



Darling Downs Regional Resilience Strategy





Document details

Security classification	Public
Date of review of security classification	August 2022
Authority	Queensland Reconstruction Authority
Document status	Final
Version	1.0
QRA Reference	QRATF/21/7642 GD: 0687

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The Darling Downs Regional Resilience Strategy is a partnership between the Queensland Government and the following four member councils of the Darling Downs and South West Queensland Council of Mayors (DDSWQCOM)

Council	Website/Disaster Dashboard
Goondiwindi Regional Council	www.grc.qld.gov.au dashboard.grc.qld.gov.au
Southern Downs Regional Council	www.sdrq.qld.gov.au
Toowoomba Regional Council	www.tr.qld.gov.au disaster.tr.qld.gov.au
Western Downs Regional Council	www.wdrc.qld.gov.au disaster.wdrc.qld.gov.au

Cover image: Tractor in Field, Goondiwindi.
This page: Lake Leslie near Warwick. Credit: Shutterstock.

Foreword

The people of the Darling Downs have strong traditions entrenched in the landscape from the escarpment and peaks of the Great Dividing Range to the fertile expanse of the Condamine and Moonie River plains. We value the rains when they come, and we endure when they don't come. We respect the natural occurrence of fire as vital for our landscape.

Our towns and hamlets are equally diverse with distinct identities, joined at the hip through landscape. This means we must individually and collectively understand the character of the landscape we love. Lived experience of the landscape, its bounty and cycle through the good and bad times, means we have learned to value the things that make us resilient – our physical and digital connections, our sense of community, our link to the landscape and our strong desire for a safe and healthy lifestyle.

As we progress on a trajectory to enhanced prosperity through major infrastructure projects and continued growth we must equally face the challenge of forging a resilient and sustainable

future that fits our needs and identities. We can do this by working together in new ways, at different scales from hyper local to cross-border to collectively drive our region to a strong future.

This *Darling Downs Regional Resilience Strategy* is about building our longer-term capacity to adapt to changing circumstances and the inevitable natural hazard impacts, in a collective, productive and constructive way. Building on our unique position and strengths, creating and harnessing opportunity to do things differently.

Our region is surging on a new wave of investment and economic opportunity. We envisage a thriving future where we are prepared for the natural ebb and flow of nature. To achieve this, we will work together on shared solutions to common problems. Embedding resilience in our work, individually and collectively, will strengthen our baseline in ways that suit our landscape and settlements, as a foundation for a stronger more resilient future.



Paul Antonio

Chair Darling Downs South West Council of Mayors

Acknowledgement of Country

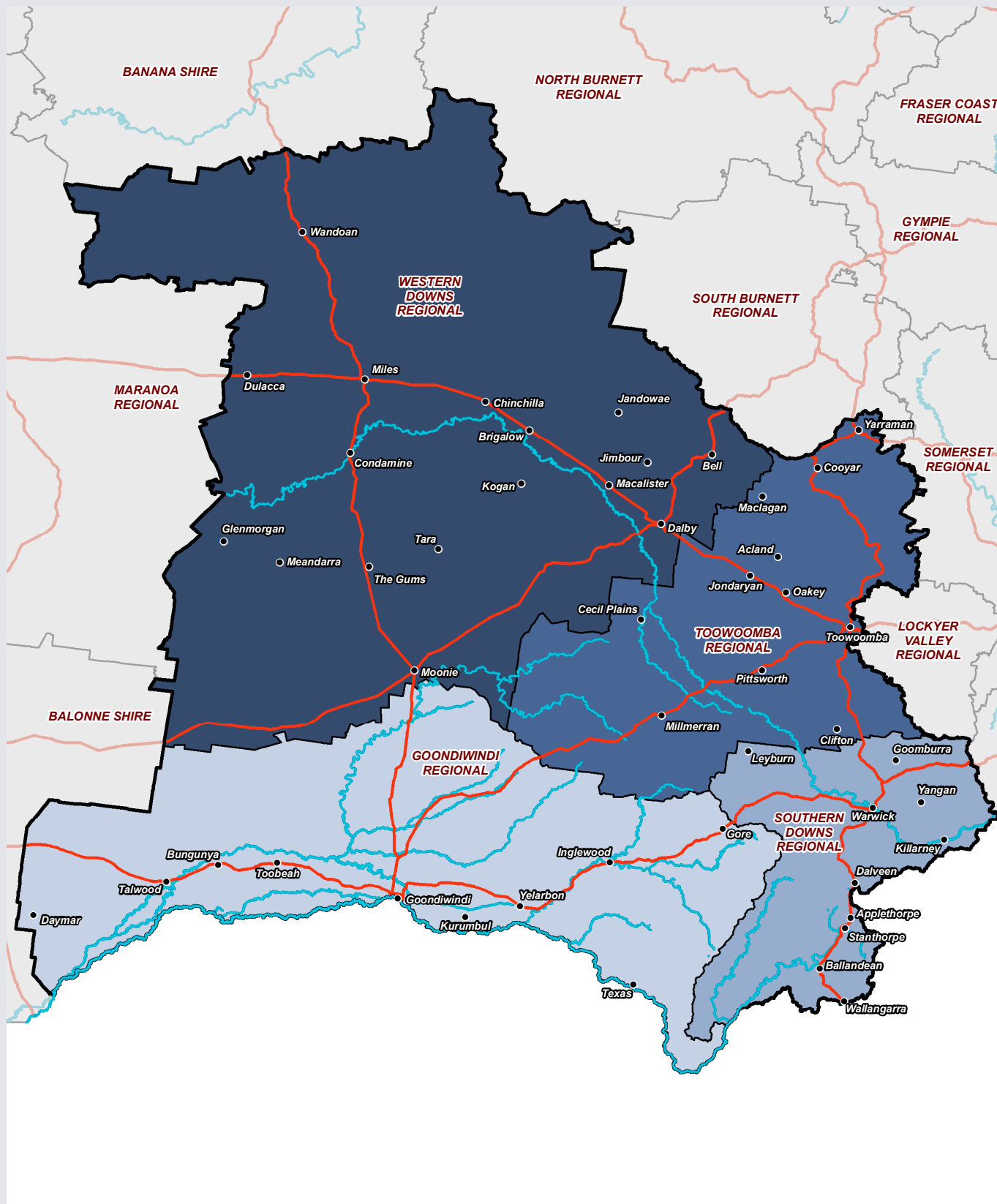
We acknowledge the Aboriginal peoples and Torres Strait Islander peoples as the Traditional Owners and Custodians of this Country.

We recognise and honour their ancient cultures, and their connection to land, sea and community.

We pay our respect to them, their cultures, and to their Elders, past, present and emerging.

Image: Sunset Panorama Toowoomba. Credit: Shutterstock.

Darling Downs region





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Image: Dumaresq River. Credit: Shutterstock.

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Vision

The Darling Downs and Granite Belt is surging towards a bright and prosperous future.

We have an opportunity to leverage our traditional strengths in agriculture, mining and logistics to share our produce, resources and economic strengths locally, regionally and globally.

To capitalize on these emerging opportunities, we must place resilience at the core of everything we do.

To be resilient on the Downs we take the good with the bad. Extreme floods have devastated our towns, prolonged droughts have challenged our spirit and severe bushfires have tested our nerve.

We have a lived experience of these disasters. We are aware of and make decisions that are sensitive to our natural hazard risks. We respect these natural processes as vital for sustaining the landscape which gives us our livelihoods.

From the top of the Main Range and the Granite Belt in the east crossing the vast Condamine plains to Talwood in the west, our community is made up of a patchwork of discrete towns and communities across a risk laden landscape.

We help each other out and band together when times are tough. Our diverse communities know what to do in the face of challenging times and hazardous events.

We share our knowledge with newcomers to ensure this lived experience stays with the land.

We know that our social wellbeing and our economic prosperity relies upon resilient infrastructure – the supply chains to our local, national and international markets are our lifelines.

We are stronger when united. We must collaborate within our region and across our borders to face shared challenges.

When we work together, with the right disaster management resources, we are more resilient.

About the Strategy

Resilience is everyone's business. Resilience in the Darling Downs region is dependent on a shared but also collective responsibility model.

This Strategy encourages a role for everyone in the Darling Downs region to rally around and deliver upon a common description of regional resilience, reflecting the voice of our locals. It highlights key opportunities to build disaster resilience that are unique to our region.

The end goals for resilience in the Darling Downs region are to:

- reduce the impact of an event so as to limit those that need support to recover, and
- set the conditions to enable transformation and adaptation to the range of stresses and shocks we experience.

The Darling Downs strategy also covers the Granite Belt area of Southern Downs Regional Council and the Border Rivers area of Goondiwindi Regional Council (which also extends into Southern Downs).

Like other parts of the Downs, these areas have their own unique landscape character and disaster resilience needs and priorities.

A reference to the Darling Downs throughout this Strategy is also in reference to these important areas.

Aims

- **The aims of this Strategy are to:**
- **tell the unique story of resilience in the Darling Downs**
- **focus on what needs to be done to bolster disaster resilience in the Darling Downs**
- **deliver a clear Regional Resilience Strategy and Local Action Plans to further strengthen disaster resilience for our region.**

Objectives

The objectives of this Strategy are to:

- **identify the region's disaster resilience priorities**
- **identify actions and initiatives to address resilience needs**
- **prioritise the identified actions and initiatives**
- **connect priorities to future funding and resourcing opportunities**
- **articulate how risk-informed disaster resilience actions and projects meet local needs and align to state and national disaster risk reduction and resilience policy objectives.**

Council partners

This Darling Downs Regional Resilience Strategy (the Strategy) is a partnership between the Queensland Government and the following four member councils of the Darling Downs and South West Queensland Council of Mayors (DDSWQCOM).

- Goondiwindi Regional Council
- Western Downs Regional Council
- Toowoomba Regional Council
- Southern Downs Regional Council.



Values guiding our resilience pathway

The Strategy reflects our values in the Darling Downs, which are unique and make us who we are. There are four underpinning values that guide our resilience pathway.

Regional collaboration

We are stronger when we work together. Many of the disaster risks we face emanate from across borders, including the state border. Likewise, many of our challenges are shared by our neighbours. It therefore makes sense to collaborate at a regional level and seek common approaches to disaster management and shared challenges.

Reliable infrastructure networks

The Darling Downs is the food bowl of Australia. Our physical and digital networks connect our people and our produce to Australia and the world. It is therefore vital that we continue to invest in strong and reliable infrastructure to serve as the gateway to our success.

Connection to landscape and each other

Across our expansive and diverse region are a patchwork of discrete towns that carry with them unique identities that define that community. All these places are intrinsically linked to the landscape they reside in. This unwavering connection between landscape character, our settlements, and our people is embraced and celebrated.

Sharing our history

Our strong agricultural history has created a level of independence and stoicism to get on with things. We have experienced the highs and lows of the Downs and respect the landscape. As communities evolve, and newcomers arrive and old timers depart, it is integral that we share our history our knowledge of the landscape to ensure this is retained in place.

Image: Solar farm between Toowoomba and Dalby. Credit: Shutterstock.



Strategic alignment

The Queensland Government is committed to strengthening disaster resilience, so our communities are better equipped to deal with the increasing prevalence of natural disasters.

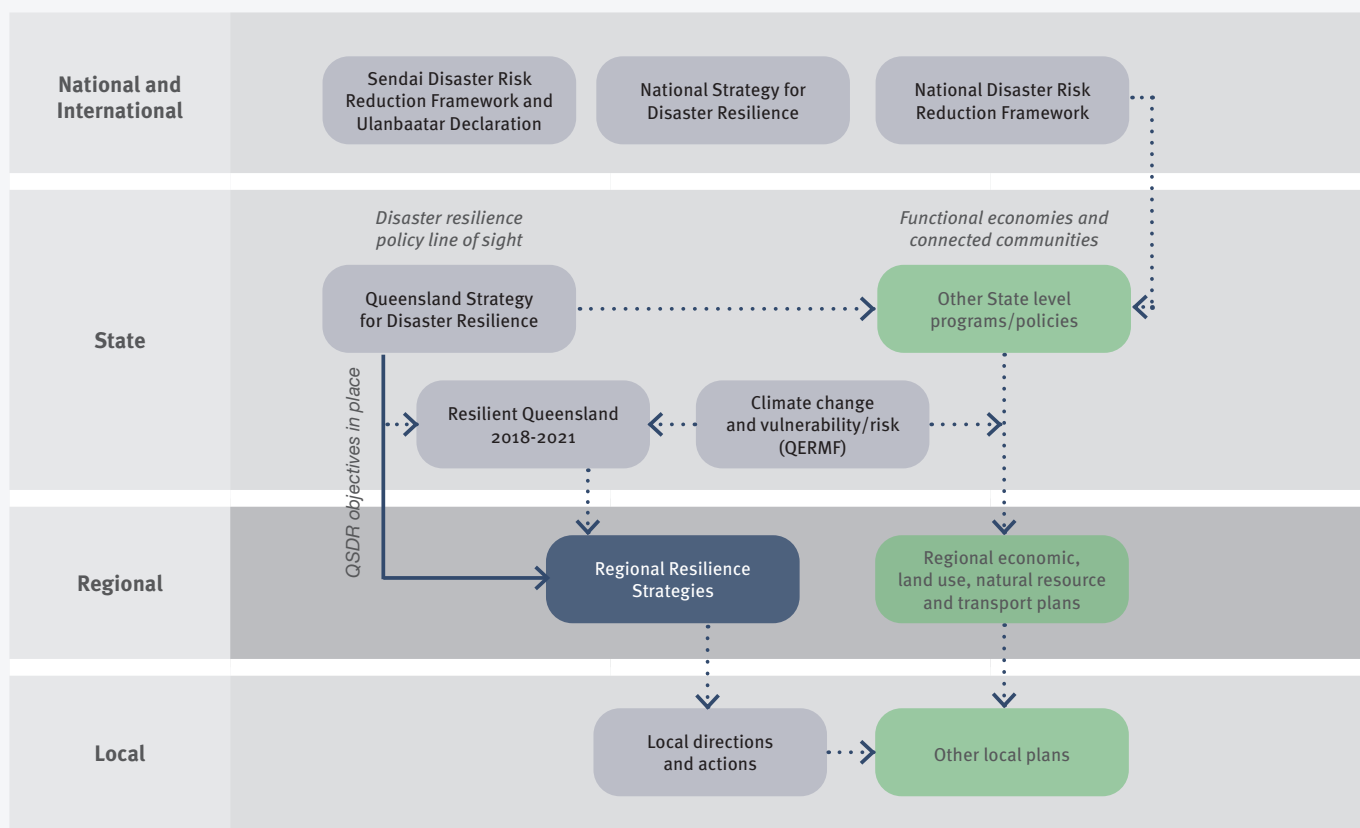
By 2022, every region across Queensland will be part of a locally-led and regionally-coordinated blueprint to strengthen disaster resilience.

The Strategy is a deliverable under the Queensland Strategy for Disaster Resilience and Resilient Queensland - the statewide long-term blueprint support Queensland's vision of becoming the most disaster resilient state in Australia.

The Darling Downs Regional Resilience Strategy aligns with the Queensland Strategy for Disaster Resilience and its implementation plan: Resilient Queensland, and with national and international disaster risk reduction and sustainable development agendas articulated by the Sendai Disaster Risk Reduction Framework and the National Disaster Risk Reduction Framework.

This Strategy supports and aligns to the Queensland Disaster Management Arrangements (QDMA) and builds upon the Queensland Emergency Risk Management Framework (QERMF) and the Queensland Climate Adaptation Strategy (QCAS). This Strategy also supports and aligns with this region's Regional Drought Resilience Plan, developed by the Queensland Department of Agriculture and Fisheries.

Figure 1. The Darling Downs Regional Resilience Strategy disaster resilience policy line of sight to local, regional, state, national and international levels.





Our engagement approach

This Strategy has been developed using a community-led approach with the voice of the locals. To build resilience means to think and deliver systematically – to deliver what is needed in the places it is needed.

We have applied CSIRO’s Resilience Adaptation Pathways Transformation Approach (Q-RAPTA) process as a resilience building approach tailor-made for the Queensland context.

An approach that is locally-led, regionally coordinated and state facilitated has allowed us to draw on local leadership and direction for this Strategy to ensure local needs and priorities of the Darling Downs are reflected.

This approach means identifying and prioritising regional resilience needs that we can strengthen over time by matching these needs with real funding and resourcing opportunities.

This approach allows for greater collaboration and coordination of resilience efforts across our region, guided by the principles of:

- local leadership
- flexibility and adaptation
- shared responsibility and collaboration
- prioritisation
- resilience becoming business as usual

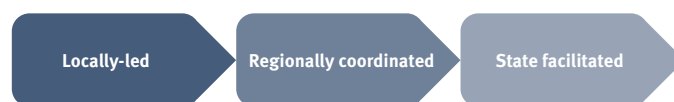


Figure 2. The Resilient Queensland implementation delivery approach.

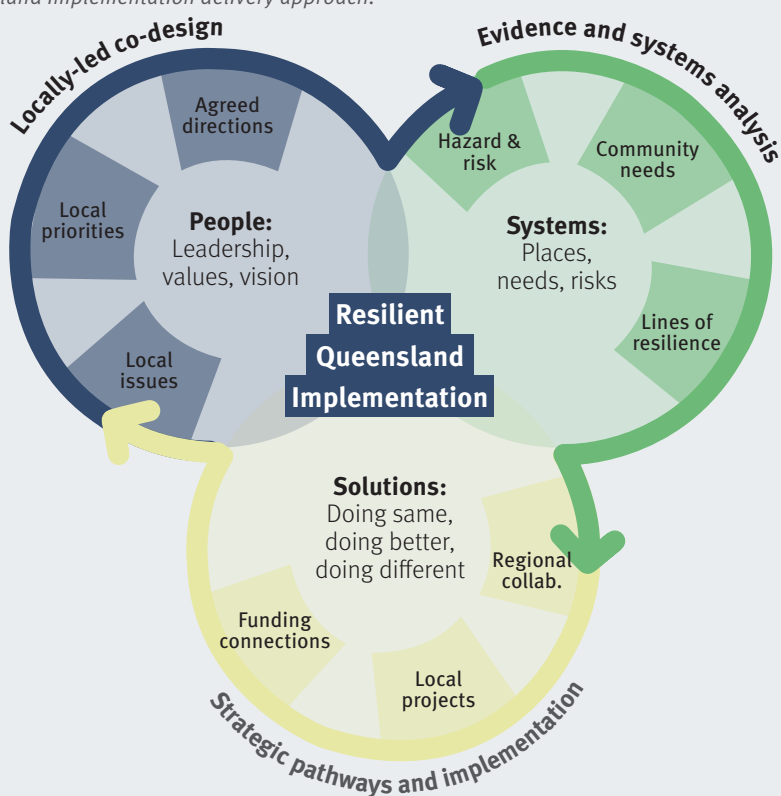


Image: Big map workshop, Western Downs. Courtesy QRA.

How the strategy has been developed

This Strategy has been co-designed with local representatives through multiple engagement opportunities using regional “Big Map” workshops and active listening. The Strategy is developed with the input of elected officials, disaster management group members, council officers, local landowners and community groups.

The process has applied the latest in resilience thinking:

- relationship and trust-building engagement
- co-design with locals
- risk-informed
- place-based strategies
- locally-led and regionally coordinated solutions
- integrated multi-objective responses.

The Strategy has a multi-dimensional and cross-disciplinary approach and considers the five elements that contribute to systems-based resilience.

The Strategy was developed taking a disaster resilience lens to our economic, social, and environmental systems to ensure the best of disaster management and risk reduction practices can be brought into effect in the Darling Downs region over time.

Our engagement with local representatives reflected a deep understanding of local and regional issues and a desire to find collective responses to these needs. The engagement process identified challenges and discussed resilience in place using Big Map workshops.

This context is then matched to an understanding of the exposure and vulnerability of each council area within the region to a range of hazards informed by the Queensland Emergency Risk Management Framework (QERMF), including

- severe storms
- flood
- bushfire
- heatwave; and
- earthquake.

Drought is also considered by the Strategy as an important resilience issue at the local level.

The impacts of climate change are a key component to long-term resilience and are incorporated, both in terms of relationships with hazards but also by alignment of the Strategy to the Sector Adaptation Plans developed for the Queensland Climate Adaptation Strategy (QCAS).

Figure 3. The five elements of resilience that contribute to systems-based resilience.

Elements of resilience

The multi-dimensional and cross-disciplinary approach of this Strategy contemplates five elements that contribute to systems-based resilience. These are:



Integration and Alignment

This Strategy reflects previous and existing work at the state, regional and local levels to ensure this work is taken forward, and not ‘reinvented’, and provides a further mechanism to connect local needs to further funding opportunities at the state and federal levels.

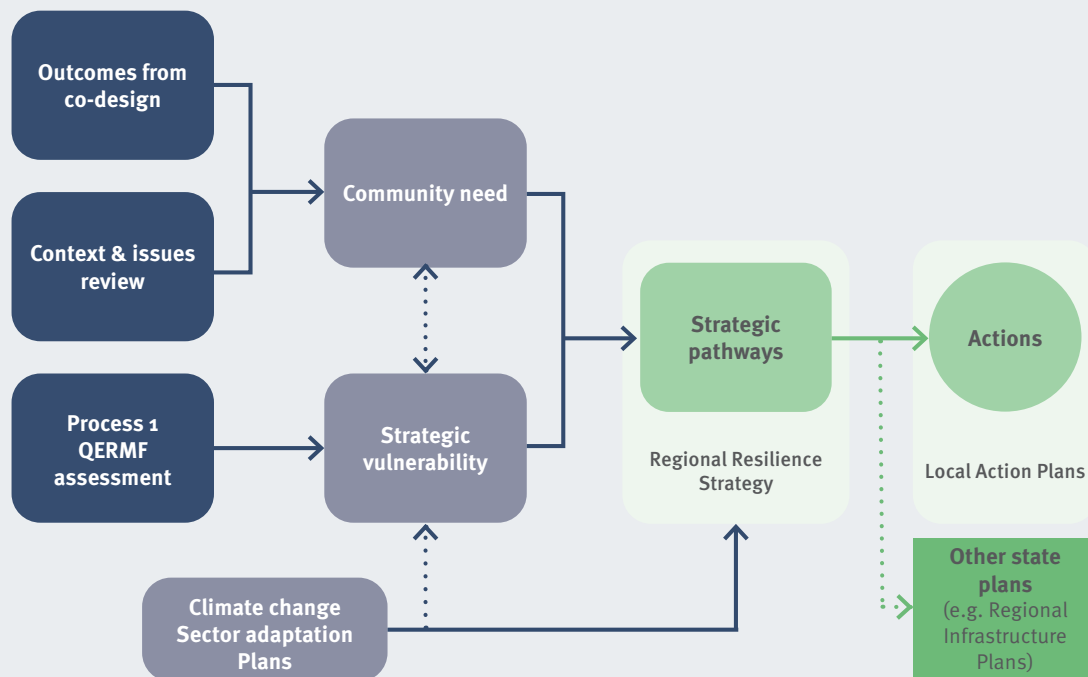
This Strategy culminates in resilience pathways that provide a linkage between locally identified actions or projects, and the state, federal and international policy environment. That way, the need for a particular project or action can be justified by it meeting a regional pathway to resilience that meets one or more objectives of the Queensland Strategy for Disaster Resilience.

This Strategy is supported by Local Action Plans setting out the specific projects and initiatives that are needed to deliver on the aspirations set out by the Strategy. These Local Action Plans are provided to partner councils to implement.

The Strategy aligns with the following risk management, recovery resilience and adaptation planning initiatives, strategies and plans:

- Queensland Resilience, Adaptation Pathways and Transformation Approach project (QRAPTA)
- Queensland Emergency Risk Management Framework (QERMF)
- Queensland State Natural Hazard Risk Assessment and hazard-specific risk assessments prepared by Queensland Fire and Emergency Services
- Climate Change Sector Adaptation Plans
- Queensland Climate Resilient Councils Climate Risk Management Framework and Guideline
- Darling Downs Regional Plan
- Shaping Southern Downs
- Goondiwindi Drought Resilience Plan
- Local Government Corporate Plans, Economic Development, Biosecurity, and other plans

Figure 4. Strategy development process reflects the CSIRO QRAPTA resilience building approach tailor-made for the Queensland context.





Resilience in the Darling Downs

Resilience is a term that means different things to different people. The QSDR defines resilience as:

A system or community's ability to rapidly accommodate and recover from the impacts of hazards, restore essential structures and desired functionality, and adapt to new circumstances.

Resilience in the Darling Downs and Granite Belt is driven by the historic connection to the land through our agricultural and pastoral roots. This underpins an ingrained stoicism that drives an attitude of get through and get on.

People have lived on the Downs and Granite Belt for a long time, and strong community and family ties span our region. We are well accustomed to the natural risks and band together when times are tough.

Our region is vast and comprised of a tapestry of unique landscapes and settlements. We share common challenges that are expressed in different ways depending on the landscape. This means that being resilient in Stanthorpe is different to being resilient in Tara.

We have lived through heatwaves, bushfire, flood, drought, storm and more recently, the COVID-19 pandemic. The compounding nature of these events, combined with underlying stresses that exist in day-to-day life can take their toll over time. Managing this fatigue is a key challenge to maintaining resilience in the region.

People are drawn to the Darling Downs, and when they decide to move here we welcome them with open arms. Though this brings with it new challenges for our resilience. Those who are new to the region are yet to experience or develop an appreciation for the landscape and what it can manifest, and may be unaware of the risks of flood, drought or bushfire.

Mother nature does not respect administrative borders. Floods or bushfires can start one side of a border but devastate the other. Managing events across jurisdictional and state boundaries is a critical aspect of resilience in our region. The COVID-19 pandemic has added another layer of complexity to manage. Working together to manage events and tackle

common issues is essential to being resilient.

Living within a flood prone landscape, we are no strangers to periods of isolation. But connection in our region is not just about getting from the front door to the shops. We play an important role in delivering food to the plates of all Australians. A resilient Darling Downs is reliant on the maintenance of strong links that span beyond our region.

2021/2022 Southern Queensland Floods

In November 2021, following an intensive rain event across Central, Southern and Western Queensland, communities across the Goondiwindi region were impacted by severe flooding.

Residents from several towns and communities were evacuated and significant damage was sustained across a large area. State road highways remained cut for two weeks from 30 November until 13 December severing connections from Inglewood to Goondiwindi, Millmerran and Warwick and from Goondiwindi to Millmerran, Moonie, St George, Inglewood, Texas and Stanthorpe.

Multiple floods again in the early months of 2022 across the Southern Downs, Toowoomba, and Western Downs have also tested the region's resilience. Particularly severe impacts occurred in Pratten, Warwick, and Killarney, with inundation in homes and businesses, while loss of life occurred near Kingsthorpe, north west of Toowoomba.

The road to recovery from these events may take time but has commenced in earnest. This Strategy will support the broader recovery process these communities will experience following the flood events.

Our resilience needs

There are many geographic, demographic and climatic events that can have major impacts on the Darling Downs and Granite Belt.

Trends

Transformative forces that could change a region:

- changing market forces for traditional commodities
- demographic shifts such as ageing population, multiculturalism and the rise of lifestyle communities
- major infrastructure projects (in-land rail, second range crossing)
- climate change
- growing tourist numbers in certain parts of the region
- increasing mental health issues
- centralisation of population into larger centres
- increased digital enterprise
- insurance availability and affordability.

Stresses

Long term situations or circumstances, weakening the potential of a given system and deepening vulnerability – they may be periodic or chronic:

- periodic and long-term drought as a constant uncertainty and economic fluctuation
- limited telecommunications in certain areas
- cumulative and compounding events
- ageing infrastructure
- weed and pest outbreak
- water resource availability (surface and ground water)
- consistent and reliable access to baseline infrastructure and services
- interruptions to regional transport corridors
- loss and ageing of volunteers
- reliance upon larger centres for essential services
- fluctuations in funding, support services and baseline service provision
- cross-border operational and communication challenges
- COVID-19 pandemic.

Shocks

Sudden events with an important and often negative impact on the vulnerability of a system and its parts (such as a flood or bushfire):

- severe storms and sudden rainfall events
- flooding
- bushfire and grassfire
- heatwave
- earthquake
- landslides.

Core resilience needs

- improved collaboration in disaster management
- improving collective understanding of hazard impacts and risks
- strategic prioritisation of physical and digital infrastructure networks to improve connectivity
- increased disaster management resources and personnel
- consistent and accessible essential service delivery
- enhanced water security
- addressing the vulnerabilities of small, isolated communities
- natural resource management and landscape sustainability
- enhanced information and knowledge sharing platforms and processes
- community-led place-based resilience plans
- long term economic stability and resilience through diversification and catalyst projects
- regional management of pest and weeds.



How resilience is affected by stresses and shocks

Our disaster management system has traditionally dealt very well with the event-based episodic or acute shocks like floods, cyclones or bushfire. But we need to continue dealing with more of the systemic issues that worsen disaster events when they occur, and place increased burden on our disaster management system.

Investment and effort in building social, economic, infrastructure and environmental resilience helps to reduce the periodic stresses and means that communities are better able to cope with episodic events when they happen.

Figure 5. How resilience is affected by stresses and shocks.



Rethinking resilience in the Darling Downs

To date our focus has been on post-disaster recovery processes and building resilience through programs like infrastructure improvements that can limit the impacts of recurrent events.

Our efforts in resilience on the Downs have also oriented heavily within the Queensland jurisdiction, even though there are many border communities in NSW that see themselves as part of Queensland - like Liston, Mungindi, and Boggabilla.

With our lived experience of recovery, we now acknowledge the need to proactively identify and deliver over time on initiatives that help avoid the stresses and shocks in the first place in a collaborative way – ultimately putting us on a more sustainable track for growth and prosperity.

How we make real and lasting change

To meet our collective challenges, we need to actively take steps to reduce disaster risk and equip our Darling Downs communities to thrive in spite of the stresses and shocks they face. We need to match community need with funding and support to deliver – by refocusing over time from recovery to prevention and preparedness.

Limiting impact or shortening recovery from stresses or shocks

This Strategy focuses on identifying actions that limit impact or shorten recovery from stresses or shocks. These will help communities in the immediate aftermath of an event.

It provides pathways for actions to adapt or transform socio-economic settlements or systems to avoid or resist the impact in the first place. This will help our communities in the Darling Downs to grapple with long term trends and stresses like climate change, mouse plagues, drought and economic cycles.

This way, we can provide a long-term blueprint for how our region can continue to improve its disaster resilience for years to come.

Figure 6. Improving our prosperity through resilience (adapted from Joseph Fiksel).





The changing funding landscape

Under the joint Australian Government-State Disaster Recovery Funding Arrangements 2018 (DRFA), assistance is provided to alleviate the financial burden on states and territories. It also supports the provision of urgent financial assistance to disaster affected communities.

The DRFA replaced the previous Natural Disaster Relief and Recovery Arrangements (NDRRA) on 1 November 2018.

The reforms to the DRFA included, for the first time, a framework to incentivise reconstruction efficiencies to create more funds for resilience and mitigation purposes.

Efforts to realise efficiencies under DRFA are critical to fund resilience and mitigation efforts in the future, and will help change the funding landscape from a focus on reconstruction and recovery to a focus on prevention and preparedness.

We now have a clear forward plan for how we can make lasting change into the future through sustained investment in resilience and mitigation activities. Recent changes in funding arrangements will enable the creation of funds for mitigation and resilience, along with a range of other funding programs (e.g. the Local Government Grants and Subsidies Program, Get Ready Queensland) that support resilience building.

Regional Resilience Strategies will provide the 'long list' of locally-identified actions that can be prioritised against a wide range of possible funding opportunities (including DRFA efficiencies) to build resilience in Queensland communities over time.

Figure 7. Changing the focus from reconstruction to prevention and preparedness.





Our region

The Darling Downs is one of the most productive and resource rich regions in Queensland. It spans 77,260 square kilometres, from the ridge of the Great Dividing Range in the east to a vast river floodplain that stretches from Miles to Goondiwindi in the west. Our region comprises the local governments of Toowoomba, Southern Downs, Western Downs and Goondiwindi.

It is also a border region, with the local governments of Southern Downs and Goondiwindi sharing long borders with NSW. Many NSW residents close to the state border either think of themselves as part of Queensland, or rely heavily on border towns in these local governments for health, education and wellbeing services, employment and recreation.

Home to 250,000 people, our region is scattered with towns and settlements dating back to the mid-late 1800s. Toowoomba is Australia's second largest inland city and is supported by the regional towns of Dalby, Miles, Warwick, Stanthorpe and Goondiwindi which provide important local services across our region. Our traditional strengths of livestock trade, cropping, coal, oil and gas continue to underpin our livelihoods. The alluvial plains of the Condamine, Moonie and Border Rivers are renowned for their fertile black soil which grows

the produce and feeds the livestock that ends up on the plates of people right across Australia. We pride ourselves on being the food bowl of Australia.

We remain connected through a vital road network that comprises the Warrego, New England, Gore and Cunningham Highways. Our region is traversed by national railway and is home to an international capable airport at Wellcamp. This emphasises the region's prominence as an important logistics hub which is further strengthened by continued public and private investment in major infrastructure projects including the Toowoomba Second Range Crossing and the proposed Inland Rail.

We are strategically located to reach national and international markets. The emerging diversity across our region paints a strong picture for future prosperity.

Leveraging from unrivalled natural beauty and a packed calendar of regional events, tourism is a strong pillar of our economy. Whether it be the camel races at the Tara Festival, fishing at Lake Coolmunda, a cellar door on the Granite Belt or the annual Carnival of Flowers, there is something for everyone on the Darling Downs.

Image: Table Top Mountain, Toowoomba Credit: Shutterstock.



Toowoomba Regional Council

Sitting atop the Great Dividing Range in the east of the region at 700 metres above sea level is Toowoomba. Over two thirds of the region's population reside here, mostly in the city of Toowoomba itself. Toowoomba city serves as the principal administrative and service centre of the Darling Downs and broader south-west Queensland. Known as the 'Garden City' for its 150 parks and gardens, Toowoomba comes alive every spring for the famous Carnival of Flowers.

Toowoomba city is supported by a number of regional townships including Hampton, Crows Nest and Yarraman to the north; Oakey, Jondaryan and Cecil Plains to the west, and Pittsworth, Clifton and Millmerran to the south. The Toowoomba region represents the 2008 amalgamation of seven shires and one city Council.

Functioning as the primary activity centre of the Darling Downs, the Toowoomba economy is quite diverse and has been subject to steady growth. Mining, food product manufacturing and agriculture are all significant export markets for Toowoomba. Toowoomba is also home to the newest regional airport in Australia which provides an important direct access to domestic and international markets.

Home to the University of Southern Queensland, a number of prestigious boarding schools, and world class health facilities, Toowoomba is an important education, training, and health hub for much of regional Queensland.

It is the gateway to the Darling Downs, sitting atop one of the few accessible openings of the Great Dividing Range. The Warrego Highway and the recently completed Second Range Crossing provide direct access to south-east Queensland. The New England Highway connects north-south while the Warrego and Gore Highways head west.

Southern Downs Regional Council

Southern Downs region is located approximately an hour south of Toowoomba via the New England Highway and 2 hours south east of Brisbane via the Cunningham Highway, which connects to the Darling Downs via the picturesque Cunninghams Gap.

Southern Downs is the smallest region in the Darling Downs in terms of land area covering only a little over 7,000 square kilometres. There are two main towns in Southern Downs, Warwick in the north and Stanthorpe in the south.

Warwick is the main population and commercial centre of the Southern Downs. A historic town, Warwick takes pride in its many heritage buildings and distinctive streetscapes. Supporting the outlying agricultural businesses, Warwick provides important manufacturing and construction industries servicing the region.

Stanthorpe, located about an hour south of Warwick, sits atop the Granite Belt in the northernmost part of the New England Tablelands. It is best known as a food and wine haven boasting greater than 50 wineries and producing almost all of Queensland's apples amongst other award-winning produce.

The Granite Belt is also a natural wonder featuring a landscape unlike anything found elsewhere in Queensland. From the breathtaking Condamine Gorge north-east of the quaint town of Killarney to the remarkable Girraween National Park, known for its granite outcrops, the Granite Belt attracts tourists all year round.

Southern Downs features a stable population that is older compared with the rest of the Darling Downs, due to the attraction of lifestyle living sought by retirees in the area.

The region shares a 175 kilometre border with New South Wales. The majority of the border is sparsely populated and there are relatively few border crossings. However, the town of Wallangarra, located half an hour south of Stanthorpe on the New England Highway straddles the border with the NSW town of Jennings on the other side, but residents see themselves as one community. These residents primarily associate with the Southern Downs region and use Stanthorpe as their primary local service centre.



Western Downs Regional Council

In terms of land area, Western Downs is the largest council of the Darling Downs, accounting for almost half of the total area. The Western Downs incorporates the western slopes of the Bunya Mountains, a large portion of the Condamine floodplain and also includes land within the Burnett, Moonie and Fitzroy River catchments.

The Western Downs has an expansive road network, with almost 10,000 kilometres of road, most of which is maintained by the local government. The Warrego Highway is the major road, connecting the main towns of Dalby and Miles to Toowoomba in the east and Roma in the west.

Dalby is the primary administrative and service centre of the Western Downs and the largest town with over 12,000 of the region's 35,000 residents.

Dalby is supported by several communities across this expansive region including Jandowae in the east, Chinchilla and Miles on the Warrego Highway, Wandoan in the far north and the towns of Condamine and Tara in the south.

The demographic profile of the Western Downs indicates a younger population than across the rest of the Downs. The region is also anticipated to maintain a stable growth rate across the coming years.

Mining, and specifically oil and gas extraction is the primary source of economic activity within the region, with coal seam gas wells a prominent feature of the landscape. The presence of existing transmission infrastructure within the local area has contributed to the establishment of a strong electricity, gas, water and waste services industry. Most notably, a significant renewable energy industry has grown in the area, including what will be Queensland's largest solar farm located south-east of Chinchilla.

Agriculture remains a bedrock of the Western Downs economy. Known as one of the primary grain and cotton growing areas in Queensland the region also contributes to one quarter of the total pork industry in the State.

Goondiwindi Regional Council

Goondiwindi region is the least populated local government within the Darling Downs with a little over 10,000 residents. Goondiwindi is the southernmost region, located largely within the Border Rivers catchment.

Sitting on the banks of the Macintyre River, the town of Goondiwindi itself is at the juncture of the Barwon, Cunningham, Gore, Leichardt and Newell Highways and is a prominent border town along the Queensland – New South Wales border. Goondiwindi is 2.5 hours south-west of Toowoomba, along the Gore Highway and 2.5 hours south of Miles along the Leichardt Highway.

Goondiwindi is a quintessential country town and is known as 'regional Australia, at its best'. A number of rivers, dams and waterways intertwine providing a valuable commodity and source of recreation for water skiing or fishing. The region also boasts a prominent street and silo art scene, with one of the largest silo art sites in the country at the Yelarbon Graincorp Silo.

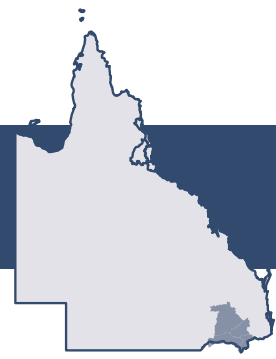
Agriculture is the primary industry within Goondiwindi, with livestock (primarily beef and pork) as well as cropping activities predominating. Approximately one quarter of all wheat production in Queensland occurs in the Goondiwindi region. A number of small towns are scattered across the area including Inglewood, Texas, Yelarbon, Toobeah, Talwood and Bungunya.

Goondiwindi was home to Gunsynd, a champion racehorse of the 1970's. Gunsynd, or as he was affectionately known as the 'Goondiwindi Grey' won 29 races, highlighted by the 1972 Cox Plate. A statue of the great stallion sits within Apex Park in Goondiwindi.

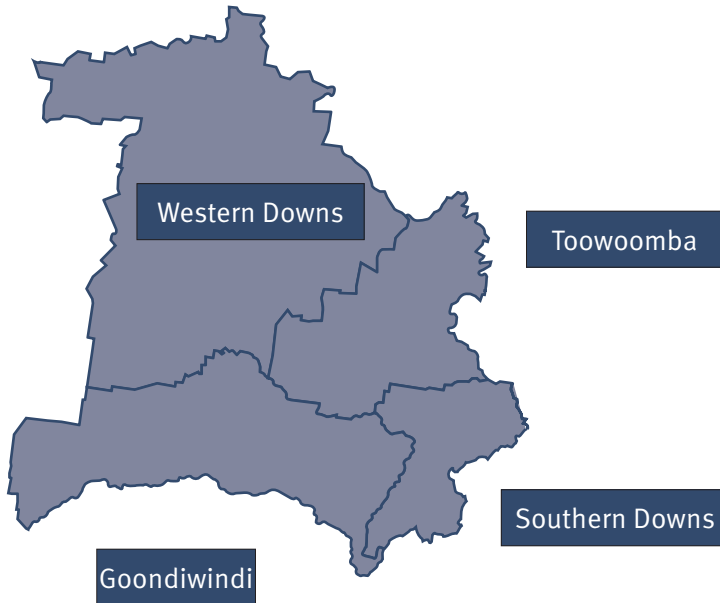
Aside from the town of Goondiwindi, the region manages a 300-kilometre-long border with New South Wales with numerous border crossings and towns at or near the border.

Image: Arrawatta. Courtesy Western Downs Council.

A snapshot of community characteristics



4 local governments



Population: 249,844
(4.9% of Queensland population)

Population of the region is projected to grow at 0.7% per year over the next 20 years

Area 77,600km² (4.5% of Queensland area)

Migration rate – 41.0%
(Queensland 44.1%)

Unemployment rate – 5.2%

Median age – 39.1
(Queensland 37.4)

Median age – 39.1 (Queensland 37.4)

Aboriginal and / or Torres Strait Islander population – 4.4%

Population aged 0-14 – 20.4%
(Queensland 19.4%)

Population aged 65+ - 18.8%
(Queensland 15.7%)

Top five employing industries:

-  Health care and social assistance (13%)
-  Education and training (10.2%)
-  Agriculture, forestry and fishing (10.1%)
-  Retail trade (9.7%)
-  Construction (8.3%)

Our landscape

From the Granite Belt atop the New England Tablelands and the ridge of the Great Dividing Range in the east to the expansive plains in the west, the Darling Downs is a vast and varied region that sits at the head of the great Murray-Darling Basin.

The region features two bioregions. The Brigalow Belt Bioregion, which encapsulates the vast majority of the region including the western floodplains, and the New England Tablelands Bioregion which covers the Granite Belt.

The eastern border of the Darling Downs is defined by the Great Dividing Range which rises steeply to 1,100 metres above South East Queensland. This part of the region is home to some of the most breathtaking scenery and views to be found anywhere in the Downs. Waterfalls, gorges and steep ridges are all prominent along the Main Range.

Towards the west, this country transitions to undulating foothills and rolling downs to expansive alluvial floodplains. These floodplains are primed with nutrient rich black soil which provides some of the most productive land in Queensland. It is clear why our region is so intrinsically defined by the landscape.

Although much of the Darling Downs is used for productive purposes, a number of significant environmental sites are still present and protected.

The Bunya Mountains, located in the north-east of the region is home to the largest stand of ancient bunya pines in the world as well as supporting more than 30 rare and threatened species. The park is home to 120 species of birds, including the rare sooty and powerful owls.

Sundown National Park, in the region's south, is a bird watcher's paradise with over 150 species of birds recorded in the area. This park is known for its steep gorges that rise to over 1,000 metres above the Severn River.

The three main river catchments that make up the Darling Downs are the Balonne-Condamine, Moonie and Border Rivers catchments.

The Balonne-Condamine is the largest catchment in the region and is actually one of the largest catchments of the Murray-Darling Basin, contributing approximately 13 per cent of the total catchment area. The headwaters of the Condamine River rise near Killarney, in the Southern Downs and head north-west towards Warwick, passing through Dalby and Chinchilla forming a crescent shape spanning the north of the region.

Where the catchment interacts with the edges of the Great Dividing Range in the east, water can flow quickly following heavy rain. As the catchment trends west riverbanks are less clearly defined and many tributaries intersect the landscape running through towns. This includes Myall Creek in Dalby and Dogwood Creek in Miles.

The majority of the catchment is characterised by expansive floodplains. Groundwater aquifers sit above the Great Artesian Basin allowing productive use of the landscape to continue long after the wet season has passed.

The Condamine River continues west through Western Downs, passing south of Chinchilla and running through the town of Condamine. The floodplain continues west beyond our region where it is joined by Dogwood Creek and becomes the Maranoa River.

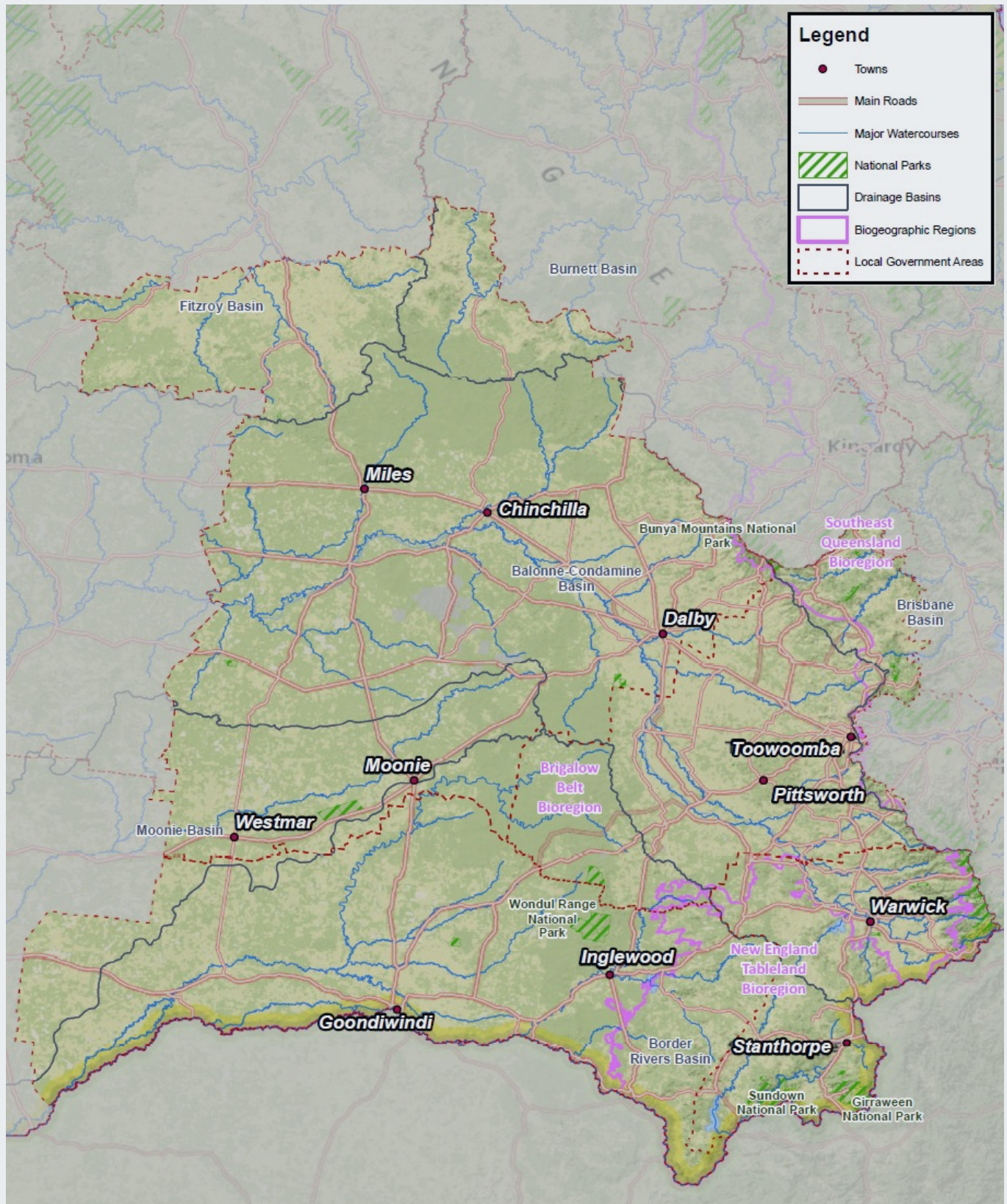
The Moonie River is a relatively small catchment that flows across a very flat landscape into northern New South Wales. Rising just south of Tara the Moonie River is joined by 13 minor tributaries that support more than 100 wetlands along the floodplain. These wetlands provide important waterbird habitats. The catchment falls only about 200 metres in vertical height from its source in the Southern Downs to where it meets the Barwon River south of Mungindi. The Moonie only flows for around a third of the year, otherwise it is most commonly a series of unconnected waterholes.

The southernmost catchment of the region is the Border Rivers. Comprising a series of interconnected rivers that rise on the western slopes of the Great Dividing Range in the New England Tablelands, south of the Queensland border. This catchment tracks north before straddling a 450 kilometre section of the Queensland – New South Wales border. The Border Rivers include the Dumaresq, Macintyre and Barwon Rivers.

This catchment shows no regard for the state border with water often falling within New South Wales before wreaking havoc to communities north of the border in Queensland.

The transitioning landscape of the Border Rivers, from the steep slopes of the Great Dividing Range to the flat plains in the west provide a habitat for native fish.

Darling Downs region





Case study: Gore Highway, Wyaga Creek Crossing

The Wyaga Creek Flood Improvement Project will see the replacement of the existing culvert with a higher flood-immunity bridge and culvert structure.

The Wyaga Creek crossing, located near Kilbronae is easily inundated following severe weather.

The Gore Highway provides a key connection between Goondiwindi and Toowoomba, via Millmerran for local and freight traffic.

Upgrades to the key regional road network, such as at Wyaga Creek will assist in improving the regions resilience.

The Wyaga Creek crossing is jointly funded between State and Federal Governments.

Our climate

Our livelihoods and lifestyle are closely linked to the climate. The Darling Downs is described as having a temperate climate. We experience hot summers and cool winters. Due to the elevation on the range and in the tablelands, the weather is generally cooler than in other parts of the State.

Summer averages range between 30 and 35°C while in winter the maximum temperature reaches between 18 and 22°C on average. Morning frosts are common across the region during winter, with average minimums ranging between 3 and 6°C.

Rainfall within the Darling Downs is highly seasonal with a clearly defined wet season occurring in the summer months.

Rainfall systems and severe storms

The average annual rainfall of the region is typically around 600 millimeters. Local factors such as topography and vegetation as well as broader weather influences such as El Nino and La Nina make the average and seasonal rainfall variable.

Rainfall systems in the Darling Downs generally occur as heavy thunderstorms or from rain depressions. These events can lead to widespread flooding or intense localised flash flooding.

Notable flood events over the last decade include:

- November 2021 Southern Queensland floods
- December 2018 Condamine River between Cecil Plains and Chinchilla
- November and December 2011 at Goondiwindi
- Late 2010 flooding at Goondiwindi
- January 2011 at Toowoomba

These events can cause widespread damage as a result of severe wind, hail or heavy rain. This can result in damage to buildings, landslides and fallen trees. There are localised pockets that seem more susceptible to damaging storms, such as the corridor from Chinchilla to Dalby and Oakey.

Fire weather

Bushfire and grassfire are endemic to the landscape of large areas of the region, often ignited by lightning strike or accidental causes.

Good fire supports a healthy landscape, with many of the region's ecosystems dependent on a level of fire frequency. Aside from fuel loads, our weather and climate play significant role in the intensity to which fire may occur, and how easily fuels may burn.

Fire weather is determined by aspects of temperature, low relative humidity, high wind and drought factor. These aspects are considered as part of a framework known as the Forest Fire Danger Index (FFDI) as well as the Grass Fire Danger Index (GFDI). Based on data analysis performed by the Bureau of Meteorology (BoM), from 1950 to 2018, annual accumulated FFDI has increased in the area by 27 per cent. The average annual occurrence of fire weather days exceeding FFDI 50 has increased by 104 per cent since 1950 (BoM, 2019). The annual fire season is also starting earlier and lasting longer, adding an estimated 28 days onto the annual season over the past 70 years.

Overall fire weather conditions are intensifying and becoming more frequent within the region. What this means is that higher fire danger days are occurring and are likely associated with drought and heatwave phenomena.



Temperature

Summers in the Darling Downs are hot, with average maximum temperatures ranging from 30 to 35°C. On very hot days, the temperature can approach 40°C. While annual temperatures have fluctuated year-on-year, the region has experienced a steady increase in temperatures over the past half-century and an increase in days over 35°C.

This can lead to heatwave conditions which can have significant impacts on society and the environment in several ways, including human health, agriculture, economy, natural hazards and ecosystems. They are also Australia's most costly disaster in terms of human impact, with severe and extreme heatwaves being attributed to more than half of all disaster-related deaths.

The BoM identifies heatwave conditions as three days or more of high maximum and minimum temperatures that are unusual for that location. This is considered in relation to the local climate and past weather at the location.

Heatwaves are generally driven by a high-pressure system which pushes hot air from the Australian interior towards the region. This pressure in the upper atmosphere stops hot air from rising, causing it to stagnate over the region. Climate phenomena such as periods of El Nino produce changes in heatwave pattern and severity, resulting in significantly more heatwave days and longer and more intense events within northern and eastern Australia.

Most people have adequate capacity to cope with many of the heatwaves experienced in Queensland, as they are low intensity heatwaves. However, less frequent, higher intensity severe heatwaves can be challenging for vulnerable populations and can translate to agricultural, infrastructure, economic and ecosystem impacts.

Drought

Drought events, associated with below average rainfall of varying intensity and duration, have a long history within the Darling Downs. These stress events have led to great innovations and successes in adaptation however, droughts can seem unending and can affect our community resilience.

The characteristics of drought are like no other natural hazard. The timeframes and severity are unknown; it's hard to know if you are in one until a considerable time passes. They are slow moving, gradual events with cumulative and compounding effects which are often psychological and financial rather than physical. Once the rain comes, recovery is equally long and arduous.

Notable drought events in the region over time have included:

- April 2017 – December 2019
- Millennium Drought 1997 - 2009
- April 1982 – February 1983
- May 1914 – March 1915
- Federation Drought 1895 – 1902

Future climate trends

The Queensland Regional Climate Change Impact Summaries provide climate change projections for the years 2030 and 2070. In the future, the Darling Downs can expect to experience:

- higher temperatures
- hotter and more frequent hot days
- harsher fire weather
- fewer frosts
- less rainfall in winter and spring
- more intense downpours.

These changes to the climate will bring with it both opportunities and risks for which we will need to prepare, impacting our lifestyle and landscape.



Our challenges and opportunities

Our unique region brings with it challenges to resilience but also opportunities. The landscape dominates our lifestyle, economy and societal function.

This means that our communities are constrained by how our landscape lets us move around, how others access us and how our infrastructure services our settlement pattern.

Our resilience challenges and opportunities are found in devising ways to live with this unique set of parameters.

Environment

The Darling Downs is intrinsically linked with the environment. It supports our livelihoods and defines our region.

While we embrace flooding as a critical aspect of nature's lifecycle and relish its benefits in nourishing our soils and replenishing our water supplies, we acknowledge that they can contribute to environmental challenges. These challenges include the transfer of pests and weeds, the degradation of topsoil and the erosion of riverbanks. It is important that we manage these impacts to enable our continued productive use of the land.

For every flood, there seems to be a drought that precedes it. We are used to experiencing droughts but their impacts can be long lasting and can strain the resilience of our people. There are some parts of the region, such as Chinchilla, where prolonged drought causes significant pressure on water supply. Drought has challenges other than lack of water. It can dry out vegetation which increases the bushfire hazard. Droughts also impact the

soil quality which has a flow on effect to cropping activities.

On top of natural hazards, biosecurity threats like pest outbreaks and plagues are ever present. Mouse plagues, feral pigs, cats and locusts are all things we have to deal with. These outbreaks can be catastrophic to our crops and livestock and cause significant environmental impacts. We are proactive in our biosecurity responsibilities and have a duty of care to maintain our landscape. Our vast region can be difficult to cover and it takes substantial resources to adequately manage our region.

The management of livestock diseases is paramount, and we must ensure spread of diseases is limited and work to isolate any outbreaks. This is particularly relevant when animals and livestock are brought to regional agricultural shows.

We can work to improve our environmental resilience. The environment does not recognize administrative borders which represents a challenge. Flood waters in the Border Rivers affecting Goondiwindi originate to a large degree in NSW. Likewise, bushfires can move across state and local borders at a rapid rate. It is vital we collaborate in this shared disaster management challenge. If we are able to do this, we will achieve better outcomes across the region.

Our landowners know their land better than anyone else, we support them to manage their part of the environment. Part of our responsibilities are to monitor changes to the environment, both natural and man-made, to ensure we can mitigate the effects of these changes or be prepared for impacts when they do occur.

Image: Caliguel lagoon near Condamine. Credit: Shutterstock.



Roads and transport

Roads and rail are the lifeblood of the Darling Downs. They connect our communities and transport our produce.

While the regional road network is already relatively resilient, it is not without its challenges.

Road closures can be prevalent and can result in isolation for our remote communities, halt freight movements and divide townships and essential services. While we are used to this, and we manage, improvement priorities for the road network include identifying opportunities to reduce road closure periods and improve the immunity of key river crossings in towns and along key routes.

With so many kilometres of road to maintain, following flooding it can be difficult to get out to determine the extent of damage or if a road can be reopened. Finding more efficient ways to manage our road network is critical to improve our resilience and free up resources to better serve our communities.

While our soils are fertile and well suited to cropping, they do not create a great base to lay roads. Shifting soils erode the quality of our roads and lead to damaged road surfaces. The continual need to maintain these roads is challenging and expensive, adding complexity to resilience solutions.

Both our roads and rail lines are significant to the regional and national economy. The proposed Inland Rail will traverse our region and presents the opportunity to cement the Darling Downs as a strategic resource and logistics hub. Planning considerations will need to ensure it minimises changes to flood behaviour, particularly on the expansive Condamine River flood plains.

Our regional airstrips play an important role in providing access and supply of essential services, particularly during floods when roads are cut. An opportunity exists to upgrade regional airstrip surfaces to be able to accommodate larger and more diverse aircraft. The ability of local government to utilise aerial support to monitor and manage various aspects of its operation and promote increased usage for industry or tourism cannot be understated.

People and communities

We know our people are inherently stoic and naturally resilient. But the buildup over time of recurrent events and underlying stresses can wear people down and test their fortitude. We must continue to evolve on our resilience journey to support our people as best we can.

Retaining active volunteers in community groups is important to building community resilience. Particularly attracting young volunteers, given the average age of volunteers is steadily increasing. This applies across all community groups from SES and Rural Fire Brigade to local Progress Associations and sporting clubs.

We are aware that people are attracted to our lifestyle and migrate to our region to enjoy retirement. These people may not yet be aware of the challenges of living through natural disasters. Diligence in reaching out to these newcomers to share our knowledge and help them understand their risks is needed.

Our region shares boundaries with many jurisdictions including a State border. Our ability to manage this jurisdictional interface is dependent on our relationships. We know we have to work together on shared challenges and disaster management activities.

We must also ensure the capability and capacity of our own disaster management personnel. Having dedicated people within our organisations to prepare for and respond to events will be critical to achieving our resilience goals.

Economy

The Darling Downs is the food bowl of Australia. Our resource rich soils have enabled a strong agricultural history which remains the backbone of our economy into the future.

Increased economic diversification, through mining, oil, gas, energy, logistics and tourism have presented many opportunities to our region. We are on an upward trajectory. By leveraging our traditional strengths, we have an opportunity to share our produce to the nation and around the world.

Our packed events calendar combined with our natural attractions ensures a strong basis to continue to build our tourism profile. Whether people want to see regional Australia, at its best in Goondiwindi or an apple pie at Applethorpe, we have a strong brand. There is an opportunity to continue to promote our region and encourage new visitors.

The challenges to our economy relate to the changing climate conditions. Our agriculture and livestock trades can be severely affected by increasing temperatures and climatic shifts. Likewise, flooding can affect our supply chains. Changes to our landscape due to climate change can affect our tourism industry.

*Image: Toowoomba Connection Road, Toowoomba.
Credit: Shutterstock.*



Towns and infrastructure

The patchwork of towns that stretches across our region is directly linked to our rich agricultural heritage. The majority of the housing stock in our regional towns predates modern building codes. While these homes have withstood the test of time and like us, lived through many natural disasters, we can work to make our homes more resilient to changing climate conditions.

Building new homes and renovating old ones to be more resilient can mitigate the effects of flood, severe storm and bushfire. Additionally, the ability to incorporate cooling measures within homes is becoming increasingly more important as the prevalence of heatwave increases.

Maintaining and strengthening our infrastructure networks is vitally important. Access to water, sewerage, energy and telecommunications is critical to meet baseline community needs. Maintaining functionality of these networks during and following disaster events can aid the recovery process and enable a return to normality more quickly.

Our region is vast and includes remote towns and homesteads. Improving our digital infrastructure networks to enable our remote communities to access online services in a fast and reliable manner is important. The pace of digital advancement has been difficult to keep up with, particularly for more remote communities.

While we are aware of our natural hazard risk, particularly to floods, we cannot always rely on old timer knowledge. Maintaining our existing flood warning infrastructure and investing in new gauges in critical locations is integral to our disaster management capabilities. This also extends to advancing our detailed modelling of flooding around key areas.

Our ability to help our community during disasters is often limited by our access to disaster management resources. Having access to fit-for-purpose facilities and equipment will enable us to reach our community and better manage the hazards. This includes evacuation centres, which need to be tailored to the needs of our local community including access for people with disabilities and practical local considerations such as pets.

Climate influences

Our climatic challenges include projections of higher temperatures, hotter and more frequent hot days and nights, harsher fire weather, fewer frosts, less winter rainfall and more intense downpours.

Changes to drought are less clear, but reduced rainfall in the region may give rise to more instances of drought than currently occur.

Rises in mean temperatures brings with it an increase in the number of hot days experienced giving the effect of an extended summer. Temperature rises will primarily impact our people, health and lifestyle, with the potential for heatwaves to occur over protracted periods compared with that experienced at present.

Rising temperatures, combined with the later onset of wet seasons and fewer winter frosts is expected to affect the timing and reliability of some crops. It may be necessary to diversify to crops that are more suited to a changing climate.

Fire hazard will grow as fire weather conditions become more intense and more frequent, making bushfires in the region more difficult to contain and suppress. Fire presents risks to our tourism industry, affecting our national parks and making it difficult to manage as visitors are often outside of phone reception and there are limited ways to understand whether people may be at risk of rapidly moving fires.

While fire has a regenerative effect on the environment, burning that is too frequent can start to change a landscape. The ongoing management of mitigation measures will become more challenging as windows to conduct planned burns decrease and potential bushfire prone areas increase.

Changing climate conditions increase the risk of biosecurity threats, as disease is able to spread more quickly and plagues more challenging to control as pests seek out food, damaging crops.

The increased strength of severe storms in the region will affect our ageing housing stock through potential structural damages while agricultural crops are likely to sustain more damage from storms of greater intensity and power.



Our exposure and risks

Critical elements in understanding risk are exposure and vulnerability which exist at both a micro and macro scale. For example, specific bridge or culvert assets may be exposed or vulnerable to natural hazards however, the resupply network these bridges and culverts support may then also be vulnerable. From a resilience perspective, it is necessary to consider risk consequences across a broad spectrum from asset-based analysis through to strategic and systems-based analysis.

The following section provides a high-level overview of the nature of hazard exposure across the Darling Downs region. The following observations are drawn in large part from the 'process one' analysis of each hazard using the QERMF approach across each local government area.

Severe storm

There is a high probability of severe storm events occurring within our region. Severe storms can be affected by local topographic conditions which make some areas more susceptible than others. This is particularly noted in the Western Downs around Chinchilla.

The ability of buildings and residences to withstand significant storm events is relevant in considering the age of the housing stock. Homes constructed prior to the adoption of modern building standards are particularly vulnerable to severe storms.

Vulnerability extends to our infrastructure networks. Whether it be fallen power lines resulting in loss of electricity, trees cutting road access or landslide undercutting roads and destroying buildings. These impacts are a significant risk for certain communities such as in the Bunya Mountains.

Flood hazard

Flooding is intrinsic to the Darling Downs. Flooding is an important part of the landscape, replenishing our aquifers and dams and is critical to the sustainability of the agricultural industry. Floods can also be devastating, as our people are only too familiar.

The January 2011 Toowoomba floods were unprecedented and were the catalyst for significant investment and reconsideration of all aspects of floodplain management across Queensland. More recently our Darling Downs communities experienced the effects of the South East Queensland Rainfall and Flooding event (22 February – 7 March 2022) and the Central, Southern and Western Queensland Rainfall and Flooding (10 November – 3 December 2021).

The nature of flooding is different across our region. Fast flowing riverine and localised flooding with limited warning is prominent around Southern Downs, the western slopes of the Bunya Mountains and in Dalby and Jandowae. In these fast-flowing areas, the nature of these events puts people and property at higher risk due to shorter warning times. In expansive floodplains in the west, floods are characterised by slower moving waters.

The impacts of flooding are well known, a number of our key supply chains are affected including airports, airstrips, rail and road. These networks are critical during and following events as they support re-supply and evacuation. Towns such as Warwick and Dalby can be effectively split in two as flood waters rise and cut access across the main bridges in town. This can impact the ability for people to access essential services, obtain supplies or even prevent them from getting to work.

While some remote townships are not within flood prone areas, they can become isolated for periods as flood waters cut roads in and out. There are some instances where vulnerable facilities such as schools and childcare are susceptible to floodwaters. These instances are well known by local authorities and management plans are in place.

Heat and heatwave hazard

Periods of high heat are familiar on the Downs. Our temperate climate and higher elevation have lessened the impact of hot days and hot nights compared to other parts of the State. Notwithstanding, changing climate conditions are expected to bring about an increase in the frequency of heatwaves. Currently, we experience around 23 to 31 days of heatwave each year, with the frequency increasing further west. It is anticipated that heatwave frequency could increase by up to an additional 34 days by the end of the century, doubling the current amount.

The increase in frequency of heatwave as well as the general rise in temperatures will affect life on the Downs. Challenges to create a comfortable living environment, particularly for the aged and vulnerable will see increased demand on water and energy networks. This emphasises the importance of ensuring demand capacity is available during periods of extreme heat as people seek shelter from searing temperatures indoors.

Heat stress can have a profound impact on livestock. In warmer weather, livestock are less likely to travel as far for water which increases the concentration of grazing in certain locations. Combined with decreased vegetation cover, this adds complexity to managing land. Increasing temperatures can also reduce milk yield and conception rates in dairy cows and can impact weight gain and reproductive performance of beef cattle.

Many crops rely on seasonal variations in temperature as well as the prevalence of morning winter frosts in higher altitude areas. Increasing temperatures may cause poor seed set in summer crops and impact on the yield of winter crops, potentially reducing quality of the product. Changes in temperature are likely to impact the timing and reliability of certain crops and may cause growers to pivot to other crops more suited to the changing climate conditions.

Increased temperatures could shorten the tourist season and impact the sustainability of the tourism industry, particularly in the Southern Downs and Goondiwindi which is known for its wine and paddock to plate produce.

Bushfire and grassfire hazard

Bushfire is becoming an increasingly prevalent part of the landscape. The Darling Downs is no stranger to the risks of bushfire, with an extensive recent history of fire events. During the 2017-18 bushfire season, the Darling Downs region recorded 279 fires, the most in the State for that period.

Recent fires have caused considerable damage to infrastructure and resulted in the loss of dwellings including the 2019 Pechey fire in Toowoomba which burnt 21,000 hectares and burnt for 16 days and resulted in the loss of six residential dwellings.

While much of the landscape across the Darling Downs is dominated by horticulture and livestock, managing availability of potential fuel, the ongoing threat of grassfire remains. Landowners who have lived in the area for some time have a good understanding and awareness of bushfire risk and how to manage it.

Exposure to residential dwellings, particularly on 'lifestyle' properties can be significant, for example those near Killarney and Millmerran. The risk can be exacerbated by the quality and nature of existing buildings. As these areas are home to a large number of new residents who have moved to the area as part of the 'tree change' phenomenon, knowledge and understanding of bushfire risk can be lacking.

Potential exposure to infrastructure assets, particularly telecommunications and power lines can cause significant impact for communities following bushfire events. When communication and power are cut, particularly to areas with new residents without lived experience of a bushfire event then consequences can be catastrophic.

The economic impact of bushfire and grassfire in the region can be significant. Loss of grazing pastures, crops and impacts to fodder, equipment and sheds can be difficult to overcome.

A number of rural fire brigades are located across the region which are deployed to respond to bushfire and grassfire events. These rural fire brigades are able to undertake hazard reduction activities during the cooler months. Hazard reduction burning is an important mitigation measure for bushfire threat and can contribute to environmental activities such as the management of weeds and restoration of landscapes.

Earthquake hazard

Earthquakes are a rare event on the Darling Downs and across Queensland more broadly, but their potential impact should not be downplayed.

The Darling Downs is located across multiple Seismic Hazard Source Zones where the likelihood of earthquake varies considerably. The risk of earthquake occurring is most profound in the western part of the Western Downs which is within Source Zone 29 where there is a 41.03% probability of a 5.35 magnitude earthquake occurring over the next 100 years.

The north-eastern part of Western Downs as well as the northern part of Toowoomba (Source Zone 3) and the majority of Goondiwindi (Source Zone 4) are subject to considerably lower probability of around 17 per cent. The balance of Toowoomba and the majority of Southern Downs, which are within Source Zone 30 are subject to a very low probability of 2.7 per cent of a 5.35 magnitude earthquake occurring within the next 100 years. This is the lowest probability within Queensland.

In relation to the exposure and risks associated with earthquakes, damage to underground infrastructure, particularly aged gas lines could be vulnerable to rupture which could cause considerable environmental and economic damage. This is pertinent considering the prevalence of underground coal seam gas extraction within the region.

Essential infrastructure, such as water, sewerage, communications and power could also be potentially impacted by earthquake. Depending on the severity of damage, this could result in cascading effects for availability of water, sanitation and public health.

The Darling Downs has considerable expanses of road and rail networks. These networks are particularly vulnerable to earthquake and could be subject to considerable damage which may be difficult to repair and affect response and recovery initiatives following an event.



Toowoomba Region

Exposure in the Toowoomba region largely relates to flood and bushfire hazard.

Transport networks are particularly susceptible to flooding with a number of bridges subject to flood hazard. Several regional airstrips as well as access to the Toowoomba Wellcamp Airport are impacted by flooding. Flood hazard is identified to affect all power stations as well as some emergency services facilities.

Bushfire risk is highest on the edge of the Main Range where settlements are prevalent on the ridgeline making the most of the stunning views. This has led to a high risk of bushfire in these areas. A number of critical infrastructure networks including power and water supply are potentially impacted by bushfire.

Toowoomba is currently exposed to around 26 heatwave days per year. Under the future scenario, the region could potentially experience up to 30 additional heatwave days each year. This will continue to place pressure on our towns and building stock to adequately keep our residents, particularly vulnerable residents, cool.

Southern Downs Region

Bushfire is a significant exposure for the Southern Downs. Owing to its expansive vegetated landscapes and granite outcrops, the risk of ignition is ever present. Telecommunication, power and water supply networks are potentially vulnerable to bushfire. The continued operation of these networks is particularly important to maintain community connections. Some vulnerable facilities are exposed including schools and aged care facilities, which can be difficult to evacuate and contain vulnerable populations.

Sitting atop the Granite Belt, Southern Downs is generally cooler than other parts of the State. Notwithstanding, it is still susceptible to around 23 heatwave days per year. Under future scenarios, this could increase by an additional 26 heatwave days per year. With a high median age and large population of residents aged over 65, increasing heatwave conditions will create health risks for this cohort.

Flooding is a key vulnerability, with fast moving waters in the upper reaches of the Balonne-Condamine catchment having potential to cause significant damage. Parts of the road network, including local bridges are potentially affected.

Western Downs Region

Across the Western Downs, flood exposure poses the greatest risk compared to bushfire. Critical assets like power infrastructure, airports, telecommunications water supply and sewerage networks are all exposed to varying degrees. The expansive road network of the Western Downs is exposed with high proportions of state and local roads exposed to potential flood hazard. Critically, there are a number of river crossings that have potential to be cut due to flooding.

Bushfire risk is also a prominent exposure. Bushfire has potential to impact a number of critical infrastructure networks such as water supply, airports, gas and oil pipelines, wastewater and power supply. A high proportion of emergency services facilities, schools and health services are also potentially exposed to bushfire risk.

The risk of severe storm with localised disruptive storms is common in parts of the region around Chinchilla. These storms have the ability to damage homes and critical infrastructure networks such as above ground power and telecommunications towers.

Exposure to heatwave in the Western Downs is potentially going to increase significantly. Currently experiencing around 28 heatwave days a year, this could increase by an additional 51 heatwave days per year. This could place a strain on critical infrastructure networks as well as have a degrading impact on road networks.

Goondiwindi Region

Flooding is the primary exposure of the Goondiwindi region. Significant parts of our road network can be subject to inundation causing roads to be closed. Additionally, flooding can have a significant impact on many of our towns including to residential and commercial buildings as well as some community infrastructure assets such as emergency services facilities and schools.

Bushfire risk also has the potential to create vulnerabilities within the region with large parts of the region identified as being within potential bushfire prone areas. Vulnerabilities include key infrastructure networks such as power and water supply and vulnerable facilities such as schools.

Considering heatwave, Goondiwindi region currently experiences around 31 heatwave days per year. This could potentially increase by up to 47 additional days of heatwave each year. This could place strains on our critical infrastructure networks, housing stock and vulnerable populations.

Image: countryside near Warwick. Credit: Shutterstock.

Unique exposure challenges on the Darling Downs

The communities of Southern Downs Regional Council have experienced firsthand the debilitating challenges associated with compounding events. This causes a cumulative expression of risk to community wellbeing and economic prosperity as there has been limited or no reprieve and ability to recovery fully between events.

The challenges for the region commenced with the persistent drought that has occurred since 2014, with several towns having to rely upon trucked water.

This was then followed by severe bushfires across the region in 2019. Air quality remained a key concern for many months following that event. The global pandemic then hit in early 2020, causing the same socio-economic challenges experienced by other communities.

While drought-breaking rains in 2021 filled water supply dams, flood impacts were evident. Recent major flooding in 2022 in Pratten, Warwick and Killarney have further compounded impacts for Southern Downs communities.

2021 / 22 Southern Queensland floods

Following successive years of drought, in late November 2021 significant rainfall impacted communities across the Goondiwindi region. Residents from Inglewood, Yelarbon and Texas were evacuated from their homes due to flooding. As well as this, vulnerable community members in Goondiwindi were temporarily evacuated to Warwick and Toowoomba as potential flooding threatened the community.

Flooding caused widespread damage across the region to bridges and railways as well to a small number of shops, crops and livestock.



Case study: Bunya Mountains Community Association – Community Safe Landing Site

The Bunya Mountains is home to 45 permanent residents, but its population often far surpasses this as the area is a known tourist destination.

The Bunya Mountains Community Association is a small but active group of locals who are committed to enhancing the liveability of the Bunya Mountains for both residents and visitors.

Due to its isolation, limited access and transient population there are a number of unique challenges for the area. One such challenge was the need to for emergency medical evacuations.

Recognising this need, the Bunya Mountains Community Association sought to enable access to the area via helicopter for emergency medical evacuations. Without any existing suitable landing locations, a new landing area would be required.

The Association was unable to achieve government support as a formal helipad was not considered warranted in the area. Not to be deterred, the community reached out to Lifelight in Toowoomba for advice.

An experienced helicopter pilot was able to assist the Association with finding a suitable and safe helicopter landing site that would enable a medical evacuation.

A level site with no overhead power lines was identified within the national park behind a workshop. The Association worked with Queensland Parks and Wildlife to gain approval to access the site for emergency evacuations. The Association also coordinated with Lifelight to ensure they were aware of the landing site and that it would be suitably maintained to enable emergency medical evacuations to occur.

The Association was able to clear a safe landing site to enable emergency medical evacuations and have developed management procedures.

In July 2021, the community safe landing site was required on two occasions within one week for emergency medical evacuations.

This provides a powerful example of the importance of local volunteers in improving community resilience. The community safe landing site will be a valuable asset and provides comfort for the community to know that such a service is available if an emergency arises.



Our pathways to resilience

This Strategy has been formulated through regional engagement and collaboration with the local governments and stakeholders. It builds upon existing resilience efforts across the region, including a wealth of existing studies, reports, plans and strategies. It also draws upon strategic observations from the initial assessment of exposure and vulnerability undertaken across the region.

Consideration of locally identified community needs, strategic vulnerabilities and risk information can inform and bolster resilience initiatives across the region.

Regional Strategic Pathways

The strategic pathways (on next page) form a blueprint for coordinated resilience action for the Darling Downs region. Efforts at the local level are calibrated to work toward the achievement of regional goals. Each strategic pathway is mapped to its corresponding QSDR objective, referenced by the the coloured number reference.

The concept of resilience action can be considered in the context of three options or opportunities:

‘Doing same’ – some parts of the system may be able to continue successful functioning even with disruption. However, other parts of the system will not endure major disruptions and to ‘go back to normal’ after disasters is reinforcing existing vulnerabilities.

‘Doing better’ – some parts of the system may be amenable to incremental changes and adjustments, allowing for improved decisions and actions based on updating knowledge.

‘Doing differently’ – large parts of the system will not be able to withstand increasing frequency or magnitude of disruption and will require a step change to deliver on goals and things that are valued. System structural changes can be achieved by addressing root causes and re-prioritising.

For the Darling Downs, the doing same, doing different and doing better model encompasses the following examples:

- continuing to maintain and strengthen infrastructure networks and community cohesion
- improving disaster management facilities and early warning networks
- enhance collaboration with cross-border partners.

	Resilient society	Resilient towns and infrastructure	Resilient transport	Resilient economy	Resilient environment
Doing same	Maintain community cohesion 2	Strengthen utility networks 3	Maintain the road network 4	Support local businesses in risk awareness and business continuity 2	Support landowners to manage weed and pest outbreaks 1
	Manage community expectations in disaster management and service provision 2	Investigate opportunities to improve aerial support 3	Support upgrades to regional airstrips 4		Connect with NRM groups to manage weeds and pests 2
	Support local knowledge sharing 1				
Doing better	Provide training and education to leaders and disaster management officers 4	Provide purpose built disaster management facilities and resources 1	Provide early warning of road closures 1	Encourage new skilled workers to regional centres 2	Update flood and bushfire modelling and data capture 1
	Provide support for more Disaster Management Roles 1	Improve flood warning infrastructure network 4	Manage impacts of new transport infrastructure 1		
	Encourage increased volunteerism 2	Improve telecommunications networks 4			
Doing different	Improve engagement with new communities 1	Address housing stresses and support Build Back Better initiatives 3	Increase integrity of road network at key locations 4	Embrace new opportunities 3	Collaborate across borders to manage weeds and pests 2
	Support community capacity building 4	Support place based community resilience initiatives 4	Increase supply chain resilience 4		
	Advance cross-border collaboration on disaster resilience issues and opportunities 2				

- 1** we understand the potential disaster risks we face
- 2** we work together to better manage disaster risk
- 3** we seek new opportunities to reduce disaster risk
- 4** we continually improve how we prepare for, respond to and recover from disasters

Delivering over time

The strategic pathways provide broad themes that address the region’s identified resilience needs. Focusing the right effort at the right time is critical to advancing resilience in a sustainable way.

Being able to describe what is needed, and when, is a key aspect of coordinating whole of government and collective responses to locally identified needs.

The diagram below provides a conceptual roadmap to understand key actions and investment priorities for the region, and when they might be applied, having regard to funding mechanisms and broader delivery programs of investment. It anticipates that stresses and shocks will continue to happen into the future – but it provides the trigger points for key interventions at the relevant points over time (before and event, during, and after) that are needed to help sustain socio-economic growth into the future.

This can be used as a mechanism to understand key recovery and resilience priorities ahead of time, so that when an event occurs, all stakeholders are already aware of the key needs of the region through the action plan which enables post disaster efforts to be better coordinated and streamlined.

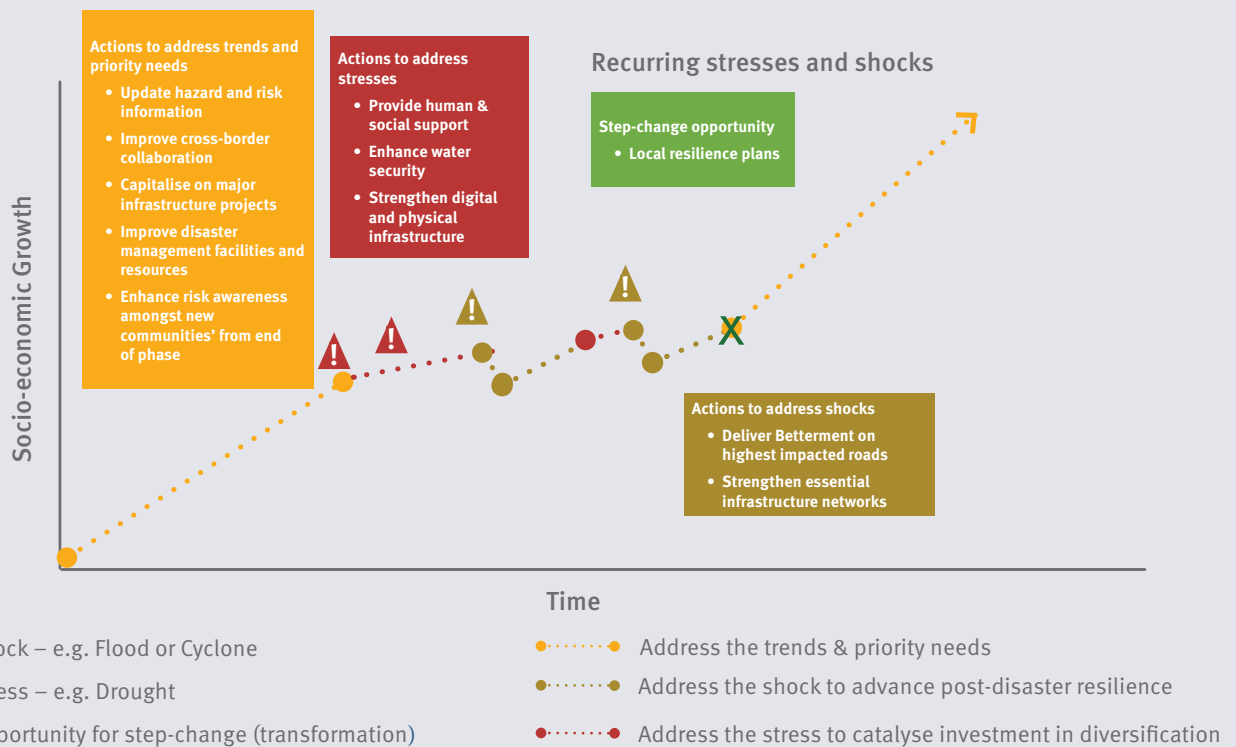
The phased approach, shown in the diagram below, acknowledges resilience is a journey and is punctuated by events that change our circumstances. Sometimes, it is easier to achieve changes to the status quo after an event, when the consequences are in clear memory. As challenging as events are, they also present opportunities for change so that today’s lessons can be retained and put to work for future benefit. In other periods, under blue sky conditions, other opportunities exist to build hazard and risk information datasets, undertake monitoring, and plan for uncertain times.

Importantly, this approach means that efforts, projects and activities need not be all done at once. Individual local government circumstances will dictate what is needed and when certain actions are best carried out depending on local priorities and needs at any given time.

The Darling Downs meaning of resilience and local contextualisation of natural disasters has triggered a method of delivery over time that responds to the region’s unique circumstances.

Future action and investment priorities and phasing

Figure 8. Improving our prosperity through resilience (adopted from Joseph Fiksel).



Action Planning

A Local Action Plan for each local government in the region supports the implementation of this Strategy. The Local Action Plan identifies a suite of potential projects, that if implemented, would contribute to improving resilience to natural hazards at both the local and regional level. It is calibrated to provide direction on how to pivot actions as events occur and circumstances change.

Each local government will be primary driver for implementing the Local Action Plan, however it is acknowledged that not every action identified is the responsibility of the local government. Some actions will require involvement by state agencies, local stakeholder groups, charities, NRM bodies and community groups. Where this is the case, councils can work with stakeholders to share these actions and projects.

Darling Downs delivering resilience over time – The Challenge – Solution – Outcome Framework

place-based, community-led resilience plans and strengths-based community/council interface

'Right-sizing' disaster management and resilience resources to community need is a complex challenge for every Queensland council. It can be difficult to quantify community expectations and needs, or the role councils can play in enhancing the resilience of specific communities or groups.

The towns of the Darling Downs tend to be discrete and quite independent. The landscape is dotted with small towns, each with their own unique history, natural hazard profile and cultural connections. These places are linked through road, rail and telecommunications connections that are vital to staying socially and economically connected, both regionally and beyond.

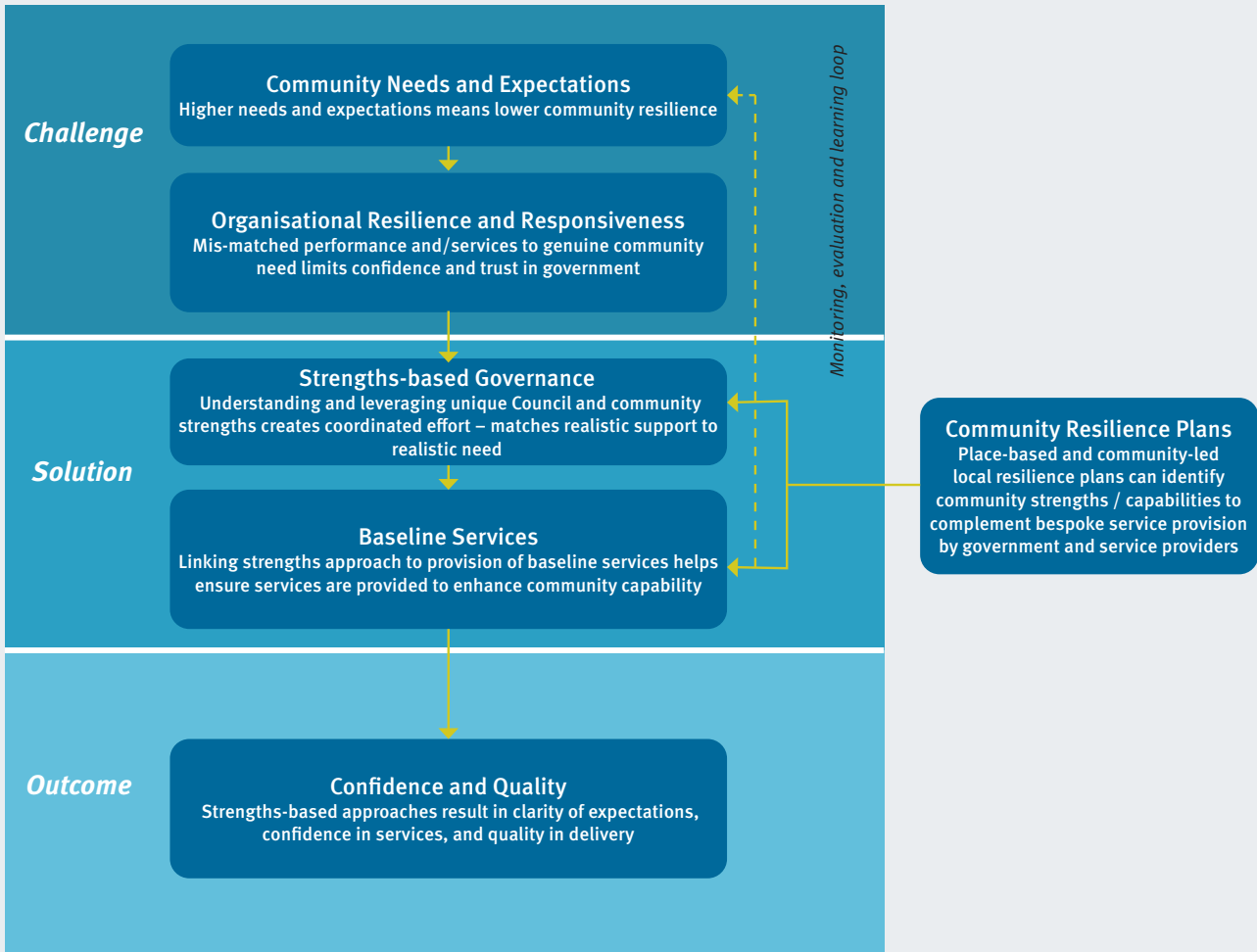
This patchwork of differing needs and issues can result in certain places having lower levels of community resilience than others. Councils by their nature have very limited resources –they experience challenges prioritising resources to certain places over others. This can be perceived as a lack of service provision when it is more about how resilience responsibilities should be shared between community and government. This sharing of responsibility is a core principle of disaster management and the Queensland Strategy for Disaster Resilience.

Councils can overcome some of these challenges by employing a strengths-based framework of governance in these places. Helping communities to 'self-help' so they are less reliant on council resilience resources in times of need. This can support the continued delivery of government and council baseline services, such as infrastructure provision and maintenance.

For this to happen, the resilience needs of each local community need to be known. Place-based resilience plans are community-led, pragmatic, and chart a course for community-scale and individual-level self-help. These plans can provide a prioritised list of resilience needs that can be actively implemented over time by the community.

The outcome of a strengths-based community/council interface is confidence in the quantum and quality of services provided by government, and the role of community, households and individuals in enhancing their own resilience responsibilities.

Figure 9. The Darling Downs governance model for resilience over time: Challenge – Solution – Outcome Framework





Implementation

Working together to implement the strategy

This Strategy will be implemented as a partnership across the four local governments of the Darling Downs region.

The Strategy actions will be driven through local leadership and regional resourcing under the direction of DDSWQCOM, with appropriate support from other coordinating bodies and entities including District Disaster Management Groups (DDMGs), local disaster management committees, recovery and resilience officers, state government agencies, and not-for-profits.

This approach recognises that while actions are best delivered locally, multi-disciplinary regional level support is also required to encourage cross jurisdictional collaboration, provide technical assistance and proactively assist project implementation.

Enduring governance and funding arrangements

This Strategy supports how local governments, and stakeholders work together to achieve common resilience outcomes for the Darling Downs region.

Under this model, the Strategy acts as the regional blueprint for coordinated and sustained action. An agreed governance arrangement will support the implementation of the Strategy and an enduring commitment to championing resilience into the future. Stakeholder-identified key requirements for the successful implementation of this Strategy are:

- a broad, multidisciplinary approach to resilience building
- sustaining governance arrangements, funding, and resource capability for implementation of resilience actions over time
- a clear understanding of how resilience arrangements interplay with Queensland Disaster Management Arrangements
- greater collaboration between government and nongovernment organisations to optimise resilience service delivery and efficiency
- clarification of the proposed resilience implementation arrangements at state, regional and local levels so that local actions can be programmed and delivered accordingly.

This model is underpinned by a role for everyone in delivery including:

Local leadership

Local governments are encouraged to establish their own multi-disciplinary resilience working groups to transition community and climate-related disaster resilience to front-of-mind in all local government functions. This could be achieved by combining existing recovery group arrangements with an ongoing resilience focus over the calendar year.

Regional coordination

Regional coordination is encouraged through the DDSWQCOM with a strong link to other existing related governance arrangements such as the relevant DDMGs.

State support

As a locally-led and regionally coordinated strategy, the role of the State is intended to be one of provision of enabling measures such as administration of grant funding programs, delivery of core governmental functions that interface with resilience building, and facilitation or coordination of support that can assist implementation.



www.qra.qld.gov.au/regional-resilience-strategies/darling-downs