The intersection of agriculture and regional development

A framework and case studies

ACIL Allen Consulting
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The intersection of agriculture and regional development - a framework and case studies

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Though as regional towns have grown, so too has their reliance on other industries and services to fuel their economic growth and prosperity. Similarly, as agriculture pushes towards a target of $100 billion in farmgate value, it is being transformed by new consumer trends and increased adoption of new technologies and decision-making tools, and globalisation has broadened our world view.

Under constant change and evolution, it is fair to say that the interconnectedness between rural industries and the regions is no longer a given. In order to prosper, we need to better understand the relationship between the regions and rural industries, particularly the policy and economic drivers, and create alignment that supports mutual benefits, now and into the future.

To help us better understand this level of co-dependence and unpack what the future connectedness looks like, AgriFutures Australia engaged ACIL Allen to complete a practical study looking at the current intersection and explore rural industry needs and the corresponding solutions that regional Australia can provide.

The report aims to better inform industry, policy makers and all levels of government about the policy settings needed to broker this mutual benefit and identify gaps. This work is the culmination of significant industry and regional consultation and analysis of existing regional and rural industry policies and trends. On an industry-by-industry basis, it considers what the current and future needs are and the intersection with the specific regions in which they operate. Importantly, it includes a number of case studies that not only demonstrate the complexity of the interconnectedness between agriculture and regional development, but also the advantages to be gained and recommendations for change.

We see this report as the stepping stone for engaging in an important and ongoing discussion about the future direction and needs of rural industries, and how we can continue to work hand in hand with the regions. It is an exciting time for both, and the COVID-19 pandemic has presented a unique growth opportunity to capitalise on.

This report has been produced under AgriFutures Australia’s National Rural Issues (NRI) Program, which is part of the National Challenges and Opportunities Arena. NRI focuses on thought-provoking and horizon-scanning research to inform debate and policy on issues of importance across rural industries.

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Michael Beer
General Manager, Business Development
AgriFutures Australia

For more than two centuries, Australia’s rural industries and regional towns and communities have jointly prospered through a long and interconnected relationship. Many of our rural, regional and remote towns were born as service centres for local farming, fishing and forestry businesses. In turn, the rural sector’s reliance on the regions for labour, inputs, connectivity, transport and infrastructure, to name a few, cannot be understated.
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Executive summary

Purpose

The purpose of this scoping study is to understand the intersection between regional development and agriculture, forestry and fisheries. This includes:

- The contribution of agricultural industries to regional development
- The degree to which rural industries rely on regions and pre and post-farmgate production
- How regional development trends can strengthen rural industries and vice versa
- Similarities and differences in regional and rural development policies and priorities
- Gaps where rural industry growth relies on but is unlikely to be filled by regional development
- Scope for rural industries to partner with other industries to develop regions.

Approach

This analysis has been conducted by reviewing literature relevant to regional and agricultural trends, government policies and programs and the determinants of agricultural and regional growth. This led to the development and application of a framework for understanding the relationship between agricultural growth and regional development. The framework was applied to existing national data sets and between agricultural growth and regional development. This led to the development and policies and programs and the determinants of agricultural

Findings from this scoping study

Regions and agriculture

A ‘region’ is a broad term used for many purposes:

- Governance (electorates and local government)
- Government service provision (councils, health etc.)
- Environmental management (e.g. Natural Resource Management (NRM) regions)
- Industry development (e.g. agriculture or tourism)
- Multiple industry development (e.g. regional development authorities and committees)

The contribution of agriculture, forestry and fisheries to regions is variable and is often related to the existence and/or the opportunities for other industries in the region. Agricultural (farmgate) goods are primarily produced in regions where producers can access land, ocean, water and, to a lesser extent, labour.

About half of post-farmgate goods are produced regionally as there is a need for processors to be located close to perishable goods or have access to other inputs. Alternatively, processors choose not to co-locate with the industry but choose to be close to markets, and/or need to source inputs from a wider area, and/or require access to significant or specifically skilled labour.

The key trends for agriculture and regional development include:

- Population growth overall is static but is mixed across regions (growing where amenity is high/jobs are available and reducing elsewhere). This leads to consolidation in some larger towns and declines in smaller centres.
- Agriculture moving to scale and using technology, which is not increasing jobs.
- Technology and infrastructure enabling migration to regions.

Although there are multiple determinants of growth for both regional development and agriculture, many of them are common to a region’s comparative advantage and enhanced by enabling infrastructure/technology, which is commonly needed to support any industry, including agriculture, operating in a region.

Industry, the community and government must all play a role in supporting regional agricultural growth. Market and industry forces have determined and will continue to determine the size/scope/nature of the regional industry and the pattern for settlement. Government, together with the region and industry, needs to play a role in facilitating infrastructure, services, disaster support and climate change adaptation. Agriculture specifically requires government to establish effective trade and market access arrangements to encourage exports. There needs to be an affordable ease of doing business (red tape reduction and regulatory reform), which will enable all regional businesses. Agriculture is unique in terms of its research and development (R&D) system (primarily funded through grower levy payers matched with government contributions for research and development) administered through Research and Development Corporations (RDCs). This system has potential to broaden its remit into innovation in the areas where agriculture and regional development intersect to the benefit of regional communities and broader society.

There are many government policies and programs available that assist growth in agriculture and support development in the regions. However, it is critical that individuals and industry organisations operating within regions are aware of the available measures and can access this support when appropriate.

Case studies

Using case studies, this work illustrates that regions can develop a strong agricultural industry where they have comparative national advantage, providing there is sufficient enabling infrastructure. Across products, regions and the determinants of growth, there is considerable variation, as would be expected. This makes it difficult to draw definitive conclusions across industries or across regions. There is opportunity where appropriate, for collaboration with other rural industries (e.g. tourism, renewable energy etc.) and to value-add within regions.

All enabling infrastructure is shared not only with other industries but also with the regional communities. The better the access to essential services and infrastructure, the better the growth opportunities for industry (agricultural or otherwise) and the community.

Innovation hubs, where they exist, can be leveraged and built on in terms of attracting capital, improving capability and increasing capacity. Policies and programs are in place; however, it is difficult to determine the level of access and uptake, as well as the efficiency, effectiveness or appropriateness of the existing support mechanisms, from a high-level scoping study focused on all regions where agricultural production occurs.

The intersection of agriculture and regional development

The intersection of agriculture and regional development can be characterised by five dimensions:

1. Agriculture is produced where it has access to land and water and what is produced is largely defined by the agroecological system.
2. Some agriculture is labour-intensive, and these industries can struggle to access labour and compete with other demands for labour within and outside the region.
3. The perishability and/or the ease of transport of an agricultural product creates complementary and value-adding opportunities in regions.
4. Regions have unique comparative advantages, but some regions have fewer options to diversify.
5. Remoteness is a real barrier for growth of regions and all regional industries.

Making sense of the intersections

In terms of the determinants of growth, the opportunities for rural and regional industries (including agriculture) lie in:

- Leveraging comparative advantage of the region and synergies with other industries in the region.
- Sharing enabling infrastructure and technologies to improve industry and communities.
- Adapting to changing environments to become sustainable.
- Building markets for local produce and developing regional food economies.
- Managing risks through economic (or geographic) diversification and by using skills and services that support other industries.
- Encouraging rural businesses to invest (capital) in other businesses in the region.
- Partnering on approaches to disaster and climate risk.
- Capitalising on innovation hubs, technology and R&D designed for rural industries to develop new industries.
Recommendations for the way forward

This study provides a framework for integrating analysis of agricultural and regional development. This framework enables a strategic view of the way forward. There are many opportunities for growth and development that can be leveraged. Following the COVID-19 pandemic, there is additional incentive for facilitating economic growth in regional areas that will have positive flow-on impacts for the agriculture sector.

Application of the framework suggests that, combined with regional consultation, this approach can be applied across the country to understand gaps and opportunities in each region. Following this, strategies could pivot on the ability of agriculture and regions to:

• Defend where there are existing industries with comparative advantage.
• Expand by developing underutilised resources where available or moving to higher-value categories.
• Explore new bundling opportunities for complementary industries or other industries where comparative advantage exists.

Our overarching recommendation for the next step in growing agriculture and developing regions is to develop a national evidence-based strategy. This should be done by leveraging the capacity and capability within existing bodies such as AgriFutures Australia, Regional Development Australia (RDA) and local government in conjunction with the National Farmers’ Federation (NFF) and state farming bodies. To form this strategy, we recommend undertaking a comprehensive needs assessment – using our framework – across all regions and corresponding engagement with local industry and community in each of those regions. The needs assessment must capture the insights of stakeholders in the regions, so that future investments are targeted towards solving problems and are not too general in nature (all of our past work on regional development tells us this is a critical success factor in getting regional development to work). From this, a series of validated needs can be identified, and a strategy (and sub-strategies) can be developed as to how those needs can be met through industry, regional and/or government commitment.

Other specific recommendations that emerge from this report (refer Chapter 4) are:

1. Improve the ease of doing business for everyone regardless of their industry or their region by reducing red tape and other unnecessary impediments.
2. Assess the regional efficacy of policies and programs, particularly in terms of whether they provide sufficient benefit to the agriculture sector, and reform them accordingly.
3. Link regions to industry plans and ensure industry plans span the whole value chain to capture the upstream and downstream benefits.
4. In addressing problems relevant to a specific region, input from the agriculture sector and communities in the region should be sought at all stages.

The solutions to problems for the agriculture sector that are shared across regions, and so do not appear to be regional problems as such, should nevertheless take account of regional impacts.

Following the COVID-19 pandemic, there is additional incentive for facilitating economic growth in regional areas that will have positive flow-on impacts for the agriculture sector.
This chapter outlines the scoping study’s purpose and background, including the recent and (likely) future trends in agriculture, forestry and fisheries, and regional development in Australia. It also contextualises the policy environment for regional development, agriculture, and related industries.

1.1 Purpose

This scoping study analyses the relationships and intersections between regions, agricultural industries operating in those regions, and the government policies (and programs) that support the competitiveness, growth and resilience of agriculture and regions.

The scoping study’s terms of reference (TOR) are outlined in Box 1.1.

These TOR specifically address the need for an understanding of, and evidence to support:

- The contribution of agriculture, forestry and fisheries to regional development and the regions to support food and fibre production pre and post-farmgate.
- The alignment of policies and programs for agricultural growth and regional development.
- Future trends in regional development and how they can support agriculture.
- Gaps that may not be filled by current regional development policies and programs.
- Opportunities for partnerships with other industries for the development of mutually beneficial regional development strategies.

This study was commissioned by AgriFutures Australia and other Research and Development Corporations (RDCs) with the National Farmers’ Federation (NFF). AgriFutures Australia, other RDCs and the NFF will use the outcomes of this scoping study to inform future research on regional development, industry investment in the regions and future policy development by government.

1.2 The agricultural sector and the regions

This scoping study analyses the relationships and intersections between regions, agricultural industries operating in those regions, and the government policies (and programs) that support the competitiveness, growth and resilience of agriculture and regions.

1.2.1 Definition of a region

Defining a region in Australia is not clear cut. There are multiple definitions. For example, there are:

- Six states and two territories in Australia
- 56 Natural Resource Management (NRM) regions defined through the Australian Government’s National Landcare Program
- 60 Regional Development Australia (RDA) regions that were built from 2014 local government areas and do not align with any existing regions
- 77 tourism regions (administrative regions primarily used by Tourism Research Australia for research and policy purposes)
- 78 Natural Resource Management regions that are an Australian Bureau of Statistics (ABS) approximation of the 2016 Natural Resource Management regions
- 168 Commonwealth electoral divisions
- 448 State electoral divisions
- 563 local government areas (LGAs)

In addition, there are several agricultural zones and regions used by various products, for example wine regions or grain zones, that are primarily related to agroecological zones.

To overcome changing political boundaries and to collect statistical information without overlap or duplication, the ABS has statistical definitions of regions which comprise aggregates of ‘mesh blocks’ or functional areas that build upon each other over four Statistical Area Levels (SA1 to SA4), states and territories and the nation.

Australia is comprised of 358,122 mesh blocks, the smallest units, and 107 SA4 regions (the largest units at a sub-state level).

For the purpose of simplicity, we generally define a region in this study as a SA4. This is the largest ABS sub-state region. SA4s are designed based on a number of criteria, including population (a minimum of 100,000 people) and labour markets. In this report, we exclude SAAs in capital cities and other major metropolitan regions.

1.2.2 The dominance of agriculture, fisheries and forestry in the regions

Most agriculture, forestry and fisheries are produced in regions. Agriculture, forestry and fisheries account for 58 per cent of Australian land use, contribute 11 per cent of goods and services exports, 2.2 per cent of value-added (gross domestic product) and 2.6 per cent of employment (2018-19). The gross value of agricultural production in 2018-19 was $69 billion and more than 70 per cent of what is produced is exported. About two-thirds of Australia’s export earnings come from “regional industries”, including agriculture, fisheries and forestry, as well as tourism, retail, services and manufacturing.

Agriculture, forestry and fisheries (refer Figure 1.1) are also significant contributors to Australia’s food and beverage product manufacturing, which is the largest sub-sector within manufacturing, accounting for more than 27 per cent of all manufacturing (2017-18) and comprising more than 13,000 businesses. About 40 per cent of employees in food and beverage product manufacturing are based in regional areas. The largest employers are bakery product producers, meat processors and ‘other’ food product producers.

This makes the regions where these goods and services are produced integral to the economic wealth of the nation. Further, recent work by the Productivity Commission (PC) showed that regions with high levels of employment in agriculture have a more “diverse range of adaptive capacity outcomes”.

Box 1.1 The scoping study’s terms of reference

The objective of this project is to provide AgriFutures Australia (AgriFutures), and rural industries more generally, with a scoping study on:

- The intersection between Australia’s rural industries and regional development in practice and the extent to which agriculture, fisheries and forestry industries contribute to regional development and rely on the regions to fuel pre and post-farmgate food and fibre production.

- Understanding the intersection of regional development policies and programs and agriculture, fisheries and forestry growth strategies, including commentary on any similarities and differences in rationales and objectives.

- Identifying how future regional development trends – for example in population growth, improved infrastructure and connectivity, and the development of regional innovation hubs – could lead to a strengthening of rural industries and vice versa.

- Identifying gaps where rural industry growth, and the inputs to achieve that growth, rely on but are unlikely to be fulfilled by the current trajectory of regional development.

- Considering whether there is scope or opportunity for rural industries to partner with other Australian sectors, such as mining, IT, finance, health, education or construction, in pursuing regional development strategies in areas of mutual benefit.
1.2.3 Key trends in agriculture affecting the regions

Across Australia, we produce a diverse range of agricultural, forestry and fisheries products and the regions these products are produced in are also diverse. Many regional economies are intrinsically connected to the performance of the agricultural sector. Some regions have distinct comparative advantage to produce certain products due to climate, soil or access to land, water or ocean.

Just as the drivers and barriers for growth of specific agricultural products are different, the drivers and barriers for growth in regions can be different (although there are some important similarities as discussed in the next chapter).

Some regions have irrigated production systems, some are dryland, some are cropping, some specialise in livestock, others are mixed. Some are intensive production systems and others use alternative production techniques, some are produced on small family farms, others at scale. Some produce primarily for domestic consumption and others are highly exposed to international competition.

While this diversity makes it difficult to identify key trends across agricultural regions, there are some common themes across Australia. These include:

- An increase in the size of farms and the scale of operations
- An increase in productivity resulting from the adoption of technology
- A resulting decline in agricultural employment levels and a corresponding shift of rural populations to larger regional towns.

Figure 1.1 Contribution of agriculture, forestry and fisheries to the Australian economy (2018-19)

58% of Australian land use is for agriculture

About 70% of Australian agricultural products by value are exported

This accounts for 11% of total goods and services exported

Agriculture, forestry and fisheries account for 2.2% of Australian GDP

Agriculture, forestry and fisheries account for 2.6% of employment


1.2.4 Key trends in the regions affecting agriculture

Between 2006 and 2016, parts of regional Australia experienced population growth primarily because of the mining resources boom. Since 2016, this growth has been curbed due to the end of the boom, agricultural productivity gains over the long term and the related trends of consolidation and growth of regional towns and centres.

The COVID-19 pandemic has seen a perceived (but not yet realised) resurgence to the regions. With lower population densities and a greater ability to socially distance, the regions have been nominated as attractive and safe locations for Australians to live, work and play. While the long-term impact of COVID-19 on population settlement patterns is not yet understood, there is much anecdotal evidence to suggest that it may cause a structural shift in how and where Australians choose to live now that social distancing and remote working has become the new norm.

In 2017, the Productivity Commission (PC)\(^2^2\) and the CSIRO\(^2^3\) acknowledged the positive impact that technology was having for regional Australia in realising employment and population growth and improved social connection:

Australia’s regions have enjoyed overall employment growth and improved social connections as technology is helping to bring people closer together (virtually if not physically) – this will only improve further in the future. This has provided new opportunities for many regional towns and helped to cement their long term viability and vitality.


Key findings from the PC’s report relevant to regions and agriculture include:

- Agricultural regions, especially those in broadacre cropping, tend to have lower rates of employment growth relative to regions with dominant service sectors such as healthcare or education.
- Agricultural regions have seen the consolidation of small towns into larger regional towns.

This is a response to the long-term decline in employment in agriculture and is due in part to technological progress and improved management. The impacts of these trends on regions depends on their industry mix and the employment offering in specific industries such as services.

Lower rates of employment in many agricultural regions have not translated to a decline in the value of goods produced or a decline in farm incomes. Employment is reducing in some areas due to innovation and improvements in on-farm and supply chain productivity.

Regions are more than just agriculture. There are related industries that can work to complement agriculture, fisheries and forestry production, such as food (and fibre) manufacturing, tourism, agricultural support services, other related services including technology services, financial services, education and healthcare to name a few. Additional industries in a region reduce reliance on primary products exposed to variable climates and variable markets and provide much-needed employment opportunities. This provides much incentive for agricultural-dominant regions to diversify their economies, which would build regional resilience and increase adaptive capacity.

1.2.5 The future of agriculture in the regions

The sectors that already sustain regional Australia – such as mining and power generation, agriculture, service industries and manufacturing – hold the key to unlocking new job opportunities.

Productivity Commission, 2017\(^2^4\)
Background

Regional expertise and knowledge. In addition, this leads to broader economic impacts such as increasing employment, resulting increases in income and ultimately a further increase in demand for products.

Taking existing industries in regions and modifying them in the face of future opportunities needs to be balanced with the development of new industries. Given that there are synergies between agriculture, forestry and fisheries with agribusiness, agtech and food and fibre manufacturing, and regions being collocated to the production base, this is a logical first step (refer Figure 1.3). This will strengthen Australia’s competitive advantage in food and agriculture.30

However, ensuring that high-value products are retained for value-adding rather than exported as bulk products requires an incentive to producers through a price signal or better payment terms, or risk reduction greater than what they can achieve on the global market.

Australia (and the world) is faced with unprecedented uncertainty on economic, climatic and socio-behavioural levels because of the COVID-19 pandemic, extreme drought conditions, massively destructive bushfires and fragmented trading relationships. This new world we find ourselves in will continue to evolve over time, making any firm assessment of future trends difficult.

From a rural industries perspective, research conducted by CSIRO on behalf of AgriFutures Australia in 2015 provided an understanding of global trends. These are presented in Figure 1.2a and to a large degree are still relevant in 2021. More recent work has a more technological focus (refer Figure 1.2b) but is underpinned by similar fundamentals such as consumer preference and environmental concerns.

Specifically, the synergies that can be exploited with agriculture in regions can also play a key role in developing new value-adding post-farmgate industries using local and regional expertise and knowledge. In addition, this leads to broader economic impacts such as increasing employment, resulting increases in income and ultimately a further increase in demand for products.

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Figure 1.2a Megatrends for agriculture

- A hungrier world: Population growth will drive global demand for food and fibre
- A bumper ride: Globalisation, climate change and environmental change will reshape the risk profile for agriculture
- Transformative technologies: Advances in digital technology, genetic science and synthetics will change the way food and fibre products are made and transported
- A wealthier world: A new middle income class will increase food consumption, diversity diets and eat more protein
- Choosy customers: Information empowered consumers of the future will have expectations for health, provenance, sustainability and ethics

Figure 1.2b Megatrends for agriculture

- Conservation agriculture: Cover crops, Carbon farming, Hyper precision, Microbial farming
- Connected data: 5th generation mobile comms, Sensor revolution, Internet of Things blockchain, Artificial intelligence
- Advanced agronomics: CRISPR gene editing, Trait expression, Precision robotics, Biologics
- Digital livestock: Facial recognition, Fitness trackers, Designer livestock, Mega diaries
- Consumer-driven demand: Food and farm partnerships, Divergent diets, Plant protein revolution, Social media mandates


Figure 1.3 Megatrends for food and agribusiness.

The future consumer
- Food safety and food fraud
- Global consuming class
- Health and wellness
- Targeted eating
- Plant-based and alternative proteins
- Traditional proteins
- Direct to consumer

Sustainability
- Sustainable inputs
- Soil and land management
- Food waste
- Energy smart food
- Reduced packaging waste
- Urban agriculture
- Sustainable aquaculture

Innovation
- Animal feed and health
- Precision ag and big data
- Advanced breeding and fertilisation
- Supply chain transformation

Source: Adapted from FiAL, 2019, Protein market – Size of the prize: analysis for Australia and FiAL, 2017, and Size of the prize – an overview of 16 global opportunities for Australian food and agribusinesses
The rest of this report

The rest of this report is structured as follows:

Chapter 2 outlines our framework for identifying investment opportunities for agricultural and regional growth and development. This chapter also includes an overview of the suite of current policies and programs available at the Commonwealth Government level.

Chapter 3 presents a series of detailed case studies using the framework to assess the regions and products in more detail, and to draw out the potential investment opportunities.

Chapter 4 provides analysis, gaps and opportunities.

This will be a challenge and is further complicated by the fact that 72 per cent of value-added agricultural products are consumed by the domestic market. Australia’s domestic market is not large, and even with immigration driving growth (which is now curtailed in the face of COVID-19), the market is unlikely to demand additional food products. So, looking to export markets is key and developing products for export and export markets is contingent on:

- Supply chain efficiencies
- Total factor productivity gains across both the farm and the value-add sector
- Trade and market access arrangements
- Product and market differentiation through product integrity and securing an environmental, social and governance (ESG) proposition.

The megatrends identified for regional development in Australia out to 2040[8] are:

- Defeating distance
- Global exposure
- Diverging places
- New economies
- Environment as risk.

Considering recent events (the COVID-19 pandemic), a more holistic approach may be required to better integrate the production base with its locational characteristics (i.e. the natural, social and economic environment in which it operates) and encourage growth and sustainability over the long term.
This chapter introduces our framework for understanding the intersection between regional development and agriculture. It discusses the concepts (informed by the literature, policy documents and recent relevant studies) that are important to this scoping study and introduces a methodology for applying the framework to real-world data.

2.1 Key concepts of growth

2.1.1 Determinants of regional economic growth

The determinants of long-term regional economic growth form an important part of this framework’s foundations. They provide the concepts through which a region’s unique characteristics can be analysed and its regional economic development priorities can be identified.

These determinants have been derived from the COAG Standing Council on Regional Economic Development. The determinants were critical in the development of 100 regional development committees under the Commonwealth’s umbrella initiative of Regional Development Australia. The concepts drive much of what we now understand to be place-based economic development across Australia’s regions. The determinants are outlined in Table 2.1.

More recently, the Regional Australia Institute (RAI) has identified key themes important for the growth of regional economies and communities. In a submission to the Select Committee on Regional Australia, RAI identified the following four key themes for growth and development in regions:

- Investing in ‘soft’ infrastructure – human capital and liveability
- Governments and regions working together
- Empowering regions through flexibility and place-based policy
- Shifting the narrative of regional Australia

In addition, the RAI has developed a series of regional competitiveness indicators for Regional Development Australia (RDA) regions. These indicators are based on Regional Institute of Australia Insights Data (2016) and provide a snapshot of key information that assists with the understanding of regional areas.

The Insight themes developed by RAI include:

- Institutional foundations
- Natural resources
- Infrastructure and essential services
- Economic fundamentals
- Human capital
- Technological readiness
- Business sophistication
- Demography
- R&D
- Business dynamo (business activity)

Each theme is composed of a series of 71 indicators reported by RAI. Ranks (from 1 to 10) are relative across all 60 RDAs (and 563 local government areas; LGAs) and are based on deciles. A rank of 1 indicates a stronger performance and 10 is a weaker performance.

Indicators such as these can be useful when assessing relative priorities for growth and development in regions across Australia.

<table>
<thead>
<tr>
<th>Determinant</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human capital, particularly education and skills</td>
<td>Improvements in human capital can enhance the innovative and productive capacity of a workforce. Developing a highly skilled and educated workforce assists with building the resilience of a region. Individuals with greater education and skills can pursue a wider range of employment opportunities, adapt to new processes and technologies that improve productivity, and improve their standard of living.</td>
</tr>
<tr>
<td>Sustainable (economically, environmentally and socially) communities and population change</td>
<td>Population is one of the most important resources of a region. Population can change economic, environmental and social sustainability. Population change affects demand for regional infrastructure and services, and population can boost the labour force and expand the productive capacity of the region’s economy.</td>
</tr>
<tr>
<td>Access to international, national and regional markets</td>
<td>Access to markets includes access to trading partners, clients and labour. Improving access to markets broadens trade, allows competitive industries to grow, and can increase the availability of goods and services.</td>
</tr>
<tr>
<td>Comparative advantage and business competitiveness</td>
<td>Comparative advantage is an area of relative strength or specialisation. Efforts to develop regional economies are most successful when they focus on building such strengths. Businesses can also use a region’s comparative advantage to build a competitive advantage, which is also developed through the combination of factors such as knowledge, resources, skills and the ability to innovate.</td>
</tr>
<tr>
<td>Effective cross-sectoral and intergovernmental partnerships (including through place-based approaches) and integrated regional planning</td>
<td>Coordinating cross-sectoral actions and government policies reduces the likelihood that policies are implemented in a fragmented manner and minimises duplication at different levels of government. The key determinants facilitate coordination and cooperation between different levels of government by focusing development efforts. They also provide a foundation for regional planning and give a strategic and coordinated basis for considering activities and investments to support the long-term economic growth of regional Australia. This approach can help regional leaders identify opportunities to align with government policies, implement regional actions that support existing policies, and take advantage of regionally focused programs.</td>
</tr>
</tbody>
</table>

Source: Regional Australia Standing Council (2011) Framework for regional economic development; COAG
2.1.2 Determinants of agricultural growth

AgriFutures and NFF’s work on growing agriculture into a $100 billion sector by 2030 provides a succinct description of the key determinants of agricultural growth, as described below.

AgriFutures Australia’s drivers and risks

Table 2.2 lists drivers and risk considerations outlined in AgriFutures Australia’s work on the $100 billion target from which regional development strategies can be built.

<table>
<thead>
<tr>
<th>Framework</th>
</tr>
</thead>
</table>

### Table 2.2 Drivers and risks associated with meeting the $100 billion target

<table>
<thead>
<tr>
<th>Drivers</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology and data – getting more from adoption</td>
<td>Climate and water – adapting farming and infrastructure</td>
</tr>
<tr>
<td>Off-farm R&amp;D – creating value up the supply chain</td>
<td>Biosecurity – sharing responsibility to sustain integrity</td>
</tr>
<tr>
<td>Off-farm infrastructure – efficiency and capital attraction</td>
<td>Unresponsive regulation</td>
</tr>
<tr>
<td>Markets and market access – accelerating access and managing development risks</td>
<td>Consumers – meeting/exceeding changing preference</td>
</tr>
</tbody>
</table>

Source: ACIL Allen and AgriFutures Australia (2019) ‘Agriculture – a $100 billion sector by 2030?’

NFF’s pillars of the 2030 Industry Road Map

NFF’s Roadmap includes five pillars that detail aspirations, actions, impacts and a metric to achieving the $100 billion vision. The aspirations are summarised below.

**Pillar 1**

**Customers and the value chain**

This pillar focuses on connections with agriculture by Australians and the global market. Aspirations for this driver are:

- Deep engagement with customers and to build trust and transparency
- Providing a competitive connection to global markets, and delivering clear market signals to guide paddock-to-plate investment
- Developing Australia to have world-leading market access and the capacity to maximise the economic benefits.

**Pillar 2**

**Growing sustainably**

This pillar involves environmentally friendly practices and recognising that farmers are stewards of Australia’s landmass. The aspirations by 2030 for this driver include:

- Farmers continuing to embrace sustainable farming methods that drive productivity and profitability
- Embracing a carbon-neutral approach that enables Australian agriculture to have a competitive advantage and productivity gains
- Developing a smart water policy that improves waterways and enables farmers to be more productive
- Stamping the loss of productive farmland, improving the health of landscapes and brokering lasting co-existence arrangements with other landholders
- Halving food waste and reducing the number of Australians facing food insecurity.

**Pillar 3**

**Unlocking innovation**

This pillar focuses on facilitating innovation in Australia through advances in science and technology by:

- Working to translate public and private research and development into tools and services, thereby giving Australian agriculture a competitive edge
- Digitising the agricultural value chain and sharing the benefits fairly among participants
- Reducing the reliance on fossil fuels, in favour of biofuels and renewable sources of electricity that are affordable and reliable.

**Pillar 4**

**Capable people and vibrant communities**

This pillar involves attracting and developing people and regional communities by:

- Providing an attractive and clear career pathway to attract workers and develop their skills, with tailored streams for new entrants through to seasoned professionals
- Robust and sustainable mechanisms to access labour from Australia and around the world
- Creating strong regional communities that have world-class education and health facilities, culture and entertainment, and a diverse economy
- Embracing a culture of safety in agriculture that reduces workplace injuries and eliminates on-farm fatalities.

**Pillar 5**

**Capital and risk management**

This pillar focuses on sophisticated approaches to governance, risk management and planning for the future by:

- Embracing new governance models to help farm businesses better plan, manage risk and increase profit
- Demonstrating returns and a supportive policy environment to attract investors into Australia’s agricultural businesses
- Implementing innovative tools to reduce the inherent risks of farming, while having consistent and well-administered government risk management policies.
2.1.3 Establishing the relationship between key concepts

Table 2.3 shows the linkages between the determinants identified above. It also identifies how relevant each determinant is to the growth of agriculture in the regions.

Table 2.3 Concordance between the determinants of agricultural and regional economic growth

<table>
<thead>
<tr>
<th>Determinant of regional economic growth</th>
<th>Relevant determinant of agricultural growth</th>
<th>Why relevant?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human capital, particularly skills and education</td>
<td>Capable people and vibrant communities (NFF)</td>
<td>This pillar involves attracting and developing people and regional communities. It also relates to the sustainable communities’ determinant.</td>
</tr>
<tr>
<td>Sustainable (economically, environmentally and socially) communities and population change</td>
<td>Climate and water – adapting farming and infrastructure (AgriFutures)</td>
<td>Climate change is a non-discriminating disruptor that can significantly reduce the value of agriculture. Adaptation will be required and can be leveraged beyond R&amp;D to include industries changing location, and renewal of business models and assets to strengthen resilience.</td>
</tr>
<tr>
<td>Growing sustainability (NFF)</td>
<td>This pillar involves environmentally friendly practices and recognising that farmers are stewards of Australia’s landmass.</td>
<td></td>
</tr>
<tr>
<td>Access to international, national and regional markets</td>
<td>Off-farm infrastructure – efficiency and capital attraction (AgriFutures)</td>
<td>Off-farm infrastructure underpins agriculture’s ability to move produce to market at a competitive cost.</td>
</tr>
<tr>
<td>Markets – accelerating access and development (AgriFutures)</td>
<td>Access to a market comprises both physical access to a market, including through efficient transport infrastructure, as well as business relationships and networks. Transport connections and other infrastructure provision assists in attracting and retaining population and businesses.</td>
<td></td>
</tr>
<tr>
<td>Consumers – meeting/exceeding changing preferences (AgriFutures)</td>
<td>Continuing to meet and exceed consumer preferences and expectations is the cornerstone of making progress towards the $100 billion target by 2030. Our reputation as a clean and safe source of food and fibre must be based on a clear understanding of trends and how they can be met. We must have an adaptive capacity to engage with negative sanctions and campaigns to demonstrate agriculture’s credentials and address concerns raised in an open and transparent manner.</td>
<td></td>
</tr>
<tr>
<td>Customers and the value chain (NFF)</td>
<td>This pillar focuses on connections with agriculture by Australians and the global market.</td>
<td></td>
</tr>
<tr>
<td>Comparative advantage and business competitiveness</td>
<td>Off-farm R&amp;D – creating value up the supply chain (AgriFutures)</td>
<td>A region’s comparative advantage can stem from various sources, such as its geographic location, availability of natural resources, climate, and the existence of industry clusters or access to infrastructure. Local businesses can use a region’s comparative advantage to build a competitive advantage, which provides an efficiency advantage or underpins the development of an innovative product or service.</td>
</tr>
</tbody>
</table>

Source: ACIL Allen Consulting

Figure 2.1 Determinants of regional and agricultural growth

Figure 2.1 presents the key determinants for both regional and agricultural growth. These include two overarching determinants: enabling infrastructure and technologies, and comparative advantage. These two determinants are common to the potential for opportunity in any region and for any product. An example is recognising that there may be regions that are unsuitable for producing agricultural products or have considerable comparative advantage in other industries, e.g. mining. In addition, a region may be unable to sustain the industry due to lack of key infrastructure (either physical like roads or rail, essential like social and health services or enabling like telecommunications and access to the internet) and therefore be unable to attract or retain labour, get products to market efficiently or effectively or use technology to enable and/or improve production. To some extent, these two determinants are two sides of the same coin – if a region and/or a product has comparative advantage, then that can contribute to growth, but if a region and/or a product has limited natural advantage, this advantage can be created through enabling infrastructure and technology.
The other key determinants of growth include:

- **Flexibility and agility:** Including human capital, skills and education that enables an industry or region to be resilient and adapt in the face of uncertainty.

- **Sustainable communities:** In terms of the triple bottom line – social, economic and environmental sustainability. Important for attracting and retaining people and industry, and for the long-term prosperity of a region. Enabled by physical, social and economic infrastructure.

- **Markets and market access:** This includes the physical ability to get products to market either domestically or internationally (i.e. adequate infrastructure/logistics capability) and issues related to trade access, such as phytosanitary requirements or other barriers to trade.

- **Risk management:** Including the ability to, through processes and management, deal with physical risks like climate change (e.g. water availability) and environmental change (e.g. biodiversity), and business risks such as production (e.g. yield or quality) and/or market issues (e.g. price volatility).

- **Access to capital:** Crucial for development at a community or business level and often difficult to attract due to the nature of the location and its inherent risks or the nature of agricultural production, which is also inherently risky.

- **Partnerships:** Important in terms of leadership for the promotion and establishment of strategic plans/directions for enabling and achieving growth and development. Required across all levels of government (Commonwealth, state and local) and between regions and government/s, industry and government/s, and regions and industries.

- **Innovation and technology:** Such as access to R&D supports, agtech and other technologies that can assist with access to services, improve production or manage risk.

### 2.1.4 The role of government and industry in supporting growth

Historically, governments in Australia have had a large role in supporting the agriculture sector and regional development. These two sets of policies have not always been coordinated or even considered to be complementary. Further, there may be unintended consequences from other policies and many more players than just regional development and agriculture e.g. industry, science and technology, education, health.

Since the 2000s, governments have pulled back from some supporting functions, e.g. schemes where they buy all of an agricultural industry’s output and take responsibility for selling it, or regulations determining both the amount and price of an industry’s output. The recent organising principle for government intervention and support at the industry and regional level has been market failure. The default setting for policy has been that market and industry processes will determine the size, scope and nature of industries, as well as the pattern of regional settlement and growth. Where those processes do not work well, governments step in to correct them.

Even under this organising principle, which places theoretical limits on government action, there is much left for government to do. This can be summarised as providing the agriculture sector with the background conditions (enablers) that maximise its chances of success under its own efforts. To put this another way, the government’s role is to remove the impediments to success that the sector cannot be expected to remove itself. In no particular order of importance:

- A central role for government is to use its diplomatic influence to assist agricultural exporters gain access to international markets.
- Agricultural industries are subject to natural disasters, and an individual producer is unlikely to be able to completely insure against them. Governments, in effect, are the insurer of last resort against drought, flood, bushfires and cyclones.
- Only governments can put in place policies to mitigate climate change. Because agriculture is an activity that takes place outdoors, it is particularly vulnerable to climate change. Adaptation to climate change can be done, to an extent, by individual agricultural producers, or a small number acting together, but even here the role of government is crucial (e.g. by assisting with funding of adaptation projects, or by ensuring the legal and regulatory system is supportive).

- If regions are to be attractive places for people to live and work in the agricultural sector, it is up to governments to provide the necessary public services and public goods, such as schools, TAFEs, universities, hospitals and medical clinics, social services, police, transport, and roads.
- Communications services these days are privately provided, but private providers may not have sufficient financial incentive to provide adequate internet and telephone infrastructure in regions with insufficient population. This then becomes a chicken-and-egg problem – the absence of communications infrastructure becomes an impediment to growth. It is up to governments to ensure, with subsidies if need be, that regions have the communications infrastructure that is central to modern life, and this is increasingly important in the agriculture sector. The chicken-and-egg problem is then solved.

A region has sufficient population to be attractive to private providers of communications services, subsidies may not be needed, or not as much in any case.

### 2.2 A methodology for analysing agricultural growth in the regions

A methodology was developed to operationalise the framework and to manage the complexity of examining all products across many statistical regions (refer Chapter 1). The methodology relies on a series of filters or analytical steps to:

1. Identify which products are important to regions (and vice versa)
2. Establish which ‘determinants of growth’ are important to a product within a region
3. Explore the unique characteristics, needs or opportunities for growth of a product within a region
4. Understand which government policies and programs can help products and regions to capitalise on the opportunities identified.

From this, we identify lessons or observations for products and regions that will drive future growth.

#### 2.2.1 Step 1: Using industry statistics to identify regions that are important to products

Using ABS data, we examined which regions (at an SA4 level) were the largest producers of each product by gross value of agricultural production (GVAP) (see Table 2.4). The shaded rows indicate products and regions used for detailed case study analysis.

**Products not included in the ABS dataset**

This ABS dataset does not include wood products or fish and seafood. The analysis for these products was developed separately.

- **Fish and seafood**: Fish was divided into two segments – wild catch and aquaculture using 2016-17 data based on the share of production. The top-producing regions are:
  - **Wild catch fish (rock lobster)** in Western Australia – Outback South: 30 per cent national share of wild catch.
  - **Aquaculture (salmon)** in Tasmania: 61 per cent national share of aquaculture.

- **Forest and wood products**: Victoria as a state accounts for 27 per cent of production (native and plantation) by value (2016-17). The largest region in Victoria (which crosses over into South Australia) is the Green Triangle Region.
- **Mangoes**: In a bid to ensure representation included a territory, a major Northern Territory product was included. In 2018, the Northern Territory produced 52 per cent of the national mango crop.40,41
### Table 2.4 Top-producing regions by major product groups by gross value (2018-19)

<table>
<thead>
<tr>
<th>Commodity group</th>
<th>Top-producing SA4 region in Australia</th>
<th>National share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle and calves</td>
<td>Queensland - Queensland - Outback</td>
<td>$2,000 million</td>
</tr>
<tr>
<td>Cotton lint (irrigated and non-irrigated)</td>
<td>New South Wales - New England and North West</td>
<td>$590 million</td>
</tr>
<tr>
<td>Eggs</td>
<td>Queensland - Darling Downs - Maranoa</td>
<td>$220 million</td>
</tr>
<tr>
<td>Fruit and nuts (excluding grapes)</td>
<td>Victoria - North West</td>
<td>$740 million</td>
</tr>
<tr>
<td>Grains (wheat, oats, barley, sorghum, maize, rice, triticale, other grains)</td>
<td>Western Australia - Wheat Belt</td>
<td>$3,700 million</td>
</tr>
<tr>
<td>Milk</td>
<td>Victoria - Latrobe - Gippsland</td>
<td>$930 million</td>
</tr>
<tr>
<td>Oilseeds</td>
<td>Western Australia - Wheat Belt</td>
<td>$480 million</td>
</tr>
<tr>
<td>Pigs</td>
<td>Queensland - Darling Downs - Maranoa</td>
<td>$1190 million</td>
</tr>
<tr>
<td>Poultry</td>
<td>New South Wales - Riverina</td>
<td>$270 million</td>
</tr>
<tr>
<td>Pulses</td>
<td>South Australia - Barossa - Yorke - Mid North</td>
<td>$1160 million</td>
</tr>
<tr>
<td>Sheep and lambs</td>
<td>Victoria - Warrnambool and South West</td>
<td>$620 million</td>
</tr>
<tr>
<td>Sugar cane – Cut for crushing</td>
<td>Queensland - Townsville</td>
<td>$480 million</td>
</tr>
<tr>
<td>Vegetables for human consumption</td>
<td>South Australia - South East</td>
<td>$850 million</td>
</tr>
<tr>
<td>Wine production</td>
<td>South Australia - South East</td>
<td>$400 million</td>
</tr>
<tr>
<td>Wool</td>
<td>Western Australia - Wheat Belt</td>
<td>$880 million</td>
</tr>
</tbody>
</table>

Note: This data does not include wood and fish – these products were analysed separately.

Source: ABS, 7503.0 Value of agricultural commodities produced, Australia, 2018-19

### Illustrative case studies

Further refinement was necessary to provide detailed examples of the framework’s application. A set of case studies was agreed in conjunction with AgriFutures Australia recognizing that as a scoping study, this work is not able to assess all products and/or all regions. With a variety of different products, and a focus on a region in many states and territories, the aim is to show the framework in practice and to derive a set of lessons learnt that may be relevant in other regions for the same or similar products or different products in the same or a similar region.

The six case studies selected are listed below and detailed in Chapter 3.

1. Cattle in Outback, Queensland
2. Cotton in New England and North West, New South Wales
3. Dairy in Gippsland, Victoria
4. Mangoes in Northern Territory
5. Wheat in Wheat Belt, Western Australia
6. Wine in South East, South Australia.

Table 2.5 presents an overview of the case studies by product and their rank in terms of value to the region, and agriculture’s rank as regional employer, and the share of regional employment that the sector accounts for. This provides a relative importance of other non-agricultural industries in these regions.

### Table 2.5 Overview of case studies

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Top-producing SA4 region in Australia by GVAP</th>
<th>National share of GVAP</th>
<th>Agricultural commodity in the region (by value)</th>
<th>Agriculture as an employer in the region</th>
<th>Agriculture employment as a % of the region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle and calves</td>
<td>QLD - Queensland - Outback</td>
<td>$2,043,792,466</td>
<td>#1</td>
<td>#1</td>
<td>33%</td>
</tr>
<tr>
<td>Cotton</td>
<td>NSW - NENW</td>
<td>$390,320,407</td>
<td>35%</td>
<td>#2</td>
<td>16%</td>
</tr>
<tr>
<td>Dairy</td>
<td>VIC - Latrobe - Gippsland</td>
<td>$925,467,068</td>
<td>21%</td>
<td>#4</td>
<td>9%</td>
</tr>
<tr>
<td>Mangoes</td>
<td>NT</td>
<td>$55,000,000</td>
<td>52%</td>
<td>#3</td>
<td>2%</td>
</tr>
<tr>
<td>Wheat/grains</td>
<td>WA - Wheat Belt</td>
<td>$3,652,325,157</td>
<td>36%</td>
<td>#1</td>
<td>25%</td>
</tr>
<tr>
<td>Wine</td>
<td>SA - South East</td>
<td>$403,332,146</td>
<td>42%</td>
<td>#1</td>
<td>15%</td>
</tr>
</tbody>
</table>


Each case study (refer Chapter 4) then investigates each region and product in more detail to determine:

- The context and challenges for each region and product
- Potential investment opportunities
- Existing policies and programs
- Key observations.
Framework

2.2.2 Step 2: Establishing which determinants of growth are important to a product within a region

For each determinant of growth and for each product, the determinants are scored (0 = not an issue, 4 = a very important issue). Scoring was done by reviewing the relevant industry and RDC strategic plans to determine relative areas of importance for each product.

This provides focus for analysis of the key determinants (those scoring a 3 or more) in the case studies. Scoring by determinant for the 15 products is presented in Appendix A.

2.2.3 Step 3: Exploring the unique characteristics, needs or opportunities for growth of a product within a region

**SWOT analysis**

SWOT analysis is a technique used in strategic planning. SWOT is an acronym for Strengths, Weaknesses, Opportunities, and Threats and is a structured method that evaluates each of those four elements.

A SWOT analysis is a simple yet powerful technique to leverage strengths, improve weaknesses, minimise threats, and take the greatest-possible advantage of opportunities.

Detailed SWOT analyses for each case study are presented in Appendix B.

**TOWS analysis**

TOWS analysis is a variant of the SWOT and works to make connections between each element of the SWOT. It involves working around the SWOT and combining information from two elements to create options that are potentially actionable by an investment. These combinations include:

- **Strengths-Opportunities.** The idea is to use the strengths identified to take advantage of opportunities identified by the SWOT.
- **Strengths-Threats.** The idea is to use the strengths identified to minimise threats facing a region and/or revealed comparative advantage industries.
- **Weaknesses-Opportunities.** This involves improving the weaknesses identified by the SWOT by taking advantage of opportunities facing a region and/or revealed comparative advantage industries.
- **Weaknesses-Threats.** This involves eliminating the weaknesses identified by the SWOT to avoid threats.

Table 2.6 below shows how the exercise can work in practice. It uses a series of targeted questions to help identify what the options, actionable strategies or practical issues are from the SWOT analysis.

The results of the TOWS analysis for each case study are presented in Appendix B.

<table>
<thead>
<tr>
<th>Strengths (relating to each fundamental characteristic)</th>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strength-Opportunity options</td>
<td>Which of the region’s/industry’s strengths can be used to maximise the opportunities identified?</td>
<td>Strength-Threat options</td>
</tr>
<tr>
<td>Weaknesses (relating to each fundamental characteristic)</td>
<td>Weakness-Opportunity options</td>
<td>How could the region’s/industry’s weaknesses be minimised through the opportunities identified?</td>
</tr>
</tbody>
</table>

Source: Adapted from various sources
Due to the complexity of the policy space in Australia in terms of both agriculture and regional development, this scoping study focuses at a high level on the policies and programs that relate to the intersection of agriculture and regional development relevant to the identified determinants for growth at a Commonwealth level (refer Figure 2.2). Some assessment at an industry, state and local level is provided for each case study in Chapter 3.

This can be evidenced by the many policies and programs across all three levels of government (Commonwealth, state and local – there are 540 local governments across Australia, and 52 RDA regions) administered across multiple portfolios. Within agriculture, fisheries and forestry industries, there is also a multitude of different industries, as large as the beef cattle industry to emerging industries such as industrial hemp or seaweed. Horticulture, for example, has more than 37 industries and fish and seafood has a similar number.

The complexity of dealing with investment in regions (only for infrastructure) can be illustrated by ACIL Allen’s detailed assessment returned 119 pieces of relevant regulation/legislation.44

### Agriculture, fisheries and forestry-specific policies and programs

The Department of Agriculture, Water and the Environment (DAWE) represents interests across agriculture and land (including fisheries, forestry), water, the environment (including parks and heritage) and natural hazards such as drought and bushfires, as well as biosecurity, trade and research.44

DAWE aims to:

- Drive strong and sustainable agricultural industries
- Manage our unique environment and heritage
- Support our regional communities.

In relation to agriculture and regional development, it is responsible for a large range of policies and programs, including but not limited to:

- Agricultural workforce
- Drought and rural support programs
- Agricultural levies, R&D and rural innovation
- Agricultural infrastructure
- A globally competitive and sustainable Australian food industry
- Biotechnology
- Market access and trade
- Changing climate
- Agricultural and food supply chains
- Agricultural, fisheries and forestry industry policies.45

### Regional development-specific policies and programs (including COVID-19 programs)

The Department of Infrastructure, Transport, Regional Development and Communications (ITRD&C) has primary responsibility for policies and programs relating to regional Australia. The framework for regional development is “complex and interrelated”44 across all levels of government and involves partnerships with many institutions and industries in the commercial and the community sectors. It contains projects at all scales (small, medium and large) and timesframes (short, medium and long term) and includes everything from improving community amenity and facilities to provision of essential services such as education, health and community services, and to major infrastructure such as airports, roads, rail and the National Broadband Network.

Current key programs and initiatives administered by the department46 include the:

- COVID-19 Relief and Recovery Fund ($650 million in support for regions through the $1 billion program)
- Regional Deals
- Regional Recovery Partnerships ($100 million over two years for 10 regions)
- Regional Development Australia
- Regional and community programs, which include:
  - Building Better Regions Fund ($200 million in grants, $100 million for regional tourism)
  - Community Development Grants
  - Drought Communities
  - Murray Darling Basin Regional Economic Diversification ($270 million)
  - National Stronger Regions Fund
  - Regional Growth Fund
  - Regional Jobs and Investment Package
  - Stronger Communities
  - Tasmanian Jobs and Growth.

ITRD&C has specific portfolio responsibilities. Other Commonwealth departments and agencies also develop and administer policies that impact the development and growth of regional Australia and support agriculture, e.g. Department of Agriculture, Water and the Environment (DAWE); Department of Foreign Affairs and Trade (DFAT); Department of Education, Skills and Employment (DESE); Department of Industry, Science, Energy and Resources (DISER); Department of Prime Minister and Cabinet (DPMC; Treasury and Finance to name a few. Some of these programs48 include:

- Future Drought Fund ($6 billion)
- Regional Connectivity Program ($30 million)
- Broadband for rural and regional communities ($300 million)
- Protecting Oceans ($47.4 million)
- Relocation Assistance to Take Up a Job Program ($17.4 million)
- International Freight Assistance Mechanism ($1.93 billion)
- Export grants ($51 million)
- $14 million for fisheries, including for a campaign encouraging consumption of Australian sustainable seafood
- $25 million for forestry to salvage logs from bushfire-impacted timber mills
- A $4.1 million research and development program that will support activities directly benefitting regionally based industries, including securing raw material inputs for manufacturing in regional Australia.
- National Water Grid Authority, with the aim to “help grow Australian agriculture, build resilience to drought and support regional prosperity” ($3.5 billion)49

### Framework

#### 2.2.4 Step 4: Identify which government policies and programs can help products and regions capitalise on the opportunities identified

- Land use regulation
- Environmental regulation
- On-farm regulation of water
- Regulation of farm animal welfare
- Regulation of technologies
- Agriculture and vet chemicals
- Transport regulation
- Food regulation
- Competition regulation
- Foreign investment.

At an industry level, ADL Allen recently assessed the red meat processing industry’s regulatory environment (predominantly located in regional areas) at a state and Commonwealth level. This assessment identified seven themes and contains significant funding support for agriculture and regions in general, and some industries specifically, such as horticulture and dairy export programs. The seven themes are:

- Trade and exports – strengthening agricultural ties with major and emerging export markets
- Biosecurity – to lower costs and assist with market access
- Stewardship of land and water
- Supply chain resilience
- Water and infrastructure when and where it is needed
- Modernising innovation and research through collaboration and commercialisation
- Human capital to enable people and their communities.

The Productivity Commission’s 2016 report on Regulation of Australian Agriculture43 developed a framework for reviewing regulation across 10 categories and made 29 detailed recommendations for reform. Categories examined included:

- Community Development Grants
- Drought Communities
- Murray Darling Basin Regional Economic Diversification ($270 million)
- National Stronger Regions Fund
- Regional Growth Fund
- Regional Jobs and Investment Package
- Stronger Communities
- Tasmanian Jobs and Growth.

ITRD&C has specific portfolio responsibilities. Other Commonwealth departments and agencies also develop and administer policies that impact the development and growth of regional Australia and support agriculture, e.g. Department of Agriculture, Water and the Environment (DAWE); Department of Foreign Affairs and Trade (DFAT); Department of Education, Skills and Employment (DESE); Department of Industry, Science, Energy and Resources (DISER); Department of Prime Minister and Cabinet (DPMC; Treasury and Finance to name a few. Some of these programs include:

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- National Water Grid Authority, with the aim to “help grow Australian agriculture, build resilience to drought and support regional prosperity” ($3.5 billion).
Although the Commonwealth Government is the key investor in regional development, infrastructure, state and local governments are also responsible for community and regional development programs. Co-funding is a requirement of most grants provided by the Commonwealth Government for regional development, and state governments regularly co-fund regional development grants. Several business development programs are also promoted, along with national research and cluster programs that can support regional development.

Regional governance is considered a sub-Commonwealth issue, but all tiers of government need to collaborate to deliver the needs of Australia’s diverse regions. Australia’s Council of Australian Governments (COAG) is the overarching intergovernmental forum and is an important facilitator of multi-level governance, including food and agriculture and regional development. The RDA program is also considered important in facilitating multi-level cooperation and allowing for better access to the Commonwealth Government and Commonwealth funding so as to optimise performance.

Generally available measures and policies

There are also a variety of policies and programs that provide generally available support to industries operating in the regions. For example, the Commonwealth offers many incentives and support measures to farmers through the tax system (as discussed in the Dairy in Gippsland case study), however there is nothing specifically regional about these support measures.

Also, the Commonwealth (through ITRD&C) offers a substantial range of funding programs and support mechanisms to regions for infrastructure development or renewal. These support mechanisms are often matched or accompanied by state government support programs (as discussed in the Cattle in Outback Queensland case study), which are sometimes focused on agriculture but are often more focused on regional development. Moreover, Commonwealth and state government education, training, and research funding is often vast and generally available to those living in regions.

It is critical that individuals and industry organisations operating within regions understand these generally available measures and access their support when appropriate.

Policies and programs as levers for opportunity

Figure 2.2 presents a matrix of policies and programs run by Commonwealth Government departments that are relevant to the determinants of growth. Acknowledging that growth of agriculture and regions is a shared industry-government responsibility, the policies where industry more broadly can directly influence and/or choose to act independently from government are also highlighted. A similar exercise could be conducted for each state/territory and even at a local government level. This would provide a reference point to regions and industry on responsibility and portfolio, and enable identification of areas for leverage in relation to agriculture, fisheries and forestry growth in regional areas.

RDA (administered through ITRD&C) could operate as a conduit to accessing resources needed to advocate on behalf of a region (or across regions) at the Commonwealth level. This 2017 initiative (revised since its establishment in 2008) brings together all levels of government to enhance the development of Australia’s regions through a national network of 52 RDA committees composed of local leaders. The primary aims of RDA committees are to:

- Engage and consult with communities
- Participate in regional programs and initiatives and promote such activities within their communities
- Provide information and advice on their region to all levels of government
- Support informed regional planning

An example of how this works in practice was demonstrated in early 2020 when the Western Australia Wheatbelt region (a major wheat and grain-producing region) was, with support from RDA, included on Infrastructure Australia’s Infrastructure Priority List for a secondary freight network.

(Ths) program of works is a result of a collaborative approach between RDA Wheatbelt, the Wheatbelt Development Commission, Main Roads Western Australia and Western Australia Local Government Association representatives, and has the full support of all 42 Wheatbelt Shires. The size of the collaboration has seen it recognised as the biggest local government collaboration in Australia.

A recent Senate Committee has called for a further review of the RDA program “to ensure that the program is meeting its objectives of promoting sustainability and economic growth in Australia’s regions”.

Agriculture, fisheries and forestry industry support has been established on sectoral lines, meaning that cross-sectoral coordination is challenging and has not been successful in involving all RDCs on all cross-sectoral issues at a large scale. AgriFutures Australia has done considerable work in the cross-sectoral space through its National Rural Issues program and its partnerships, such as the Rural R&D for Profit Program. Recently, the RDCs, with the support of the Commonwealth Government, established Agricultural Innovation Australia (AIA), a cross-sectoral flagship to promote R&D across all 15 RDCs. This could be a potential vehicle for regional development R&D (socio-economic research) to inform policy and support advocacy for areas where agriculture and regional development intersect.
### Figure 2.2 Commonwealth government policy and programs by responsible department and the determinants of growth

<table>
<thead>
<tr>
<th>Policy Area</th>
<th>Responsibility</th>
<th>Policy levers</th>
<th>Determinants of agricultural and regional growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture levies policy</td>
<td>DAWE</td>
<td>Federal department</td>
<td>Accessibility, industry, risk, enabling infrastructure, comparative advantage</td>
</tr>
<tr>
<td>Supply chain management policy</td>
<td>DAWE</td>
<td>Federal department</td>
<td>Industry, sustainability, access to capital, risk management</td>
</tr>
<tr>
<td>Food security</td>
<td>DAWE</td>
<td>Federal department</td>
<td>Industry, risk management, food security, food supply chain</td>
</tr>
<tr>
<td>Food safety</td>
<td>DAWE</td>
<td>Federal department</td>
<td>Industry, risk management, food security, food supply chain</td>
</tr>
<tr>
<td>Food regulation</td>
<td>DAWE</td>
<td>Federal department</td>
<td>Industry, risk management, food security, food supply chain</td>
</tr>
<tr>
<td>Food supply chain</td>
<td>DAWE</td>
<td>Federal department</td>
<td>Industry, risk management, food security, food supply chain</td>
</tr>
<tr>
<td>Food labelling</td>
<td>DAWE</td>
<td>Federal department</td>
<td>Industry, risk management, food security, food supply chain</td>
</tr>
<tr>
<td>Quality systems</td>
<td>DAWE</td>
<td>Federal department</td>
<td>Industry, risk management, food security, food supply chain</td>
</tr>
<tr>
<td>Product integrity</td>
<td>DAWE</td>
<td>Federal department</td>
<td>Industry, risk management, food security, food supply chain</td>
</tr>
<tr>
<td>Agtech</td>
<td>DAWE</td>
<td>Federal department</td>
<td>Industry, risk management, food security, food supply chain</td>
</tr>
<tr>
<td>Animal welfare</td>
<td>DAWE</td>
<td>Federal department</td>
<td>Industry, risk management, food security, food supply chain</td>
</tr>
<tr>
<td>Trust and social licensor</td>
<td>DAWE</td>
<td>Federal department</td>
<td>Industry, risk management, food security, food supply chain</td>
</tr>
<tr>
<td>R&amp;D funding</td>
<td>DAWE</td>
<td>Federal department</td>
<td>Industry, risk management, food security, food supply chain</td>
</tr>
<tr>
<td>Education policy</td>
<td>DAWE</td>
<td>Federal department</td>
<td>Industry, risk management, food security, food supply chain</td>
</tr>
<tr>
<td>Agricultural infrastructure</td>
<td>DAWE</td>
<td>Federal department</td>
<td>Industry, risk management, food security, food supply chain</td>
</tr>
<tr>
<td>Industry sector policy</td>
<td>DAWE</td>
<td>Federal department</td>
<td>Industry, risk management, food security, food supply chain</td>
</tr>
<tr>
<td>Biosecurity</td>
<td>DAWE</td>
<td>Federal department</td>
<td>Industry, risk management, food security, food supply chain</td>
</tr>
</tbody>
</table>

Illustrative case studies

This chapter presents a series of six case studies that illustrate potential investment opportunities across a set of some of the highest-value products across states and highlight the existing policies and programs available to support agricultural and regional growth. The case studies demonstrate how aspects of the framework developed for this scoping study can be applied to specific industries operating in regions where they have a comparative and (sometimes) competitive advantage.

3.1 Cattle in Outback, Queensland

Figure 3.1 Cattle in Outback, Queensland – Summary

<table>
<thead>
<tr>
<th>Product group</th>
<th>Top-producing SAA region in Australia by GVAP</th>
<th>National share of GVAP</th>
<th>Agricultural product in the region (by value)</th>
<th>Agriculture as an employer in the region</th>
<th>Key determinants of growth</th>
<th>Investment opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle and calves</td>
<td>Queensland - Queensland - Outback</td>
<td>16%</td>
<td>#1</td>
<td>#1</td>
<td>Innovation and technology</td>
<td>Improving traceability</td>
</tr>
<tr>
<td></td>
<td>$2,000 million</td>
<td></td>
<td></td>
<td></td>
<td>Sustainable communities</td>
<td>Improving transport and connectivity</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Markets and market access</td>
<td>Productivity gains</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Risk management</td>
<td>Partnships</td>
</tr>
</tbody>
</table>

Note: Refer Appendix A for determinants of growth assessment.
Source: ACIL Allen Consulting

3.1.1 Context and challenges

Queensland’s Outback region covers the west and the far north of the state, and spans from the tip of Cape York to the borders of the Northern Territory and New South Wales. The region comprises 34 local government areas and the regional centres of Charleville, Longreach and Mount Isa. The region covers 1,182,300 square kilometres, or 68 per cent of Queensland’s total area, and is home to about 82,200 people (based on 2018 data). Agricultural land occupies 1,022,500 square kilometres, or 86 per cent of the region. Areas classified as conservation and natural environments (nature conservation, protected areas and minimal use) occupy 147,400 square kilometres, or 12 per cent of the region. The most common land use by area is grazing native vegetation, which occupies 965,700 square kilometres or 82 per cent of the region.60
Illustrative case studies

ABS data from the 2020 Labour Force Survey shows that about 42,800 people were employed in the region, which accounts for two per cent of total employment in Queensland and 17 per cent of Queensland’s agriculture, forestry and fishing workforce. Agriculture, forestry and fisheries is also the largest employment sector in the region.65

In 2018–19, the gross value of agricultural production (GVAP) in the region was $2.3 billion, or 18 per cent of the total GVAP in Queensland ($12.9 billion). Cattle and calves were the most important product produced in the region (at $2 billion) and contributed 88 per cent of the total value of agricultural production in the region.65

There are several operating, regulatory, environmental, supply chain and customer-related challenges facing the cattle industry that will need to be resolved in the future to improve the sector’s profitability and sustainability. These challenges are reflected in the stated priorities of Red Meat Advisory Council’s (RMAC) 2030 Red Meat Strategy,64 as outlined below:

• The industry’s people (or human capital). The industry will seek to:
  – Attract and retain good people by creating safe and healthy workplaces.
  – Develop skilled and capable people by creating pathways for career advancement.
  – Enable practice change through new technologies and innovations.

• The industry’s customers, consumers and communities. The industry will seek to:
  – Educate and advocate for Australian red meat by being transparent in how it is produced.
  – Respond to needs by creating a customer-centric culture.
  – Position red meat as a protein of choice, with an evidence-based narrative around the health and nutrition benefits of Australian red meat within a balanced diet.
  – Identify high-value opportunities, such as red meat-based snacks and other new red meat food categories.

• The industry’s livestock. The industry will seek to:
  – Ensure whole-of-industry animal health and welfare through capturing and reporting data within traceability and feedback processes.
  – Adopt best practices.
  – Optimise animal production for the environment and market, adhering to ethical practices, collaborating and data sharing.

• The environment. The industry will seek to:
  – Advance its sustainability frameworks and support their adoption.
  – Play a role in reducing Australia’s greenhouse gas emissions, and moving to a carbon-neutral industry by 2050.
  – Acknowledge the vital role as stewards and managers of 50 per cent of Australia’s landmass.
  – Build on its approach to climate variability, through investment into research.

• The domestic and international market. The industry will seek to:
  – Reduce tariff and quota barriers to trade: this means the best value for our red meat products.
  – Reduce non-tariff barriers to trade: this means realising the full potential of existing markets and pursuing new markets.
  – Build on our commitment to biosecurity and food safety and advocate for adequate resourcing of Australia’s border, customs and biosecurity capacity.
  – Promote investment in our industry, by improving the confidence of venture capitalists to invest in agriculture technology and innovation.
  – Ensure Australia remains competitive with international red meat markets, through increased innovation in key high-cost areas including labour, energy and regulatory charges.

• The systems used by industry. The industry will seek to:
  – Ensure end-to-end integrity, traceability and provenance, creating a single, user-centric supply chain integrity system.
  – Improve digital connectivity, by seeking technology partners to support improved and cost-effective connectivity.
  – Embrace automation and agtech, encouraging adoption of emerging technologies.

Investment against these challenges will have mutual benefit for the region and the cattle industry. Observations about potential investments opportunities are outlined below.

3.1.2 Potential investment opportunities

Based on the SWOT/TOWS analysis provided in Table B.1, the following investments to support regional growth in Outback Queensland’s cattle industry are identified.

Improving traceability and integrity systems to build demand for the region’s products

More demand for red meat means higher prices and profitability for the region’s producers, who will invest part of these profits in regional communities. Supply chain integrity and traceability is managed centrally through MLA’s Integrity Systems Company (ISC). ISC (formerly NLIS Ltd) was created in September 2016 to ensure a streamlined, efficient management structure for the delivery of the Livestock Production Assurance (LPA) program, National Vendor Declarations (NVDs) and the National Livestock Identification System (NLIS). ISC was launched following a recommendation by industry and government in 2013 through their SAFEMEAT partnership – that one company be given responsibility for delivering a fully integrated integrity system. The structure was implemented to help ensure resources are more effectively directed to further develop and improve these key systems, which underpin market access, customer expectations and the safety of Australian red meat and livestock.64

The value and future of the ISC to red meat was analysed by ACIL Allen in MLA’s 2020 performance review. One issue for the ISC raised in the review relates to its strategic horizon and operations. The ISC, according to many stakeholders consulted for the review, is at a crossroad. Some stakeholders are seeking ISC to remain focused on short-term investments that enhance the operationalisation of the current integrity system. They see longer-term (or blue sky) investments in the digital transformation of the system and future system thinking as distractions to its day-to-day management of integrity processes. While the ISC is a subsidiary of MLA, it operates on behalf of and in partnership with industry and government. In many ways, the ISC represents the ongoing maturing of industry services funded by levies and government contributions beyond traditional views of R&D and marketing. The need for integrity systems is well-understood by the red meat supply chain and funding by industry levies and government through RDCs is widely supported. As such, the ISC is a mechanism for delivering a collaborative whole-of-industry approach to integrity that draws on MLA’s significant capabilities as the largest industry services body.

Further, there are significant opportunities for industry itself to build on traceability and integrity through vertical integration and branding programs. Some beef companies based in the North are already leveraging this kind of model and have partnered with lot feeders and meat processors to secure their supply chains. Branding helps to secure export markets and signals integrity, provenance and trust to consumers domestically and overseas.

Improving the region’s transport and connective infrastructure

Cattle are transported on multiple discrete journeys across the supply chain, and the red meat sector is exposed to considerable transport costs and constraints. It is impacted by the quality of government policy, investment in infrastructure and regulations governing transport. The red meat sector shares key roads, railways, port and airports with other sectors operating in the region (namely mining). Common use of key arteries by these sectors follows well-understood least-cost pathways to domestic consumption and export. Grain movement is important to the red meat feedlot sector, which relies on efficient grain freight inputs to support its operations.

It is important to resolve the red meat sector’s transport problems, which would not only improve the cost-effectiveness of the cattle sector but also the productivity of many other trade-exposed sectors operating in the region.66 These problems are primarily an issue of regulatory and investment barriers to road access, including the inability to use certain types of trucks, such as the A-Double, on certain roads. Using A-Doubles would improve efficiency of the transport of cattle, but avoiding double handing and cross-loading requires significant upgrades to many roads.67

Improving productivity

Productivity gain in the northern cattle zone is at a slower rate than its southern counterparts. There is a need for investment in genetics and breeding programs, adoption of technology, and risk management tools to cope with changing climatic conditions.
3.1.3 Existing policies and programs

This section outlines the relevant policies and programs that can be leveraged to drive growth in Outback Queensland’s cattle industry. (Refer Table 3.1).

Improving traceability and integrity systems to build demand for the region’s products

The 2023 Commonwealth legislation sunsetting provisions associated with the streamlined and modernisation of agricultural levies provide a logical point in the future to consider changes to ISQ that will drive its implementation and ongoing improvement. The changes, which may arise from RMMCs Red Meat MOL reforms (currently under consideration by the industry), may also be a source of opportunity to enhance the industry’s integrity and traceability systems.

Improving the region’s transport and connective infrastructure

These problems are complex and costly to fix. There are many Commonwealth and state-based policies, programs, strategies and funding sources that could be explored to support infrastructure upgrades and connectivity improvements. The Department of Infrastructure, Transport, Regional Development and Communications (ITR&D&C) holds policy responsibility for the Commonwealth’s investment in transport and related infrastructure for the region. Key ITR&D&C programs that are relevant to this analysis are:

- **Program 2.1: Surface transport.** This Program supports economic growth, makes travel safer and increases transport access. It delivers programs, policies and regulation for efficient, sustainable, safer and better-connected road, rail and maritime sectors. The Program seeks to deliver benefits from surface transport programs, policies and regulations that:
  - improve travel safety and minimise the number and severity of incidents in the road, rail and maritime sectors
  - support economic growth by improving transport efficiency and sustainability
  - connect people, communities, businesses and markets by improving transport access.

- **Program 2.2: Air transport.** This Program makes travel safer, supports economic growth and increases transport access by ensuring the aviation industry operates within a clear and robust safety, planning and environmental regulatory framework. The Program seeks to deliver benefits from air transport programs that make travel safer by ensuring the aviation industry:
  - operates within a clear and robust safety, planning and environmental regulatory framework
  - supports economic growth by improving transport efficiency and sustainability
  - connects people, communities, businesses and markets by improving transport access.

- **Program 3.1: Regional Development.** This Program benefits Australians in regional areas by supporting regional economic growth and building stronger local communities through:
  - regionally focused stakeholder consultation and engagement
  - research
  - policy development
  - program delivery activities to create jobs, drive regional economic growth and build stronger regional communities.

The Commonwealth Government delivers these programs within the context of national partnerships with state governments and regions. The National Partnerships Agreement on Land Transport Infrastructure Projects is an example of these agreements. The Agreement aims to contribute to ‘the development of a safe, sustainable national transport system through land transport infrastructure and planning projects.’

The role of the Commonwealth is to provide ‘a financial contribution to the States for the Projects set out in the Schedules, to support the implementation of this Agreement’ (section 16A). The role of states is to provide ‘a financial or in-kind contribution, where agreed, to Projects set out in the Schedules, to support the implementation of the Agreement (section 17A) and to Deliver the infrastructure Projects set out in the Schedules in order to meet the objectives and outcomes’ in the Agreement (section 17C).

States also have their own strategies and programs to support regional and industry infrastructure development. Ensuring efficient movement of livestock and freight (through road and rail) is a key priority of the Queensland Beef Processing Strategy 2019-22. The strategy was developed following extensive consultation with major beef processors and representative bodies about the challenges facing the industry and the opportunities to work in partnership with industry to respond to these challenges. It sets out actions to support and develop the beef processing sector, focusing on four priority areas: Priority 1: Enhancing industry engagement and representation; Priority 2: Ensuring efficient movement of livestock and freight (road and rail); Priority 3: Building and retaining a skilled workforce; and Priority 4: Investing in supply chain and processing efficiency.

An example of the investments and commitments under the Strategy include the upgrade to the Yoppoo rail line. The Queensland Government has committed $5 million to upgrade rail infrastructure in Nambour. This involves upgrading 1.9 kilometres of track and sleepers, as well as replacing timber bridges and culverts. The upgrade improves Rockhampton’s beef industry by increasing opportunities for regional producers to transport livestock by rail. It will also enable producers in northwest and central west Queensland to again transport livestock by rail direct to the JBS abattoir. The project was expected to be completed by the 2019-20 period.

3.1.4 Key observations from the case study

This case study has highlighted the importance of two investments to cattle in Outback Queensland.

Investment in integrity and traceability systems has implications for a broad range of determinants of growth for the sector. It can support greater confidence in the region’s products, which in turn can support increased consumer demand for those products. Improved integrity and traceability in the red meat sector can also provide opportunities for the region’s producers and processors to access new export markets and to effectively manage the biosecurity risks that can constrain market access in some countries. These investments will also support local markets, as improved traceability provides confidence that animal welfare measures are being adhered to and that products are managed safely along the supply chain.

Investments in the region’s transport and connective infrastructure will address a series of place-based issues that have been identified by industry, the Commonwealth Government and state governments. There are many opportunities to improve local infrastructure to deliver benefits to the cattle industry, as well as other important industries operating in the region. The major townships of the region will also benefit from improved transport infrastructure through improved travel times and increased safety.

There are a range of Commonwealth and state-based regional economic growth programs that specifically aim to address regional infrastructure barriers and constraints. These programs are delivered within the context of complex national agreements. There are also a range of state-based strategies that aim to improve existing infrastructure. Although there is much already in place to support infrastructure improvement, cattle industry leaders must work closely with local authorities, state governments, Commonwealth agencies and other industries to ensure the projects are delivered in ways that best support the industry. These are complex, place-based considerations that require case-by-case analysis and ongoing participation from all stakeholders to be effectively understood or resolved through whole-of-industry or all-region analyses such as provided in this report.

The investment opportunities identified in this case study are essentially defensive mechanisms to maintain the scale and productive capacity of cattle farmers/processes operating in the region. The region’s geographic isolation and climate make it well-suited to grazing production systems, and the investment in co locating processing plants in past decades supports a vibrant red meat industry. With the region being perfectly suited to grazing and the dominance of cattle, there are few opportunities to produce different agricultural products in the region. The investments outlined here will support production in the region but will have limited impact on the overall economic development of the region. That is, they will support an industry that has a natural competitive advantage, but it is unlikely that the investments will attract complementary industries to the region or facilitate additional development in the region’s major townships.
### Table 3.1 Policies and programs – Cattle in Outback Queensland – Transport infrastructure

<table>
<thead>
<tr>
<th>Category of policy / program</th>
<th>Relevant government (portfolio)</th>
<th>How/why are they relevant?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional development and transport infrastructure investment</td>
<td>Commonwealth and state governments</td>
<td>National Partnership Agreements, namely The National Partnership Agreement on Land Transport Infrastructure Projects. This agreement aspires to a safe and sustainable national transport system that enhances the interconnectivity of corridors (networks) of significant economic opportunity across Australia.</td>
</tr>
</tbody>
</table>

The planned activities under Program 1.1 over the next 3-4 years will include:

- Management of Government’s infrastructure investment programs to deliver efficiency-enhancing road and rail projects in partnership with state, territory and local governments.
- Development of options and the provision of policy advice to optimise the impact of infrastructure investment, including potential priority projects, funding and financing, and land transport market reforms.
- The enhancement of connections with and between regional communities and economies by investing in transformative transport infrastructure.

The planned activities under Program 2.1 over the next 3-4 years will include:

- Provision of analysis and policy advice on:
  - National road, rail and maritime operations, safety and productivity.
  - Licencing and registration arrangements for heavy vehicles.
- Encouragement of the trial and adoption of new technologies that improve efficiency, sustainability and safety, including automated and connected vehicles.
- Maintenance of the regulatory framework for an efficient and environmentally sustainable surface transport system that can meet projected growth and support the freight supply chain.

The planned activities under Program 2.3 over the next 3-4 years will include:

- Management of Government’s air transport programs, including:
  - Overseeing development of the Western Sydney International (Nancy-Bird Walton) Airport.
  - Developing and implementing capacity building programs with our neighbouring economies.
- Development of options and provision of policy advice on promoting safe air transport.
- Support for investment in aviation infrastructure, including regional airports.

The planned activities under Program 3.1 over the next 3-4 years will include:

- Management of Government’s regional development programs to deliver projects that support the economic growth and liveability of regions.
- Provision of policy advice on developing regional Australia, including more resilient local economies.

Source: Various Commonwealth and state government websites
3.2 Cotton in New England and North West, New South Wales

Figure 3.2 Cotton in NENW, New South Wales – Summary

<table>
<thead>
<tr>
<th>Product group</th>
<th>Top-producing SSA region in Australia by GVAP</th>
<th>National share of GVAP</th>
<th>Agricultural product in the region (by value)</th>
<th>Agriculture as an employer in the region</th>
<th>Key determinants of growth</th>
<th>Investment opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cotton</td>
<td>New South Wales - New England and North West</td>
<td>35%</td>
<td>#2</td>
<td>#1</td>
<td>Innovation and technology</td>
<td>Leveraging innovation</td>
</tr>
<tr>
<td></td>
<td>$390 million</td>
<td></td>
<td></td>
<td>Risk management</td>
<td>Diversity through partnership</td>
<td></td>
</tr>
</tbody>
</table>

Note: Refer Appendix A for determinants of growth assessment.
Source: ACIL Allen Consulting

3.2.1 Context and challenges

Cotton production in Australia occurs predominantly in northern New South Wales and southern Queensland. Australian cotton is high quality and more sustainably produced (in terms of water use efficiency) than any other cotton in the world. Australia also produces high yields and uses best practice approaches because of its extensive research and innovation program. The gross value of cotton production was about $1 billion in 2018-19. Although only a small producer globally, Australia exports about 99 per cent of its yearly crop, predominantly to China and other Asian nations. Cotton requires ginning prior to export, which is a vital value-add industry for cotton-producing regions. Gins are generally located where cotton is produced. The average Australian cotton farm directly creates jobs for about nine people, most of whom are in regional areas. Most of the cotton is produced on family-owned farms, and regions like New England and North West (NENW) in New South Wales have better-than-average economic indicators due to the high value of cotton exports.

Cotton production, however, is variable due to climatic conditions and water availability. The recent drought has impacted the industry considerably. The industry also faces social licence issues, predominantly due to environmental concerns relating to water use.

The NENW region of New South Wales is the largest cotton-producing region in the country. Comprising of nearly 12 per cent of New South Wales (99,100 square kilometres), it is located in the north of New South Wales, and west of the Great Dividing Range. It includes the tableland areas around Armidale and north to the Queensland border. The region has good road access to Sydney and Brisbane, as well as access to Newcastle Port and regional airports, and covers 11 local government areas:

- Glen Innes Severn
- Gunnedah
- Gwydir
- Inverell
- Liverpool Plains
- Moree Plains
- Narrabri
- Tamworth Regional
- Tenterfield
- Uralla and Walcha
- most of the Armidale Regional local government area.

Eighty per cent of NENW is agricultural land. Apart from cotton and other broadacre crops, the region’s largest agriculture industry is beef cattle. As a result, 40 per cent of the region’s agricultural land is grazing-modified pastures. In 2018-19, 2.5 per cent of the region’s agricultural land was used to produce cotton. Other key products in the region are wool, sorghum and tomatoes.
The region is home to about 188,000 people and is expecting an influx of nearly 14,000 people by 2036. The region accounts for 17 per cent of the workforce. The region accounts for 17 per cent of the agricultural workforce in New South Wales. Other major regional employers include health and aged care, retail services and local government administration.

Regional gross value of cotton production was $390 million in 2018-19. Cattle and calves' gross value of production was $611 million. NEPP produces 18 per cent of the New South Wales gross value of agricultural production.

There are considerable new infrastructure projects underway, including new international freight opportunities through the Brisbane West Wellcamp Airport, an expanded Tamworth Regional Airport, and the Melbourne-Brisbane Inland Rail project.

The region expects to use its strong base in agriculture as a launch pad for new and emerging industries with a focus on intensive agriculture, horticulture, green industries, renewable energy generation and tourism.

3.2.2 Potential investment opportunities

Based on the SWOT/TOWS analysis provided in Table B.2, the following investments to support regional growth in the cotton industry in New England and North West, New South Wales are identified.

Leveraging innovation

In terms of agriculture and innovation, the region is poised to realise growth, and this is well-laid out in its Regional Plan. However, in terms of the cotton industry specifically, the ability to grow within the NENN region is limited by competing agriculture land use and water availability. However, the growing R&D and innovation precincts in the region are well-placed to assist the cotton industry with improving water use efficiency and its environmental impact.

As an industry, the future of cotton probably lies beyond the NENN region. Significant research over the last 20 years has looked into the ability to produce cotton in other regions in Australia, especially Northern Australia where water is more readily available.

Economic diversity through partnering with others

Working with other industries in the NENN region such as the beef cattle industry (cottonseed is an important feedstock) has potential. Further, there is potential to look at new uses for cottonseed, which accounts for 86 per cent of the crop by weight. Cottonseed oil is also used in food and food manufacturing processes as it is low in saturated fats. It can also be used in nutraceuticals and cosmetics.

3.2.3 Existing policies and programs

As articulated above, the NENN region has significant plans underway from a strategic perspective with a focus on agriculture.

The region is home to one of Australia’s key agriculture institutions, University of New England (UNE), which was established in 1938 and has more than 20,000 students. In addition, the Cotton Research and Development Corporation (CRDC) is in Narrabri. In September 2020, the Sydney Institute of Agriculture, the New South Wales Government and the Grains Research and Development Corporation (GRDC) announced that they had invested in a multi-million-dollar International Centre of Crop and Digital Agriculture, to be located at the University of Sydney’s Narrabri Campus.

Further, under a $1 million grant from the New South Wales Department of Industry’s Boosting Business Innovation Program, the University of New England’s SMART Region Incubators have created smart workspace hubs in Tamworth and a SMART Farm Innovation Centre in Armidale.

R&D programs, such as those run by CRDC on behalf of the industry (about 300 projects per annum), have three goals:

- Increase productivity and profitability on cotton farms.
- Improve sustainability and value chain competitiveness.
- Build adaptive capacity for the industry.

These are enabled through strengthening partnerships and adoption and driving research impact, and will be beneficial to the industry as a whole, and cotton producers in NENN.

The NENN region has a focused Regional Plan with four goals:

- Strong and dynamic regional economy that focuses on:
  - Expanding agribusiness and food processing sectors, agricultural productivity and alternatives such as mining and renewable energy.
  - A healthy environment, with a focus on water and climate change adaptation.
  - Strong infrastructure and transport network for a connected future.
  - Strong regional communities from a social, economic and environmental perspective.

In addition to Commonwealth Government supports through policies and programs detailed in Chapter 2, the NENN region has access to New South Wales Government support through the New South Wales Regional Development Framework. This framework aims to provide supports for better coordination and decision-making for regional investments. The investment model:

- Includes a minimum standards (baseline) approach to access to quality services and infrastructure across the state.
- Has a focus on jobs and growth, with support for growing regions.
- Assists with and activates economic diversification by examining regional potential and the broader economic outlook.

The New South Wales Government has established a Regional Growth Development Corporation (Regional Growth NSW), with the aim to partner with government, business, industry and education providers and “drive economic growth and prosperity in regional New South Wales” through implementation in “Special Activation Precincts.” One of these precincts is based in Moree in the NENN region.

The Moree Special Activation Precinct...

...will support the diversification of its agricultural economy by building on its strong connection to country and sustainable water endowments.

The precinct will foster world class opportunities to value-add and embrace new technologies such as protected cropping and innovative energy solutions.

This precinct aims to support high-value agriculture, including value-adding industries such as fertiliser manufacturing, and grain, meat and nut food processing opportunities. These projects are enabled through a planned intermodal hub.

Other New South Wales Government programs include:

- $1.7 billion Regional Growth Fund, which aims to facilitate regional development from essential infrastructure to arts and culture, data connectivity and job creation (including a $300 million regional growth environment and tourism fund).
- $400 million regional digital connectivity program.

3.2.4 Key observations from the case study

The cotton industry is aware of its impediments to growth in general and in relation to growth in the NENN region. To counteract these issues, the industry has a focused R&D agenda through CRDC and other institutions. The R&D agenda acknowledges the need to look for new regions to grow cotton, work with others to solve problems like improving water use efficiency, and develop a sustainable cotton industry and sustainable communities in cotton-producing regions.

The region wants to economically diversify off its strong agricultural base. Although opportunities for cotton may be limited, there is a strong drive to focus on the importance of agriculture to the region, to which cotton is a major contributor.

The innovative and world-leading research communities established in the region, and high producer innovation adoption levels, are testament to the region’s agricultural industries, including cotton.
3.3 Dairy in Gippsland, Victoria

### Figure 3.3 Dairy in Gippsland, Victoria – Summary

<table>
<thead>
<tr>
<th>Product group</th>
<th>Top-producing SA4 region in Australia by GVAP</th>
<th>National share of GVAP</th>
<th>Agricultural product in the region (by value)</th>
<th>Agriculture as an employer in the region</th>
<th>Key determinants of growth</th>
<th>Investment opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy</td>
<td>Victoria - Latrobe - Gippsland</td>
<td>21%</td>
<td>$930 million</td>
<td>#1</td>
<td>Innovation and technology</td>
<td>Improving enabling infrastructure</td>
</tr>
</tbody>
</table>

Note: Refer Appendix A for determinants of growth assessment.  
Source: ACIL Allen Consulting

3.3.1 Context and challenges

Gippsland is situated in the southeast of Victoria. It is bounded by the Ovens Murray region and New South Wales to the north; the eastern Victorian coastline to the south; and metropolitan Melbourne to the west. Gippsland accounts for 18 per cent of Victoria’s land area (covering an area of 41,737 square kilometres). As at 2018, the region had an estimated resident population (ERP) of 282,966, or 4.4 per cent of Victoria’s population.

Gippsland’s key natural resources and environmental features include:

- Thomson Reservoir – up to 60 per cent of Melbourne’s total water storage capacity
- Renewable energy opportunities
- Water and soil supporting agriculture
- Timber
- Brown coal deposits.

Key environmental assets include Gippsland Lakes, Alpine areas, Bass Coast and a range of National Parks.

There is a large dairy-processing sector in Gippsland producing fresh milk, milk powder, butter, cheese and other products for domestic and export markets. Speciality cheese businesses also exist, and some organic dairies produce a range of high-quality cheeses and other value-added dairy products.

Being in the peri-urban fringe, Gippsland has major road infrastructure that keeps the region well-connected to metropolitan Melbourne via the Princes Highway and South Gippsland Highway. These are supplemented by the Bairnsdale-to-Melbourne freight and passenger train line that runs through Latrobe.

The Gippsland region is also home to significant water storages such as the Thomson Dam, which accounts for 60 per cent of Melbourne’s drinking water. Gippsland has traditionally relied on agriculture and mining, which contribute 15.0 per cent and 10.1 per cent, respectively, of the region’s gross value. Dairy contributed to nearly half ($926 million) of the region’s $2.2 billion in gross value of agricultural production in 2018-19.

Over the past 20 years, the Australian dairy industry has faced a range of challenges. These have also been felt in Gippsland, as one of Australia’s largest dairy-producing regions, and are...
The Australian share of global trade in dairy products is six.

Despite growth in some years, the overall milk production increased market and climate volatility have made the preferences for various value-added dairy products.

Increased market and climate volatility have made the preferences and the ability of the region to meet those relationships between domestic and international customer needs.

These concentrations could be leveraged to better understand capabilities and facilities, some of which directly support dairy.

The Gippsland region has access to considerable R&D and capacities (including digital skills training).

Based on the SWOT/TOWS analysis provided in Table B.3, the following investments to support regional growth in Gippsland’s dairy industry are identified.

Better leveraging Gippsland’s R&D capabilities and capacities (including digital skills training)

The Gippsland region has access to considerable R&D capabilities and facilities, some of which directly support dairy. These concentrations could be leveraged to better understand the relationship between domestic and international customer preferences and the ability of the region to meet those preferences. This research will also cover the range of market access and social science research that explores consumer preferences for various value-added dairy products.

The presence of significant research capability also provides opportunities to explore how the region’s production facilities can transition to having a lower carbon footprint. In making this transition, the region’s research and translation capabilities can be leveraged to help producers more effectively adopt new technologies and efficient production practices.

Gippsland’s research capabilities should also be mobilised to focus on the education and training capabilities of the region’s universities/research institutions, and should also be leveraged to support upskilling of dairy’s workforce in areas of digital farming.

Focusing on improving the region’s enabling infrastructure

Gippsland’s natural endowments (which make it ideal for dairy) should be used to combat some impacts of climate change — namely drought. In 2013, the Macalister Irrigation District (MID) initiative provided for the modernisation of the MID by achieving about 12.3 gigalitres in water savings through more efficient management of the irrigation system and higher on-farm productivity.106 In 2019, the MID initiative (stage 2) was funded for another four years to complete its modernisation, taking total Victorian and Commonwealth government funding for both stages to $175.7 million. The upgrades and modernisation program has included channel upgrades, new pipeline, automated outlets, a balancing storage and reconfiguration of parts of the 100-year-old system.107 This project could be further extended in future years to drive the benefits of the MID to dairy producers, as water is a major cost to dairy farmers.

Improving the region’s digital connectivity

Improving the digital connectivity and reliability of the region will help address some operating constraints facing the industry. Improvements to this connectivity will be two-fold. First, additional investment in mobile and NBN infrastructure will be required to address local area blackspots. Recent announcements aimed at accelerating the rollout of NBN in regional areas by the Commonwealth Government (to the value of $4.5 billion) should be used as leverage by industry to ensure the region is a priority for infrastructure delivery.108 Second, it will require support from the region’s educators to provide the education and training required to upskill an ageing workforce with the digital skills that will be required in the coming decade.

This may require more coordination by industry to identify the skills required and the training options that are meaningful to individual businesses.

Industry investment in capital stock

Dairy’s (ageing) capital stock on farm will require renewal to ensure it can produce the products demanded by national and international markets at competitive prices. This will require efficient and effective next-generation production and manufacturing facilities to be developed through a combination of private and government-led investment.

According to the National Dairy Farmer Survey (NDFS), the vast majority of respondents (94 per cent) made on-farm investments between 2017-19. These were mostly minor (96 per cent), but an arguably large proportion made moderate (27 per cent) or major (21 per cent) purchases. In the same survey, 79 per cent of respondents indicated that they have investments planned for between 2019-20, and while this proportion is high in real terms, only eight per cent predicted investment will be in the ‘major’ category. Investment has been considerably more widespread among respondents with larger herds, and this is set to continue. Machinery (54 per cent), dairy plant (22 per cent) and irrigation plant (21 per cent) are the most mentioned areas of planned investment over the next two years. While the number of respondents predicting capital investment between 2019-20 is positive, the current low levels of farmer confidence draw into question what proportion of intended investment will materialise.109

3.3.2 Potential investment opportunities

Based on the SWOT/TOWS analysis provided in Table B.3, the following investments to support regional growth in Gippsland’s dairy industry are identified.

3.3.3 Existing policies and programs

This section outlines the relevant policies and programs that can be leveraged to drive growth in Gippsland’s dairy industry.

Leveraging the region’s R&D and training strengths and opportunities

The region has good access to a mature research concentration and capability. There are several ways this capability can be leveraged to support the many developmental needs of dairy in Gippsland, which range from specific research projects relating to technology, breeding and soils, through to education and training for the next generation of industry leaders.

Access to a steady and reliable pool of research funds will be critical. Here the opportunities lie with the RDCA, local universities (such as Federation University) and CRCs (such as the Food CRC, Soil CRC and Capital Markets CRC). There is a large range of programs, funding sources and capabilities that can be leveraged to support research that will drive the productivity and sustainability of dairy in the region.

In addition, the region is home to a significant funding source, the Gardiner Dairy Foundation (the Foundation). Established in 2000, the Foundation is a partnership between Victorian farmer, processor and manufacturer groups and the Victorian Government, and aims to increase the international competitiveness of the Victorian dairy industry. The Foundation was created with $62 million in funding from the sale of assets, including milk brands, as part of deregulation of the dairy industry. The Foundation is not reliant on industry or government funding and is thereby able to be flexible and agile in responding to industry’s opportunities and challenges.

The Foundation’s purpose is to ‘maximise benefits to the Victorian dairy industry and dairy communities’. The Foundation achieves this by investing in a range of RD&E, people and community development projects, together with enabling industry engagement and supporting industry issues management across the value chain.110 A summary of its relevance to this case study is provided in Table 3.3.

Supporting improvements to the region’s water infrastructure

The MID is the largest irrigation district in southern Victoria. The district has secure water supplies supplemented by good rainfall, productive soils, a strong dairy sector and developing vegetable and cropping industries. The MID dates to the turn of the last century when the Victorian Government started regulating the region’s water supply through a series of irrigation projects. Between 1912 and the late 1950s, irrigation infrastructure was gradually expanded, with the construction of numerous dams, channels and weirs. In 1959, two irrigation districts were amalgamated (the Maffra Sale and Central Gippsland irrigation districts) to form the MID as it now exists.
Southern Rural Water is modernising the district through a combination of pipelining, channel automation and regulator upgrades. More than $92 million in capital works have been completed during Phase 1A ($82 million) and Phase 1B ($60 million). Combined, these two phases seek to improve availability and service for customers and provide 22,000 megalitres of water savings to be made available for irrigation use within the district.109

The third phase of modernisation will focus on de-silting channels and strategically placing automated regulators to help improve and manage flow across the whole system. Benefits of the projects include:

- Modernised systems for three supply zones
- Reduced times between orders and delivery in modernised channels and strategically placing automated regulators
- Modernised systems for three supply zones
- More efficient irrigation practices reduce farm run-off and drain outfall, which reduces nutrient run-off to the Gippsland Lakes
- Better asset conditions, investing in the district and supporting future food production
- Improved safety by removing manual handling of regulator drop bars.

It is important for the region’s producers to secure reliable access to cost-effective water. The infrastructure improvements in the MID should assist producers in achieving this access if they are successfully delivered. Producers will benefit from additional support from representational bodies to ensure the improvements are implemented and the prices for water that follow are appropriate. Prices are determined by the Victorian Essential Services Commission following recommendation by the Southern Rural Water Board. This recommendation is made following consultation with the Macalister Customer Consultative Committee, which is made up of irrigators from within the district. There are currently prices for high reliability and low reliability, and infrastructure and service access fees, that need to be competitive.110

Improving digital connectivity
Communities living in regional Victoria often have less positive digital experiences to those in metropolitan areas. In some regions, a lack of connectivity can make it hard to do business (particularly high-technology businesses), access information, make mobile phone calls or use education and lifestyle tools like social media.

The Commonwealth Government has primary responsibility for ensuring the adequacy of telecommunications infrastructure across Australia. It has typically pursued regional telecommunications development through a single set of policies and programs. These broad-based policy and program levers have been useful in altering the telecommunications landscape to encourage investment and competition. However, this approach is not able to coordinate public and private investment effectively to meet the varying priorities of diverse communities and user groups, like those in Gippsland’s dairy industry.111

The Victorian Government advocates to the Commonwealth Government to ensure it meets its responsibilities to address regional Victorians’ telecommunications needs. To support this role, the Victorian Government (in partnership with regions) is developing a detailed understanding of place-based telecommunications issues to enable more efficient investment decisions and to prioritise locations most in need.

The Victorian Government is also investing in pilot infrastructure projects across a range of digital technologies, places and industries that can demonstrate alternative technology and market solutions to those currently adopted by the Commonwealth.

It is important for the dairy industry to be an active participant in many of these projects. There is a clear role for industry representative bodies to work closely with the Government and regional partnership signatories to ensure the projects deliver benefits for dairy and the region (Table 3.3).

Investment in the industry’s capital stock
Research published by Dairy Australia suggests that farmers have invested heavily in recent years but are questioning their capacity and confidence to continue investing. So, the question becomes what policies and programs are available to build farmer confidence, so they continue to invest in the on-farm capital required for longer-term profitability and sustainability?

The Commonwealth Government provides many generally available tax incentives that enable instant write-offs and deductions, and incentivise investment in small and large on-farm assets. There are also a range of measures that allow for income spreading and smoothing, and these assist farmers with variable incomes and provide incentives (through increased certainty) that encourage ongoing investments in farm businesses.

There are also specific loan schemes (as provided by the Commonwealth’s Farm Business Concessional Loans Scheme) that provide low-interest loans for the purposes of capital renewal.

It is important that all producers are cognisant of the tax incentives and loans and have the capability to access that support. It could be the role of regional and industry bodies to ensure that all businesses are accessing the support when appropriate.

Where there is a valid case for the support to be extended, industry bodies and representatives should play a key role brokering discussions with government to progress arguments for greater assistance. Effective brokering will come through greater coordination between the industry services body and representative bodies for sectors of the Australian dairy industry around a common goal – to make the case for better supporting producer access to government incentives that encourage on-farm asset renewal.

3.3.4 Key observations from the case study
This case study has identified four investment opportunities to drive the productivity and growth of dairy in Gippsland. Two opportunities (R&D and ageing capital stock) are explicitly place-based and industry-specific. By progressing these opportunities, dairy can address a series of industry constraints and continue to maintain its position domestically and internationally. The opportunities will also benefit the broader dairy industry, which can leverage the benefits of R&D and can learn from the process of capital renewal.

Two other investment opportunities (namely water infrastructure and digital connectivity), while important for regional economic growth, are not industry-specific. These investments are underway, and state and Commonwealth governments have invested millions of dollars in improving this enabling infrastructure to the region.

There are other existing government funding sources and programs that industry can examine to ensure they are well-calibrated to the needs of dairy.

Gippsland’s proximity to Melbourne and its natural environmental endowments mean it is ideally positioned to produce a vast variety of agricultural products. Any initiatives that aim to support economic development in the region will have benefits for Gippsland and the industries operating in it, including dairy.
## Table 3.2 Policies and programs – Dairy in Gippsland – R&D

<table>
<thead>
<tr>
<th>Category of policy / program</th>
<th>Relevant government (portfolio, legislation, function, etc)</th>
<th>How/why are they relevant?</th>
</tr>
</thead>
<tbody>
<tr>
<td>National and cooperative research funding and industry-based funding</td>
<td>Commonwealth departments of Agriculture, Industry and Educations</td>
<td>Large number of competitive and cooperative research funding sources. Significant research capability that could be leveraged locally.</td>
</tr>
</tbody>
</table>
| Gardiner Dairy Foundation – A partnership between Victorian farmer, processor and manufacturer groups and the Victorian Government | Victoria (Foundation established under the Dairy Act 2000 but supported by industry as well) Under its current strategy (2019–21), the Foundation will prioritise its investment programs in the following areas that relate to the key elements identified in the SWOT/TOWS analysis:  
- Research, development and extension  
  - Major collaborative partnership to discover and apply new genetic technologies that generate step-changes in productivity from new pasture and forage plants and improved herd genetics.  
  - Major collaborative partnership to develop and deliver feed base management tools that improve productivity, profitability and animal nutrition.  
- People and community development  
  - Attracting and building capability in key industry technical fields and enterprise management.  
  - Increasing the number, support for and capability of dairy industry leaders at all levels.  
  - Grants that support Victorian dairy communities.  
- Industry engagement and strategic support  
  - Stakeholder engagement to identify contemporary industry and community needs.  
  - Supporting wide industry discussions to advance key issues that benefit the industry.  
- Agile response to emerging industry issues or opportunities. |}

Source: Dairy Australia, 2019, Australian Dairy Situation Analysis: May 2019

## Table 3.3 Policies and programs – Dairy in Gippsland – Digital connectivity

<table>
<thead>
<tr>
<th>Category of policy / program</th>
<th>Relevant government (portfolio, legislation, function, etc)</th>
<th>How/why are they relevant?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved mobile coverage</td>
<td>Victorian Department of Jobs, Precincts and Regions</td>
<td>Government has committed $44 million to improve mobile coverage. This has secured a total infrastructure investment of $151 million for Victoria and 193 new mobile towers being built in areas with poor or no mobile coverage. This activity brings together private investment and Commonwealth Government funding, while working in partnership with the telecommunications industry. The new mobile towers provide new 3G/4G mobile coverage over almost 6,000 square kilometres and for more than 24,000 households and local businesses. The mobile towers vastly improve mobile coverage for regional Victorian residents, businesses and visitors.</td>
</tr>
<tr>
<td>Enhanced broadband</td>
<td>Victorian Department of Jobs, Precincts and Regions</td>
<td>Business demand for more effective digital connectivity is increasing rapidly. To attract innovative, digital businesses and increase the digital capacity of existing businesses, regional cities and towns may need to provide higher-grade digital services than those currently available from existing networks and standard NBN infrastructure. The Victorian Government is piloting models for providing enhanced, business-grade broadband services in designated areas and regional towns. A $7 million investment through the Connecting Regional Communities Program will initially trial solutions in Morwell, Horsham and North Geelong, for application to other regions if the trial is successful. The project enables regional businesses to compete more effectively with metropolitan, interstate and international businesses, as well as help attract business investment and position regional areas for job growth.</td>
</tr>
<tr>
<td>Digital agriculture</td>
<td>Victorian Department of Jobs, Precincts and Regions</td>
<td>Mobile and internet connectivity in the agricultural sectors can provide farmers with valuable information on weather conditions, disease control and new methods of maximising crop yield, and enable livestock tracking. However, many Victorian farmers find it difficult to access and use quality digital infrastructure and services. In many locations, farmers are unable to connect to the internet or adopt digital technologies. The Victorian Government has allocated $12 million to conduct four Internet of Things trials in regions around Birchip, Maffra, Tatura and Serpentine. This is part of a $27 million commitment to digital agriculture. The trials assess the contribution that the Internet of Things makes to farm performance within the dairy and other agricultural sectors. Trials investigate issues from network level to on-farm devices. Farmers participating in the trials will partner with the Government to identify and select internet-connected devices, sensors and other objects to assist with tasks like monitoring and predicting plant and animal health, and various other real-time farm inputs and processes. These devices will improve decision-making for farmers, potentially save time and labour, and boost farm performance. The trials, which are underway, will help stimulate competition in the agtech and telecommunications markets and improve the competitiveness of Victorian farms on a global scale.</td>
</tr>
</tbody>
</table>

Source: Various and program guidelines
Illustrative case studies

3.4 Mangoes in the Northern Territory

Figure 3.4 Mangoes in Northern Territory – Summary

<table>
<thead>
<tr>
<th>Product group</th>
<th>Top-producing SAA region in Australia by GVAP</th>
<th>National share of GVAP</th>
<th>Agricultural product in the region (by value)</th>
<th>Agriculture as an employer in the region</th>
<th>Key determinants of growth</th>
<th>Investment opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mangoes</td>
<td>Northern Territory</td>
<td>52%</td>
<td>#2</td>
<td>#3</td>
<td>Innovation and technology Sustainable communities Markets and market access Comparative advantage</td>
<td>Labour supply Improvements in regional infrastructure</td>
</tr>
</tbody>
</table>

Note: Refer Appendix A for determinants of growth assessment.
Source: ACIL Allen Consulting

3.4.1 Context and challenges

The Northern Territory has about 1.3 million square kilometres of land and is home to just a quarter of a million people (ABS 2018). Agricultural land accounts for about 47 per cent, with the most common agricultural land use being grazing on native vegetation, which accounts for 45 per cent of the land used for agriculture (ABARES 2016). The agriculture, forestry and fishing industries contributed more than $700 million to the Northern Territory economy in 2018-19, which is 2.6 per cent of gross state product. This accounts for one per cent of the total gross value of Australian agricultural production. About 1.8 per cent of the Northern Territory’s workforce are employed in agriculture, less than the national share at 2.6 per cent (2019-20).

The Northern Territory’s climate is volatile, and production challenges faced in the rest of Australia are magnified in the tropics due to biosecurity concerns, seasonal conditions, attraction of labour and competing industries (for labour), such as mining. In addition, long distances from major domestic markets make supplying domestically a challenge. Meeting export market demand is also a challenge, as it is difficult for the region to ensure consistent supply in many products due to climate variability and labour constraints. Live export cattle is the dominant agricultural industry (81 per cent by value), in the region, both to international and interstate markets. Other important industries in the Northern Territory include horticulture (of which mango production accounts for 52 per cent of value), fisheries and forestry.

In 2018-19, the Northern Territory produced a gross value of $53.4 million of mangoes, of which 73 per cent were produced in the Darwin SAA region and some were produced near Katherine (320km southeast of Darwin) and Mataranka (420km southeast of Darwin). The area planted to mangoes in the Northern Territory is more than 6,300 hectares. Katherine is considered a major growth area for the Northern Territory in terms of agribusiness.

In the Northern Territory, mangoes account for 52 per cent of horticultural value and 92 per cent of the value of fruits and nuts (excluding grapes) produced in the territory, and represent seven per cent of the gross value of agriculture in the territory.

A distinct advantage of mango production in the Northern Territory is that it is the first area in Australia where plants flower, meaning there is a seasonal advantage nationally in terms of first harvest (refer Figure 3.5). However, an industry weakness is high season-to-season variability due primarily to climate.

Australian mangoes are considered high quality and relatively efficient in terms of production, harvest, packing and cold chain practices. The main mango variety produced in Australia is Kensington Pride (KP). Other varieties of commercial importance include Calypso, Honey Gold, R2E2 and Nam Dok Mai.
Handling of mangoes during harvest and post-harvest is labour-intensive and complex because of the fruit’s fragile nature. Further, the texture and ripening of mangoes requires visual assessment and manual dexterity to maintain quality while picking. The mango industry is heavily reliant on casual workers to cover gaps during peak harvest and packing times (in the Northern Territory this is generally between September and December). In addition, casual workers are needed for other activities such as packing.

The industry has increased its focus on quality and established standards, including dry matter content measured using non-invasive technologies, such as near infrared (NIR) technology calibrated to each variety.122 The industry has also developed a supply forecasting process to enable better coordination of supply across retail providers to manage peak demand.123

About 90 per cent of Australian mangoes are consumed domestically. The remaining 10 per cent, or 7,012 tonnes, which had a value of $25 million in 2014–15, are exported. Major export markets include Hong Kong, New Zealand, Singapore and the United Arab Emirates. Market access is a major export market. Major export markets include Hong Kong, New Zealand, Singapore and the United Arab Emirates. Market access is a Major export markets include Hong Kong, New Zealand, Singapore and the United Arab Emirates. Market access is a

Regional competitiveness indicators from Regional Institute of Australia Insights Data124 for Regional Development Australia (RDA) regions125 provide a snapshot of key information that assists with understanding the area where mangoes are produced (RDA, Northern Territory: Big Rivers and Northern regions). The data presented in Table 3.4 is a subset of the themes and 71 indicators126 reported by RAI. The ranks are relative across all 60 RDAs and are based on deciles, where 1 indicates a relatively stronger performance and 10 indicates a relatively weaker performance.

Table 3.4 shows that agriculture is a relatively weaker performer in terms of employment across the Northern Territory (based on the proportion of the workforce employed in the industry). The Northern Territory is also a weak performer in terms of employment in areas further from the coast. The RDA Northern region is closer to Darwin and is therefore relatively more competitive across all RAI themes than the Big Rivers region. The Big Rivers region is strong in terms of a young and growing population but requires relative development across most themes. Both regions are underperforming in terms of access to infrastructure and essential services. These regions are both relatively poorly placed in terms of access to technical education, health services, distance to an airport and road and rail infrastructure (refer Table 3.5).

Labour supply issues

Labour supply and availability has been a long-standing issue for the horticulture industry and is a specific concern for mango producers in the Northern Territory. The nature of the work, the ‘sensitivity’ of the mango, and the Northern Territory’s tropical climate and remoteness limit its attractiveness for seasonal labour.127

As a result of the COVID-19 pandemic and national and international border closures, this issue is greater than ever. Recent work on labour shortages in the horticultural industry because of COVID-19 has been conducted by Horticulture Innovation Australia (refer Box 3.1).

In August 2020, about 170 workers from Vanuatu were flown into Northern Territory to assist with the harvest of horticultural products.128 This is well short of the required 2,100 workers that are usually employed for the Northern Territory mango harvest, including locals, backpackers and seasonal worker program visa holders.129,130 The mango industry specifically and the horticultural industry more generally are advocating for more support at a regional and national level to assist with the COVID-19 exacerbated labour shortages. The national approach to date includes a Seasonal Worker Programme,131,132 however although the pilot schemes and trials running under this program are welcome, more people are needed to assist with summer harvest.

In the very long term, investment in technology development and adoption could reduce reliance on labour. Robotics for mechanical harvest have been developed at Central Queensland University but are still in design phase.133 Investment to accelerate projects such as this may be of great benefit to the industry, noting that both the benefits and the costs would need to be considered in determining suitability for investment. The mango industry has the aim to have 30 per cent automation on farm by 2030.134

4.3.2 Potential investment opportunities

Based on the SWOT/TOWS analysis provided in Table B.4, the following investments to support regional growth in the Northern Territory’s mango industry are identified.

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Table 3.4 RAI – Northern Territory regions

<table>
<thead>
<tr>
<th>RAI insight theme/indicator*</th>
<th>NT Big Rivers</th>
<th>NT Northern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional foundations</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Agriculture</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Timber resources</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Commercial fishing and aquaculture</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Instructive and essential services</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Economic fundamentals</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Human capital</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Labour market efficiency</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Technological readiness</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Business sophistication</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Demography</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Research and development – Science</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Business dynamo</td>
<td>7</td>
<td>7</td>
</tr>
</tbody>
</table>

Note: A score of 1 indicates a strong performance and 10 is a weak performance. *theme is in bold (and incorporates multiple indicators); Indicator is in lighter text – and has been reported at this level due to the focus of this project. Source: http://insight.regionalaustralia.org.au/UAT-2016/

Table 3.5 Focus on infrastructure and services – Northern Territory regions

<table>
<thead>
<tr>
<th>RAI insight theme/indicator*</th>
<th>NT Big Rivers</th>
<th>NT Northern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional foundations</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Agriculture</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Timber resources</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Commercial fishing and aquaculture</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Instructive and essential services</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Economic fundamentals</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Human capital</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Labour market efficiency</td>
<td>9</td>
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<tr>
<td>Technological readiness</td>
<td>10</td>
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<td>Business sophistication</td>
<td>10</td>
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</tr>
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<td>Demography</td>
<td>5</td>
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</tr>
<tr>
<td>Research and development – Science</td>
<td>10</td>
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<td>Business dynamo</td>
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Illustrative case studies

Box 3.1 Seasonal horticulture labour demand and workforce study

EY’s recent report for Horticulture Innovation Australia found the product with highest demand for labour in the Northern Territory is mangoes, requiring up to 1,200 people per month in peak season. Key findings with respect to the mango industry in the Northern Territory include:

- Remote locations, considered less attractive in terms of living conditions and less accessible (e.g. far from cities, not well-connected to transport), are expected to be more impacted by casual labour shortages.
- ‘Sensitive’ products, characterised by very high labour intensity, time sensitivity/ specific harvest window and/or hard picking conditions (e.g. mangoes), are expected to be more vulnerable.
- Casual labour gap is expected to be more significant in locations where internal borders could restrict mobility, such as the Northern Territory.
- Smaller growers with less sophisticated recruitment channels (e.g. limited access to labour hire companies), fewer options to access workers, low-cost business models where labour rates will remain under pressure, or lower volumes of work are more likely to be impacted.

Improvements in regional infrastructure

The Northern Territory, particularly the Big Rivers region, has relatively poor infrastructure and essential services (refer Table 3.4 and Table 3.5). This lack of infrastructure and services greatly impacts the ability to attract and retain labour. Improvements in roads, social and community infrastructure and essential services such as education and health are critical to enabling a vibrant mango industry in the region.

3.4.3 Existing policies and programs

This section outlines the relevant policies and programs that can be leveraged to drive growth in mangoes in the Northern Territory.

Labour support, skills development and training

In addition to the Seasonal Worker Program, the Commonwealth Government also offers a Community Development Program aimed at remote employment and community development. This program offers subsidised positions for program participants through remote Australia and operates in more than 1,000 indigenous communities, including those in the Northern Territory. More generally, the Commonwealth Department of Education Skills and Employment offers a raft of employment-related programs. In addition, the Northern Territory Government offers skill-building funding opportunities for employees.

Reducing labour costs is a key element under the mango industry’s Strategic Investment Plan (2017–2021). Under this plan, the industry has a focus on increasing skills and improving labour efficiency, and reducing on-farm costs (as labour is a large proportion of costs). Last year, the Commonwealth announced access to $6,000 for relocation and travel expenses for potential farm workers ($2,000 for migrant workers), valid from 1 November 2020 to 31 December 2021.

Infrastructure

Recent infrastructure programs in the Northern Territory include an extensive road upgrades ($21 million jointly funded by the Commonwealth Government, the Northern Territory Government and the local government (Litchfield Council)) in mango regions, aimed at improving local industry productivity.

The project will improve:
- Access and connectivity between mango farms and packing sheds in the Litchfield municipality
- Safety for contractors, workers and residents.

In addition, the Commonwealth Government and the Northern Territory Government have a variety of infrastructure projects that will improve various regions and are designed to stimulate economic development, including in the agriculture, forestry and fisheries industries.

Mango industry-specific programs

The agriculture, forestry and fishing industry are also economically important. The industry has significant potential with a growing Asian middle class focussed on high quality produce. The agribusiness sector is vital in regional areas with relatively small investments having significant impacts.

Infrastructure Strategy, Northern Territory (2017) This strategy aims to enhance essential services and improve social and community infrastructure to attract and retain the regional workforce. Further work to investigate land capability is being conducted to ensure that infrastructure projects are in line with current and future productive industries.

As an industry, mangoes need continued focus on R&D for biosecurity, technological development (which assists with export markets) and increased production. Effective extension and industry development services to build capability and increase adoption of best practice could be improved at an industry level, and there are also opportunities to improve regional communication and development.

The current program (Strategic Investment Plan 2018–2021) is focused on three key areas:
- Increasing industry productivity through increased yield (new varieties) and decreased costs (best practice management and on-farm costs etc).
- Improved R&D and extension capability.
- Increased grower profitability through increased consumer demand.

3.4.4 Key observations from the case study

Mangoes are growing in importance in their contribution to Northern Territory’s agricultural production, and contribute more than 50 per cent of the national crop. Mangoes as an industry is a high-growth prospect due to the high demand for the fruit, both nationally and internationally.

The Northern Territory has comparative advantage in terms of climatic conditions and availability of land, however the industry in the Northern Territory is limited in its growth potential without investment in essential infrastructure (especially in the Big Rivers region). Essential infrastructure needs to include improved route to market (better roads and access to airports), as well as broader social services such as access to healthcare and education.

The mango industry in the Northern Territory is in dire need of solutions (short and long-term) to secure labour supply. The ability to attract and retain seasonal labour is both a regional issue and an industry issue, and requires a coordinated and long-term response well beyond the immediate impacts of the COVID-19 pandemic.

As an industry, mangoes need continued focus on R&D for biosecurity, technological development (which assists with export markets) and increased production. Effective extension and industry development services to build capability and increase adoption of best practice could be improved at an industry level, and there are also opportunities to improve regional communication and development.

Trade and market access remains a major issue for the industry but is not a region-specific issue.

Source: EY, 2020, Seasonal Horticulture Labour Demand and Workforce Study, public report.
3.5 Wheat in Wheatbelt, Western Australia

Figure 3.6 Wheat in Wheatbelt, Western Australia – Summary

<table>
<thead>
<tr>
<th>Product group</th>
<th>Top-producing SA4 region in Australia by GVAP</th>
<th>National share of GVAP</th>
<th>Agricultural product in the region (by value)</th>
<th>Agriculture as an employer in the region</th>
<th>Key determinants of growth</th>
<th>Investment opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat/ grains</td>
<td>Western Australia - Wheat Belt</td>
<td>36%</td>
<td>#1</td>
<td>#1</td>
<td>Innovation and technology</td>
<td>Commitment to regional innovation through partnership</td>
</tr>
<tr>
<td></td>
<td>$3,700 million</td>
<td></td>
<td></td>
<td></td>
<td>Markets and market access</td>
<td>Economic diversity</td>
</tr>
</tbody>
</table>

Note: Refer Appendix A for determinants of growth assessment.
Source: ACIL Allen Consulting

3.5.1 Context and challenges

Wheat and other grains is one of Australia’s largest agricultural outputs and one of our biggest exports. In 2018-19, the gross value of production for wheat was $6 billion, which was the largest gross value of production of all crops.149 Due to drought in the eastern states, most of this value was produced out of Western Australia, which had a bumper season and recorded a gross value of agricultural production for wheat of $2.1 billion (2018-19).150 Western Australia generates about 50 per cent of Australia’s total wheat production, with nearly all of it exported (about 95 per cent). Main exporting regions are Asia and the Middle East. Western Australia produces high-quality white wheat varieties that have high flour milling yield that is suitable for a variety of food products.151

The Wheatbelt region, aptly named, is a large region (nearly 200,000 square kilometres) located in the southwest corner of Western Australia, with 55 local government areas. Sixty-three per cent of the region is classified as agricultural land and 31 per cent of the region is predominantly used for dryland cropping, which is mainly wheat and barley. Other major products produced in the region include sheep and lamb, wool, and canola.152

The region has a population of 138,000, with 25 per cent employed in agriculture, forestry and fishing industries. The region accounts for more than half of all people employed in agriculture, forestry and fisheries in Western Australia.

About nine per cent of the region’s workforce are employed in grain-related enterprises (grain-sheep, grain-beef or other grain growing).153 About 10 per cent of people are employed in education and training and less than 10 per cent in healthcare and social services.154

Although predominantly an agricultural region, the economy has been moving to diversify, with interests in mining, retail trade, construction and fisheries.155 The region has significant essential infrastructure (roads, rail, air, telecommunications), including generating more than 50 per cent of Western Australia’s renewable energy from wind farms.156 As 30 per cent of the region is nature conservation area, there is significant prospect for nature-based tourism and agri-tourism, especially for small-scale production systems such as eggs, vegetable growing and honey.158

Western Australia has a very stable climate relative to other states and territories, with few extreme weather events. It has the most reliable rainfall of any Australian state and receives the highest proportion of this rainfall during the wheat-growing season. Western Australia also has the lowest incidence of crop damage from frost and because summer rainfall aligns with harvest. These conditions mean that Western Australia has the most reliable yields of any major grain-producing state.159
Illustrative case studies

Soil health is an issue. The Western Australia Wheatbelt is located on "one of the oldest and most stable land surfaces on Earth." This means that soils are weathered and have fertility issues, and this has been exacerbated by intensive agriculture production. In 2013, a study by the Western Australia Department of Agriculture found that soil acidity cost an estimated $900 million annually from loss of agricultural productivity. However, soil health is highly variable across the region. Further, soils in the Western Australia Wheatbelt have limited capacity for carbon storage.

From a regional perspective, the RDA Wheatbelt lists the following regional priorities in its 2018-19 Annual Report:

- Support for innovation in small businesses
- Aged care infrastructure to support an ageing demographic
- Improving health and education outcomes for Indigenous Australians in the region
- Exploring innovation in intensive agriculture and agricultural diversification into new and emerging products for the region, e.g. native foods, wine, quinoa and goat cheese (to name a few)
- Continued action regarding improving digital connectivity
- Economic diversification through renewable energy and tourism
- Local housing programs
- Improving rail and road networks
- Education delivery opportunities to enhance regional capability
- Childcare and other care services to support the workforce.

3.5.2 Potential investment opportunities

Based on the SWOT/TOWS analysis provided in Table B.5, the following investments to support regional growth in the wheat industry in the Wheatbelt are identified.

Commitment to region-specific R&D and innovation through partnership

The unique nature of the climate and soils in Western Australia makes the application of technology difficult when that technology has not been designed for the regions. Leveraging value from the Grower Group Alliance (GGA) and partnering beyond Department of Primary Industry and Regional Development (DPIRD) with other existing Western Australia R&D institutions and the private sector would further innovation in the region and assist with building capacity and capability among farmers.

The GGA was initially funded by GRDC when GGA was established in 2002. Between 2002 and 2013, it was hosted by several Western Australia institutions where partnership arrangements were formed, such as University of Western Australia (UWA), DPIRD and the Grain Industry Association of Western Australia (GIWA). In 2018, GGA incorporated as a not-for-profit association with membership. It is comprised of grower groups and a farmer-driven network, and aims to build capacity and capability, and connect industry with researchers and funding opportunities.

Economic diversity for a region heavily dependent on agriculture

Acknowledgment of the region's reliance on agriculture, and the environmental constraints of further intensive agriculture requires the industry and the region to consider complementary opportunities for economic diversification. By working with the conservation areas and other agriculture that is being produced in the region (e.g. horticultural produce), there are opportunities for agri-tourism offerings.

There is also potential for economic diversity through renewable energy and developing education infrastructure and institutions that will increase the capability and capacity of regional communities and improve social and economic sustainability.

3.5.3 Existing policies and programs

R&D funding and support

In 2018, the Western Australia Government provided $24 million in R&D investment to drive growth and retain the Western Australia grain industry's international competitiveness. This was boosted by a further $4 million in 2018-19. Further, there was $45 million to leverage Commonwealth Government co-investment in:

- A new cropping systems research program
- Genetics and crop protection projects
- Grain product quality and market research
- Capacity building, including university and private sector R&D grants.

These investments are in addition to industry levies payable to GRDC and matched with Commonwealth contributions, which provide about $200 million per annum in investments across a range of R&D and biosecurity programs for grains nationally.

More recently, through the Western Australia Recovery Plan (in response to COVID-19), the Western Australia Government announced $8.1 million to continue the eConnected Grainbelt program. This is to improve risk management through collecting data and promoting the availability of information and agtech tools across Western Australia’s grain industry “to provide growers with tailored information including weather, pests and diseases and to maintain 187 automated weather stations.”

Clean energy technology investments

There are further opportunities for regional manufacturing as part of the Western Australia Government’s COVID-19 recovery plan.

3.5.4 Key observations from the case study

Wheat (and grains) are at the centre of economic activity in the Wheatbelt, Western Australia. This, and other agricultural production in the region, provides a foundation for economic diversity important for the future of the region. Areas for exploration include innovation, agri-tourism and food processing opportunities.

Partnerships in R&D leverage the region’s strengths and build regional capability. These serve the region well in its ability to adapt to a changing climate and diversify its economy (specifically related to innovation), and also to provide region-specific R&D solutions for grains.

General supports by the Western Australia Government to improve existing infrastructure will enable efficiencies in wheat farming, including adoption of space-based technologies, and getting product to market, while also attracting skilled labour and potential growth industries in agriculture and other industries, such as renewable energy.

Economic recovery programs

As part of the Recovery Plan, there has been announcement of a multi-million-dollar funding package to support the Wheatbelt region through:

- Education and skills training via regional TAFEs
- A ‘Buy local’ program, which includes improvements to local roads and the provision of social infrastructure such as social housing
- Infrastructure programs to increase tourism and jobs

This is in addition to state-wide programs that will also impact the region, including:

- Supports for ‘green jobs’
- Clean energy technology investments
- R&D investments (noted above).

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Chapter 3

3.6 Illustrative case studies

3.6.1 Production and regional focus

The South Australian wine industry accounts for 80 per cent of Australia’s premium wine production, with almost half of all Australian vineyards located in the state. Accounting for more than $2 billion of revenue per year, the industry exports to more than 100 countries, with the major markets being the United Kingdom, China and the United States of America. More so than most industries, the South Australian wine industry is regionally focused, with some sub-regions, e.g. the Barossa Valley (which is important in itself as it is known for types of wine and brands). The sub-regions have specific microclimates and soils that determine the grape varieties they best support. There are 10 main wine-growing sub-regions: Adelaide Hills, Barossa Valley, Clare Valley, Coonawarra, Eden Valley, Langhorne Creek, McLaren Vale, Padthaway, Riverland and Wrattonbully. The characteristics of each sub-region are set in Table 3.6.

3.6.2 Industry challenges

The South Australian wine industry is a great success story, but it is not without its challenges, many of which have a regional dimension. These include management of water resources, continued access to markets, and the need for new infrastructure (e.g. in transport), and the need to retain and attract young people to the industry, which means making the wine regions attractive place to live. Climate change poses a major challenge, as conducive conditions for existing specific grape varieties in particular sub-regions are threatened by changes to temperature and precipitation. Soil quality is another key issue.

3.6.3 Wine industry plan

The South Australian wine industry’s vision is to be recognised as leading nationally and internationally and to work from its strengths of: 170

- Strong brands
- Internationally recognised regions
- Quality at every price point
- Scale and diversity
- Old vines, iconic wines and heritage
- Connecting wine, food and tourism
- Biosecurity

The Wine Grape Council of South Australia released a South Australian Industry Plan in May 2019. 171 The strategic priorities, and objectives within each priority, reflect the importance of regional challenges for the industry, e.g. water, managing seasonal cycles, transport and cost of utilities. The plan is summarised at a high level in Table 3.7, and the three potential investment opportunities are highlighted and include:

- Climate change adaptation
- Innovation to reduce costs, improve biosecurity and adapt to a changing climate
- Continued market access
- Optimising state and national legislation and regulation, particularly in relation to workplace health and safety, transport, utilities and red tape reduction for businesses
- Working together with complimentary sectors, such as tourism, food and the arts.

The South Australian South East region is well-placed to realise these opportunities through a coordinated approach with related sectors, investment by state and local government, and R&D programs run by the South Australian Department of Primary Industries and Regions (PIRSA) and Wine Australia.

3.6.4 Key observations from the case study

Wine is more dependent on region than most products. This is because the region determines the type of grapes grown and can influence the quality of the wine. Wine is also a high-value product and is often sold based on variety or region of production.

There is potential to grow the industry through:

- Innovation to reduce costs, improve biosecurity and adapt to a changing climate
- Continued market access
- Optimising state and national legislation and regulation, particularly in relation to workplace health and safety, transport, utilities and red tape reduction for businesses
- Working together with complimentary sectors, such as tourism, food and the arts.

The South Australian South East region is well-placed to realise these opportunities through a coordinated approach with related sectors, investment by state and local government, and R&D programs run by the South Australian Department of Primary Industries and Regions (PIRSA) and Wine Australia.

Figure 3.7 Wine in South East, South Australia – Summary

<table>
<thead>
<tr>
<th>Product group</th>
<th>Top-producing SA4 region in Australia by GVAP</th>
<th>National share of GVAP</th>
<th>Agricultural product in the region (by value)</th>
<th>Key determinants of growth</th>
<th>Investment opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wine</td>
<td>South Australia - South East</td>
<td>42%</td>
<td>#1</td>
<td>Innovation and technology</td>
<td>Reduce costs through innovation</td>
</tr>
<tr>
<td></td>
<td>$403 million</td>
<td></td>
<td></td>
<td>Sustainable communities</td>
<td>Leverage tourism and food industry in the region</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Markets and market access</td>
<td>Climate change adaptation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Risk management</td>
<td></td>
</tr>
</tbody>
</table>

Note: Refer Appendix A for determinants of growth assessment. Source: ACIL Allen Consulting

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Table 3.6 South Australia wine sub-region characteristics

<table>
<thead>
<tr>
<th>Sub-region</th>
<th>Total vineyard</th>
<th>Tonnage 2019</th>
<th>Top three varieties</th>
<th>Exports by GI* content (*1000 litres</th>
<th>Rainfall (mm, 1991-2018 average)</th>
<th>% exports &lt; $5.00 bottle</th>
<th>% exports &gt; $15.00 bottle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adelaide Hills</td>
<td>3,832</td>
<td>31,882</td>
<td>Sauvignon Blanc (29%), Chardonnay (34%), Pinot Noir (22%)</td>
<td>2,925</td>
<td>720</td>
<td>7%</td>
<td>17%</td>
</tr>
<tr>
<td>Barossa Valley</td>
<td>11,156</td>
<td>64,900</td>
<td>Shiraz (62%), Cabernet Sauvignon (16%), Grenache (4%)</td>
<td>15,698</td>
<td>538</td>
<td>3%</td>
<td>45%</td>
</tr>
<tr>
<td>Clare Valley</td>
<td>4,984</td>
<td>26,886</td>
<td>Riesling (36%), Shiraz (28%), Cabernet Sauvignon (15%)</td>
<td>4,794</td>
<td>516</td>
<td>5%</td>
<td>9%</td>
</tr>
<tr>
<td>Coonawarra</td>
<td>5,293</td>
<td>34,413</td>
<td>Cabernet Sauvignon (49%), Shiraz (28%), Merlot (7%)</td>
<td>7,049</td>
<td>604</td>
<td>7%</td>
<td>27%</td>
</tr>
<tr>
<td>Eden Valley</td>
<td>2,102</td>
<td>13,505</td>
<td>Riesling (37%), Shiraz (20%), Chardonnay (13%)</td>
<td>1,218</td>
<td>524</td>
<td>2%</td>
<td>25%</td>
</tr>
<tr>
<td>Langhorne Creek</td>
<td>6,094</td>
<td>51,801</td>
<td>Shiraz (38%), Cabernet Sauvignon (30%), Merlot (10%)</td>
<td>7,800</td>
<td>401</td>
<td>45%</td>
<td>5%</td>
</tr>
<tr>
<td>McLaren Vale</td>
<td>7,173</td>
<td>41,851</td>
<td>Shiraz (55%), Cabernet Sauvignon (21%), Grenache (6%)</td>
<td>12,236</td>
<td>600</td>
<td>6%</td>
<td>16%</td>
</tr>
<tr>
<td>Padthaway</td>
<td>4,067</td>
<td>24,660</td>
<td>Shiraz (27%), Chardonnay (29%), Cabernet Sauvignon (18%)</td>
<td>4,442</td>
<td>498</td>
<td>76%</td>
<td>2%</td>
</tr>
<tr>
<td>Riverland</td>
<td>21,816</td>
<td>518,432</td>
<td>Shiraz (25%), Chardonnay (29%), Cabernet Sauvignon (15%)</td>
<td>48,786</td>
<td>266</td>
<td>43%</td>
<td>0%</td>
</tr>
<tr>
<td>Wattonbulla</td>
<td>2,666</td>
<td>15,252</td>
<td>Shiraz (32%), Chardonnay (29%), Merlot (16%)</td>
<td>1,652</td>
<td>535</td>
<td>6%</td>
<td>28%</td>
</tr>
<tr>
<td>Adelaide Hills</td>
<td>3,832</td>
<td>31,682</td>
<td>Sauvignon Blanc (29%), Chardonnay (34%), Pinot Noir (22%)</td>
<td>2,925</td>
<td>720</td>
<td>7%</td>
<td>17%</td>
</tr>
</tbody>
</table>

* GI: geographical indication
Source: https://www.wineaustralia.com/market-insights/regional-snapshots

Table 3.7 South Australia Wine Industry Plan

<table>
<thead>
<tr>
<th>Strategic priority</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Water</td>
<td>• Ensure industry is effectively represented at policy level</td>
</tr>
<tr>
<td></td>
<td>• Promote efficient use of water in grape production and processing</td>
</tr>
<tr>
<td></td>
<td>• Promote efficient use of water in wineries</td>
</tr>
<tr>
<td>2. Managing seasonal cycles</td>
<td>• Provide leadership on climate change</td>
</tr>
<tr>
<td></td>
<td>• Provide leadership on climate change responses</td>
</tr>
<tr>
<td></td>
<td>• Increase industry participation in emissions reduction</td>
</tr>
<tr>
<td></td>
<td>• Industry has the capacity to manage the impact of a changing climate</td>
</tr>
<tr>
<td>3. Cost and reliability of utilities</td>
<td>• Ensure industry is effectively represented in policy processes</td>
</tr>
<tr>
<td></td>
<td>• Increase the capacity of industry to minimise utility input costs</td>
</tr>
<tr>
<td></td>
<td>• Ensure industry understands the business impacts of utility market transformation</td>
</tr>
<tr>
<td>4. Transport</td>
<td>• Industry is effectively represented to government</td>
</tr>
<tr>
<td></td>
<td>• Industry is informed on transport regulations</td>
</tr>
<tr>
<td></td>
<td>• Improve the efficiency of grape harvest and grape and wine transport</td>
</tr>
<tr>
<td>5. Market and industry development</td>
<td>• Encourage the market development of South Australian wine regions</td>
</tr>
<tr>
<td></td>
<td>• Leverage any opportunities for wine, food and tourism-based economic development in South Australia</td>
</tr>
<tr>
<td></td>
<td>• Provide wineries with the opportunity to promote and market wines and interact with consumers</td>
</tr>
<tr>
<td></td>
<td>• Secure and maintain export markets for premium South Australian wine</td>
</tr>
<tr>
<td>6. Succession</td>
<td>• Access to trained and skilled employees</td>
</tr>
<tr>
<td></td>
<td>• The wine industry is a career of choice for young people</td>
</tr>
<tr>
<td></td>
<td>• Succession planning</td>
</tr>
<tr>
<td></td>
<td>• Promote industry leadership participation</td>
</tr>
<tr>
<td>7. Industrial relations and work health and safety</td>
<td>• Ensure industry is effectively represented in relation to industrial reforms</td>
</tr>
<tr>
<td></td>
<td>• Adequately trained workforce</td>
</tr>
<tr>
<td></td>
<td>• Improve employer understanding and knowledge of employment/HR/WHS law</td>
</tr>
<tr>
<td></td>
<td>• Promote adoption of good practice HR/human resources/WHS</td>
</tr>
<tr>
<td></td>
<td>• Build, maintain and foster productive relationships with key stakeholders in relation to IR, HR and WHS</td>
</tr>
<tr>
<td>8. Efficient policy, legislation and regulation</td>
<td>• Ensure the industry has developed policy in key areas to influence government</td>
</tr>
<tr>
<td></td>
<td>• Maintain the wine associations as the ‘go to’ for the industry</td>
</tr>
<tr>
<td></td>
<td>• Provide education and information about key changes for business</td>
</tr>
<tr>
<td></td>
<td>• Value chain enhancement</td>
</tr>
</tbody>
</table>

This chapter provides analyses from the case studies with reference to the intersection of agriculture and regional development, and key findings, including gaps in policies and programs and lessons for future work.

4.1 Analysis

This section discusses the relationships between regions and agriculture, the intersection of the determinants of growth and development and the interdependence of agricultural and regional growth.

4.1.1 The relationships between regions and agriculture

Essentially, the productive potential of agriculture cannot be realised unless the productive potential of the region (through factors of production such as land, labour and capital) is addressed. This is implicit in the results of Step 3 of the framework – the SWOT/TOWS analysis (refer Appendix B) and the detailed case studies in Chapter 3.

This is because of five dimensions (below) that essentially determine what can be produced and where – it is all about location, location, location.

The first three dimensions relate to agriculture and the last two are additional dimensions that impact a region’s ability to grow:

Dimension 1: Agriculture is produced where it has access to land and water, and what is produced is largely defined by the biophysical system

Agricultural products are produced in regional areas. This is because they depend primarily on inputs such as land, soil, water and climate. More specifically, different products often require specific climatic conditions. Different regions have different comparative advantages in terms of these inputs.

Agricultural products are produced in regional areas. This is because they depend primarily on inputs such as land, soil, water and climate. More specifically, different products often require specific climatic conditions. Different regions have different comparative advantages in terms of these inputs.

4.1.2 Determinant intersections

In terms of the determinants of growth, the intersect for rural and regional industries (including agriculture) lie in:

- Leveraging comparative advantage of the region and other industries.
- Sharing enabling infrastructure and technologies to improve industry and communities.
- Adapting through flexibility and agility to changing environments to become sustainable.
- Building markets for local produce and food economies.
- Managing risks through economic (or geographic) diversification and by using skills and services supporting other industries.
- Encouraging rural businesses to invest (capital) in other businesses in the region and vice versa.
- Partnering on approaches to disaster and climatic risk.
- Capitalising on innovation hubs, technology and R&D designed for rural industries to develop new industries.

Dimension 2: Some agriculture is labour-intensive, and these industries can struggle to access labour and compete with other demands for labour within and outside the region

Labour is another key input into the agricultural production process. Attracting and retaining labour in the regions where production occurs is critical. The more labour-intensive an industry, the more important the regional environment.175

Dimension 3: How perishable and/or the ease of transport of an agricultural product creates complementary and value-adding opportunities in regions

Co-dependent products, that is those that generally require processing, for example cattle, cotton, dairy and wine, require access to processing facilities like abattoirs, gins, dairies or wineries. This argument is often chicken and egg in terms of which comes first – the product or the processing industry. The capital costs of processing infrastructure are generally high, so if a processing facility closes, often there is a decline in production of the product in that region and a possible shift to better-serviced regions. How perishable and/or the ease of transport of an agricultural product creates complementary and value-adding opportunities in regions.

For some industries, this means there are distinct benefits to being optimally located to market, whether that be large domestic markets or ports or airports for export.

Dimension 4: Regions have unique comparative advantages, and some regions have few options to diversify

Economic diversification is considered essential for regions, as agriculture production is inherently risky and being reliant on one sector can curb development. Gains in productivity and trends towards consolidation reduce the reliance on labour in some regions. This is predominantly an issue for broadacre cropping or grazing enterprises and typically occurs in regions that have lower populations. This can create further issues around the sustainability of local communities.

Dimension 5: Remoteness is a real barrier for growth of regions and all regional industries

The more remote a region is, the more difficult it is to ‘grow’ and the greater the need for enabling infrastructure and technology to facilitate opportunities within agriculture or more generally. Remoteness, resulting from the tyranny of distance, makes it costly to provide enabling infrastructure in terms of the actual cost and the per capita costs.

4.1.3 An approach for the consideration of the inter-dependence of agriculture growth and regional development

If growth is an objective worth pursuing, it is important to determine the importance of agriculture (as part of that strategy) and the type of strategy worth pursuing.

Regions are comprised of agricultural production and the production of other goods and services. A region’s natural comparative advantage and any resulting dependency on agriculture may impact its ability to generate further agricultural growth and/or regional growth. Alternatively, a region may have a comparative advantage, or the potential for a comparative advantage, through enabling infrastructure, to produce goods and services other than agriculture.

There are several high-level strategies for growth. These can be summarised as:

- Expand – the opportunity for a region to expand in terms of the production of agricultural or non-agricultural production where it has comparative advantage.
- Defend (existing position, and become more productive/profitable) – the opportunity to maintain a dominant agricultural industry for as long as possible, noting that this strategy is suitable only when the region has few, if any, alternatives to the production of that agricultural product. This can be done by developing underused resources where available or moving to higher-value categories.
- Explore – the opportunity to initiate growth through understanding what opportunities may exist either as alternatives to or as complements of the existing agricultural base. Such as new bundling opportunities for complementary industries or other industries where comparative advantage exists.

Using a high/low scoring approach based on regional dependence on agriculture, potential alternatives to agriculture, potential demand for the product, potential for agricultural growth, and potential for regional growth allows each of the products and regions illustrated through case studies to be assessed in terms of a potential strategy for growth.

This is illustrated using the case study regions and products and is presented in Figure 4.1.
This assessment shows the different growth strategies that could be applied in these regions from an agricultural or non-agricultural growth perspective. This could be useful no matter what agricultural region was being assessed and may help to easily categorise an appropriate growth strategy for a product and/or a region.

Each of the terms subjectively and relatively scored (as low or high) in Figure 4.1 are defined as follows:

- Regional dependence on agriculture: the degree to which the region is dependent on agriculture relative to other industries, such as mining or other services.
- National significance of the product: the degree to which the product being assessed (left column) contributes to our national economy.
- Potential demand for the product: the degree to which domestic and/or global demand is increasing for each product. For example, there is a decline in demand for wine on a global scale. Meat consumption is declining domestically but there is potential for increased demand globally.
- Potential for agricultural growth in the region: the degree to which more agriculture could be produced in the region, either the product being considered or any other agricultural product.
- Potential for regional growth: the degree to which the region can grow relative to other regions. For example, some regions are less likely to be growth regions than other regions as they have relatively less alternatives to the agriculture that is already produced, or are less connected in terms of infrastructure etc.

Figure 4.1 Assessment matrix for determining a potential growth strategy

<table>
<thead>
<tr>
<th>Product group</th>
<th>Regional dependence on agriculture</th>
<th>National significance of the product</th>
<th>Potential demand for the product</th>
<th>Potential for agricultural growth</th>
<th>Potential for regional growth</th>
<th>Evaluation</th>
<th>Potential strategy for growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle and calves</td>
<td>QLD - Queensland Outback</td>
<td>16% #1 #1</td>
<td>33%</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>WA - Wheat</td>
<td>36% #1 #1</td>
<td>25%</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>TAS</td>
<td>61% #1 #8</td>
<td>7%</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Dairy</td>
<td>VIC - Latrobe Gippsland</td>
<td>21% #1 #4</td>
<td>9%</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Mangoes</td>
<td>NT</td>
<td>52% #2 #3</td>
<td>2%</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Salmon – aquaculture</td>
<td>TAS</td>
<td>61% #1 #8</td>
<td>7%</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Wheat/grains</td>
<td>WA - Wheat Belt</td>
<td>36% #1 #1</td>
<td>25%</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Wine</td>
<td>SA - South East</td>
<td>42% #1 #1</td>
<td>15%</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

4.3 Gaps and opportunities

There are several practical gaps and opportunities that can be addressed by government and/or industry that will encourage growth and development in all regions and all agriculture, forestry and fisheries industries. Although none of these are particularly novel, significant potential exists in rectifying the gaps and realising the opportunities.

4.3.1 Gaps

Improve the ease of doing business for everyone regardless of their industry or their region

Three key areas where changes can be made to improve the ease (and cost) of doing business in regions were outlined by the Productivity Commission (PC) in 2017. These are largely still to be addressed and include:

- Planning, zoning and development processes
- Environmental regulations

In general, these processes lack flexibility and agility and are complex and excessively prescriptive arrangements. These impose costs (in terms of time and money) on businesses seeking to expand or take up new opportunities in regions. The quarantining of land for coal mining in the Latrobe Valley is an example of where regulation may be impeding regional development in Victoria. There are also anecdotal indications that environmental regulations often contradict planning laws. There are several practical gaps and opportunities that can be addressed by government and/or industry that will encourage growth and development in all regions and all agriculture, forestry and fisheries industries. Although none of these are particularly novel, significant potential exists in rectifying the gaps and realising the opportunities.

4.2 Overarching recommendation

Our overarching recommendation for the next step in growing agriculture and developing regions is the development of a national evidence-based strategy.

This should be done by leveraging the capacity and capability within existing bodies such as AgFutures Australia, Regional Development Australia (RDA) and local government, perhaps in conjunction with the National Farmers Federation (NFF) and state farming bodies. To form this strategy, we recommend undertaking a comprehensive needs assessment – using our framework – across all regions and corresponding engagement with local industry and community in each of those regions.

The needs assessment must capture the insights of stakeholders in the regions, so that future investments are targeted towards solving problems and are not too general in nature (all of our past work on regional development tells us this is a critical success factor in getting regional development to work). From this, a series of validated needs can be identified, and a strategy (and sub-strategies) can be developed as to how those needs can be met through industry, regional and/or government commitment.

Analysis and key findings

Figure 4.1 Assessment matrix for determining a potential growth strategy

<table>
<thead>
<tr>
<th>Product group</th>
<th>Regional dependence on agriculture</th>
<th>National significance of the product</th>
<th>Potential demand for the product</th>
<th>Potential for agricultural growth</th>
<th>Potential for regional growth</th>
<th>Evaluation</th>
<th>Potential strategy for growth</th>
</tr>
</thead>
<tbody>
<tr>
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<td>16% #1 #1</td>
<td>33%</td>
<td>High</td>
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<td>High</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>WA - Wheat</td>
<td>36% #1 #1</td>
<td>25%</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>TAS</td>
<td>61% #1 #8</td>
<td>7%</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Dairy</td>
<td>VIC - Latrobe Gippsland</td>
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<td>9%</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Mangoes</td>
<td>NT</td>
<td>52% #2 #3</td>
<td>2%</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Salmon – aquaculture</td>
<td>TAS</td>
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<td>7%</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Wheat/grains</td>
<td>WA - Wheat Belt</td>
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<td>25%</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Wine</td>
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<td>42% #1 #1</td>
<td>15%</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

Source: ACL Allen Consulting
4.3.2 Opportunities

Link regions to industry plans and ensure industry plans span the whole value chain to capture the upstream and downstream benefits

The planning process for regions is different in each state and territory. It is sometimes directed and/or supported by the Commonwealth Government through programs such as RDA, or by state governments (e.g., New South Wales), and other times it is a more organic process that occurs within a region. Industry plans are also equally diverse – sometimes driven by industry and coordinated by an industry services company (RDC) and sometimes developed on a more regional basis by an industry.

What is apparent from this analysis is that there are many dimensions that relate to both agriculture and regions and common opportunities for growth can be identified. Given this, it would be logical for industry plans to consider the regions they operate in. Further, it would also make sense that industry plans consider the whole value chain to ensure they capture upstream and downstream benefits. It is important to note that industry, regional and governmental leadership is crucial for the development and implementation of coordinated plans.

Solve problems relevant to a specific region with the industry and communities in the region

Although our framework provides a lens for analysis and a place to start in terms of a top-down approach to understanding the needs of industry and regions, it is no substitute for a participatory approach. This involves identifying and articulating the needs of a region in the region and in consultation with the industry and communities in that region. Approaches that could be used in this space include Participatory Action Research (PAR), as described in Box 4.1.

Solve shared problems across regions or across industries when it makes sense to do so

Although specific problems need specific solutions, it is possible to consider solving problems common to all regions and/or industries. It is appropriate to do this when the problem is easily identifiable and shared across multiple regions or industries. An example might include a solution to connectivity or the provision of essential services where equal access should apply and where there may be economies of scale or scope in a single solution.

Box 4.1 Participatory Action Research – An opportunity to transform

→ Participatory Action Research (PAR) is an approach used within communities to engage, encourage ownership and drive change. It is loosely defined as a collaborative process that seeks to understand, reflect and transform. It is more tangible than traditional research methods as rather than just observing, recording and analysing a situation, it drives towards meaningful change.

→ Originally founded based on Action Research and defined as “a systematic approach to investigation that enables people to find effective solutions to problems they confront in their everyday lives” (Stringer, 2007), it becomes participatory by involving those most affected in the process. Key components of PAR are that it:

- Involves stakeholders who are most affected by what you are seeking to improve or change
- Enables stakeholders to participate in identifying questions, answering them and making decisions about action
- Involves stakeholders in gathering data about their own questions
- Works in a collaborative, less hierarchical way that shares power with all stakeholders
- Encourages stakeholders to take responsibility for their own critical analysis, evaluation and management
- Supports stakeholders to learn progressively and publicly by testing action ideas (…and possibly making mistakes along the way); and which progressively enables stakeholders to ask and answer the bigger questions.


This Appendix provides an analysis of each major product group with respect to the determinants of growth. This information has been sourced from a variety of industry plans, as well as the strategic plans of the RDCs.

### Table A.1  Cattle and calves, lamb and sheep

<table>
<thead>
<tr>
<th>Determinant for growth</th>
<th>Score (0-4)</th>
<th>Notes/comments/justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation and technology</td>
<td>3</td>
<td>Features in MLA strategy with respect to products, processes and practices; robotics, digitisation etc.</td>
</tr>
<tr>
<td>Flexibility and agility</td>
<td>3</td>
<td>Needed for ‘core investments’ in consumer and community support, market growth and diversification, supply chain integrity, productivity and profitability.</td>
</tr>
<tr>
<td>Sustainable communities</td>
<td>3</td>
<td>Features prominently in MLA strategy in multiple dimensions (sustainable: diets, environment, animal welfare).</td>
</tr>
<tr>
<td>Markets and market access</td>
<td>4</td>
<td>Exports are 58% of value of total production ($17.2 billion out of $28.5 billion).</td>
</tr>
<tr>
<td>Risk management</td>
<td>3</td>
<td>$3 billion allocated to help farmers and communities prepare for drought and manage risk (Meat Industry Strategic Plan; MISP).</td>
</tr>
<tr>
<td>Access to capital</td>
<td>2</td>
<td>Does not seem to be a problem for the industry.</td>
</tr>
<tr>
<td>Partnerships</td>
<td>3</td>
<td>Relationship with government is important, as are research partnerships and free trade agreements with trading partners.</td>
</tr>
<tr>
<td>Enabling infrastructure</td>
<td>2</td>
<td>An objective in the MISP is “improving efficiencies in regulation, infrastructure and logistics”.</td>
</tr>
<tr>
<td>Comparative advantage</td>
<td>2</td>
<td>Red meat industry is appropriately concentrated in geographic areas suited to cows and sheep.</td>
</tr>
</tbody>
</table>

Source: Various
## Table A.2 Cotton

<table>
<thead>
<tr>
<th>Determinant for growth</th>
<th>Score (0-4)</th>
<th>Notes/comments/justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation and technology</td>
<td>4</td>
<td>Innovation is a fundamental component of the cotton industry, and it’s apparent across Cotton Research and Development Corporation (CRDC) goals, enabling strategies and key focus areas. Cotton is often considered a market leader in terms of innovation. Innovation is one of Cotton Australia’s (CA) strategic priorities.</td>
</tr>
<tr>
<td>Flexibility and agility</td>
<td>1</td>
<td>Not really a focus of either CRDC or CA and is covered through innovation and technology determinants. CRDC has a goal to build adaptive capacity, which relates to flexibility and agility.</td>
</tr>
<tr>
<td>Sustainable communities</td>
<td>2</td>
<td>Cotton farming sustainability is a goal/strategic priority for both CRDC and CA. CRDC also talks to environmental sustainability and sustainable value chains. CA looks to measure sustainability across the triple bottom line and notes the value of cotton to the community.</td>
</tr>
<tr>
<td>Markets and market access</td>
<td>2</td>
<td>Expanding Asian markets, new markets, new market uses, and partnership are opportunities for the industry, with a need for better understanding and information. Threats include government policies around market access. CA looks to future-proof markets and reduce barriers to trade.</td>
</tr>
<tr>
<td>Risk management</td>
<td>3</td>
<td>Cotton production faces a range of risks, including biosecurity breaches, insect resistance, climate change, trade, consumer expectations, biodiversity threats, farmland availability and declining resources. Improvements to risk management will be led through technology and innovation.</td>
</tr>
<tr>
<td>Access to capital</td>
<td>1</td>
<td>Access to human and natural capital (primarily water) are mentioned but limited focus on financial capital.</td>
</tr>
<tr>
<td>Partnerships</td>
<td>3</td>
<td>Strengthening partnerships is an enabling strategy for CRDC – this is tightly lined with innovation and technology. CA’s dominate partnership is with Australian Cotton Shippers Association, and focuses on trade and international market promotion.</td>
</tr>
<tr>
<td>Enabling infrastructure</td>
<td>1</td>
<td>Communications and transport infrastructure are listed as weaknesses for the industry by CRDC.</td>
</tr>
<tr>
<td>Comparative advantage</td>
<td>1</td>
<td>Competitiveness is important in terms of the value chain through a focus on higher-value uses for cotton.</td>
</tr>
</tbody>
</table>


## Table A.3 Eggs

<table>
<thead>
<tr>
<th>Determinant for growth</th>
<th>Score (0-4)</th>
<th>Notes/comments/justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation and technology</td>
<td>2</td>
<td>Fairly important for on-farm efficiency.</td>
</tr>
<tr>
<td>Flexibility and agility</td>
<td>2</td>
<td>Adapt to community expectations on hen welfare.</td>
</tr>
<tr>
<td>Sustainable communities</td>
<td>3</td>
<td>Flock health/biosecurity, hen welfare, feed efficiency.</td>
</tr>
<tr>
<td>Markets and market access</td>
<td>2</td>
<td>Eggs are not exported. Logistics of getting product to domestic markets seem to be working well.</td>
</tr>
<tr>
<td>Risk management</td>
<td>3</td>
<td>Food safety is very important.</td>
</tr>
<tr>
<td>Access to capital</td>
<td>0</td>
<td>Does not appear to be a major issue.</td>
</tr>
<tr>
<td>Partnerships</td>
<td>4</td>
<td>Relationships with supermarket companies are very important.</td>
</tr>
<tr>
<td>Enabling infrastructure</td>
<td>1</td>
<td>Not apparently a high priority, waste removal.</td>
</tr>
<tr>
<td>Comparative advantage</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Source: Various
## Table A.4 Fish and seafood – aquaculture

<table>
<thead>
<tr>
<th>Determinant for growth</th>
<th>Score (0-4)</th>
<th>Notes/comments/justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation and technology</td>
<td>3</td>
<td>Innovation and technology are important for sustainability, certification and managing risks such as biosecurity, as well as reduction in costs of compliance and production.</td>
</tr>
<tr>
<td>Flexibility and agility</td>
<td>0</td>
<td>Not a focus.</td>
</tr>
<tr>
<td>Sustainable communities</td>
<td>3</td>
<td>Sustainable aquaculture is important in terms of environmental sustainability and water and energy use efficiencies. Lack of support from some sectors of the community make it difficult to establish land-based production facilities. Sustainability of the industry is an objective of Seafood Industry Australia.</td>
</tr>
<tr>
<td>Markets and market access</td>
<td>4</td>
<td>Market access is crucial for exports in a competitive global market. Ensuring good biosecurity controls and rigorous sustainable management is key to achieving third-party certification and social licence. Domestic markets are important too and the focus is on industry reputation and social licence.</td>
</tr>
<tr>
<td>Risk management</td>
<td>2</td>
<td>Biosecurity, social licence, regulatory risk, business risk and market risk are all important.</td>
</tr>
<tr>
<td>Access to capital</td>
<td>1</td>
<td>This is not a stated concern, although the implication is that there are many smaller businesses that have capital needs.</td>
</tr>
<tr>
<td>Partnerships</td>
<td>2</td>
<td>Partnerships are linked to relationships with local governments and local communities.</td>
</tr>
<tr>
<td>Enabling infrastructure</td>
<td>2</td>
<td>Enabling infrastructure, although important, is discussed in terms of RD&amp;E infrastructure.</td>
</tr>
<tr>
<td>Comparative advantage</td>
<td>2</td>
<td>Competitiveness of the industry is discussed in relation to other land uses and export markets.</td>
</tr>
</tbody>
</table>


## Table A.5 Fish and seafood – wild catch

<table>
<thead>
<tr>
<th>Determinant for growth</th>
<th>Score (0-4)</th>
<th>Notes/comments/justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation and technology</td>
<td>2</td>
<td>Innovation and technology are important for sustainability, certification and risk management.</td>
</tr>
<tr>
<td>Flexibility and agility</td>
<td>0</td>
<td>Not a focus.</td>
</tr>
<tr>
<td>Sustainable communities</td>
<td>4</td>
<td>Commercial fisheries are critical for the sustainability of small regional coastal communities and ensuring sustainable fisheries management is of key importance to maintaining social licence. Sustainability of the industry is the objective of Seafood Industry Australia.</td>
</tr>
<tr>
<td>Markets and market access</td>
<td>4</td>
<td>Market access is crucial for exports in a competitive global market. Ensuring good biosecurity controls and rigorous sustainable management is key to achieving third-party certification and social licence. Domestic markets are important too and the focus is on industry reputation and social licence.</td>
</tr>
<tr>
<td>Risk management</td>
<td>2</td>
<td>Biosecurity, social licence, regulatory risk, business risk and market risk are all important.</td>
</tr>
<tr>
<td>Access to capital</td>
<td>1</td>
<td>This is not a stated concern, although the implication is that there are many smaller businesses that have capital needs.</td>
</tr>
<tr>
<td>Partnerships</td>
<td>3</td>
<td>Partnerships with governments are needed to reduce regulation and move to co-management opportunities to give greater responsibility to industry stewards. Other key partnerships are with Indigenous fishers and recreational fishers, as well as biosecurity.</td>
</tr>
<tr>
<td>Enabling infrastructure</td>
<td>2</td>
<td>Enabling infrastructure, although important, is discussed in terms of RD&amp;E infrastructure.</td>
</tr>
<tr>
<td>Comparative advantage</td>
<td>2</td>
<td>Competitiveness of the industry is discussed in relation to other marine uses and export markets.</td>
</tr>
</tbody>
</table>

### Table A.6 Forests and wood

<table>
<thead>
<tr>
<th>Determinant for growth</th>
<th>Score (0-4)</th>
<th>Notes/comments/justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation and technology</td>
<td>2</td>
<td>Innovation and technology are important in terms of assisting the industry in achieving its objectives of increased productivity and sustainability.</td>
</tr>
<tr>
<td>Flexibility and agility</td>
<td>2</td>
<td>An indirect focus through decision-making and capability needs of the industry (Program 5).</td>
</tr>
<tr>
<td>Sustainable communities</td>
<td>3</td>
<td>Sustainability is a clear goal. The focus is on environmental and industry sustainability and social sustainability in terms of consumer acceptance.</td>
</tr>
<tr>
<td>Markets and market access</td>
<td>1</td>
<td>Program 2 is focused on aligning products to market needs. There is a desire for consumer acceptance to develop markets but there is no discussion on market access requirements.</td>
</tr>
<tr>
<td>Risk management</td>
<td>3</td>
<td>Increasing resource availability and reducing risk is the aim of Program 4. Climate variability and environmental risks (including biosecurity), operating risks, OH&amp;S risks and political and market risks are key focus areas for the industry.</td>
</tr>
<tr>
<td>Access to capital</td>
<td>1</td>
<td>Not a stated issue and noted increase in capital investment over recent years.</td>
</tr>
<tr>
<td>Partnerships</td>
<td>3</td>
<td>Partnerships are important in terms of environmental and social/community acceptance issues. These fall under Program 2. Under Program 5, there is focus on a partnership with ABARES.</td>
</tr>
<tr>
<td>Enabling infrastructure</td>
<td>1</td>
<td>Not a stated issue.</td>
</tr>
<tr>
<td>Comparative advantage</td>
<td>2</td>
<td>This driver is not a focus of the Forest and Wood Products Australia (FWPA) Strategic Plan.</td>
</tr>
</tbody>
</table>


### Table A.7 Horticulture

<table>
<thead>
<tr>
<th>Determinant for growth</th>
<th>Score (0-4)</th>
<th>Notes/comments/justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation and technology</td>
<td>4</td>
<td>This is covered in the Hort Innovation Strategic Plan. Relates to Pillar 1: Drive knowledge and innovation into horticulture industries. Relates to Pillar 2: Deliver the highest-value R&amp;D, marketing and trade investments across industries, now and into the future.</td>
</tr>
<tr>
<td>Flexibility and agility</td>
<td>4</td>
<td>Relates to initiatives under Pillar 2 of the Hort Innovation Strategic Plan: ‘Drive innovation across industries to support change and adaptation of practices, to improve productivity and competitiveness’ and ‘Focus on the future of horticulture to understand and prepare for challenges and opportunities that are ahead’. Relates to an initiative for Pillar 3: ‘Streamline processes and systems to be more flexible and more efficient’.</td>
</tr>
<tr>
<td>Sustainable communities</td>
<td>2</td>
<td>Only one mention of this in the Hort Innovation Strategic Plan, around Pillar 3: ‘Invest in talent and creating new capabilities and building an inclusive, collaborative, grower-first culture’.</td>
</tr>
<tr>
<td>Markets and market access</td>
<td>1</td>
<td>Program 2 is focused on aligning products to market needs. There is a desire for consumer acceptance to develop markets but there is no discussion on market access requirements.</td>
</tr>
<tr>
<td>Risk management</td>
<td>4</td>
<td>Increasing resource availability and reducing risk is the aim of Program 4. Climate variability and environmental risks (including biosecurity), operating risks, OH&amp;S risks and political and market risks are key focus areas for the industry.</td>
</tr>
<tr>
<td>Access to capital</td>
<td>2</td>
<td>Food safety was a part of the ‘Vegetable Strategic Investment Plan 2017-19’, but not the Hort Innovation Strategic Plan.</td>
</tr>
<tr>
<td>Partnerships</td>
<td>3</td>
<td>Partnerships are important in terms of environmental and social/community acceptance issues. These fall under Program 2. Under Program 5, there is focus on a partnership with ABARES.</td>
</tr>
<tr>
<td>Enabling infrastructure</td>
<td>1</td>
<td>Not explicitly mentioned as an industry priority. Hort Innovation’s own organisational infrastructure (as the RDC) mentioned instead.</td>
</tr>
<tr>
<td>Comparative advantage</td>
<td>2</td>
<td>Industry competitiveness discussed in a general sense, but it is not identified as a particular issue that is unique to horticulture.</td>
</tr>
</tbody>
</table>

Source: Various
### Table A.8 Dairy

<table>
<thead>
<tr>
<th>Determinant for growth</th>
<th>Score (0-4)</th>
<th>Notes/comments/justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation and technology</td>
<td>4</td>
<td>Dairy Australia’s (DA) remit is to support productivity through innovation on farm to improve profitability. ‘Precision Dairy’ is also one of the six focus areas of the ‘Dairy Moving Forward’ strategy. Technology (digital, automation and renewables) provides an opportunity for increasing efficiency and profitability.</td>
</tr>
<tr>
<td>Flexibility and agility</td>
<td>2</td>
<td>Flexibility relates to DA’s Feedbase and Animal Nutrition program in terms of pastures, forage and animal feeding systems, as well as looking for flexibility within the international market.</td>
</tr>
<tr>
<td>Sustainable communities</td>
<td>3</td>
<td>Sustainability is mentioned in terms of the environment, genetic breeding material, sustainable capital source and the profitability of dairy farms and the dairy industry. There is a DA project targeting the communication of the benefits of the dairy sector to the local community under the ‘Sustainable Growth’ program. Sustainability is a key issue for the broader dairy industry and is linked to the environment and markets.</td>
</tr>
<tr>
<td>Markets and market access</td>
<td>4</td>
<td>Securing improved market access is of crucial importance to the industry.</td>
</tr>
<tr>
<td>Risk management</td>
<td>3</td>
<td>Adverse market conditions domestically and internationally are considerable threats. Changing climate, social licence issues and biosecurity are also concerns.</td>
</tr>
<tr>
<td>Access to capital</td>
<td>3</td>
<td>A clear priority for the industry, as capital availability and cost are seen as industry threats.</td>
</tr>
<tr>
<td>Partnerships</td>
<td>2</td>
<td>DA partners with industry, government and the other RDCs on a variety of projects that aim to develop the industry.</td>
</tr>
<tr>
<td>Enabling infrastructure</td>
<td>2</td>
<td>Infrastructure is key in export processes, R&amp;D, transport and road connectivity, digital connectivity, and on-farm infrastructure.</td>
</tr>
<tr>
<td>Comparative advantage</td>
<td>2</td>
<td>Industry competitiveness is discussed in terms of export markets and managing of price volatility.</td>
</tr>
</tbody>
</table>


### Table A.9 Mangoes

<table>
<thead>
<tr>
<th>Determinant for growth</th>
<th>Score (0-4)</th>
<th>Notes/comments/justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation and technology</td>
<td>4</td>
<td>Technology is important for driving quality and productivity outcomes – especially in terms of non-invasive techniques for assessing ripeness and quality. Also, technology plays an important role in market access opportunities through reduced product loss and reduced cost of compliance with international phytosanitary requirements.</td>
</tr>
<tr>
<td>Flexibility and agility</td>
<td>1</td>
<td>Not an issue.</td>
</tr>
<tr>
<td>Sustainable communities</td>
<td>3</td>
<td>Improved industry sustainability is a stated outcome for the industry. There is focus on R&amp;D for environmental sustainability, biosecurity and resource management purposes.</td>
</tr>
<tr>
<td>Markets and market access</td>
<td>4</td>
<td>Market access is a dominant theme in terms of the phytosanitary requirements of international markets. Along with consistent supply, market access is the primary limitation on exports.</td>
</tr>
<tr>
<td>Risk management</td>
<td>2</td>
<td>Biosecurity, production, market and regulatory risks are mentioned throughout the Strategic Plan.</td>
</tr>
<tr>
<td>Access to capital</td>
<td>1</td>
<td>There is mention of better use of existing capital, not necessarily issues relating to access.</td>
</tr>
<tr>
<td>Partnerships</td>
<td>2</td>
<td>Partnerships are important in terms of co-investment and across the supply chain.</td>
</tr>
<tr>
<td>Enabling infrastructure</td>
<td>1</td>
<td>Not a stated issue.</td>
</tr>
<tr>
<td>Comparative advantage</td>
<td>3</td>
<td>Competition from imports and competition in international markets are issues. There is also competition within Australia in terms of production windows, availability, quality and varieties.</td>
</tr>
</tbody>
</table>

Appendices

Table A.10 Pork

<table>
<thead>
<tr>
<th>Determinant for growth</th>
<th>Score (0-4)</th>
<th>Notes/comments/justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation and technology</td>
<td>4</td>
<td>Objective 5 of the Australian Pork Limited (APL) Strategic Plan discusses the need to ‘improve capability’. This refers to the focus on rapid and complete uptake and adoption of information and technologies that will improve the productivity and reputation of the total pork value chain. It also looks to optimise operational effectiveness to maximise the returns to producers. This determinant is also critical to the Pork CRC’s Strategic Plan 2019-22: <a href="http://april.com.au/wp-content/uploads/2020/05/Strategic-Plan-APRIL-May-2019.pdf">http://april.com.au/wp-content/uploads/2020/05/Strategic-Plan-APRIL-May-2019.pdf</a></td>
</tr>
<tr>
<td>Flexibility and agility</td>
<td>2</td>
<td>Not really a focus of the APL Strategic Plan and is covered through the innovation and technology determinant.</td>
</tr>
<tr>
<td>Sustainable communities</td>
<td>4</td>
<td>Objective 4 of the APL Strategic Plan talks about ‘Leading Sustainability’. This objective highlights the need to be proactive as an industry in fostering the delivery of viable and sustainable farming practices and a healthy and profitable industry.</td>
</tr>
<tr>
<td>Markets and market access</td>
<td>4</td>
<td>Objective 2 of the APL Strategic Plan is focused on ‘building markets’. This objective is focused on converting consumer appeal into better value for producers and other participants in the value chain through a deep understanding of customer needs in chosen segments.</td>
</tr>
<tr>
<td>Risk management</td>
<td>3</td>
<td>The APL Strategic Plan refers to five strategic objectives. Objective 3 relates to ‘driving value chain integrity’. This refers to ‘building on Australia’s clean and safe image both at home and abroad whilst strengthening the already high degree of trust for Australian pork through industry integrity systems.’</td>
</tr>
<tr>
<td>Access to capital</td>
<td>1</td>
<td>Not mentioned as an issue.</td>
</tr>
<tr>
<td>Partnerships</td>
<td>3</td>
<td>Partnerships mentioned in a general way throughout the Strategic Plan. Some reference to a specific ‘Feed Grain Partnership’, which is a cross-sectoral feed grain partnership involving many other RDCs and the Pork CRC, and acts as a focal point for major organisation and companies in the feed grain industry. This also relates to the innovation and technology determinant.</td>
</tr>
<tr>
<td>Enabling infrastructure</td>
<td>1</td>
<td>Not mentioned as an issue.</td>
</tr>
<tr>
<td>Comparative advantage</td>
<td>1</td>
<td>No explicit references.</td>
</tr>
</tbody>
</table>

Source: Various

Table A.11 Poultry (chicken meat)

<table>
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<tr>
<th>Determinant for growth</th>
<th>Score (0-4)</th>
<th>Notes/comments/justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation and technology</td>
<td>3</td>
<td>Objective 3 of the Chicken Meat Strategic Plan is focused on chicken meat production through the whole supply chain. This will include R&amp;D investments relating to:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• More automation (initiatives for innovative ways to improve efficiencies).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Improving nutritional management and feed use efficiency.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Improving biosecurity practices within the supply chain.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Enhancing chicken welfare and handling methods.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Management strategies for chicken health.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Improving supply chain security by investing in feedstocks, genetics and logistics.</td>
</tr>
<tr>
<td>Flexibility and agility</td>
<td>3</td>
<td>An important enabling activity of the Chicken Meat Strategic Plan is focused on provision of ‘training and capacity building opportunities’.</td>
</tr>
<tr>
<td>Sustainable communities</td>
<td>4</td>
<td>Objective 2 of the Chicken Meat Strategic Plan is focused on improving the ‘industry’s impact on the environment’.</td>
</tr>
<tr>
<td>Markets and market access</td>
<td>4</td>
<td>Key focus areas of Objective 4 of the Chicken Meat Strategic Plan are:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Better understanding consumer trends and market opportunities.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Developing the industry value proposition.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>These relate to the necessity for individual companies to undertake tailored market assessments.</td>
</tr>
<tr>
<td>Risk management</td>
<td>3</td>
<td>Objective 1 of the Chicken Meat Strategic Plan is focused on ‘improving food safety’.</td>
</tr>
<tr>
<td>Access to capital</td>
<td>2</td>
<td>Not mentioned in the Strategic Plan.</td>
</tr>
<tr>
<td>Partnerships</td>
<td>2</td>
<td>Partnerships only mentioned in a general way.</td>
</tr>
<tr>
<td>Enabling infrastructure</td>
<td>2</td>
<td>No explicit mention of infrastructure or infrastructure needs.</td>
</tr>
<tr>
<td>Comparative advantage</td>
<td>1</td>
<td>No explicit mention in the Strategic Plan.</td>
</tr>
</tbody>
</table>

Source: Various
### Table A.12 Sugar

<table>
<thead>
<tr>
<th>Determinant for growth</th>
<th>Score (0-4)</th>
<th>Notes/comments/justification</th>
</tr>
</thead>
</table>
| Innovation and technology | 4 | Drive profitability is Goal 1 of Sugar Research Australia’s (SRA) Strategic Plan. This goal includes investments in areas such as:  
• Increased sugarcane yield and commercial cane sugar (CCS).  
• Restructured and modernised breeding program and broadened genetic base.  
• Better soil health, reduced nutrient losses and improved water quality.  
• Integrated and focused soil health program and enhanced nitrogen management.  
• New integrated precision technologies and activities. |
| Flexibility and agility | 3 | Enhance capability is Goal 3 of SRA’s Strategic Plan. This goal includes investments in areas such as diversified revenue streams and product innovation. |
| Sustainable communities | 4 | Improve sustainability is Goal 2 of SRA’s Strategic Plan. This goal is present across many of the investment priorities. |
| Markets and market access | 2 | Market access is not a dominant theme of the SRA Strategic Plan. |
| Risk management | 3 | Biosecurity, production, market and ageing capital risks mentioned throughout the SRA Strategic Plan (at least 20 times across several domains). |
| Access to capital | 2 | The SRA Strategic Plan is focused on the use of existing capital, not necessarily issues relating to access. |
| Partnerships | 2 | Partnerships are linked to Goal 3 of the SRA Strategic Plan but are not a dominant driver of investments against this goal. |
| Enabling infrastructure | 2 | The SRA Strategic Plan is focused on existing on-farm infrastructure and not necessarily issues relating to enabling infrastructure. |
| Comparative advantage | 2 | This driver is not a focus of the SRA Strategic Plan. |

### Table A.13 Wheat, grains and oilseeds

<table>
<thead>
<tr>
<th>Determinant for growth</th>
<th>Score (0-4)</th>
<th>Notes/comments/justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation and technology</td>
<td>3</td>
<td>Innovation and technology are central to Grains Research and Development Corporation’s (GRDC) objective to assist the industry with investing in R&amp;D to create enduring profitability.</td>
</tr>
<tr>
<td>Flexibility and agility</td>
<td>2</td>
<td>Agility is a component of GRDC’s investment strategy to ensure opportunities for profitability and sustainability can be realised. Grain Growers note the importance of flexibility in approach to regional differences.</td>
</tr>
<tr>
<td>Sustainable communities</td>
<td>2</td>
<td>Sustainability in terms of the industry is important to growers – there is some focus on sustainable resource use (e.g. water use efficiency, soil management) and sustainability as a social licence issue. No focus on regional communities.</td>
</tr>
<tr>
<td>Markets and market access</td>
<td>4</td>
<td>Market access is important in terms of supporting and enhancing current products, exploring new product opportunities, maintaining and improving price, optimising input costs, and managing risks. Grain Growers highlight the need to meet market demands and specifications.</td>
</tr>
<tr>
<td>Risk management</td>
<td>3</td>
<td>Biosecurity, financial risks, production risks, climate risks, business risks and market risks all require management.</td>
</tr>
<tr>
<td>Access to capital</td>
<td>2</td>
<td>Access to capital is considered a strength of the industry.</td>
</tr>
<tr>
<td>Partnerships</td>
<td>2</td>
<td>Partnerships are of importance to the industry in terms of innovation and market access.</td>
</tr>
<tr>
<td>Enabling infrastructure</td>
<td>2</td>
<td>Grain Growers reference the importance of regional infrastructure, including connectivity, if the industry is to use R&amp;D to ‘transform’.</td>
</tr>
<tr>
<td>Comparative advantage</td>
<td>1</td>
<td>Maintaining a competitive edge is important for export market opportunities and is dependent on innovation and access to technology.</td>
</tr>
</tbody>
</table>

## Appendices

### Table A.14 Wine

<table>
<thead>
<tr>
<th>Determinant for growth</th>
<th>Score (0-4)</th>
<th>Notes/comments/justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation and technology</td>
<td>4</td>
<td>Important for improved grape and wine quality, biosecurity, soil and water. Use of robotics, digitisation, big data and genetics.</td>
</tr>
<tr>
<td>Flexibility and agility</td>
<td>2</td>
<td>Required for challenges including climate change, wastewater, chemicals and trade disputes.</td>
</tr>
<tr>
<td>Sustainable communities</td>
<td>4</td>
<td>A key strategic priority, especially relating to the environmental and sustainable management of pests and diseases.</td>
</tr>
<tr>
<td>Markets and market access</td>
<td>4</td>
<td>Exports are 44% of value of total production.</td>
</tr>
<tr>
<td>Risk management</td>
<td>3</td>
<td>A key strategic priority – planning, stakeholder management, governance, financial, operational, marketing and R&amp;D.</td>
</tr>
<tr>
<td>Access to capital</td>
<td>0</td>
<td>No mention in key documents.</td>
</tr>
<tr>
<td>Partnerships</td>
<td>0</td>
<td>No mention in key documents.</td>
</tr>
<tr>
<td>Enabling infrastructure</td>
<td>2</td>
<td>Not a lot of emphasis in key documents.</td>
</tr>
<tr>
<td>Comparative advantage</td>
<td>2</td>
<td>Wine grapes are grown in appropriate locations.</td>
</tr>
</tbody>
</table>

Source: Various

### Table A.15 Wool

<table>
<thead>
<tr>
<th>Determinant for growth</th>
<th>Score (0-4)</th>
<th>Notes/comments/justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation and technology</td>
<td>3</td>
<td>Technology used for sheep and wool management, biosecurity supply chain management, textile innovation and social media marketing.</td>
</tr>
<tr>
<td>Flexibility and agility</td>
<td>3</td>
<td>Challenges to industry require flexible and agile practices. Challenges include high labour intensity, Brexit, healthy productive sheep and wool management.</td>
</tr>
<tr>
<td>Sustainable communities</td>
<td>2</td>
<td>“Sustainable future” for wool growers is part of Australian Wool Innovation’s (AWI) strategic framework. Sustainability is discussed in terms of biosecurity, land management and environmentally conscious products.</td>
</tr>
<tr>
<td>Markets and market access</td>
<td>4</td>
<td>Exports are 98% of value of total production (export value of $3.8 billion in 2018-19).</td>
</tr>
<tr>
<td>Risk management</td>
<td>3</td>
<td>Important in terms of regulatory compliance, performance management, health and safety, reputation, knowledge and IP, and finance.</td>
</tr>
<tr>
<td>Access to capital</td>
<td>0</td>
<td>Appears not to be a problem for the industry.</td>
</tr>
<tr>
<td>Partnerships</td>
<td>2</td>
<td>Key partnership between woolgrowers, government, processors and manufacturers, retailers, and consumers.</td>
</tr>
<tr>
<td>Enabling infrastructure</td>
<td>2</td>
<td>Types of important infrastructure include in-shed, digital and IT.</td>
</tr>
<tr>
<td>Comparative advantage</td>
<td>2</td>
<td>Wool industry is appropriately concentrated in geographic areas suited to cows and sheep.</td>
</tr>
</tbody>
</table>

Source: Various
Appendix B

Results of Step 3: SWOT and TOWS

This Appendix details the SWOT and TOWS of each of the six case studies (product and region).

B.1 Cattle in Outback, Queensland

The SWOT for cattle in Outback Queensland is provided in Table B.1.

This product and region can produce large quantities of high-quality and safe beef that is profitable. The industry is underpinned by robust biosecurity and red meat tracing systems that continually improve and receive ongoing investment from RD&E corporations. The region is home to a diversity of cattle businesses, which range from animal breeding, through farming and wholesaling, to processing and retailing. Cattle in Outback Queensland also has good access to national and international markets (namely Asia), with Townsville providing live export port facilities and Brisbane being the home of Australia’s largest export terminal for red meat.

While this region has good access to export and distribution facilities, the sheer geographical distances red meat must travel to reach markets is a weakness. These distances expose numerous supply chain inefficiency and fragmentation issues that require resolution. The export-oriented nature of red meat also means that the region and product are trade-exposed and subject to the uncertainties of export markets.

For this product and region, there are opportunities to drive future demand in Asia and elsewhere for high-quality products. There are opportunities to further grow demand in export markets through the development of niche products that attract and retain an appropriately skilled workforce.

Using strengths to maximise opportunities

The cattle industry’s reputation for high-quality and safe products could be exploited to help drive international demand for Australian products. There are opportunities to better leverage the investments undertaken by Meat and Livestock Australia (MLA) in red meat traceability systems to ensure they are efficient and effective, and well-understood by international customers. This will ensure that all points in the red meat supply chain in the region are adhering to the SAFEMEAT and other traceability requirements. There are also opportunities to improve compliance with the region’s red meat systems by supporting their digitisation (many processes are currently managed manually by supply chain participants).

Queensland has world-class processing facilities and infrastructure, which includes the largest export terminal for red meat (Brisbane) and the second-largest live export port (Townsville). It also has 43 operational regional slaughterhouses and killing rooms that service domestic consumers. While infrastructure upgrades have occurred through the Queensland Government and the Commonwealth Government’s various infrastructure priorities and projects (such as Inland Rail between Brisbane and Melbourne), there remains considerable scope to improve existing infrastructure and intermodal connectivity, as discussed below.

Cattle’s reputation for quality and safety and its ongoing investment in R&D to minimise the environmental impact of the sector could be leveraged to address the social licence issues facing red meat. This will include continued investment in R&D, marketing and stakeholder communications by key industry representative bodies like MLA and Peak Industry Councils.

Road freight is the dominant land transport mode for livestock and meat products. In many places, road freight inefficiencies can be overcome by innovative new vehicles such as the A-Double truck-trailer combination. Research reported by the Red Meat Advisory Council (RMAC)[1] suggests that Performance-Based Standards-accredited vehicles, such as the A-Double, also offer safety levels that are between 60 and 70 per cent higher than the existing general fleet.

Insufficient matching of the latest high-productivity vehicles is a significant drain on productivity. In many instances, the Queensland and local governments continue to have inconsistent vehicle access regulations.

Seaports and their connective infrastructure are critical to red meat. RMAC has reported that road and rail approaches to seaports constitute the largest single cost to moving a container through the port. Where road freight deliveries to ships do not arrive at optimal weights (underweight pack outs), significant productivity is lost. This places obligations on government to retrofit key supply chains to accommodate the highest-productivity vehicles. Some of these projects are likely to be worthy of consideration as priority projects.

Rail is an important freight mode (especially in Queensland) and critical in delivering red meat products to major seaports like Townsville. The effectiveness of the region’s rail system will rest on matching this rail with highest-productivity road freight connections, as well as resolving the direct full-cost-recovery pricing pricing of interstate road freight operating on highways in direct competition with rail. [1]

Using strengths to minimise threats

The cattle industry’s reputation for high-quality and safe products could be exploited to reduce trade barriers – especially in relation to biosecurity and health of Queensland’s cattle. It will also be possible to better leverage the investments undertaken by Meat and Livestock Australia (MLA) in red meat traceability systems to ensure they are efficient and effective, and well-understood by foreign governments and potential export markets. This will ensure that all points in the red meat supply chain in the region are adhering to the SAFEMEAT and other traceability requirements. There are also opportunities to improve compliance with food safety requirements through a digital process (many processes are currently managed manually by supply chain participants).

Improving weaknesses by taking advantage of opportunities

The geographical distances between Outback Queensland and major markets are large. Improvements in road, rail and seaport infrastructure (as discussed above) and the interoperability of transport modes will address these issues over time.

The presence of world-class processing facilities and infrastructure should be leveraged to help address key workforce and skills gaps identified in the SWOT. There are opportunities to pool resources and develop training programs that attract and retain an appropriately skilled workforce. The push into niche products will provide opportunities for additional jobs that in many cases will be high-value.

Minimising weaknesses to avoid threats

Investing in infrastructure, red meat traceability systems and supporting the emergence of high-value niche products will address many of the threats identified in the SWOT, especially climate change and drought.
Results of Step 3: SWOT and TOWS

Table B.1 Cattle in Outback, Queensland – SWOT

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Renowned for producing high-quality, safe and reliable beef that is productive and profitable.</td>
<td>• Policy instability/regulatory reform is slow and holding back development: Major changes to Queensland vegetation management laws were made between 2004-2018, along with significant changes in relevant maps and regulation. Policy instability increases costs of compliance and creates uncertainty for investors. General increase in complexity and impediments to efficient beef supply chain operations.</td>
</tr>
<tr>
<td>• World-leading animal welfare practices.</td>
<td>• Geographical distances to market: Queensland’s beef cattle sector has a very long physical supply chain. Despite having an extensive road network and regulated transport standards, these large distances, and often the requirement to engage third parties, mean that any gains in operational efficiency will have a material positive impact on cost.</td>
</tr>
<tr>
<td>• Robust/strict biosecurity, ongoing investment in R&amp;D and innovation.</td>
<td>• Supply chain inefficiencies and fragmentation: Vertical integration affords beef producers greater visibility over their supply chains. Reduced reliance on third parties allows greater control over the timing of product movements. The significance of supply chain efficiency to the beef cattle sector means that it is also an area of focus for innovation.</td>
</tr>
<tr>
<td>• Diversity of cattle businesses support a variety of production systems, from breeding-only to breeding and finishing and just fattening, in some productive areas in central Queensland.</td>
<td>• Trade-exposed and labour-intensive industry.</td>
</tr>
<tr>
<td>• World-class processing facilities and infrastructure: Queensland is home to 42% of Australia’s cattle herd, the largest export terminal for red meat (Brisbane) and the second-largest live export port (Townsville).</td>
<td>• Increasing operating costs (including processing costs) due to drought and the rising cost of energy.</td>
</tr>
<tr>
<td>• Close trade relationships with, and geographic proximity to, Asia.</td>
<td>• Social license: Animal welfare, environmental impact and healthy diets will place the industry’s social licence to operate under a high degree of external scrutiny and uncertainty.</td>
</tr>
<tr>
<td>• Extensive road network and regulated transport standards.</td>
<td>• The industry is increasingly reliant of forms of ‘blue’ water, and is vulnerable to the potential cost increases and water restrictions that may be introduced should increased stresses be felt by water and infrastructure providers.</td>
</tr>
<tr>
<td>• Queensland has 43 operational regional slaughterhouses and killing rooms that service domestic consumers.</td>
<td>• Extreme climatic conditions and weather events: These force primary producers to destock due to a lack of feed.</td>
</tr>
<tr>
<td>• Extensive areas of native pastures.</td>
<td>• Increased global competition.</td>
</tr>
</tbody>
</table>

Table B.1 Cattle in Outback, Queensland – SWOT cont.

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Drive future demand in Asia (increased protein consumption by the growing middle class): Queensland’s geographic proximity to Asia means producers can benefit from relatively low freight costs and transport times. This presents a competitive advantage over other exporting nations, particularly in the expanding high-end chilled beef market segment, which is experiencing increased demand due to its perceived higher quality.</td>
<td>• Extreme climatic conditions and weather events: These force primary producers to destock due to a lack of feed.</td>
</tr>
<tr>
<td>• Supply chain innovation and visibility: Digital innovation will increase the transparency of the supply chain, allowing near-real-time visibility of inventory levels at each stage. Movement of inventory along the supply chain will therefore become more efficient, reducing cost and increasing effectiveness.</td>
<td>• Increased global competition.</td>
</tr>
<tr>
<td>• Niche beef/organic beef products that appeal to consumers: These social changes present an opportunity for the Queensland beef industry to target niche premium markets reflecting consumer preferences. There has been a focus on lean meat, nutrition, food safety (including traceability), production practices, packaging and ethical production. Consumers are showing a preference for food that demonstrates their values and benefits their lifestyle. Consumers want their consumption choices to support values such as animal welfare, environmental protection and sustainability.</td>
<td>• Domestic regulation: This heightened level of domestic regulatory intervention is likely to continue, with environmental legislation targeting the red meat industry’s high level of carbon emissions and water consumption a key area of concern.</td>
</tr>
<tr>
<td>• Drive future demand in Asia (increased protein consumption by the growing middle class): Queensland’s geographic proximity to Asia means producers can benefit from relatively low freight costs and transport times. This presents a competitive advantage over other exporting nations, particularly in the expanding high-end chilled beef market segment, which is experiencing increased demand due to its perceived higher quality.</td>
<td>• Threat of substitutes: Consumer trend towards increased pork and poultry consumption continues and is supplemented with non-meat protein substitutes such as textured soy. (see: <a href="https://www.agrifutures.com.au/wp-content/uploads/2020/03/20-02-1.pdf">https://www.agrifutures.com.au/wp-content/uploads/2020/03/20-02-1.pdf</a>).</td>
</tr>
<tr>
<td>• Infrastructure upgrades: e.g. Freight for the Meatworks Sector – future directions. Better access to markets and processors has been provided through common-sense changes to road transport regulations and more opportunities on rail for cattle and grain.</td>
<td>• Trade barriers: Liberalisation in trade relations reverses and nations revert to multi-lateral trade agreements, which are slower to be agreed and result in Australian red meat facing restricted access and high tariffs to key international markets.</td>
</tr>
</tbody>
</table>

Source:
- https://www.publications.qld.gov.au/dataset/23f4f979-a772-4213-b5f1-fb1d8b054e20/resource/bf6a8f29-4dfe-4244-bbbe-38e400a02238/appendix
- CRCNA (2020), Northern Australia Beef Situation Analysis
B.2 Cotton in New England and North West, New South Wales

The SWOT for cotton in New England and North West (NENW), New South Wales is provided in Table B.2.

For this product and region, the key strength is its innovative and collaborative nature, with high levels of regional capability. The NENW region is home to the University of New England (UNE), Cotton Research and Development Corporation (CRDC), other R&D opportunities in SMART hubs, and new agricultural research institutes such as the recently proposed International Centre of Crop and Digital Agriculture. Grower participation in research and extension is high and there is good integration with associated industries in the region, such as the use of cottonseed in NENW feedlots. Innovation in terms of technology, as well as the development of good systems and processes, has enabled the industry to improve its risk management, especially in relation to biosecurity concerns but also in terms of water use efficiency and market understanding.

Additionally, NENW is strategically positioned between Sydney and Brisbane on key road and rail transport routes and ports (Port Botany), allowing for the movement of agricultural products, and has relatively good access to broadband infrastructure.

Key industry and regional weaknesses include reliance on water and water allocations, made even more concerning in times of drought and exacerbated by climate change. Additionally, because of its reliance on water, the industry is exposed to large variations in income year to year. The local workforce is ageing, and the cotton industry is not a large employer relative to other industries, including beef cattle, which employs five per cent of the region’s population. Opportunities in the region and the industry include the continued or enhanced use of innovation and technology to improve water use efficiency, plant breeding, biosecurity, and farming systems. In addition, there are prospects for renewable energy and alternate uses for cottonseed and cottonseed oil, and there is potential for recycled cotton and participation in the circular economy. The push for regional manufacturing because of COVID-19 may benefit the region and the industry, as there could be potential for the domestic manufacturing of cloth from raw cotton – although this is likely cost-prohibitive. Some of this work will also improve the sustainability of the industry and the region, and assist with the industry’s social licence issues. Construction of the Inland Rail network will support further growth and connection for the region.

Due to concerns with water use efficiency and other environmental issues, cotton faces a social licence issue both within the region and as an industry more broadly. Threats like this can be compounded by other issues, such as the potential threat to R&D funding, which would impede innovation and technology development. Land use conflict in the region is high, with mining and other agriculture, as well as renewable energy developments, competing for land. Threats to water availability, water security, costs, storage and alternative water uses are also considerable. Climate change, as for most products and most regions, is a concern. Market competition from synthetic fibres is especially a concern if these fibres can be produced more sustainably with less water and environmental impact.

Based on the analysis provided in Table B.2, further analysis is undertaken using the TOWS technique (as shown below).

Using strengths to maximise opportunities

The cotton industry is a market leader in terms of innovation capability, and this may enable the development of water use efficiency technology. Taking advantage of general research expertise at UNE and cotton-specific research expertise could provide a solution for a problem that is bigger than both the region and the industry, and would allow for the sustainability of agriculture in NENW. In general, R&D experts and funding opportunities attract and build capability within the region, which may assist with the development of complementary industries such as manufacturing or alternative product development, e.g. cottonseed or recycled cotton.

The development of good data collection systems and processes already used at a production level can be maximised by taking the opportunity to use data and technology to drive better decisions in the face of risk and uncertainty. This could assist with biosecurity controls, climate change and new market development beyond China.

Using strengths to minimise threats

An industry that is an above-average adopter of new technology understands the impact R&D investment has on developing expertise. This understanding can help to secure long-term support for R&D funding. R&D has the potential to solve water availability threats and improve environmental and social outcomes for the region. Social licence issues can be overcome, and this will assist with increasing the sustainability of the cotton industry in the region. Further, collaboration with and support from associated industries in the region can reduce the threat of land use conflict, for example, working with feedlots to supply cottonseed for cattle feed.

Improving weaknesses by taking advantage of opportunities

As water use efficiency improves, the variability of crop year to year will decrease. Reducing the reliance on water (i.e., increasing water use efficiency) will increase social licence. Further, this will make regional incomes less variable and smooth out R&D funding. Continuing to enhance capability and further involving the community can improve the relationship between industry and the community. Another possible benefit of adoption of technology by cotton growers is that it frees up their time, which enables them to increase their involvement in the local community.

Minimising weaknesses to avoid threats

Access to capital and alternate forms of investment not reliant on the regional levy base will increase access to research funds and build increased capability. Better use of data and technology to inform risks will aid better on-farm and off-farm decision-making. Social licence can be restored in conjunction with other sustainable developments in the community, e.g., renewable energy.
NENW has developed a comprehensive supporting industry framework. Progression of the industry has been enabled by extensive services sector in agribusiness, education, health, technology, and transport and logistics (universities, genetic research, CRCA). Productive climate, rich soils, and the availability of coal, solar and wind resources. NENW has a natural competitive advantage with respect to soil and water resources for agricultural production. Strategically positioned between Sydney and Brisbane on key road and rail transport routes. Good access to seaports (Port Botany) and airports, and good broadband infrastructure, enables the movement of agricultural products. Much of the NENW region output is exported through ports in Sydney and Brisbane. Logistics hubs presently exist in Moree and Narrabri to support the transport process. Inland Rail provides a more efficient transport mode for output from northern New South Wales. Australian cotton growers are more productive than global industry leaders. Australian cotton growers are three times the world average.)

Australian irrigated lint yields are now the highest of any major cotton-producing country in the world (being about three times more bales per hectare).

High demand for Australian cotton due to its premium quality characteristics, reliability and a proven track record in meeting manufacturer and consumer needs. Sustainable, high-quality, low-contaminant cottons that attract a premium on the world market.

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Australian irrigated lint yields are now the highest of any major cotton-producing country in the world (being about three times more bales per hectare).

High demand for Australian cotton due to its premium quality characteristics, reliability and a proven track record in meeting manufacturer and consumer needs. Sustainable, high-quality, low-contaminant cottons that attract a premium on the world market.

Environmental sustainability:

- Environmental sustainability:

- Export market exposed and heavily reliant on Vietnam and China: In 2019, prices were supported by a depreciated Australian dollar and strong demand from traditional export markets, particularly China.

- Communications: A coordinated and considered local response is needed to address significant but locally based efficiency issues, including funding the creation and ongoing maintenance of heavy-vehicle access to cotton gins.

- Ageing workforce, particularly in the mining and agricultural sectors.

- Industry’s reliance on water, water allocations and exposure to drought.

- Tradeability of water is restricted in NENW.

Strengths strengths cont.

- Round-bale-picking technology had caused a ‘revolutionary’ decrease or ‘step-change’ in the number of employees needed during cotton harvest.

- Public storage and private infrastructure (pumps and storages) systems are particularly important for irrigated cotton.

- Unique cotton landscape and high value-added industries : the region has traditionally been a moderately valuable feed stock for cattle feedlots locally within NENW.

- Australia’s only significant cottonseed crushing (crushing to produce oil, as opposed to stock-feed crushing) is in Narrabri.

- High levels of grower participation in applying research findings (extension implementation). Milling in Narrabri for export markets may also leverage considerable container logistics capability.

- Skilled strategy: Leading training opportunities for New South Wales growers. Also skilled workforce in agricultural production and manufacturing sectors.

Weaknesses

- Environmental sustainability:

- Export market exposed and heavily reliant on Vietnam and China: In 2019, prices were supported by a depreciated Australian dollar and strong demand from traditional export markets, particularly China.

- Communications: A coordinated and considered local response is needed to address significant but locally based efficiency issues, including funding the creation and ongoing maintenance of heavy-vehicle access to cotton gins.

- Ageing workforce, particularly in the mining and agricultural sectors.

- Industry’s reliance on water, water allocations and exposure to drought.

- Tradeability of water is restricted in NENW.

Results of Step 4: SWOT and TOWS

Opportunities

- Water-use efficiency (evidence of water use efficiency improvements), new resilient varieties, and infrastructure improvements to improve water availability for irrigation.

- Growth into new regions.

- Data-driven decisions to develop more specific actions around intensive agriculture.

- Better connect producer regions to port – new investments in infrastructure will increase connectivity and freight productivity.

- Freight, logistics and distribution – Inland Rail construction network will further support growth in the region. Inland Rail will provide the NENW region’s most productive agricultural product areas with increased transport competitiveness. This creates new opportunities for investment in export-focused, value-added manufacturing and intensive agriculture.

- Crude oil prices and environmental concerns support cotton production.

- Plant breeding, biotechnology, farming systems and assessments for disease resistance.

- Renewable energy: Secure, reliable access to water, capital and all necessary inputs.

- Biosecurity preparedness.

- Future-proof markets for Australian cotton and fewer threats to trade.

- Enhanced industry social license.

- Expanding Asian markets.

Opportunities cont.

- Enhanced industry social license.

- Expanding Asian markets.

- High-value uses for recycled cotton and participation in the circular economy.

- Growing recognition of cottonseed and cottonseed oil as export products.

Threats

- Access to research funding and expertise.

- Social licence.

- Biosecurity.

- Competitor regions and infrastructure priorities.

- Threats to irrigation water availability: Water security/ cost of water/water storage will be limiting factors in the development of agribusiness. Climate change, water availability, freight connectivity, water allocations and high water prices have already impacted producers.

- Conflict between the mining, agriculture and renewable energy sectors over land uses and land use compatibility.

- Competition from synthetic fibres.

- Interstate growers looking to invest.

- Weather extremes, diseases and pests.

- Rising energy costs.

- Environmental concerns: Cotton chemicals linked to leaf drop.

- Spray drift.

B.3 Dairy in Gippsland, Victoria

The SWOT for diary in Gippsland, Victoria is provided in Table B.3.

For this product and region, the key strengths are the presence of established concentrations, expertise and capability in the fields of research and development required to support innovation in dairy. There are also key strengths in the region’s connectivity to domestic and international markets, with reasonable road and rail access to Melbourne export hubs, Melbourne Airport, the Port of Melbourne and national highways. The region is endowed with natural advantages, including high and reliable rainfall, and is supported by effective regional irrigation systems, as well as access to a relatively high-quality and stable supply of inputs such as grains. The region has several established dairy processing plants, serviced by a relatively skilled and stable labour force, that are within close geographic proximity to farms.

For this product and region, mobile and digital connectivity is considered a weakness, with the region reporting blackspots, as are productivity and competitiveness constraints. While the region has a concentration of capital stock (including processing and manufacturing facilities), capital is ageing and requires renewal in the coming decade(s). The region’s population is also ageing, which has implications for the availability of labour in the future.

For this product and region, the anticipated substantial increase in the global demand for food presents a considerable opportunity for Gippsland’s food products, and in particular dairy. There are opportunities to improve the region’s digital connectivity and the freight and transport networks that service dairy, and enhance Gippsland’s profile as a value-added region that produces high-quality products demanded by discerning customers. The transition to a low-carbon economy could present growth opportunities for clean coal technologies, renewable energy and energy efficiency in dairy.

For this product and region, the uncertainties of government R&D/innovation funding and the effectiveness of structural adjustment policies and programs that aim to help the region transition to a low-carbon economy are threats.

There is ongoing land use conflict between the region’s dairy producers and peri-urban areas and vegetable sectors. Climate change threatens the industry, with high likelihood of more severe and unpredictable weather events. Dairy in Gippsland also faces ongoing price pressure in national and international markets, which could erode the industry’s profits and undermine its sustainability.

Based on the analysis provided in Table B.3, further analysis is undertaken using the TOWS technique (as shown below).

Using strengths to maximise opportunities

The Gippsland region has access to considerable R&D capabilities and concentrations. These concentrations could be leveraged to better understand the relationship between domestic and international customer preferences and the ability of the region to meet those preferences. This research will also cover the range of market access and social science research that explores consumer preferences for various value-added dairy products.

The presence of significant research capability also provides opportunities to explore how the region’s production facilities can transition to having a lower carbon footprint. In making this transition, the region’s research and translation facilities can transition to having a lower carbon footprint. In making this transition, the region’s research and translation facilities can be leveraged to help producers more effectively adopt new technologies and efficient production practices.

Using strengths to minimise threats

Gippsland’s natural endowments (which make it ideal for dairy) should be exploited to combat some impacts of climate change – namely drought. In 2013, the Macalister Irrigation District (MID) initiative provided for the modernisation of the MID by achieving about 12.3 gigalitres in water savings through more efficient management of the irrigation system and higher on-farm productivity.185 In 2019, the MID initiative (stage 2) was funded for another four years to complete its modernisation, taking total Victorian and Commonwealth government funding for both stages to $114.7 million. The upgrades and modernisation program has included channel upgrades, new pipeline, automated outlets, a balancing storage and reconfiguration of parts of the 100-year-old system.186 This project could be further extended in future years to drive the benefits of the MID to dairy producers.

Gippsland’s research concentrations and capacities should be mobilised to address issues related to declining industry profits experienced over the past two decades.

Using strengths to maximise opportunities

Improving weaknesses by taking advantage of opportunities

Improving the region’s digital connectivity and reliability will help address some operating constraints facing dairy. Improvements to this connectivity will be two-fold. First, additional investment in mobile and NBN infrastructure will be required to address local area blackspots. Recent announcements aimed at accelerating the rollout of the NBN in regional areas by the Commonwealth Government (to the value of $4.5 billion) should be used as leverage by industry to ensure the region is a priority for infrastructure delivery.187 Second, it will require support from the region’s educators to provide the education and training required to upskill an ageing workforce with the digital skills that will be required in the coming decade. This may require more coordination by industry to identify the digital skills required and the training options that are meaningful to individual businesses.

Minimising weaknesses to avoid threats

Dairy’s ( ageing) capital stock will require renewal to ensure it can produce the products demanded by national and international markets at competitive prices. This will require efficient and effective next-generation production and manufacturing facilities to be developed through a combination of private and government-led investment.

Gippsland’s digital connectivity is inadequate and constrains productivity and business competitiveness. The region has variable service quality across primary production areas, which must be addressed to help drive supply chain productivity and effectiveness.

Results of Step 3: SWOT and TOWS

Appendix B

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185 This

186 This

187 This

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### Table B.3 Dairy in Gippsland, Victoria – SWOT

#### Strengths
- Innovative and premium products, backed by world-class research, development, and extension (RD&E); Strong RD&E capabilities, particularly in dairy (National Centre for Dairy in Ellinbank). RD&E has played a role in improving the nutrition of pastures and feed used, as well as ongoing improvements to dairy cow genetics.
- Secure and sustainable natural advantages: Stable climate, high and reliable rainfall, particularly suited to livestock production, access to freshwater resources. The Gippsland region enjoys high and reliable rainfall, fertile soils, and the Macalister Irrigation District near Maffra.
- Skilled workforce in agricultural production and manufacturing sectors.
- Globally connected: Proximity to domestic and international markets through Melbourne, Melbourne Airport and Port of Melbourne. The Gippsland region has important economic connections and linkages to export ports in Melbourne and New South Wales.
- Well-established road and rail freight networks: The road freight transport network is a key link that connects major dairy processing centres at Leongatha, Korumburra and Maffra with distribution and export hubs in Melbourne.
- Major dairy processing plants: Concentration of agricultural production and capital in a region with access to diverse agricultural and service sub-supporting industries. Many top companies have a presence in the Victorian dairy industry, reaping the benefits of working with operations in the region.
- Strong export focus and a growing presence in large and emerging Asian markets.
- Victoria’s large dairy food manufacturing industry produces a wide and diverse range of products for domestic and export markets.
- Access to competitively priced grains.
- A quality-assured industry: Internationally recognised and transparently demonstrated food safety standards.
- Strong government and industry support.
- Victoria has several top universities teaching specialised courses in agriculture and food processing.
- Gippsland holds a competitive advantage in dairying due to productive soils and high and reliable rainfall. There is also a significant level of investment in land irrigation, dairy processing plants and infrastructure that in turn supports food manufacturing and value-adding within the region.

#### Weaknesses
- Mobile and digital connectivity is inadequate and constrains productivity and business competitiveness. Variable service quality across primary production areas.
- Employment in agriculture expected to continue to decline. Population expected to decline and workforce to age in rural areas.
- Reliance on Asian markets and supermarkets.
- Industry’s capital stock (i.e. on-farm production facilities) is ageing and requires significant upgrade and renewal. This further reduces the industry’s ability to generate profits and attract the investment required to remain nationally and internationally competitive.
- Shortage of access to skilled labour at all levels in the dairy supply chain and lack of widespread recognition of career pathways throughout the supply chain.
- Reduced water availability associated with the drought has pushed water prices to unforeseen highs that threaten dairy farm viability.
- Lack of cohesion by some industry groups and negativity within the industry.
- Poor image and a general lack of awareness and understanding of the industry’s significance and opportunities.
- IT blackspots limit advances in technology areas.

### Table B.3 Dairy in Gippsland, Victoria – SWOT cont.

#### Opportunities
- Digital connectivity: Improve digital connectivity through the Connecting Regional Communities Program and Mobile Blackspots Program.
- Transition to low-carbon economy could present growth opportunities for clean coal technologies, renewable energy and energy efficiency in dairy and agriculture.
- Improved freight networks that connect major dairy processing centres at Leongatha, Korumburra and Maffra with distribution and export hubs in Melbourne. This would improve connectivity with ports and other key domestic markets and extend the capability of local supply chains.
- Opportunity for further growth in the sector by growing the herd size and by attracting new capital or better using existing capital (i.e. use spare capacity within processing plants and leverage opportunities gained through additional water availability due to efficiencies created by modernisation of infrastructure).
- If the projected substantial increase in the global demand for food represents a considerable opportunity for Gippsland’s food products, and in particular dairy.
- Value-adding: The dairy sector provides opportunities for the region to realise its aims for value-adding in agribusiness. In addition, there is the potential to further enhance Gippsland’s profile as a food producer of state and national significance.
- Since 2004, there has been a trend of converting dairy land to horticulture, particularly for vegetable production.

#### Threats
- Uncertain funding for R&D and a decline in the levy base due to industry performance.
- Structural adjustment policies and support do not effectively transition energy industry workers to emerging industries (such as the services industries). This could result in higher unemployment across the region.
- Ongoing price pressure in national and international dairy markets increases input costs and makes industry unprofitable and therefore unsustainable.
- Land use conflicts: Agriculture, especially dairy farming in the peri-urban municipalities, is being threatened by urban expansion as productive farmland is sold for rural residential or low-density residential land (urban encroachment). Potential conflict between community attitudes and industry investment in intensive agriculture.
- Climate variability: Extreme weather events and climate change.
- Impact of climate change and associated policies on key industries (farming, forestry, and mining).
B.4 Mangos in the Northern Territory

The SWOT for mangos in the Northern Territory is provided in Table B.4.

For this product and region, the key strengths include the tropical climate and favourable growing conditions. The Northern Territory produces the first mangos of the Australian market, having about 12 weeks' advantage at the beginning of the season relative to other mango-producing regions. The market is also counter-seasonal with other global producers. Product, especially that grown closer to Darwin, has good access to an airport for domestic and international airfreight.

Further from the capital, there is a distinct regional and industry weakness in terms of access to infrastructure, and hence access to market becomes more problematic. Around Katherine, digital connectivity is very unreliable and often non-existent. Roads and other physical infrastructure are poor. Both mango-growing regions in the Northern Territory have a distinct weakness with respect to most infrastructure and essential services, including education and health services (refer Table 3.5).

Opportunities include better infrastructure and services, both at a regional and an industry level. For example, increased access to R&D in other related industries (horticulture) and internationally may have a lot to offer in terms of new varieties, biosecurity and other risk management. Considerable market access opportunities exist for mangos. Tight phytosanitary controls in importing countries require considerable negotiation and costly infrastructure (variable heat treatment). Increases in technology development will assist with this and with supply chain traceability. Opportunities also exist for new varieties, increased planting density and expanded plantations.

The mango industry in the Northern Territory suffers from threats that include access to labour and labour shortages exacerbated by the COVID-19 pandemic. Mangos is a labour-intensive industry, and although the region has a young and growing population, it is difficult to attract and retain quality seasonal labour. Climate change and weather-associated risks such as cyclone are threats, particularly for the Darwin region. Biosecurity (pest and disease) is an ongoing threat for many industries in the tropics (and other regions), and mangos are no exception. Lastly, the threat of competition from imports, as well as other domestic production regions, is real.

Based on the analysis provided in Table B.4, further analysis is undertaken using the TOWS technique (as shown below).

### Using strengths to maximise opportunities

Adoption of new technology can maximise the opportunity to improve supply chain traceability and access to international markets. This impact can be magnified by Northern Territory’s reputation for producing a high-quality and valued product that is in demand. A regional marketing and branding campaign can leverage this further – and there is the potential to tie it to other key industries in the Northern Territory, namely tourism, and capitalise on the region’s tropical location and aesthetic beauty.

### Using strengths to minimise threats

Adoption of new technology may encourage the provision of technical education opportunities in the region and make way for the younger and growing population to develop a career in orchard fruit and agriculture more broadly. A growing population can minimise the threat of losing labour to alternative industries such as mining or tourism. This would need to be supported by training and development of young people in the region. The Big Rivers region in particular is lacking in access to education facilities and other essential infrastructure key to developing a local workforce. Another major threat is the lack of seasonal labour due to COVID-19 border closures. One way to fill this gap would be to work comprehensively with the local population and offer incentives, including on-the-job training and other development opportunities.

### Improving weaknesses by taking advantage of opportunities

Better risk management (climate variability and biosecurity) can help build export markets, minimise seasonal variability and maximise access to markets. Adoption of technology, possibly supported by access to capital and training, will allow for lower costs and reduced reliance on labour. Application of R&D for other industries and international R&D will accelerate the development of new varieties better matched to the changing climate and that can resist pests and diseases. R&D also has the potential to find new and high-value uses for mango fruit waste, an ongoing issue for the industry.

### Minimising weaknesses to avoid threats

Improved communications and extension can help growers realise the benefit of R&D levies, reducing the loss of R&D investment and increasing the capability and capacity to adopt new technology and practices. Improved information on the need for labour, technological developments and essential infrastructure will also enable the industry to better advocate for their needs.

Developing reliable distribution networks can avoid the threat of imports by improving producers’ ability to get the product to market. Better roads and access to airports, as well as other essential infrastructure including communications infrastructure, will help the region access domestic and international markets.
Table B.4 Mangoes in the Northern Territory – SWOT

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Climate and favourable tropical conditions: Warm and humid coastal climate in the Darwin region. Cooler summers and warmer winters promote earlier mango flowering and fruit set, resulting in an earlier harvest than other regions.</td>
<td>• Mobile and digital connectivity is inadequate and constrains productivity and business competitiveness. Variable service quality across primary production areas.</td>
</tr>
<tr>
<td>• Growing conditions: Red, sandy soil during the dry, and humidity and monsoonal rain during the wet.</td>
<td>• Lack of skilled workforce and an ageing industry workforce.</td>
</tr>
<tr>
<td>• 50% market share: Mangoes are a commercially important crop in the Northern Territory, which produces about half of the national mango crop.</td>
<td>• Short growing period: Growing mango varieties that extend the harvesting period would boost sales.</td>
</tr>
<tr>
<td>• Early market access: Mango flowering in the Northern Territory is the earliest yearly flowering event of all mango-production regions in Australia, and mangoes from the Darwin region are the earliest fruit to reach the Australian market. This allows Darwin to avoid competition from northern Queensland and to also escape the onset of the wet during November, which can seriously affect fruit quality.</td>
<td>• Limited funds available for the R&amp;D and marketing requirements of the industry.</td>
</tr>
<tr>
<td>• Changing consumer opinions of the fruit from a luxury to a household staple: The Northern Territory is now not only the largest grower of mangoes in the country, but also of a consumer favourite.</td>
<td>• Extension services insufficient to cover the whole of the industry.</td>
</tr>
<tr>
<td>• Adoption of new technology: At a Darwin farm, new technology has been brought in to ensure high quality and transparency. Every mango has a barcode that can be scanned to identify who packed it and its condition when it was packed.</td>
<td>• Fragmented market and lack of coherent branding in export markets.</td>
</tr>
<tr>
<td>• Adoption of new varieties.</td>
<td>• Biosecurity: Lack of preparedness for exotic invasions.</td>
</tr>
<tr>
<td>• Australian varieties are unique in international markets as they are novel in nature.</td>
<td>• Roads and connectivity: Upgrades needed to improve mango quality and increase local industry productivity.</td>
</tr>
</tbody>
</table>

Table B.4 Mangoes in the Northern Territory – SWOT cont.

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Digital connectivity: Improve digital connectivity through the Connecting Regional Communities Program and Mobile Blackspots Program.</td>
<td>• Climate change: The ongoing sustainability of the mango industry in the Northern Territory will require on-farm adaptation actions from growers, including canopy management, transition to new cultivars, orchard relocation and orchard cooling practices.</td>
</tr>
<tr>
<td>• Building Australian mango exports: Secure more international markets in Asia, Europe and, most importantly, the United States. During the 2019-20 season, promotional programs were created in collaboration with exporters, importers and retailers in Singapore, Hong Kong, South Korea, New Zealand and the US. The Australian mango industry is looking to grow this volume as part of the Mango Strategic Investment Plan.</td>
<td>• Climate change: The Darwin growing region will be more vulnerable than Katherine and other regions.</td>
</tr>
<tr>
<td>• Biosecurity: Australian Mangoes (AMIA) will bring more regular information about pests and diseases to look out for on farm (e.g., mango leaf gall midge, black twig borer).</td>
<td>• Labour shortages/access to labour: Worker shortage “the real issue” has been antagonised by the COVID-19 pandemic.</td>
</tr>
<tr>
<td>• Marketing/branding: Promotion through media, influencers, consumers, events and social media.</td>
<td>• Change to the horticultural Award rate: The new rules were strongly opposed by farming groups when first flagged in 2018, with warnings that farms would be forced out of business.</td>
</tr>
<tr>
<td>• Using data in the supply chain: By constantly measuring how supply chains perform, we can identify areas where further work is needed to get the quality outcomes that the industry needs.</td>
<td>• Weather-related challenges and exposure to extreme weather events: “Bushfires and gusty winds over the last 72 hours have wiped out millions of dollars’ worth of mangoes in the Northern Territory”</td>
</tr>
<tr>
<td>• Improving supply chain traceability: Product identification that allows accurate traceability.</td>
<td>• New pests to manage as the changing climate allows species to change their ranges.</td>
</tr>
<tr>
<td>• High-density mango block plantations.</td>
<td>• Imports: Market displacement and biosecurity.</td>
</tr>
<tr>
<td>• Developing reliable distribution networks: export and domestic supply chain coordination; logistics; and unreliable temperature control during transit.</td>
<td>• Rising operational costs: Heat could hamper fruit transport and labour costs could increase as working conditions become more difficult.</td>
</tr>
<tr>
<td>• Tap into innovative R&amp;D in other industries and overseas.</td>
<td>• Value-add opportunities for waste</td>
</tr>
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</tr>
</tbody>
</table>
Results of Step 3: SWOT and TOWS

B.5 Wheat in Wheatbelt, Western Australia

The SWOT for wheat in the Western Australia Wheatbelt is provided in Table B.5.

For this product and region, the key strengths are that due to the dominance of agriculture in this region (the majority of which is exported), the infrastructure and access to markets have been developed to service the region, making freight costs competitive. Land is generally affordable and is suited to the production of wheat, oilseeds and other grains. The climatic conditions are relatively stable, enabling the region to produce consistent quality and supply needed to service the demands of the export market. The Western Australia Government is committed to supporting both the region and the industry in terms of provision of services and R&D investment.

The region and the industry’s key weaknesses include a need for further investment in strategic infrastructure, such as renewable energy infrastructure and digital connectivity. Farming conditions in Western Australia are different to those in eastern states, which makes application of R&D challenging. There is also considerable rainfall variability across the region, meaning productivity is not stable across the region. There is a lack of market diversity, with 95 per cent of the crop exported to Asia and the Middle East. Trade disruptions because of COVID-19 and changing global politics is a key risk.

Opportunities exist in terms of making better use of existing technologies and using new technologies, such as space-based technologies. Growers in the region are first adopters and are open to new technologies to improve production methods or reduce costs. This mentality and corresponding capability provide an opportunity to enhance R&D investment and innovation. There is considerable focus on value-adding of agricultural products – this has been further encouraged because of the COVID-19 pandemic. The Western Australia Government is investing in complementary infrastructure to encourage economic and industry diversification in the region. There is also potential for diversifying the types of grains and legumes produced, which would add to rather than compete with Australia’s wheat export offering.

The threats faced by the region and the industry are predominantly around climate change, biosecurity concerns, continued access to R&D and access to global markets.

Based on the analysis provided in Table B.5, further analysis is undertaken using the TOWS technique (as shown below).

Using strengths to maximise opportunities

Strong willingness to adopt new technologies will enable above-average uptake of space-based technologies, which are set to take cropping to the next frontier by allowing for precision cropping, variable rate fertiliser technology, intelligent watering systems, better use of chemicals, better biosecurity monitoring and yield monitoring. Benefits will include reduced input costs, better risk management and remote farming opportunities. Further, existing good systems and processes can be maximised both by space-based technologies and by using data and technology to drive better decisions in the face of risk and uncertainty.

Consistently building on the region’s reputation for high-quality product will maximise new market opportunities, enable diversification of markets and minimise the threat of low-cost international competition.

Using strengths to minimise threats

Being market leaders in innovation and technology will encourage increased and secure investment in research and build regional research capability. Developing partnerships with local institutions and leveraging opportunities in the private sector will assist with maximising this strength. Encouraging R&D and associated training in the region builds capability and leads to regional innovation.

Applying good risk management systems and processes to areas other than cropping can help to economically diversify the region, minimise the impacts of climate change and increase the resilience and adaptive capacity of regional farmers and communities in the Wheatbelt.

Improving weaknesses by taking advantage of opportunities

Connectivity issues will be minimised with space-based infrastructure, making technologies more readily accessible and available in the regional environment and reducing reliance on terrestrial systems.

Better biosecurity management can help build confidence for new export markets, as will minimising seasonal variability within the region.

Minimising weaknesses to avoid threats

Different farming conditions in Western Australia mean that local research investment and building on-the-ground capability is important to ensure that innovation and technology is fit for purpose. Further, better use of data and technology to inform climate change risks will aid better decision-making.

This requires improvements in digital connectivity, as this is currently inadequate and constrains productivity and business competitiveness. The region has variable service quality across primary production areas, which must be addressed to help drive efficiency along the supply chain.
Table B.5 Wheat in the Wheatbelt, Western Australia – SWOT

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Market leaders: World-leading producer of export products (grain, livestock and resources).</td>
<td>• Different farming conditions in Western Australia: Wide variations in the productivity of farms within each of these regions, primarily due to differences in the extent and reliability of rainfall.</td>
</tr>
<tr>
<td>• Consistency in supply and quality: World leader in the production of quality, safe and clean food-grade wheat.</td>
<td>• High reliance on the export market: Western Australia generates about 60 per cent of Australia’s total wheat production, with more than 95 per cent of this exported, predominantly to Asia and the Middle East.</td>
</tr>
<tr>
<td>• Government commitment to the region post COVID-19, including eConnected Grainbelt program to promote the availability of information and agtech tools across Western Australia’s grain industry that provide growers with tailored information, including on the weather, pests, and diseases.</td>
<td>• Ageing and vulnerable populations will increase demand for social services, and for associated services such as passenger transport, leisure and recreation, housing and accommodation, and early intervention programs.</td>
</tr>
<tr>
<td>• Significant affordable and available freehold land.</td>
<td>• Investment is required in strategic infrastructure, land development and housing, as these will underpin growth opportunities.</td>
</tr>
<tr>
<td>• Significant fundamental infrastructure (power, water, telecommunications, community).</td>
<td>• Large number of farms: Wheat production occurs across the Western Australia Wheatbelt on 4200 mostly family-run farms.</td>
</tr>
<tr>
<td>• Largest producer of alternative energy, generating more than 50% of the state’s renewable energy from wind farms.</td>
<td>• Government RD&amp;E support: DPIRD has a strong research, development and extension (RD&amp;E) focus on wheat production (investments right along the wheat value chain, from pre-breeding and agronomic research to variety development, through to past and disease management, grain quality assessment and export market intelligence).</td>
</tr>
<tr>
<td>• Developed transport network (road, rail, air).</td>
<td>• Western Australia’s dry harvesting environment results in many locations of equivalent distance from port, rates in Esperance, which also provide access to international and regional ports at Geraldton, Bunbury, Albany and Perth, enabling easy access to the Port of Fremantle of the Wheatbelt region. The region has well-developed transport links with major highways and rail routes to Perth, enabling easy access to the Port of Fremantle and regional ports at Geraldton, Busselton, Albany and Esperance, which also provide access to international export markets.</td>
</tr>
<tr>
<td>• Large number of farms: Wheat production occurs across the Western Australia Wheatbelt on 4200 mostly family-run farms.</td>
<td>• Relative climate reliability: Western Australia has the most reliable rainfall of any Australian state and receives the highest proportion of this during the growing season.</td>
</tr>
<tr>
<td>• Government RD&amp;E support: DPIRD has a strong research, development and extension (RD&amp;E) focus on wheat production (investments right along the wheat value chain, from pre-breeding and agronomic research to variety development, through to past and disease management, grain quality assessment and export market intelligence).</td>
<td>• Infrastructure connectivity (strategic road corridors). Rail freight is a significant feature of the Wheatbelt region. The region has well-developed transport links with major highways and rail routes to Perth, enabling easy access to the Port of Fremantle and regional ports at Geraldton, Busselton, Albany and Esperance, which also provide access to international export markets.</td>
</tr>
<tr>
<td>• Western Australia’s dry harvesting environment results in low moisture content and low risk of weather-damaged grain.</td>
<td>• Culture of resourcefulness and innovation.</td>
</tr>
<tr>
<td>• Relative climate reliability: Western Australia has the most reliable rainfall of any Australian state and receives the highest proportion of this during the growing season.</td>
<td>• Competitive freight rates: A comparison of freight rates in South Australia and Western Australia shows that, for many locations of equivalent distance from port, rates in South Australia are higher than in Western Australia.</td>
</tr>
</tbody>
</table>

Table B.5 Wheat in the Wheatbelt, Western Australia – SWOT cont.

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Space technology.</td>
<td>• Changing rainfall patterns, climate change and frost risk. These changes will be variable across the Wheatbelt (Avon) NRM region, providing both challenges and opportunities for the farming community.</td>
</tr>
<tr>
<td>• New markets: Growing markets in Asia important for future growth.</td>
<td>• Reduced research funding and expertise.</td>
</tr>
<tr>
<td>• Leveraging industry diversification: The Wheatbelt economy is diversifying, with strong mining and mineral processing, along with retail trade, construction and fisheries outputs also supporting the economy.</td>
<td>• International competition and lower-cost producers, e.g. Indonesian trade partnership has recently come under pressure from increased competition from low-cost producers such as those in the Black Sea region.</td>
</tr>
<tr>
<td>• Economic diversification: Key infrastructure and planning initiatives, including the Mucuha Employment Node and the Indian Ocean Drive Guidelines, reflect a diversifying economic sector, shifting towards value-adding of primary industries, tourism and freight and logistic sectors.</td>
<td>• Seasonal variability.</td>
</tr>
<tr>
<td>• Expansion of irrigated horticulture and value-adding of horticultural products for sale in the metropolitan market and for export.</td>
<td>• Climate change/southwest grain-growing region of Western Australia also being acknowledged as subject to a drying and warming trend in its climate. Given the changing climate, it seems likely there will be a decrease in wheat yield in Western Australia without continuous improvement in crop genetics and agronomic practice.</td>
</tr>
<tr>
<td>• Diversification: Continuing diversification into new crops and products (some may combat climate change).</td>
<td>• Crop area decline.</td>
</tr>
</tbody>
</table>

Appendix
Results of Step 3: SWOT and TOWS

B.6 Wine in South East, South Australia

The SWOT for wine in this region is provided in Table B.6.

For this product and region, the key strengths are quality, brand and image. The industry can introduce new varieties, and it has a reputation for excellent quality-assurance standards. It has a very favourable domestic and, most importantly, international presence, and renowned iconic brand names. On the production side, there is a diversity of soils and climates that enable different grape varieties to be grown, and access to a skilled workforce. The industry also has a well-established wine tourism focus and is a leader in environmental sustainability.

Weaknesses include slow adoption of innovation and technology by some producers, reliance on chemicals and pesticides, reliance on a small number of markets, risk management due to the large number of producers, shortages of skilled workers and difficulties attracting young people into the industry. Transport is an ongoing challenge and inefficient policy, legislation and regulation weigh on the industry.

There are several opportunities for the industry. They include new traceability technologies, reduced waste and carbon emissions, the possibility of new markets, and better risk management, e.g. in the use of water.

Threats include IP theft, biosecurity, Australia’s relationship with China, high energy, labour and water costs, availability of water, and climate change.

Based on the analysis provided in Table B.6, further analysis is undertaken using the TOWS technique (as shown below).

Using strengths to maximise opportunities

The brand, quality and production strength of the industry can be used to introduce new varieties and penetrate new markets, notwithstanding competition from other producers. Skilled labour and research capabilities, which the industry has access to, can be used to implement new technologies and provide leadership on climate and sustainability. This will assist both production and marketing.

Using strengths to minimise threats

These strengths can also be used defensively – to protect positions in established markets against lower-cost producers and in response to political-cum-trade threats. They can also be used to adapt to climate change and its effect on soils, diseases and water availability.

Improving weaknesses by taking advantage of opportunities

The difficulty in attracting younger people to the industry could be improved by adoption of more technology and more leadership on climate and sustainability. This would make the industry more attractive for young people for whom environmental issues are front of mind and for whom digital technology is integral to their lives.

Minimising weaknesses to avoid threats

Faster adoption of technologies, especially labour-saving technologies, could offset the high cost of labour. Penetration of new markets will de-risk the political risk in major markets (China). Improving transport links (with the support of government) will help make the industry more cost competitive.
### Table B.6 Wine in South East, South Australia – SWOT

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Ability to introduce new varieties.</td>
<td>• Slow adoption of innovation and technology by some producers.</td>
</tr>
<tr>
<td>• Access to skilled workforce.</td>
<td>• Reliance on chemicals and pesticides.</td>
</tr>
<tr>
<td>• High-quality reputation: South Australia’s reputation for excellent quality-assurance standards.</td>
<td>• Reliance on a small number of markets.</td>
</tr>
<tr>
<td>• High domestic and international market presence: The South Eastern Australia wine region is the engine that drives the Australian wine industry. South Australia exports its premium wines to more than 100 countries, including major markets (China, UK, US, Canada). Adelaide has joined an exclusive group of Great Wine Capitals – an internationally renowned network of which membership will strengthen our global reputation for premium food and wine tourism.</td>
<td>• Risk management due to the large number of producers.</td>
</tr>
<tr>
<td>• Renowned names and regions, and a large network: Brand, quality, scale, diversity. Iconic wines and biosecurity standards. Penfolds Grange, the Barossa Valley, Peter Lehmann, Wolf Blass – the list goes on. These special wines, signature sites and larger-than-life characters are synonymous with a vibrant industry that continues to make the world take notice.</td>
<td>• Ageing workforce, inability to attract young people to a career in the industry and shrinking pool of people willing to take on industry roles.</td>
</tr>
<tr>
<td>• Framework for addressing risk management exists.</td>
<td>• Transport: The wine industry is experiencing multiple challenges in terms of transport – upgrades, access to staff, regulations.</td>
</tr>
<tr>
<td>• Diversity of soils and climates that provide a perfect platform for excellence and innovation. The Mediterranean climate has helped winemakers successfully embrace Spanish and Italian varieties.</td>
<td>• Inefficient policy, legislation and regulation: Governance and industry policies and practices have developed over time, and have had a negative impact on efficiency and productivity.</td>
</tr>
<tr>
<td>• Prestige: ‘Her’ varieties such as Penfolds Grange.</td>
<td>• Leadership/promotion/influencers: Eight of 13 individuals to receive the Maurice O’Shea Award are from South Australia. The award is recognised as the highest honour the industry can confer on one of its members.</td>
</tr>
<tr>
<td>• Focus on sustainability.</td>
<td></td>
</tr>
</tbody>
</table>
There is some evidence as seen in both the PC and the CSIRO report that the sustainability of the sector and/or region is an important factor in the decision to remain or move. The AICD study found that the decision to remain in a region is influenced by the presence of the availability of other industries, the accessibility to markets, and the presence of other businesses in the same industry.

The ACT is excluded as it has little or no agriculture, forestry or fishing industry.


The NT horticultural sector is predominantly made up of small businesses, with farms of different sizes spread throughout the region.


The NT horticultural sector is the largest in the Northern Territory, accounting for 40% of the total agricultural production in the region.


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