Goulburn Murray Resilience Strategy

ADAPT TRANSFORM THRIVE

2020

VICTORIA State Government

REGIONAL PARTNERSHIPS GOULBURN

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During the development of this this Strategy, we have also spoken to and listened to the perspectives of more than 200 people from this region including community members, young farmers, Traditional Owners, dairy and horticulture farmers, niche industries, industry groups, processors, local government staff and councillors, and financial counsellors.

Thank you to all these people who have an interest in working together to build the resilience of our region.

ACKNOWLEDGEMENT OF COUNTRY

The Goulburn Murray region acknowledges the Yorta Yorta, Dja Dja Wurrung, Barapa Barapa, Wamba Wamba, Wadi Wadi and Taungurung peoples as the Traditional Owners of the lands covered by this strategy.
We acknowledge the resilience of Traditional Owners, who have for millennia lived and thrived through change on these lands. We continue to learn from them about what it takes to be resilient on this Country, and pay our respects to their elders, past, present and emerging. We acknowledge the contribution of regional Tradtional Owners in developing the interventions within this strategy.

FACILITATORS

This project has been facilitated by a team from RM Consulting Group, the Australian Resilience Centre and DG Consulting.

Foreword

The Goulburn Regional Partnership is very pleased to present the Goulburn Murray Resilience Strategy. This document is a response to the macro drivers of change that are impacting on our region – both positive and challenging. Our region may never have been subject to such dynamic volatility, and the pace of change is difficult for communities to cope with.

In the face of such rapid change – driven by factors such as climate change, water recovery for the environment, technological change, market access, bio-security risks, global pandemic issues such as COVID-19, energy challenges and quickly changing competitiveness of some of our traditional agricultural sectors – there has been no overarching vision and strategy to support our region to position itself for a smoother path into the future.

Lack of resilience is hurting our regional economies and communities. This shows up when a challenge or shock manifests, and causes significant disruption and dislocation. A resilient region would be able to better absorb the challenge, allow different parts of our economy to continue to flourish, and facilitate the challenged part of the economy to more quickly adapt and move forward.

The Goulburn Murray Resilience Strategy lays out 8 Resilience Principles that we believe will assist our region to better deal with change, and details a series of proposed interventions that will help address each principle. Importantly, the interventions will combine to produce a strategic, concerted momentum that will help take our region forward. If implemented individually, and in an ad-hoc way, the impact of the suite of interventions will have less impact. They will just be another series of projects and pilots – and we have all seen plenty of those before.

Recognising the importance of irrigated agriculture to drive outcomes in our region, our Resilience Strategy has a strong focus on that sector, but the thinking behind the strategy applies to all sectors of our community and economy. More ideas and projects should come toward this process, over time.

It is crucial that the region shifts its focus from responding to shocks and events, to develop an understanding that enduring long term positive change can only be driven by looking more deeply at systemic structures and the patterns and process that these systems have set up. Our region simply must move from a 'persistence' mindset, to an active 'adaptation and transformation' mindset.

These things matter, because change is not going away. In all likelihood, the rate of change is going to accelerate. So, does the Goulburn Murray Region continue to be buffeted by change, or do we recognise both challenges and opportunities early, and have the collective will to invest in ideas, policies and projects that will not only better deal with the issues of the day, but build a resilience platform to leverage the wonderful natural assets and advantages our region enjoys.

The Resilience Strategy does not only focus on challenge and shock. It takes stock of the inherent natural advantages of our region, and is alert to the opportunities opening up from Free Trade Agreements, distributed energy models, and the efficiencies and productivity gains from agtech.

Whilst our region in under pressure on several fronts, it is also poised to flourish on many others.

This Resilience Strategy will help set a longer term framework, and engender a different way of looking at change, that will play an important role in minimising the impact of challenges, and maximising the plethora of opportunities before us.

Although initially led by the Goulburn Regional Partnership, the success of this strategy will require support from all three Regional Partnerships which encompass the GMID, as well as a wide range of other public and private organisations.

David McKenzie
Chair Goulburn Regional Partnership

A Resilient Goulburn Murray Region

In the coming decades, agriculture and land management within the Goulburn Murray region will face many major changes, including many challenges. To prepare for and confront an unpredictable future head on, the region will build its resilience collectively. Resilience is more than survival. Resilience is about thriving in the face of change.

Vision: Thriving in the face of change

Regardless of future change, communities across the Goulburn Murray region wish to live in a place with the following characteristics:

TOGETHER: *A region that has pride, wellbeing, cohesion and a spirit of resilience and ingenuity.*

ATTRACTIVE: *A region with desirable places to live, work and invest. With protected and healthy biodiversity, waterways and landscapes.*

PROSPEROUS: *A region with diverse industry, where agriculture continues to be an important part of the economy, supporting a range of primary, secondary and tertiary operations diverse in size, type and ownership.*

Resilience = ability to cope with and thrive in the face of change

Broadly, 'resilience' is a cornerstone concept for managing an uncertain future. It is the capacity to cope with change while evolving in positive ways.

Resilience is not dogged maintenance of the current situation, or a return to the past, it incorporates a range of action including bouncing back to how things were PERSISTANCE.

Even better, it can look like bouncing forward ADAPTATION or fundamental change TRANSFORMATION.

The Goulburn Murray region faces continual change and acute stresses. Taking a resilience approach will help us to shape the trajectory of change, rather than being forced to respond in a particular unwanted direction.

Without resilience

If we don't work on the things that are known to build resilience, we are likely to find that our region will struggle to meet future change. This could result in unprofitable enterprises, diminished regional attractiveness, eroded natural assets, reduced wellbeing, and systemic failures.

inflexible
-fixed systems where efficiency is paramount

defeatist
-it's all doom and gloom, why bother

complacent
-let's just keep doing what we've always done

disconnected
-divided and disengaged industries, agencies, people, places

Finland has a self-identified national spirit called sisu, which loosely translates as pluck, grit, resilience. It is a powerful spirit in a country that has survived and thrived with poor soil, harsh winters and geopolitical conflict.

Map


Swan Hill
Kerang
Cohuna
Loddon River
Boort
Pyramid Hill
Murray River
Cobram
Nathalia
Yarrawonga
Echuca
Goulburn River
Tongala
Campaspe River
Rochester
Shepparton
Tatura
Stanhope
N
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25
50
75

The challenges and trends

COMPLEXITY

The Goulburn Murray region is a complex dynamic system with many interacting elements that influence each other in predictable and unpredictable ways. The system is changing. While some of the change is outside our control (climate, global markets, technology), we can shape our response to change and continue to create opportunities.

UNCERTAINTY

The world is changing more quickly than ever before. It is impossible to predict exactly how the region will change in the future. Traditional approaches to planning are not well suited to these uncertain conditions. The best approach is to build our region's capacity to cope with a wide range of possible futures. We can do this by applying resilience thinking.

WATER AVAILABILITY

Over the last twenty years, there has been an almost 50% net decline in water resources. This is due to a combination of climate change, water recovery as part of the Murray Darling Basin Plan, changes to water policy and competition for water from outside the region.

Living with variability in water availability is already a feature of agriculture in the Goulburn Murray region. Supply and demand determine water price and competing industries buy or sell water at different price points.

CLIMATE CHANGE

Human activity is causing climate change, through our release of greenhouse gases from the burning of fossil fuels, land use change and agriculture. Atmospheric concentrations of carbon dioxide are now more than 40% higher than they were before industrialisation.

The Goulburn Murray region has been getting warmer and drier. The region can expect temperatures to continue to increase year round; more hot days and warm spells; fewer frosts; less rainfall in autumn, winter and spring; and more frequent and more intense downpours. By the 2050s the climate of Shepparton could be more like Griffith, NSW, while Swan Hill will be more like Balranald, NSW.

FARM SCALE

In line with national trends, there are fewer and larger farms, with increasing production efficiency. Increasing scale, combined with mechanisation and automation, leads to reduced demand for labour and rural depopulation.

There are also increasing numbers of rural residential properties that are supported by off farm income. This leads to fragmentation of agricultural land parcels. Pressure is growing for supply of this class of property, particularly close to larger towns such as Shepparton.

MEGATRENDS

RIRDC and CSIRO completed a foresight study of Australian agriculture and rural industries. The narrative of the future is told through a set of interlinked megatrends impacting Australia and the wider global world over the coming 20 years. Population growth will drive demand for food and fibre. A growing middle income class will increase consumption and diversify diets. Consumers will be more choosy for health, ethical and environmental reasons. Advances in science and technology will change the way food and fibre is produced. Risk profiles will shift in response to climate change and globalisation.

COMPETITIVE ADVANTAGE

The regional foundations are strong. There is plentiful land, with high quality soils, to support a variety of agricultural commodities. There is higher rainfall relative to other parts of the southern Murray Darling Basin. A diverse services sector exists, combined with ample processing and value-add capacity. The modernised, low energy, water supply system can provide high levels of service. Government, industry and community leaders are also committed to working collaboratively.

DAIRY SECTOR

The dairy industry plays an important role in the regional economy and is currently in transition. Consolidations continues on farms and in processing, and farm systems are diversifying away from being dominated by grazing of irrigated pastures. Regional milk production has declined by a third since 2000.

The industry remains confident in its future with a positive demand pattern driven by the Asian market. In response to changing operating environments, there is a trend towards more adaptive and agile farming systems. This includes increased diversification and intensification of production systems, supported by an increasingly broad range of feed base options

HORTICULTURE

Horticulture has continued to slowly expand and increase its water use over the last 50 years. The industry is focussed on fresh market fruit, a departure from previous decades where processing dominated. The trend for fresh fruit will continue due to higher values and a renewed interest in fresh fruit export. Expansion of annual horticulture is also occurring with vegetable production moving further from Melbourne. There are also opportunities in high value niche markets.

DIVERSIFICATION

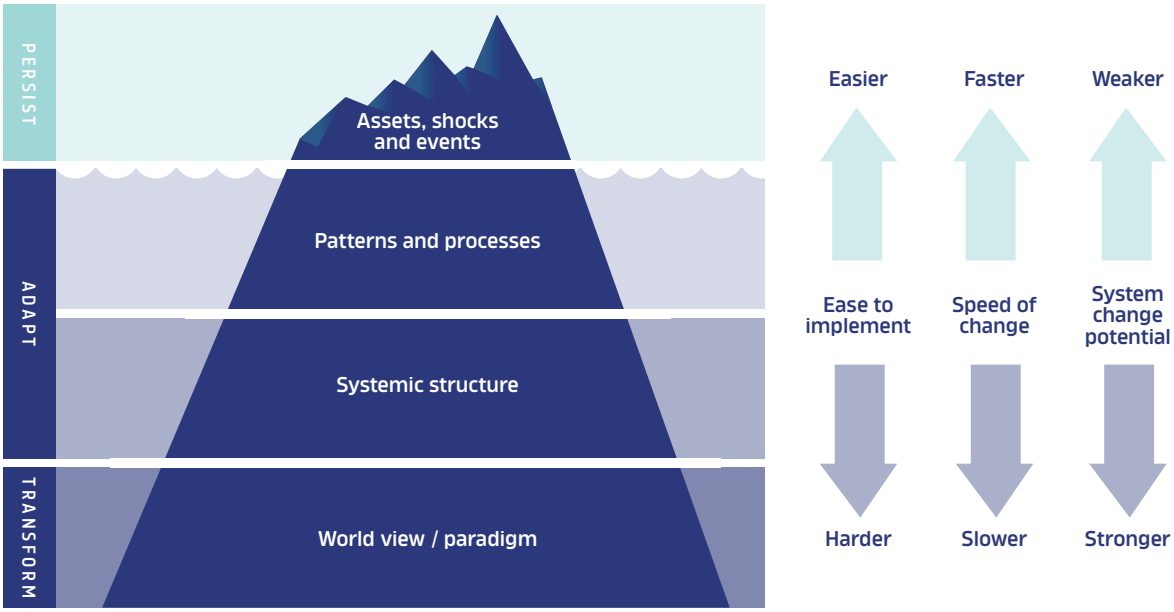
There is opportunity for further diversification in land use and production across the Goulburn Murray region. Growth in intensive shedded agriculture is expected, including glasshouses, piggeries and poultry. There is potential to increase indigenous food and fibre production and cultural tourism. There is opportunity to increase on-farm value adding, including via agri-tourism. Growth in demand for alternative renewable energy production could also stimulate new industry.

Types of Resilience

Resilience is not a synonym for dogged maintenance of the current situation, or a return to the past. Resilience is a spirit of courage and enterprise and encompasses a system or the components within a system's capacity to persist, adapt and fundamentally transform.

In the face of major drivers of change, some parts of industries within our region will be focused on persisting. However, it is more likely that we will need to continually adapt, and sometimes we will need to transform.

The iceberg model demonstrates that it is most effective to intervene more deeply within our system. Working above the water line will not address the underlying patterns, processes and systemic structures that enable us to adapt and transform. It may take time and be harder to implement, but deep adaptation and transformation provides stronger potential to respond positively in the face of change.



Source: Paul Ryan, Australian Resilience Centre

Resilience principles

The following principles describe the characteristics of systems that demonstrate resilience. They must underpin any interventions taken to increase resilience within a system.

- Develop a complexity perspective
- Manage networks and connectivity
- Develop governance that embraces change
- Value, retain and build response and recovery capacity
- Foster cohesion, self-organisation and local responsibility
- Focus on slow variables, leverage & tipping points
- Design for flexibility
- Learn for change

Resilience in action

Principle 1.
Develop a 'complexity' view of the world

The tendency to focus on enterprises or industries in isolation from the whole system has reduced resilience by missing critical linkages, feedbacks and unintended consequences. While agricultural production and food processing are critical to economic and employment growth, the long-term resilience and wellbeing of the region is dependent on other factors such as ageing and declining populations, lifestyle land ownership, biodiversity, and ecosystem health. Developing an understanding and capacity to plan and work with this complexity is one of the most powerful steps we can take towards building a resilient region.

Principle 2:
Develop governance that embraces change

Governance approaches that embrace change help a region to prepare for, respond to and learn from change. The Goulburn Broken Irrigation Futures project in the early 2000s clearly identified a suite of issues that were the precursors to most of the serious challenges the region now faces. A recent review of that work showed that despite its high quality, extensive process, the governance system was unable to move away from business as usual. We want to learn from that failure by developing an approach that can embrace change.

Principle 3:
Foster cohesion, self-organisation and local responsibility

Because no one group has control of a complex system, no one can build resilience on their own. Resilience building must be a system wide, collective process. Self-organisation, local decision making, and cohesion are important for addressing local scale problems. There is very clear evidence that communities with strong social capital and capacity to self-organise suffer less during shocks and disasters and recover faster.

Principle 4:
Design for flexibility

Flexibility offers long term regional resilience in the face of uncertainty by allowing for future adaptation at lower cost.

It is crucial to avoid "lock-in traps", which occur when system feedbacks become self-reinforcing, preventing change. For example, it is possible that the relatively 'fixed' footprint of current infrastructure (roads, channels) may reduce land use and production system diversity. A key lesson from the Connections project is that while there may be a higher up-front cost for investing in flexibility, in the longer term it is likely to be worth it.

Principle 5:
Manage networks and connectivity

Shifting demographics and land uses create new system dynamics for the region. For example:

- The shift from largely rural communities to increasingly urban or lifestyle communities may have implications for how agriculture is practiced.
- Management of wastes and emissions from intensive animal systems requires system wide focus.
- Habitat connectivity is crucial for biodiversity, allowing species to move.

Principle 6:
Value, retain and build response and recovery capacity

Buffers, reserves, diversity and redundancy provide long term shock absorption and rapid recovery capacity to systems. A number of recent studies suggest the economic benefits of building response and recovery capacity are significant, but that those benefits are realised over longer time frames. The prevailing paradigm is focused on shorter term efficiency and economic return at the expense of these capacities.

A Goulburn Murray example is maintenance of surface and subsurface drainage capacity, which will support future response and recovery capacity to wetter periods if and when required. Another example is Victoria's water allocation policy. By using a rolling 2-year process it creates reserves and buffers against dry conditions.

Principle 7:

Focus on slow variables, leverage & tipping points

There are a number of slow variables that continue to play a critical role in shaping the Goulburn Murray Region, including terms of trade on traditional commodities, labour costs and regulations, and climate change. Slow changes make the system more vulnerable to short term shocks by eroding capacity to prepare, respond and recover.

For example, lower commodities prices over time reduce buffers and reserves of capital. As a result, short term spikes in input costs or interest rates, limit the capacity to pay debt. These immediate challenges can become acute when the system has ground slowly towards a major tipping point. Teasing out the short and long-term dynamics and the presence of tipping points can generate important insights for dealing with the underlying cause of change.

Principle 8:

Learn for change

Learning is critical in complex systems. Learning needs to be fostered and structured to allow local scale innovations to develop, be tested and then scaled up.

The decline in government funded Research, Development and Extension (RD&E) means a new approach to learning and innovation needs to evolve that best suits the complexity of the Goulburn Murray region. This model requires novel partnerships across private and public institutional boundaries. It requires mechanisms to collect, synthesise and share learning and a governance system that can support and enable innovations to scale up and out.

Five areas for intervention

People from this region have come together to identify "resilience interventions", which are ways we will try to influence the resilience of our region. These interventions fall into five streams that embody the principles of resilience in real and practical ways.

RESILIENCE IMPLEMENTATION PLAN – FIVE STREAMS

a) Futures of agriculture
b) Learning for change
c) Circular economy
d) Natural & built assets
e) Leadership & coordination

The interventions are community-supported and based on resilience principles. They will support social, economic and environmental resilience within the agricultural landscapes of the Goulburn Murray region.

In keeping with the resilience principles, no one person or organisation will implement this strategy. Many people have come together to set this vision and many different organisations, businesses, communities and individuals will lead the interventions with many partners.

This is a living strategy, so the interventions will and must evolve over time as we learn and the region changes. We will focus on these five areas together to build the resilience of our region to cope with change and create opportunities to thrive.

GOULBURN MURRAY RESILIENCE INTERVENTION STREAM:

Futures of Agriculture

GOAL

The goal of this intervention stream is to build the ability of the agriculture sector to address change and challenges and thereby increase resilience. The interventions focus on attracting investment, embracing technology, diversifying crop types and improving supporting infrastructure.

OUTCOMES

- Diverse range of enterprise size, type and ownership
- Increased profitability of farming systems
- Regional economic growth

HOW DOES THIS INTERVENTION STREAM CONTRIBUTE TO RESILIENCE?

The Goulburn Murray regional economy is expected to remain dominated by agriculture and food. The physical assets of the region (e.g. its good soils), existing supply chains and existing services, combined with a global increase in demand for high quality food, provides the opportunity to attract new high value irrigation development. Robotics, big data and the internet of things have potential to reduce the cost of production and make the region more competitive.

The proposed interventions in this stream focus on building the ability of the region to be resilient in the face of change – supporting long term prosperity. By enabling diversification, improving productivity efficiencies, increasing connectivity, and embracing complexity, these interventions allow the region to absorb and respond to future challenges and shocks.

This region already has extensive experience in developing unique responses to challenges. For example, the development of Salinity Management Plans in the early 1980s created capacity and practical action to manage the emerging threat of salinity. These Salinity Management Plans later transformed into Land and Water Management Plans which also focused on addressing water quality, biodiversity loss and water use efficiency. Our locally developed interventions draw on this legacy and acknowledge a range of other work underway including Irrigation Futures, Connections and Local Area Planning.

WHAT IS THE ALTERNATIVE, IF WE DO NOTHING?

Irrigated agriculture dominates the Goulburn Murray region, and in recent years, economic growth has been at or near zero and productivity is falling. If we don't proactively respond to the challenges of climate change, decline in water resources and farm structural adjustment, the region will continue to stagnate and then decline.

FOUNDATION INTERVENTIONS

A1 Agricultural Redevelopment Coordination

The Agricultural Redevelopment Coordination (ARC) Project will provide a one-stop shop for agricultural investment. Provision of data, guidance on approval processes, case management of development proposals, and inter agency liaison, would be key services provided.

Investment is often hampered by lack of information, unfamiliarity with planning systems, difficulty in navigating red tape and regulatory requirements. This intervention will enhance support to investors who wish to redevelop agricultural properties in the Goulburn Murray region. Investors could include current landholders or outside investors. Proposed projects would need to meet assessment criteria aligned with resilience objectives.

This will include revising the Regional Investment Prospectus to provide branding of the region and its significant relative advantages. Information on land, water and infrastructure assets would be made available to potential investors.

The ARC Pilot Project is currently being implemented by Goulburn Broken CMA.

TIMESCALE

Short to medium term

RESILIENCE VALUE

Farm redevelopment can increase diversity and flexibility of businesses and improve ability to respond to the changing agricultural environment. This will assist developers to engage with and work through complexity. It also fosters development of networks and cohesion.

A2 Indigenous Crop Production

The Dja Dja Wurrung and Taungurung corporations are investigating projects to trial and develop the case for agricultural development of native crops. This intervention proposes support to these trials.

An example is the Djandak Dja Kunditja (Country Healing its Home) project which aims to trial and demonstrate Kangaroo Grass as a native perennial cereal grain for use in broad acre dryland cropping.

The revival of traditional food crops has multiple objectives including sustainable land management, utilisation of natural resources and return of economic advantage to Traditional Owners.

TIMESCALE

Short term

RESILIENCE VALUE

Provides opportunities for self-organisation and local responsibility for solutions. Can increase diversity and flexibility in agriculture.

A3 **Smart Farming**

In a changing and complex environment, embracing change and complexity is vital. This includes embracing technology change. It increases the resilience of farming enterprises and food manufacturing by enabling them to move up the value chain to higher profitability production.

In this intervention, we propose building local capability through connection with leading research and innovation partners. This will include:

- Building on findings from the current AgVic On-Farm Internet of Things Trial.
- Increasing digital literacy through courses, digital festivals and other initiatives
- Trialling low-power wide area networks
- Investigation of opportunities to capitalise on existing digital infrastructure in the region.
- Investigation of opportunities to utilise robotics and artificial intelligence to enhance agricultural production.

TIMESCALE

Short to medium term

RESILIENCE VALUE

Provides data for learning that improves better decision making and adaptation.

A4 **AgriTourism Network**

The intent of this intervention is to diversify agricultural income streams through development of agri-tourism opportunities. This would link farms directly to consumers.

Farm trails would be developed to promote the opportunities and guide tourists through the region. Repurposing of existing infrastructure (e.g. unused houses or farm sheds) would be encouraged.

This intervention could incorporate a learning for change component. Increasing knowledge of the food supply system and connecting people to their food. It would also incorporate a focus on indigenous foods and multicultural foods. The phrase “many great flavours to taste” is an example from the Greater Shepparton Visitor Guide.

Links with environmental tourism intervention (D2) as related infrastructure can support both.

TIMESCALE

Medium to long term

RESILIENCE VALUE

Will promote diversification of farm business income and build connection to and knowledge of consumers.

A5 **Regional Resilience Fund**

The purpose of this intervention is to incentivise investment that increases the resilience of farm enterprises.

This will include adaptive or transformative change to practices, systems and risk mitigation strategies. It could include diversification to less water reliant farming. This initiave will explore the feasibility of the fund and a range of other financial incentives to support innovative projects.

The program could also extend to facilitating connections with potential investors, an innovation network connecting businesses with innovation services and capabilities, funding for business decision making activities and provision of a skills and training package tailored to opportunities in the Goulburn Murray region.

This intervention has parallels with existing programs such as the Future Industries Fund and the Regional Jobs Fund.

This intervention could include establishment of a not-for-profit Regional Resilience Foundation, which would enable the private sector and philanthropic groups to contribute to resilience building initiatives.

TIMESCALE

Medium term

RESILIENCE VALUE

Will promote change and diversification of farm businesses and build skills to continually adapt to future shocks.

GOULBURN MURRAY RESILIENCE INTERVENTION STREAM:

Learning for Change

GOAL

The goal of this intervention stream is to support our region to learn so we can develop innovative ways to address change and challenges. The interventions selected focus on increasing skills, knowledge and information flows.

OUTCOMES

- Research undertaken specific to local problems
- Increased water and financial literacy within agricultural industries
- Evidence of innovative practices applied in agriculture and land management

HOW DOES THIS INTERVENTION STREAM CONTRIBUTE TO RESILIENCE?

The interventions proposed in this stream will support learning and knowledge flows across our region. This will help people increase the skills and knowledge needed to achieve resilience.

WHAT IS THE ALTERNATIVE, IF WE DO NOTHING?

Throughout the engagement undertaken in development of the Goulburn Murray Resilience Strategy, we heard that many farmers, industries and communities struggle with change because they don't have the knowledge or skills needed to adapt or transform.

Without learning, people, businesses and organisations across this region will persist with approaches that don't work in a changed environment.

FOUNDATION INTERVENTIONS

B1 Goulburn Murray learning centre

A regionally based centre for learning, in relation to agriculture and land management. This centre would provide a local resource to coordinate local research, data, extension, knowledge sharing and adoption. The intent is to work with leading partners to align with existing RD&E and create a culture of learning and success. Activities could include:

- Communicating research and knowledge from other parts of region and outside the region. Need broad perspective to drive learning.
- On ground experimentation pilots - farm trials. Supports farmer preference for practical demonstrations.
- Coordination of regional agriculture and land data in a central place.
- Developing water and financial literacy.
- RD&E in relation to technology; soil health; crop varieties; regenerative agriculture; water use efficiency; indigenous crops.

TIMESCALE

Medium term

RESILIENCE VALUE

Increasing local skills will assist with coping with change and diversification of the regional economy. This intervention could network with a wide range of existing R&D initiatives and organisations in the region.

B2 A Goulburn Murray regional hub in the One Basin CRC

The ONE Basin CRC is a University of Melbourne and University Southern Queensland proposal. The purpose of this new CRC is to deliver valued and trusted advice for the agri-sector, leaders, communities and environmental managers in the Murray Darling Basin.

The CRC proposes to develop policy, technical and financial solutions that support Basin communities, businesses and governments to understand and reduce their exposure to climate, water and environmental threats.

A Goulburn Murray regional hub would support two-way learning between researchers and our region about water challenges and opportunities of relevance to us and the wider basin.

TIMESCALE

Medium term

RESILIENCE VALUE

New sources of innovation are critical for adaptive and transformative management. This intervention could network with a wide range of existing R&D initiatives and organisations in the region.

B3 **Coordinated regional research**

Coordinated research into key areas of change in the Goulburn Murray region can support local adoption of innovations that strengthen resilience.

This intervention could be realised through a formal body, such as the One Basin CRC (B2), or the Goulburn Murray learning hub (B1), or individuals or organisations could band together to do research and share results.

Research topics could include:

- Circular economy opportunities and barriers in the region.
- Climate risk analysis of major food value chains and identification of business opportunities
- The practical applicability of climate smart agriculture technologies in the Goulburn Murray region
- Social research into regional and local barriers to adoption of innovation.
- The effects of various technologies on water use efficiency.

TIMESCALE

Ongoing

RESILIENCE VALUE

Research and development needs to be coordinated to achieve the best outcomes. This intervention would enable and encourage creative thinking, and allow redundancies in science.

B4 **Renewed Rural Skills Connect**

Creation of a buddy system pairing resilient or transformative farmers with more traditional farmers or young farmers entering the region. This would increase social networks and skills sharing across practical/technical knowledge and business planning.

Link with financial & water literacy and succession planning training, potentially included in the learning hub (B1).

The existing Rural Skills Connect program, could be used as a platform.

Could incorporate a digital platform to assist with matching people.

TIMESCALE

Medium term

RESILIENCE VALUE

Resilience value will be high if this is designed to connect transformational farmers with those who are struggling to cope with change.

GOULBURN MURRAY RESILIENCE INTERVENTION STREAM:

Circular Economy

GOAL

The goal of this intervention stream is to support our region to develop a circular economy, underpinned by a transition to renewable energy sources. A circular economy is restorative and regenerative by design. It aims at eliminating waste and the continual use of resources.

OUTCOMES

- Improved circulation of regional resources
- Increased local and renewable energy production
- Reduced carbon emissions (CO_2)

HOW DOES THIS INTERVENTION STREAM CONTRIBUTE TO RESILIENCE?

The Goulburn Murray region currently uses enormous amounts of resources, including energy and water, and in the process, we produce large amounts of waste products. There are huge opportunities for the region to work together to transition to renewable energy sources and connect waste and inputs in ways that will positively transform our region.

A circular economy, underpinned by use of renewable energy, will transform the way goods are produced and used to increase efficiency and self-sufficiency within the region. This will require changes that intersect social, economic and environmental systems. To succeed, our region will need pay attention to networks and connectivity and learning from change.

The proposed interventions will support industry development, improve soil fertility, decarbonise industry and repurpose or reuse waste streams. Developing a circular economy in the Goulburn Murray region will make us less reliant on external resources, and build buffers and redundancy, so the region can absorb and respond to challenges and future shocks.

WHAT IS THE ALTERNATIVE, IF WE DO NOTHING?

Over the last twenty years, the region's net water resources have declined by nearly 50%. Other finite resources such as fossil fuels and phosphorus are cornerstones of agriculture and land management, but production of these resources is predicted to reach a tipping point in the next 10 years. Along with global increase in demand for high quality food, this means that for industries in the Goulburn Murray region to survive, they will have to do more with less.

FOUNDATION INTERVENTIONS

C1 **Regional circular economy coordination**

This regional circular economy coordinating body will identify barriers and opportunities within the Goulburn Murray region, and areas where circularity requires support or intervention.

This will build on the State-wide Circular Economy Policy and Action Plan due to be finalised by DELWP in early 2020.

This intervention could include a digital platform or marketplace as a circular economy exchange. This would identify what wastes are produced versus what inputs are needed.

Education and advocacy would also be a key component. Many people are simply not aware of the opportunities already available, or the rationale/motivation for engaging.

TIMESCALE

Short to medium term

RESILIENCE VALUE

Provides network to support transition to circular economy, making us less reliant on external resources, and building buffers and redundancy. Increases awareness and local skills to catalyse innovation.

C2 **Biogas pilot**

A pilot biogas system will be constructed within the Goulburn Murray region to demonstrate their potential to local farmers.

Methane from effluent/manure can be captured from lagoons/ponds through biological or thermochemical processes to produce energy. Other benefits include reduced odour and Greenhouse gas emissions, and improved fertiliser value of solids by-products.

To make systems viable, farms need to be of sufficient scale or potentially work together in clusters. They also need to incorporate use of feedpads or barn style housing to ensure sufficient solids production and capture.

TIMESCALE

Short term

RESILIENCE VALUE

Increased self-sufficiency building waste into energy source. Potential for scaled innovation. Secondary benefits in odour, GHG and nutrient management will assist farmers meet environmental obligations (a slow variable).

C3 **Locally owned energy**

This intervention proposes a pilot of peer-to-peer energy production and trading.

This could prioritise connection between industry and local generation – potentially also seeding biogas plants (C2).

This would increase industry self-sufficiency and reduce exposure to market variabilities.

This intervention builds the potential for the region to own and control a significant regional input.

TIMESCALE

Medium term

RESILIENCE VALUE

Increases industry self-sufficiency and reduces exposure to market variabilities. Builds on trend in renewable installations but with a local focus on ownership and use.

C4 **Indigenous renewables startup**

Support to a new joint venture development of renewable energy assets that will be Indigenous owned.

The proposal is to investigate the development of two flagship renewable energy assets: a grid connected utility scale solar photovoltaic; and a bioenergy waste to energy plant.

This will support Traditional Owners' efforts to improve their prosperity and ability to shape the local economy so they can direct their own futures.

TIMESCALE

Short to medium term

RESILIENCE VALUE

Supporting Indigenous led business development. Projects could become demonstrations to support learning and encourage others to implement across region.

C5 **By-products as fertiliser**

While by-products are an acknowledged fertiliser resource, there are barriers to their use on agricultural land including consistency of supply, contamination concerns and knowledge about resources.

This intervention would support a regional network to divert by-products from landfill and coordinate their use on farms across the region.

Improved soil organic matter supports eco-system regeneration. This intervention will provide a valuable source of nutrients, cultivate microbes, improve water retention and increase yield.

TIMESCALE

Short to medium term

RESILIENCE VALUE

This will demonstrate leadership in farm use of by-products and in doing so reduce the reliance on chemical fertilisers.

C6 **Circular economy seed fund**

This intervention will provide local producers with grants to investigate and trial innovative processes that reduce or re-use waste and regenerate natural systems.

This could include research and development in robotic effluent and solid waste separation, subsoil manuring, biosolid opportunities, or recycled water for cooling.

Projects could become demonstrations to support learning and encourage others to implement across the region.

TIMESCALE

Short to medium term

RESILIENCE VALUE

Investing in local innovation means solutions are tailored to the needs of industries in the region to foster local responsibility and collective action.

GOULBURN MURRAY RESILIENCE INTERVENTION STREAM:

Natural and Built Assets

GOAL

The interventions prioritised in this stream will lead to natural and built assets that support social, economic and environmental resilience within our agricultural landscapes. Natural assets include waterways, forests, soils and their related ecosystems. Built assets include transport, water and power networks plus public and private infrastructure and facilities. Both provide important economic, recreational and environmental services and functions.

OUTCOMES

- Reliable communication and transport across the region
- Increased extent and health of terrestrial ecosystems
- Increased waterway health

HOW DOES THIS INTERVENTION STREAM CONTRIBUTE TO RESILIENCE?

The physical assets of a region – its geography, forests, waterways, facilities and infrastructure – have a profound impact on a region's ability to respond to change. A region with flexible, well connected assets with inbuilt redundancy, is more resilient to change.

Interventions in this stream focus on building resilience by enabling diversification, increasing connectivity and improving liveability. Natural and built assets are a crucial factor for the attractiveness of a region. Attractive, well serviced areas encourage people and business to relocate. This can assist the region to combat the global trend towards urbanisation.

Built infrastructure can facilitate economic diversification. In particular, transport and communication are powerful tools for connectivity. Currently, there is a digital gap between cities and rural areas. The needs of rural and remote users are often overlooked in upgrades to telecommunications and transport infrastructure.

Natural assets such as rivers, lakes, green spaces and vegetation not only improve the liveability of rural areas, but also underpin agricultural industry, contribute to carbon sequestration, stimulate the restoration economy and increase tourism opportunities.

WHAT IS THE ALTERNATIVE, IF WE DO NOTHING?

Our current built and natural assets face serious challenges associated with demographic and climate change. Challenges such as reduced water inflows, increased heat, and agricultural impacts, threaten the health of waterways, forests and grasslands and their associated flora and fauna. Meanwhile, demographic change threatens both small towns and growth areas, potentially resulting in underserviced populations and economies.

FOUNDATION INTERVENTIONS

D1 Alternative Transport Technologies

Electric, hydrogen fuelled, and autonomous trucks and cars are fast-approaching. They offer huge potential for reduced costs and emissions and improved reliability, efficiency and safety.

However rural and regional areas are at risk of being overlooked regarding infrastructure upgrades such as charging stations.

This intervention involves exploring the prospect of developing renewable energy charging stations within the Goulburn Murray region to support passenger and freight transportation. It is recommended that facilities provided ensure support to multiple brands and fuel types to increase flexibility.

TIMESCALE

Short to medium term

RESILIENCE VALUE

Proactive localised response to anticipated shock in personal vehicle market. Builds on existing efforts by local government.

D2 Collaborative and alternative digital solutions

As advocated in the Goulburn Digital Plan, this intervention involves exploration of feasible alternative digital connectivity solutions for the Goulburn Murray region.

For example, the region could advocate for improvements to Sky Muster to enable innovative business models, use of ag tech and improved connection. The intervention could also support industry collaboration to attract shared services or infrastructure to reduce cost burdens.

This would benefit emergency management, mental and physical health, education, business productivity, tourism and the regional economy.

TIMESCALE

Medium term

RESILIENCE VALUE

Improving communication and digital networks and connectivity has a range of resilience building benefits.

D3 **Foster Environmental Tourism**

The purpose of this intervention is to encourage greater appreciation and use of our environment and thereby improve environmental stewardship.

Potential inclusions are:

- development of nature-based tracks and trails
- support for indigenous enterprises that leverage our natural and cultural landscape
- increasing services and infrastructure to environmental tourism assets with locally based operators/owners to increase local economic benefit.
- use of technology to enrich physical experience (e.g. guide via apps)
- market/promote opportunities available in region

This intervention could link to farm and food related trails and tourism (A4).

TIMESCALE

Medium to long term

RESILIENCE VALUE

Diversified income streams build economic resilience. Also increases awareness of environmental values in local and wider population.

D4 **Regional Resilience Fund – Natural Assets**

The purpose of this intervention is to incentivise investment that increases the resilience of the natural assets within our region. This will result in environmental, social and economic benefits, including improved liveability and wellbeing, carbon sequestration, and increased recreation and tourism opportunities.

Eligible projects are those that can create adaptive or transformative change to practices, systems and risk mitigation strategies. It could include the Resilient Rivers program, revegetation, floodplain restoration, and other projects to improve natural assets.

Incentives could be in the form of tax incentives, low interest loans or grants to support innovative projects. They could be sourced from public or private investment.

This intervention is closely related to the Regional Resilience Fund – Agriculture (A5).

TIMESCALE

Medium term

RESILIENCE VALUE

Waterways, forests, soils and their related ecosystems are critical system components. Their health and function underpins a range of social, cultural, economic and environmental outcomes.

GOULBURN MURRAY RESILIENCE INTERVENTION STREAM:

Leadership and coordination

GOAL

The goal of this intervention stream is to support our region to lead and coordinate actions that will foster a culture of resilience in the Goulburn Murray region. The interventions selected focus on increasing resilience capacity, increasing information flows and improving community connectivity.

OUTCOMES

- Action driven by the community
- Increased leadership diversity
- Public and private coordination of interventions

HOW DOES THIS INTERVENTION STREAM CONTRIBUTE TO RESILIENCE?

The interventions proposed in this stream will encourage self-organisation, coordinate activity, provide accountability and increase resilience capacity. This will help our region drive adaptation and transformation from within.

WHAT IS THE ALTERNATIVE, IF WE DO NOTHING?

Throughout the engagement undertaken during development of the Goulburn Murray Resilience Strategy, community and industry told us that local leadership and coordination will be crucial to build resilience. Without it, the region will be subject to policy and projects that aren't suited to its complex and unique dynamics.

FOUNDATION INTERVENTIONS

E1 Resilience capacity building

This intervention involves building the capacity of farmers, other land managers and agency staff to embrace change and build resilience.

It will require a range of activities, practiced over time as capacity building is slow but ultimately incredibly effective and long lasting. It could be incorporated into a range of existing regional activities including leadership training and Board inductions.

Locally tailored programs could be focussed on:

- Understanding and accepting change as normal
- Understanding resilience concepts and the potential presented by adaptation and transformation
- Developing understanding of the importance of buffers to withstand crisis times
- Supporting learning and collaboration with each other and outside the region
- Empowering community led decision making

The approach will involve development of resilience champions (respected locals) to support the capacity building.

TIMESCALE

Short term

RESILIENCE VALUE

Building capacity to engage with and use the resilience principles is a high value, foundation action.

E2 Resilience seed bank

A resilience seed bank is a virtual storehouse that collects and catalogues ideas or projects that support transformation and resilience.

This intervention is modelled on the Seeds of the Good Anthropocene, which includes a map of ideas/projects (seeds), an overview of each seed and a platform to submit new seeds.

In the Goulburn Murray region, our seed bank could capture the innovations that are growing the future we want.

Social networks can self-organise around the seedbank, supporting a spirit of resilience in the region.

TIMESCALE

Ongoing

RESILIENCE VALUE

Maintaining a bank of ideas is an important aspect of systemically catalysing and organising innovation.

E3 **Community leadership forums**

This intervention will involve a range of activities to connect resilience leadership with the community, including:

- An annual public forum would provide a means to help demonstrate accountability, by enabling a wide cross section of the community to understand what has been achieved, as well as how they can get involved. This builds on the regional forum approach that was instrumental in initiating this strategy. Participants would be supported to think at a systems level, about new interventions, interaction with existing interventions, unintended consequences and the sparks of disruptive or transformational opportunities.
- Innovation workshops could be held across the region to provide opportunities for local communities to identify issues that are impacting them and suggest appropriate place-based solutions.
- Establishing a program of Leadership Tables, to provide informal opportunities where people can come and share their ideas, their perspectives on emerging issues and can provide a sounding board to test innovative change proposals. This process may also lead to a more structured deliberative panel process, or provide an opportunity to develop succession plans for future Taskforce members.

TIMESCALE

Annual

RESILIENCE VALUE

Strengthening regional resilience leadership and capacity is a high priority. The forums will provide important avenues for shared learning and exchange.

Implementation

There is plentiful experience that developing a good plan on its own is not sufficient to create change. Appropriate governance arrangements will lead to effective implementation, turning this Strategy into real change for the region.

Governing a complex, dynamic region presents many challenges. We have made efforts like this in the past, learning that strategies fail without resources to coordinate implementation. Current and previous leadership and coordination forums tend to focus on a limited span of issues or a constrained geographic region. There are no existing governance groups or processes that span the entire Goulburn Murray region or address all of the issues that will need to be integrated to build resilience. There are no current ongoing arrangements with a clear focus on building resilience and creating transformational change across the region.

A Regional Resilience Taskforce will be established to act as the custodians of this strategy, the region's shared vision and voice, and to translate that vision into resilience building action. The Taskforce will be responsible for embedding resilience principles into governance structures and processes, and for catalysing, testing and scaling innovations up and out. It will monitor unintended systemic consequences and risks, and progress of the system towards a desired future.

The Regional Resilience Taskforce will be established under the Regional Partnerships structure. It will not replace or duplicate the existing Regional Partnerships but will provide a cross-cutting structure that complements their work and integrates and addresses the particular issues needed to deliver this regional resilience strategy.

REGIONAL RESILIENCE TASKFORCE

A Regional Resilience Taskforce will be established. The Taskforce will be the custodians of the region's shared vision and voice, and translate that vision into resilience building action. It will be responsible for embedding the resilience principles into key governance structures and processes, and for catalysing, testing and scaling up and out innovations. It will monitor unintended systemic consequences and risks, and progress of the system towards a desired future.

The Regional Resilience Taskforce will be established under the Regional Partnerships structure. It would not seek to replace or duplicate the existing Regional Partnerships, but would provide a cross cutting structure to complement their work and to integrate and address the particular issues needed to deliver the regional resilience strategy.

The Taskforce will be skills based and diverse, with expertise relevant to overseeing resilience building actions. It will be comprised of regional leaders who have influence within the community.

The Taskforce will be supported by a small, professional secretariat.

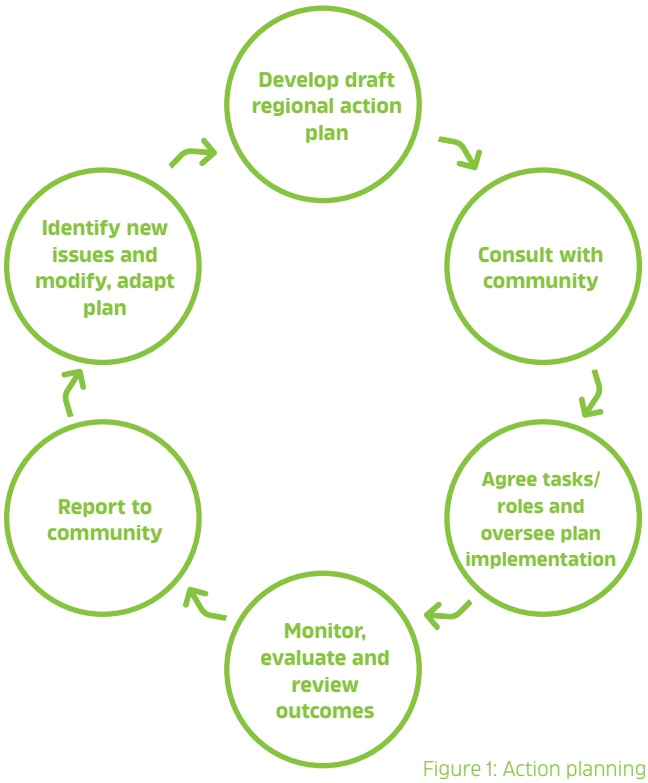


Figure 1: Action planning and implementation process.

Goulburn Murray Resilience Taskforce

DRAWN FROM

Community

Community Board
Co-chaired by LCRP & GRP

Staff

REPORT VIA

REGIONAL PARTNERSHIPS LODDON CAMPASPE

REGIONAL PARTNERSHIPS GOULBURN

REGIONAL PARTNERSHIPS MALLEE

SUPPORT AND ENGAGE RESILIENCE INITIATIVES WITH

ADVOCATE & INFORM

Place-based resilience groups

BUILD RESILIENCE LOCALLY

Resilience stream forums

TAKE ACTION ON INITIATIVES

Multiple levels and areas within government

Current priority interventions

The following table contains a summary of the current priority interventions in this strategy. This list of interventions will change over time as the strategy evolves.

NO.	TITLE	RESILIENCE VALIE	LINKAGES
A1	Agricultural Redevelopment Coordination	Farm redevelopment can increase diversity and flexibility of businesses and improve ability to respond to the changing agricultural environment. This will assist developers to engage with and work through complexity. It also fosters development of networks and cohesion.	A5
A2	Indigenous crop production	Provides opportunities for self-organisation and local responsibility for solutions. Can increase diversity and flexibility in agriculture.	A5
A3	Smart farming	Will promote change and diversification of farm businesses and build skills to continually adapt to future shocks.	D2, A5
A4	AgriTourism network	Will promote diversification of farm business income and build connection to and knowledge of consumers.	D3
A5	Regional Resilience Fund - Agriculture	Will promote change and diversification of farm businesses and build skills to continually adapt to future shocks.	A1
B1	Goulburn Murray learning centre	Increasing local skills will assist with coping with change and diversification of the regional economy. This intervention could network with a wide range of existing R&D initiatives and organisations in the region.	
B2	One Basin CRC regional hub	New sources of innovation are critical for adaptive and transformative management. This intervention could network with a wide range of existing R&D initiatives and organisations in the region.	
B3	Coordinated regional research	Research and development needs to be coordinated to achieve the best outcomes. This intervention would enable and encourage creative thinking, and allow redundancies in science.	B1, B2, A1

NO.	TITLE	RESILIENCE VALIE	LINKAGES
B4	Renewed rural skills connect	Resilience value will be high if this is designed to connect transformational farmers with those who are struggling to cope with change.	A5
C1	Regional circular economy coordination	Provides network to support transition to circular economy, making us less reliant on external resources, and building buffers and redundancy. Increases awareness and local skills to catalyse innovation.	C5, C6
C2	Biogas pilot	Increased self-sufficiency building waste into energy source. Potential for scaled innovation. Secondary benefits in odour, GHG and nutrient management will assist farmers meet environmental obligations (a slow variable).	
C3	Locally owned energy	Increases industry self-sufficiency and reduces exposure to market variabilities. Builds on trend in renewable installations but with a local focus on ownership and use.	
C4	Indigenous renewables startup	Supporting Indigenous led business development. Projects could become demonstrations to support learning and encourage others to implement across region.	C6
C5	By-products as fertiliser	This will demonstrate leadership in farm use of by-products and in doing so reduce the reliance on chemical fertilisers.	C1
C6	Circular economy seed fund	Investing in local innovation means solutions are tailored to the needs of industries in the region to foster local responsibility and collective action.	C1
D1	Alternative transport technologies	Proactive localised response to anticipated shock in personal vehicle market. Builds on existing efforts by local government.	
D2	Collaborative and alterna-tive digital solutions	Improving communication and digital networks and connectivity has a range of resilience building benefits.	A3

NO.	TITLE	RESILIENCE VALIE	LINKAGES
D3	Foster environmental tourism	Diversified income streams build economic resilience. Also increases awareness of environmental values in local and wider population.	A4
D4	Regional resilience fund – natural assets	Waterways, forests, soils and their related ecosystems are critical system components. Their health and function underpins a range of social, cultural, economic and environmental outcomes.	
E1	Resilience capacity build-ing	Building capacity to engage with and use the resilience principles is a high value, foundation action.	
E2	Resilience seed bank	Maintaining a bank of ideas is an important aspect of systemically catalysing and organising innovation.	E1