–24 financial year.⁴⁴

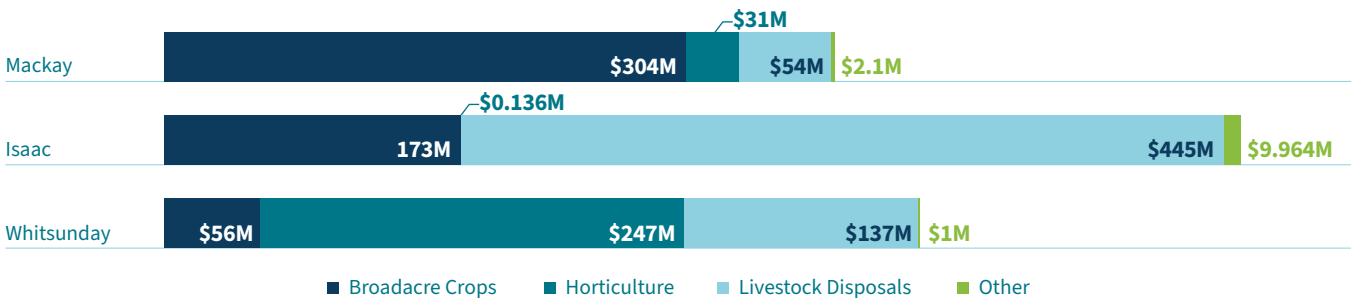


Figure 11: Demographics of the Greater Whitsunday Region by Local Government areas.⁴⁵

Mackay				Isaac				Whitsunday				Queensland			
Population (2022)								Australian Digital Inclusion Index							
125,162	22,770	35,580	5,378,277					71.7	72	69	71				
Projected population as at 30 June 2041								Unemployment rate (2021)							
151,835	25,312	48,075	6,899,969					4.0	2.4	4.3	5.4				
Median age of residents (2021)								SEIFA Index (Index of relative socio-economic disadvantaged) (2021)							
38.3	33.7	40.4	38					999	1,012	969	—				
Aboriginal or Torres Strait Islander Peoples (2021)								Number of local businesses (2021)							
7,507	1,164	2,156	237,303					10,343	1,990	3,994	460,669				
Population who speak a language other than English at home (2016)								Population with disability (2018)							
5.9	4.8	6.8	14.5					18.5%	11.1%	16.6%	6.0%				
Median total personal income, excluding pensions and allowances (2019)								Protected Area (km²) (2020)							
58,541	76,411	46,801	50,298					106,631	154,875	98,579	15,061,088				

The region is well serviced with key transport infrastructure for locals and visitors, as well as transport of goods in and out of the region. There are three regional airports connecting the region with the rest of the state and Australia including Moranbah, Proserpine and Mackay. Smaller landing strips and those located on cattle stations are also important, supporting the Royal Flying Doctors Service and many rural communities during medical and other emergencies. There are two deep water seaports and three bulk shipping terminals – the Abbot Point, Hay Point and Dalrymple Bay Coal Terminals – as well as reliable freight service rail network. Road transportation is well serviced with key highways connecting the region with the rest of the state and the nation. The Bruce Highway and Gregory Developmental Road provide north to south connectivity, while west to east is supported by the Bowen Developmental Road and the Peak Downs Highway. There are several regionally significant railway corridors that traverse the region, pivotal in the movement of resources. The North Coast Line follows the coastline connecting Sarina, Mackay, Proserpine and Bowen, while the Goonyella and Newlands Systems service the coal mining area of the Bowen Basin, transferring material to ports.

Figure 11 presents a regional profile drawing on key Australian Bureau of Statistics (ABS) data. The SEIFA Index is a tool ranking areas in Australia according to relative socioeconomic advantage and disadvantages where the mean score is 1000. The Australian Digital Inclusion Index considers Access, Affordability and Digital Ability.

Climate

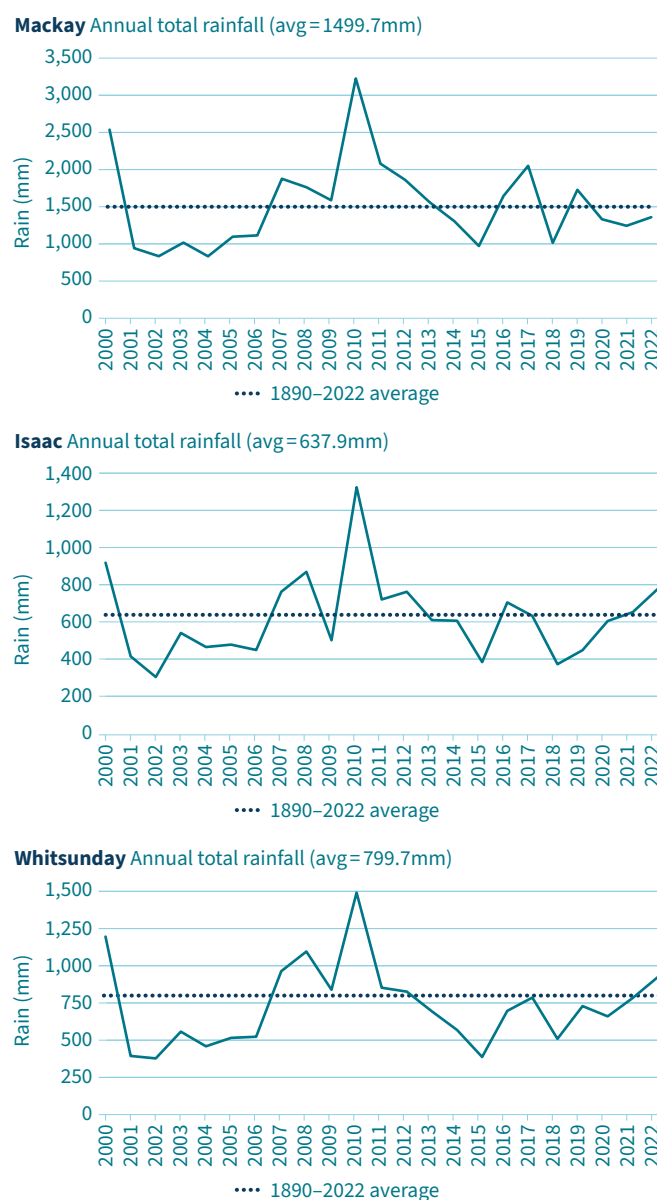
The region sits just above the Tropic of Capricorn, resulting in the climate being sub-tropical in nature. Rainfall predominantly occurs through the summer months with monsoonal rain often experienced in the coastal parts of the region and tropical cyclones a common occurrence.

Annual rainfall for the region between 2000–2023 compared to the 1890–2022 average annual rainfall.

The graphs in Figure 12 show the 2000–2023 annual rainfall for the regions LGAs, as well as the 1890–2022 average annual rainfall. For the last 23 years, the average annual rainfall correlates closely with the long term average, being 1519mm/yr verse 1499 mm/yr for the Mackay LGA, 638 mm/yr versus 637 mm/yr for the Isaac LGA, and 730 mm/yr versus 800 mm/yr for the Whitsunday LGA. The Mackay LGA has had 11 years out of the last 23 under the long-term average, compared to 13 years for the Isaac LGA and 15 years for the Whitsunday LGA.

The average maximum and minimum temperatures for the regions have steadily trended upwards over the last four decades.

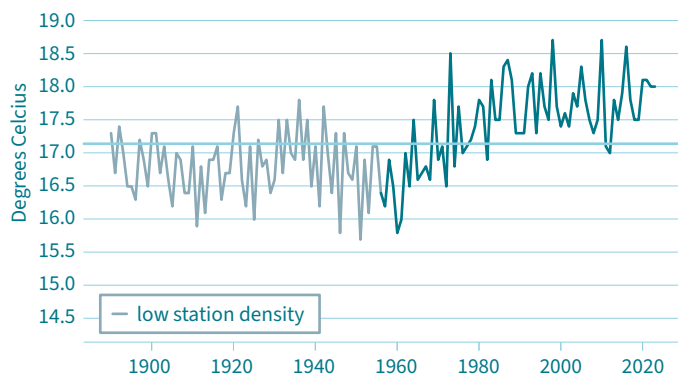
Figure 12: Annual rainfall for three LGAs of Greater Whitsunday Region.⁴⁶



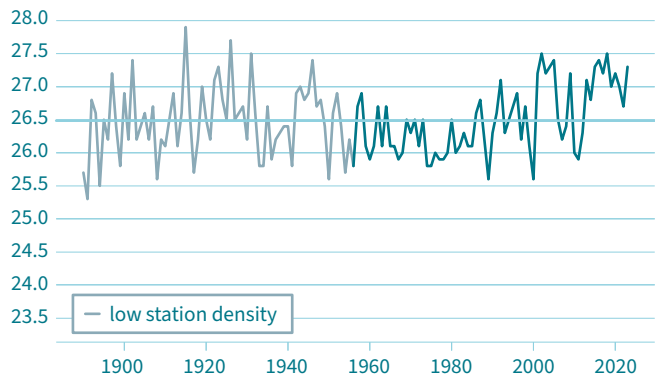
The rising maximum and minimum temperatures are shown through rising evaporation rates. While temperature is not the only cause of evaporation rates, it is a major determining factor. When combining both annual rainfall and evaporation rates, there is a strong correlation between high evaporation rates and low rainfall – as depicted in Figure 14. This correlation presents management challenges for farmers and graziers.

Figure 13: Long term temperature trends for three LGAs of Greater Whitsunday Region.⁴⁷

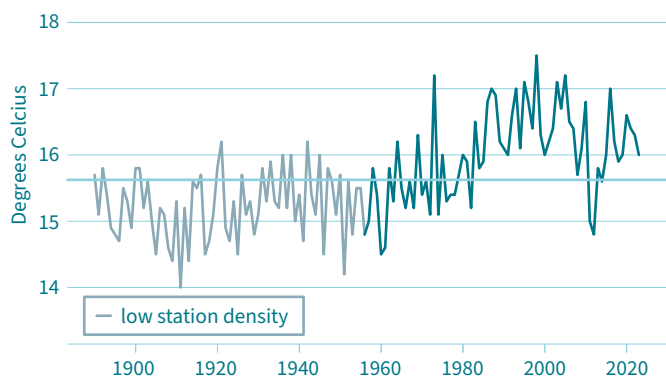
Mackay Annual minimum temperature (avg = 17.1°C)



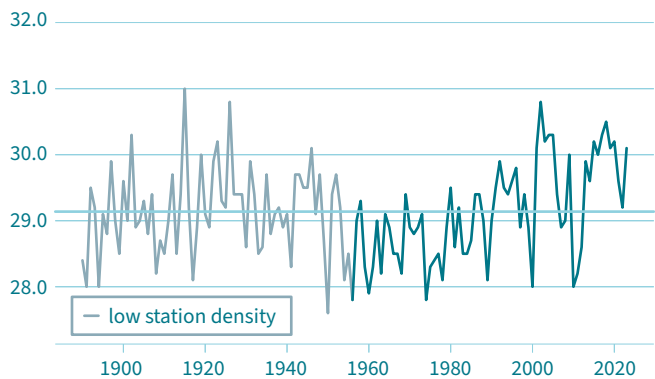
Mackay Annual maximum temperature (avg = 26.5°C)



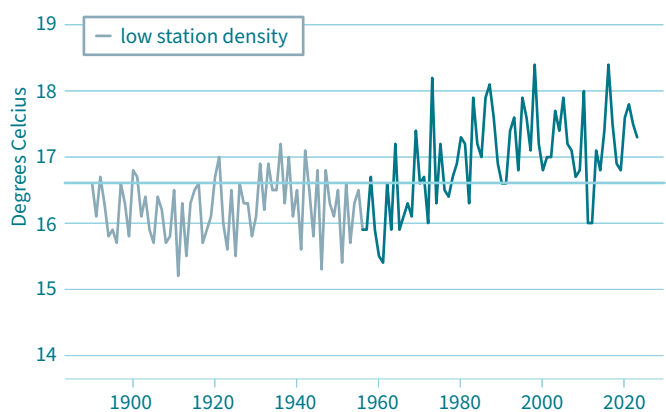
Isaac Annual minimum temperature (avg = 15.6°C)



Isaac Annual maximum temperature (avg = 29.1°C)



Whitsunday Annual minimum temperature (avg = 16.6°C)



Whitsunday Annual maximum temperature (avg = 29.2°C)

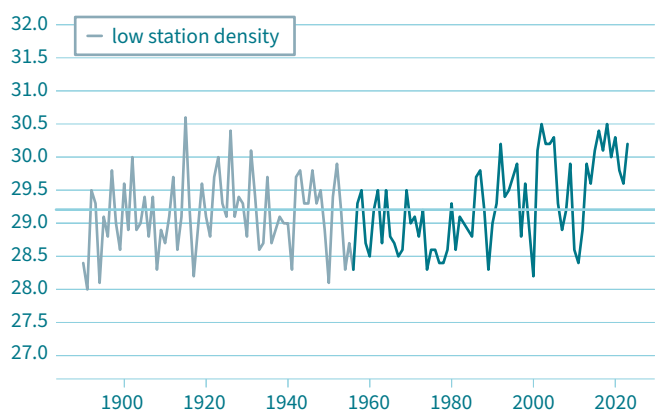


Figure 14: Annual daily evaporation rate and annual rainfall 2000 to 2022 in Mackay, Isaac and Whitsunday regions.⁴⁸

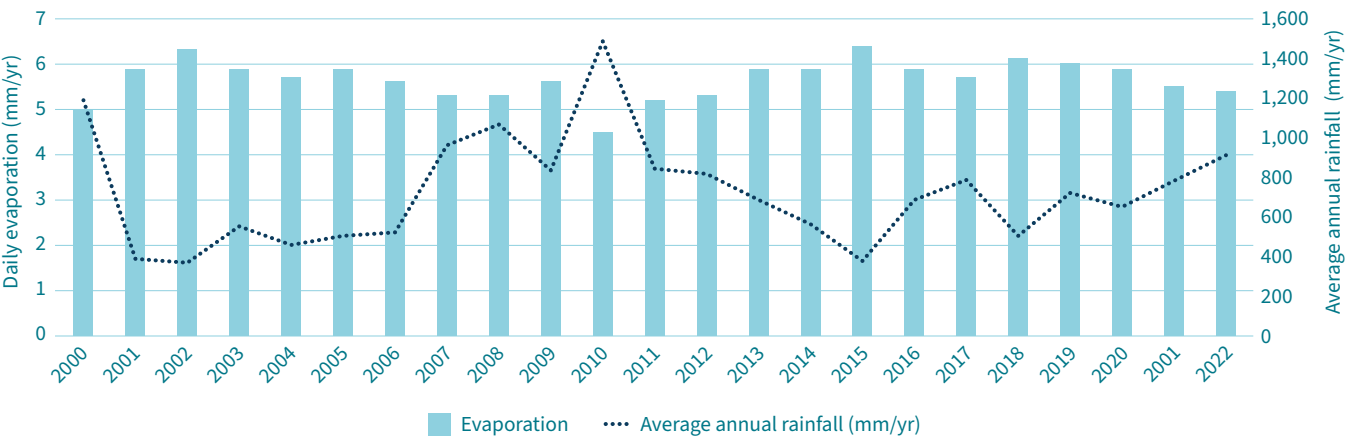
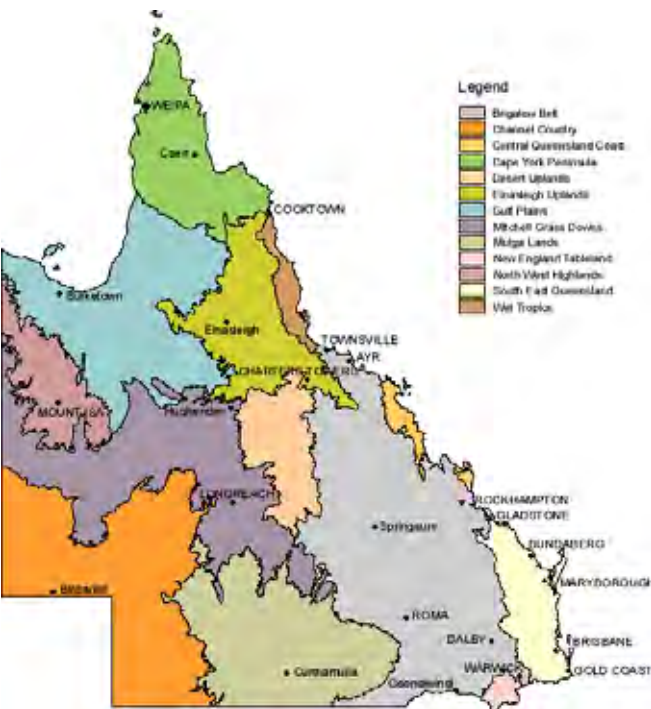


Figure 12 shows the region encompasses two bioregions – the dominant ‘Brigalow Belt’ and the smaller pockets of ‘Central Queensland Coast’.

Figure 15: Bioregions of Queensland.⁴⁹



History of drought in this region

The Greater Whitsunday region of Queensland has a long relationship with drought.

“Rural people are resilient.”

– Community member

The region is the traditional country of several First Nations language groups – particularly the Juru, Gia, Ngaro, Yuwibara, Koinmerburra, Barada and Wiri and Widi People. They and their ancestors have had a long connection to the land and water, that is anchored deeply in their cultural, spiritual and historical identity, and, as such, also had experience and deep knowledge of drought. Over time, land dispossession, urban development, loss of native flora and fauna, along with pollution and climate change have had unique impacts on First Nations peoples and effected both their cultural practices and decision-making power. There is still a strong link between water and country – the waterways, waterholes and the patterns of rain and flood in this region – and the cultural practices/identity of the Aboriginal/First Nations people.

Connolly, Williams and Williams¹⁸ 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.”

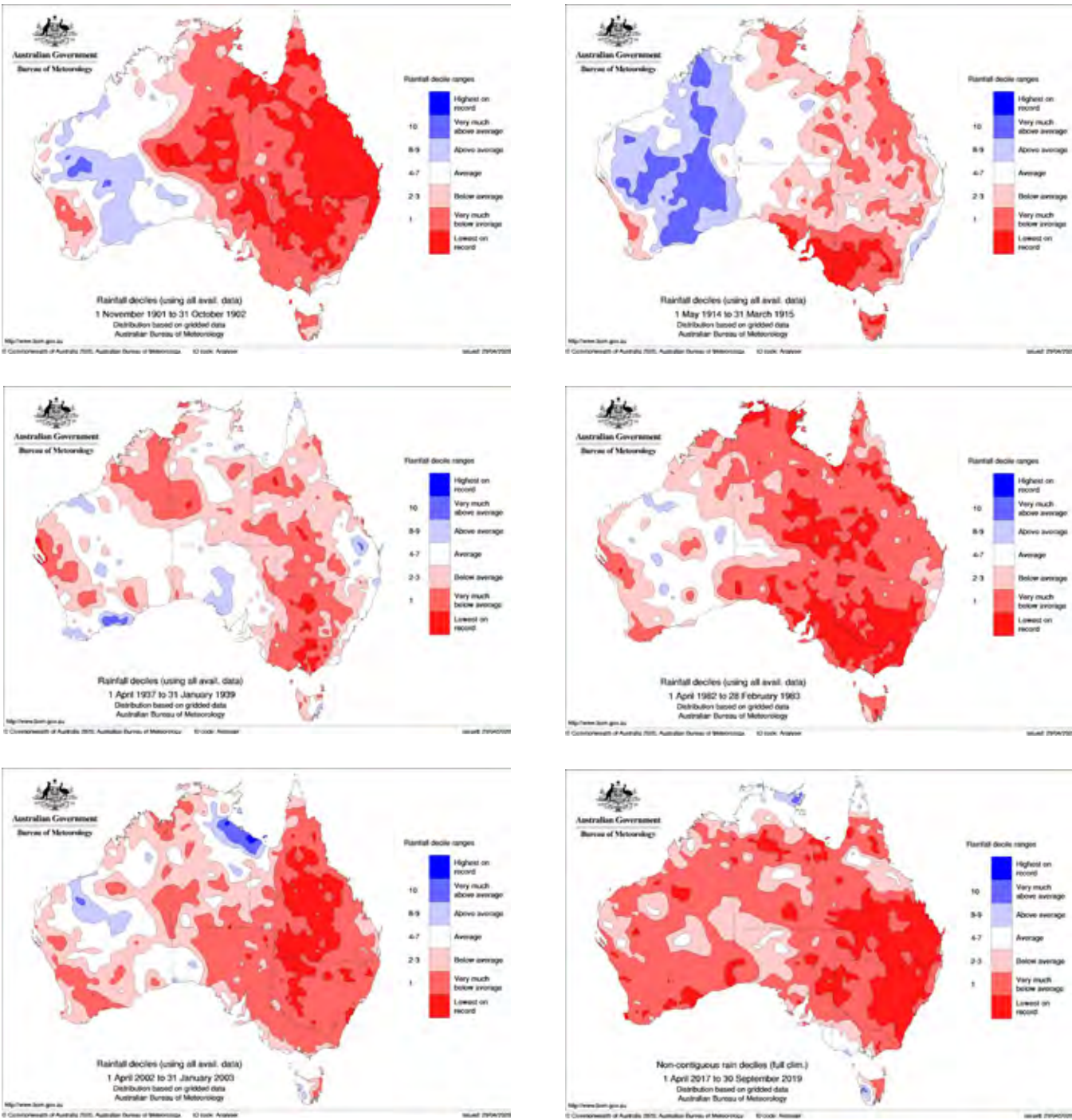
The first major European exploration of the region was carried out by Ludwig Leichardt on his epic journey in 1844 to 1845. After travelling overland from the continent’s east coast, north-west to the top of Australia – a journey that took him through perilous territory of nearly 5,000km for nearly 18 months – Leichardt returned with tales of the wide pasture lands of what is now the western areas of the Greater Whitsunday region. By 1846 he was lauded as the “Prince of Explorers” and wealthy entrepreneurs of the time were keen to invest in his future expeditions, as well as push north and establish pastoral ‘runs’ in what we now know as the Isaac region. The modern-day Isaac region takes its name from the Isaac River, which in turn takes its name from Frederik Isaac who was one of Leichardt’s party of explorers.

The records of the early pastoralists describe long periods of harsh, hot weather, even on the coastal hinterlands. Harold Finch-Hatton¹⁹ described his time in the area during 1875 as

“The fierce searching light of a vertical sun prevents it from being gloomy, and, indeed, the trees in the open timbered country give a very scanty shade...in the middle of the day, birds and beasts retire to the cool shade of the scrubs on the banks of the creeks, and there is not a sound to be heard, nor a living thing to be seen it is so fiercely hot”.

The rolling grasslands to the west were soon established with pastoral runs. Sheep were more profitable but suffered badly in the climate, and in the coastal rangeland were badly affected by the prevalence of burrs and the prickly grass-seeds. While cattle were less profitable, they were easier to manage, and by the 1860s the foundation of the region’s livestock cattle industry were well established. Over time, there was some small-scale success in commercial cropping – mostly wheat, cotton, tobacco and horticulture to service the small town populations.

Figure 16: Maps showing significant droughts in Queensland region 1901 to 2023.⁵⁰

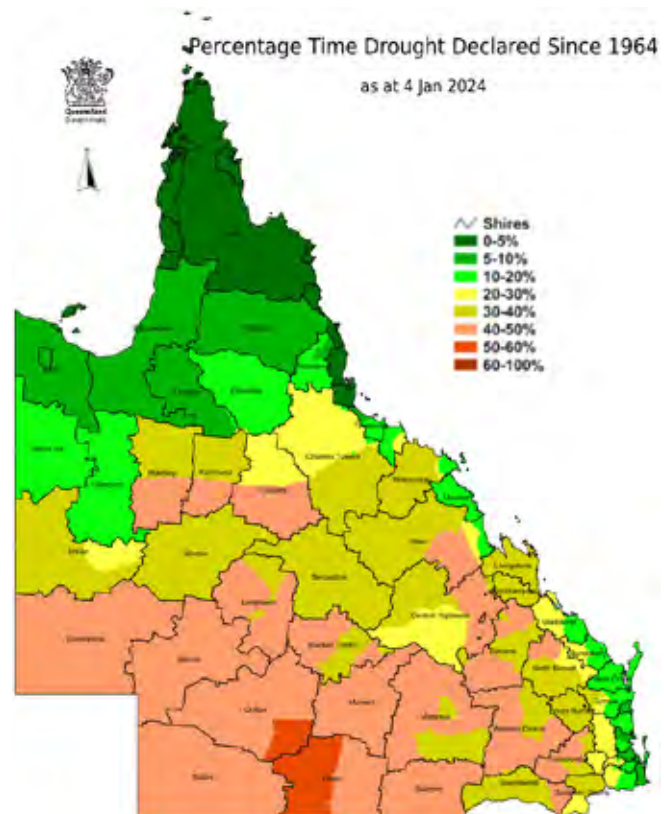


Captain Louis Hope and John Buhot established the first viable cane plantation near Brisbane in 1862, although sugar cane had been grown in the Moreton Bay settlement (mainly for fencing) as early as the 1830s. The climate, soils and topography around Mackay also proved to be particularly suitable and aided by the 1864 Sugar and Coffee Regulations and the lack of restrictions upon importation of Pacific Island labourers, sugar cane growing boomed exponentially. By 1883, Mackay as the leading sugar growing area in the state, had thirty-one major plantations and twenty-six mills of varying vintage and design. Today, Mackay is still known as a ‘sugar town’ but several mills have closed and despite record high prices for sugar, the pressure on cane farms to close due to their peri-urban location and the increasingly high value of the land for housing development is having a noticeable effect.

The region generally escaped the worst of the recorded droughts that ravaged the western parts of the state over the decades. Nevertheless, the infamous ‘Federation Drought’ took a severe toll on the region, as it did all over the country.

The Mackay and south eastern portion of the Whitsunday LGAs falls in the second lowest category for time spent in drought between 1964 and 2023 (10-20%). This data suggests these areas within the Greater Whitsunday region would experience relatively limited drought impacts. However, for the Isaac and the rest of the Whitsunday LGAs, the incidence may be greater (30-40% time in drought) increasing the likelihood of drought related impacts occurring.

Figure 18: Time drought declared since 1964.⁵¹





Past impacts of drought in this region

People, culture and community

“Drought has a big impact in our region.”

– Local Government Officer

Through our engagement, research and the examination of historical data, together we have been able to build a detailed ‘story’ of the past impacts of drought in the Greater Whitsunday region.

Having strong, healthy and vital communities is central to building drought resilience in the Greater Whitsunday. 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, the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) proposed the following framework as a useful way to understand community drought vulnerability and drought resilience (Figure 19).

The exposure is the level of stress or change that may be faced by a community (such as a drought) while the sensitivity relates to their dependence on the factor that is changing (e.g. rainfall or water supplies). These combined determine the level of impact. However, the community’s adaptive capacity or resilience can mitigate some of the impacts and hence reduce their level of vulnerability. Community feedback, government reports and statistical evidence all suggest that 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 Foundation²⁰ (2017) summarises community vitality as: “Creative Placemaking; Fostering ‘Local’; Future Readiness; Active Lifestyles and Civic Engagement.”

Figure 19: Drought Vulnerability Framework.⁵²

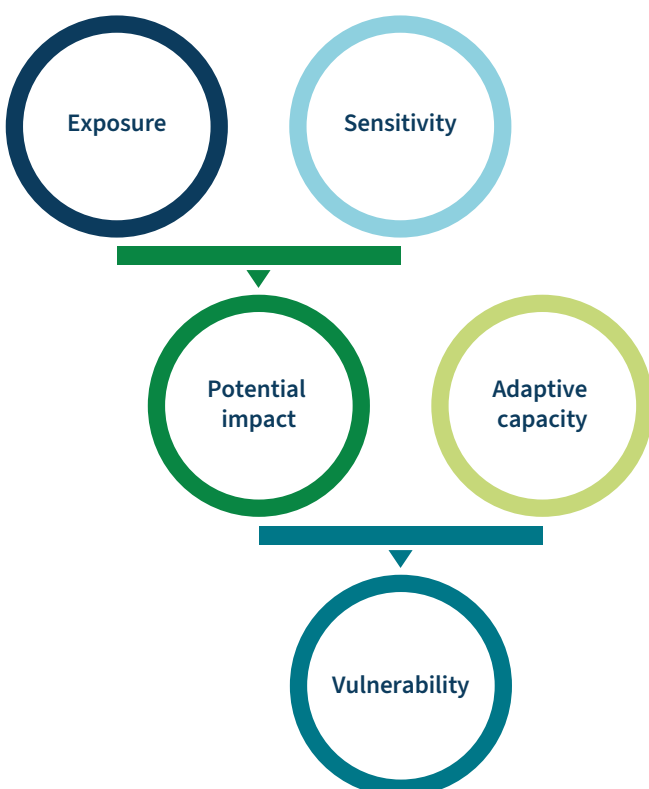


Figure 20: Population change projection for three LGAs of Greater Whitsunday Region.⁵³

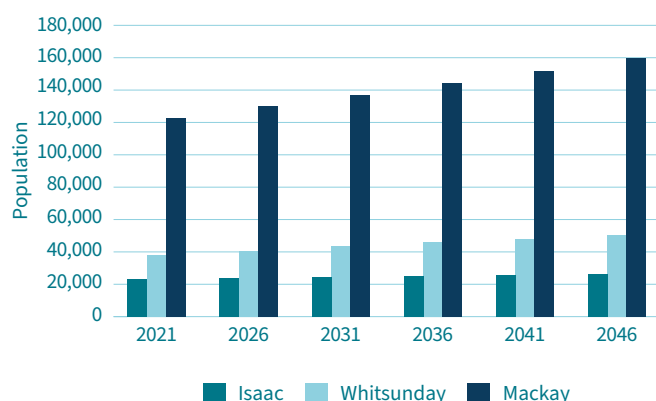


All these factors affect the ‘adaptive capacity’ of communities, and consequently, their drought resilience. Many of these factors were highlighted through a review of outside ‘expert’ knowledge (data and reports) and through engagement in the region (interviews, meetings and comments). Some may be considered ‘chronic stresses’ that increase the impacts of drought. There is evidence that drought is recognised as a “normal part of life” in the western parts of the region and to a certain extent the experience of drought is less ‘shocking’ than other regions. However, there is also evidence drought has had a noticeable impact on a number of factors and therefore clear action should be taken to address these factors – addressing the negative and enhancing the positive – in order to strengthen community drought resilience for the future.

Figure 21 shows the populations of Greater Whitsunday LGAs (2001–2021) overlaid with the GW regional average rainfall. The statistics show little or no correlation between population trends and seasonal fluctuations, although Isaac appears to have a slight correlation. Analysis of regional industry employment trends may provide more clarification for population trend drivers.

As noted, population forecasts for the whole region do not seem affected by possible climactic changes – all areas are predicted to experience growth, with the Whitsunday area expecting the highest growth of 1.2% per annum.

Figure 21: Projection of population for three LGAs of Greater Whitsunday Region.⁵⁴



The unemployment rate for the GW regions is lower than the Queensland rate for the census periods of 2011, 2016 and 2021 – except for the Mackay LGA which exceeded Queensland’s average rate for 2016. The 2016 period had the highest unemployment rate for all three regions, which would be related to a downturn in the resources sector at that time. The downturn appears to correlate with the annual average rainfall for the 2015–2016 years being the lowest for the 2001–21 period. It would be expected if drought was driving the unemployment rate in the regions, the agricultural sector employment rate would have dipped for these years. However, the reverse happened, with the 2016 year having the highest agricultural employment percentage of the three recording periods.

The broad findings from the Regional Wellbeing Survey²¹ show for the Greater Whitsunday (and north to Townsville) region, as the average score for the “Personal Wellbeing Index (PWI)” of 74, which was the second-highest ranking in Queensland. Similarly, respondents from the region expressed a “Global Life Satisfaction (GLS)” level of 72.7 that was slightly higher than the national average of 71.4. Respondents recorded higher than national scores for personal topics such as sense of achievement, quality of relationships, sense of safety, and meaningfulness of life. Few respondents declared they had experienced personal financial distress in the last 12 months and their satisfaction with general and mental health was about par with the Queensland regional state average. Greater Whitsunday respondents scored their community highly for:

- a great place to live
- sense of community
- community leadership
- community copes well
- faith in local decision-makers
- opinion of local government
- general consensus their community offered everyone a ‘fair go’
- connectedness
- participation in volunteering.

It is important to note these rankings were achieved just two years following a significant drought in 2018/2019. While during the engagements people spoke of the (perceived) negative impacts of drought, it was generally conceded drought had less significant effects than other typical disasters such as cyclones and floods.

Figure 22: Comparison between unemployment and agriculture and mining industries employment for three LGAs of Greater Whitsunday Region and Queensland.⁵⁵



As with many other regions, participants in our engagements highlighted the mental health impacts of drought and went as far as to state it contributed to mental health problems such as depression. Mental health, and in particular the notable high suicide rate in and around Mackay, are a topic of much local discussion and attention. This is particularly referred to in the North Queensland Public Health Network (NQPHN) ‘Suicide Prevention Community Action Plan’ (2022). This has led to several highly laudable projects such as the Greater Whitsunday Council of Mayors (GWCOM) Suicide Prevention Taskforce and their innovative pilot model, ‘Pathways Connect’. However, it is not possible to examine the mental health and suicide data for the region, and draw a direct correlation between periods of drought and an increase in mental health incidents.

“It’s frustrating talking to someone in Brisbane who has never set foot on a farm or property, telling you what they can or can’t do for you based on what they see on a computer screen. We want local people on the ground who understand more about the land, and what we are going through.”

– Community member

Economy

“Drought does not rate as highly in people’s thinking compared to other natural disasters.”

– Community member

“It feels like the government makes it hard on purpose to avoid having to pay out..”

– Community member

The 2020–21 Total Regional Output in the GW region was \$42.298 billion or 5.87% of Queensland’s Total Regional Output. The regional output is dominated by the mining sector as well as contributions from construction, manufacturing, agriculture, and several service and administrative sectors (Figure 23). The ranking of those industries in their contribution to regional output varies across the LGAs.

Analysis of the Reef Catchments NRM region’s data in Figure 24 and Figure 25 shows a close correlation between annual sugar production and price, but little correlation between production and rainfall.

Beef cattle numbers for the Reef Catchment NRM region show a similar story as sugar. There appears little influence of prevailing seasonal conditions on cattle numbers which are more aligned to price variations.

Figure 23: Regional output by industry sector for three LGAs of Greater Whitsunday Region.⁵⁶

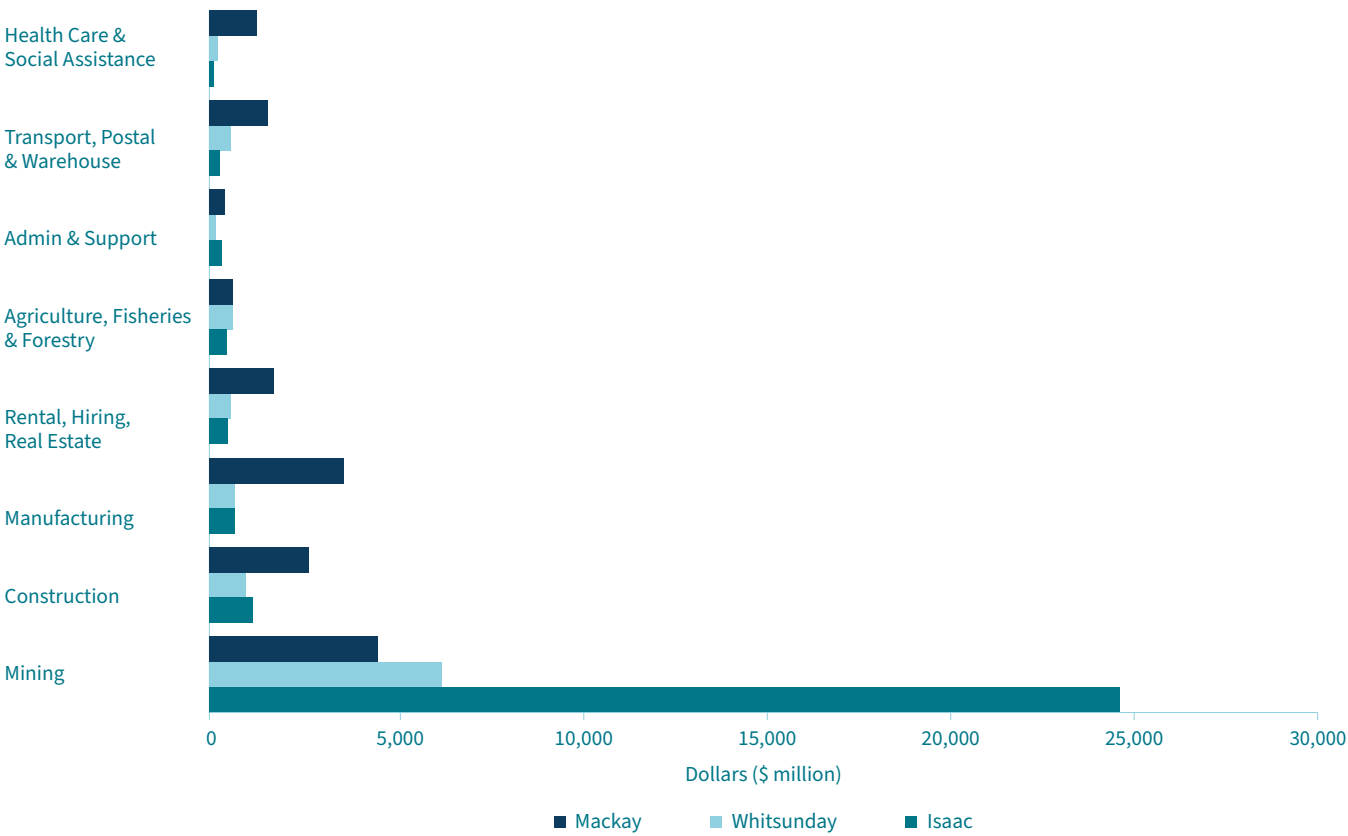


Figure 24: Relationship between annual sugar production and price in Reef catchments of GW region.⁵⁷

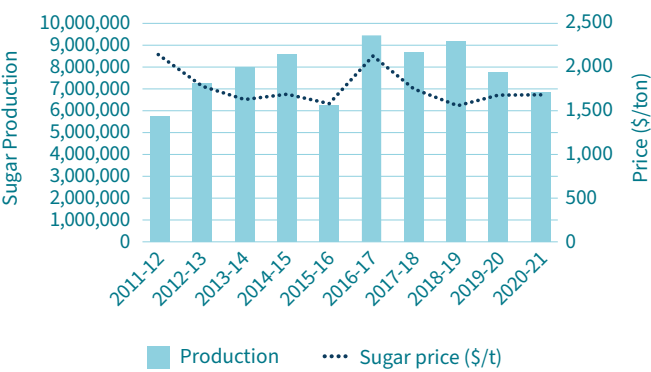


Figure 25: Annual sugar production and Mackay region annual rainfall in Reef catchments of GW region.⁵⁸

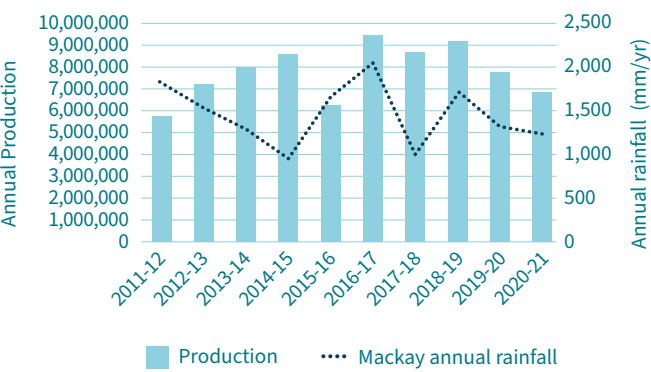


Figure 26: Relationship between annual beef cattle numbers and price in reef catchments.⁵⁹

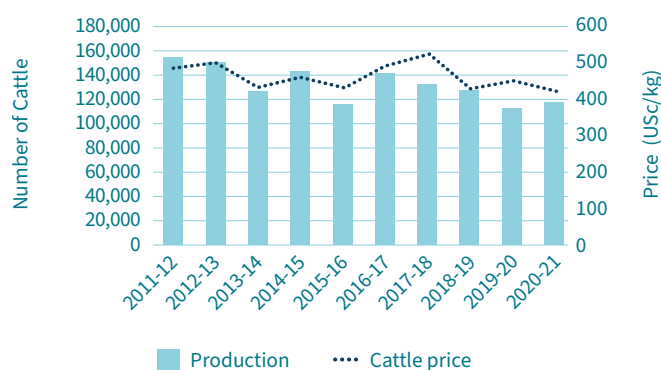
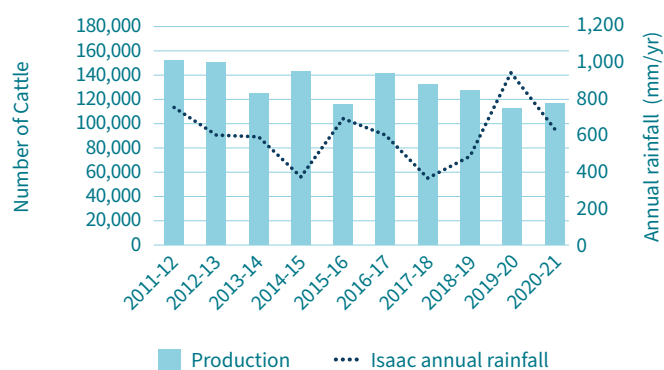


Figure 27: Annual beef cattle numbers and Isaac region annual rainfall in reef catchments.⁶⁰



There is limited information available on agricultural production at the enterprise level. Using data on average farm business performance for the Curtis to Moreton ABARES region (Figure 28 and Figure 29), as a surrogate for agriculture in the GW region, shows little correlation to prevailing seasonal conditions. More granular statistics for farm business performance in the GW region may generate different results. However, trend data on cattle numbers and sugar production in the region support the basic assumption that factors other than rainfall are primary drivers of farm business performance in the GW region.

Diversification

Carbon Farming is presenting opportunities for GW primary producers to diversify their enterprise mix while also improving the condition of their natural resources. An analysis of the Emissions Reduction Funds register identifies eight soil carbon projects and three vegetation-based projects registered with the ERF. Two of the vegetation projects targeted the assisted regeneration of regrowth while the third project established permanent plantings on land previously used for agriculture. The soil carbon projects increase carbon in soil in the agricultural system by altering the stocking rate, duration or intensity of grazing; or by converting cropland to permanent pasture. In 2020 Queensland had 250 registered carbon farming projects.

Several reports have been commissioned exploring the opportunity for the GW region to diversify from and grow the two largest agricultural industries of cattle and sugar. The Greater Whitsunday Alliance and CRC for Developing Northern Australia commissioned a report in 2020 into the region's agricultural industries and associated waste streams supply chains²².

The report identified the region's key strengths as:

- Relatively stable climate and good natural resources, making the region capable of producing a variety of different products.
- Capacity for growth both within existing commodities as well as for potential in new and related areas.
- Location between the far North and Southern Queensland making it a key node in the broader supply chain.

The report outlined a detailed strength, weakness, opportunity and threats analysis of the region's agricultural supply chains. Table 1 is a summary of the opportunities identified.

Table 1: Potential opportunities for agricultural industries to grow in the Greater Whitsunday Region.²³

Industry	Opportunity
Beef Cattle	• Regional branding. • Create an integrated end to end supply chain. • Collaboration within and outside the region, within and across industries.
Sugar Cane	• New products in time. • New generation of farmers. • Collaboration within and outside the region, within and across industries.
Horticulture	• Regional branding. • Export potential. • Collaboration within and outside the region, within and across industries.
Broadacre Cropping	• Regional branding. • New products in time (products in demand from international markets). • Collaboration within and outside the region, within and across industries.

Figure 28: Farm business debt and income for the Curtis to Morton ABARES region.⁶²

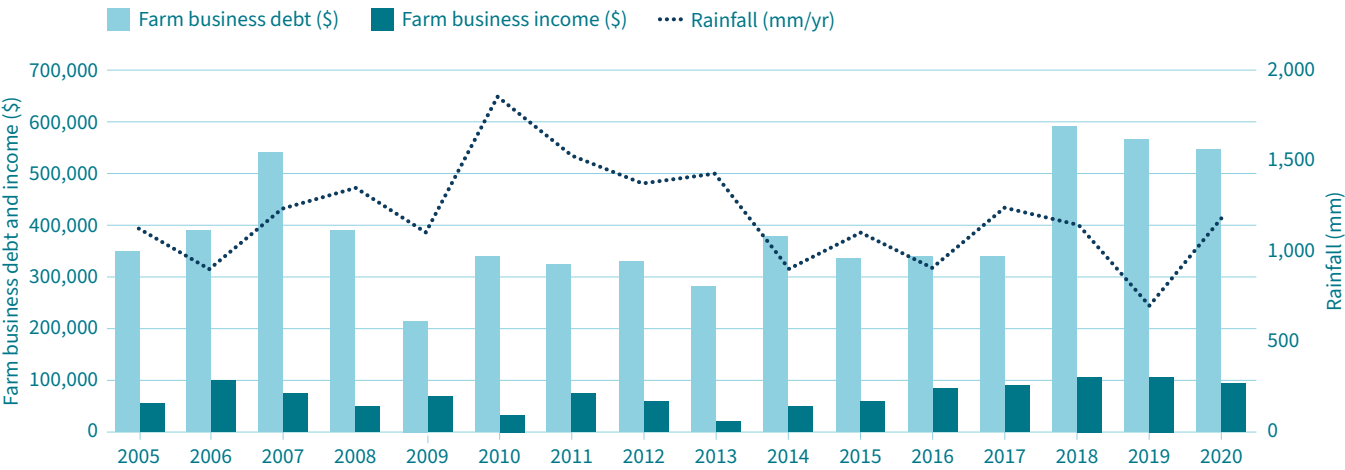
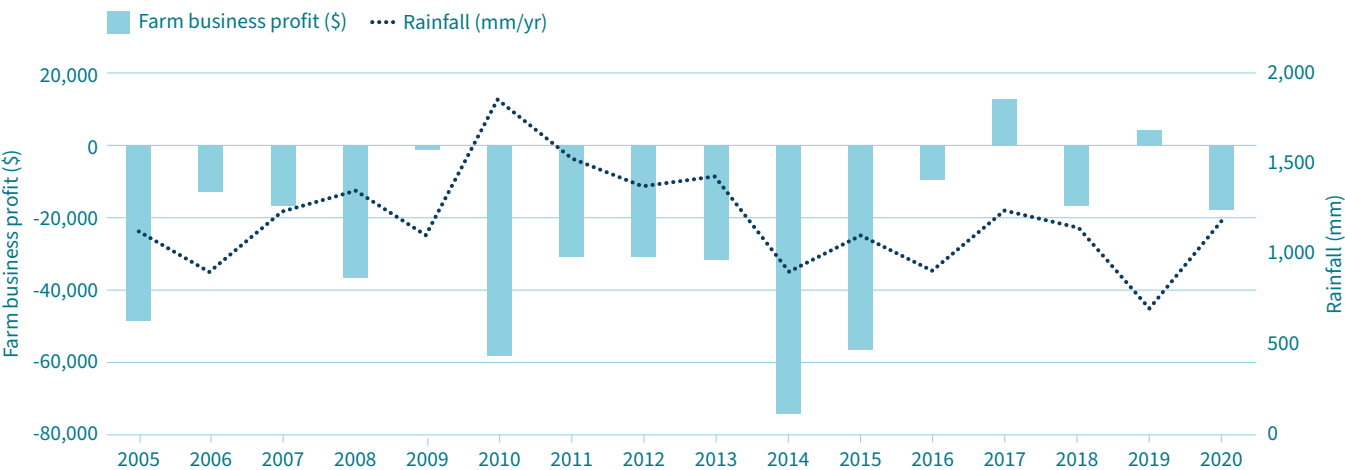


Figure 29: Farm business profit for the Curtis to Morton ABARES region.⁶¹



The report identified an opportunity to introduce alternate crops into the sugar cane bare fallow cycle. Given the Mackay region has relatively low risk to drought, this could provide a high value crop opportunity driven by high demand and low supply when other parts of Queensland and Australia are in drought.

Another report ‘Investing in the Mackay Future Foods Biohub’ was commissioned in 2020 by the Queensland Department of State Development, Tourism and Innovation in conjunction with GW3, RDA Mackay-Isaac-Whitsunday and North Queensland Bulk Ports Corporation. This report identified opportunities to:

- Generate bioenergy from biogas, bioliquids and solid biomass.
- Utilise sugar cane waste to produce fermentation feedstock, biochemicals and biofuels.
- Utilise waste material from meat processing as potential feedstocks such as tallow and wastewater for biodigestors.
- Increase aquaculture enterprises.
- Grow algae for potential feedstock.
- Utilise horticulture waste into animal feedstock and organic waste into biogas or biomass energy production.

Landscape and natural environment

“Drought has a big impact on wildlife.”

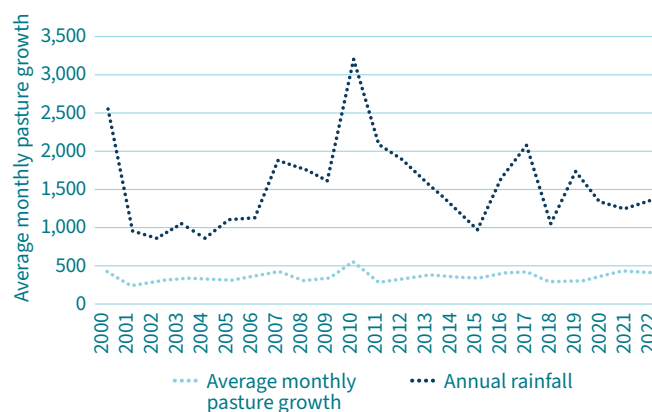
– Local Government Officer

Traditional Owners of the regions managed the country by living with the landscape, including their understanding and management of the impacts of drought. Traditional Owners have survived and thrived in this landscape for thousands of years. Kerwin states, *“As with all societies, technology, development, and land management systems were used to harness local environmental conditions so as to provide and enhance a way of life”*²⁴. In recent times it has been recognised that stemming the loss of traditional land management practice knowledge and sharing this knowledge in a culturally appropriate manner is key in building more drought resilient landscapes and communities of this region.

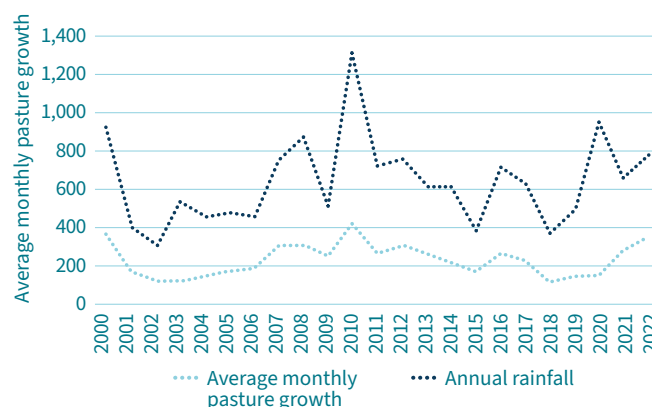
Since 1999, Long Paddock’s modelled average monthly pasture growth (over a 12 month period) has been used as a primary indicator of the severity of drought conditions. Annual pasture growth is influenced by rainfall (amount, timing, and intensity), temperature, radiation, soil moisture and condition. Analysis of the data in Figure 30 indicates a close correlation between pasture growth and rainfall for the Isaac and Whitsunday regions, however little correlation for Mackay.

Figure 30: Average monthly pasture growth and annual rainfall for three LGAs of Greater Whitsunday Region.⁶³

Mackay



Isaac



Whitsunday

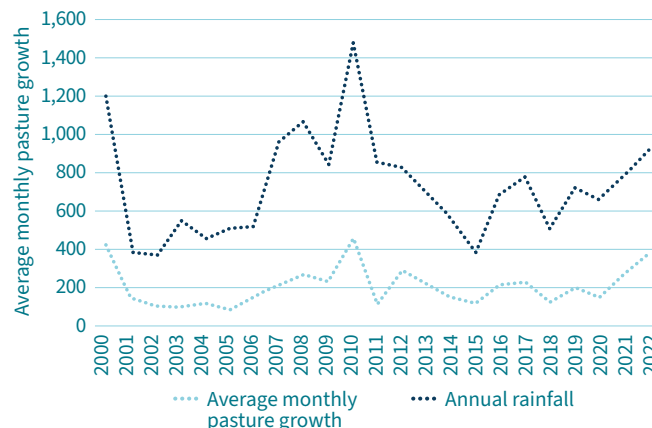
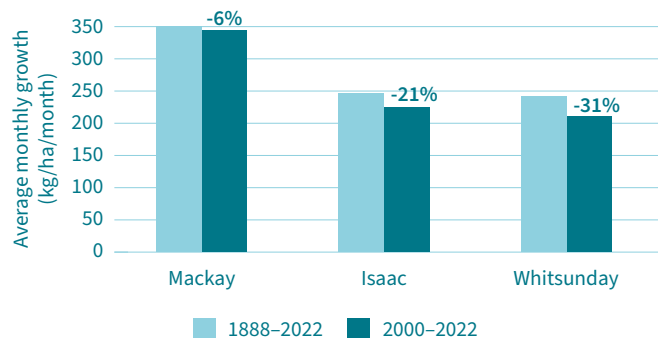


Figure 31: Comparison of the 2000 to 2022 average monthly pasture growth with the longterm average monthly pasture growth.⁶⁴



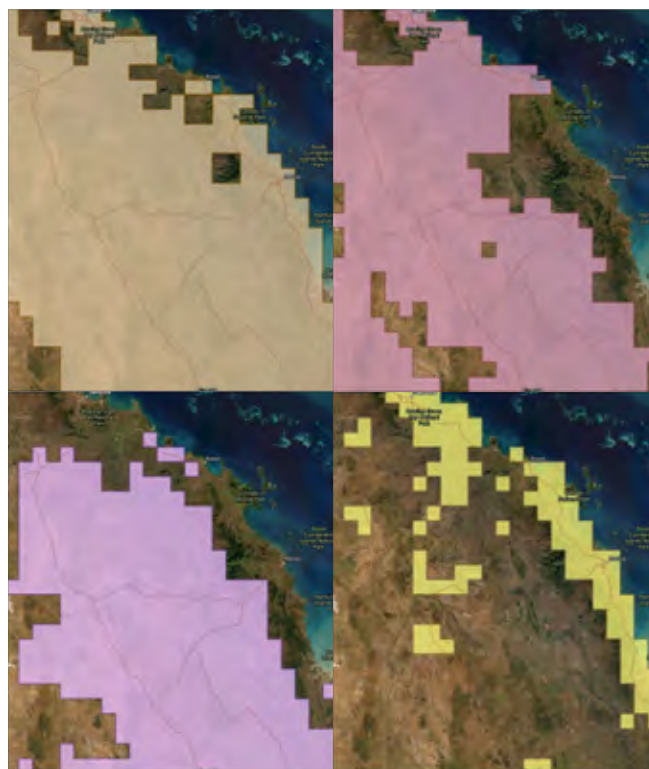
For the 2000–2022 period, the Isaac region’s average monthly pasture growth declined by 8.5% when compared to the long-term average. The Whitsunday region’s decline in growth was 12.9% while Mackay had a smaller decline of 1.7%. This is a further example that drought impacts on the Mackay region are smaller than the Isaac and Whitsunday regions. This regional difference is further exemplified when comparing average annual total ground cover between the three LGAs. Total cover in the Isaac and Whitsunday LGAs have declined by 5% and 10% respectively over the last two decades when compared to the long-term average, whereas cover in the Mackay LGA has declined by 2%.

Published research identifies drought results in mobilisation of sediment (topsoil) from paddocks to water ways. “*Excess fine sediment delivery is a major contributor to the declining health of the Great Barrier Reef and identifying the dominant source areas of fine sediment has been critical to prioritising erosion remediation programs.*”²⁵. This has a negative impact on both land and wetland condition.

Invasive weed infestation of the region is a major production and environmental issue. Weeds have an ability to quickly establish bare areas, particularly after drought periods. Figure 32 provides a snapshot of four major Weeds of National Significance that occur in the GW region. Parthenium weed is considered the greatest threat to agricultural production in the region of the weeds listed; noting much of the region has overlapping threats.

The joint NRM regions of Reef Catchments, NQ Dry Tropics and Fitzroy Basin Association (which all share boundaries with the GW region) have in total 93, 204 and 283 respectively rare and threatened species in their regions (Figure 33). Many of these species would be common to two or three of the NRM regions. There are two prominent threatened ecological communities, the Brigalow and Broad leaf tea-tree communities.

Figure 32: (Clockwise from top left) Parthenium, Parkinsonia, Harrisia Cactus and Hymenachne extent in the Greater Whitsunday region.⁶⁵



The impacts of drought on terrestrial and aquatic flora and fauna populations are well documented for some species and evolving for others. Endemic species have evolved to survive the impacts of drought (ecological resilience) however their ability to do this is closely correlated to the health of the populations and the environment going into drought. For aquatic dependent species, both water quantity and quality are integral to their survival. High levels of extraction leading into and during dry times potentially reduces water quality (e.g. increases salinity levels) thus placing stress on aquatic ecosystems. Also, climatic conditions associated with drought, such as prolonged periods of hot days are also impacting on species such as fish, when river warming does not produce the appropriate conditions required for breeding.

The status of native woody vegetation in the Greater Whitsunday is summarised in Figure 34.

Percentage of remnant vegetation and average annual clearing rate for GW regions show Isaac as having the lowest percentage of remnant vegetation. A key contributing factor is the land use being primarily beef cattle, with large areas of the region being cleared to establish improved pastures (particularly buffel grass). An analysis of the remnant vegetation statistics against annual rainfall shows some negative association between clearing and rainfall in the Isaac LGA, although this may be circumstantial (Figure 35).

Figure 33: Number of rare or threatened species in Queensland.⁶⁷

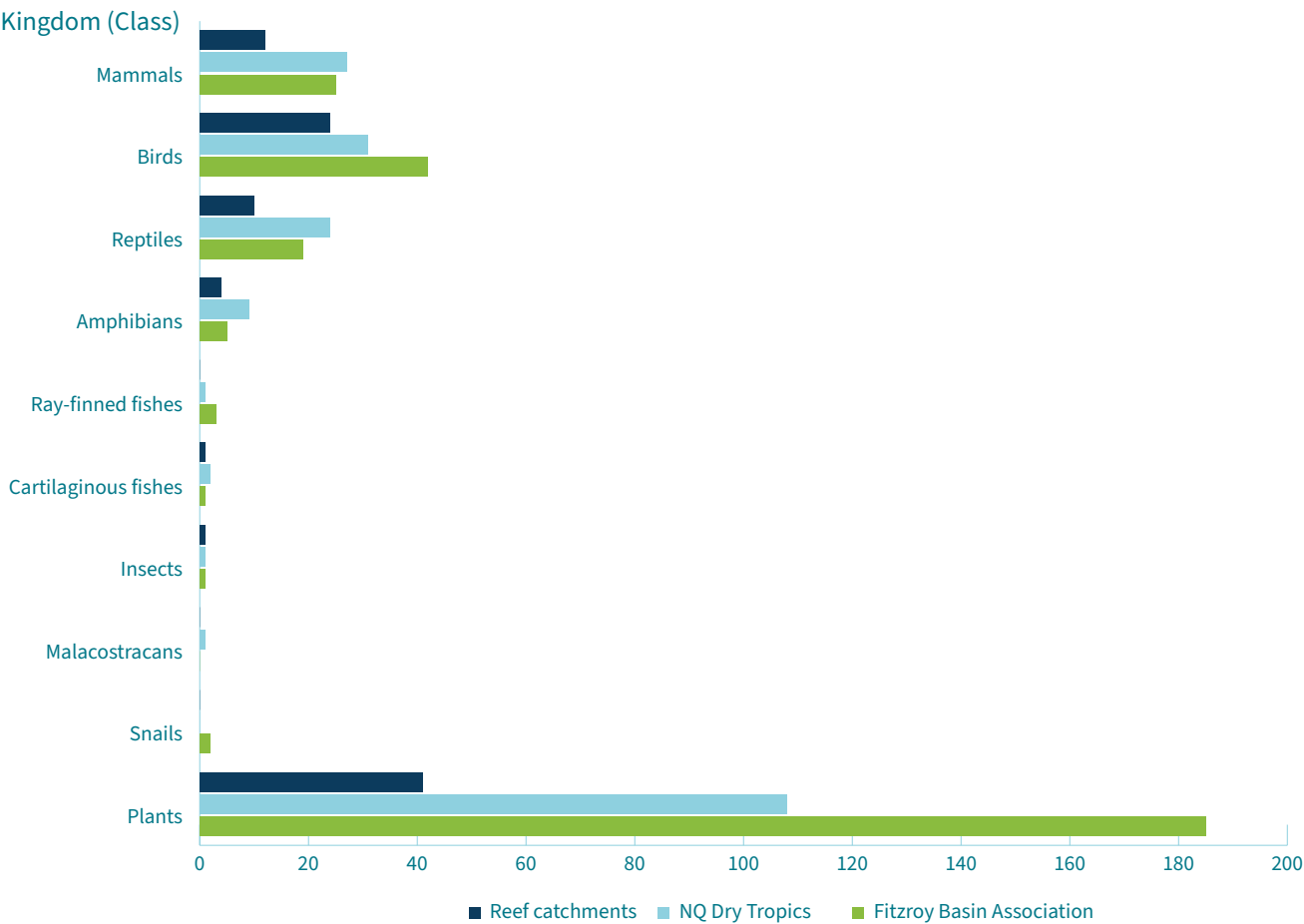


Figure 34: Native woody vegetation status in Greater Whitsunday Region.⁶⁶

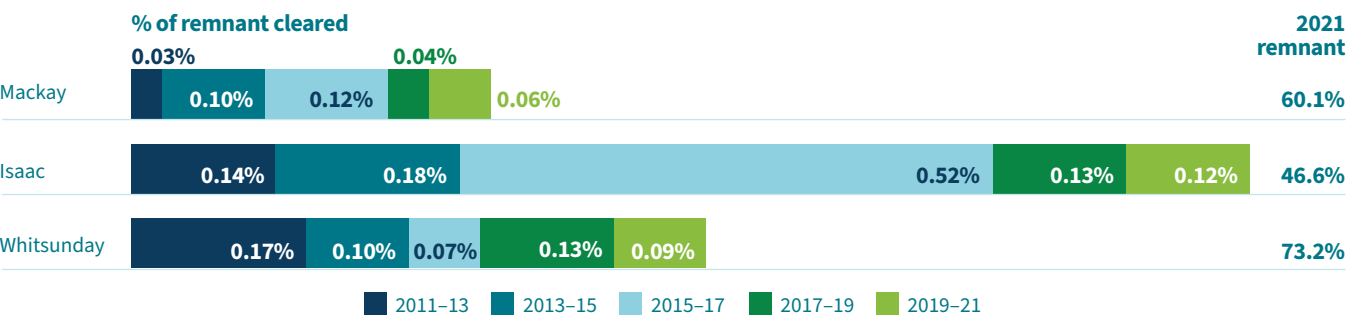
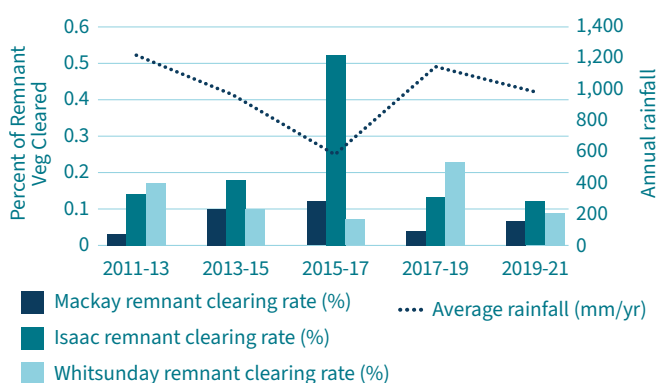


Figure 35: Regional remnant clearing percentage in the Greater Whitsunday Region.⁶⁸



Infrastructure and built environment

“Feel so alone. We are constantly being pushed online to access support which is not acceptable. Internet services are unreliable and expensive, where we have to get up at 1am to avoid excessive download costs. IF we do get online, the process is complicated, taking time to find and read through all the information. All of this adds to the anxiety and stress already being felt.”

– Community member

“Irrigation management advancement carries great opportunities for economic reliance during adverse weather conditions.”

– Canegrowers member

Infrastructure takes many forms. This includes physical infrastructure such as roads, rail lines, water storages/structures, buildings, weather stations and communication towers, services that maintain infrastructure, and non-physical infrastructure that supports digital connectivity.

Water security is a recurrent topic for most regions of Queensland. The Mackay, Isaac, Whitsunday Regional Water Strategy Final Report – 2021 states “Water supply to the GW region is largely controlled under three Water Plans – the Burdekin Basin, Pioneer Valley, and Whitsunday”. Groundwater is the main source of water supply in Bowen and is managed by the Bowen Groundwater Management Area water sharing rules. Large volumes of supplemented water are currently supplied through the MIW region via the water supply schemes of Bowen Broken, Proserpine, Pioneer, Eton, and to a lesser extent Burdekin Haughton. Allocations from the supplemented water supply schemes are subject to low levels of utilisation, particularly in the irrigation sector, with usage of available water for the period 2013–2019 averaging 37%, 25%, and 39% for the Eton, Pioneer and Proserpine water supply schemes respectively²⁶.

The Burdekin Falls Dam provides most of the water taken from the catchment to users in the Burdekin Haughton scheme, and only a small portion is provided to the MIW region through the Burdekin Moranbah Pipeline. The pipeline conveys 22,600ML of HP allocation 218km from Gorge Weir to the Moranbah Terminal Storage. There is a relatively large amount of unallocated water still available in the Burdekin Basin, indicating there is still room for a significant amount of water resource development within the catchment.

The Water Resource Plan 2002 for the Pioneer Valley covers approximately 2400 square kilometres and includes two supplemented water supply schemes, the Pioneer and Eton schemes. These are supplied from the Teemburra and Kinchant Dams, which have storage capacities of 147,000ML and 72,000ML respectively. The major water uses are irrigated agricultural production (sugar cane) and urban supply for Mackay. There are two general unallocated water reserves available in the plan area, 4,000 ML/a in the Sandy Creek catchment and 10,500 ML/a in the Pioneer catchment²⁷. These reserves could be used to support any future demand for agricultural, urban or industrial growth.

The Whitsunday Water Plan Area covers the Proserpine River and some smaller catchments in the area. The only bulk water infrastructure in the scheme is the Peter Faust Dam, which has a capacity of 491,000ML. A groundwater management area has been established around the town of Proserpine. Groundwater in the remainder of the Whitsunday Water Plan Area is not licensed which means there are no volumetric limits on these groundwater users.

In the report²⁸ there were 26,800ML in General Reserves and 1,500ML in Strategic Reserves under the plan.

The Urannah Water Scheme is proposed to proactively develop irrigation, mining, and renewable energy initiatives in the Whitsunday region through the construction of the Urannah Dam on the Broken River. Modelling undertaken recognised Council currently has access to 1,693ML of un-supplemented groundwater which could be utilised when supply in the Peter Faust Dam diminishes, thereby greatly mitigating this supply risk²⁹. The un-supplemented groundwater licence volume for the Coastal and Proserpine water supply schemes meets about half of the current demand and a quarter of the projected 2036 demand – providing a significant hedge against the risk of supplemented surface water supply interruptions.

Isaac Regional Council does not have a completed Regional Water Supply Security Assessment. The supply of water to the Isaac Regional Council is a relatively unique situation where Council are heavily dependent on allocations from the Burdekin Moranbah, Eungella Water, and Bingegang Pipelines. Council owns water infrastructure that meets either part or all of the water supply requirements for some townships, but in many cases are wholly reliant on water from miners. Demand can be highly variable from year to year, depending on both climatic conditions and the level of mining activity and associated increase or decrease in the urban population. To grow water security, the Isaac Regional Council plan to³⁰:

- “Ensure that legal arrangements for secure allocation are in place, Council to hold their own water licences, and supply is secured through reliable yield and delivery systems.
- Water purchase price to be commensurate with other regional local governments.

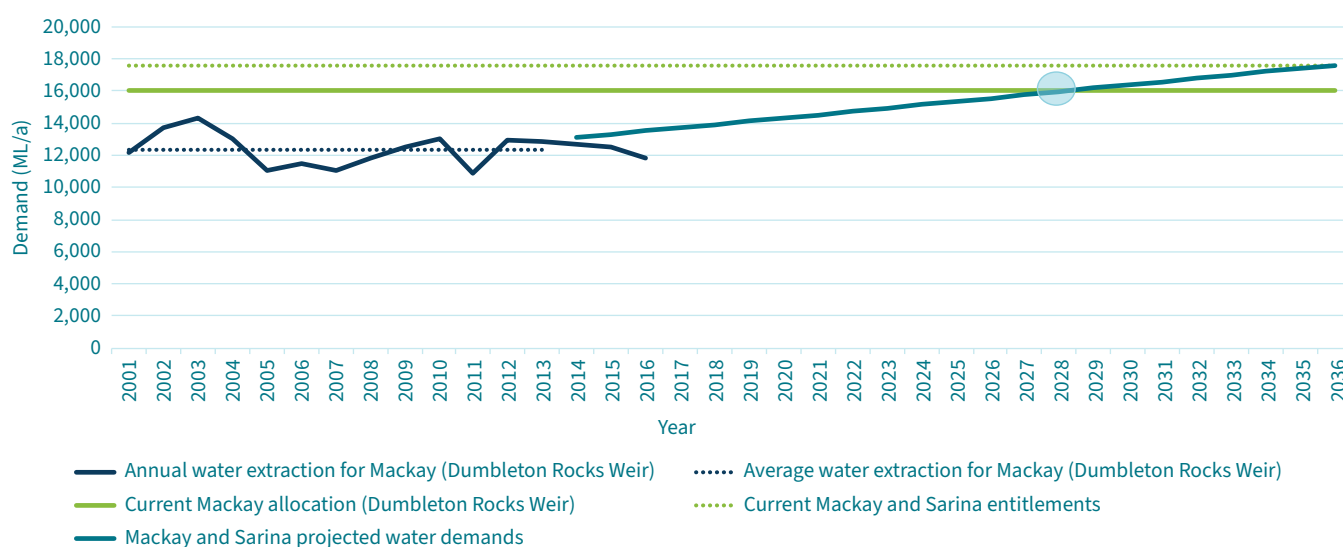
- If supply continues via resource sector, Council will seek government intervention to compulsorily acquire the water allocations.
- Obtain government support to hold the resource sector accountable for their historical obligations.”

Water security for the Mackay region was assessed in 2017 through development of the Mackay regional water supply security assessment – 2017³¹. The assessment found “Demand for water in the Pioneer Valley is primarily met through the Pioneer River Water Supply Scheme (WSS), which provides water for irrigation, industry and the Mackay reticulation network. Groundwater is also a water supply source for some domestic and irrigation use, principally for the production of sugar cane”.

Three recycled wastewater plants operate in the Mackay region. Recycled water is used for agriculture and urban amenities such as golf courses. Many irrigators also source groundwater from aquifers, which underlie much of the area, as well as un-supplemented surface water – i.e. water not managed under the Pioneer River WSS.

Agricultural water demand from the Pioneer River WSS appears unlikely to change significantly in the near future, although some growth in agricultural activities may occur. For example, some farmers in the Mackay region have recently been trialling the cycling of rice crops in addition to sugar cane. While the extent of rice cropping now and in the future is currently unclear, there is the potential farming rice crops in between traditional sugarcane planting and harvesting schedules may result in increased water demand from the agricultural sector.

Figure 36: Mackay regional water supply security assessment.⁶⁹



Existing Surface Water Supply Schemes in the Greater Whitsunday Region

Case Study: Kinchant dam – the Eton water supply scheme

Kinchant Dam is located 10km Northwest of Eton and 35km Southwest of Mackay. During high river flows, water is harvested from the Pioneer River into Kinchant Dam and distributed to around 300 cane farms through a network of pump stations, 35km of open channels and 130km of pipes.

Case Study: Teemburra Dam – the Pioneer River Water Supply Scheme

The Teemburra Dam is located 50km west of Mackay on a tributary of the Pioneer River. The dam was built in 1997 and has a current storage capacity of 147,000ML (Sunwater). The water is mainly used for the Pioneer Valley irrigation system (mostly sugarcane), and for urban and industrial purposes around the Mackay region.



Image: Water supply options. Source: 2021 Mackay, Isaac, Whitsunday Regional Water Strategy report (GW3).



Image: Water demand. Source: 2021 Mackay, Isaac, Whitsunday Regional Water Strategy report (GW3).

Case Study: Peter Faust Dam – the Proserpine Water Supply Scheme

The Peter Faust Dam is located around 26km west of Proserpine. It was built in the 1990s with a storage capacity of 491,400ML (Sunwater, 2024). Most of the water is used for the irrigation of sugarcane, with distribution through Kesley creek, pipelines and channels.

Case Study: Theresa Creek Dam, Clermont

The Theresa Creek Dam is located 22km southwest of Clermont within the Isaac Regional Council LGA. It was built in 1983 and has a storage capacity of 79,900ML. The main purpose of this dam is to supply water to the Clermont township, however it also provides important recreational benefits.

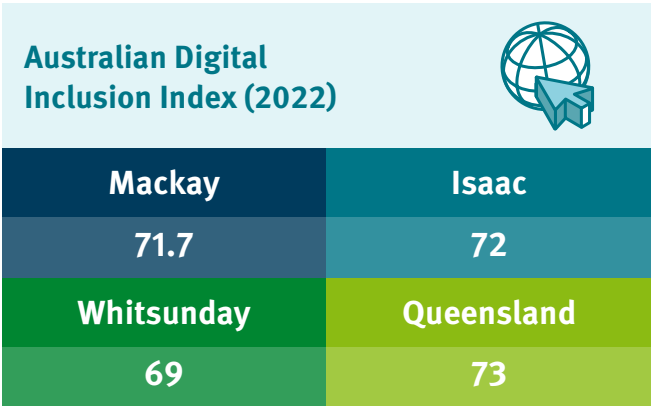
Regional transport infrastructure priorities have been established for the GW region in the Regional Transport Plan – Mackay Isaac Whitsunday Region 2018³². The priorities set the direction for the region’s transport network over the next 15 years. The four regional priorities established through the Mackay Isaac Whitsunday Regional Transport Plan development process are:

- **Priority 1:** A transport system that supports economic development
- **Priority 2:** A more resilient transport network
- **Priority 3:** A transport system that is safe for customers
- **Priority 4:** Liveable and connected communities.

The transport plan identified climate change impacts as a major challenge in providing effective and efficient transport networks for the future. The Greater Whitsunday Alliance (GW3) and Cooperative Research Centre for Developing Northern Australia (CRCNA) commissioned the Regional Agribusiness Supply Chains final report³³. This report cites the Regional Transport Plan as providing solutions to addressing ‘several last mile access issues’ curtailing potential improvements in the agricultural supply chains. The report also identified ‘considerable room for rail infrastructure upgrades.’

In the 2021 Canberra University Regional Wellbeing survey, respondents from central Queensland were asked to rank the quality of their local roads on a score of 1 to 7 (1 being ‘very poor’ and 7 ‘very good’). The sample rated the Gladstone, Isaac, Livingstone, Mackay, Rockhampton and Whitsunday (grouped LGAs) regions roads at 3.4.

Figure 37: Australian Digital Inclusion Index (2022).



The Australian Digital Inclusion Index uses survey data to measure digital inclusion across three dimensions of Access, Affordability and Digital Ability. The following are scores for 2022. The divide between capital cities and the rest of Australia remains marked. In 2023, areas outside state and territory capitals recorded a score of 3.4 points less than the national score, and 5.0 points less than capital cities.

In the 2021 Canberra University Regional Wellbeing survey, respondents were asked to rank their access to telecommunications using a scale from ‘very poor’ (1) to ‘very good’ (7) for services of mobile phone reception (i) and access to high speed, reliable internet (ii). A single measure of overall access to telecommunications was then constructed by taking the average score of responses to these items. The sample rated telecommunications in the Gladstone, Isaac, Livingstone, Mackay, Rockhampton and Whitsunday (grouped LGAs) regions at 3.8. Urban Queenslanders gave a rating of 5.0 and regional Queenslanders gave a rating of 3.9 on average.

Future drought impacts

The Queensland Department of the Environment, Tourism, Science and Innovation³⁴ has modelled future climatic conditions for the GW region (Figure 38) and predicted the following scenarios:

- higher temperatures
- hotter and more frequent hot days
- more intense downpours
- less frequent but more intense tropical cyclones
- rising sea levels
- more frequent sea-level extremes
- warmer and more acidic seas.

Under both a low and high emissions scenario, the mean temperature is predicted to rise across the region with the Mackay having the lowest increase and Isaac the largest increase in temperature. In a low emissions scenario, Isaac is predicted to experience the largest decline in annual rainfall while all the shires are predicted to have lower rainfall in all scenarios.

The map in Figure 39 shows a high fire risk for the GW region as of July 2023. The relationship between drought and bushfire risk (modelled through several tools) has been described as:

1. high biomass – low curing = lower fire risk
2. high biomass – high curing = very high fire risk
3. low biomass – low curing = very low fire risk
4. low biomass – high curing = lower / moderate fire risk

Low biomass is experienced in drought except where snap exceptional hot drying climatic conditions (often referred to as ‘flash drought’) may bring forward the curing of large amounts of biomass.

Figure 38: Modelled future temperature and precipitation annual forecasts relative to 1986 to 2005 average values.⁷⁰

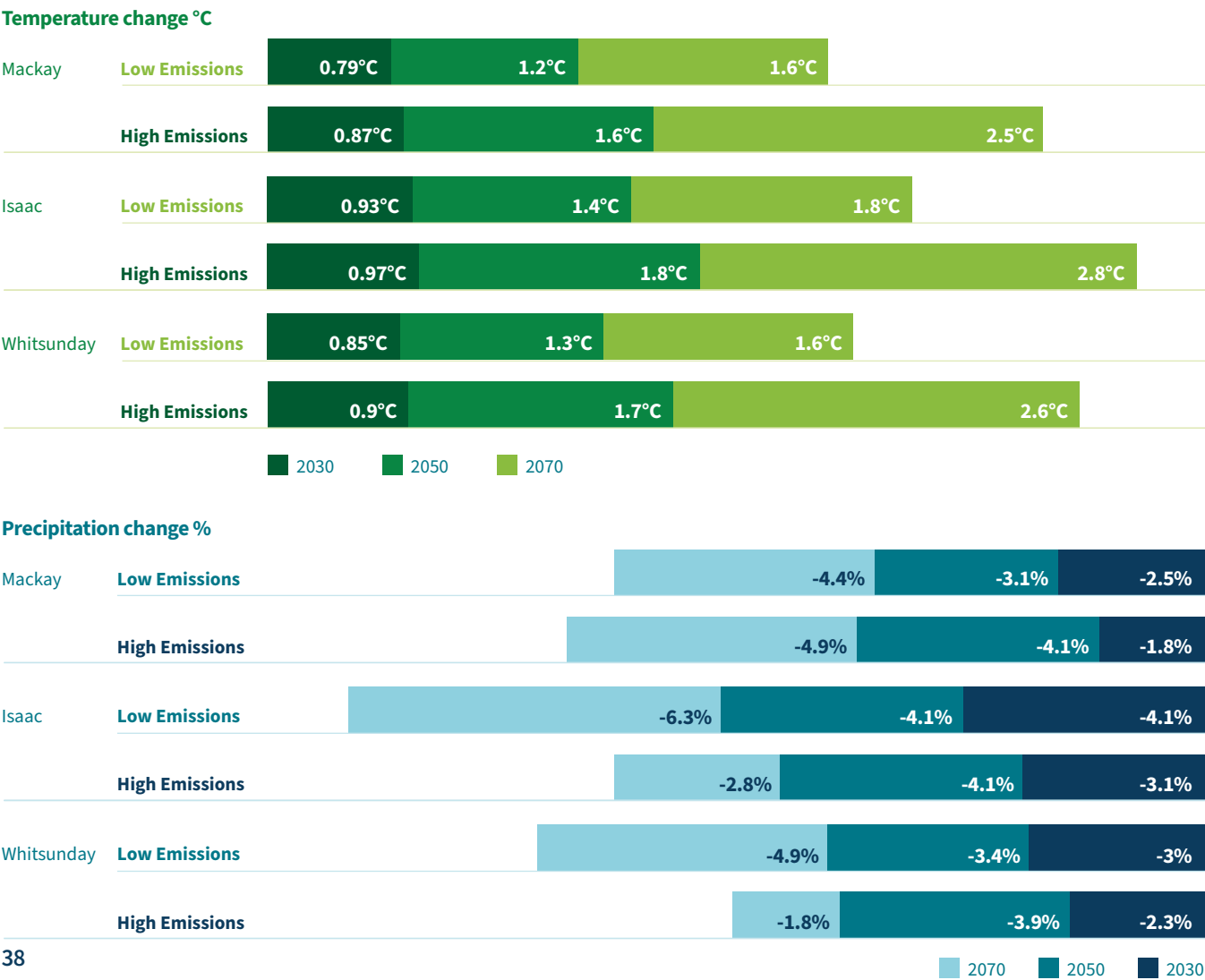
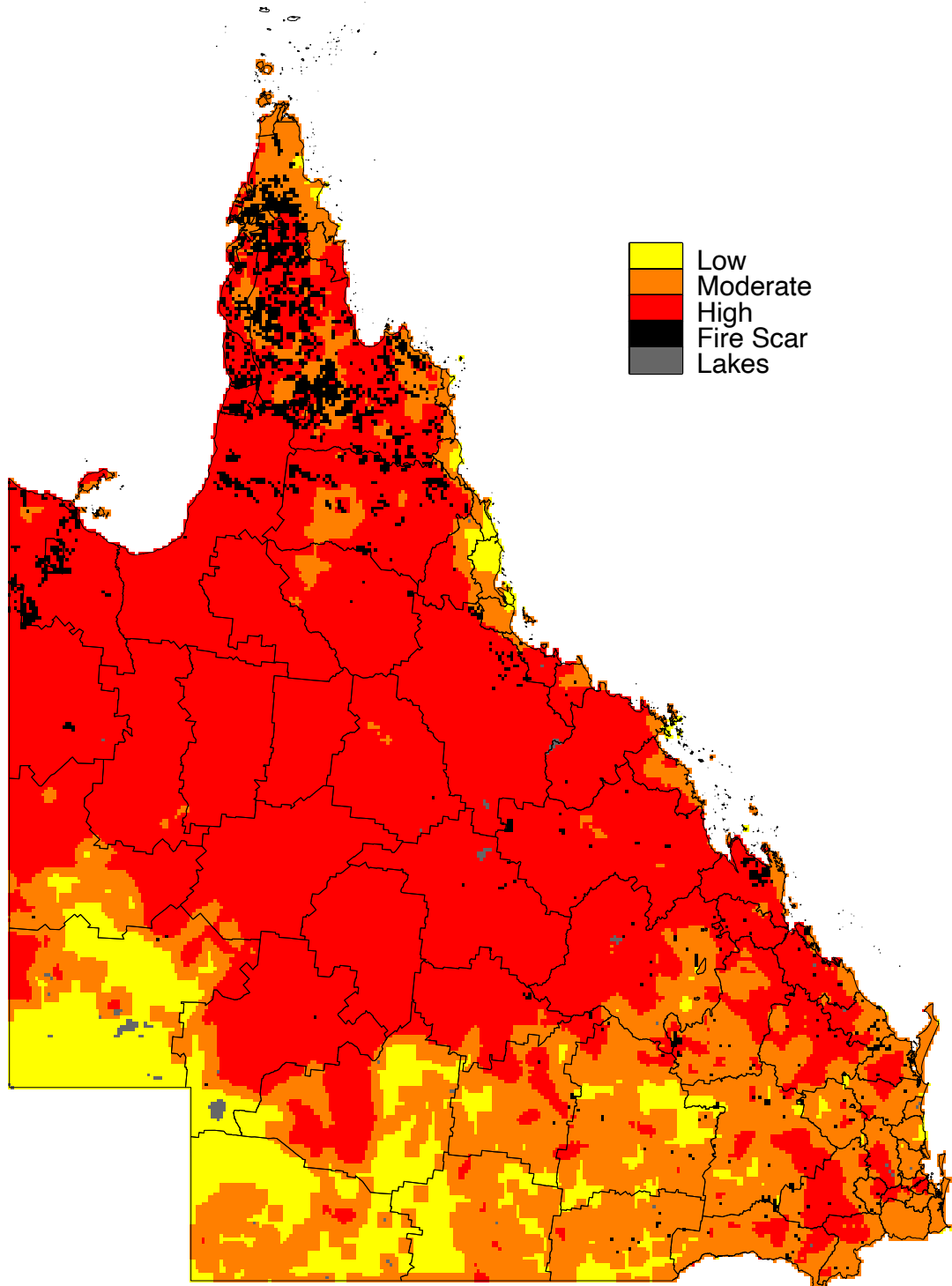


Figure 39: Pasture Grass Fire risk in Australia.⁷¹

Potential Grassfire Risk

31 July 2023



Fire scars are fires occurring in the last three months

Building drought resilience in our region

Lessons learnt from the past – stories of resilience

“There has been mistakes made and resources wasted in the past and some measures have been counterproductive.”

– Landholder

“Everyone should be able to stand on their own two feet.”

– Landholder

“They sound good but no one has ever heard of them (existing drought support tools). I’m never going to use that.”

– Landholder

“I get a swag of emails but I don’t read them. The old girl probably does though.”

– Landholder

“It’s hard to get those guys out there to listen to anyone without experience. If they don’t trust ya, they won’t talk to ya mate.”

– Landholder

“Science explainers to increase trust in tools is essential, otherwise they’ll just sit there.”

– Landholder

Case Study: Isaac Navicare system

Access to timely and appropriate mental health services in rural and remote areas of Queensland is a common challenge, with barriers including limited local providers, long waiting lists, unreliable telecommunication, and reluctance to trial telehealth. The Isaac Navicare health navigation service was opened in Moranbah in November 2021 to address these gaps.

The Isaac Navicare is a new, community co-designed, free care navigation service, which helps to address barriers by coupling care navigation with supported telehealth, and referrals to mental health providers and other supports. The Care Navigator from Isaac Navicare has been helping people access support – including referrals, making appointments with mental health care professionals, accessing online mental health support from online psychology partners and other support services like housing, employment and disability.

Research from the Wesley Research Institute shows more than 200 people within the community were connected with vital mental health support within their initial 12 months through Navicare⁷². Supportive care navigation was key to the uptake and acceptance of tele-mental health services for clients during the 12 month pilot study⁷³.

Case Study: Mackay, Isaac Whitsunday Regional Water Strategy

The Greater Whitsunday Alliance released the Mackay, Isaac and Whitsunday Regional Water Strategy in 2021 to identify water related needs and potential strategies to meet those needs across the region⁶⁰. Water needs were identified for agriculture, aquaculture, urban and mining expansion in Bowen, Proserpine, Moranbah and surrounding areas. Some of the specific recommendations are summarised as:

- To meet irrigation demands for high value crop near Bowen and industrial activities at the Abbot Point State Development Area, water could be supplied via pipeline from the Peter Faust dam to the Bowen area.
- The proposed Urannah Water Dam in the Bowen Broken system could deliver 103,000ML via a southern or northern pipeline to miners in the Bowen Basin, high value irrigation in Bowen, and broadacre irrigation in Proserpine.
- A mine water reuse scheme could decrease pressure on existing water supplies and may open new irrigation opportunities for agriculture in the region.

Case Study: Do regenerative grazing management practices improve vegetation and soil health in grazed rangelands?

Regenerative grazing is a component of regenerative agriculture that uses some form of rotational grazing system – maintaining rest-rotation cycles to support landscape recovery and improve farm profitability. It is increasingly seen as a profitable grazing land management approach in temperate or sheep grazing systems⁷⁴. However, there is not sufficient quantitative evidence to support the benefits of this approach in dry tropics region of Northern Australia, which represents around 60% of the total Australian beef cattle herd⁷⁵. Most of the studies assessing changes in vegetation and soil health in the subtropics are on land use change between grazing and native forest⁷⁶ or an evaluation of different grazing management strategies on profitability⁷⁷. Only few of the published research shows the regenerative grazing practice can improve land condition in rangeland systems⁷⁸.

The space for time study in the Great Barrier Reef Catchment Australia assessed vegetation and soil properties among regeneration grazing sites and locations in the Burdekin

(Queensland) catchments, where regenerative grazing strategies were implemented for between five and 20 years⁷⁹. Data was also collected at adjacent control sites where more traditional continuous set-stocking grazing approaches were applied. The study showed that better improvements in vegetation, soil and land condition can be obtained in well managed rotational planned grazing than at sites that do not use periods of strategic rest as part of their grazing management. Although, it is likely to take at least three to five years and up to 15–20 years, for statistically significant improvements – particularly for areas moving from a degraded baseline condition. Although this research finding indicates regenerative grazing can lead to improvements in land condition, further research on the social and economic dimensions of regenerative grazing is needed to conclude whether regenerative grazing will accelerate improvements, compared with other best-practice grazing land management approaches.

Building partnerships for future management

There are several effective organisations relevant to drought management in the Greater Whitsunday region. Initial discussions with the Greater Whitsunday Council of Mayors helped to identify those most relevant to develop this Regional Drought Resilience Plan. Instead of working with one lead organisation, RECoE worked with a partnership of groups in the region:

- CQUniversity
- Greater Whitsunday Alliance
- Greater Whitsunday Communities
- Fitzroy Basin Association
- North Queensland Dry Tropics
- Reef Catchments.

This alliance comprised one regional business-focused organisation, one regional community-focused organisation, three natural resource management groups and a regional university – each with their own networks and consultative processes. The process helped to test an alternative vision for governance of drought management in the future that could allocate responsibility to a regional coordination partnership, rather than to a single lead organisation.

To develop this RDR Plan, each member engaged in a consultative process through their networks. Then, themes and actions were distilled by the members from the wealth of data collected. This approach led to greater penetration and involvement with relevant stakeholder groups, helping to minimise criticisms of duplication and over-consultation. However, it also blurred the ‘line of sight’ from various inputs to the final composition of the plan. This is because it essentially created an intermediate layer of engagement between the six partners, necessary to negotiate the actions and themes.

Vision

People and industries in the Greater Whitsunday region are prepared for and resilient to drought events, and have implemented support mechanisms to help people, enterprises and communities during drought times by 2030.

Key aims and objectives

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

- A regional drought surveillance program in place that monitors and analyses key indicators of current and emerging environmental (meteorological and landscape), social and economic conditions, which are markers of drought.
- There is widely shared and well-informed regional engagement with managing drought risk for long-term community resilience.
- Support and resilience programs are tailored to the varying geography and industry footprints in the region.
- Risk management is focused on addressing the stress on communities, rural people, agricultural enterprises and businesses in small towns from drought impacts.
- Planning for and responding to drought risks builds on the strengths of existing service providers, programs and networks where possible, including mechanisms in place to address risks from other natural disasters and economic and social changes.

Establishing priorities

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

- **Coordination** that brings together the different organisations and agencies that can have roles in managing drought impacts and building resilience. This is an essential first step in a region that has quite disparate needs and a number of effective organisations that overlap with different stakeholder interests.
- **Infrastructure** that collects, reports and builds knowledge of the cause, impacts and likelihood of occurrence of drought. This knowledge base is essential in taking pre-emptive action to reduce the impacts of drought.
- **Knowledge** of those sections of the community who are most vulnerable and why, to the risks associated with drought.
- **Strategic actions** that build communities capacity to better prepare for, manage and minimise existing impacts and recover from drought.
- **Systems and frameworks** that measure, evaluate and report the community's drought resilience capacity.

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 varying perspectives – including the relevance to the region and the strength of relationship to drought issues and responses. This narrowed the focus from a broader range of issues around disaster management, community vulnerability and regional development priorities more generally to the subset of issues that were specifically relevant to drought.

In the next step, as part of the deliberative model of co-design, the six regional partners categorised the selected ideas and issues into themes to help group the diversity of issues into key areas. These were further refined over several months of discussion.

In the third step, pathways and actions to address the nominated issues were finalised between the coordinating partners, as part of the development of the initial draft of this plan. This focus on actions to address the issues, involved substantial work to identify priorities and cross-match issues to themes, so that a condensed set of actions could be developed and agreed on.

The engagement and co-designed planning processes highlighted two significant issues requiring ongoing priority and attention, involving requirements to:

- develop more effective governance structures and arrangements to develop and deliver sustainable drought resilience initiatives, particularly at a regional scale – this includes resolving the issue of how the RDR Plans can be coordinated and administered in the future
- develop pathways to implementing programs in staged or tiered approaches to the needs of particular stakeholder groups in the region and the differing structures and programs of potential partner and delivery agencies in the region.

RDRP conceptual framework

Drought poses a significant risk to regional communities' economies, health, landscapes and infrastructure. This plan provides a pathway for establishing a risk management approach to building drought resilience for communities. This approach establishes the current risk drought presents and what action is required in future to ensure the ongoing impacts of drought are managed appropriately, reducing impacts on regional communities.

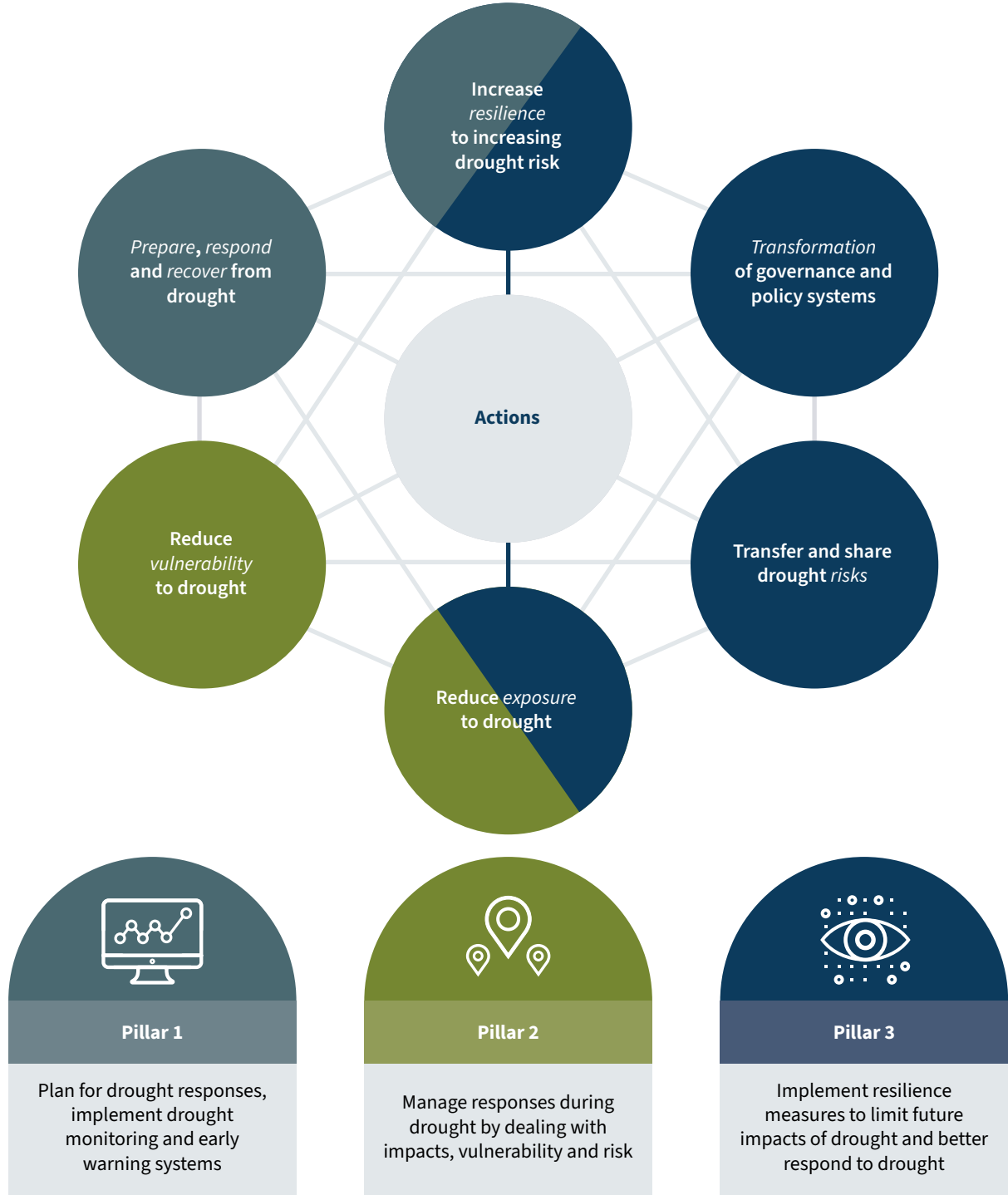
This plan draws on and adapts to the 'D-RAMP' model³⁵ (Figure 40) for Drought Resilience, Adaptation and Management that was chosen by stakeholders for its practical logic and ease-of-use. The model outlines three pillars to prepare, respond and limit:

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

The prioritised strategic pathways and key actions generated by the stakeholders and decision agencies in the Greater Whitsunday region have been summarised under each pillar. This was used to develop a unique plan for the region that is consistent with national planning frameworks and complements other state and regional planning programs (Figure 41).

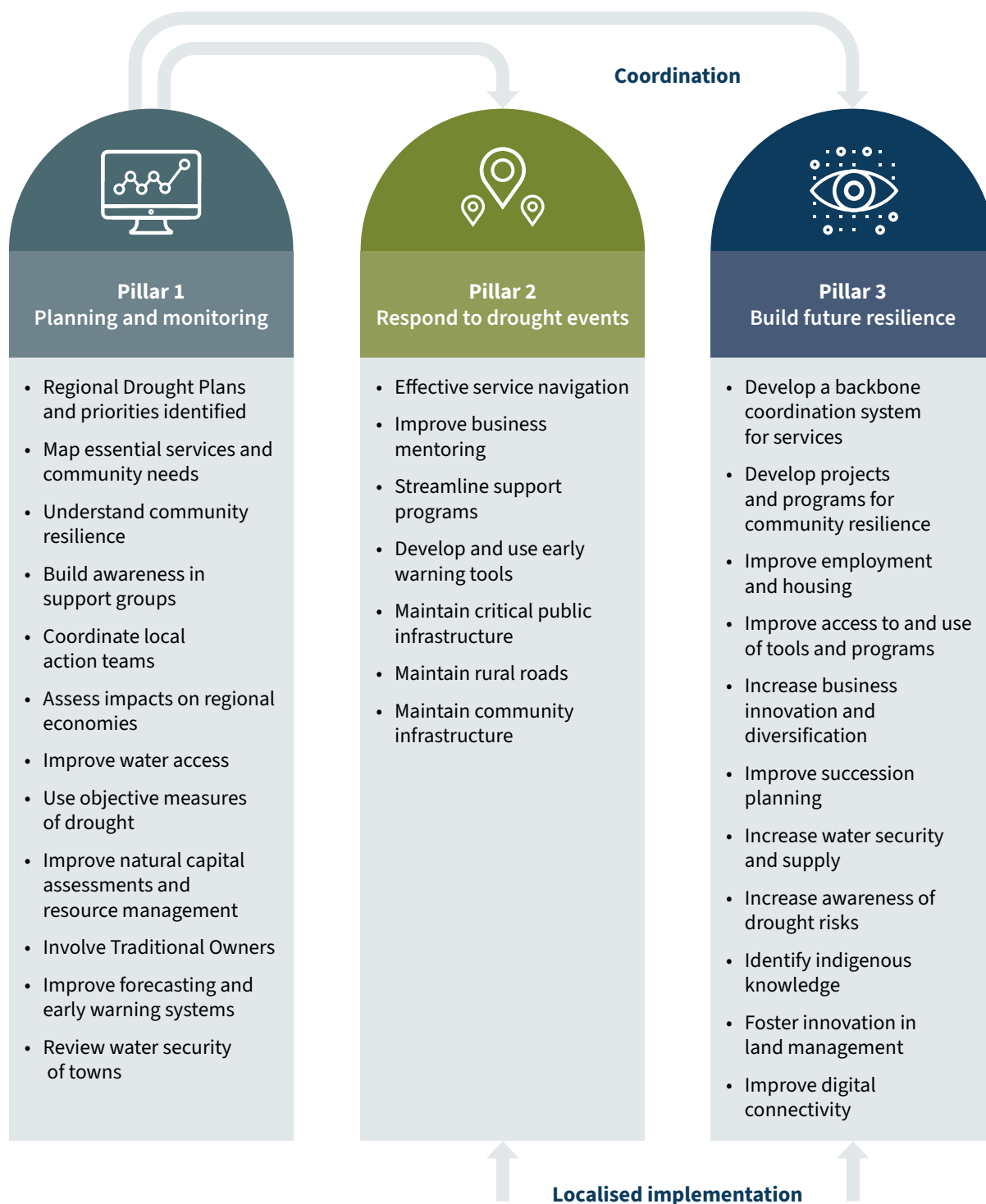


Figure 40: Key pillars and actions of the Drought Resilience, Adaptation and Management Policy (DRAMP) framework.⁸¹



Key priorities

Figure 41: Three pillars for the Gulf Hinterland Regional Drought Resilience Plan.



Key themes and pathways

Nine broad themes have emerged from the consultation process in the Greater Whitsunday region.

Figure 42: Themes identified for the Greater Whitsunday Regional Drought Resilience Plan.





Theme 1

Develop tools and services for drought resilience

There are gaps in the tools and services needed for businesses and people within the region to be more resilient to drought events. While there are a large number of existing tools, many need to be better framed at the local and regional scale to be useful. There may need to be an initial gap analysis required to identify what tools are available and where they could be adapted to regional needs.



Theme 2

Build people's capacity to access and use the tools

A common theme is a current lack of awareness from people about existing tools and support. These need to be made more accessible. There needs to be ongoing support – ideally from within the region – for financial counselling and business tools, training to improve management systems, and better use of forecast tools for weather and climate.



Theme 3

Weather variability and changing patterns

The impacts of drought vary widely across the region, making it important to tailor management and response strategies. Drought is different across the region from high rainfall to low rainfall areas. There is a need for better criteria and indicators for drought conditions, including objective measures for different aspects such as soil moisture, temperature, and rainfall deficiencies.



Theme 4

Build personal and community resilience

It is important to connect people and communities in tougher times – including programs to foster landholder networks and programs to support communities, including indigenous groups. Leadership programs and coaching conversations are good programs that build resilience and may be pathways to providing better mental health support. Programs need to be place-based to be effective and generate participation.



Theme 5

Nature based resilience

Protecting wetlands, water quality in creeks and rivers, and impacts on biodiversity is important during droughts – as well as the higher fire risks. There is interest in natural capital and mechanisms that provide returns to growers for environmental management – e.g. carbon sequestration. The links between soil health and profitability in grazing is important, and initiatives such as natural sequence farming and regenerative agriculture are promising.



Theme 6

Reducing negative economic impacts in drought periods

Negative economic impacts occur wider than the farm sector. Strategies are needed to limit economic impacts on small towns, marginalised people and indigenous groups. Diversification is one strategy to limit economic fluctuations. However, many agricultural enterprises are small, so people rely on external jobs for income – but diversification makes it difficult to manage in a drought because of time constraints. Maintaining and extending the Rural Financial Counsellor services is important.

Theme 7**Integrating traditional owner knowledge and practices**

There are gaps around identifying and using cultural knowledge about how to deal with drought. Currently Traditional Owners are focused on better ways to preserve knowledge and improve access to country. There are concerns about poor water security, which is linked to loss of native vegetation and resources. Other priorities include education about cultural heritage requirements and more involvement of Traditional Owners in governance.

Theme 9**Improve coordination**

Coordination is an issue in drought times, with too much duplication in services and processes. The number of different groups operating in the drought space may be well intentioned but can be perceived as confusing and poorly coordinated. Greater use of technology and different service delivery models might improve coordination and deliver multiple goals. There is a need for drought coordination at the regional level, rather than at the LGA or local level – recognising some planning and coordination will still be required at the state level.

Theme 8**Provision of effective infrastructure**

Establishing and maintaining effective infrastructure is a key priority. This includes providing reliable water supplies to urban, industry and agricultural uses – particularly to small towns during drought periods. It is important to maintain rural roads during drought periods. Communications infrastructure and technology is increasingly important as the backbone for networking, coordination and communication during drought times.



The Regional Strategy

“I think the whole community needs support in droughts and would rather not single out one group, a holistic approach is desirable and needed.”

– Landholder

“To improve resilience farmers need to be focused on improving pasture management, cattle management, and soil health. Yet with a large percentage of farmers working away the ability to learn and improve is limited.”

– Extension Officer

“Farmers need to think long-term. Build much stronger business strategies through soil improvement, financial planning, breeding selection, grazing assessments, disease control and robust selection processes.”

– Extension Officer

“Avoid pushing farmers into improvements immediately. They need time to think it through.”

– Extension Officer

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

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

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

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

→ ACTION PLAN

People, culture and communities



Pillar 1 – Planning and monitoring

Projected outcome: Communities use a resilience framework to monitor the level of resilience readiness of organisations, groups and individuals. Results are used to design systemic processes in each community to maintain – and where needed – develop resilience levels.

Priority	Resilience activity	Priority action
Essential services and community bottom line (what must be available in times of drought) is better understood. 	Develop risk profiles of vulnerable groups – including women, children, the elderly, farmers, pastoralists, marginalised communities and Indigenous groups.	Map risk profiles of vulnerable groups at the LGA or community level.
	Map the complexity of drought impacts on people and their needs and likely requirements over time – identifying thresholds or tipping points where needs intensify.	Map potential drought impacts on people and likely tipping points.
	Identify and establish the essential ‘basket’ of services during times of drought.	Identify the essential services required at the community level during drought times. Conduct an audit at the LGA or community level of available services and identify gaps.
Understand and strengthen community resilience. 	Use regionally relevant resilience assessment and development tools to build and maintain community resilience levels – including for marginalised groups and Traditional Owners.	Review the options for resilience tools suitable for the relevant regional communities and acquire them for use. Use appropriate tools and methods to assess and understand community resilience. Recommend the use of appropriate tools and methods to build community resilience.

Priority	Resilience activity	Priority action
Better awareness and understanding of drought in support groups. 	Build understanding of drought impacts among support workers and support the integration of weather forecasting, in better planning for health and wellbeing interventions.	Implement awareness and education programs for support workers to understand the impacts of drought. Adapt weather forecasting tools for use in community and services sector planning.
Coordinated local action teams or groups. 	Identify options to developing support groups at local, community or regional levels.	Trial different approaches to establishing local action teams or groups in relevant communities.



Pillar 2 – Respond to drought events

Projected outcome: CWQ communities with ready access to the information they need to respond to drought situations.

Priority	Resilience activity	Priority action
Effective service navigation.  	Ensure the appropriate ‘basket’ of services are available in communities during drought events and provide a navigation service. Establish a navigation system for users to better access support and manage the impacts of drought – including agriculture.	Lobby and advocate for resources to ensure services meet the needs identified in the audit (see Pillar 1). Coordinate supply of services where required. Identify trigger points where assistance needs to be escalated and coordinated effectively. Identify information and search mechanisms that can assist in coordination. Establish and provide a navigation service for users.



Pillar 3 – Build future resilience

Projected outcome: Enable people and communities to gain the skills to increase resilience to drought and other adverse events.

Priority	Resilience activity	Priority action
Improved service, navigation and backbone coordination. 	Find improved methods for targeting, coordinating and integrating support from government, non-government and private sector organisations during droughts.	Regularly review options for improving support from varied providers during droughts, and share findings with providers.
Future development of community resilience is improved. 	Develop and provide a comprehensive program for young people that is tailored to their needs and encourages a deeper understanding of the options available for effectively responding to droughts within their communities. Develop and implement strategic community development projects to build resilience and connectedness, supporting the community to develop and transition to new strategies for resilience. Conduct regular activities to build community resilience.	Conduct a review and assessment of existing programs, identify gaps. Develop and modify programs aimed at educating youth on drought response strategies. Regional organisations and groups to advocate for resources to deliver and maintain programs and services. Identify a shortlist of potential projects at the community level. Secure resources to conduct pilot projects. Regularly monitor community wellbeing and resilience indicators. Provide support to LGAs and communities to conduct resilience building activities. Provide support for people in other LGAs to travel and attend, representing their communities.
Secure employment during drought is improved. 	Focus on employment and skills development strategies that improve the security of employment in drought-affected communities.	Encourage workforce and skills development networks within key industry clusters, education, and employment providers to coordinate and jointly identify needs for employment, training and skills in the region. Identify critical actions to improve job security during drought. Pilot employment incentives and opportunities for drought-affected communities in the region. Support the emergence of Indigenous-led businesses and social enterprises.

Priority	Resilience activity	Priority action
Improve housing to support resilient communities. 	Develop strategies and programs to maintain housing access and affordability during drought periods.	Develop an innovative housing strategy for the region that supports a growing workforce and provides stable accommodation for a resilient community.
Improve future drought planning and monitoring. 	Build local teams in the region to provide improved interpretation and usage of drought monitoring, early warning and short time forecasting products.	Establish strategies to create local teams. Seek resources to pilot.
Integrate drought resilience planning and monitoring. 	Integrate drought planning procedures and capability at the LGA, regional, state and national levels.	Identify a relevant package of procedures and capacity-building activities for drought planning to be implemented at the LGA and regional levels. Seek resources to pilot and implement. Seek resources to undertake a study on integrating drought into state and federal disaster management frameworks.



→ ACTION PLAN

Economy



Pillar 1 – Planning and monitoring

Projected outcome: The regional economy is better prepared for dry times and drought through planning to provide jobs and retain a regional workforce which will sustain communities.

Priority	Resilience activity	Priority action
Regional economy is more drought resilient. 	Identify the likely impacts of drought on rural and regional economies. Identify strategies to better manage and lessen impacts.	Map the vulnerability of local and regional economies to drought events. Identify strategies to offset adverse impacts (e.g. increased infrastructure or maintenance expenditure in drought times) at the LGA and regional levels.
Improve water access for local businesses, industries, and agriculture. 	Explore ways to improve access to water supplies for local businesses, industries and agriculture.	Engage in the Burdekin Regional Water Assessment process in 2024 to identify local water needs and opportunities. Review Plan and recommendations. Research and identify options to improve water access – such as through improving water markets or increasing water supplies. Develop an options paper.



Pillar 2 – Respond to drought events

Projected outcome: Increased capacity to provide services, regional coordination, and support diversification and innovation to maintain the regional economy.

Priority	Resilience activity	Priority action
Improve business mentoring. 	Provide more low-cost business mentoring programs – such as Rural Financial Counsellors – to help enterprises make better business decisions during drought events.	Prepare a short briefing note on the critical value of business mentoring in drought-affected regions. Seek resources to pilot new support business mentoring programs. Lobby for increased funding and resources for existing programs.
Streamline support programs. 	Improve coordination between support programs during drought, particularly between different government and voluntary programs.	A Resilience Officer to improve communication between support providers, reducing duplication and overlaps.



Pillar 3 – Build future resilience

Projected outcome: Support activities know to promote future resilience.

Priority	Resilience activity	Priority action
Drought-resilient business development. 	Develop strategies to support agricultural businesses to be more efficient and innovative – focusing on cost reduction and resilience planning.	Develop and support programs building financial and business skills. Develop resilience plans for drought events at the enterprise level.
Improve business diversification. 	Explore options for enterprise and regional diversification as a way of generating greater resilience to drought events.	Support trials for new agricultural and other enterprises. Support the emergence of Indigenous-led businesses and social enterprises.
Improve succession planning and training. 	Develop programs and services encouraging succession planning, innovation, and skill development for younger producers as part of planning for enterprise level resilience.	Develop and pilot programs that aim to ensure younger producers have the necessary skills and knowledge for resilience planning. Focus support on younger producers and community members to ensure they are more effective during drought events. Encourage agricultural succession planning as part of longer term resilience planning.

→ ACTION PLAN

Landscape and natural environment



Pillar 1 – Planning and monitoring

Projected outcome: Land managers are prepared and able to assess and understand what is required for resilience of landscapes and the natural environment.

Priority	Resilience activity	Priority action
Move towards more objective measures of drought. 	Develop monitoring and reporting tools that facilitate linkages between objective measures of drought and resource condition – i.e. categorise droughts into four levels of increasing intensity and map the risks to natural environments.	Continue to develop objective measures of drought intensity (as opposed to binary drought declarations) and risk that can be easily communicated to different stakeholder groups.
Develop or adapt early warning tools. 	Tailor early warning and drought monitoring systems to regional level risks and assessments.	Identify the most useful early warning tools that can provide regional level assessments.
Natural capital assessments. 	Establish baseline data of natural capital for farm and property level assessments. Develop case study examples that can be used as baselines for longer term monitoring and ecosystem market opportunities.	Identify proponents to: - Investigate natural capital assessment providers relevant to the region (assessments should be aligned to the Conserving Nature – a Biodiversity Conservation Strategy for Queensland). - Search for funding and programs to develop case study assessments. - Where appropriate, plan and run information sessions on natural capital assessments linking producers to providers and/or ecosystem markets.
Resource management practices become more drought resilient. 	Develop regional level approaches to natural and agricultural resource management, including assessment of current and future water needs.	Investigate opportunities to build natural and agricultural capital accounts at the regional level, capturing the effects of drought periods. Map current and future water needs and identify how these are sensitive and/or relevant to drought events.

Priority	Resilience activity	Priority action
Improve resource management. 	Building awareness of pasture assessment and management tools, and their capacity, to support better decision making as part of focusing support programs on agricultural managers with better management skills.	Raise awareness, lead and facilitate delivery of programs to meet this resilience activity.
Involve Traditional Owners in water ownership. 	Explore and trial options for greater involvement by Traditional Owners in water planning and ownership.	Trial and develop different options for Traditional Owners to be involved in water planning and ownership for both resource management and agricultural development goals.



Pillar 2 – Respond to drought events

Projected outcome: Enable land managers and communities to access and use information for making decisions.

Priority	Resilience activity	Priority action
Using early warning and resource monitoring tools. 	Increase local capacity for effective interpretation and use of early warning, forecasting and monitoring tools for drought events – including those related to resource condition.	Coordinate better delivery and use of forecasting, monitoring and assessment tools at the local and regional levels.



Pillar 3 – Build future resilience

Projected outcome: Landscapes and land managers are better prepared for dry times and have the skills to manage in dry times.

Priority	Resilience activity	Priority action
Increased water security.  	Increase water security.	Engage in the Burdekin Regional Water Assessment process in 2024 to identify local water needs and opportunities. Develop a water security plan for each LGA. Negotiate investment in water infrastructure with state and federal government organisations, and private sector entities.
Increase awareness of drought risks.  	Improve communication and information sharing processes to increase awareness of risks to landscapes and natural environments associated with drought. Source or develop new models and tools, to share information and inform decision making during drought.	Explore options for outreach and communication with different cohorts in the region. Explore the development of tools to help communicate drought conditions and risks to different stakeholders and cohorts.
Increase focus on planning and managing for drought events. 	Design strategies to incentivise management practices that improve landscape resilience and encourage others to make positive changes.	Advocate policies to government that promote landscape and business resilience as a means of building drought resilience. Seek additional investment into landholder engagement services that promote adoption of more sustainable management practices, as a cost-effective solution to drought resilience.
Identify local and Indigenous knowledge and wisdom. 	Identify, capture and integrate local and Indigenous knowledge and wisdom on successful ways of managing drought pressures and impacts.	Identify local and regional custodians of local, traditional and Indigenous knowledge and wisdom. Gain resources to capture and record local and Indigenous knowledge. Identify ways knowledge and wisdom could be better utilised.

Priority	Resilience activity	Priority action
Invest in future skills development for land managers. 	Support the development and adoption of management practices that maintain resource condition – such as pasture monitoring tools, herd management tools (e.g. preg testing workshops) and soil assessment tools.	Develop and invest in programs that provide land managers with better skills relating to soil, pasture and herd management.
Foster innovation in land management. 	Foster and support capacity building trials of innovation alternatives for land management – such as different approaches to regenerative agriculture.	Support innovations and trials of different land management practices that aim to improve resource condition.



→ ACTION PLAN

Infrastructure and built environment



Pillar 1 – Planning and monitoring

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

Priority	Resilience activity	Priority action
Improve drought forecasting and early warning systems.  	Coordinate a review of existing drought monitoring and early warning systems to identify gaps and undertake a needs analysis.	Within 12 months, organise a lead agency to review drought monitoring and early warning systems relevant to the region. Perform a gap and needs analysis, making recommendations for improvements. Develop a guide to help users understand the various roles and strengths of different systems.
Town water supplies are secure. 	Each LGA to review the adequacy of future water supplies for smaller towns – both in terms of physical supply and potential ownership/control issues.	Greater Whitsunday LGAs to engage with the Queensland Department of Local Government, Water and Volunteers (DLGWV) to support and review the plans and recommendations developed under the ‘Urban Water Risk Assessment Project’. Each LGA to prepare a Water Security Plan in response and seek resources to implement.
Adequate public infrastructure is available to support social amenity and community wellbeing. 	Each LGA to identify baseline priority needs for public infrastructure to support social, amenity, sporting and community wellbeing during times of drought – e.g. green spaces and waterways.	Undertake a participatory needs assessment identifying critical public infrastructure required for each community during drought times – noting substantial overlaps with natural disaster planning. This may include establishing small regional knowledge and communication centres in each community, maintaining spaces for social connectiveness. LGAs to engage with the Queensland Government in preparation of the Greater Whitsunday Regional Infrastructure Plans – to establish and/or maintain critical infrastructure and seek resources to implement.



Pillar 2 – Respond to drought events

Projected outcome: Landholders and communities have capacity to respond to drought events through accessing grants and being aware of drought vulnerability indicators for the region.

Priority	Resilience activity	Priority action
Critical public infrastructure remains operational. 	Undertake regular assessment of public infrastructure, such as water security and community amenities.	Greater Whitsunday region to develop and implement assessments as per infrastructure plan (see Pillar 1).
Rural roads are maintained during droughts. 	Ensure rural roads are maintained during drought conditions.	Advocate for adequate funding for LGAs to maintain rural roads in drought times.





Pillar 3 – Build future resilience

Projected outcome: Essential infrastructure is in place and maintained so communities and industries can access in dry times and drought.

Priority	Resilience activity	Priority action
Water security is increased.  	Increase water supply options through investment in sustainable approaches to water harvesting, building new storages and groundwater recharge.	Greater Whitsunday LGAs to engage with the Queensland Department of Local Government, Water and Volunteers (DLGWV) under the 'Urban Water Risk Assessment Project' and the 'Burdekin Regional Water Assessment' process to identify local water needs and opportunities. Develop a water security plan for each LGA.
Efficient water use is improved. 	Explore new infrastructure and technologies that may deliver innovative water security solutions.	Conduct a review of water use efficiency in key agricultural sectors and identify potential improvements.
Digital connectivity is improved. 	Improve communication technology and access across the region to enable (a) better service delivery (b) greater economic diversification and (c) better networking and coordination during drought events.	Greater Whitsunday LGAs continue to advocate for digital connectivity that promotes and facilitates the capacity of the region's businesses and communities to operate effectively in drought events.
Community infrastructure to support liveability.  	Expansion of existing community amenities to improve liveability and support wellbeing during drought – meeting the changing needs of the community, including for marginalised groups and Traditional Owners.	Seek financial investment opportunities to build and maintain community infrastructure to support liveability and wellbeing.

Community partnerships and communication strategy

Implementation will commence once funding and support is provided. A Regional Oversight Group and governance will be established, with guidance from the Greater Whitsunday Council of Mayors.

The actions will be prioritised into a set of workplans, with initial priorities selected for early attention that match available funding, partnerships, personnel and time constraints. Potential alignment with other major strategies, plans and policies will also be considered. Criteria to be used in shortlisting initial actions for attention are likely to include factors such as cost, availability of resources, size of the potential changes, certainty, impacts on stakeholders, and the possible pathways to implementation.

Further development of the plan may include:

- Assessments of the state of vulnerability of different sectors and groups.
- Assessments of the region's capacity to absorb and adapt to stresses and shocks, and transition/transform when needed.
- Identifying interactions between economic, social, cultural, health and environmental impacts of drought.

- Better understanding of the relationships between the regional economy and water availability, supply and demand, especially regarding the expansion of water-intensive agricultural and mining activities.
- Identifying innovative proposals that help with transition and transformation in different sectors.
- Predictions of future possible drought impacts on different sectors, livelihoods and segments of communities, and links with proposed priorities, actions, and projected outcomes.
- Analysis of where linkages between components are weak or missing, to identify vulnerabilities and resource needs for addressing them.

Following endorsement of this plan, a process will be actioned to engage and communicate with the community about the progress of activities to be implemented. This Communication Framework has been co-designed by key stakeholders; however 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 2: Key engagement activities

Communication event(s)	Timing	Key audience
Ministerial announcements	Within 2 months of sign-off	General Public
Media releases – National, State, Regional and Local	As required	General Public
Plan – inclusion on websites (PDF and/or links)	Within 3 months of sign-off	General Public
Community/Sector engagement	As required	General public, business representatives, agriculture representatives, community representatives
Project implementation/MER reports	As per MER Plan, as agreed with funders	Regional partner, funding bodies
Project updates – media releases	As required	General public, DPI
Annual Report – general distribution	Annually at end of year	General public, DAFF, DPI, government agencies, non-government agencies
Annual Report – inclusion on websites (PDF and/or links)	Annually at end of year	General public, DAFF, DPI, government agencies, non-government agencies
Project completion reports	At completion of project	Regional partner, DPI, funding bodies

Monitoring, Evaluation and Learning (MEL)

Implementation of plan elements may consider using a Monitoring, Evaluation and Learning (MEL) strategy to help evaluate and improve progress. The key stages of the MEL approach are summarised in the Figure.

“Preparedness planning and holistic planning are becoming core areas for extension to enable landholders to engage with concepts around succession planning and how this supports business development, resilience, and longevity.”

– Extension Officer

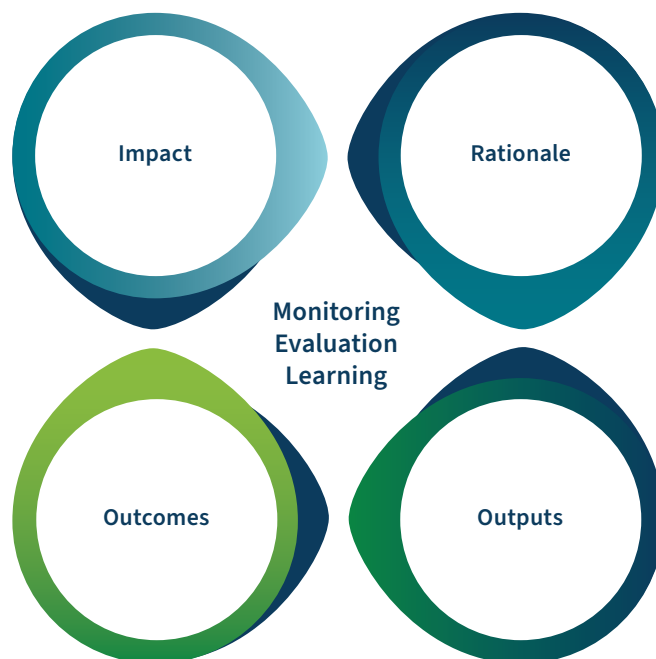
Figure 43: Adapted from Future Drought Fund (FDF) approach to Monitoring, Evaluation and Learning (MEL).

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 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 Future Drought Fund Monitoring, Evaluating and Reporting Plan identified the following assumptions for the plan to be effectively implemented:

Key assumptions affecting outcomes from 1–2 years

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

Key assumptions affecting outcomes from 2+ years

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

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

Monitoring progress and evaluating outcomes

Table 3 is based on the relevant Future Drought Fund 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 3: Key monitoring indicators

Outcome level: Impacts 4+ years	
FDF Standard Indicators	- 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	Strong and healthy people living with the land and resilient to drought. 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.
Evaluation Approach	These longer-term impacts may be 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. The evaluation of outcomes may also be designed for specific programs.

Outcome level: Long-term outcomes 4+ years	
FDF Standard Indicators	- 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.
Specific Regional Indicators	Key Aims and Objectives - A regional drought surveillance program is in place that monitors and analyses key indicators of current and emerging environmental (meteorological and landscape), social and economic conditions, which are markers of drought. - There is widely shared and well-informed regional engagement with managing drought risk for long-term community resilience. - The region comes together to build drought resilience. - Widespread enterprise level drought risk management is established across the region. - Measures are implemented to limit impacts of drought and better respond to drought. - Adequate and appropriate drought risk management essential infrastructure in place and stress tested for times of drought.
Evaluation Approach	<i>Critical to regional-level monitoring of, and improvement to, the Plan will be an on-going regional oversight group (ROG) comprising of the Plan 'owner(s) and key stakeholder representatives. This group would have the role of initiating actions in line with the plan, reviewing progress against the plan objectives and making changes to the Plan as needed to maintain its relevance and usefulness.</i> 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: - Monitoring and reporting of regional level indicators that are captured as part of Local Government surveillance, surveys and annual reporting. - Liaising with the regional Drought and Innovation Hub to ensure that key indicators for the region are captured and provided over time. - Recording case studies of changes made and benefits evident as a result of actions taken from the implementation of the Plan.

PDF Standard Indicators	Outcome level: Success measures and intermediate outcomes 2–4 years	Specific Regional Indicators	The achievement of Key Pillars to underpin the achievement of objectives are:
	Actions have been taken based on this Plan • The majority of plans have had elements implemented • Primary producers and businesses are supported to improve their sustainability and resilience. Decisions have been made to implement • 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. Capacity has been developed • 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. Regional Stakeholders are involved • 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.		(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.
		Evaluation Approach	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.

Continued on next page

Evaluation Approach

Continued from previous page

- 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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