Torres Strait and Cape York Regional Drought Resilience Plan

2022–2030

Australian Government
Department of Agriculture, Fisheries and Forestry

Future Drought Fund

Queensland Government

Rural Economies
Centre of Excellence

TCICA
Torres Cape Indigenous Council Alliance Inc.

Gulf Savannah NRM

James Cook University Australia

TNQ Drought Hub

Cape York Natural Resource Management

The Torres Strait and Cape York Regional Drought Resilience Plan has been developed as a partnership between the Rural Economies Centre of Excellence and the following organisations who will lead implementation of any actions: Torres Cape Indigenous Council Alliance Inc., Gulf Savannah NRM, James Cook University, Tropical North Queensland Drought Hub and Cape York Natural Resource Management.

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 Agriculture and Fisheries).

Acknowledgement

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

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

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

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

Contact us

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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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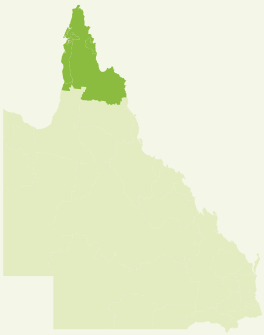
Regional foreword and acknowledgements



This plan proudly acknowledges the many Aboriginal peoples and Torres Strait Islander peoples and the Traditional Owners of Country within the Torres Cape Indigenous Council Alliance (TCICA) region. This region includes the boundaries of and acknowledges the long-term resilience building efforts of the Mornington, Aurukun, Torres and Cook Shire Councils, the Torres Strait Island Regional Council, the Kowanyama, Pormpuraaw, Napranum, Mapoon, Lockhart River, Hopevale and Wujal Wujal Aboriginal Shire Councils, the Northern Peninsula Area Regional Council, and the Weipa Town Authority. Our region's plan is strongly aligned to, and indeed represents an implementation sub-set of the current and ongoing Queensland Reconstruction Authority (QRA) resilience planning process. It also builds on scenario planning undertaken in Cook Shire via the Department of Environment and Sciences' Communities in Transition Program.

The region is a wonderful and diverse place. My own community of Kowanyama is based on the Yir Yoront language name for "place of many waters". Like all parts of the Cape, while often wet, my community equally can suffer the impact of drought.

Many people down south would never think of the TCICA region as a place that faces drought. Every year, however, there is a long dry season of variable intensity. Sometimes, the wet season comes late or finishes early, and consequently, the dry season can be very long. On rare occasions, the wet may fail all together.

The impacts of these long dry spells can be devastating, and they have a high cost for our communities. Basic food security and the security of essential drinking water can become stressed. Pastoralists struggle more to manage through an already fragile cattle and feed production system. Ecosystems and cultural places of global and local significance can become stressed. Bushfires increasingly turn to wildfires and become the predominant focus of people's lives across the landscape. The region's wetlands and lagoons hold great significant for our communities, and these places are visited and used for fishing, hunting and camping. They are often also culturally significant story places.

These drought impacts are in themselves problematic, but change is also coming. The climate change projections for our region are that it is likely to become more wet, but with more extreme rainfall variation and also greater evaporation, reducing water availability in soil, groundwater and water storage systems. This brings big risks to our existing industries such as grazing, mining, construction, tourism and fishing in the Gulf of Carpentaria, and emerging industries like carbon farming.

There are, however, strategies that can be taken to move forward, and the development of newly available water resources is a big part of that. The recent Cape York Water Plan identifies some additional 516 gigalitres of water for potential use, and importantly, most of this water sits in the hands of the region's Traditional Owners. With sensible water development, and other strategies that continue to improve the resilience of our communities to disaster, there is a once in a lifetime opportunity to smash through the impacts of late and failed wets. This will create new economic opportunities for communities, introduce new technologies for water supply and delivery, and encourage a focus on building regional resilience more broadly. Combined together with planning and delivery action via the Queensland Reconstruction Authority (QRA)'s Resilience Strategy, this emerging Regional Drought Resilience Strategy can help our region prosper. Resilience for our communities is all about having healthy country and healthy waters as a foundation for keeping our communities strong.

The people of Cape York, Torres Strait and Mornington Island expect this region to be at the heart of new national discussions about building long term resilience to drought and water shortage. This Plan creates the chance to change the national narrative about drought, and to deal with what it means for people in our wonderful region. We hope the Plan helps the region benefit from the new national focus on drought and water security through investment via the Future Drought Fund, the National Water Grid Fund, and through innovative alignment with the new Regional Drought Hubs.

Mayor Robbie Sands
Chair
Torres Cape Indigenous Council Alliance (TCICA)

Introduction

Regional Drought Resilience Planning

Australia, and particularly the State of Queensland, is no stranger to drought. First Nations traditional stories of drought go back thousands of years and European settlers have officially recorded drought in Australia since the late 1700s. Droughts have been officially 'declared' in Queensland since 1897.[1]

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

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

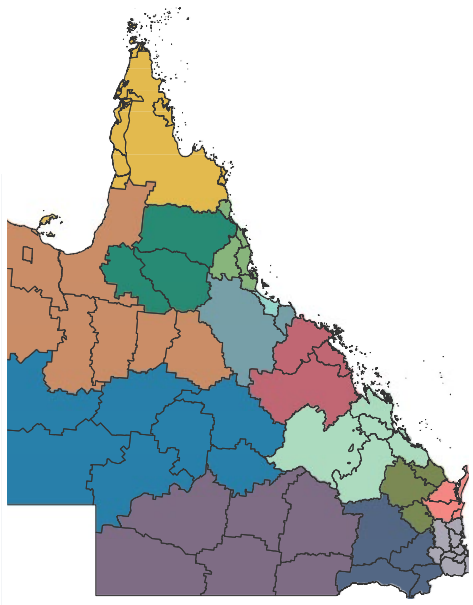
Queensland is the most disaster impacted state in Australia, and Queenslanders are susceptible to a variety of hazards. We are facing unprecedented change in both our current and future operating environment with a dynamic political, social, economic and policy landscape surrounding disaster risk reduction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

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

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

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

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



Legend

- Local Government Areas

Resilience Strategy Regions

- Burdekin and Charters Towers Region
- Burnett Region
- Cape York and Torres Strait Region
- Central West Region
- Darling Downs Region
- Far North Hinterland to Gulf Region
- Fitzroy and Capricornia Region
- Mackay, Isaac and Whitsunday Region
- Mary Region
- North West Region
- South East Region
- South West Region
- Townsville and Palm Island Region
- Wet Tropics Region

Regional planning and approach

This Regional Drought Resilience Plan (the RDRP or "the Plan") was co-designed, developed and produced via a collaborative partnership between TCICA, the RECoE (via JCU), the Queensland Department of Agriculture and Fisheries (DAF), Gulf Savannah NRM, Cape York NRM, Torres Strait Regional Islands Council (TSIRC), Torres Strait Regional Authority (TSRA), and key regional stakeholders. The engagement model built upon earlier work undertaken by TCICA, RECoE, Red Cross Queensland (2021), the Queensland Reconstruction Authority (QRA 2021) and CSIRO. This process was informed by international best practice from the World Bank and the United Nations Office for Disaster Risk Reduction (UNDRR, 2021). It has enabled community reflection on these issues, combined data, and paid respect to local, traditional and 'scientific' knowledge. The planning process was reviewed by independent assessors, and their feedback has been incorporated into both the refinement of the planning process and the final plan.

Regional engagement process

The Plan engagement process has sought to bolster existing engagement across the region dealing with resilience and disaster response. These processes have included TCICA's Economic Opportunities Plan and Regional Telecommunications and Digital Connectivity Strategy, scenario planning under the Communities in Transition Program, regional approaches to exploring food security, the Torres Strait Adaptation and Resilience Plan, and the QRA Cape York and Torres Strait Region Regional Resilience Strategy. It has connected with the Regional NRM Planning process in the Cape and Northern Gulf Regions. To add drought-specific depth, detailed consultations were held with (13) TCICA Councils plus TSIRC, TSRA and other key stakeholders. Alignment with the QRA Resilience Plan was seen as being crucial, and key stakeholders have had a chance to review emerging strategies. The final RDRP was endorsed by the TCICA on the 10th of May 2022. TCICA, RECoE, Cape York NRM, TSIRC, TSRA and the Gulf Savannah NRM will continue to work together in a strong long-term partnership to ensure effective delivery of the Plan.

"The RDRP started a new conversation on how people in the region view drought. The region as a whole didn't think they had a 'drought problem'. Through the RDRP engagement there was a realisation that there is a vulnerability or exposure to the impacts of drought, especially when it comes to issues around water security and increased risk of wildfires."

Participant

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".[2]

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".[3]

This technical definition of drought is understood by this Plan, but our focus is instead directed to the language that people in the region use to describe the acute water shortages they face. Shortages are an annual occurrence exacerbated by long dry seasons, late wets, or failed monsoons.

'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"*.[4]

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".[5]

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

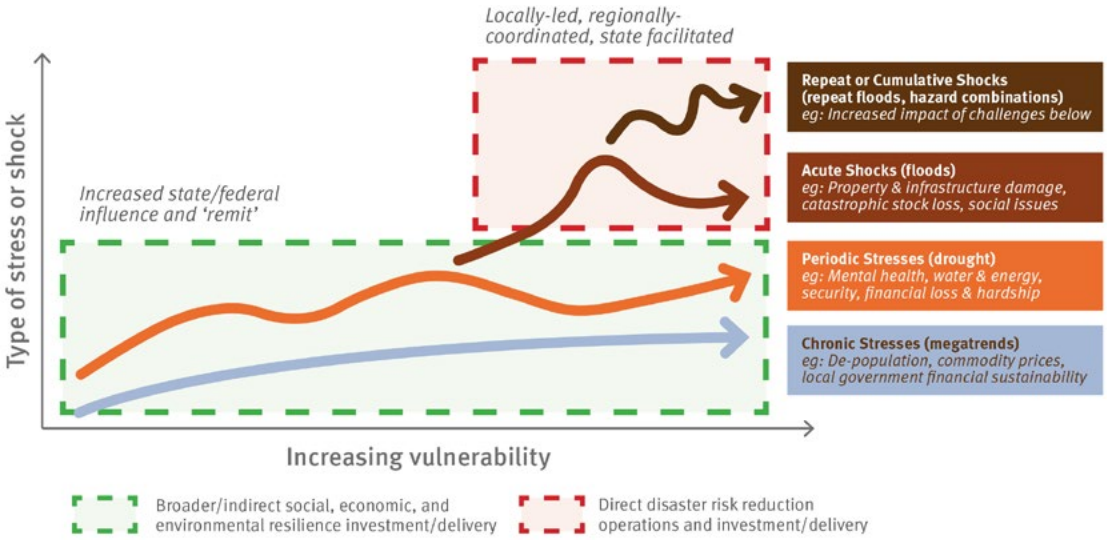
"Drought is very different here in Cape York than it is down south. Long dry spells or prolonged dry seasons is the language used… not specifically the word 'drought'."

Participant

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

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

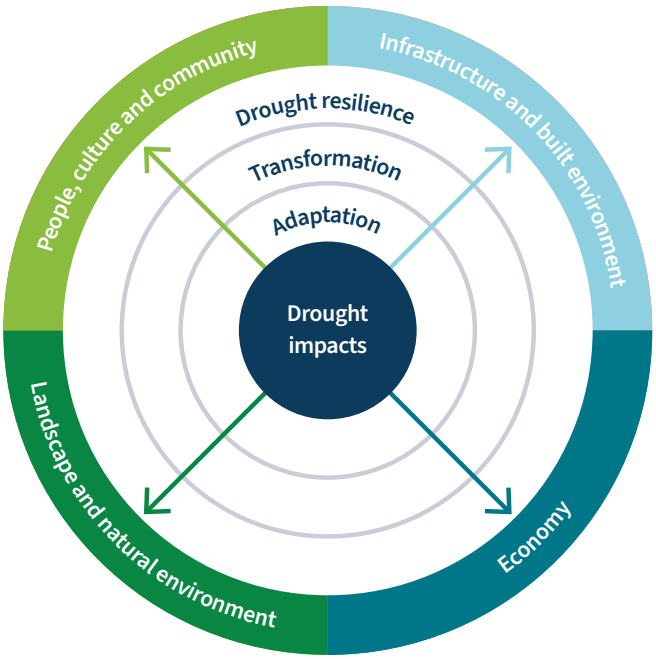
Figure 3: How resilience is affected by stresses and shocks. *Source: Queensland Reconstruction Authority.*



Whilst drought has been often referred to as "an enduring feature of the Australian landscape", when viewed in this context of community resilience, drought is also understood as a periodic stress that comes and goes. However, it is now evident that the warming caused by climate change has added to the variability in Queensland's weather and "increased the severity of drought conditions during periods of below-average rainfall".[6]

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

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



How to use this plan – strategic alignment

The purpose of this plan

The RDRP has been developed in accordance with guidelines distributed by the Australian Government's Future Drought Fund (FDF) program. It has been shaped by the inputs from key stakeholders, along with the voices and experiences of the region's people. Accordingly, the Plan's purpose is to:

- express the outcomes of the region's RDRP process and the region's aspirations and identify and establish networks and partnerships to support drought resilience planning and action
- combine the best of local and traditional knowledge with best practice data and information
- clearly identify and plan for the ongoing and future impacts of drought across the region and highlight pathways that the region can use to adapt to changes and build drought resilience
- specify key actions (regional/local) that can be implemented to build regional drought resilience.

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

Key inputs

The Queensland Regional Drought Resilience Planning program builds on work completed under QRA's Queensland Strategy for Disaster Resilience and its implementation plan, *Resilient Queensland*. RDRP meetings have indeed built upon the QRA resilience planning process. Throughout QRA's work and TCICA's development of regional resilience strategies, water shortages, variable climate and increased wildfire risk have been raised as a serious challenge impacting regions. The region's 14 LGA's have undertaken 12 months of consultation, with the QRA mapping the resilience landscape. The RDRP engagement approached followed on that conversation with a focus on identifying and planning for the impacts of drought and considering how to be more resilient to the impacts of future droughts. The RDRP Plan 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. This Plan draws from and builds upon many important works. Some key activities, projects and studies which have been drawn upon to inform this plan include the following key plans and programs:

- The Emerging RDA TNQ Regional Strategy
- TCICA Economic Opportunities Plan
- TCICA Regional Health Dialogue
- Cape York and Gulf Savannah Regional NRM Plans
- Local Council Corporate Plans and Cook Shire Plan
- Local Asset Management Plans and Cook Shire CIT Roadmap
- Cape York Regional Infrastructure Package
- TSIRC Water Usage Report and Case Study
- Cape York and Torres Strait Regional Resilience Plan (QRA)
- TCICA Regional Telecoms & Digital Connectivity Strategy
- Cape York Regional (Land Use) Plan & Cape York Water Plan
- Aboriginal & Torres Strait Islander Community Master Plans
- Local and District Disaster Management Plans
- Cook Shire Drought Plan and Healthy Country Plans
- LGA's Drinking Water Quality Management Plans
- TSRA's Torres Strait Regional Adaptation and Resilience Plan 2016–21

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

We also hope it will be closely considered by charities, non-government organisations, not-for-profits, businesses and government agencies with an interest in the region.

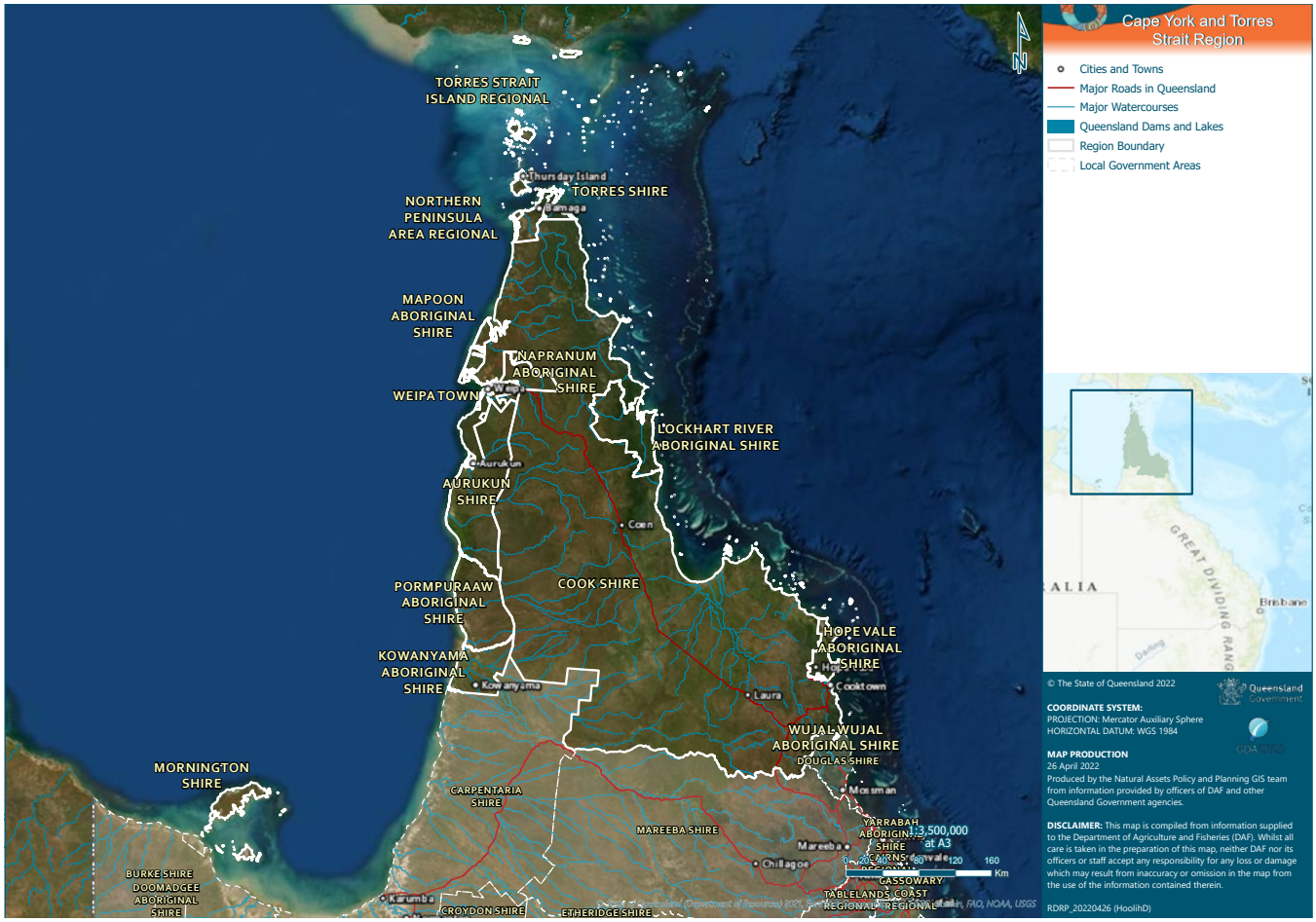
When this plan should be considered

There is a strong focus on aligning with RDRP within the existing planning and programs frameworks for the region, but particularly within the QRA resilience planning framework. The plan should specifically be considered in supporting strategic regional actions and in seeking funding to progress implementation.

Image: Controlled burn along the Peninsula Development Road, Cape York. *Source: Torres Cape Indigenous Council Alliance.*

Regional profile

Figure 5: Cape York and Torres Strait regional map. *Source: Department of Agriculture and Fisheries, Queensland Government.*



The region is an iconic part of Northern Australia and Queensland, bounded by ocean on three sides and including the northern most tip of the Australian continent. Cape York in general is a weathered, low plain dominated by meandering rivers and large floodplains. The Torres Strait contains a group of at least 274 islands, some 18 of which are inhabited. The region also includes Mornington Island, which is in the Gulf of Carpentaria, and the largest of 22 low lying islands that form the Wellesley Islands group (Torres Cape Indigenous Council Alliance Inc, 2019). The region is an Indigenous domain and contains a wealth of leased grazing lands, Indigenous heritage, high conservation values and natural resources. It is bounded by the Coral Sea to the east, the Gulf to the west and Papua New Guinea to the north. It covers a land area of some 130,000 km^2 and includes 14 Local Government areas (see Figures 6 and 7).

Figure 6: Councils, land area, population and percentage Identifying as Aboriginal and/or Torres Strait Islander in the region. *Source: Australian Bureau of Statistics, Census Data 2021.*

Council	Area (km^2)	Estimated Resident Population (2021)[1]	% Indigenous and / or Torres Strait Islander (2021)[1]
Aurukun	7,424.0	1,347	88.7%
Cook	105,719.7	4,638	21.1%
Hope Vale	1,111.7	1,157	88.4%
Kowanyama	2,555.3	1,016	86.8%
Lockhart River	3,574.5	817	78.4%
Mapoon	537.1	346	78.2%
Mornington Island	1247.7	1,233	80.2%
Napranum	2,004.4	1,114	81.1%
Northern Peninsula Area	1,052.1	3,255	82.2%
Pormpuraaw	4,395.4	860	78.4%
Torres Shires Councils	883.7	3,938	68.9%
Torres Strait Islands Regional Council	490.0	5,236	90.6%
Weipa	10.8	4,556	19.9%
Wujal Wujal	11.8	319	93.5%
Total	**131,018.3**	**29,852**	**61.8%**

Figure 7: Regional socioeconomic profile.

	Torres Strait and Cape York region	Queensland
Population as at June 2021 (people)	29,852	5,221,233
Median total personal income $/year (2021)	$29,628	$40,924
Expected population of region in 2041	32,360	7,161,661
Australian Digital Inclusion Index: 2021 *(Region Mean)*	66.25%*	71.1%
Median age of residents as at 30/06/2020	30.2 yrs	37.8 yrs
Unemployment rate December quarter 2021 *(excl. Aurukun & Cook) (Range 11% – 56.5%)*	23.8%	5.5%
% Aboriginal or Torres Strait Islander Peoples (2016) *(Range 19.5% – 94.8%)*	65.7%	4.0%
SEIFA 2016 Socio Economic Index of Social Disadvantage **(Mean of 14 LGAs) (Weipa of 1064)	691**	996
% people who speak a language other than English at home (2021)	42.8%	13.5%
% of families with children under 15 years of age and no parent employed in region (2016)	36.5%	13.8%
Registered businesses as at 30/06/2021 *1–4 employees*	855	460,807
Remoteness Area (RA) classification in 2016	82.4%	1.1%
Contributed to Queensland GDP	$1.416 billion	$360.971 billion

Source: QLD Treasury Office, TCICA, Australian Digital Inclusion Index, Qld Mental Health Commission.

Although the region is remote, it is recognised both nationally and internationally for its vibrant and diverse communities, cultures and traditions, and its outstanding natural and cultural values. It is sparsely populated, covering around 7% of Queensland's land area, but less than 0.5% of the State's population (Department of Environment and Science, 2019). The entire region is classed as remote or very remote (Australian Bureau of Statistics, 2020). The most populated towns are Weipa, Cooktown and Thursday Island. Cape York, Torres Strait and Mornington Island indeed have a rich Indigenous heritage; one reflected in the large proportion of the population who identify as Aboriginal and/or Torres Strait Islander at 65.7% (varying from 20% in Weipa to 95% in Napranum). This compares to a Queensland average of 4.0%.

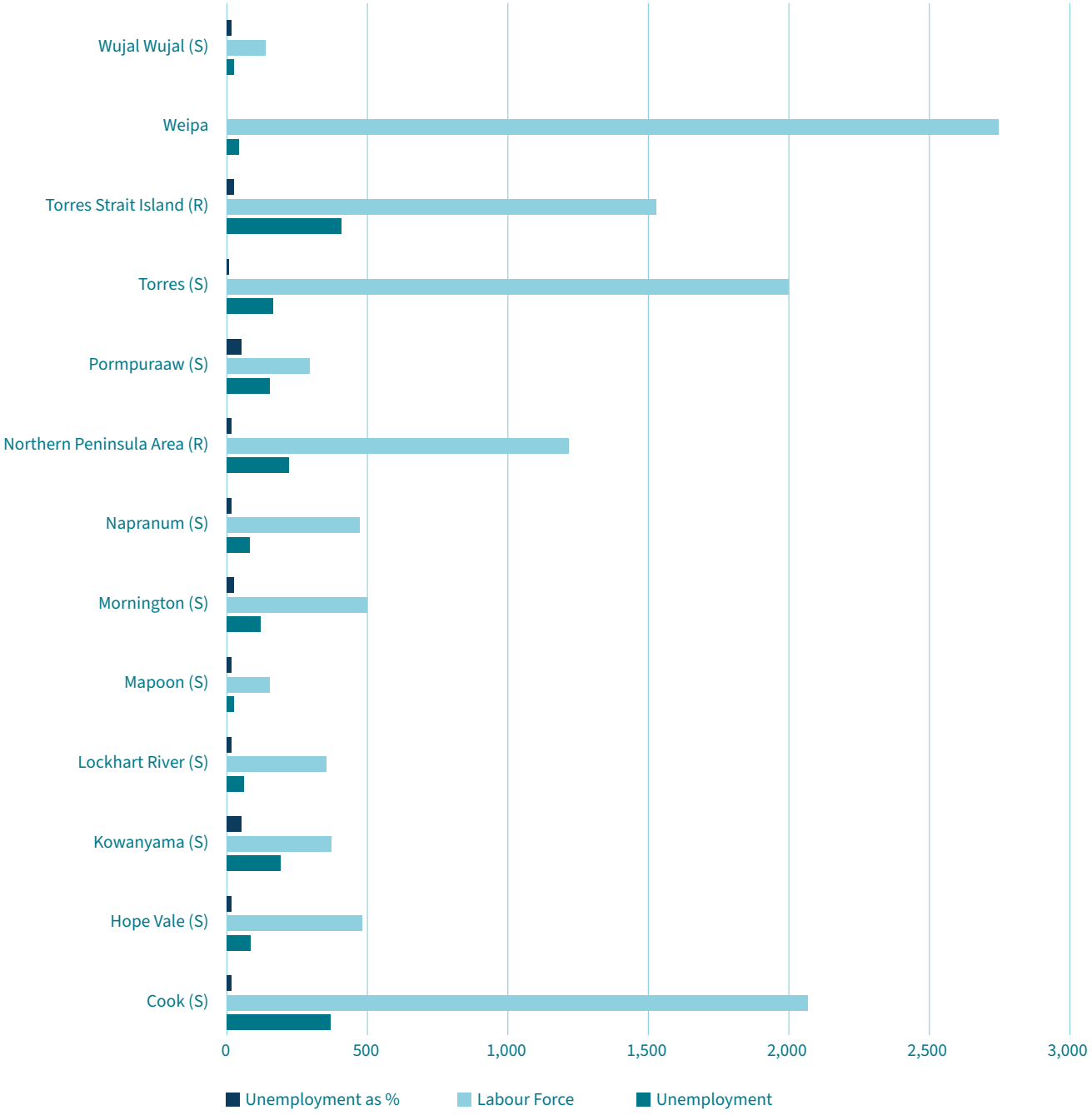
Employment (see Figure 8) is typically less than 50% (Australian Bureau of Statistics, 2020). The statistic varies widely across Local Government Areas from 75% (Weipa Shire) to less than 25% (Napranum Shire). Employment is dominated by the government sector, including Public Administration and Safety (21%) and Education and Training (10%). Mining is well represented across several shires at 15% of total employment.

Agriculture, Forestry and Fishing represents only 4% of the total employment in the region. Agricultural production from Cape York totalled $42.1M (Australian Bureau of Statistics, 2021), with $1.5M from crops (4%) and $40.6M from livestock (96%).

This total agricultural production represents 0.31% of Queensland's production, and 0.07% of national production (Australian Bureau of Statistics, 2021). Small scale horticulture occurs around Lakeland Downs and the Endeavour Valley, with a focus on bananas, sorghum, corn, legumes and a range of tropical fruit. The Lakeland district is highly dependent on groundwater and limited surface water storages, making it intensely vulnerable to drought. A rich fishing industry exists in both the Torres Strait and the Gulf of Carpentaria, with the Gulf fishery being drought susceptible. Savanna burning projects and carbon credits generated have created a new industry on Cape York, which "supplements" the incomes of Traditional Owners and pastoralists as a component of the agricultural production.

The 2016 Australian Bureau of Statistics' Socio-Economic Indexes for Areas (SEIFA), as a relative measure of people's access to material and social resources (Figure 8), indicates the region faces challenges, with all of the Local Government Areas (except Weipa) within the 10% highest for Index of Relative Socio-economic Disadvantage (IRSD), lowest 10% for Index of Relative Socio-economic Advantage and Disadvantage (IRSAD) and lowest 10% for Index of Economic Resources (IER) (Australian Bureau of Statistics, 2018).

Figure 8: Unemployment and Labour Force status. *Source: Australian Government National Skills Commission, March 2022.*

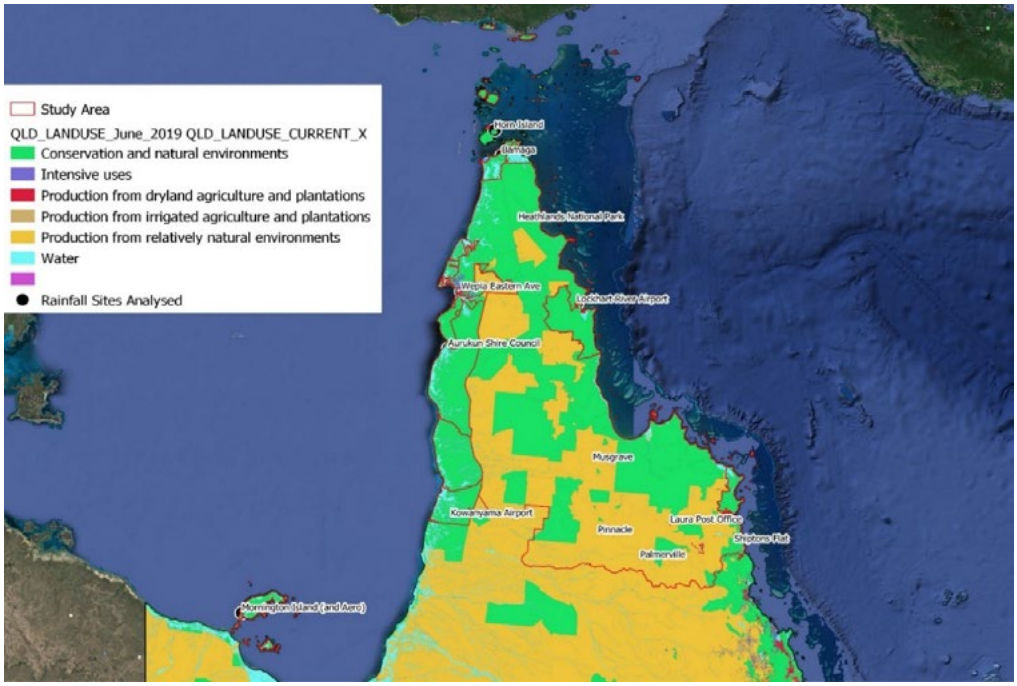


The majority of the region is Aboriginal Freehold Land (ALA), including Cape York Peninsula Aboriginal Land (CYPAL) in joint management of National Parks and protected areas (~65%). Pastoral leases cover some 44% of the study area, with mining leases (especially about Weipa) being the third largest category (Figure 9).

Summers are hot with maximum temperatures of 33–36°C in January. The coolest temperatures are experienced along the coast and to the east. Humidity is high, averaging 60–80%, across the region with southern inland readings lowest. Temperatures moderate in winter with July average minimums dropping to 21°C in the north and 15°C in the southern inland. Evaporation rates, especially during the late dry season (Sept–Dec), in response to low humidity and high temperatures, are very high. These often exceed monthly rainfall totals by an order of magnitude, which leads to rapid loss of surface waters and reduced soil moisture. Indeed, the region's annual average potential evaporation is almost 50% greater than the annual average rainfall, contributing to the depletion of soil moisture (Dept. of Environment and Sciences, 2019).

On a national basis, the region receives some of the highest annual average rainfalls, broadly receiving greater than 1,000mm/year, increasing towards the east and the tip of Cape York. Rainfall within the region is typified by a very strong wet (Oct–March) and dry (April–Sept) seasonal pattern. Rainfall is driven both by the south-east winds on the east coast captured by elevated topography and annually by the impact of the southern monsoon. The east coast has a hot and humid climate with seasonal south-east trade winds that can generate rainfall across the year. The western regions of Cape York are dry tropical with a true summer monsoon weather pattern from November to April. Annual average rainfall varies from approximately 1,000mm in the south (Palmerville) to greater than 3,000mm in the Lockhart River catchment in the north east. Some 80–90% of the rainfall occurs during the four months from December to March with early and late storms occurring in November and April (Department of Environment and Science, 2018). Within the region, the rainfall variability index ranges from 0.4 to 0.9. Variability Index values are lower within the north and west coast (~0.5) than in the southern and central areas (~0.85).

Figure 9: Land use in the region. *Source: Australian Land Use and Management Classification Primary Code Level.*



As a consequence of rainfall, there are many water resources in the region with multiple values, including wetlands, water courses, floodplains, coastal areas, aquifers and the major rivers; the cultural and environmental lifeblood of many communities. Across the Peninsula, water resources include fifteen complete river basins and two partial ones (Cape York NRM, 2016). East flowing river catchments are generally steeper, shorter and contain fewer permanent lagoons, whereas west flowing rivers like those in the Mitchell catchment experience large wet season flows and widespread flooding but have very low or no flows in the dryer parts of the year. The Gulf coast in the west contains some extensive wetlands, fourteen of which have attracted national importance for waterbird populations.

There are also abundant ground water resources, particularly in the sedimentary deposits of the Annan, Carpentaria and Laura rivers. There are various arrangements and different responsible authorities for providing water supply to the population centres of Cape York, delivered via a combination of surface water and ground water, and extraction from some perennial river systems. Most rivers, however, are perennial subject to large variations in flow. Large properties and isolated commercial activities rely on a combination of annually unstable groundwater bores, in stream pumps, small weirs and dams and rainwater tanks.

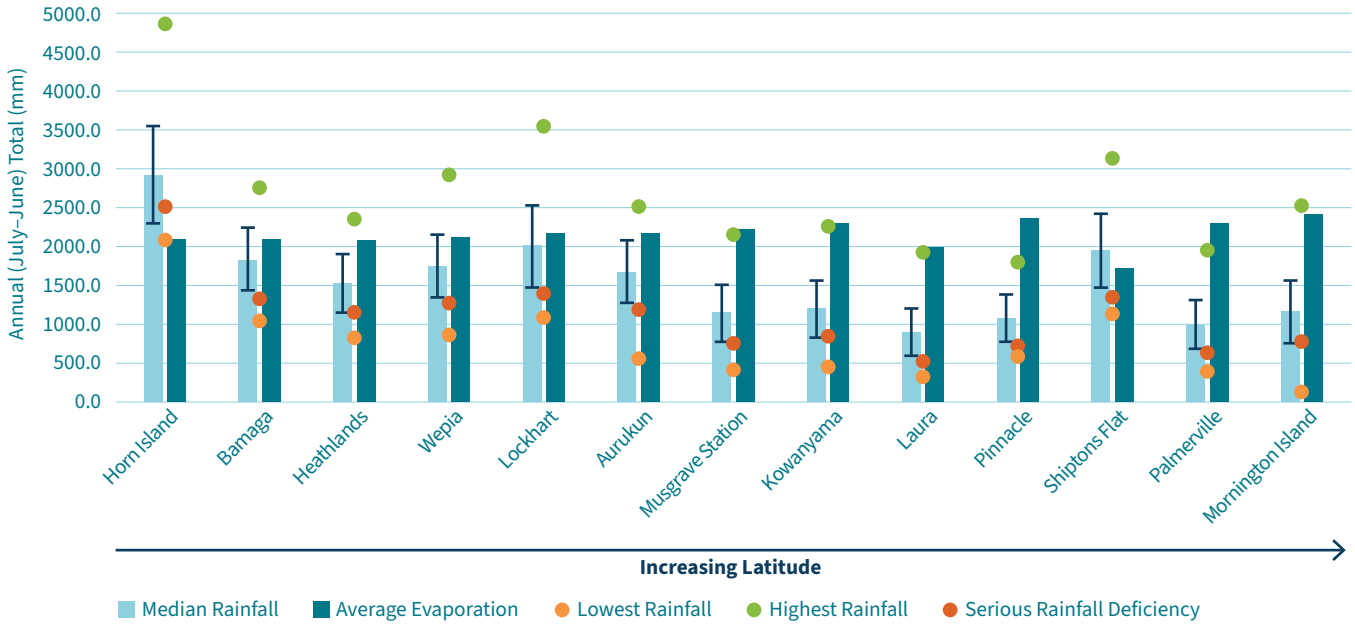
Image: Kowanyama Cattle Muster 2021. *Source: Kowanyama Aboriginal Shire Council.*

History of drought in this region

The region has a strong and pronounced wet/dry season signature in the rainfall record (Figure 10). For this reason, regional people tend not to use the traditional language of drought heard in other parts of Australia. There is a deep and nuanced vernacular, deeply embedded in the Indigenous languages and local ways of talking about dryness and extreme dry. People may often refer to long dry seasons, late wets, or even failed monsoons. While different to the notion of extended drought in the south, these conditions bring many significant challenges to the region's Traditional Owners, graziers, service communities, Local government and the region's nationally and internationally significant cultural and environmental values.

With the vast majority of rainfall occurring in the November to March period, there are intense dry seasons where little to no rain falls (April–October) every year, especially in the central and west of the region. Combined with high temperatures that drive high evaporation rates (especially in the late dry season), the region experiences seasonal rainfall shortages. Additionally, as mentioned above, the region's annual average potential evaporation is almost 50% greater than the annual average rainfall, which contributes to the depletion of soil moisture (Department of Environment and Science, 2019). Where a wet season is late or provides low rainfall, this very quickly translates into an extended period of extremely dry conditions, translating into water shortages such as in communities, industries, infrastructure providers and services. In times of low rainfall or late wet seasons the region also experiences prolonged wildfire seasons.

Figure 10: Median annual rainfall (+- standard deviation), average evaporation, lowest and highest recorded rainfall and serious rainfall deficiency (drought) for selected rainfall stations analyses (all years data). *Source: BoM.*



Formalised drought declarations are rare in the region (Queensland Government, 2021), and this may be a result of institutional and social factors rather than actual need. Only portions of the Cook, Kowanyama and Pormpuraaw shires have recorded formal declarations (and less than 1:20 years). Drought declarations, however, will only occur where particular (more southern) definitions of drought are applied, and application has been successfully made to a Local Drought Committee. With a less formalised agricultural and grazing sector, the occurrence of drought conditions is likely to exceed the occurrence of drought declarations. The engagement also identified that people in the agriculture and grazing sector did not apply for drought funding due to self-sufficiency, lack of digital connectivity and computer literacy. To improve resilience in the region, both of these need to be improved as the region may miss out on future funding opportunities. Indicatively, in the period 1989–2018, dry years (rainfall totals in the lowest 30%) occurred seven times, and wet years (highest 30%) occurred 11 times. This is consistent with the previous 30-year period (1959–1988) where eight and 11 years were recorded respectively. Annual rainfall across Cape York has been relatively stable, with a slight (3%) increase observed (CSIRO and BoM, 2015). Inter-year variability of rainfall within the study area is low, and some of the lowest in Australia. The Variability Index tends to decrease in the north of the region, with increasing reliability of the monsoon systems. An early break to the wet season (rains Oct–Dec) is unreliable, while monsoon season rains (Jan–Apr) are very reliable, with approximately 22% variation in totals received year-to-year (CSIRO and BoM, 2015).

Studies examining long-term rainfall patterns and pasture growth trends (Cobon, et al., 2019) have noted, however, that rainfall variability has significantly increased 1910–1960 versus 1961–2010. This increased variability was influenced by increasing wet extremes rather than prolonged or severe dry periods, and consistent with observed and modelled changes in the main climate drivers (e.g. ENSO) for the region. Low rainfall conditions (Serious or Severe) are typically experienced by a small number of sites within any given year. However, in several notable examples, such conditions were widespread within the region, impacting multiple sites. Notable years include 1918, 1922, 1925, 1960, 1965, 1987, 2014 and 2018. A correlation with multi-year variation in wet season rainfall within the region and the El Niño-Southern Oscillation (ENSO) has been reported (Sharmila and Hendon, 2020) in Figure 11. Broadscale droughts in Australia, such as the Federation Drought (1895–1903) and the Millennium Drought (2001–2009), did not appear to produce similar widespread and persistent drought conditions within the region (Cape York NRM, 2016).

Across the region, consecutive drought years (i.e. Serious or Severe Rainfall deficiency) tend to be uncommon (Figure 11), with preceding or successive years annual rainfall totals more than the drought criteria applied. Mornington Island is an exception, with several multi-year (up to 3yrs 1995–1998) droughts noted. The use of Serious Rainfall Deficiency (10% of rainfall record) as a drought criteria assumes that while these are relatively uncommon events (~1:10yr or greater), they will result in stress in the system observed (community, agriculture, environment), and thus they are a useful proxy for the occurrence of observable drought. However, analysis of 13 Bureau of Meteorology Stations indicated that the use of the 10 percentile requires some caution. Rainfall records are typically positively skewed towards a small number of extreme high rainfall events. As a consequence, the Serious Rainfall Deficiency criteria may be exceeded while the region still receives 75% of the median annual rainfall (Figure 10). The engagement also identified that base line data is lacking in the region, with few weather stations and rainfall gauges. Resilience will only come if we have a better understanding of the ecology of the region and improved weather and climatic data to make informed designs on how the country can become resilient to the effects of drought.

Figure 11: Number of rainfall stations recording drought conditions with data & Southern Oscillation Index (SOI).

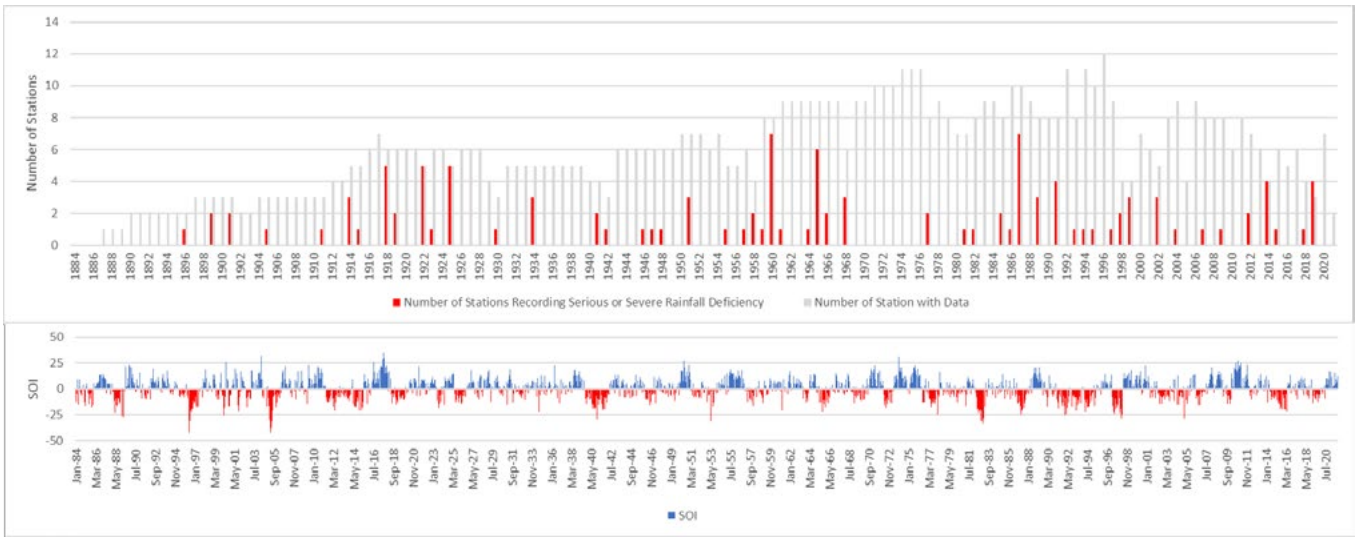


Image: Beach sunset in Pormpuraaw. *Source: Jennifer McHugh.*

Past impacts of drought in this region

The TCICA region has a unique rainfall pattern highly dominated by rainfall in the wet (November–March) and little or no rainfall in the dry (April–October). This proves challenging to apply the traditional concept of drought, which is more easily understood in southern Australia, where the combination of deeper droughts and their impact on agriculture are perhaps more in the public eye. As with all Australian landscapes, drought, in its various forms, is a significant and predictable feature of the climate in the region. However, due to the combination of relatively high rainfall and low variability influenced by the relatively dependable southern monsoon, the incidence of traditional forms of drought are less than across most of Australia. Again, Mornington Island is perhaps the exception, with a climatic zone more similar to the Southern Gulf area. When drought occurs, however, this lack of regularity can have significant consequences.

Because traditional drought narratives are largely conceptualised relative to southern Australian farming conditions, official drought or institutionalised declarations within the study area are rare (<5% of months drought declared post 1964). **Regular lack of water, however, is a key feature of this region** coupled with long dry periods with increased risk of wildfires. Long dry seasons where little or no rain falls, coupled with high evaporation rates (often twice or more the annual total rainfall) often see water stress across the region. This is especially evident in many communities, where infrastructure is challenged and a low and/or late wet season will see supply issues.

"Lagoons, rivers and wetland hold significant place for community. These places are visited, used for fishing, hunting and camping. They are cultural significant and story places. Resilience is in having health country and if the country is sick then you have a sick community. Country can't be healthy unless it is lived on. The country needs people on it to see it, observe it and protect it. See the seasonally changes. Without people living on Country how can we see the impacts of drought, how can we prepare for future events if we are not on the land. It is similar to the western view of we don't know what's out there to preserve and protect but for Indigenous people we aren't on the land so the land is sick. We need people back on the land to read country, weather patterns, see the growing seasons and fire seasons."

Participant

Communities in the Cape and Torres region experience water shortages, reduced water quality and restrictions each dry season. These conditions are strongly exacerbated by drought. Aging infrastructure and excessively high-water usage contribute to the water shortages and restrictions. Each of the LGA's reported excessive water usage and the Master Plans identified that most of communities are in excess of an average daily household demand of 500 l/d. Indeed, some councils report a daily usage of up 1000–2000 l/d. Community Master Plans identified current supply does not meet either current or predicted future demand.

In regard to agricultural operations in the region, drought risk has been nationally modelled to examine the potential impact of drought on farm profits and household income (Hughes, Burns, Soh and Lawson, 2020). This indicates that the region is within the lowest risk categories, largely in response to large farm sizes, a lower proportion of cropping activity and low exposure to drought. The Cape York and the Queensland Gulf region, however, recorded a risk (expressed as a percentage change in farm profit between normal and drought years) of 18.3% (Hughes, Burns, Soh and Lawson, 2020). This is due to a combination of the low incidence of multi-year droughts, low stocking density of most properties and very extensive holdings (100,000Ha+). Some useful rainfall events (50mm+) are expected during the Wet across the region, even in low rainfall years (CSIRO and BoM, 2015). During the Wet, pasture growth is rapid, and potentially more so than higher rainfall years in response to less cloud cover. Where pastoral operations have water points, stock can graze native pastures during dry seasons with limited stock losses, especially where dietary supplements (licks) are provided. In short, annual and deep dryness affects what is possible, more due to a lack of available water for irrigation and the drying out of bores and small dams. Where substantive ground-water resources have been used for horticulture however (e.g. Lakeland), there is indeed an existential production threat to significant horticultural crops. This is why alternative water sources are being explored.

In 2015, parts of Cook Shire, Pormpuraaw and Kowanyama LGA were officially declared to be in drought. The dry winter period coupled with persistent drought conditions meant there had been little relief for affected producers. In times of prolonged dry season the dams and swamps run dry. Producers have to take calves off their mothers to feed them, that way the calves and mothers don't die. The longer dry seasons also means that there is an increase in the wildfire season which are getting longer and more intense.

"After wildfire have gone through, the grasses are killed and food availability for cattle is lost. There is a loss of ground cover, top soil and bare earth is exposed. When the region experiences long dry seasons, cattle feed runs out. Graziers have to purchase feed from Mareeba as irrigation and water licencing regulations prohibit them from growing their own feed. In dry periods the grasses are nutrient poor and cattle need to be supplementary fed through extended dry periods. Many graziers in the region are looking at ways to diversify their income. Many properties are destocking and moving to a carbon economy."

Participant

In addition to the wildfire risks mentioned above, increased deep wet and dry cycles are likely to significantly impact operational and ecological impacts as well as impacts on areas of cultural significance. Consequently, increased water and heat stress within cattle operations are also likely to require significant rethinking of paddock and landscape design. Economically, this also impacts savanna burning projects, and carbon credits are an important and emerging sector within the region. The ability to implement managed and strategic burns is central to the success of these projects, and it is becoming an increasingly important part of the Peninsula economy. Several areas have noted that during dry years, especially with high temperatures, large wildfires have run unmanaged across sections of the region. Beyond the ecological and cultural effects of these fires, they have dramatically decreased the carbon earning potentials.

"Prolonged dry seasons impact on native grasses which are predominately savanna grasslands in Cape York. Dry periods impact on open woodlands and melaleuca communities which grow in floodplains. These systems require recharge from the rains to keep healthy biodiversity. In times of extended dry periods the natural systems, seeps, creeks and rivers that typically pull up fires have dried out and fire will travel into unburnt and fire sensitive communities. Repeated wildfires in these communities cause them to disappear from the ecosystem and this is occurring in Cape York. People who manage country in Cape York like pastoralists, Aboriginal Corporations and Land Trust and NRM land managers like QPWS will all be impacted by longer dry seasons and the wildfires that dryness will bring."

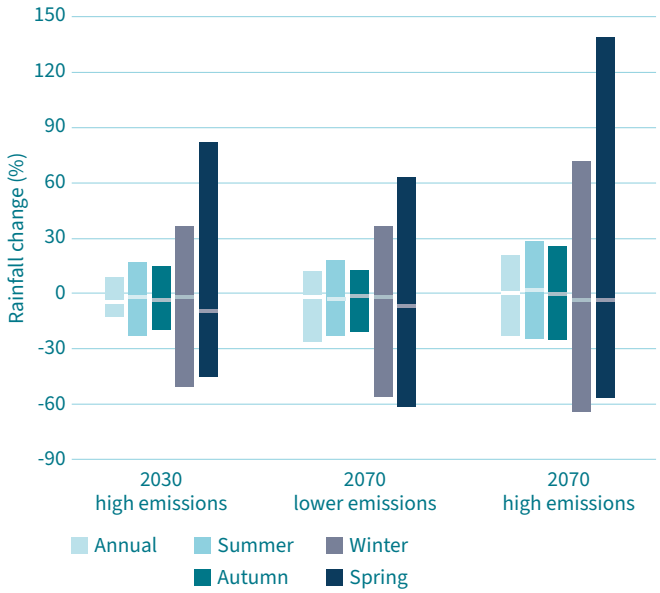
Participant

Image: Kowanyama Cattle Muster 2021. *Source: Kowanyama Aboriginal Shire Council.*

Likely future impacts (risks) of drought in this region

Due to the effect of climate change, Australia as a whole, has been getting warmer. Since 1910, the average maximum (daytime) temperature has risen by 0.7°C and the minimum (night time) temperature by 1.1°C, with much of this change occurring since 1950 (Howden, Crimp and Stokes, 2008). The region presents a variable climate future. The Department of Environment and Science (2019) summarises key variables as higher temperatures, hotter and more frequent hot days, more intense downpours, less frequent but more intense tropical cyclones, rising sea level and more frequent sea-level extremes. Warmer and more acidic seas are also likely contributing to coral reef bleaching on both the east and west coast.

Figure 12: Modelled percentage change in future Rainfall for 2030 and 2070 under various emission scenarios. *Source: Adapted from DES, 2019.*

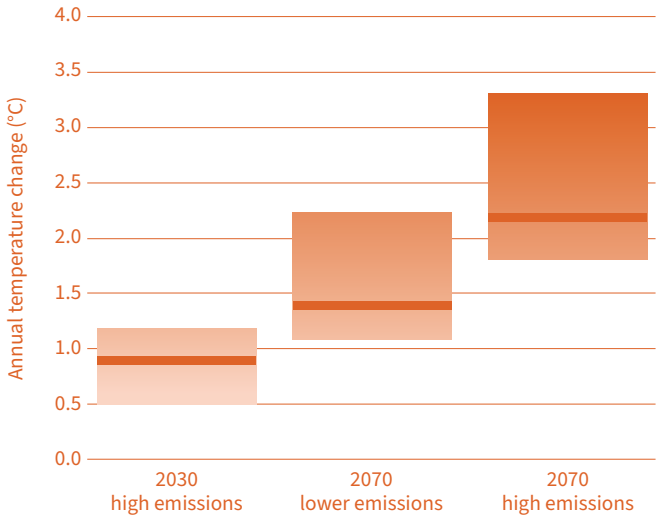


Regional predictions are that generally, rainfall totals will slightly increase (see Figure 12), but importantly, they will be more variable, especially with regards to extreme rainfall events (Department of Environment and Science, 2019), with likely prolonged dry seasons or rains will come later when they do occur. As such, the prevalence of (metrological) drought conditions into the future within the region will likely remain at or about the current frequency (Gulf Savannah NRM, 2022).

Temperature, however, is expected to significantly increase across the region under all of the various emission scenarios (DES, 2019). This has the potential to increase evaporation rates, decrease soil moisture and directly impact critical processes within the region, such as fire management. This also has important implications for local water storage and supply, especially within communities that already experience annual seasonal water stress. Drinking water quality decreases and it becomes less palatable, increasing the purchase of bottled water or sugar drinks. People are unable to water market gardens and lawns. Cultural, fishing and hunting activities are curtailed. Within the agricultural sector, drought conditions related to decreased soil moisture will potentially become more prevalent under all modelled scenarios.

Increasing temperatures have significant implications for agricultural production, especially for beef production, which currently accounts for 96% of total regional production (see Figure 13). Thermal stress indices of greater than 80 (on the Temperature–Humidity Index) significantly impact production. These conditions are predicted to increase in frequency from a current frequency of 50–70% of days per year, to 100% with a temperature increase of +2.7°C by 2100 (Cobon, Terwijn and Williams, 2017). Water demand by livestock is also strongly related to temperature and is therefore likely to increase as temperatures rise. Higher demand mean that stock will be unable to travel far from watering points, limiting use of the grazing resource in extensive grazing operations and tending to increase grazing pressure and soil degradation near watering points. Further, to this increased demand by stock and increased evaporation rates may make surface water scarcer and accelerate the depletion of surface waters and small water storages such as farm dams (Howden, Crimp and Stokes, 2008), with impacts of both graziers and infrastructure builders.

Figure 13: Modelled temperature increases for 2030 and 2070 under various emission scenarios. *Source: Adapted from DES, 2019.*

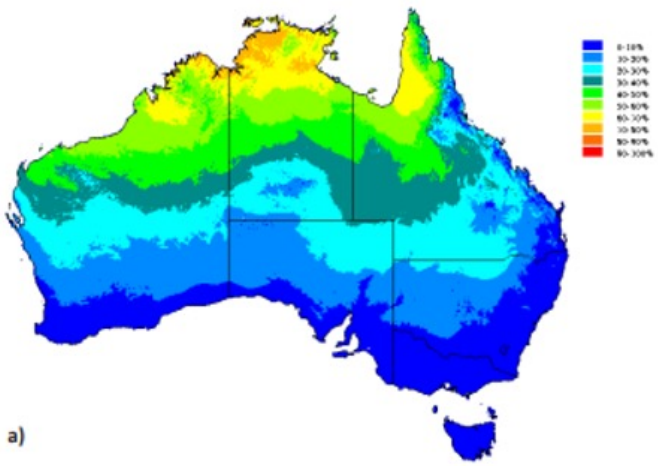


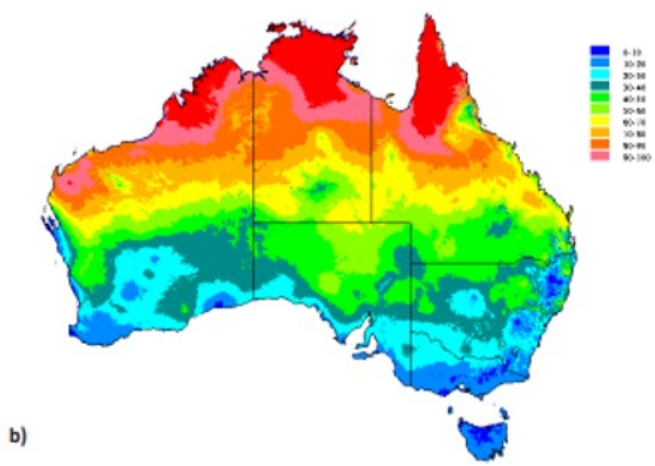
Increased temperatures and the associated water stress also have the potential to directly impact the liveability of the region (see Figure 14). Wet bulb temperatures in excess of 31°C already occur within the region on a relatively low frequency. All modelling projections (RCP2.6, 4.5 and 8.5 to 2090) shows an increase in the frequency of days exceeding thresholds for temperature and humidity beyond which climatic conditions become deadly (Mora et al., 2017). This is in the context of the many communities which are already experiencing significant social disadvantage and have limited capacity for social adaption.

Without action, the above predicted climate impacts will likely exacerbate the past experience of the impacts of drought outlined in Chapter 8. Impacts on ecological and cultural places of significance will intensify, impacting Indigenous cultural practices and food security (through hunting and bush foods). Local water supply problems will worsen, affecting basic water security to communities, properties and outstations. Pastoral operations will face increasing operational risk, and the depth of dry season water insecurity will likely increase for economically impacted horticultural districts. The risk of wildfire will increase, with declining surface and groundwater availability to enable effective fire management options.

These emerging impacts lend testament for the need for regional strategies to address drought within the region, alongside and within wider strategies for improving the region's resilience to disaster.

Figure 14: Frequency of days per year that temperature-humidity Index > 80 for 1957–1997 and Future Climate Scenario of +2.7oC. *Source: Mora et al., 2017.*





What existing planning is telling us about drought priorities

Whilst Cape York, Torres Strait and Mornington Island are not Australian places traditionally associated with drought, changing weather patterns will mean that periods of prolonged dry weather and reduced water supply will become more severe, and wildfire will increase. It is in this context that we plan for drought in this northernmost part of Australia. This RDRP has both explored existing drought-related development initiatives and has engaged with a wide variety of regional stakeholders on their priorities. As mentioned before, several existing processes that have been able to be integrated into the RDRP process, including:

- QRA's and TCICA's broader **Resilience Planning** processes related to the region.
- TCICA's **Regional Economic Opportunities Strategy** and the **Cook Shire Communities in Transition process**, seeking to build a broader economic base across the region and within local communities.
- The TSRA's **Torres Strait Adaptation and Resilience Plan 2016–2021** (now being updated).
- **Cape York, Gulf Savannah and Torres Strait Regional NRM Plans**, addressing NRM challenges.
- Regional node negotiations associated with the **Tropical North Queensland Drought Hub**.
- TCICA's Telecommunications and **Digital Connectivity Strategy**, seeking to improve digital capacity and connectivity and to deepen economic and social resilience.
- The State's **Cape York Regional Plan** (2014), addressing a range of land use and natural resource management issues. The plan identifies areas of high ecological value and priority agricultural and living areas. It aims to reconcile competing values with community aspirations for development.

- The region's **Water Plan (Cape York)** finds a balance between the needs of existing water users, the environment and future water users, by providing for the necessary water requirements to sustain ecosystems, whether they depend on surface water or groundwater. It includes all surface and ground waters over 15 river catchments (excluding the Mitchell catchment, Mornington Island and the Torres Strait). System allocations have now been determined and include cultural and environmental values and some 516 GL in reserve (Department of Natural Resources, 2018).
- TSIRC and TSRA research and analysis works on water security and usage.

TCICA's engagement process has followed on from the 12-month consultation period with councils on resilience with the QRA, having also involved local industries and communities, 14 Councils, Cape York NRM, the Torres Strait Regional Authority, and several State and Federal agencies. Combined, literature reviews and these community engagements have identified several consistent and emerging priorities of relevance to future drought management. These have included:

- **Water Security:** The need for a strong regional approach to water security, including water usage.
- **Agricultural Development and Food Security:** The need to use available water within the region to improve agricultural development outcomes and to translate this into improved food security.
- **Digital Connectivity and Capacity:** Implementing the region's digital resilience strategy.
- **Improved Pastoral Sector Resilience:** Growing drought resilience in the regions pastoral sector.
- **Coordinated Fire Management:** Ensuring culturally and socially appropriate burning regimes to protect from wildfire and deliver improved economic, social, cultural and ecological outcomes.
- **Improved Mental Health Servicing:** Delivering improved personal resilience to drought.
- **Improved Regional Governance Capacity:** Lifting the region's capacity to drive resilience strategies.

In this context of climate disruption, the impacts of future drought may be more intense and magnified in the region. As such, policy makers must ensure that water and drought policies take into account increased climate variability and a future of uncertain climate trajectories. To help address these priorities, the Australian Government has provided an integrated support package through the Future Drought fund to build the resilience of regional Australia to the impacts of drought. The Fund commits $5 billion from 2020–2024 to drought resilience programs. This RDRP for the region aims to use this Plan to do just that.

Building drought resilience in our region

Diverse narratives on key lessons about past drought have emerged from these engagements and include:

- that the region experiences drought in ways that are significant but different to other parts of Australia
- that dialogue about drought in the region needs to reflect to the way people talk about these issues
- the region faces significant resilience stresses to basic water/food security and digital connectivity
- agricultural development has historically been limited by a lack of stored water and extreme seasonal dryness, yet has much potential to expand through the right strategies
- the need for greater regional and property planning flexibility in supporting pastoralists to plan to increase their operational flexibility through more efficient vegetation management, water resource and associated fodder development, weed, pest animal and biosecurity management and fire management
- cultural and environmental values are a key feature of the region's future resilience, and both are significantly impacted through drought and wildfire risk
- projected climate change for the region will significantly increase the depth of droughts, temperature, evapotranspiration and demand on fragile water resources.

"Through the engagement a common thread emerged in that people have recognised the climate in the region is changing. The seasons are different and failed wet seasons are happening more often and the weather becoming less predictable. Bio-indicators are swinging around: trees flowering at weird times, crocs nesting early or late against the historic norm. Traditionally access to the region is cut off during the wet season because the Peninsula Development Road is cut off due to flooding. This year people have been able to travel around the Cape in March which has not been heard of."

Participant

With these lessons and future trends in mind, and considering the strong interplay between this RDRP and the QRA Resilience Plan, our vision is to increase drought resilience in the face of a more variable climate. Importantly, however, the engagement identified that there is a lack of base line data on drought impact for the region. More research is needed on how species are affected seasonally. We understand how drought affects cattle, but there is little understanding as to what that means for native fauna. We don't know what variable climate and drier conditions means to food availability for people and fauna.

The RDRP and QRA Regional Resilience Plan aims to improve resilience across the whole of Cape York and the Torres Strait region on economic, social, environmental and cultural terms. Infrastructure resilience is considered here to be embedded within economic, social and environmental considerations. These plans will support councils to embed regional resilience in their planning and decision-making functions. Improving resilience across the Cape and Torres region will reduce the long-term costs to the State and Federal Government in responding to events. A coordinated approach to regional resilience building will deliver economies of scale and help to drive resource efficiencies through better use of networks, consistent communications and minimising the risk of duplication.

Our region aims to set clear strategies and robust delivery arrangements to achieve this vision. This targets the priorities outlined previously. These priorities were determined by building on existing processes, through engagement and strategic dialogue among regional organisations. The region's partners are working actively on progressing all key emerging pathways (broad directions) and more detailed strategies within their mid to longer term work programs, though timing and sequencing can be resource dependent and affected by cross-cutting priorities such as responding to the current COVID pandemic. It is important to note that the region's communities and industries have engaged in this RDRP process, despite the timing coinciding with some of the most critical periods in the progression of the pandemic.

The Regional Drought Resilience Strategy

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

Based on the regional priorities identified above, the following key regional drought resilience strategies are emerging within the region. This strategic thinking also builds on the scenario planning work embedded in the Department of Environment and Science's Communities in Transition Roadmap for Cook Shire (CSIRO et al. 2019). This work involved and was informed by CSIRO's Resilience, Adaptation Pathways and Adaptation and Transformation Approach (RAPTA). Community thinking in that process canvassed current pressures and scenarios to determine potential future pathways. We have also carefully reflected on the importance of the relationship between drought resilience and drought vulnerability factors, as recommended by Phelps and Kelly (2019).

Particular care was also taken to align the pathways and strategies to Future Drought Fund priorities, and this is particularly reflected in the consideration of economic, social, environmental and cultural outcomes in each pathway.

To ensure a balanced quadruple bottom line approach, each strategy is denoted to reflect its influence on economic, environmental, social and cultural priorities. Each strategy reflects the Drought Resilience, Adaptation and Management Policy (DRAMP) Framework outlined by Crossman (2018). This summarises practical actions to prepare for and deal with drought through three pillars (Tsegai et al. 2015; Crossman 2018):

- **Key Pillar 1:** Implement drought monitoring and early warning systems
- **Key Pillar 2:** Assess drought vulnerability and risk
- **Key Pillar 3:** Implement measures to limit impacts of drought and better respond to drought.

These strategies have been developed to both reflect the globally recognised DRAMP Framework address economic, ecological, social and cultural benefit.

Image: View of Thursday Island. *Source: Torres Cape Indigenous Council Alliance.*

Pathway 1: Developing, implementing and monitoring the achievement of a cohesive water security strategy for communities and outstations across the region by 2025.

Cape York and Torres Strait Islander communities and outstations are among the highest levels of water insecurity in Queensland. Drought, along with other factors (such as a lack of water metering and household over-crowding), exacerbates this situation, and in some cases, can result in the loss of basic drinking water supplies. Poor water security exacerbates many factors facing the health and wellbeing of Indigenous people of the region, and equitable access to acceptably treated drinking water is an UN-recognised human right. Indeed, both water quality and supply issues are variously affected across our communities. As a problem deeply exacerbated by drought, the Regional Drought Resilience Plan recognises the need for local communities across the region to understand the risks, assess vulnerability and develop a cohesive package of measures that align the efforts of Federal, State and Local Governments. Without basic water security, the economic, social and cultural potential of our communities is limited.

Key regional actions:

- Determine foundational water security objectives through auditing (quality and quantity) and costing the water security needs of regional communities and outstations (**KP1** & **KP2**).
- Progress local water usage planning (storage/ distribution) and culturally appropriate water wise campaigns (**KP3**).
- Explore existing/new technologies and infrastructure that might deliver innovative water security solutions (**KP2**).
- Develop a cohesive program of works to deliver infrastructure and practice change for water security (**KP3**).
- Negotiate progressive State, Federal and private sector investment in priority water security needs (**KP3**).

Lead institutions	Key partners and stakeholders	Investment targets
• TCICA • TSRA • TSIRC	**Key partners** • Water Services Association of Australia **Key stakeholders** • Department of Regional Development, Manufacturing and Water • National Water Grid Authority • DATSIP	• National Water Grid Fund • Preparing Australia Fund • Future Drought Fund

Economic outcomes		Reduced cost risks to Councils and water service providers.
Environmental outcomes		Improved drinking water quality across the region.
Social and cultural outcomes		Improved community level health outcomes and increased community liveability.
Governance outcomes		More capacity for communities to reside in outstations to meet cultural obligations.

Pathway 2: Mobilise available water resources to deliver drought resilient economic opportunities and food security across the region.

Historically, agriculture has been extremely limited in the region because of its remoteness, limited opportunities to store available water, generally poor soils, and the crushing impact of extreme wet/dry rainfall cycles. There are also significant fodder, horticultural and some broadacre cropping opportunities. The region's environmental and cultural assets, however, also need to be protected and well managed. With the recent Cape York Water Plan allocating some 516 GL of water to potential consumptive use, the Cape has a generational opportunity to develop a more resilient agricultural and pastoral sector for the future. With Indigenous communities holding the rights to most of these waters, Councils, Traditional Owners and other agricultural interests have the shared interest needed to work together to explore these opportunities. This approach also needs to extend to establishing systems that deliver basic food security and affordability across our communities.

Key regional actions:

- Explore, develop and trial the most appropriate policy pathways for Traditional Owners, graziers and Councils to work together to access water for strategic agricultural development for economic and food security (**KP1** & **KP2**).
- Co-design an appropriate social enterprise model to foster local food production and distribution (**KP3**).
- Explore new infrastructure and technologies that might deliver innovative water security solutions (**KP2**).

Lead institutions	Key partners and stakeholders	Investment targets
• RECoE • Cape York NRM • TNQ Drought Hub	**Key partners** • TCICA • Health & Wellbeing Qld • RDA TNQ • QDAF • The Cairns Institute **Key stakeholders** • Cape York Land Council • Department of Regional Development Manufacturing and Water • Agforce / Growcom	• National Water Grid Fund • Future Drought Fund • CRCNA Indigenous EOI Call

Economic outcomes		Increased economic activity and diversity within the region.
Environmental outcomes		Processes in place to protect key regional environmental assets.
Social and cultural outcomes		Improved dietary health outcomes and social resilience of Traditional Owners/pastoralists.
Governance outcomes		Increased access to country for Traditional Owners and a stronger future for the Cape's Indigenous and non-Indigenous pastoralists.

Pathway 3: Implement TCICA's Digital Connectivity and Capacity Strategy to improve regional and community resilience in the face of drought and other disasters.

With drought being another broad stress on community resilience, in the region, improved participation in the digital economy would provide a major opportunity to diversify regional economies, develop improved global economic participation, improve workforce attraction and retention, and enable business competitiveness. The deployment of digital infrastructure also has significant non-economic impacts such as facilitating enhanced wellbeing, improved service delivery, opportunities for education and training, and improved liveability and social connectivity. Key to this is high-speed reliable digital connectivity, effective planning for access, and localised digital capabilities.

Key regional actions:

- Establish and operate an effective ICT Partnership Group to progress most appropriate infrastructure and technology solutions for implementation of the TCICA Digital Capacity Strategy (**KP2**).
- Secure the resources required to close infrastructure gaps, enable last-mile digital solutions and lift the digital literacy of institutions, business and individuals across the TCICA region (**KP3**).

Lead institutions	Key partners and stakeholders	Investment targets
• TCICA	**Key partners** • The Cairns Institute • TNQ Drought Hub • Gulf Savannah NRM • FNQROC **Key stakeholders** • NBN Co • Telecommunications Providers and Brokers	• Northern Australian Regional Connectivity Program • Blackspots Program

Economic outcomes		Increased economic opportunity and efficiency.
Environmental outcomes		Greater capacity for innovative environmental management.
Social and cultural outcomes		Increased social capital and improved health services. More effective regional governance.
Governance outcomes		Improved Traditional Owner capacity to manage cultural values more cultural events.

Pathway 4: Improve the general resilience of the pastoral, horticultural and cropping sectors to manage the impacts of drought.

While there are real opportunities for new agricultural development in the region, there is significant work to be done to build resilience of existing pastoral and cropping enterprises. The Future Drought Fund signals a shift in national and State Drought responses from more emergency assistance to long term approaches to resilience building at district and property scales. Cape York's pastoral sector is vulnerable to high rainfall variability and could significantly improve industry resilience through lifting business resilience, property design, targeted small scale feed production and more opportunities to diversify incomes through natural capital markets, tourism and other ventures. The Lakeland Irrigation area, which depends on groundwater and limited surface storages, is particularly vulnerable in the event of an extended number of dryer years. Much coordinated and cooperative effort is needed to lift this resilience.

Key regional actions:

- Establish a strong Cape York node within the TNQ Drought Hub develop and enable broad and coordinated strategies to support business resilience planning, action and adoption of innovation (**KP1** & **KP2**).
- Support the continued development of options to achieve long term water security for protecting assets and achieving agricultural growth in the Lakeland horticultural district (**KP3**).
- Within the context of the Cape York Water Plan, explore policy and technology options to increase targeted water storage and fodder production within Cape York pastoral enterprises (**KP3**).
- Explore targeted research and development priorities that could be progressed under the Future Drought Fund research programs or the Queensland government's Drought and Climate Adaptation Program (**KP3**).

Lead institutions	Key partners and stakeholders	Investment targets
• Cape York NRM	**Key partners** • TNQ Drought Hub • QDAF • Agforce • Growcom • RDA TNQ **Key stakeholders** • Department of Regional Development, Manufacturing and Water	• Future Drought Fund • National Water Grid Fund

Economic outcomes		Increased economic resilience in the pastoral sector and growth in horticulture/ cropping.
Environmental outcomes		Coordinated effort to maintain and enhance GBR and Gulf of Carpentaria water quality.
Social and cultural outcomes		Growth of social capital and services in key Peninsula communities.
Governance outcomes		Opportunities for Traditional Owners working on country and pastoral sector participation.

Pathway 5: Strengthen the coordination of fire management across the region to minimise the economic, social, cultural and ecological impacts of wildfires exacerbated by drought.

With predicted climate change scenarios in the region, the broad scale risks of regularised burning regimes being disrupted by more extreme fire events weighs heavily on the minds of land managers and communities. Wildfires have significant cultural, economic, environmental and operational impacts for people in the Peninsula. The Peninsula, however, has a long and proud history of coordinated fire management, information gathering and deployment. Indeed it played a key role in the formation of the Northern Australian Fire Information system, and it has been an iconic place that has benefitted from Traditional Owner leadership in the concept of cultural burns. The Peninsula now has a rapidly growing carbon abatement economy, providing economic diversity and opportunity for Traditional Owners and pastoralists alike. Key coordination systems have frayed, however, in recent years, and more needs to be done to re-grow the region's coordinative capability in this nationally important field. Important lessons could be drawn from other Australian regions.

Key regional actions:

- A more regionalised approach to annual fire mapping and upgraded information sharing (**KP1**).
- Revitalisation of regional coordination of fire information management, monitoring, planning and response (**KP2**).
- Ongoing coordinated support for well managed carbon farming enterprises and cultural burns (**KP3**).

Lead institutions	Key partners and stakeholders	Investment targets
• Cape York NRM	**Key partners** • Traditional Owner and Ranger Institutions • Agforce • TNQ Drought Hub **Key stakeholders** • QFES • NAFI • QDAF • QPWS • National Recovery and Resilience Agency	• Future Drought Fund • NESP Hubs

Economic outcomes		Reduced economic costs of fire disaster.
Environmental outcomes		Restoration and protection of culturally and environmentally appropriate burning regimes.
Social and cultural outcomes		Reduced stress from bushfire risk and increased presence on country for TOs.
Governance outcomes		Protection of key cultural assets and continuation of cultural burning practices.

Pathway 6: Improving mental health services in the region, and through better health care, bolster individual and family resilience to drought and other disasters.

Drought is just another one of the many stressed adding to poor health and mental health outcomes for Peninsula communities. A regional wide health forum hosted by TCICA in 2021 illustrated the high level of community demand for a more collaborative approach to improving preventative and acute health care arrangements across the region; one that proactively addresses the social determinants of health. There was a general desire to move to a more partnership-based between major providers and communities, including a strong place-based approach within individual communities. More baseline monitoring of weather and drought is also required to underpin these efforts, with more weather monitoring stations required in the region.

Key regional actions:

- Continue to develop a longer-term partnership framework for improving preventative health and health servicing arrangements across the region and its communities, including more place-based approaches (**KP2** & **KP3**).

Lead institutions	Key partners and stakeholders	Investment targets
• Based on emerging collaborative arrangements for improving preventative health and health servicing in the region.	**Key partners** • TCICA **Key stakeholders** • Queensland Aboriginal and Islander Health Council • Torres and Cape Regional Health Service • NQ PHN • Allied health services	• Commonwealth Department of Health • Queensland Health

Economic outcomes		Reduced health care costs through increase in preventative health approaches.
Environmental outcomes		More people engaged in managing country in culturally appropriate ways.
Social and cultural outcomes		Improved health outcomes and liveability within the region's communities.
Governance outcomes		Improved health outcomes for the key holders of cultural knowledge in the region.

Pathway 7: Improving the regional governance capacity at various scales within the region to plan, deliver and monitor progress towards regional disaster resilience.

Regional Drought Resilience Planning is just one activity on the wider process of building regional resilience in the face of drought and growing risks from climate change in the TCICA region. All three pillars of the DRAMP Framework need to be operational. This means building long term capacity in the region and at Council and property/business scales to grow overall disaster and drought resilience. This particularly means Federal, State and Local Governments working well together and with industries and communities to support regional and local action.

Key regional actions:

- Include drought considerations in TCICA annual disaster management forums, including the inclusion of anticipatory data and knowledge systems and improved measurement of impacts (**KP1** & **KP2**).
- Build on the region's existing foundational capacity for long term drought resilience planning, delivery, monitoring, evaluation and learning (**KP1**–**KP3**).
- Explore and deploy development of a strong, regionally focused model for the long-term institutional management of water, energy and digital infrastructure and technologies across communities (**KP2** & **KP3**).
- Work with both Federal and State Governments for firming up the strength of regional NRM arrangements in Cape York Peninsula and the Torres Strait for the longer term (**KP2** & **KP3**).
- Improve baseline level weather monitoring and the relevance and deployment of prediction tools in the region (**KP1**).

Lead institutions	Key partners and stakeholders	Investment targets
• RECoE • TCICA • Cape York NRM • TSRA	**Key partners** • The Cairns Institute • QRA/BOM • NEMA • TNQ Drought Hub	• Future Drought Fund • TNQ Drought Hub

Economic outcomes		Reduced economic costs of disaster.
Environmental outcomes		More efficient investment into regional environment improvements.
Social and cultural outcomes		Improved regional social cohesion and more effective regional governance.
Governance outcomes		Greater integration of cultural considerations in planning/delivery.

Building local drought priorities and actions

This Regional Drought Resilience Plan (RDRP) is focused on developing the broader regional strategies required at the whole of region scale. This is needed to structure and enable local scale responses to these issues in at least two contexts:

1. At local community scales, i.e. in Mornington Island, Kowanyama, Pormpuraaw, Aurukun, Napranum, Weipa, Mapoon, the Northern Peninsula Area (NPA) communities, Thursday/Horn Islands, Torres Strait Island Regional Council (TSIRC) Island Communities, Lockhart River, Coen, Laura, Musgrave, Hopevale, Cooktown, Lakeland and Wujal Wujal.
2. At property scale on Indigenous, pastoral and farming properties across the region.

As a regional plan, this process has not been sufficiently resourced or programmed to develop detailed local drought responses in these two local contexts, but this effort is progressing well in the context of the QRA Resilience Strategy process. Indeed, the region is positioned to progress support for the resolution of regional plan priorities at those scales. The following details, how the regional strategies outlined here, will enable the progression of local priorities into action.

Translating regional strategies in local community action

As outlined in the regional strategy part of the document, this plan mobilises localised strategic action by relevant stakeholders on several key "whole of region" issues of importance in building drought resilience. More research will be needed to quantify the significance of these issues. With examples of emerging local area actions, these include:

1. Water security (e.g. more drought resilient water supplies).
2. Agricultural development and food security (e.g. improved fodder cropping).
3. Digital connectivity and capacity (e.g. more widely distributed fixed wireless services).
4. Fire management (e.g. greater local preparedness to fight wildfires).
5. Mental health servicing (e.g. more innovative mental health services).
6. Governing to build community resilience (e.g. dealing with drought in annual resilience forums).

Translating regional priorities into local property action

There are three key mechanisms for supporting the translation of regional priorities for action in improving drought resilience on properties and in industries across the Peninsula region. These are outlined as follows:

1. **Supporting Property Scale Drought Resilience Plans:** Pathway 4 outlines the regional intent of key service providers (particularly Cape York NRM, QDAF and the TNQ Drought Hub) in coordinating support for property scale development and delivery of Property-base Business Resilience Plans.
2. **Infusing Innovation in Property-based Decision Making:** Pathway 4 outlines current negotiations to embed the Cape York region as a delivery node within the TNQ Drought Hub. This will be the key regional approach taken to infusing new innovations and technologies into local property action.
3. **Establishing Local Drought Resilience in Lakeland:** Lakeland is the region's one significant diversified agricultural district, with a strong banana, melon and horticultural industry. As a regional strategy of importance, RDA TNQ is leading the exploration of appropriate water development solutions to reduce the drought risks and to enable the protection and expansion of the Lakeland Irrigation Area.

Together, the above regional approaches will deliver local action to secure regional drought resilience.

Community partnerships and communication strategy

Our core approach for the implementation of this RDRP is based on the emergence and continued growth of several layers of partnership to ensure a firm and continuing commitment to achieving impact. At the centre of these arrangements sit the commitment of several key regional partners to act as the long-standing owners of the RDRP. Particular Federal and State agencies hold the key to progressing policy and bilateral budgetary and program solutions to the long-term drought related issues facing the region. Combined Federal interest in broader resilience building (both drought, flood and other natural disasters) is led via the new Australian Government Recovery and Resilience Agency. This agency leads Australian responses to natural disasters and holds responsibility for dispersal of the Future Drought Fund. Other key Australian Government agencies that need to be drawn into this response include the: (i) National Water Grid Authority; (ii) National Indigenous Australians Agency (NIAA); and (iii) Office of Northern Australia.

At the State Government level, TCICA has broadly worked with the QRA and the Queensland Fire and Emergency Service Agency (QFES) in building and implementing the region's broad Resilience Strategy, within which this RDRP is embedded. The region's capacity to drive implementation partnerships, however, is funding dependent. Queensland's DAF, as the Queensland lead on drought response and recovery, will need to increasingly partner the region in supporting responses to, and long-term monitoring of, this RDRP.

1. Partnerships among key regional institutions

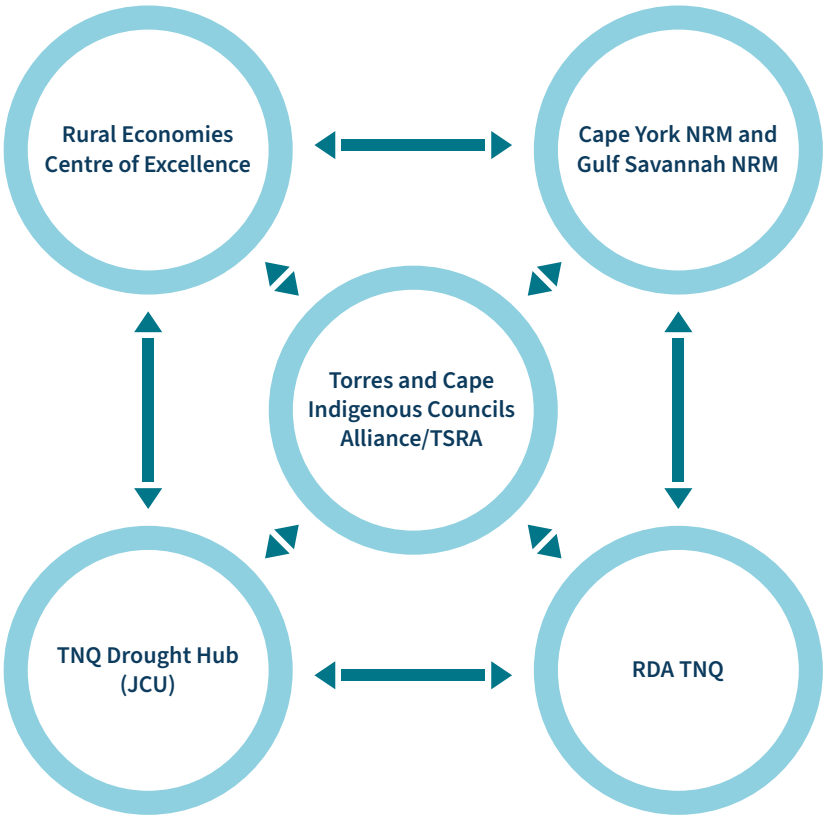
Active coordination of drought resilience strategy development and delivery is increasingly building through cooperation across several key regional institutions that will partner with TCICA, TSIRC and TSRA in supporting strategy implementation. These include, but are not limited to, the key institutions in Figure 15.

Both Local Government communities and the region's land holders (generally pastoralists and Traditional Owners) are the key players most directly affected by drought and water shortage. Hence raising capacity of both TCICA and the region's regional NRM board and industry bodies is crucial to ensure RDRP delivery. Cape York NRM is also working toward becoming a node focused on innovation delivery through the new TNQ Drought Hub, hosted by James Cook University. Because of similar issues facing the Northern Gulf region, TCICA and Cape York NRM are additionally partnering with Gulf Savannah NRM because of its aligned interests and additional resilience planning capacities. As the key DAF-sponsored drought resilience planning agency, the Regional Economies Centre of Excellence (RECoE), with its local presence sponsored through JCU's Cairns Institute, provides the overall planning support and additional facilitation support to ensure this five-way partnership continues into the future.

2. Support for the local resilience plans of local governments

As the final part of the implementation puzzle, key regional partners will continue over coming years to work with LGAs across the region to support the development of local resilience, response and recovery actions. Drought-related issues mentioned in our pathways and strategies above include water and food security and improving digital connectivity. Local action will be to key to achieving long term regional resilience.

Figure 15: Key regional institutions to support strategic implementation.



Monitoring, evaluation and learning (MEL)

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

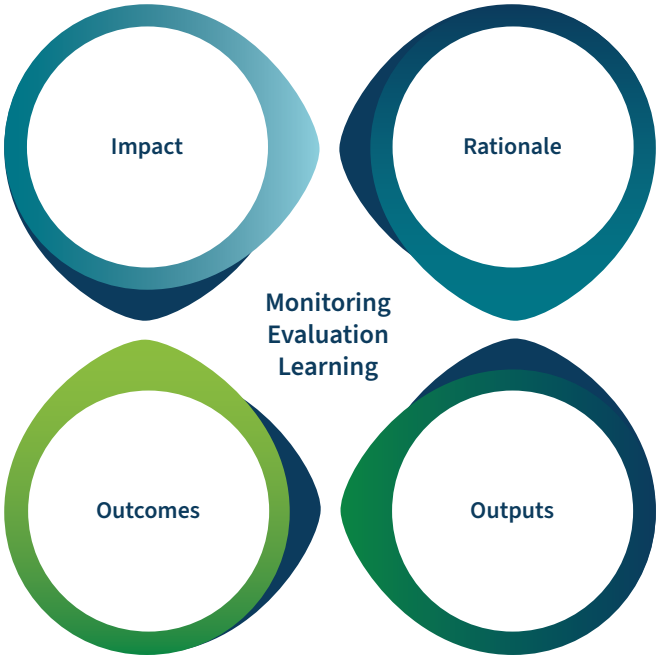
- empower communities to identify the impacts of drought and develop regional drought resilience and response management plans
- support communities to consider the incremental, transitional and transformational opportunities needed to strengthen drought resilience and encourage innovative initiatives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

Any planning process, however, requires a strong monitoring, evaluation and learning cycle. For the purposes of this plan, we adopt the framework of FDF for evaluation with a focus on impact, effectiveness, appropriateness and efficiency as shown in Figure 16.

Figure 16: 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?

Theory of Change

The core underpinning our rationale is that building regional resilience will improve capacities to respond and adapt to the impact of drought. Resilience is a multifaceted concept involving a range of views that combine resistance in the face of adversity, rebounding and transformation (Dale et al. 2014, Babacan et al. 2020). Three common conceptualisations of resilience include an engineering resilience return to a point of stability following a disturbing event (Grimm and Wissel, 1997); the amount of disturbance a system can absorb before changing to another stable state of equilibrium (Gunderson & Holling, 2002); and a characteristic that allows members to thrive in an environment characterised by change, uncertainty, unpredictability, and surprise (Hightree et al., 2018). The theory of change adopted for this project incorporates dimensions of the wider context for drought and increased community capacity for planning and transformation in the face of drought. Drought resilience is more than susceptibility and vulnerability (Birkmann and Fernando, 2007). Resilience thinking addresses the dynamics and development of complex social–ecological systems (Miller et al, 2010). Our theory of change commences with consideration of the wider context and addresses social and economic resilience as well as the resilience of agricultural and environmental systems.

Overall Program Outcomes

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

Outcomes	Examples
Economic	Reduced economic costs arising from drought.
Environment	Reduced environmental decline emerging from drought.
Social and Governance	Increased general community health as a key resilience factor.
Cultural	Greater integration of cultural considerations in planning/delivery.

Program Logic

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

RDRP Drought Resilience Vision			
Activity	**Delivery Process**	**Outcome**	**Process Indicator Examples**
Water Security	→	Reduced cost risks to Councils and water service providers.	Audit of individual community water security completed.
Agricultural Development and Food Security	→	Increased access to country for Traditional Owners and a stronger future for the Cape's Indigenous and non-Indigenous pastoralists.	Trials of agricultural development involving Traditional Owners, graziers and Councils in place.
Digital Connectivity and Capacity	→	Increased social capital and improved health services.	Partnership Group established and operational.
Improved Pastoral Sector Resilience	→	Increased economic resilience in the pastoral sector and growth in horticulture/cropping.	Cape York Node established within the TNQ Drought Hub.
Coordinated Fire Management	→	Protection of key cultural assets and continuation of cultural burning practices.	Stronger regional approach to fire management developed.
Improved Mental Health Servicing	→	Improved health outcomes and liveability within the region's communities.	Regional partnership framework established to address health and health service models.
Improved Regional Governance Capacity	→	Improved region capacity to drive resilience strategies.	Drought considerations included in disaster and other planning processes.

Assumptions underpinning the implementation of the plan

The FDF MEL plan has already identified the following assumptions for the plan to be effectively implemented. Key assumptions affecting outputs affecting the 1–2 year outcomes include that:

- 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 needs
- relevant planning at other scales can be aligned
- regional communities are motivated to take ownership of completed plans and actively seek to implement
- communities are willing to share learnings with other regions
- there are sufficient learnings to inform future program design.

Longer term assumptions affecting outcomes over two years include the need for partnership support from Federal and State agencies, the development of clear pathways for negotiating investment and institutionalisation of ongoing MEL.

MEL Data Collection Methods

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

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