Growing Greater Whitsunday Agribusiness

Report for Stage 1
'Planting the Seed'

Regional Development Australia
MACKAY-ISAAC-WHITSUNDAY QLD

ISAAC REGION

Mackay Regional Council

Whitsunday Regional Council

Queensland Government

GW3D
GREATER WHITSUNDAY ALLIANCE
MACKAY ▶ ISAAC ▶ WHITSUNDAY

Contents

Executive Summary

Report compiled by:

Helen Newell
Project Coordinator
Growing Greater Whitsunday Agrifood (GGWA)

Executive Summary

The Mackay-Isaac-Whitsunday economy is currently underpinned by our heritage industries and raw export of primary resources, services and products via the mining, agriculture and tourism sectors.

The aspiration is to create a regional economy that is robust and diversified, and able to minimise the cyclical impacts on our traditional resource based export industries. The ability exists to capitalise on current heritage industry exports, while at the same time creating new services and products within heritage, and new industries based around respective sector knowledge and innovations.

Agriculture and food, and the aligned support services, play a critical role in sustaining our regional economy and also help to feed and educate the world by producing and exporting a diverse range of quality food products, commodities, knowledge, and innovation via transformative products and services.

The Mackay-Isaac-Whitsunday (MIW) Agricultural Overview (2016) provides a snapshot of the MIW region's agricultural sector which contributed a gross value of close to $1.393billion to the Queensland and Australian economies. This overview highlights that with the "proximity to the burgeoning Asian market, equable climate, fertile soils and current agricultural supply chain infrastructure, we (MIW) are well positioned to grow agricultural production in the region and increase our ability to value-add".

It also calls for a group to investigate opportunities and develop a MIW Agriculture Infrastructure and Policy Plan to provide the framework for the MIW agricultural industry to reach its potential in coming years.

In response, the Growing Greater Whitsunday Agribusiness (GGWA) initiative was launched in late 2016 and a steering committee formed to provide thought leadership to develop and implement planning to support growth and development of the MIW agribusiness sector.

GGWA aims to deliver economic benefit by increasing the productivity, profitability and sustainability of the agribusiness sector, with a particular focus on value-add opportunities.

This report for Stage 1: 'Planting the Seed' provides background on the GGWA initiative and an overview of opportunities identified during industry and stakeholder engagement to grow the agribusiness sector in the MIW region, during three project stages and three time horizons.

During Stage 1, over 250 stakeholders were engaged across the agribusiness value chain to identify opportunities for growing the agribusiness sector.

Stakeholders welcomed the GGWA initiative, with many commenting that "the time was right", highlighting that growing the agribusiness sector strengthens the diversity of the MIW region and acts as a buffer to mitigate the economic impact of job losses, such as those lost during the mining downturn. Stakeholders also recognised that the aims of GGWA are closely aligned with the development of Northern Australia initiatives and the Queensland Government's commitment via the Advance Queensland initiative to develop 10-year road maps for key sectors, including biofutures and agriculture RD&E.

Opportunities identified by industry and other stakeholders were prioritised using a framework focused on three strategy areas: **planning**, **infrastructure** and **marketing**. These priorities provide a foundation for further investigation and implementation during Stage 2 – **'Cultivating Opportunity'**.

Many of the industry sectors and growth enablers below are interconnected, highlighting that growth or decline in one is likely to impact on others. For example, an increase in chickpeas grown as complementary crops by sugarcane farmers may boost quantities available to meet the increasing demand for exports and add further benefits across the value chain, including: sustainability by improving soil health and generating new income streams, whilst boosting demand for transport and logistics services (e.g. road and port).

Industry Sectors:

1. Aquaculture
2. Beef & Livestock
3. Biofutures
4. Cropping - Broadacre
5. Horticulture
6. Sugar

Growth Enablers:

A. Agritourism
B. Branding
C. Exports
D. Investment Attraction
E. Planning – Regional & Business
F. Sustainability
G. Technology & Innovation
H. Transport & Logistics
I. Water Security
J. Workforce

1. Global Trends

Diagram 1 highlights a range of opportunities emerging in the MIW region in response to global mega-trends, including the global food challenge of feeding nine billion people by 2040 and our close proximity to Asia with its growing middle class and increasing demands by consumers for clean, green, safe, healthy and sustainable products.

Common themes and key messages that emerged during stakeholder engagement have been captured in the GGWA Action Plan (Appendix 2), including the need to:

- **Continue to forge strong regional leadership** to strengthen advocacy and increase cross-sector collaboration to drive increased investment in enabling infrastructure, e.g. water infrastructure to meet the demands of industry (mining, agriculture and other) as well as community and provide the best regional solutions and return on investment.
- **Increase the profile of the 'Greater Whitsunday' regional brand** to leverage provenance, creating a strong food culture and demand for local products by locals, tourists and the broader population and increasing the MIW region's reputation for liveability and 'experiential tourism'. This brand may also attract investment by promoting sustainability achieved by adopting leading edge practices on-farm.
- **Become known as the 'delicatessen of Asia',** exporting high value products to Asia rather than be the 'food bowl of Asia', focused on volume and commodities.
- **Create new value-added products** by turning waste into value by harnessing innovation and connecting the problem with solutions, e.g. turning tomato waste into bio-actives for health benefits.
- **Develop new markets and demand for value-added products**, e.g. branded beef and processed fruit and vegetables, and developing regional stories about our farmers and connecting consumers to the people behind where their food comes from.
- **Increase organic production**, e.g. beef, fruit and vegetables, using sustainable farming practices backed by leading edge innovation and technology; creating new opportunities or 'jobs of the future' to attract and retain young people in the region.

This report for Stage 1 – 'Planting the Seed' is the catalyst for growth during Stage 2 – 'Cultivating Opportunity' and Stage 3 – 'Harvesting Success', by providing a GGWA Action Plan to deliver projects aimed at higher returns across the value chain in the short, medium and long term. It is not intended to be a technical profile for each industry but rather links the groundwork set by the Mackay-Isaac-Whitsunday Agricultural Overview to an Action Plan capturing projects identified by industry stakeholders to grow the sector. The projects are aimed at delivering economic value to the MIW region through job creation, regional branding, increased exports, investment attraction and better use and development of enabling infrastructure including roads, rail, airports and water.

The burgeoning support from the Greater Whitsunday Alliance (GW3) during Stage 1 highlighted the importance of 'connecting the dots' to ensure that the interconnectedness of projects across industry sectors, growth enablers and regional areas are leveraged to optimise benefits. GW3's mandate to work with all levels of government, engaging and collaborating across industries and other regions, is considered essential for delivering economic benefits for the agribusiness sector during Stage 2 and 3 of the GGWA initiative.

Stage 2: 'Cultivating Opportunity' calls for the development of Ten-Year Roadmaps and Action Plans for each industry sector to consolidate key information and continue stakeholder engagement to ensure that opportunities identified are industry led.

Stage 3: 'Harvesting Success' recognises that a number of growth opportunities for industry sectors rely on development or improvements in infrastructure or other growth enablers. The GGWA Overview diagram demonstrates that although growth in the sector may not be quantified until Horizon 3, the Regional Strategy Areas, Planning, Infrastructure and Marketing provide the framework underpinning this long term growth.

Diagram 1: Global Trends - Opportunities to Grow Greater Whitsunday Agribusiness

GLOBAL TRENDS

- Population growth - 9B by 2040
- Food security
- Demand to double food production by 2040
- Climate and environmental concerns and active agribusiness policy and programs
- Burgeoning Asian middle class
- Consumer demands for safe, healthy, convenient and sustainable food

AUSTRALIA & QUEENSLAND

- Clean and green reputation
- Developing Northern Australia
- Asia on our doorstep
- FTAs - China, Japan, Korea
- Mining to dining boom
- Agribusiness research: global trends
- Advance Queensland initiatives: Ten Year Road Maps: Biofutures and Agrifood RD&E
- Focus on knowledge-based jobs of the future

GROWING GREATER WHITSUNDAY AGRIBUSINESS (GGWA)

- Tourism: international and domestic to Great Barrier Reef
- Regional branding: e.g. Greater Whitsunday Food Network (GWFN)
- Regional leadership, talent and collaboration
- Connectivity in region - people, resources and knowledge
- Regional success stories
- Innovation is in the DNA of business and community
- Leverage METS sector relationships, e.g. India
- Seasonal advantage: tomatoes and winter veggies, chickpeas to India
- Infrastructure - underdeveloped capacity: ports, rail, air
- Value chain opportunities to value-add
- Biofutures - burgeoning global reputation
- Foreign investment in tourism and mining - can it be leveraged?
- Diversification of regional economy

2. SWOT Analysis

The SWOT analysis in Diagram 2 highlights the strengths, weaknesses, opportunities and threats for the agribusiness sector; highlighting challenges to overcome to grow the agribusiness sector in the MIW region.

Diagram 2: SWOT Analysis: Mackay-Isaac-Whitsunday Region

Strengths

- Geographical size of region: 90,125 square kms is small enough to link people, services, resources and knowledge
- Regional leadership and collaboration: regional bodies – industry peak bodies, local government, State and Commonwealth agencies and regional and local economic development groups and others working together and with all levels of government and across industry sectors, to drive economic development
- Diversity: climate, rainfall patterns and soil types that sustain a wide range of agribusiness products
- Developing Northern Australia initiatives: NAIF funding, CRC for Northern Australia
- Burgeoning 'Greater Whitsunday' regional brand and food tourism: provenance and stories about farmers shared via GWFN, farm tours, food trails and social media
- Reputation for quality products: e.g. Signature Beef exported to ~ 30 countries; 'Bowen' mangoes and tomatoes
- Biofutures: reputation of Mackay and wider region now attracting global interest and investment
- Increasing adoption of technology, innovation and best practice, e.g. Project Catalyst (sugar) and reef management
- Expertise in sustainable farming practice for water quality and reef management
- Regional councils looking at innovative solutions for land use to enable agricultural production

Weaknesses

- Distance from distribution centres and high value markets (domestic and international)
- Water security, e.g. for horticulture in Bowen
- Lack of 'shovel ready' projects to take advantage of NAIF funding ($5 billion in concessional loans)
- Resistance to adopting technology and innovation, e.g. costs high for small scale farms with low profitability
- High entry costs of owning a farm is barrier for new entrants
- 'Green tape' can be disincentive for investment
- Capacity of farmers/producers to export: consistent supply, business skills, finance, market development and access
- Climate change, variable weather patterns and drought, increasing risk and costs of production
- Biosecurity and impacts on some export products and locations, e.g. white spot, fruit fly
- Increasing foreign ownership of agricultural assets for food security
- Decline in resource sector activity – increase in unemployment with skilled workforce leaving the region
- Natural disasters: damage to crops and on-farm infrastructure with flooding of roads preventing access to markets

Diagram 2: SWOT Analysis: Mackay-Isaac-Whitsunday Region

Opportunities

- Global food challenge and growing interest from Asia, Europe, Canada and USA for co-investment in Australian agriculture
- Increasing global demand for protein, expanding opportunities for exporting: aquaculture and beef
- Global interest in Australia's traceability and food safety systems: opportunity to use our science to build relationships and educate consumers about our product differentiation
- Global demand by consumers for sustainable food production and environmental protection, using practices developed in Australia
- Increasing domestic market demand for: aquaculture, organic products (beef, horticulture, grain)
- Global desired access to agribusiness (production and processing) knowledge, skills and expertise

Threats

- Global food challenge, food security and level of foreign investment in agricultural land and other assets
- Global food trends – focus on 'food miles' and carbon footprint being a driving force behind 'buy local' campaigns
- Climate change and other environmental factors, e.g. water quality and reef management, challenging sustainability of food production
- Food safety and biosecurity, e.g. white spot in aquaculture
- Consumer awareness increasing demand for products that demonstrate high standards of: animal welfare, environmental and sustainable production
- Licence to operate: environmental protection of the Great Barrier Reef
- Digital disruption
- Lack for vision and focus toward innovation from sector groups to explore opportunities – a focus toward the here and now issues
- Lack of trust from rural sector toward those entities able to support and help transition the agribusiness sector to a new way of doing business that is able to leverage from current strengths and find solutions toward current weakness

3. MACKAY-ISAAC-WHITSUNDAY REGION-OVERVIEW

Global trends, identified in Diagram 1, are shaping agriculture and rural communities across the globe.

Global changes in market conditions, advancements in technology, new environmental pressures and consumer demands will continue to impact the future of agriculture and rural communities, including the MIW region. MIW has a reputation for innovation, particularly in the mining equipment, technology and services Sector (METS), where it is seen as a global leader and hub for innovation. The Agribusiness sector can leverage the lessons learnt and international relationships forged by the METS sector to grow agriculture production, skills, products, services and resources in the region.

The MIW region is a highly productive region with a diversity of products and relatively small geographical area (90,125 square kms), facilitating good connection between people, resources and infrastructure to leverage new products and services, growth of current sectors and development of skills and jobs. MIW is a region undergoing continual change where providing opportunities for agriculture in regard to produce, knowledge and skills export both domestically and internationally could support a reinvigorated agribusiness future.

Several studies and reports were analysed during Stage 1 of the GGWA project, highlighting opportunities for the agricultural industry in the MIW region. The Rural Futures Strategy (2012) was of particular interest, involving several stakeholders engaged during the GGWA project.

"The objective of the Rural Futures Project was to develop a Rural Futures Statement articulating the importance of rural communities as strong and viable sustainable economies, and their contribution to the health, character, livability and wealth of the region.

The project identified the MIW region as one of high capacity and skill, borne of its historical roots as an agricultural economy.... The region also already exhibits several examples of innovative and sustainable practices, and these could provide a basis for an innovation network, designed to boost rural industries' profitability, productivity, and export potential."

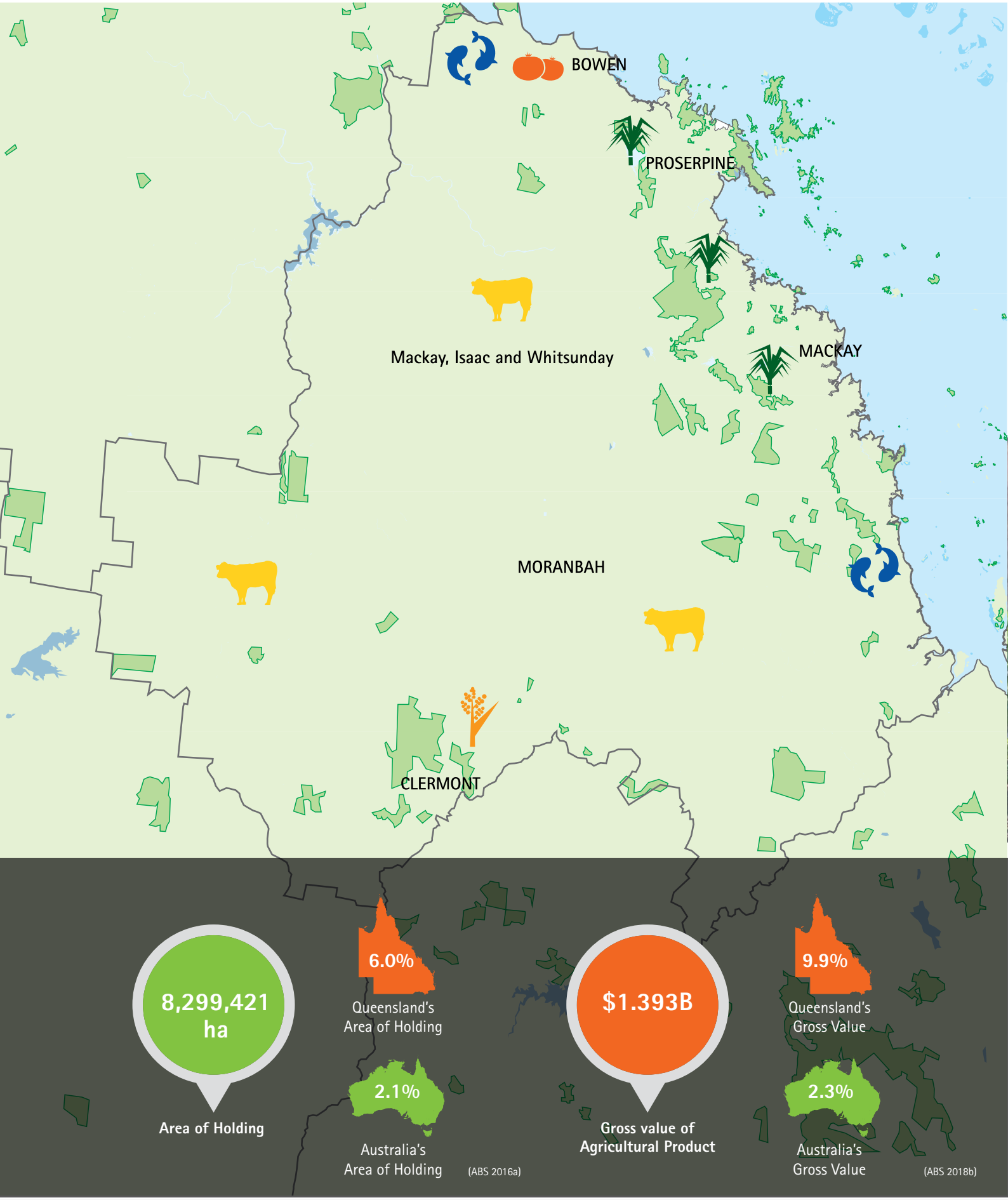
ABARES reports that in 2017/18 the gross value of agricultural production in the Mackay region was $1.39 billion, which was 10 per cent of the total gross value of the agricultural production in Queensland ($14.01 billion) across 6.02% of Queensland's land holdings. The MIW region has a diverse agricultural sector. The most common commodities in the region based on the gross value of agricultural production were livestock ($615 million), followed by sugarcane ($460 million), vegetables ($193 million) and pulse crops ($74 million). These commodities contributed almost 91 per cent of the total value of agricultural production in the region.

The GGWA project has identified six priority industry sectors for potential economic growth through new development, value adding, exports, investment attraction and job creation, including: Aquaculture, Beef/Livestock, Biofutures, Cropping - Broadacre (excluding sugar), Horticulture and Sugar. An overview of opportunities identified for each industry sector are listed in Section 4 followed by details of each key Growth Enabler that underpin this growth in Section 5.

Summary	Gross Value ($AUD)	% MIW Gross Value
Livestock	$615,188,990	44.2
Livestock Products	$4,127,505	0.3
Hay and Silage	$1,394,701	0.1
Total Livestock Related	**$620,711,196**	**44.6**
Sugarcane – cut for crushing	$460,627,582	33.1
Other Pulses	$73,793,825	5.3
Sorghum for Grain	$13,209,183	1
Wheat for Grain	$11,399,373	0.8
Other	$5,244,843	0.4
Total Broadacre Crops	**$564,274,806**	**40.5**
Vegetables	$193,360,918	13.9
Fruit and Nuts	$5,183,331	0.4
Total Horticulture	**$198,544,249**	**14.3**
Nurseries, Cut Flowers, Turf	$9,297,376	0.7
Total	**$1,392,827,627**	**100**

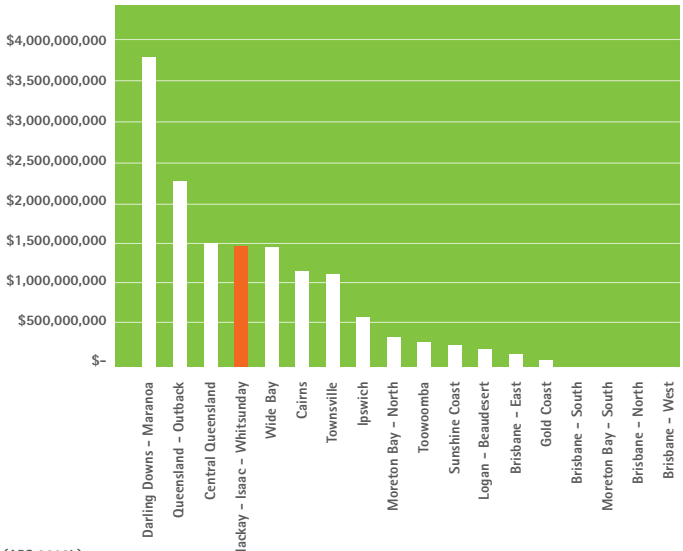
MIW – Value of agricultural production (Source: ABARES About my Region – Mackay 2018)

MIW Agriculture - At a Glance

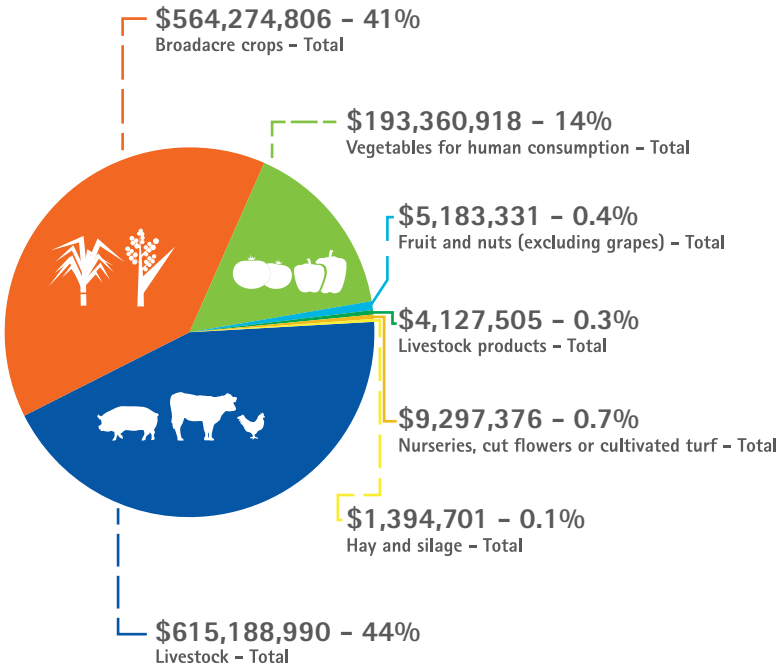


MIW Agriculture - Gross Value

The MIW region is the fourth ranked region in Queensland in relation to gross value of agriculture production.



(ABS 2018b)



Beef Cattle & Calves – $613m

5.1%

of Australia's beef cattle and calves

Sugar Cane – $461m

28.4%

of Australia's sugar cane

Sorghum – $13m

5.6%

of Australia's sorghum

Tomatoes – $109m

24.1%

of Australia's fresh market tomatoes

Other Pulses – $74m

2.7%

of Australia's other pulses

Capsicum – $32m

26.2%

of Australia's capsicum

Beans – $14m

7.6%

of Australia's beans

Mangoes – $5m

3.6%

of Australia's mangoes

Sweet Corn – $9m

6.1%

of Australia's sweet corn

Pumpkins – $3.9m

5.1%

of Australia's pumpkins

(ABS 2018b)

Demographics

The Agriculture, Forestry and Fishing industry employs 4672 workers across the MIW region or 5.49% of the region's workforce.

(Mackay regional Council 2018)

A large portion of farming business in the MIW region are family based businesses with only 24.23% of MIW farm businesses employing permanent or ongoing staff. This increases slightly to 33.16% when we talk about MIW farm businesses that employ short-term or seasonal staff.

(ABS 2015)

The farming population across MIW is an ageing one with the average age of farmers being 57 years (in line with the national average) and with this ageing population comes experience highlighted by the fact that the average MIW farmer has been involved in farming for 38 years.

(ABS 2018a)

MIW farmers source 85% of their income via agricultural production on their holding, with 11% from off-farm employment or business activities. The on-farm income percentage in MIW is in line with the national and state averages.

(ABS 2018a)

4. Industry Sectors – Priorities for GGWA

4.1 Aquaculture

Global context:

The Federal Government's report "Scaling Up – Inquiry into Opportunities for Expanding Aquaculture in Northern Australia" (Feb. 2016) noted:

> There is an increasing global demand for seafood as a source of high-quality protein. Globally, countries are turning towards aquaculture to meet seafood protein demand as reliance on wild-caught fisheries cannot meet this demand. The aquaculture industry has increased its share of the total global food fish supply from 9% in 1980 to 48% in 2011.

Australian and Queensland context:

> The 'Scaling Up' report highlights that "Northern Australia has a natural advantage for aquaculture production with a long coastline, pristine waters, the availability of suitable land, and its proximity to Asia. This, in addition to boasting a tropical climate, which encourages high aquaculture growth rates and the natural occurrence of a number of tropical species found in Northern Australia."

> In Australia, aquaculture production is increasing as seafood demand increases. Most seafood that Australians consume is imported and this provides local producers with a significant opportunity and challenge to increase market share through import replacement.

> Biosecurity is a risk to the industry and currently consumes significant resources, e.g. white spot. Access to appropriate pest and disease diagnosis facilities was highlighted in the 'Scaling Up' report.

> The 'Scaling Up' report uses the Guthalungra Prawn Farm as a case study, noting that the regulatory processes took 14 years, costing approximately $3 million. The report also highlights the need to review these processes to increase commercial viability.

> A recent EIS process undertaken by sea farms for a development in the Northern Territory indicates that a two-year process is now achievable. (Refer presentation by sea farms at Developing Northern Australia Conference, June 2017)

> In 2018/19, the Queensland Government identified land-based marine aquaculture development areas (ADAs) to promote and grow a sustainable aquaculture industry in Queensland. ADAs are in coastal areas where marine species can be cultivated in earthen ponds that require access to seawater. This is often referred to as 'land-based marine aquaculture.' ADAs help protect areas with the potential for land-based marine aquaculture development and provide investors with a list of areas for aquaculture development. Investors aren't limited to ADAs and may explore other areas of Queensland for land-based marine aquaculture development. In total, the MIW region has 2442 ha of ADA identified area. https://www.business.qld.gov.au/industries/farms-fishing-forestry/fisheries/aquaculture/site-selection-production/development-areas/investment

> In 2019, both Pacific Reef Fisheries and Tassals commenced expansion of aquaculture operations within the MIW region.

MIW industry overview:

The MIW region is also well suited to aquaculture, with a large area of undeveloped coastal land and significant coastal transport infrastructure. The MIW region currently produces 1,471 tonnes of aquaculture product on 89ha of ponded area, which gives a yield of 16.53 tonnes per hectare. This is the second highest yield in the state and is almost two times the state average. The total aquaculture production value in the MIW region is $20.9 million. The predominant aquaculture product in MIW is prawns.

Production, ponded area and employment - Queensland Aquaculture Industry (2013-2014)

Statistical Division	Production (tonnes)	Ponded Area (ha)	Employment (FTE)	Yield (tonnes per ha)	$ per ha
MIW	1471	89	80.4	16.38	234,832
Total Qld	7869.10	796	534	9.89	150,395
Ranking (out of 12 regions)	3	4	3	2	2
% Qld	18.69%	11.18%	15.06%	167.14%	156.14%

The MIW region is home to several aquaculture facilities including Australian Prawn Farms, who operate a 33ha prawn farm at Ilbilbie. The business supplies 350 tonnes of prawns to the Australian market annually. A new 259ha aquaculture facility has been approved for Guthalungara by Pacific Reef Fisheries, which is expected to generate revenue of approximately $50 million per annum and employ approximately 100 full-time and 100 seasonal employees, and Tassals have purchased a prawn aquaculture facility near Proserpine.

MIW opportunities:

> Aquaculture production occurs throughout the region, with the major concentrations in the Whitsunday region, coastal area south of Sarina and at Ilbilbie in the Isaac region. Major products produced in the region are prawns and barramundi, with potential to expand.

> In response to the 'Scaling Up' report, DAF completed an analysis of land areas considered suitable for Aquaculture development across Queensland considering various land use overlays to identify areas suitable. This report has supported the development of ADA's across Queensland

> As the industry matures it is expected that industry will lead development of supporting infrastructure such as hatcheries, feed mills and fish processing facilities needed as the aquaculture industry expands. Associated with this development is the link to STEM research and water management innovation which in turn creates opportunity for value-add industries and products.

> FTAs with North Asian trading partners provide opportunities for seafood exporters as 'tariffs of up to 20% on seafood will be eliminated.

GGWA recommendations to support strategy focus areas	Planning	Infrastructure	Marketing
1.1 Develop a ten Year Regional Roadmap and Action Plan (RRAP) – Aquaculture, including: regional strategy area priorities for planning, infrastructure and marketing.	> Stakeholder Engagement > Land Use > Biosecurity Strategy > Industry Development > Investment Attraction > R&D partnerships	> Water > Road Access > Air Freight > Cool Chain Logistics > Containerised Port Options > Energy (Power Needs)	> Domestic and International Markets > Market Access for Exports > Investment Proposals
1.2 Deliver an industry engagement forum to consult with industry about: > Opportunities highlighted in the Federal Government's 'Scaling Up' report to grow the industry; > Opportunities associated with Queensland Government ADA's and development of aquaculture industry and > Current RD&E strategy and priorities			

4.2 Beef & Livestock

Global context:

> Globally, Australia's beef industry is seen as 'clean and green' with our traceability systems enhancing food safety and trust in products sourced from Australia. Australia's major markets are: USA, Japan (JAEPA 2015), Korea (KAFTA 2015) and China (ChAFTA 2015).

> China has emerged as a major beef market in recent years. China's challenge is to feed 22% of the world's population with only 7% of its farmland and 6% of its water resources. Constrained also by environmental and supply chain issues, China will continue to import a significant proportion of the beef it consumes. Chinese consumers see Australian beef as being safely produced, with consistent quality standards and superior taste and nutritional value. Under the China Australia Free Trade Agreement (ChAFTA) signed in 2015, Australia will pay zero tariff by 2024.

Australian and Queensland context:

> Increasing amalgamation of farms from family owned to large scale corporates.

> Increasing demands by consumers for clean, green, healthy, sustainable and ethically produced food.

> Changes in marketing to meet consumer demand for information, including the "stories" behind how and where their food has been produced.

> Increasing use of technology on farm, e.g. remote sensing, drones, genetics.

> The Australian Organic Market Report (2018) highlights the increasing growth of organic pastoralist where in 2018, 4028 operations and 1998 certified producers were recorded while a growth of 23% in organics processors and handlers was recorded as compared to 2016 numbers. All this backed by the increasing consumer demand for organic beef.

> Cattle processing is forecast to drop by 3% to 7.6 million head in 2019 due to dry conditions nationally - this is likely to see the national herd numbers fall to their lowest since mid-1990's.

> Coming into 2019, many producers had depleted feed stock piles. Carcass weights are expected to drop due to a higher proportion of female cattle being sent to processing.

> Low Australian dollar in 2019 coupled with positive shifts in demand for Australian beef are likely in 2019, however increased competition from US and Brazil will see competition ramp up.

> Live cattle exports are forecast to decline in 2019 due to contraction of the northern herd numbers and high cost of Australian cattle to key markets in Indonesia and Vietnam.

MIW industry overview:

There are approximately 1021 beef cattle operations in MIW running predominantly Brahman and Brahman cross breeds. Beef cattle operations stretch from the coast to the west of the region, with several larger graziers situated over the range. A number of feedlots can be found within the region and the beef cattle industry is currently the largest agriculture income producer in the MIW region.

The beef cattle industry generates $613 million of gross value for the MIW region, which represents 11% of Queensland's beef industry. Livestock are generally trucked by road to saleyards and abattoirs with beef used in domestic and export markets. The region is home to one large meat processing facility (Thomas Borthwick and Sons), with plans afoot for several smaller niche operations in the region.

MIW opportunities - industry development:

> Several beef producers in MIW are part of the Future Beef, a collaboration between industry and Department of Agriculture and Fisheries, which aims to assist graziers and the beef supply chain in Northern Australia to increase production, profitability and sustainability. Their work is driven by the National Beef Production Research, Development and Extension Strategy, which aims to build wealth for those in all sectors of the beef industry, by being market driven and sustainable.

> The Future Beef team support the Clermont Cattleman's Challenge, an industry driven initiative that encourages adoption of best practice grazing. Some producers are interested in the cooperative model to expand their business with preference for processing beef in the MIW region; requiring access to 'custom kill' facilities.

> Organic beef: Large producers in MIW are investing in the conversion to organic beef production in response to domestic and global demands. Organic beef producers in the MIW region are expecting significant premiums for their beef and plan to use local processor, Borthwick's, as they scale up production. Borthwick's have added an organic program recently to meet this gap in the market. This increase in organic production will increase demands for other organic products in the beef value chain, including feed supplements for drought mitigation and organic feedstocks for finishing at feedlots.

> Feedlots: Mackay Regional Council (MRC) approved a feedlot near Koumala, with the owner planning to use an innovative business model to boost farm gate returns by growing silage required to feed cattle to certify them as grain fed, reduce transport costs and realise a 40-70 cent premium per kilogram. The business model also provides opportunities for sugarcane growers in the region to diversify by planting crops in rotation

with sugarcane that can be supplied to the feedlot. It is likely that this business model will be considered by other producers and provides an opportunity for MRC to consider approvals in other areas.

> Eungella Dairy: Department of State Development, Infrastructure, Manufacturing and Planning (DSDMIP) have commissioned a report to identify opportunities to increase the sustainability of two dairies in this tourism location in the Mackay region. Report findings will be shared with the GGWA group as appropriate.

> Some producers in the Isaac region are interested in live cattle exports and this opportunity will be reviewed in future if market opportunities improve.

GGWA recommendations to support Strategy focus areas	Planning	Infrastructure	Marketing
2.1 Develop a ten-year Regional Roadmap and Action Plan (RRAP) – Beef and Livestock, including: regional strategy area priorities for planning, infrastructure and marketing.	> Stakeholder Engagement > Land Tenure > Biosecurity Strategy > Industry Development > Investment Ready and Attraction > Producer Forum Engagement and Attendance at Beef Expo > Mapping Services and Providing Knowledge Support for Niche Product Development	> Water > Road Access > Air Freight > Cool Chain Logistics > Containerised Port Options > Energy (Power Needs)	> Domestic and International Markets > Market Access for Exports > Investment Proposals
2.2 Investigate opportunities for beef cooperatives, branded beef and expanding organic beef production in the Isaac region.			
2.3 Investigate potential growth in sector from new and expanding feedlots in the region: > Liaise with local government regarding potential for further small feedlot development on coast subject to land use planning and environmental considerations, investment and market demands. > Consult feedlot owner planning major expansion in the Central Highlands (< 20,000 head) to assess value chain improvements and promote opportunities to producers (beef and grain) in the Isaac region.			
2.4 Map services available in MIW for custom kill and cool chain facilities required to commercialise emerging branded beef products.			

4.3 Biofutures

Definition:

The term 'biofutures' broadly refers to the industrial biotechnology and bioproducts sector. This sector focuses on the development and manufacturing of products from sustainable organic and/or waste resources, rather than fossil fuels. It encompasses a spectrum of innovative scientific and industrial technologies designed to convert sustainable feedstocks or waste into a diverse range of bioproducts. Agriculture, plantation forestry, algae, organic and carbon-rich 'waste' streams could all be used as feedstocks in the future to generate a wide range of sustainable chemicals, fuels, synthetic rubber, cosmetics, detergents and textiles.

Global context:

> Globally, biofutures are in a rapid phase of development, driven by government support and strategic alliances between technology providers, research institutions and raw material suppliers.

Australian and Queensland context:

> The Advance Queensland Biofutures Ten-Year Roadmap and Action Plan espouses that "biofutures is seen internationally as the next wave of economic development, providing major opportunities for innovation, jobs and growth" and aims to set Queensland on a path to ride this wave.

> The Biofutures Ten-Year Roadmap and Action Plan is being delivered by the DSDMIP. The Roadmap identifies many opportunities to attract international operators in terms of climate, land, feedstock varieties, existing capabilities in cogeneration and production of biofuels and funding for developing projects and the biofutures industry.

MIW industry overview:

> The MIW region currently has five sugar factories, an ethanol distillery, a cogeneration plant, a small biodiesel plant and a bio-commodities pilot plant. Several biofutures facilities that have potential for expansion include Wilmar Ethanol Distillery at Sarina; Mackay Sugar Cogeneration Plant at Racecourse Mill (Mackay); Mackay Port (NQBP) and other entities considering establishment of processing plants.

> The MIW region has a range of heritage crops and emerging industrial biotechnologies and bioproducts. In 2018, the MIW Regional Office (MIWRO) of the DSDMIP completed an Economy Building Initiative (EBI) project to highlight opportunities for the region. The Mackay Biofutures Precinct Site Assessment and Development Project produced three reports - identification of potential bio-precinct sites: positioning the MIW region in biofutures; and biofutures investment opportunities in the region.

> MIW region has formed a biofutures Steering Committee with role of the committee to;

- Progress biofutures opportunities for the MIW region.
- Promote existing bio-industry sites and feedstock opportunities in MIW.
- Develop an investment prospectus.
- Investigate technical and non-technical barriers to biofutures precincts.
- Develop a MIW Biofutures Regional Strategy and Action Plan.
- Identify existing and emerging bio technologies and feedstocks in the MIW regions to match identified sites.
- Determine the right mix of business case conditions and development incentives to attract investors to the region.
- Promote sustainable technologies with socioeconomic and environmental benefits to secure value chains and job creation.
- Link research, innovation, agribusiness applications, marketing, technology readiness and commerciality programs with potential biofutures projects.

> Queensland Waste to Biofutures Fund and the Queensland Resource Recovery Industry Development Program are the current programs to support development of biofutures projects.

MIW opportunities:

> The Mackay Isaac Whitsunday Biofutures Steering Committee (MIWBSC) was formed in 2019 by GW3, the economic development agency for the MIW region. The committee has members including federal, state and local government representatives, peak bodies and relevant privately-owned companies.

> The region is well positioned to expand into several biofutures ventures including production of biofuels, biogas and cogeneration and bi-products using agricultural and landfill waste.

> The region currently has five sugar factories, an ethanol distillery, a cogeneration plant, a small biodiesel plant and a bio-commodities pilot plant.

> Extensive biofuels and biochemical feedstock including sugarcane, seed oils, algae and agricultural waste.

> Ports, transport and logistics capability to national and international markets supported by government investment in road upgrades in the next decade.

> Skilled workforce and CQUniversity in Mackay offer comprehensive training opportunities in trades and engineering.

> Manufacturing capacity to build plant and equipment with many engineering companies to support the biofutures industry. The Queensland Government continues to support biofutures opportunities and are directly seeking innovations, products and services focused on the development and manufacturing of organic resources or waste into fuels, plastics and biochemicals. The Queensland Government's vision is for a $1 billion sustainable and export oriented industrial and biotechnology and bioproducts sector support by international investment creating regional jobs.

GGWA recommendations to support strategy focus areas	Planning	Infrastructure	Marketing
3.1 MIW Biofutures Steering Committee (MIWBSC) to develop a regional Biofutures Strategy and Action Plan (RRAP) – Biofutures, including: > Situation analysis of industry > Mapping of available and potential feedstock opportunities > Development of export market plans and investment prospectus updates. > Stakeholder and industry engagement and relationship plan > Potential regional strategy area priorities for planning, infrastructure and marketing.	> Stakeholder Engagement and Leveraging > Industry Development > Investment Attraction > Feedstock Development and Study > R&D Partnerships	> Water > Road and Rail > Processing Facilities > New Feedstock Production (Land) Areas > Energy (Power Needs)	> Domestic and International > Investment Portfolios
3.2 Develop a biofutures prospectus - to provide introduction level information pertaining to the MIW region's suitability for biofutures investment and development.			
3.3 Develop a biofutures data information portal – digital web-based product that houses regional information and spatial location data aligned to feedstock current, feedstock potential, soil data, climate data, transports/freight data, energy and water supply data, land availability and location, port supply arrangements, etc.			

4.4 Cropping

Broadacre including: chickpeas, mung bean, sorghum, soy and sunflower (excluding sugarcane)

Global context:

Changes in Asian eating trends provide opportunities for Australian grain exports including oat, quinoa, chickpea and mung bean. Markets of interest to MIW include:

China:

> The emergence of the "Weetbix" culture in the rising middle class: Chinese consumers are no longer satisfied with a single variety of staple food, such as rice and flour, and are instead focusing more on green, nutritious, healthy, and rare high-quality miscellaneous grain crops and the food made from them. Energy bars with grains can also be found in the handbags of athletes and health-conscious women. (FLA e-News, Feb. 2017)

> Demand for sorghum for production of "Bai Ju" alcohol is increasing (700,000 T pa) with potential to attract international investment for joint ventures/partnerships if the right cultivars can be produced in MIW with weather variability.

India:

> Demand for chickpeas is increasing, and Australia has seasonal advantage over some competitors. Adani's investment in mining in the MIW region offers a unique opportunity to develop partnerships in agriculture through their offices in Brisbane and Townsville.

Australian and Queensland context:

> Several events have been held in Queensland over the past couple of years highlighting the opportunities for increasing exports of grains to Asia, including a Grains Trade Mission to Korea and developing the organic grain value chain. Due to the challenges of pest control, production of organic grain has not increased as rapidly as organic beef in Queensland.

Australia:

> The start of the 2019-20 winter crop season was mixed. Above average rainfall in important growing regions in South Australia, Victoria and southern New South Wales during May replenished soil moisture levels and created favourable planting and growing conditions. However, autumn rainfall in most cropping regions in Western Australia, northern New South Wales and southern Queensland was lower than average and soil moisture levels remained low. The below average rainfall and low soil moisture levels in these regions constrained planting and hampered early development of dry sown crops.

> Area planted to **winter crops** in Australia is forecast to rise by around 9% to 19.6 million hectares in 2019-20, largely reflecting significant area taken out of grains and oilseed production and cut for hay in 2018-19.

- Area planted to **wheat** is forecast to increase by 8% to around 11 million hectares.
- Area planted to **barley** is forecast to increase by 12% to 4.2 million hectares.
- Area planted to **canola** is expected to increase by 6% to 2 million hectares.
- Area planted to **chickpeas** is forecast to increase by around 22% to 370,000 hectares.
- Area planted to **oats** is forecast to rise by 17% to 798,000 hectares.

> Summer crop production is estimated to have declined by 35% in 2018-19 to 2.6 million tonnes, driven by falls in production of cotton and rice. However, production of grain sorghum increased slightly. The area planted to summer crops declined by 18% to 1.1 million hectares.

- Grain **sorghum** production is estimated to have increased by 2% in 2018-19 to 1.3 million tonnes, reflecting an increase in the planted area.
- The 2018-19 **cotton** harvest is largely complete, and production is estimated to have decreased by 54% to around 485,000 tonnes of lint and 685,000 tonnes of cottonseed. Area planted to cotton is estimated to have declined by 35% to 343,000 hectares, largely reflecting drier than average seasonal conditions during the planting window and reduced supplies of irrigation water.

> **Rice** production is estimated to have declined by 91% in 2018-19 to 59,000 tonnes. This decline reflects a 90% decline in planted area due to reduced supplies of irrigation water available to rice producers in New South Wales.

Queensland:

> Seasonal conditions during autumn were mixed in Queensland cropping regions. Rainfall in most cropping regions was average to above average with above average to extremely high rainfall in the north western cropping region in central Queensland. There was below average rainfall in some cropping regions in southern Queensland. Low soil moisture levels discouraged planting in many regions, particularly in the south eastern part of central Queensland and the Darling Downs.

> Area planted to **winter crops** in Queensland is forecast to rise slightly in 2019-20 to around 752,000 hectares, mainly due to an increase in area planted to wheat in central Queensland, where most Queensland winter crop production is expected to occur this season. Winter crop production is forecast to be 1 million tonnes, compared to the 10-year average production of 1.8 million tonnes. Yields for all winter crops are forecast to average higher compared to the previous season, largely because of reasonable crop prospects in central Queensland

- Area planted to **wheat** is forecast to increase by 15% to around 460,000 hectares. Wheat production is expected to rise to 690,000 tonnes. The average yield is forecast to increase because most of the wheat crop is expected to

be in central Queensland where yields are expected to improve from 2018-19.

- Area planted to **barley** is forecast to fall by 7% to 65,000 hectares due to lower than average rainfall in southern Queensland, where most barley is grown in Queensland. Barley production is expected to fall by 10% to around 85,000 tonnes.

- Area planted to **chickpeas** is forecast to fall by 10% to 180,000 hectares in response to weaker import demand from India. Production is forecast to rise by 4% to 198,000 tonnes because of an expected increase in yields. Almost all chickpeas are expected to be grown in the central Queensland where prospects are reasonable.

> Harvesting of 2018-19 **summer crops** in Queensland is now largely complete and total production is estimated to have fallen by 9% to around 1.5 million tonnes. This largely reflects a significant fall in cotton production.

- Production of **grain sorghum** is estimated to have increased by 3% to 1 million tonnes. A slight fall in average yield was offset by increases in area planted.

- **Cotton** production is estimated to have declined by 49% to 164,000 tonnes of lint and around 231,000 tonnes of cottonseed in 2018-19. Area planted to cotton is estimated to have fallen by 33% to around 117,000 hectares.

MIW industry overview:

There are approximately 1143 operations in the MIW region growing a range of broadacre crops. Pulses are the dominant cereal crop in MIW and are widely grown in summer. Additionally, sorghum and wheat are also produced in the region.

Climatic conditions, grain prices and availability of water will all impact upon cereal crop rotation in the west.

The grain supply chain comprises a range of businesses, including grain growers/producers, mills and feedlot operators, bulk handlers and marketing and trading companies. The grain grown in MIW and broader central Queensland is either exported or consumed locally by a range of industries and businesses. Grain volumes exported via the Port in Mackay fluctuate according to regional climate drivers and market needs.

In 2017-18, a total of 148,245T of grains were exported of which 121,469T were chickpeas. In 2018-19, 46,049T of grains were exported due to drought and supply into the domestic market. The 2018-19 year was the smallest amount of exports that the port has had over the last 17 years. Most of the exports were in sorghum. The maximum amount of exports that the port has seen over the last 17 years has been 386,000T in 2012.

MIW opportunities:

Grain Feedstock for Biofutures:

> The 'Feedstock to Develop Biofuels Project' report by Farmacist, commissioned by DSDMIP - MIWRO and funded by DSDMIP Regional Projects Funding, will inform future work with regional stakeholders including Department of Agriculture and Fisheries to develop the oilseed feedstocks in the region.

Exports:

> There are crop rotation opportunities for sugarcane farmers to produce complementary crops while also managing the land, e.g. chickpeas and soy beans. Chickpea crop gross value of production has been increasing as a proportion of total value since 2007-08. For the most current 2016-17 financial year, chickpea GVP as a proportion of total Queensland grains is estimated to have risen to just under half total value, worth $767 million out of a total of $1.68 billion. India has increasing interest in high quality products from Australia.

> Containerisation and bulk supply options from both coastal and inland ports; developing enabling infrastructure associated with grain transport, processing, storage and handling is required to achieve export potential. Interest exists at a number of ports locations along with the development of the CQ Inland Port Project- opportunities to integrate MIW supply of grain feedstocks via these supply chains is being explored.

GGWA recommendations to support strategy focus areas	Planning	Infrastructure	Marketing
4.1 Develop a Ten-Year Regional Roadmap and Action Plan (RRAP) – Cropping (Broadacre), including: regional strategy area priorities for planning, infrastructure and marketing.	> Stakeholder Engagement > Industry Development > Market Development (Exports) > Investment Attraction > R&D Partnerships	> Water > Road and Rail > Containerisation and Shipping > Energy (Power Needs)	> Domestic and International > JV for Investment and Development
4.2 Facilitate collaboration between NQBP, grain producers in Isaac region and Canegrowers (growing complementary crops) to accelerate NQBP plans to develop infrastructure for containerisation of grain and coastal shipping to increase export of agricultural products from Mackay Port. **NB:** Refer Growth Enabler – Transport and Logistics (5.8) for further information. Townsville Port also have interest in this market.			
4.3 Investigate trade and investment opportunities aligned to pulse crop exports and leverage from relationships established between multinational entities and the MIW region in other sectors.			

4.5 Horticulture

Global context:

Austrade and Trade & Investment Queensland have identified opportunities for exports of horticulture products from Australia, subject to negotiating appropriate protocols with importing countries. The ABARES Report 'What China wants – Analysis of China's food demand to 2050' provides extensive details on opportunities available once protocols and other market access requirements are in place.

Australian and Queensland context:

Demand for organic horticulture is increasing in domestic and global markets.

Bowen is regarded as a major horticulture production area in Australia, contributing an estimated $449 million GRV (based on industry production statistics, not ABS data). The region is a major provider of winter vegetables including tomatoes, beans, capsicums, melons and mangoes. Bowen now has the largest organic farm in Australia, producing some of these products utilising leading edge technology for sustainability.

MIW industry overview:

There are approximately 102 fruit and vegetable producers in the MIW region, with a large portion of this industry situated around the Bowen region. Mangoes form the bulk of the fruit product grown in the region, with capsicums, tomatoes, beans and melons forming the bulk of the vegetable crop.

Product is generally packed on site and transported to larger capital city markets for on-sale into domestic fresh markets. Opportunities exist within the industry for value-adding and exploring the opportunities for additional food processing and/or sale of underutilised product within the Bowen region.

Industry overview includes:

> Industry worth ~$450 million a year – based on internal industry production figures

> Largest winter growing region in Australia

> Employ around 3200 skilled and unskilled workers each year

> Horticulture is a major agricultural economic driver in this region, with opportunity to value-add

> Vegetable production: from April/May through to November; Mango production: November and December

> Estimated 9575 hectares used for production

MIW opportunities:

> Water security is considered a critical enabler for expanding the horticulture industry and developing cropping in the Whitsunday region. The Bowen Gumlu Growers Association (BGGA) in partnership with Bowen Collinsville Enterprise (BCE) are key stakeholders and advocates for developing water infrastructure in the region associated with the proposed Urannah Dam, with the potential customer base including rural producers at Collinsville, Whitsunday Water Supply, Abbot Point State Development Area, horticulture at Bowen and resources sector in the Bowen and Galilee Basins.

> The BGGA has identified value-added processing and/or access to additional markets for seconds produce as critical to future proofing the industry by increasing farm gate returns through diversity of income streams and reducing lost revenue from waste (~40%). Using innovation to turn this waste into high value exportable items, such as high value bio-actives and powder-based products, the industry plans to overcome the current barrier of lacking the protocols necessary for exports.

> GrowCom has and is investigating a funding model to provide an export facilitation service in Northern Queensland, including Bowen, to support growers in developing export markets.

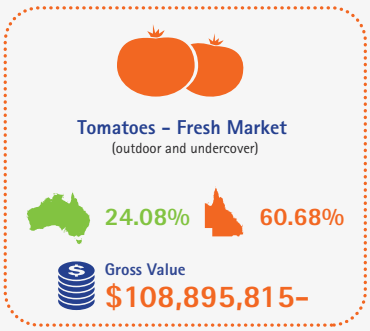
> The Australian Mango Conference held in Bowen in May 2017 attracted over 500 attendees and generated significant revenue for local businesses in hospitality etc; with similar opportunities being explored.

> BGGA is exploring the opportunities associated with biofuel creation from production waste including processing of farm mulch plastics waste.

> BGGA, in collaboration with Bowen Chamber of Commerce and local government, is exploring and trailing the economic benefits associated with international student development and training in cropping production systems. The program at present has students from Japan studying horticulture production systems and operations in Bowen with the Japanese Agriculture Exchange Council (JAEC).

GGWA recommendations to support strategy focus areas	Planning	Infrastructure	Marketing
5.1 Develop a Ten-Year Regional Roadmap and Action Plan (RRAP) – Horticulture, including: regional strategy area priorities for planning, infrastructure and marketing.	> Stakeholder Engagement > Land Use > Biosecurity Strategy > Industry Development > Market Development (Exports) > Investment Attraction > R&D Partnerships	> Water > Air Freight > Cool Chain Logistics > Regional Distribution Hub > Processing Plant > Export Treatment Facility > Road and Rail > Containerisation and Shipping > Energy (Power Needs)	> Domestic and International > JV for Investment and Development
5.2 Support BGGA and BCE to develop the project scope and investment proposal for a processing plant for value-adding of waste.			
5.3 Investigate further processing opportunities for conversion of farm plastic waste to biofuels.			
5.4 Investigate market development and sale of seconds product to wholesale export markets.			

Vegetables for human consumption:



Tomatoes – Fresh Market
(outdoor and undercover)

24.08% 60.68%

Gross Value
$108,895,815–

Capsicum
(excluding chillies)

26.15% N/A

Gross Value
$31,686,171–

Beans
(including French and runner)

7.57% 11.53%

Gross Value
$14,358,720–

Melons

2.70% 8.83%

Gross Value
$5,952,057–

Pumpkins

5.07% 10.16%

Gross Value
$3,965,948–

Sweet Corn

6.09% 7.63%

Gross Value
$9,377,703–

Fruit and nuts - Orchard fruit

Mangoes

3.56% 6.49%

Gross Value
$4,756,025–

4.6 Sugar

Global context:

Record world sugar supply is expected to drive prices down to a 16 year low in 2018/19. In 2018/19 carryover stocks are expected to reach record levels and production to be higher than consumption. If realised, world sugar supplies would exceed record levels. Support policies in the EU and countries such as India, Thailand and US are expected to continue to keep sugar prices well above the world price, providing incentive for higher production within those countries. (ABARES Agricultural commodities, June Quarter Report 2018)

A similar outlook report in 2016/17 predicted increases in the sugar price of 6% from previous year. The sugar market continues to show ongoing price volatility, however current reports indicate world price is expected to increase slightly in 2019/20 and global production is forecast to fall slightly below consumption due to global fall in area planted to both sugarcane and sugar beet. However, high global stocks of sugar will dampen the expected recovery in world sugar prices. Over the medium-term, fundamental changes to Brazilian energy policy are expected to provide Brazilian sugar mills with an incentive to increase ethanol productions, resulting in likely decline in global sugar stocks. However, it is not clear to what level Asian countries will expand and accelerate sugar supply. (ABARES Agricultural commodities, March Quarter Report 2019)

Australian and Queensland context:

> Queensland produces 95% of Australia's raw sugar and around 85% of Queensland raw sugar is sold on the world market. The sugar industry is the cornerstone of many Queensland regional communities, injecting millions into regional communities each year and providing employment opportunities for many Queenslanders.

> Sustainable production of sugarcane in the context of declining water quality entering the GBR from farms is a focus for the industry and community. Project Catalyst is driving change and adoption of technology in the industry for sustainability and protection of the reef.

> The MIW '30 Year Sugar Industry Strategy – 2015 – 45' highlights the challenges faced by the industry including global competition, rising input costs (including electricity, fuel and fertilisers), ageing workforce, push to adopt new technology and urban encroachment.

> Mackay Sugar and Wilmar Sugar are major employers in the MIW region and have diversified over the past 5-10 years to increase sustainability of their business model. Mackay Sugar has installed a co-generation facility at its Racecourse Mill, which can produce 38MWh of electricity which equates to 30% of Mackay's electricity needs. Wilmar has an integrated business model including production of biodiesel, fertilisers and feed supplements. Their organic certification for a range of feed supplements for the beef industry is of interest as the production of organic beef in the MIW region increases.

MIW industry overview:

> Whilst cereal and oilseed crops are the dominant broadacre crops in the west of the region, sugarcane is the dominant broadacre crop across the wider MIW region with around 1058 growers and 130,000 ha of production area. Sugarcane is generally harvested between July and December and transported via rail and road to the various mills dotted across the region. Over 1.07 million tonnes of sugar was produced in the MIW region in 2018 from 7,375,712 million tonnes of sugarcane.

> The MIW region continues to see farm production below 70 tonnes of cane per hectare, which is the lowest yield per hectare across Australia. This decline in production per hectare is an ongoing trend for the past 25 years.

> Closer analysis of production trends highlights an increasing range of yield between the top producers and the remaining producers across all soil and climate types. This indicates that the decline in production is not solely climate based and in part relates to husbandry practices and activity.

> The potential sale of Mackay Sugar and purchase by foreign investors is seen by the industry as both a positive and negative, depending on those commenting.

MIW opportunities:

> MIW canegrowers are investigating market opportunities for increasing production of complementary crops. Whilst crop rotation using chickpeas and soy beans has been widely used to manage the land (ensuring ground coverage, input of nitrogen etc), the market opportunities have not been realised.

> Pulse crops provide strong opportunities for the industry with crop gross value of production increasing as a proportion of total value since 2007/08. With increasing demand for export of chickpeas, canegrowers can supplement other production in the Isaac region.

> The emerging biofuels industry and links to new markets with opportunities to co-locate at a range of existing sites and locations. e.g. sugar mills, distilleries. – also refer to Biofutures section.

> Canegrowers are interested in working with other industries to develop these new opportunities that require export market development and enabling infrastructure, including transport and

logistics, e.g. containerisation from Mackay Port, strengthening the value chain for complementary crops.

> Industry stakeholders and support groups in the MIW region are interested in completing an industry situational analysis. The analysis is designed to capture information and data which can be used to develop policies and programs designed to arrest declining levels of production and economic performance of the industry. Information sought could include - production (farm, harvesting and mill), economic and financial performance data, producer demographics, business confidence assessments, climatic influence, practice and activity information, etc.

GGWA recommendations to support strategy focus areas	Planning	Infrastructure	Marketing
6.1 Develop a Ten-Year Regional Roadmap and Action Plan (RRAP) – sugar, including: regional strategy area priorities for planning, infrastructure and marketing. **NB:** This approach is consistent with developing Ten Year Roadmaps for the other industry sectors and would incorporate the proposed 'Sugar Industry Strategy.'	> Stakeholder Engagement > Industry Strategy > Biosecurity Strategy > Milling Asset and Operations Part Sale. > Industry Development > Market Development (Exports) > Investment Attraction > R&D and Innovation Partnerships	> Water > Road and Rail > Containerisation and Shipping > AQIS Treatment Facilities > Energy (Power Needs)	> Domestic and International > JV for Investment and Development > Sustainability Marketing
6.2 Facilitate collaboration between canegrowers and other stakeholders for market development for complementary crops, e.g. chickpeas and the infrastructure required for export. Also refer to Cropping (4.4) and Transport and Logistics (5.8).			
6.3 Complete a MIW Situation Analysis Study - purpose is to collate data and information that can be used to support the development of policies, programs designed to support sugar industry sector rejuvenation. Data and information from this study would underpin the Ten-Year Roadmap.			

5. Growth Enablers – Priorities for GGWA:

5.1 Agritourism

Global context:

In 2018-19, Australia saw international visitors surpass nine million for the first time with spend reaching $42.5 billion. However, while trips increased, the average length of stay decreased from 34 nights to 32 nights, which led to a decrease in average trip spend (down $79 per visitor to $5,080). Despite these lower yields, international visitors are increasingly important. The emergence of newer Asian markets and the growing impact of the international student cohort on the visitor economy means they will continue to capture an increasing share of spend. Forecasts show that visitor numbers will increase by another 3 million visitors in the next five years, with two-thirds coming from Asian markets.

The surge in current and future visitation from Asia comes from rapidly expanding middle class populations – a result of unprecedented levels of urbanisation and industrialisation and large, relatively young populations and workforces. This global trend will see the world's middle class swell to over 5 billion people by 2030, with nearly 3.5 billion coming from the Asia Pacific region.

Over the past decade, travellers at the older end of the market have driven growth in international and domestic demand. For example, those aged 55 and over accounted for one-third of the total growth in visitor spend between 2007-08 and 2017-18. Looking to the future, however, the youth market (those aged 15-29 years) will assume increasing importance. This is already evident in the international sector, with these young travellers accounting for 45% of international spend in 2017-18. These younger visitors present a different profile to older generations, staying longer but spending less per night due to their economic circumstances and life stage. They also have a preference for budget travel, which is reflected by: greater use of low cost carriers (LCCs), lower patronage of traditional hotel accommodation, lower average daily spend, more likelihood of independent travel and a tendency to travel alone.

Australian and Queensland context:

Falling exchange rates, low inflation, increased consumer confidence, and more budget travel options means that travelling at home is becoming far more attractive due to its price competitiveness with overseas holiday destinations. This is providing a strong boost for regional economies, due to the fact that most domestic overnight spend occurs outside the capital cities. In 2017-18, domestic overnight spend increased 7.9% to $67.5 billion, while day trip spend passed $20 billion for the first time. While Australians have taken an extra 25 million domestic overnight trips over the last five years – or one extra trip per year for every Australian resident – they are staying for shorter periods. However, an increase in both day and overnight trips has offset any decline in trip spend, with every Australian spending almost $4,400 on domestic travel in 2017-18 (up more than $700 compared to 2012-13).

The greater dispersal of tourists beyond the major cities is critical in ensuring the benefits of tourism are spread more evenly across the country, diversifying the economic base of regional communities, while reducing the burden on tourism infrastructure in our gateway cities. In 2017-18, 44 cents in every tourism dollar was spent in regional areas, an injection of $51 billion to regional communities. This spend resonates at a local level, with around one-third of tourism-related businesses and more than half of the tourism workforce located in regional Australia. Tourism itself accounts for 4% of economic output and 8% of jobs in regional Australia.

In 2017-18, the Whitsundays ranked in the top 5 regional destinations for domestic travellers.

MIW opportunities:

> All regional councils are looking at increasing tourism, including agritourism, in economic development strategies. This initiative will strengthen regional branding through food trails, farm visits etc.

> The work undertaken by the Greater Whitsunday Food Network has promoted quality produce to both domestic and international tourists through the weekly Greater Whitsunday Farmers Markets, farm tours and Paddock to Plate events.

> There is opportunity for local government to consider opportunities for agritourism in town planning processes with application fees and approval processes reflecting different levels and intensity of activity.

GGWA recommendations to support strategy focus areas	Planning	Infrastructure
A.1 Support Initiatives of local government and agrifood and agritourism groups to promote regional and sub regional events and markets.	> Liaise with LG's and GWFN regarding assistance toward Events Strategy and rural landscape and produce aligned tourism experiences.	> Work with GWFN to identify farmers markets infrastructure needs and align to grant programs.
A.2 Increase training and mentoring for producers and agritourism interest groups.		
A.3 Increase the number of agritourism development in the region.		
A.4 Development of farmer markets in Isaac and Whitsundays.		

5.2 Branding including: Regional and products

Global context:

> Consumers are demanding closer connection to the food they eat with "stories" about farmers and the regions they live and farm in being of increasing interest, e.g. the success of provenance in France.

> Multinational food retailers and food and beverage companies seeking ability to brand their products sustainable (social and environment) via independent sustainability platforms and standards. This in turn requires food suppliers to enter into transparent supply arrangements relating to auditing of practices and supply volumes. Globally, ten companies control the global food and beverage supply chain. All of these companies have a public commitment to sustainable sourcing of food by 2020 and are active in the support of various global sustainability standards and roundtable organisations. They each seek to be able to brand their products with sustainable sourcing programs. (Associated British Foods, Coca Cola, Groupe Danone S.A, General Mills, Kellogg Co., Mars Inc, Mondelez International Inc, Nestle S.A, Pepsi Co Inc, Unilever Group)

Australian and Queensland context:

> Major companies like Coles, Woolworths, Teys Brothers and Borthwick's are tapping into this global trend for products sold both domestically and to export markets, e.g. for beef.

> Multinational food and beverage companies with operations in Australia have established formal policy and procurement programs based on sustainable food production supply chains and branding where this includes the farm supply actions.

> The Queensland Government in 2019 announced it would be phasing out junk food promotions at government owned sites and events in response to unhealthy dietary habits and obesity.

> The Australian Medical Association in 2018 called for improvements in food labelling and branding and a tax on sugar food products to combat obesity.

> Reports indicate that one third of Australians claimed to have actively sought products with higher environmental, social and community benefits. In addition, consumers sought this information or links to this information within easy to use product packaging and branding.

> Austrade's report highlights that Australian food has a reputation as a reliable supplier of some of the best fresh products in the world. This reputation is enhanced by clean and green credentials forged by food safety management, quality assurance systems and high levels of environmental stewardship. Despite this Australian export produce, marketing and branding is not active in promoting this to buyers in the supply chain in general.

MIW opportunities:

> Food production in the MIW region could be marketed under a general Whitsundays brand and in doing so, connect our region's food to the scenic amenity value of our region's nature landscape.

> DSDMIP, MRC, IRC and WRC collaborated during a significant regional food project that led to the Greater Whitsunday Food Network being established in 2015. This group assists farmers to developing new products and market them at weekly farmers markets in Mackay, farm tours and food trails.

> Cruise ships regularly visit the Whitsundays with tourists visiting the markets at Airlie Beach looking for local products as gifts, e.g. honey. Stores at Cairns Airport provide good examples of how to market uniquely Australian and regional products to domestic and international tourists.

> The annual 'Paddock to Plate Dinner' with celebrity chef and Gympie Region's Food and Culinary Tourism Ambassador, Matt Golinski, is very well attended and used to promote the value of buying local produce to the hospitality industry, e.g. restaurants, tourist destinations and hospitality and catering companies at mining camps.

> Product branding, e.g. organic branding for beef, enhanced by the 'story' behind the product is realising premium returns for producers.

GGWA recommendations to support strategy focus areas	Planning	Infrastructure	Marketing
B.1 Undertake an export brand and labelling study assessing the market opportunities and value proposition aligned to the creation of a regional agriculture brand for all food produced in the MIW region. Markets under a Greater Whitsundays brand and where food produced is done so under best practice environmental and social standards and where buyers can gain an experience and/ or understanding of what it takes to be a producer of food in the MIW region.	> Establish an MIW Export Hub working group to oversee agribusiness export studies and strategy. > Complete an additional "In Market Study" to evaluate agribusiness export opportunities in MIW region. > From the studies, develop an Agribusiness Export Strategy.	> Within the Agribusiness Export Strategy – consider the development of regional Export Hub facility and/or a North Queensland Export Hub facility and commercial links to MIW region	> Consider the development of a Greater Whitsundays agribusiness marketing brand within the Export Strategy.

5.3 Exports

Global context:

> The global food challenge, population growth and concerns over food security are driving increasing demand for exports of agricultural products from Australia.

> Globally, Australia is a top ten producer of major agricultural commodities. Global demand for key agricultural commodities is forecast to grow by 140% between 2007 and 2050.

> Asia's middle class is expected to grow from 500 million to 3 billion by 2030, creating untold demand for diets of the western world and see Australia as meeting their demands for clean, green, safe and sustainable products.

> Australia has developed Free Trade Agreements recently with China, Japan, Korea and Indonesia.

> The food Australia has available for export would feed around 2% of the Asian population, raising questions about claims that Australia can become 'Asia's food bowl' (Food, Farming and Our Future) but also acting as a driver for investment to boost production to help fill this gap in supply.

Australian and Queensland context:

Austrade highlights that:

> Australia has an international reputation as a reliable supplier of some of the best fresh products in the world. This reputation is enhanced by clean and green credentials forged by world-class food safety management, quality assurance systems and the environmental stewardship of our farmers and managers.

> Australia exports more than 90 fresh fruit and vegetable products to more than 60 countries. Our largest destinations include: Hong Kong, Japan, USA, and Singapore.

> Proximity to Asia shortens transport times, allowing Australia to deliver fresher, more attractive fruit and vegetables to these markets by sea and air, often supplying in counter-seasonal months in times of short supply. Depending on the location of production, fresh produce can be packed and airfreighted to Asian markets within 48-60 hours from harvest. Produce sent by sea in refrigerated containers can be in Asian markets within 12-20 days of harvest.

> Australia has also earned a worldwide reputation as a supplier of safe, high quality beef. Similarly, our reputation for quality seafood, produced using environmentally sustainable practices in wild-catch fishing and aquaculture, is driving increasing demand.

MIW opportunities:

> Austrade and Trade and Investment Qld (TIQ) have identified several opportunities relating to products grown in the MIW region, subject to market access issues, including post-harvest and other protocols being resolved.

> With Asian markets on our doorstep, and our reputation as a successful exporter in the METS sector to India and China, the region has the opportunity to leverage these relationships to expand exports of high value beef, aquaculture, tropical fruits, grains and pulses.

> The Queensland Government has allocated $1.3 million for the Growing Queensland's Food Exports program to support fruit and vegetable growers to access markets in Japan, China and South Korea following signing of the free trade agreements in 2015.

> Growcom is pursuing funding to deliver an export facilitation service to farmers in the Bowen area, which is likely to have benefits in building capability across the region.

> Develop a range of branded high value products, value-added for export, and put the Greater Whitsunday region on the map as the "Delicatessen for Asia".

> Explore the opportunities aligned to agribusiness export potential for goods and products via air freight - links to completion of a MIW Agribusiness Export Mapping Study.

GGWA recommendations to support strategy focus areas	Planning	Infrastructure	Marketing
C.1 Complete a MIW Agribusiness Export Supply Chain Study to evaluate current and future markets opportunities for rural commodities, along with the identification of key barriers to realising these opportunities.	> Develop and submit Export Mapping Study proposal – seeking private and public funding contribution. > Incorporate learnings from other regional agribusiness export studies.	> Profile existing hard and soft infrastructure in support of export opportunities and capabilities.	> Complete an in market export capability assessment for MIW and the major agribusiness products and services. > Promote the MIW Agribusiness Export Study.
C.2 Partner with industry stakeholders to develop a Regional Export Development Plan (REDP) – Agrifood, including: products, quantities, differentiation, importing country profiles, seasonal advantages, market access, workforce planning etc. This plan will also include: > Completion of an Export Mapping Study. > Export opportunities identified in the Ten-Year RRAPs for industry sectors, used to promote the diversity for investment attraction and build relationships with stakeholders. > Key growth enablers identified in the 10 Year RRAPs for industry sectors, e.g. water, transport and logistics and collate data and information from stakeholders to support feasibility studies and business cases for infrastructure developments.			

5.4 Investment Attraction

Global context:

> Internationally, Australia is seen as being globally successful in five key industries: resources and energy, agribusiness, financial services, education and tourism.

> Food security is driving many countries to invest in agriculture across the globe. Australia is seen as a politically and financially stable environment for investment with good returns in agriculture.

> The food Australia has available for export would feed around 2% of the Asian population, raising questions about claims that Australia can become 'Asia's food bowl' (Food, Farming and Our Future) but also acting as a driver for investment to boost production to help fill this gap in supply.

Australian and Queensland context:

> 58% of Australia's total food production is sold to overseas consumers. Australia's share of production exported by value has risen, especially over the past decade. The value of food exports relative to total food value now sees exports making up over 35% of food production. This is despite minimal increase in production growth. Interestingly, imports also continue to grow-particularly in the areas of seafood, out of season produce and processed foods. 93% of food consumed domestically remains primarily Australian made. (ABARES 2018)

> Global demand for key Australian agricultural commodities is forecast to grow by 140% between 2007 and 2050. The Australian agriculture industry will require almost $110 billion in capital to maintain our share of world food exports. To capitalise on the growing demand, Australian agribusinesses need to prepare for alternative funding sources locally and internationally to fund their future growth. (Australian Ag Investment Readiness Forum 2017)

> Austrade and TIQ facilitate significant investment into Australia and can provide leads on opportunities, e.g. at Beef Australia Expo May 2018.

> Austrade hosts The Northern Australia Investment Forum each year to attract good quality investors from around the world and showcase investment ready projects and opportunities. The forum facilitates connecting experts in the areas of investing in the north.

> Growth in agriculture production will require significant agricultural debt levels and improved business succession planning. These issues are driving some industry peak entities and farmers/producers to look for investors or joint venture arrangements to provide capital investment to develop agricultural assets.

> International investment is new to many rural land managers, therefore building the knowledge, skills and business acumen required is a key part of becoming 'investment ready' to attract the right investment partner.

MIW opportunities:

> Raise the profile of the region and develop a regional investment strategy and prospectus web portal and marketing material to promote opportunities for investment in the agribusiness industry.

> The MIW region have long term relationships in place through the success of the METS sector and can build new opportunities in the agribusiness sector through these contacts, e.g. in China and India.

> The potential acquisition of 70% of Mackay Sugar by European Group Nordzucker AG, while dependent on shareholder consent and a few other conditions, should successfully proceed and signals the solid base for such partnerships and investments, given Australia's stable political climate and well developed infrastructure.

> The Clermont Beef Expo (2015) focused on equity partnerships, involving a panel of experts to assist beef producers to consider both domestic and international investment. GGWA could develop a partnership with regional champions in the beef industry in Clermont to help build capacity and promote services available to help farmers/producers to become 'investment ready', e.g. Bentleys Investment Forum (8 August 2017).

> Build a portfolio of 'investment ready' projects and promote their role as a one-stop-shop for investors; using a streamlined process for connecting investors with projects or businesses of interest.

> Participate in Austrade's Northern Australia Investment Forum to raise the profile of the region and build capacity for attracting investment.

> Continue to develop the MIW TIQ regional working group and its operations – whereby agribusiness investment attraction is a focus. Develop an agribusiness investment prospectus based on outputs from MIW Export Agribusiness Mapping Study, and other regional data.

GGWA recommendations to support strategy focus areas	Planning	Infrastructure	Marketing
D.1 Develop a 'Regional Investment Strategy and Prospectus and Web Portal' including process, regional profile, marketing material, relationship development plan and key events calendar and promoting agribusiness investment opportunities. This strategy will highlight the strengths of the region including: high potential for productivity, diversity of products, innovation and sustainable farming practices, land tenure, climate management, profiles of expertise available and extensive database of contacts to assist potential investors to source information. Marketing material developed to be branded "Invest Greater Whitsunday Agribusiness ".	> Identify local case studies, success stories and contacts. > Consolidate respective sector plans. > GGWA to develop a MIW Agribusiness Investment Prospectus. > From the studies, develop an Agribusiness Export Strategy.	> Profile existing infrastructure against what is required to transform and realise enhanced agribusiness export and investment potential.	> Promote the development and delivery of strategy areas of focus to MIW and broader stakeholders base – Focus toward promotion of export market strategy, Investment and Trade prospectus and presentation at key AG Forums. > Develop an MIW Agribusiness Investment Prospectus and media promotions material. > Create a MIW agribusiness brand that leverages the GWFN.
D.2 Build capacity in region to develop 'investment ready' projects or businesses, e.g. participate in the Annual Australian Ag Investment Forums and collaborate with partners to leverage expertise in investment attraction for benefit across MIW region.			
D.3 Complete an export market study for major ag commodity produced in the MIW region. From this study, utilise information that will be of value in the development of a Regional Investment Strategy.			

5.5 Planning

Definition of planning:

For the purposes of GGWA, this enabler includes: federal, state, regional and local government planning; value chain mapping; business and succession planning; workforce planning and other 'planning' considered relevant to growing the agriculture sector in MIW.

Global context:

The 'Developing the North, Our North Our Future' report recognises the importance of planning at several levels to connect Australia to global opportunities and sets out Federal Government priorities for planning and investing in: land; water; business, trade and investment; infrastructure; workforce and governance.

Australian and Queensland context:

> CSIRO's 'Australia 2030' report highlights that "Future strategic decision making will need to take into consideration the rapid pace of change, market disruption, and the future uncertainty and volatility."

> 'Developing Northern Australia' strategies provide a perfect opportunity to reassess state, regional and local plans to leverage opportunity.

> Small businesses account for 44% of total employment in Queensland and from 2013-2017 this increased by 4.3% (Source: ABS 2017, Australian Industry, Cat no, 8155.0). Within agriculture, 77.7% of the industry is made up of small businesses across Australia and the 76.9% of the total industry value-add is from small business and 53.5% of wages and salaries is attributed to small business within the agribusiness sector. Many family owned farms fit in the small business category and highlight the importance of good planning to manage risk and build business sustainability to support growth.

> Generally, planning for the agriculture sector over the past 15–20 years has been focused toward respective commodity reforms and restructure initiatives via a focus toward improved effectiveness and efficiencies through policy and higher order strategy activities. Equally, the reforms have tended to be farm and primary processing in focus and have not been successful toward integrating the supply chain as a whole in planning processes.

MIW opportunities:

> 'Developing Northern Australia' strategies provide an opportunity to reassess state (e.g. Qld Agricultural Land Audit), regional and local government plans to identify opportunities for the MIW region, e.g. water security and transport and infrastructure.

> Opportunities to review regional and local plans to consider alternative uses for marginal agricultural land, e.g. with salt intrusion to expand opportunities for other sectors in the agricultural industry. An example shared with the GGWA group was a feedlot approved by MRC and located on land with salt intrusion that had overcome this perceived barrier by implementing an innovative business model that leveraged the diversity of products available on-farm to increase profitability and sustainability.

> Protection where possible of high value agricultural land, e.g. controlling the construction of solar farms; urban encroachment on sugarcane etc.

GGWA recommendations to support Strategy focus areas	Planning	Infrastructure	Marketing
E.1 Establish strategic planning working groups, leveraging leaderships and expertise to accelerate priority enabling infrastructure projects.	> Collaborate with QDAF. > Complete analysis of freight supply chain arrangements.		
E.2 Engage with federal, state and local governments and planning departments via industry and stakeholder forums.			
E.3 Engagement supply chain stakeholders at key events and support development of relationship with supply chain to ensure support and engagement toward opportunities.			

5.6 Sustainability

Definition of sustainable agriculture:

"The production of food, fibre, or other plant or animal products using farming techniques that protect the environment, public health, human communities, and animal welfare." (Grace Communications Foundation)

Global context:

> The 'Food, Farming and Our Future' report highlights the impact of changing consumer demands for sustainability and the importance of securing a licence to operate: 'Community focus on how food is produced has amplified significantly in recent years. At the same time, the number of people with understanding and empathy for the day to day realities of farming has fallen to historically low levels in modern communities. Farmers have expressed frustration at the focus being placed on their operations, suggesting that they often feel like they are farming a fishbowl."

Australian and Queensland Context:

> The Great Barrier Reef is an international icon and one of the nation's cultural and ecological treasures. It is home to a breathtaking array of life, worth $6 billion a year to the Queensland and Australian economies and supports over 69,000 jobs. Governments at all levels have invested heavily in programs to enhance regulations to ensure clean water for a healthy Great Barrier Reef; driving positive change on-farm.

> Project Catalyst: 'Good for farmers, good for the reef' is an innovative program and change agent for many sugarcane growers in Australia. Leading farmers are working with WWF Australia and the Coca-Cola Foundation, natural resource management groups, the Australian Government and others to develop practical, cost-effective solutions to improve water quality on the reef.

> Conferences in Queensland, e.g. '2017 Future Food and Fibre – Food and Fibre production for future generations' have highlighted the environmental and financial benefits of adopting sustainable farming practices, including carbon sequestration and returns of biodiversity to agricultural lands and remnant vegetation, increasing resilience to climate variability and pests and diseases.

> Energy security:

- Rising power costs and reliability issues are driving farms and rural businesses to find alternative energy solutions to reduce the impact of costs and disruption to operations, e.g. reverting to diesel to reduce on-farm input costs.
- With energy costs increasing by 100% in ten years for some farmers, the NFF has stepped up its campaign for a bipartisan energy policy. DAF are also working with QFF to promote the benefit of energy audits offered by the QLD Government to raise awareness of how to reduce energy costs.

> The Energy Savers Plus Extension Program is delivered by the Queensland Farmers Federation with support and funding from the Queensland Government. The Queensland Government has committed to extend the Energy Savers Program with 200 more audits and $4 million in rebates for farmers to implement audit recommendations. There are also audits and rebates available for customers who use over 100 MWh per year.

The previous round of Energy Savers audits identified 7,500 MWh per year in energy savings with a payback of less than five years and a total of over $3 million per year in energy savings. Over 44 per cent of farms have implemented some of the audit recommendations, with another 18 per cent planning to do so.

The Energy Savers Plus Extension Program is part of the Queensland Government's $2 billion energy plan and aims to assist agricultural businesses identify and realise energy savings and productivity improvements. The objective of the Energy Savers Program is to assist farmers reduce energy costs by supporting the accelerated adoption of improvements in on-farm energy use.

> The Australian Government estimates food waste costs the Australian economy $20 billion each year. Over 5 million tonnes of food ends up as landfill, enough to fill 9,000 Olympic sized swimming pools. One in five shopping bags end up in the bin, equating to $3,800 worth of groceries per household each year. The Food and Agriculture Organisation outlines three general levels where action is needed on a global scale.

1. Reducing food wastage in the first place.

- This includes developing better food harvest, storage, processing, transport and retailing processes. A key factor in this is the relaxation of legislation related to labelling and packaging.

2. Reuse surplus food within the human food chain.

- In Australia, there are several initiatives dedicated to finding secondary markets for unwanted food.
- If food is not fit for human consumption, the next best option is to divert it for livestock feed, conserving resources that would otherwise be used to produce commercial feedstuff.
- Gleaning, or the practice of gathering food straight from the field, is another growing trend where organisations and, in some places, entrepreneurs are spotting opportunities to acquire produce at reduced rates.

3. Where reuse is not possible, recycling and recovery should be pursued.

- By-product recycling, anaerobic digestion, compositing, and incineration with energy recovery allows energy and nutrients

to be recovered from food waste, representing a significant advantage over dumping it in landfills. Uneaten food that ends up rotting in landfills is a large producer of methane, a particularly harmful greenhouse gas. Again, technology is being developed in this space to turn food waste into green energy.

MIW opportunities:

> There is opportunity to promote progress in adoption of sustainable management practices in the region, e.g. use of sustainability certification as marketing tools such as Bonsucro with sugar and other agrifood industries, such as sustainable beef production practices.

> The region has built a credible profile and expertise in sustainable farming and water quality management, and there is an increasing demand for exporting this expertise internationally, e.g. to the Asian/Pacific region.

> Mackay Regional Council, Reef Catchments and a local cane farmer have partnered to create a water quality offset program. The program, commissioned in 2008, has been successful in preventing over 250 tonnes of nutrients and 150 tonnes of suspended solids from flowing into the reef. There is potential to expand these initiatives.

> A Queensland Government sponsored R&D Forum held in Airlie Beach (2012) identified several opportunities to turn agricultural and other organic waste into valuable income streams by applying technology and innovation available at the time. Current technology may offer new opportunities.

GGWA recommendations to support strategy focus areas	Planning	Infrastructure	Marketing
F.1 Promote leading edge sustainability management in the region through adoption of innovative farming practice to enhance water quality condition and ecosystem functions.	> Support regional annual reporting of agribusiness impact toward GBR health and regional water quality via the MWHR2RP. > Support the Queensland Government and QFF Energy Savers Program by encouraging rural producers to get involved. > Support cropping innovation and leading practices via the Project Catalyst Initiative. > Develop an energy park investment hub prospectus for MIW region. > Undertake supply chain and study analysis of food waste in MIW region and potential market and supply chain-based solutions to reduce waste at the farm gate and in households.	> Enhance MIW regional collaboration amongst stakeholders - build off existing sustainability platforms and activities. > Work with the MIW Biofuels Committee to identify energy park sites suitable for biofutures investment. > Work with commercial stakeholders in accessing food waste incorporation into compost-based production systems	> Promote the MIW region current and future activity regarding sustainable supply chain practices. > Promote respective sustainability programs and initiatives offered by government, commodity sectors by ensuring local agribusiness stakeholders are aware. > Promote programs associated with reducing food waste.
F.2 Explore long-term opportunities for biofuels and other renewable energy sources.			
F.3 Promote benefits of energy audits to reduce energy costs and raise awareness with producers and processors.			
F.4 Advocate for renewable energy development in strategic areas of marginal land condition and identify potential synergies between rural production and energy production via renewables.			
F.5 Reduce food waste at farm and household levels and identify repurposing opportunities and/or recycling programs to reduce food waste.			

5.7 Technology & Innovation including Research and Development

Global context:

> Innovation and technology are driving improvements in agricultural production, productivity and sustainability across the globe with the gap between developing and under developed countries closing, e.g. use of drones becoming mainstream in many countries.

> Australia has slipped on global innovation indicators. Whilst remaining high for investment in R&D, commercialisation of R&D is a weakness that other countries have benefited from. In 2015, the Global Innovation Index ranked Australia 17th overall in terms of innovation but 72nd for innovation efficiency. (CSIRO: Australia 2030)

> Farmers across the globe are now demanding applied research solutions to on-farm problems to drive productivity.

Australian and Queensland context:

> The Australian Ag Tech market is still in its infancy compared to countries like US and Israel, and production in some EU countries where investment per hectare is about 50 times greater than here.

> Analysis completed by the Australian Farming Institute (P2D Project) highlighted that technology advancement and digital agriculture alone could increase gross value of the production in Australia by $20.3 billion.

> Some of the immediate AgTech challenges are aligned to poor broader network and connectivity issues and lack of telecommunication infrastructure. Other matters relate to poor producer trust regarding data governance and access to farm data, and a lack of strong value proposition for some solutions and the way some AgTech players bring products to the market.

> Common AgTech themes for improved decision making processes in agriculture production are:

- Optimising input use efficiencies - variable rate technologies and practices
- Timely decision making process via real time monitoring and remote and proximal sensing
- Increased process automation and labour savings
- Accelerating genetic gains through data
- Improved market access via traceability and product assurance
- Improving biosecurity systems (reducing pest influence and loss)

> A report from Earnest and Young (Agriculture Innovation- A National Approach to Grow Australia's Future) highlighted 5 key recommendations to supporting ag innovation:

- Strengthening the innovation ecosystem and its leaderships and cohesion.
- Increasing funding and investment (mix of public and private funding)
- Scale up and better communication innovation practices and ideas
- Strengthening regional inputs and ensuring decisions which are fit for purpose - bottom up planning approach
- Ensuring innovation platform is created – hard and soft infrastructure

> The importance of technology and innovation in the agriculture sector in Queensland is demonstrated by the number of industry and government AgTech development strategies and programs in place. For example:

- Grains – focus toward block chain technology and real time protein mapping that is able to support better understanding of crop inputs and impacts toward production yield and industry strategies and initiatives.
- Cotton – focus toward use and adoption of crop monitoring sensors and their link to production. e.g. moisture probes.
- Sugar – Use of sensors and smart connected technologies to support data analysis and decision support tools.
- Horticulture – automated crop health monitoring, weed management, sensors, robotic harvesting and packing.
- Red Meat – MLA developed its Digital Value Chain Strategy, which seeks to integrate and interpret data within the livestock industry and thus connect supply chain stakeholders via open data. Other opportunities relating to automated ability measure carcass composition and measure and differentiate between meat, fat and bone, thus providing for processor to producer feedback.
- The Australian Government has invested $75 million in the Cooperative Research Centre on Developing Northern Australia and further funding to small business to collaborate with researchers to commercialise innovation through its Entrepreneurs' Program.

> Private AgTech entities have successfully launched robotics technology using drones and high tech application equipment that is now inspiring others to develop and commercialise their innovative ideas.

> Various industry groups have launched innovation in recognition that there is a wide range of new technologies and research outcomes that have potential to improve rural producer profits or sustainability.

MIW opportunities:

> The MIW region is highly innovative and has proven success in the METS sector, with the ability to complement the agricultural sector through current plans for an Innovation Hub and opportunity to facilitate building partnerships for applied research between CQU, JCU and industry.

> The proposal to build the 'Sondella' meat processing plant near Moranbah is innovative and a potential game-changer for the region, offering a new blueprint for value-added processing.

> The horticulture processing plant being investigated by the Bowen Gumlu Growers Association in collaboration with BCE and other stakeholders will boost innovation in the region with plans to value-add waste into high value exportable products, including bio-actives.

GGWA recommendations to support Strategy focus areas	Planning	Infrastructure	Marketing
G.1 Create a MIW AgTech Working Group to support development of roadmap, studies and investigations leading to investment trade opportunities.	> Investigate and plan for the development of Cropping/AgTech Hub. > Explore the establishment of commodity sector "think tanks" designed to support innovation and continuous improvement.	> Development toward an Agribusiness Centre of Excellence supporting cropping systems innovation, research and development.	> Work with existing innovation groups and stakeholders to help them promote agribusiness innovation
G.2 Develop a MIW roadmap to create a shared vision for MIW agriculture innovation – include a consultation process with regional stakeholders. Key areas of focus include: > Improving adoption of research outcome, including faster commercialisation of products. > Increasing private and foreign investment in MIW research and AgTech development. > Optimising regional research and development investment – targeting of activities. > Improving collaboration across ag innovation systems and reducing duplication. > Comparing MIW region to other regions via case studies			

5.8 Transport & Logistics

Global context:

> Increased demand for exports requires an efficient transport and logistics service to deliver products safely, cost effectively and on time.

> With consumers demanding sustainability of food produced, reduced 'food miles', lower energy use and greenhouse gas emissions, opportunities to identify quicker supply routes will be rewarded in the value chain.

Australian and Queensland context:

> Australia has underutilised capacity and needs to upgrade infrastructure to take advantage of export and import opportunities.

> The White Paper on Developing Northern Australia highlighted that infrastructure plays an integral role in unlocking economic opportunities globally, nationally and especially in the north. The government has allocated funding to high priority infrastructure.

Funding relevant to the MIW region includes: a $100 million beef roads fund to help improve cattle supply chains and the $5 billion Northern Australia Infrastructure Facility (NAIF), providing concessional loans for infrastructure in the north and supporting projects prioritised on the new infrastructure pipeline. In addition, the federal and state governments continue to make investment toward roads infrastructure.

> TraNSIT modelling developed by CSIRO has been used extensively by government and industry to assess needs, efficiencies and impacts.

> As of May 2018, a review of the Heavy Vehicle National Law was agreed to by transport ministers. An expert panel has been created to engage with stakeholders in regard to the review. The purpose of the review is to deliver a modern, outcomes-focused law regulating the use of heavy vehicles that can improve safety for all road users, support increased productivity and innovation, simply administration and enforcement law, support use of new technologies and provide flexible and outcome-focused compliance.

> Under legislation in Queensland, heavy vehicle access to farms requires pre-approval and permits to access for pickup/drop off loads. This has caused significant disruption to operations and currently involves advocacy from Agforce and other industry peak bodies to negotiate a workable solution with DTMR.

MIW opportunities:

> A focus on exporting high value products including aquaculture, beef and horticulture requires significant planning and investment in transport and logistics. As a start GGWA in collaboration with NQBP have commissioned a CSIRO TraNSIT study for the MIW region.

> A central distribution hub in the MIW region has been suggested in various reports and studies and should be reviewed again after completion of the TraNSIT report.

> Airport could become important for facilitating exports of high value products, e.g. chilled beef, horticulture and value-added products to key destinations.

> Containerisation of agriculture products from port facilities in partnership with NQBP, providing a coastal shipping service if proof of concept trials indicate financial viability.

> Establishing a Transport and Logistics Taskforce or Working Group, similar to one previously operating in the Fitzroy region, would enable issues listed above to be discussed with representatives from DTMR, the transport industry, local government and the agricultural industry to help find solutions and resolve issues.

GGWA recommendations to support strategy focus areas	Planning	Infrastructure	Marketing
H.1 Establish a 'Transport and Logistics Working Group' to prioritise and accelerate the progress of finding solutions to current T&L needs, including containerisation of grain to Asia, air freight for chilled and branded high value beef products, aquaculture and live fish products, investigate impact of the heavy vehicle access regulations on farmers/producers and investigate the feasibility of a central distribution hub.	> Understand the strengths, weaknesses, opportunities and barriers to freight transport efficiency improvement from, to and through the MIW region for the major agribusiness products. > Extrapolate findings from the MIW Agribusiness Export Hub Study to evaluate freight solutions. > Review and validate heavy vehicle access regulations and their impact toward reducing productivity.	> Evaluate the suitability and viability of a central distribution hub in the MIW region aligned to the Export Study recommendations. > Consider the opportunities aligned to a Nth Australia Hub centre and how MIW region is able to utilise this infrastructure to support increased regional export.	> Promote the MIW Agribusiness Export Hub Study findings.

5.9 Water Security

Global context:

> Climate change is having an impact on weather scenarios across the globe with water becoming a key enabler for agriculture. Water security is of high priority for the production of food to feed the world.

Australian context:

> 'Our North, Our Future: White Paper on Developing Northern Australia' highlighted the importance of developing water infrastructure in Australia to:

- Support increased agricultural production
- Provide greater certainty for investment
- Support Indigenous economic development

> This report also highlighted water infrastructure projects aligned with the Federal Government's National Water Infrastructure Development Fund priorities to support greater investment in water infrastructure over the long term based on stated principles.

MIW opportunities:

> The need for new water infrastructure in the MIW region as an enabler for growth in agriculture was highlighted by most stakeholders engaged during the GGWA project.

> The GGWA Steering Committee recognise the importance of collaboration across the MIW region to identify and prioritise strategic infrastructure needs. The need to undertake a project like the 'Fitzroy Industry and Infrastructure Study' (FIIS) was identified to ensure that the water needs across the region are prioritised according to objective data sourced from cross-sector stakeholders and at all levels of government. It is understood that the FIIS report (2008) is still an effective and objective guide for identifying current water infrastructure needs in CQ.

> Detailed documents have been prepared over the past 10-15 years relating to water infrastructure needs identified by various organisations and groups in the MIW region. Detailed documentation is available relating to:

- Connor River Dam
- Elliott Main Channel
- Urannah Dam – pre feasibility study
- Burdekin Dam

> Other documents or discussion items considered relevant to this area include:

- Central Queensland Regional Water Supply Strategy, Queensland Government (2006)
- Engineers Australia Draft Queensland Water Strategy Framework (discussion document only)
- Various reports collated by BCE advocating for water infrastructure for Bowen

> The potential for a Regional Water Supply Strategy was discussed at a WROC meeting in May/June 2017 with all councils supportive of the idea and the need to manage the politics and conflicting positions regarding water security solutions for the region. GGWA suggest that appointing an organisation such as CSIRO may lead to the most objective outcome to assist future planning.

GGWA recommendations to support strategy focus areas	Planning	Infrastructure	Marketing
I.1 Establish a 'Regional Water Supply Strategy Working Group' to scope out, investigate and progress at a strategic regional, state and federal level a regional water supply study to meet current and future needs. This work will consider the detailed work already undertaken, including but not limited to Urannah Dam, Elliott Main Channel and Connors River. **I.2** Support an independent regional water supply study to be completed and build this into a MIW water security plan.	> Complete an independent regional water supply study and build this into a MIW water security plan.	> Support proponents in the development of prefeasibility and feasibility studies for water infrastructure.	> Support current water development proponents and their applications for water infrastructure in the MIW region.

5.10 Workforce including Education and Training

Global context:

> Australia's workforce is one of the most educated, multicultural and multilingual in the world.

> Australian farmers are recognised for their innovation and success, farming in some of the most challenging weather conditions on the globe.

> Globally, Australia is recognised for having a highly skilled and knowledgeable workforce within general farming, VET, undergraduate and postgraduate and research and science disciplines.

> Advancement of AgTech and associated farm level adoption of innovation, AI, robotics, automation within precision agriculture is ocurring at rapid pace. Driving this is the sector's need for lower costs, reduction in waste, increases in production, product quality control, and the ability to sell within a discerning market and buyers seeking farm to plate transparency on what is consumed.

Australian and Queensland context:

> According to the Australian Bureau of Statistics (2013), there are approximately 176,419 businesses across agriculture, horticulture agricultural product, wholesaling, parks and garden operations. Over 69% of the businesses were non-employing and 29% were small businesses employing fewer than 20 people.

> Agriculture Australia has identified that the agricultural workforce is shrinking and ageing. According to NFF, Australian agriculture faces an immediate and ongoing labour shortfall. They identify the need for greater clarity around skilled, on-farm job roles and continuing development opportunities for workers as a strategic route to doubling the number of current graduates by 2030. The job market for graduates is currently larger than the supply of graduates, with estimates suggesting that in some situations there could be a discrepancy of up to five times, emphasising the complex and challenging contexts in which the agricultural industries operate.

> The agricultural labour force is ageing, with the average age of a farmer 17 years older than the average worker. As at the 2016 Census of Population and Housing, 47 per cent of workers were over the age of 50 years. Furthermore, the proportion of people over 60 years increased by around three per cent when compared with 2006 data.

> The NFF Roadmap 2030 notes Australia's current poor performance in innovation based on a comparison with OECD countries. Australia currently ranks 76th among OECD countries for innovation efficiency, and there is a gap between research and the ability to translate research into practical impacts at production level. Agricultural science, including agronomy, has been identified as an occupation on the Skills Shortage list.

> China's Belt and Road Initiative is likely to have major impacts in many fields, including those covered in the AHC training package. The basis for the Belt and Road program is to create transport corridors through both land and sea routes to deliver economic, scientific and technological development across Asia, Europe, Africa and the pacific region. According to a 2018 horizon scan of emerging issues for global conservation and biological diversity, an analysis of official documents identifies that conservation and ecological protection may diminish in the face of investment in huge infrastructure projects, thus increasing the risks of ecological changes and disease transmission, as well as opening potential for illegal trade in endangered and non-native species. The Belt and Road program does include an ambition to create a big-data platform for environmental protection and is designed to support projects to combat climate change, however these are not emphasised in the current implementation.

> Since 2001, there has been a trend of declining enrolment in higher education qualifications in agricultural science and related fields, contributing to a shortage of qualified professionals in the agriculture sector. Data from the Department of Education, Employment and Workplace Relations (DEEWR) specifically related to agriculture qualifications shows that over the last decade, enrolments in agriculture have declined by over 60%.

> The agriculture, horticulture, conservation and land management sector employs 350,000 people with more than 72,000 learners, serviced by 643 RTO's, (2017 figures via AISC)

> The AHC Training Package has 882 Units of Competency across 97 qualifications and 53 unit sectors. There are 49 skill sets currently in the Training Package. The former AHC10 Training Package was superseded by the current AHC Training Package in June 2016. While the training package has been reviewed to meet National Training Package Standards, many components within the package have not been reviewed for content, new job roles and new skills requirements for more than seven years.

MIW opportunities:

> The Bowen Basin Regional Jobs and Investment Package, assisted the region in identifying opportunities toward diversifying the regional economy, creating local jobs, and growing skills in the local workforce. Following consultation, the Bowen Basin Local Planning Committee identified the following as the six priority areas that are most likely to catalyse, stimulate, diversify and grow our regional economy:

1. Aged Care, Allied Health and Social Assistance
2. Education
3. Energy and Biofutures
4. Engineering and Heavy Industrial
5. Food and Agribusiness
6. Tourism

> All six priorities have a direct or indirect relationship with the agribusiness sector, however, the food and Agribusiness priorities are most aligned to GGWA initiatives, including:

a. Increased ability to value-add (processing, packaging/transport etc) to agricultural product
b. Improved digital connectivity that allows agribusinesses to take advantage of new technologies
c. Increased access to water efficient technology to reduce costs and increase productivity
d. Increased innovative technology that leads to productivity gains
e. Improved supply chain connectivity that allows for export of agricultural product

> Resources available in the MIW region include:

- CQUniversity (CQU) campus in Mackay with links to Future Farming Institute and Centre of Excellence – Precision Agriculture, Rockhampton
- QUT Mackay Renewable Biocommodities Pilot Plant
- James Cook University (JCU)
- Rural Skills Alliance
- Gateway Schools Program
- Queensland Agricultural Workforce Officer (located in Canegrowers building)

GGWA recommendations to support strategy focus areas – planning, infrastructure and marketing:	Planning	Infrastructure	Marketing
J.1 Support an independent regional water supply study to be completed and build this into a MIW water security plan.	> Undertake regional analysis for commodity sectors assessing the issues impacting on workforce operations and availability to support production. > Align regional workforce planning to broader state and national findings and thus integrate local solutions within state and national programs and policies.		> Promote regional analysis and state and national workforce study findings.

Appendix 1: Abbreviations & Acronyms

ABARES	Australian Bureau of Agricultural and Resource Economics and Science
ABS	Australian Bureau of Statistics
ACFA	Australian Cane Farmers Association
ALFA	Australian Lot Feeders' Association
ALGA	Australian Lychee Growers Association
AISC	Australian Industry Skills Committee
AMIA	Australian Mango Industry Association (AMIA)
AQIS	Australian Quarantine Inspection Services
ASMC	Australia Sugar Milling Council
BBS	Beef Breeding Services
BCE	Bowen Collinsville Enterprise
BENI	Belyando Enterprise Network Inc.
BGGA	Bowen Gumlu Growers Association
CCA	Cattle Council of Australia
CHDC	Central Highlands Development Corporation
CHRRUP	Central Highlands Regional Resource Use Planning Cooperative Ltd
CQU	CQUniversity Australia
CRC-NA	Cooperative Research Centre (CRC) for developing Northern Australia
CS	Catchment Solutions
DAF	Department of Agriculture and Fisheries
DES	Department Environment and Science
DESBT	Department Employment, Small Business and Training
DMLA	Diversify Mackay Leadership Alliance
DNRME	Department of Natural Resources, Mines and Energy
DSDMIP	Department of State Development, Manufacturing, Infrastructure and Planning
DSDMIP MIWRO	DSDMIP, Mackay-Isaac-Whitsunday Regional Office
DITIDCG	Department of Innovation, Tourism Industry Development and the Commonwealth Games
DTMR	Department of Transport and Main Roads
ECA	Export Council Australia
FIAL	Food Innovation Australia Ltd (prior to FIAL)
Finance	Accountants, Banks, Investors etc
FIRB	Foreign Investment Review Board
FLA	Food Leaders Australia
GBR	Great Barrier Reef
GDP	Gross Domestic Product
GGWA	Growing Greater Whitsunday Agrifood
GVP	Gross Value of production
GW3	Greater Whitsunday Alliance
GWFN	Greater Whitsunday Food Network
HIA	Horticulture Innovation Australia
IRC	Isaac Regional Council
JCU	James Cook University
LiveCorp	Australian Livestock Export Corporation Ltd
MA	Mackay Airport
METS	Mining, Equipment, Technology and Services
MIH	Mackay Innovation Hub/Spit Spaces
MLA	Meat and Livestock Australia
MRC	Mackay Regional Council
NAC	National Aquaculture Council
NAIF	Northern Australia Infrastructure Fund
NFF	National Farmers' Federation
NQBP	North Qld Bulk Ports
QTLC	Queensland Transport and Logistics Council
QFF	Queensland Farmers' Federation
ONA	Office of Northern Australia
QRAA	Qld Rural Adjustment Authority (QRIDA from 1 July 2017)
QRIDA	Qld Rural and Industry Development Authority (previously QRAA)
QUT	Qld University of Technology
RCL	Reef Catchment Limited
RCS	Resource Consulting Services
RDA	Regional Development Australia
R&D	Research & Development
RD&E	Research, Development & Extension
RMAC	Red Meat Advisory Council Ltd
SEGRA	Sustainable Economic Growth for Regional Australia
T&L	Transport & Logistics
TIQ	Trade & Investment Qld
TSBE	Toowoomba & Surat Basin Enterprise
WCA	Whitsunday Coast Airport (Proserpine)
WRC	Whitsunday Regional Council
WWF	World Wide Fund for Nature
UQ	University of Queensland

Appendix 2: References

1. General Economic and Agriculture resources

- ABARES, About My Region - Mackay Queensland, 2016. Accessed from http://www.agriculture.gov.au/abares/Pages/qld-mackay.aspx

- Australian Government, Our North, Our Future, White Paper on Developing Northern Australia, 2015. Accessed at http://northernaustralia.gov.au/search/content/north%20australia%20white%20paper

- Australian Government, Agricultural Competitiveness White Paper: Stronger Farmers – Stronger Economy, 2015. Accessed from http://agwhitepaper.agriculture.gov.au/

- Deloitte, Positioning for prosperity? Catching the next wave, 2014. Accessed from https://www2.deloitte.com/au/en/pages/building-lucky-country/articles/positioning-for-prosperity.html

- Diversify Mackay Leadership Alliance – Agriculture Pillar Group. Various reports submitted to DMLA, 2015

- Gaddie Pitch Technique: https://www.youtube.com/watch?v=6lzj9aqfw4U&feature=youtu.be

- Queensland Government, Queensland AgTrends 2016-17, Forecasts and trends in Queensland agricultural, fisheries and forestry production, 2017. Accessed from https://www.daf.qld.gov.au/business-trade/agtrends

- RDA, Mackay-Isaac-Whitsunday Agricultural Overview, 2016. Accessed at www.rdamiw.ogr.au/

- RDA, Regional Roadmap Mackay-Isaac-Whitsunday 2013-2016. Accessed from http://inform.regionalaustralia.org.au/process/regional-development-processes/item/rda-mackay-isaac-whitsunday-qld-regional-roadmap-2013-2016

- RDA, Rural Futures Statement, 2012. Accessed at http://www.rdamiw.org.au/projects-1/rural-futures-project

- REDC, Regional Report Card, Mackay-Isaac-Whitsunday: Five years in focus 2016-2011. Accessed from http://winston.com.au/images/stories/winston/news-pdf/regional_report_card_2012_electronic.pdf

2. Agritourism

- SEGRA, Mackay Isaac Whitsunday Food & Agritourism: Creating a Farm to Plate Value Chain in MIW, SEGRA Spotlight 9 – Food Industry Innovation, presentation by Debra Howe, 2016. Accessed from http://2016.segra.com.au/perch/resources/debra-howe-spot9.compressed.pdf

- Banana Regional Council, Banana Shire Industry Summit Report: Capturing more of the Drive Market – How to get your share, 11 October 2016

- ABC Rural, Greater Whitsunday food project takes next step to establish region as a culinary hub, 22 Oct 2015. Accessed from http://www.abc.net.au/news/rural/2015-10-22/greater-whitsunday-food-network-ready-for-next-steps/6875286

- The Morning Bulletin, Dishing up the region on a plate – Mackay foodies put local produce on the menu, The Morning Bulletin, 20 May 2017

- EDA, 2015 International Study Tour by Economic Development Australia to USA, presentation by Christopher Holen, Baked Alaska Astoria Oregon USA: Creative place making process, EDA Conference Townsville, March 2016

3. Aquaculture:

- Australian Government, Scaling Up – Inquiry into Opportunities for Expanding Aquaculture in Northern Australia, Joint Select Committee on Northern Australia, 2016. Accessed from http://www.aph.gov.au/Parliamentary_Business/Committees/Joint/Former_Committees/Northern_Australia/Aquaculture/Report

- ABC Rural, From tank to plate: Outback pub serves up meals from aquaponics system, 12 July 2017. Accessed from http://www.abc.net.au/news/2017-07-12/aquaponics-in-the-outback/8696414

- Queensland Government, Media release: Aquaculture report released. Accessed from http://statements.qld.gov.au/Statement/2016/4/22/aquaculture-report-released

- Guthalungara Project overview , Accessed from http://www.statedevelopment.qld.gov.au/assessments-and-approvals/guthalungra-aquaculture.html

- Seafarms, Northern Australia Investment Forum, 2015. Accessed at http://seafarms.com.au/northern-australia-investment-forum/

- DAF, Bowen-Burdekin Aquaculture Precinct. Various references are included in report.

4. Beef

- DAF, Queensland's Contribution to Australia's Beef Production, Ross Dodt, Industry Development Officer, Mackay, 2017 (available on request)

- ABC Rural, Installation of new x-ray technology in abattoirs replaced with smaller trial in face of industry rejection, 22 May 2017. Accessed from http://www.abc.net.au/news/rural/2017-05-22/meat-livestock-australia-forced-to-abandon-big-tech-rollout/8546894

- CHRRUP, Chosen Change – Making the Most of opportunities, presentation by Nigel Tomkins, MLA, Research, Development & Innovation March 2017

- Beef Cooperatives: Steak Your Place Industry Forum program, Charters Towers 25 May 2017

- MLA, Feedback, Innovation: Where are the global food trend opportunities?, November/ December 2016

- Business Bundaberg, New $14.9m funding boost for farm and food economies, 30 September 2016. Accessed from http://businessbundaberg.com.au/News/new-149m-funding-boost-for-farm-and-food-economies-49184

- Cattle Council of Australia, Move to value chain thinking a step closer with funding boost, Media Release 14 April 2016

- Arcadian Organic Meat, Accessed from http://www.arcadianorganic.com.au/our-story/

- CQUniversity, Livestock Centre of Excellence led by Professor David Swain. Accessed from https://handbook.cqu.edu.au/profiles/view/1091

- 2015 Banana Shire Beef Industry Summit program: How Changes will strengthen the Industry

- Beef Australia, Beef 2015: Handshakes Program Participants & Trade Fair Exhibitors

5. Biofutures

- Queensland Government, Media Release: Government injects $8.64 million into new biorefinery and jobs for Mackay, 9 June 2017. Accessed from http://statements.qld.gov.au/Statement/2017/6/9/government-injects-864-million-into-new-biorefinery-and-jobs-for-mackay

- Queensland Government, Advance Queensland Biofutures 10-Year Roadmap and Action Plan, 2016. Accessed from http://www.statedevelopment.qld.gov.au/resources/plan/biofutures/biofutures-10yr-roadmap-actionplan.pdf

- Mackay Regional Council, International Energy Agency Bioenergy – Task 42 Biorefineries Mackay visit, 16-19 November 2016. Itinerary and background accessed from MRC.

- Queensland Government, D Sands, DAFF, Pre-feasibility study of the commercial viability of a Central Queensland Multi-crop Oilseed processing facility and its impact on grower returns, 2015

- Deloitte Access Economics, Economic impact of a future tropical bio-refinery industry in Queensland, 2014. Accessed from https://cms.qut.edu.au/__data/assets/pdf_file/0004/482728/ife-biorefinery-report.pdf

6. Branding – Regional, products etc

- SEGRA, Mackay Isaac Whitsunday Food & Agritourism: Creating a Farm to Plate Value Chain in MIW, SEGRA Spotlight 9 – Food Industry Innovation, presentation by Debra Howe, 2016. Accessed from http://2016.segra.com.au/perch/resources/debra-howe-spot9.compressed.pdf

- Mackay Isaac Whitsunday Food & Agritourism: Creating a Farm to Plate Value Chain in MIW, SEGRA Spotlight 9 – Food Industry Innovation, presentation by Debra Howe, Oct 2016

- Reef Catchments Grazing Forum: Building a Regional Food Brand, presentation by Deb McLucas, President – Greater Whitsunday Food Network Inc, March 2016

- ABC Rural, Greater Whitsunday Food Network president Deb McLucas discusses the committee's priorities, 22 October 2015. Accessed from http://www.abc.net.au/news/rural/2015-10-22/greater-whitsunday-food-network-president-deb-mclucas-on-project/6875306

7. Energy Security

- Commonwealth Government, Independent Review into the Future Security of the National Electricity Market, Dr Alan Finkel, June 2017. Accessed from http://www.environment.gov.au/energy/national-electricity-market-review

- ABC Rural, Powering the bush: Problems and solutions in rural Western Australia, 12 June 2017. Accessed from http://www.abc.net.au/news/rural/2017-06-12/powering-the-bush-problems-and-solutions-in-western-australia/8598768?WT.mc_id=newsmail&WT.tsrc=Newsmail

8. Exports

- Queensland Government, Queensland Trade & Investment Strategy 2017-2022, March 2017. Accessed from https://www.tiq.qld.gov.au/ti-strategy/

- Austrade North Asia Free Trade Agreements Seminar program, Mackay (12 May 2017):Korea (KAFTA); Japan (JAEPA) and China (ChFTA)

- Export Council of Australia, 2017 Trade Policy Recommendations: A prosperous future for all Australians through international trade, March 2017. Accessed from http://www.export.org.au/trade-policy/trade-policy-recommendations

- Australian Government, Media release: Promoting Australian Horticulture in Indonesia, 8 March 2017. Accessed from http://minister.agriculture.gov.au/hartsuyker/Pages/Media-Releases/promoting-australian-horticulture-in-indonesia.aspx

China:

- ABARES Outlook Conference 2014, What China wants: Analysis of China's food demand to 2050, Research by the Australian Bureau of Agricultural and Resource Economics and Sciences, 2014. Accessed from http://data.daff.gov.au/data/warehouse/9aat/2014/WhatChinaWants/AnalysisChinaFoodDemandTo2050_v.1.0.0.pdf

- DAF, Matrix - possible fruit exports to China (from Bowen)

9. Grains

- Austrade, Austrade Australian Grain Mission 2016 program & Korea market insight Feb 2016

- Queensland Government, Grains 2020: Modernising grains research, development and extension in Queensland, DEEDI, 2010

- Food Leaders Australia, Asian food trends add grain to the mix, FLA eNewsletter, 9 February 2017. Accessed from http://www.foodleadersaus.com.au/news

- Austrade, Media release: Chinese grains mission sows golden opportunity, 14 Sept 2015. Accessed from https://www.austrade.gov.au/news/media-releases/2015/chinese-grains-mission-sows-golden-opportunity

- Queensland Transport & Logistics Council, Supply Chain Perspective, 2013. Accessed from http://www.qtlc.com.au/wp-content/uploads/2013/01/QTLC-Supply-Chain-Perspective_Grain.pdf

10. Horticulture

- Australian Government, Media release: Promoting Australian Horticulture in Indonesia, 8 March 2017. Accessed from http://minister.agriculture.gov.au/hartsuyker/Pages/Media-Releases/promoting-australian-horticulture-in-indonesia.aspx

- Queensland Government, Media release: Queensland horticulture eyeing Asian market expansion, 21 February 2017. Accessed from https://www.tiq.qld.gov.au/queensland-horticulture-asian-market/

- Growcom, Hort360 – Presentation on adoption of innovation, 2017

- ABC Rural, Mango innovation drives sweet taste of success for growers, 9 May 2017. Accessed from http://www.abc.net.au/news/rural/2017-05-03/mango-innovation-leads-to-success-growers/8492972

- ABC Rural, Freeze-dried fruit tech to help reduce food waste, increase incomes for farmers, ABC Rural, 9 May 2017. Accessed from http://www.abc.net.au/news/rural/2017-05-08/freeze-dried-fruit-technology-helps-reduce-food-waste/8499204

- ABC Rural, Carnarvon banana growers turn waste into gourmet gelato, ABC Rural, 9 May 2017. Accessed from http://www.abc.net.au/news/rural/2017-05-09/wa-banana-growers-turn-seconds-food-waste-into-gelato/8506234

- DAF, 2016 - Horticultural production estimates for Bowen and Burdekin dry tropics

- DAF, Matrix - possible fruit exports to China (from Bowen)

11. Innovation & Technology:

- Food Leaders Australia,400M AgTech Investment Forum Program, 18 May 2017. Accessed from http://400mforum.com.au/

- AgFutures Innovation & Investment Conference program, 22-23 Nov 2016. Accessed from https://www.tiq.qld.gov.au/event/agfutures-innovation-investment-conference/

- KPMG, Queensland Government and CBA, Powering Growth: Realising the Potential of AgTech for Australia, 2016. Accessed from https://home.kpmg.com/au/en/home/insights/2016/09/powering-growth-realising-potential-agtech-australia.html

- Growcom, Hort360 – Presentation on Hort360 Innovation Coach program, launched by Growcom in 2016, program initiatives for adoption of on-farm technologies

- ABC Rural, Forget Drones, ag innovators told to focus on solving real problems, Sam Trethewey address at 2017 AgTech Investment Forum, Toowoomba, 22 May 2017. Accessed by http://www.abc.net.au/news/rural/2017-05-22/ag-tech/8546282

- ABC Rural, Aussie farmers monitoring cows from space, 20 May 2017 http://www.abc.net.au/news/2017-05-20/aussie-farmers-monitoring-cows-pasture-using-satellites/8518164

- ABC Landline, Farmers plant paddocks in smart houses to safeguard against climate change, by Pip Courtney, 4 March 2017. Accessed by http://www.abc.net.au/news/2017-03-04/farmers-grow-crops-in-greenhouses-prevent-climate-change-effects/8321720

- NSW Business Chamber, Industry Research Collaboration: Discussion paper, 2014. Accessed from https://www.nswbusinesschamber.com.au/NSWBCWebsite/media/Policy/Thinking%20Business%20Reports/Industry-Research-Collaboration.pdf

12. Investment

- Austrade, 'Why Australia Benchmark Report 2017', 2017. Accessed from https://www.austrade.gov.au/International/Invest/Resources/Benchmark-Report

- Food Leaders Australia,400M AgTech Investment Forum Program, 18 May 2017. Accessed from http://400mforum.com.au/

- AgFutures Innovation & Investment Conference program, 22-23 Nov 2016. Accessed from https://www.tiq.qld.gov.au/event/agfutures-innovation-investment-conference/

- K&L Gates and Bentleys, Australian AgInvestment Readiness Forum, 8 August 2017. Accessed from http://klgates.com/australian-aginvestment-readiness-forum-2017-08-08-2017/

- Austrade, Attracting Production Investment in the North, presentation by Chris Rees, Assistant General Manager, Northern Australia Investment, Austrade at 2017 Northern Australia Conference, 2017. Program accessed from https://northaust.org.au/program/17/program17-dna.pdf

- ABC Rural, Rare FIRB speech reveals review process at odds with public sentiment around foreign investment in farmland, 24 June 2017. Accessed from http://www.abc.net.au/news/rural/rural-news/2017-06-22/firb-review-at-odds-with-public-sentiment/8639754?WT.mc_id=newsmail&WT.tsrc=Newsmail (24 June 2017)

13. Isaac Region

- Isaac Regional Council, Northern Australia submission: Response to the Green Paper on Developing Northern Australia, August 2014. Accessed from https://www.bing.com/search?q=isaac%20regional%20council%20northern%20australia%20

14. Mackay Region

- references included in other sections

15. Organic

- DAF, Strengthening Central Queensland Organic Agriculture Workshop program, Rockhampton, 29 July 2016. Accessed from Nancy Rowe, DAF.

- Southern Cross University, Media Release: New Centre for Organics Research planned for Northern Rivers, NSW DPI Collaboration with SCU, December 2016. Accessed from http://scu.edu.au/news/media.php?item_id=15441&action=show_item&type=M

- Arcadian Organic, Accessed from http://www.arcadianorganic.com.au/our-story/

- Philip Conford, Origin of the Organic Movement, 2001. Accessed from https://www.amazon.com/Origins-Organic-Movement-Philip-Conford/dp/0863153364

16. Research, Development & Extension

- Queensland Government, Agriculture and Food Research, Development and Extension, 10-Year Roadmap, Discussion paper for consultation, DAF, June 2017. Accessed from https://www.business.qld.gov.au/industries/farms-fishing-forestry/agriculture/overview/discussion-paper

- CQUniversity, Livestock Centre of Excellence - Professor David Swain: https://handbook.cqu.edu.au/profiles/view/1091

17. Statistics

- ABARES, About My Region - Mackay Queensland, 2016. Accessed from http://www.agriculture.gov.au/abares/Pages/qld-mackay.aspx

- ABS – 7121.0– Agricultural Commodities, Australia, 2014-15

- ABS - 7503.0 – Value of Agricultural Commodities Produced, Australia, 2014-15

- ABS - 4618.0 Water Use on Australian Farms 2014-2015

- REMPLAN – Mackay SD4

- Statistics for Queensland Ports: http://www.tmr.qld.gov.au/Business-industry/Transport-sectors/Ports/Trade-statistics-for-Queensland-ports.aspx

18. Sugar

- Project Catalyst Grower Forum 2017: Innovation beyond 2020 and adopting change, presentations by various speakers, Mackay 26-28 February 2017. Accessed from http://reefcatchments.com.au/land/project-catalyst/

- Central Region Sugar Group, Mackay Isaac Whitsunday – 30 Year Sugar Industry Strategy 2015 – 45, 2015. Accessed from http://asmc.com.au/wp-content/uploads/2015/05/MIW-30-Year-Strategy-4-page-v2.pdf

- Diversify Mackay Leadership Alliance, Agricultural Pillar Group: Value add option for sugar cane, July 2015.

19. Sustainability

- Banana Shire Industry Summit: Sustainable farming program, 8 August 2017. Refer report to be released after event.

- Review Report: Practice change, Education and Extension in Reef Catchments Project, Coutts J&R, May 2017 Draft. Accessed at https://reefextension.couttsjr.com.au/Reef_Extension_Education_Review-DRAFT_May2017.pdf

- Queensland Government, Media release: $4 million to deliver improved water quality for the reef, 18 May 2017. Accessed from http://statements.qld.gov.au/Statement/2017/5/18/4-million-to-deliver-improved-water-quality-for-the-reef

- RCS, RCS Newsletters 2017. Accessed from www.rcsaustralia.com.au

- Enhancing regulations to ensure clean water for a healthy Great Barrier Reef and a prosperous Queensland – Discussion Paper, March 2017. Accessed from http://www.ehp.qld.gov.au/assets/documents/reef/gbr-discussion-paper.pdf

- CHRRUP: 2017 Future Foods & Fibre Conference, Presentation by Dianne Haggerty, WA, March 2017. Accessed by attending the conference.

- Great Barrier Reef Water Science Taskforce, Clean Water for Healthy Reef – Final Report, May 2016. Accessed from http://www.qldwater.com.au/e-flashes-1/great-barrier-reef-water-science-taskforce-final-report

- Climate Sustainability Plan2016 – 2020 Mackay-Isaac-Whitsunday, 2016. Accessed from http://reefcatchments.com.au/files/2016/12/ELECTRONIC_Reef-Catchments_Climate-Change-Plan_FINALlores.pdf

20. Technology & Innovation

- refer above to Innovation & Technology

21. Transport & Logistics

- TSBE, Transport and Logistics Symposium Program, Toowoomba, March 2017

- CSIRO, Transport Network Strategic Investment Tool (TraNSIT), Presentation by Stephen McFallan, CSIRO to GGWA Steering Committee 15 December 2016.

- Department of Transport and Main Roads, Mackay Isaac Whitsunday Regional Transport Plan: Workshop Summary, November 2016

- Toowoomba Regional Council, Agricultural Transport & Logistics Forum Program, Toowoomba, October 2016

- Graincorp, Securing grain rail for Queensland Project Regeneration – CQ Presentation, 2016

- Queensland Government, 7th Annual Queensland Transport Infrastructure Conference Program, May 2016

- CQ Transport and Logistics Taskforce, Transport Impediments Status Central Queensland Transport Draft 1, 2015

- NQBP, Your Ports Environmental Report 2015

- Diversify Mackay Leadership Alliance (DMLA): Agricultural Pillar Group, Issues and potential solutions for progressing coastal shipping in Queensland, 2015

22. Water Security

- WMDL & BCE, Whitsunday Region Growth Corridor: Water – Energy – Land – Growth, A vision for Economic Development in the Whitsunday Region based Water Infrastructure, Energy, Industrial Land and Irrigated Agriculture, April 2014.

- Facts Sheet: Elliot Main Channel: A vision for Economic Development in the Whitsundays based on Water infrastructure, Energy, Industrial land and Irrigated agriculture

- Sunwater, SunWater discontinues work on Connors river Dam and Pipelines Project, 2012. Accessed from http://www.sunwater.com.au/about-sunwater/media-room/latest-news/latest-news/2012/sunwater-discontinues-work-on-connors-river-dam-and-pipelines-project

- Sunwater, Water for Bowen project not proceeding, 2011. Accessed from http://www.sunwater.com.au/about-sunwater/media-room/latest-news/latest-news/2011/water-for-bowen-project-not-proceeding

- Queensland Government, A Benefit Cost Analysis of the project: "Water for Bowen", Innovation and Biosecurity Investment, Department of Primary Industries and Fisheries, 2008

- Queensland Government, Central Queensland Regional Water Supply Strategy, 2006.

- Bowen Collinsville Enterprise, Smart Water for the Smart State – Urannah Dam – Water for the New Millennium, 2002

23. Whitsunday Region

- WMDL & BCE, Whitsunday Region Growth Corridor: Water – Energy – Land – Growth, A vision for Economic Development in the Whitsunday Region based Water Infrastructure, Energy, Industrial Land and Irrigated Agriculture, April 2014.

- Queensland Government, Bowen Gumlu Agricultural Precinct (BGAP) – Part 1 & 2 – Commodity Analysis, TJ Mullins, Industry Development Officer, DAF, Bowen Research Facility, 2016

- 2016 – Horticultural production estimates for Bowen and Burdekin dry tropics (Version 4), 2016

- DAF, ABS stats – Vegetable production in the Mackay Statistical area, 2016

- DAF, Matrix - possible fruit exports to China

- DAF, Bowen-Burdekin Aquaculture Precinct

- Agricultural Values Assessment, Department of Agriculture, Fisheries and Forestry, 17 April 2014

24. Workforce

- Commonwealth Government, Regional Jobs and Investment Packages – Program Guidelines, March 2017. Accessed from http://regional.gov.au/regional/regional-jobs-investment-package/

This report would not have been possible without the ongoing guidance, collaborative thought leadership and support from our Steering Committee, and other key industry stakeholders.

Steering Committee

- **Paul Walmsley**
  Queensland Department of Agriculture and Fisheries
- **Amanda Camm**
  Mackay Regional Council
- **Darren Moore**
  Queensland Department of Natural Resources Mines and Energy
- **Patrick Ruettjes**
  Queensland Department of State Development, Manufacturing, Infrastructure and Planning
- **Mike Brunker**
  Whitsunday Regional Council
- **Kylie Porter**
  Greater Whitsunday Alliance
- **Robert Cocco**
  Regional Development Australia Mackay Isaac Whitsunday
- **Geoff Bethel**
  Isaac Regional Council
- **Helen Newell**
  Queensland Department of Agriculture and Fisheries
- **Stephen Smith**
  Queensland Department of Agriculture and Fisheries
- **Sam Tarlinton**
  Queensland Department of Natural Resources Mines and Energy
- **Amanda Lavarack**
  Queensland Department of State Development, Manufacturing, Infrastructure and Planning

Regional Development Australia
MACKAY-ISAAC-WHITSUNDAY QLD

Regional Development Australia
Mackay-Isaac-Whitsunday

PO BOX 1877, Mackay Qld 4740
T: 07 4957 6160
E: projects@rdamiw.org.au

www.rdamiw.org.au

Regional Development Australia
MACKAY-ISAAC-WHITSUNDAY QLD