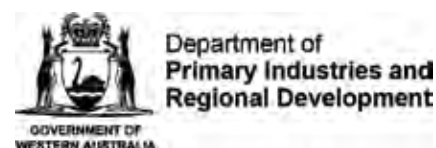




Annual Report 2018/2019

**Growing capacity, brokering partnerships
and delivering for Northern Australia**

The CRCNA acknowledges the support of our government partners.



The CRCNA acknowledges and pays respect to the Traditional Custodians of the lands across Australia on which our project participants, research stakeholders and Members live and work, and to their Elders, past, present and future. We pay respect to the Wulgurukaba and Bindal people as the Traditional Custodians of the land on which the CRCNA's head office stands.

Disclaimer

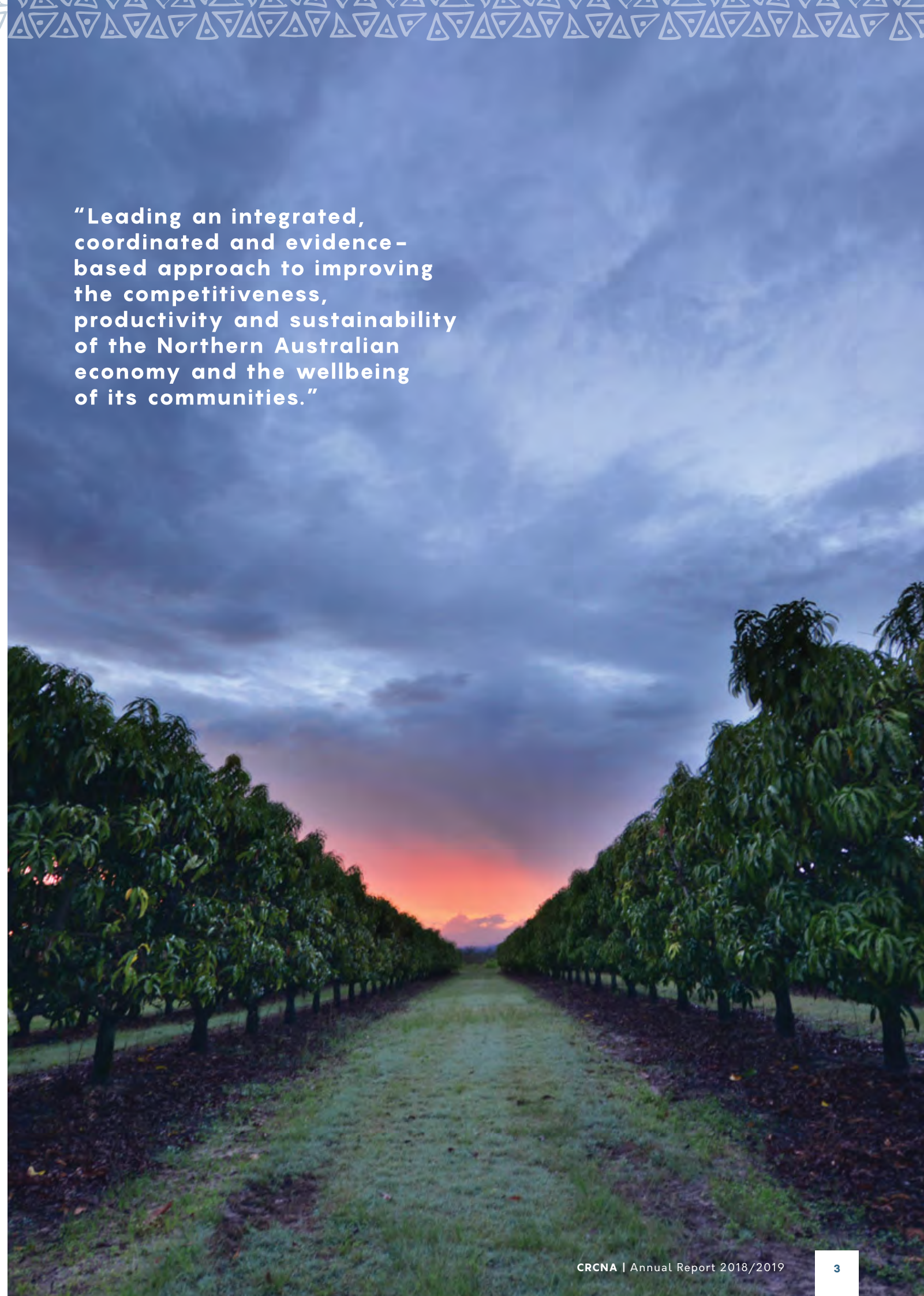
This report summarises the research activities and achievements of the Cooperative Research Centre for Developing Northern Australia (CRCNA), up until and including 30 June 2019.

Figures and project participants may have changed from the time this document was written and published. Current information about the CRCNA and our projects is available at www.crcna.com.au.

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"Leading an integrated, coordinated and evidence-based approach to improving the competitiveness, productivity and sustainability of the Northern Australian economy and the wellbeing of its communities."



Minister's foreword



**Hon. Senator
Matthew Canavan**

Minister for Resources
and Northern Australia

Northern Australia has abundant resources of all kinds. It has rich soils and plentiful water that can underpin the expansion of the agricultural and food industries. The north is also Australia's tropical region and has world-class clinical and research facilities that specialise in tropical medicine.

The future is bright for these industries given the predicted economic growth in the Indo-Pacific region over the next few decades.

For that reason, the Australian government is focused on developing the north for the benefit of all Australians. We have invested in a special focus on food, agriculture and northern health service delivery through the Cooperative Research Centre for Developing Northern Australia (CRCNA).

The CRCNA was established to support industry-led research projects in food, agriculture and northern health service delivery and continues to make great progress supporting these objectives.

In June 2019 the Minister for Industry, Science and Technology, the Hon Karen Andrews and I announced the outcomes of an important piece of research which examined the market and supply chain issues facing the agricultural sector in North Queensland.

The study, commissioned by participants in the CRCNA, identified more than \$3 billion in unmet global demand for products grown in North Queensland and highlighted opportunities for up to 2,000 new jobs.

The CRCNA's work aims to unlock economic benefits for Australia through practical partnerships between researchers and industry that lead to commercialisation. Already, the North Queensland Agricultural Market and Supply Chain Study has led to the formation of the North Queensland Agricultural Supply Chain Alliance which will work collectively to identify and progress new agricultural supply chain projects across the region.

The CRCNA is also exploring the development of a sustainable agribusiness model for traditional Australian medicinal plants. This \$1 million, 18-month research and commercial partnership has the potential to lead to Indigenous workforce opportunities, sustainable regional development and the export of uniquely Australian products.

There remains lots more to do to support the development of Northern Australia and the CRCNA continues to play an important part in developing Northern Australia.

"Delivering high-impact research which grows the economy, employment, skills and wellbeing of Northern Australian communities."

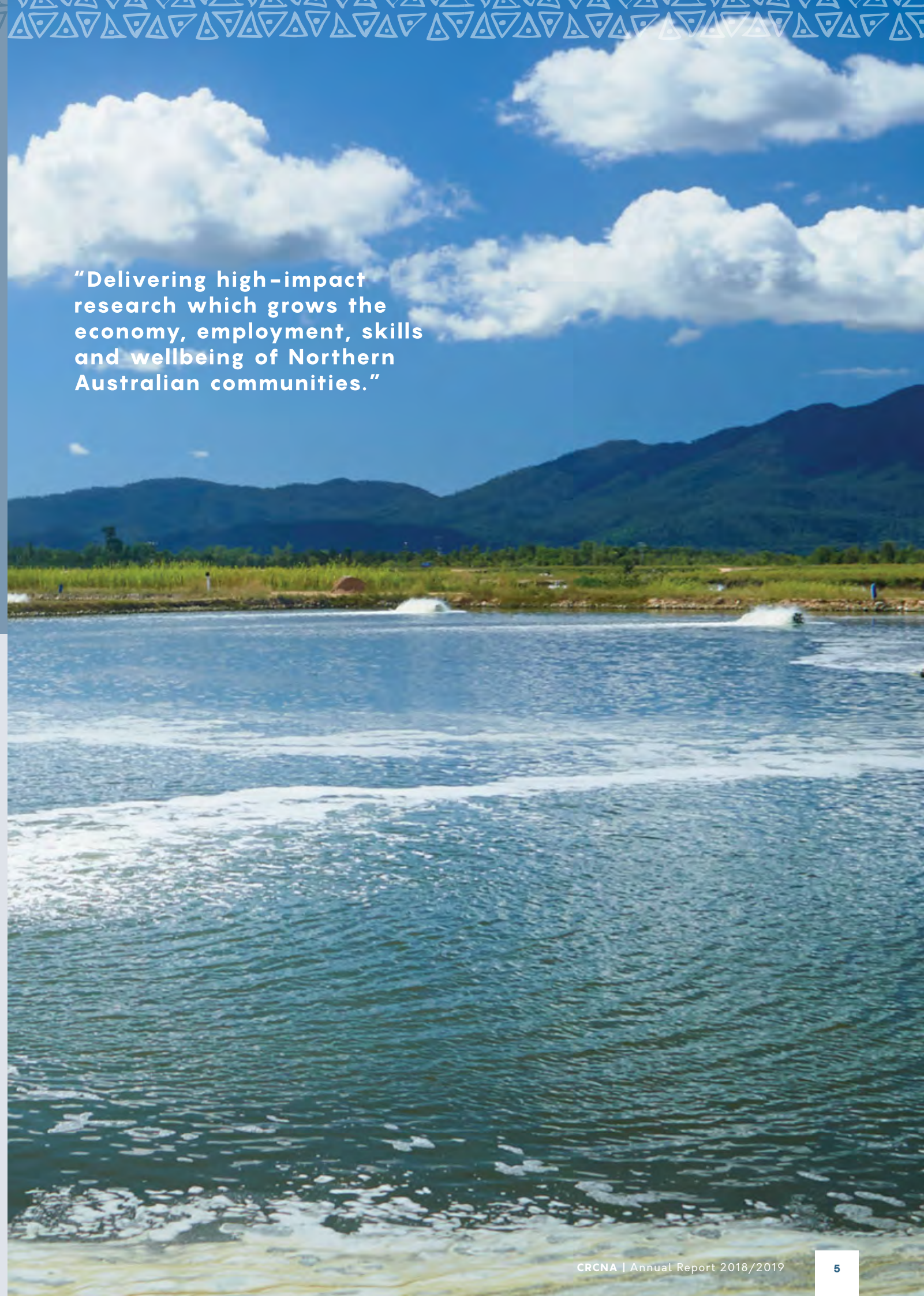


Table of contents

Chair's report	7
CEO's report	8
Strategic intent	10
Current research focus areas for Northern Australia	11
Area of operation and research locations	12
2018/19 highlights	14
Initial investment prioritisation	16
Research programs	17
Research program 1: Building potential in Northern Australia	18
Case study 1: North Queensland Agricultural Market and Supply Chain Study	20
Case study 2 : Northern Australia aquaculture situational analysis study	22
Research program 2: Supporting new and developing industries in Northern Australia	25
Research program 3: Investing in production and supply chain innovation in Northern Australia	27
Case study 3 : Transforming mango futures	28
Research program 4: Building industry and community capacity in Northern Australia	30
Research program 5: Developing Northern Australian health service delivery and models of care	31
Research program 6: Building education, training, and research capacity across Northern Australia	32
Project pipeline	35
Organisational structure	37
CRCNA Board	38

Chair's report



Sheriden Morris

Chair

There has never been a more exciting and vital time to be involved in developing Northern Australia. After many years of talking about the north's potential, there is now a real sense of urgency to move forward with impact and start realising that potential. The Cooperative Research Centre for Developing Northern Australia (CRCNA) can assist with progressing this agenda by brokering relationships and ensuring the right people, with the right tools, are working together to affect meaningful change.

The CRCNA invests in research which seeks to resolve industry challenges and provide the evidence to inform future decision-making and investment planning for industry, private enterprise, and governments. We want to see this evidence drive change and de-risk the investment framework in the north, across agriculture (including Indigenous agriculture), food innovation and production, and health service delivery sectors.

Understanding what the challenges and impediments are was a core focus for the CRCNA this past year. Six of our industry situational analysis projects are well underway, with the beef, horticulture, and forestry projects expected to be completed by the end of 2019.

The research is progressing well, and a clear narrative is emerging around what the common challenges facing business, industry, and communities across Northern Australia are. For example, we know there is a need for further investment in fit-for-purpose infrastructure for the north to help our producers get more of their product to market in a cost-effective way. We know telecommunications and

digital connectivity is a significant barrier for people doing business in the bush, and we know there is substantial opportunity for our producers to invest in value-add products – if the investment, technology, and infrastructure conditions are right.

So, what is the CRCNA doing to ensure these challenges are firmly on the agenda? And what role do we have in moving the dream of developing the north into a tangible reality?

We are leading the conversation and getting the right people around the table to ensure we are investing in projects which will affect change and implement a solution – based on strong science and robust economic rationale.

The support provided to us by the Office of Northern Australia and the Queensland, Northern Territory, and Western Australian Governments means we are uniquely positioned to work with and across jurisdictions. Our projects have participants and stakeholders located across Queensland, Northern Territory, and Western Australia. We also work with key agencies like the Northern Australia Senior Officers Networking Group (NASONG) and Austrade on projects examining the regulatory and policy barriers to development.

This past year has seen the CRCNA make significant progress in gaining a better understanding of the broader policy and development issues facing the north. We are focused on gathering intelligence to help us build a strategic framework which will support us, and our industry and government partners, to deliver high-impact investment across Northern Australia. The next 12 to 18 months will see us working hard to ensure our research recommendations are implemented—and move from being words on a page to real game-changers for industry across Northern Australia.

CEO's report



Jed Matz
CEO

This year we have been focused on progressing dozens of projects awarded during the 2017 and 2018 funding rounds and supporting our project participants to achieve their research activities and milestones.

As an organisation, we have focused on developing our Strategic Plan to guide us through the next eight years of Federal Government funding and to kick-start thinking about the future legacy of Australia's largest CRC.*

To date, the CRCNA has committed more than \$14 million towards 41 projects, with a total value of research exceeding \$40 million. This portfolio of projects includes those funded through our open funding calls, our targeted funding calls, and funding allocated towards delivering our Education Program.

FY18 highlights

Research collaborations

- Completed our first project (North Queensland Agricultural Markets and Supply Chain Study) from the 2017/18 open funding call.
- Our second funding call opened on 23 June 2018. Seven of the 55 submissions were successful in securing CRCNA funding.
- As at the end of June 2018, we had contracted 28 projects leveraging an additional \$15.6 million in project co-contributions, including in-kind and cash.

- Six industry situational analysis studies commenced in 2018 and three of these will be completed by the end of 2019.
- The CRCNA, Austrade, and PwC came together to develop a research plan focused on identifying a range of potential investors, investment opportunities and identify key policies to de-risk the investment pathway for new agricultural development in Northern Australia.

Strategic partnerships

- CRCNA Board travelled to Singapore and met with several key organisations undertaking research and looking to do business in Australia. Chair Sheriden Morris addressed a group of JCU Singapore alumni at the Australian High Commissioner's residence.
- Following the Board's visit to Singapore, we partnered with the Singapore-based Australian Chamber of Commerce ASEAN (AustCham ASEAN) to deliver a report on how Northern Australian producers can best capture the ASEAN agricultural market.
- Facilitated the formation of the North Queensland Agricultural Supply Chain Alliance which includes representatives from Townsville Enterprise, Advance Cairns, Greater Whitsunday Alliance, Qld Department of Agriculture and Fisheries, and Central Queensland University.
- An in-kind partnership with the new Future Food Systems CRC to ensure collaboration and alignment across the sector, and Northern Australian interests are considered.
- An informal agreement with the Digital Health CRC to work strategically across the health sector, identify areas for collaboration and communication to avoid duplication of research.

** in terms of the amount of initial funding awarded (\$75 million) to the CRCNA by the Federal Government.*

- An agreement with Food Innovation Australia (FIAL) to continue working towards a formalised memorandum of understanding which outlines opportunities to collaborate, and share knowledge and resources to achieve common goals and identify areas for further investment.
- Formal engagement with the Northern Australian Senior Officers Networking Group (NASONG) to enhance awareness and support of the work the CRCNA is undertaking, particularly regarding policy and regulatory framework development.

Organisational achievements

- During the Townsville Floods, the CRCNA continued to operate despite our head office sustaining significant damage during the unprecedented rain event – a testament to the commitment the team continues to have for our project participants.
- We have appointed a part-time Coordinator to manage our Education Program, including rolling out our first PhD Scholarship in the second half of 2019.
- We have redeveloped our website to make it more interactive and engaging.
- Work is progressing on developing a Project Management System for our staff, which will streamline our business, improve governance, and reduce time spent compiling data for Commonwealth reporting.
- Development of our impact tracking tool is nearing completion at the time of writing.

FY19/20 focus

The year ahead will focus on continuing to build on the excellent progress we've made so far, and on developing and implementing a valuable tool to track and measure the impact of our projects. Many projects will wrap up next year, so it will be essential for us as an organisation to measure how the projects deliver impact and achieve our strategic objectives and to ensure the implementation of recommendations.

As we continue to see common trends and themes emerging from our research work, FY 2019/20 will see the CRCNA bring these together for its first State of the North report.

Our Education Program will begin to grow over the next year and will aim to deliver a cohort of researchers and students working across the north, developing their skills and capacity for the long-term benefit of our region.



The Northern Australian rice situational analysis project launched at the Mareeba Wetlands in February 2019. Project lead L-R Russell Ford (SunRice), Prof. Robert Henry (QAAFI-UQ), Jed Matz (CRCNA), Olive Vale Pastoral grower Paul Ryan.



Burdekin Shire Council Mayor Lyn McLaughlin, CRCNA CEO Jed Matz and KPMG Australia's Robert Poole at the launch of the North Queensland Agricultural Market and Supply Chain final report in Ayr (June 2019).



CRCNA Board met with Commonwealth Capital in Singapore L-R, Joep Kleine Staarman, Tracey Hayes, John Bearne, John Wharton, Sheriden Morris, Jed Matz, Andrew Kwan, Peter Long, Mark Coffey, (Office Northern Australia), Don McDonald

Strategic intent



Kakadu Plum/ Gubinge
– Twin Lakes, WA.

Photo: Alex McDonald

The CRCNA brings together researchers, industry representatives, businesses, education providers, local, State, Territory, and Federal governments and communities to deliver an evidence base of information to support and inform the developing Northern Australia agenda for the benefit of all Australians and achieve the following objectives:

- 1. De-risk the Northern Australian investment landscape** – broker strategic discussions with relevant decision-makers and stakeholders and guide a coordinated approach which informs development planning and investment decision making across jurisdictions.
- 2. Deliver a coordinated approach to sector development** – support strategic information and knowledge-building which helps frame and understand the key challenges and opportunities facing the north's key agricultural sectors, health service sectors, infrastructure, and regional development.
- 3. Inform appropriate supply chain development and infrastructure planning across Northern Australia** – deliver an evidence base which helps prioritise supply chain and infrastructure investment to provide timely access to high-value international and domestic markets.
- 4. Deliver research, development, and extension solutions with impact** – leverage grass-roots RD&E effort, capacity and knowledge of Northern Australia to ensure solutions are implemented in a meaningful way and to the benefit of all Australians.

- 5. Build the strategic research capacity and develop the workforce skills of Northern Australians** – in the fields of agriculture, aquaculture, food, health service delivery and Traditional Owner-led business development (in agriculture, aquaculture, food and health service/ models of delivery).

Strategic objectives

The CRCNA's pathway to impact will be tracked through the successful delivery of its six research programs and measured by its ability to deliver against its strategic impacts, as shown in Figure 1.

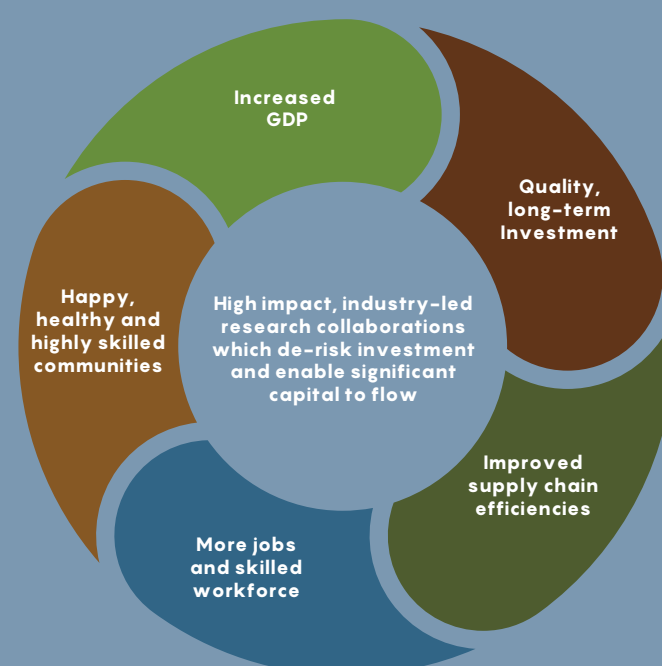


Figure 1: CRCNA strategic objectives.

Current research focus areas for Northern Australia

Through partnerships with the Australian, Northern Territory, Western Australian and Queensland Governments, the CRCNA continues to lead a clear, integrated, coordinated, and nuanced research and development approach to delivering critical outcomes in the developing Northern Australia agenda by focussing its investment in the following areas:

Agriculture, food and aquaculture

- De-risk investment in new, emerging, and established industries by identifying barriers and providing solutions.
- Support the development and growth of established industries by identifying value-add opportunities, new markets, improving supply chains, enhancing productivity, developing workforce skills, capacity and capabilities, improving decision-making processes and policy frameworks to enable solutions to be implemented.
- Advance new industries through developing and testing new production and agronomy systems, crop varieties, animal species and animal breeding techniques, and building research and workforce capabilities to support and maintain this work.
- Develop new economic and business models which support on-Country Indigenous enterprise.

Northern Australia health service delivery

- Improve health-seeking behaviours of Northern Australians by improving access to information, health care professionals, diagnostic tools, and treatment options.
- Improve the early detection of diseases through the development of new technologies which assist with the flow of information, support timely decision-making and treatment options, improve access and connectivity to existing technologies, enhance workforce skills and capability to use new or existing technologies.
- Improve access to mental health treatment and diagnostic tools and technologies and enhance workforce skills and capabilities in delivering treatment and diagnosis.

Traditional Owner-led business development

- De-risk investment in Traditional Owner-led enterprises which is supported by communities by identifying challenges and providing solutions.
- Enhance the skills and capabilities of Indigenous and Torres Strait Islander peoples and provide a pathway to building an industry-ready skilled workforce in the fields of agriculture, food, and health service delivery.



Area of operation and research locations

LEGEND



Area of operation



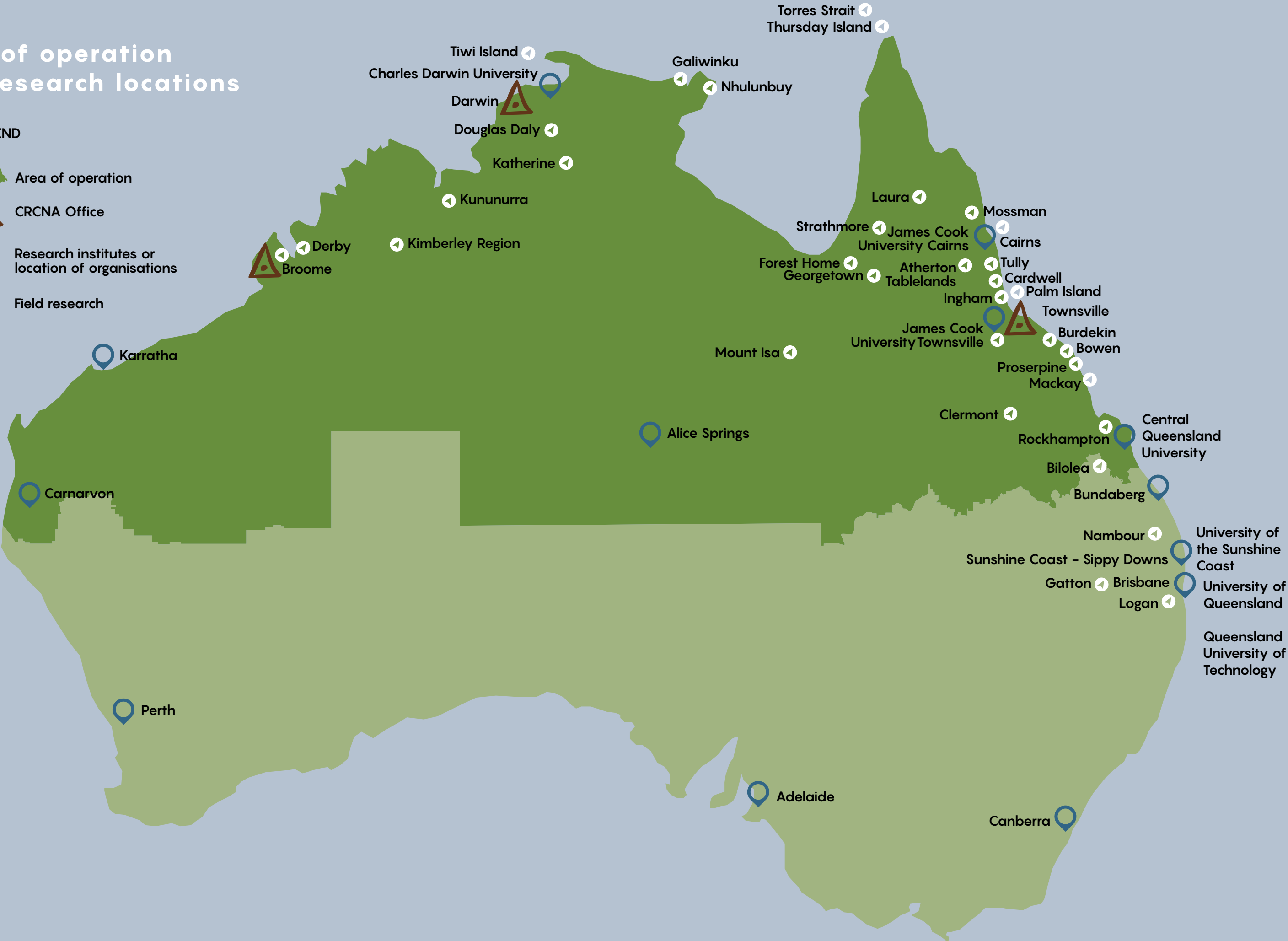
CRCNA Office



Research institutes or location of organisations



Field research



2018/19 highlights



Initial investment prioritisation



Cattle in African Mahogany forest, NT.
Photo: Timber Queensland

CRCNA’s investment prioritisation approach (shown in Figure 2) has been informed by the 2015 White Paper, feedback from our industry and strategic partnerships, and our open funding calls.

The White Paper and the work leading to its development identified several impediments and barriers to investment and development in the north. The CRCNA seeks to resolve these by developing and investing in research collaborations focused on informing strategic policy development.

An initial open funding call in 2017 identified opportunities to resolve long-standing challenges facing individual industries through trialling and adopting new technologies, systems, or models; it also identified common challenges and barriers across sectors, which have required a whole of sector analysis.

As the CRCNA matures, the outcomes and recommendations from its initial projects will further support investment planning and help identify where the organisation will focus its investment dollars on maximising impact across Northern Australia.

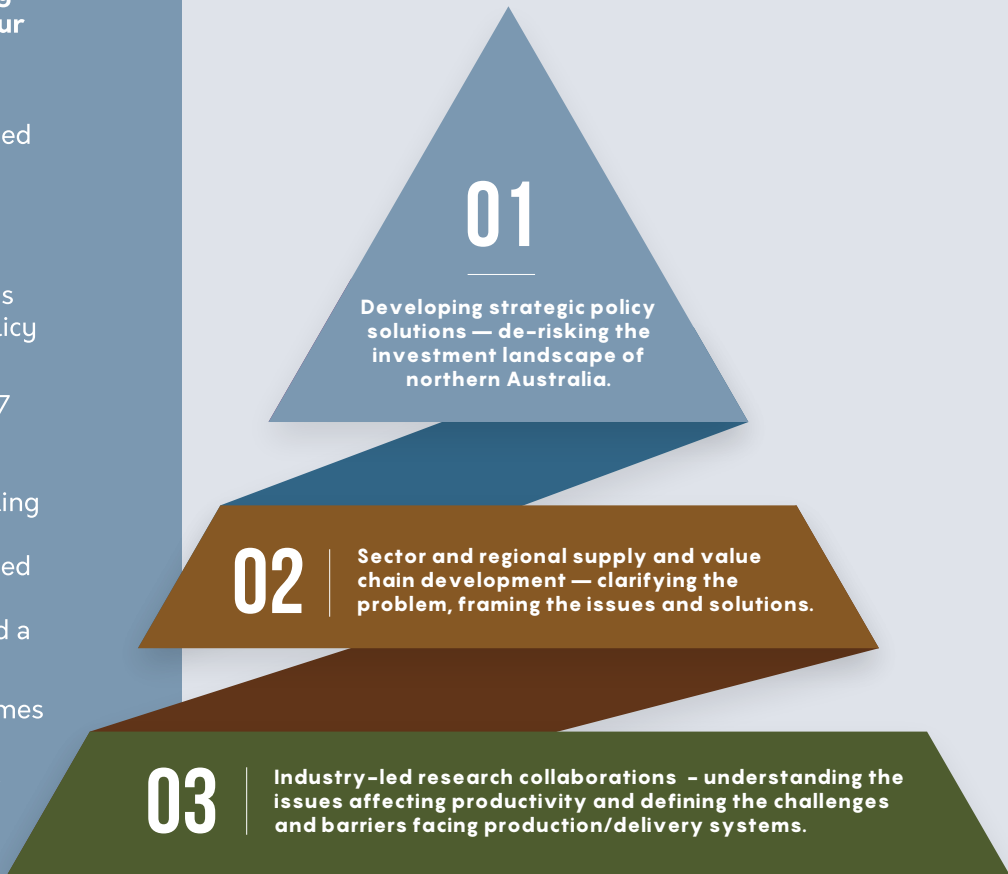


Figure 2: CRCNA investment prioritisation approach.

Research programs

Table 1 outlines the CRCNA’s six research programs and how they align with the CRCNA’s broader strategic objectives and investment prioritisation.

Research program	Objective
1. Building potential in Northern Australia	<ul style="list-style-type: none">• To find the policy and regulatory solutions to facilitate Northern Australian development, particularly in the areas of agriculture, health service delivery, and Traditional Owner-led business.• Progress de-risking of agricultural investment.• Identify priority investors.• Deliver emerging market and sector capacity situational analysis for cropping, beef, rice, horticulture, forestry, aquaculture, Indigenous agriculture, health service delivery and communications.• Support regional development by investing in projects which deliver supply chain gap analysis and identify critical infrastructure needs in regional contexts.
2. Supporting new and developing industries in Northern Australia	<ul style="list-style-type: none">• Grow and improve emerging industry sectors and help establish new industries in Northern Australia.
3. Investing in production and supply chain innovation in Northern Australia	<ul style="list-style-type: none">• Improve specific industry supply and production chains.• Deliver research which develops new technologies, efficiencies and approaches which are game-changers for Northern Australia.
4. Building industry and community capacity in Northern Australia	<ul style="list-style-type: none">• Build workforce skills and capacity, develop sectors and create a prospectus which enhances investment in agriculture and food, health service delivery and Traditional Owner-led business development.
5. Developing Northern Australian service delivery innovation	<ul style="list-style-type: none">• Create strategic breakthroughs which deliver innovation in logistics, business models and health service delivery models.
6. Developing and delivering an Industry-focused education and training program	<ul style="list-style-type: none">• Build the strategic research skills and capacity in Northern Australia in the areas of agriculture and food (including aquaculture), health service delivery sectors and Traditional Owner-led business sectors.

Table 1: CRCNA six research programs.

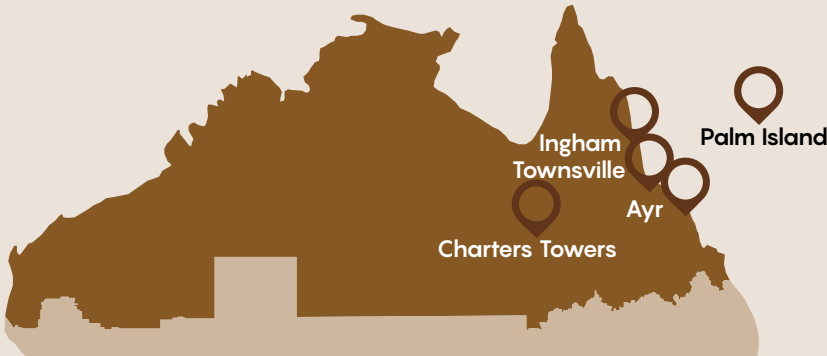
Research program 1: Building potential in Northern Australia

Projects listed are GST exclusive

Project name and description	Project participants	Research locations	Total CRC funding	Total project value
Capturing the ASEAN agricultural opportunity for Northern Australia working with AustCham ASEAN in Singapore to identify markets and commodities in ASEAN.	Australian Chamber of Commerce ASEAN Singapore	Townsville, ASEAN	\$110,000	\$110,000
Communications (digital inclusion) situational analysis project will investigate the impacts and relevance of digital inclusion for developing Northern Australia.	Queensland University of Technology, Premise, James Cook University, Charles Darwin University, Centre for Appropriate Technology, Regional Development Australia – Northern Territory	Brisbane, Toowoomba, Cairns, Alice Springs, Darwin, Karratha	\$145,000	\$288,933
Re-framing NA supply chains will develop a case for a freight equalisation scheme.	James Cook University, Charles Darwin University	Darwin, Cairns, Mackay, Rockhampton, Broome, Townsville, Dampier, Karratha, Mt Isa	\$110,000	\$155,000
Northern Australian investor identification and analysis working with Austrade, trade commissions and WA, NT and Qld Govt to identify possible agriculture development investment.	Austrade, PwC	Darwin, Brisbane, Perth	\$175,000	\$215,000
Beef industry situational analysis project will examine current Northern Australian beef industry SWOT.	CSIRO, Northern Territory Cattleman's Association, Cattle Council of Australia, Kimberley Pilbara Cattleman's Association, AgForce Qld, Meat and Livestock Australia	Townsville, Darwin, Broome, Brisbane, Canberra	\$181,163	\$470,146
Aquaculture industry situational analysis project will examine current Northern Australian aquaculture industry SWOT.	James Cook University, CSIRO, Blueshift, Australian Prawn Farmers Association, Australian Barramundi Farmers Association, Indigenous Land and Sea Council	Townsville, Darwin, Broome, Torres Strait	\$202,117	\$422,361
Rice industry situational analysis project will examine current Northern Australia rice industry including wild rice and Northern Australia specific domestic rice.	Queensland Alliance for Agriculture and Food Innovation – University of Queensland, Charles Darwin University, Olive Vale Pastoral, Savannah Ag, WA Primary Industry and Regional Development, SunRice	Darwin, Cairns, Mareeba, Brisbane, Kununurra	\$100,000	\$505,136

Project name and description	Project participants	Research locations	Total CRC funding	Total project value
Forestry and forest products industry situational analysis project will examine current Northern Australia forestry and forest products industry SWOT.	Timber Qld, NT Department of Primary Industry and Resources, Qld Department of Agriculture and Fisheries, Sunshine Coast University	Brisbane, Sippy Downs, Cairns, Darwin, Nhulunbuy, Broome, Kununurra	\$100,000	\$209,327
Evaluation of the potential to expand horticultural industries in Northern Australia will examine avocado, lychees and mango sectors.	Queensland Alliance for Agriculture and Food Innovation – University of Queensland, Qld Department of Agriculture and Fisheries, NT Department of Primary Industry and Resources, WA Primary Industry, Regional Development and Horticulture Innovation Australia	Mareeba, Dimbulah, Bowen, Ayr, Rockhampton, Brisbane, Kununurra, Carnarvon, Darwin, Katherine, Mataranka, Singapore, China, South Korea	\$181,818	\$434,029
North Queensland Agricultural Market and Supply Chain Study – examined emerging markets and supply chains to improve NQ agricultural sector access to markets. This project was completed in May 2019.	Townsville Enterprise, North Qld Region of Councils	Townsville, Ayr, Charters Towers, Ingham, Palm Island	\$227,273	\$437,933
Mackay, Whitsundays, Isaac Region Export Supply Chain Mapping Study will examine market opportunities for CQ agricultural commodities.	Greater Whitsunday Alliance, Bowen Gumlu Growers' Association, North Qld Bulk Ports, Regional Development Australia: Mackay-Isaac-Whitsunday	Mackay, Prosperine, Bowen, Clermont	\$96,000	\$196,904
Cairns Region Export Supply Chain Study will examine market opportunities for FNQ agricultural commodities.	Advance Cairns, Cairns Airport, FNQ Ports, Airfreight Handling Services, Qld Department of Agriculture and Fisheries, James Cook University, Far North Qld Region of Councils	Cairns, Mareeba, Atherton, Mourilyan, Cooktown, Karumba, Weipa	\$200,000	\$426,000
Building the Traditional Owner-led bush products sector develop a strategic sector development and research priority framework and investment plan which will guide future place-based sector development and research. This project was completed in August 2019.	CSIRO, Kimberley Land Council, Gurrigun Aboriginal Corporation, Tropical Indigenous Ethnobotany Centre, IN-Group Investments, Australian Native Food and Botanicals	Canberra, Darwin, Cairns, Broome, Cardwell, Townsville, Brisbane	\$70,909	\$266,738
Exporting perishable commodities will examine the nature of and processes involved with stakeholder's collaboration in planning and investment for exporting high-value perishable products of Northern Australia to Asian markets.	Central Queensland University, Growcom, Rockhampton Regional Council, Tropical Pines, Passionfruit Aust, Qld Department of Agriculture and Fisheries, Qld Department of State Development	Rockhampton, Bowen, Emerald	\$235,455	\$550,910

Case study 1: North Queensland Agricultural Market and Supply Chain Study



Participants

- Townsville Enterprise Ltd
- North Queensland Regional Organisation of Councils (NQROC)

Total project value

\$437,933

CRCNA funding

\$227,273

Overview

Townsville Enterprise Ltd and NQROC engaged KPMG, AEC and Premise to investigate how North Queensland producers can maximise their production opportunities to meet future international agricultural demand.

The project undertook a comprehensive assessment of five high-value agricultural commodities: soybeans, avocados, macadamia nuts, beef and on-shore aquaculture, as identified by market research of consumer trends across ten key markets. These were: Korea, China, Japan, Indonesia, Singapore, UAE, Malaysia, Hong Kong, Thailand, India.

The study included initial market assessments, market-based production and supply chain opportunity assessments and identified areas of improvement for market access and clarified where policy and regulatory barriers exist.



Key outcomes

- The project delivered a model of collaboration across and industry groups, local councils, State government agencies and researchers, which maximised stakeholder engagement and information sharing. Two subsequent regional supply chain projects funded by the CRCNA: the Mackay, Isaac, Whitsunday Agribusiness Export Supply Chain Mapping Study and the Cairns Region Export Supply Chain Study.
- The project's final report outlines the current production, supply and demand trends for each commodity, market competitors and barriers and discusses potential value-add opportunities. The research outcomes are intended to inform North Queensland producers by identifying how they may be able to diversify current agribusiness operations or explore new, emerging opportunities for investment.

Key findings and recommendations

- The research identified more than \$3 billion in unmet global market demand for North Queensland-grown agricultural products.
- Implementation of the recommendations will generate 2,000 new jobs across the region.
- Five scenarios identified (over page) which will inform future research and investment planning across the industry sectors.

The project's final report is available to read or download from the CRCNA website www.crcna.com.au/publications



Key outcomes of the intensification of beef scenario: Establishing a 190,000 head/annum feedlotting industry.

\$228m production value	Additional \$200m of export value	Additional 50 jobs direct FTE jobs
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Key outcomes of the avocado production scenario: Transition of 40,000ha from existing land use to a mix of perennial horticulture and rotational grains and pulses.

\$213m production value	\$124m of export value	Additional 800 direct FTE jobs
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Key outcomes of the macademia production scenario: Transition of 40,000ha from existing land use to a mix of perennial horticulture and rotational grains and pulses.

\$213m production value	\$124m of export value	Additional 800 direct FTE jobs
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Key outcomes of the intensification of aquaculture scenario: Developing a 500ha on-shore aquaculture industry.

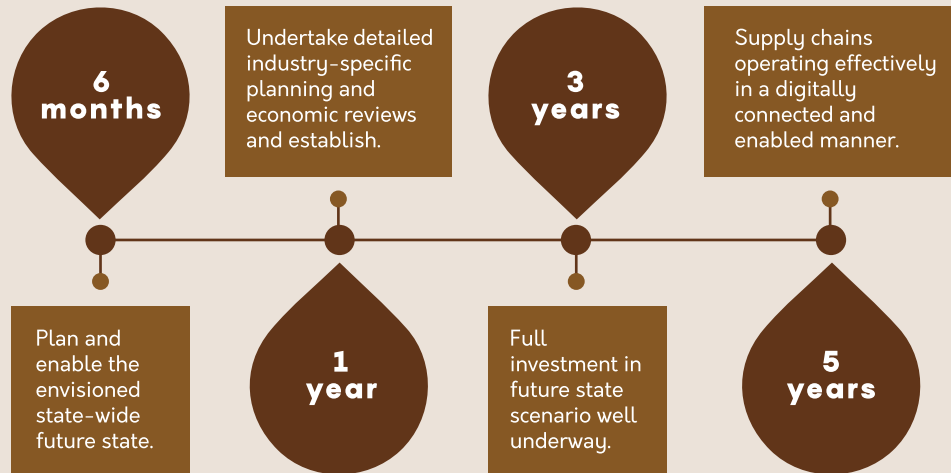
\$150m production value	Opportunities for domestic and export market	Additional 300 direct FTE jobs
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Key outcomes of the intensification of soybean scenario: Developing a 36,000ha rotational soybean industry.

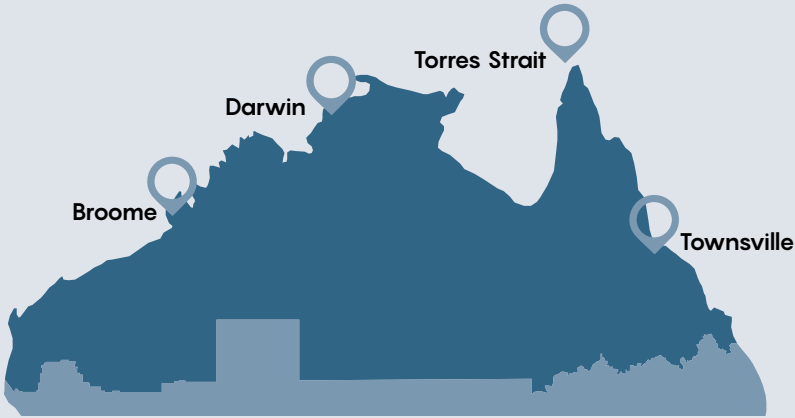
\$46m production value	Additional \$200m of export value	Utilising existing sugarcane labour
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Next steps — implementation pathway

This report is only the first step in developing a future state industry.



Case study 2: Northern Australia Aquaculture Situational Analysis Study



Participants

- James Cook University
- CSIRO
- Blueshift Consulting
- Australian Barramundi Farmers Association
- Australian Prawn Farmers Association
- Indigenous Land and Sea Corporation

Total project value

\$422,361

CRCNA funding

\$202,117

Overview

This situational analysis study will examine current industry characteristics, including industry size, production, income, productivity measures and employment levels to understand capacity and scalability limitations. It will include, but not be limited to examining: infrastructure, biosecurity, animal health management, the investment landscape, policy, training and human capital gaps and the research or alternative solutions to address them.

The project team will develop a Northern Aquaculture Industry Vision 2028 as part of this study, in collaboration with Indigenous and non-Indigenous stakeholders including industry associations, aquaculture farmers, researchers, government and Non-Government Organisations via a series of focus group sessions.

At a glance

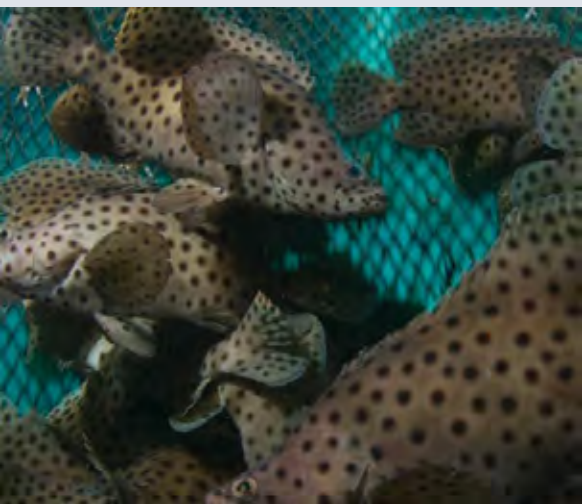
- Australia produced 93,968 tonnes of aquaculture product in 2016-17, reflecting 53% growth since 2006-07 (ABARES 2018).
- The national aquaculture industry was worth \$1.3 billion in 2016-17 and had the fastest growth in the agri-business sector.
- The gross value of production (GVP) 2016-17 for Northern Australia was around \$200 million.
- Largest sectors in Northern Australia
 - o Pearl oysters (non-edible) 38%
 - o Prawns 38%
 - o Barramundi 23% are the most significant sectors with all or substantial production in Northern Australia.

Preliminary research findings

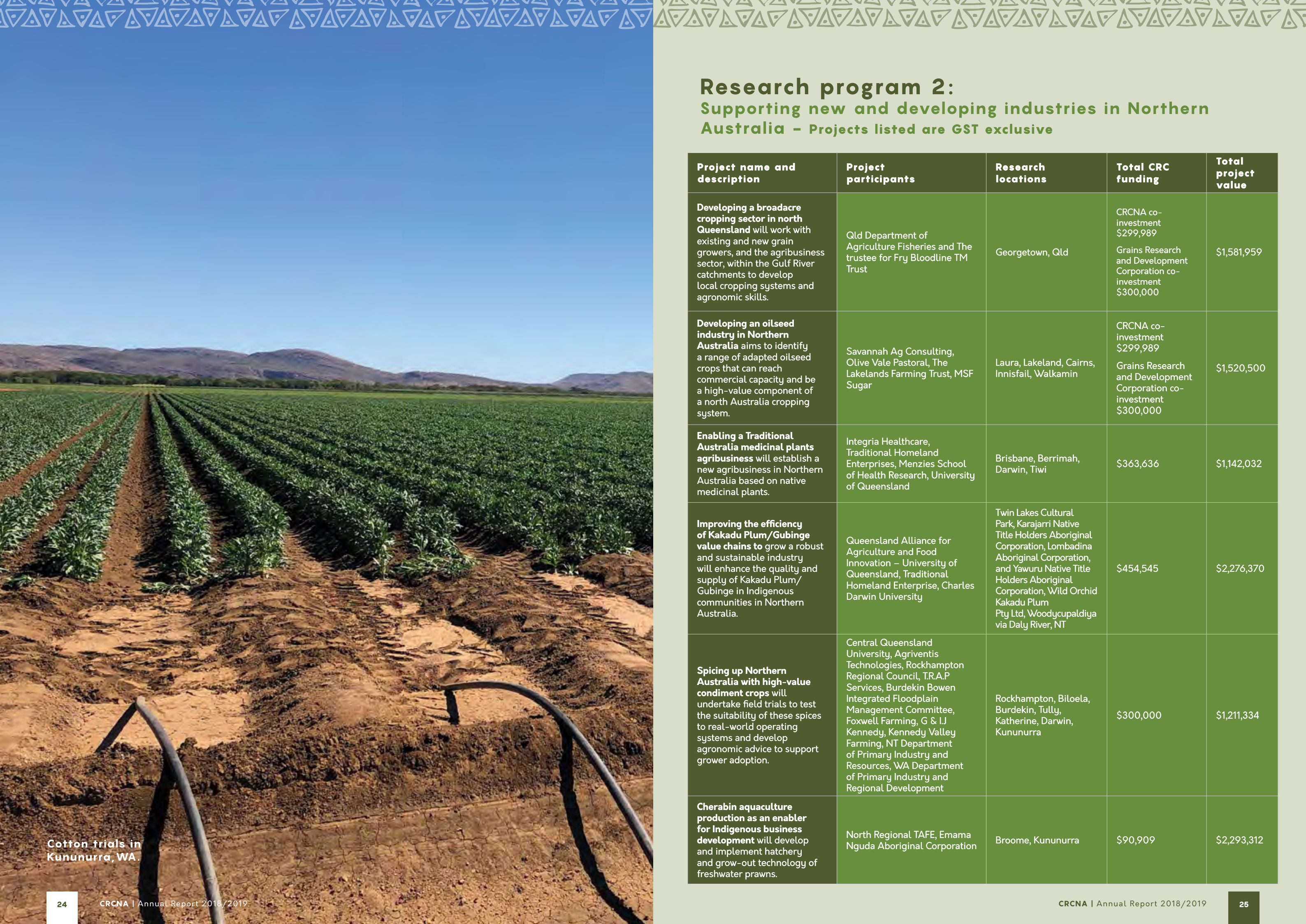
A literature review, industry workshops, forums, and surveys identified (see next page) challenges and opportunities facing the industry. The project team have also identified possible solutions for industry consideration.

Identified (possible) solutions and next steps for the industry

- Develop a coordinated action plan to boost available training, align training with business needs, and increase training engagement with Australians committed to living and working in Northern Australia.
- Work with the Australian Government to better facilitate skilled migrant employment (via skilled worker visa) to address current and short-term skills gaps.
- Support Aboriginal and Torres Strait Islanders to realise their vision for unique, Indigenous branded aquaculture products and business that provide employment and positive economic outcomes for our First Nations people.



Identified challenges	Identified opportunities
The industry is diverse, highly fragmented and reluctant to share data. There are many operators (mostly SMEs) undertaking the production of a range of species and utilising a variety of culture systems. This diversity, small number of operators in most of the sub-sectors, and the privacy requirements associated with third-party access to producer reporting to the government (and industry associations) are proving challenging to obtaining data for comparative analyses.	Significant production increases are within reach – a doubling of production by 2028 will see the industry achieve an annual value of at least \$410 million and with the right incentives and conditions, the sector could see a five-fold increase in gross value of production around \$1 billion by 2028.
History of failed projects despite significant investment and RD & E – Several reasons for this have been identified, and the project team will propose potential approaches to remove or overcome obvious barriers, as well as highlight current opportunities.	Existing and new aquaculture producers are investing – expansion in barramundi, prawns, and tropical rock oysters is primarily focused on domestic market supplies, while new lobster and red claw projects targeting overseas markets are under development.
Disease and biosecurity risks (from either endemic or exotic pathogens) pose the most significant threat. Preventing an exotic incursion at the border is paramount and more research needs to be done to understand the chronic health challenges which are reducing productivity, and what more can be done to manage aquatic animal health. Increased capability in diagnostics is required, both on-farm and in laboratories, targeting threats to aquaculture in the north.	1200 new jobs – at a range of skill levels, will be created through planned aquaculture expansion in Northern Australia by 2028. This increase in jobs will more than double with the full realisation of Project Sea Dragon in the Northern Territory.
A lack of appropriate infrastructure to support expansion –access to cheaper and better transport, energy, and digital connectivity is needed to help producers effectively compete in the market by ensuring reliable access and persistence of product.	Aquaculture business opportunities for Aboriginal and Torres Strait Islander peoples are at research and pilot production scale with support from government agencies, consultants and private investors. It is imperative we learn from past experience with Indigenous aquaculture and avoid issues of attempting technically challenging, or new unproven species, without cultural alignment of these ventures, and projects must be well-resourced with local capacity building.
Northern Australia has tremendous natural advantages for aquaculture – but limited comparative advantages. Aquaculture in Northern Australia is ecologically and geographically well placed to take advantage of markets in SE Asia and China but importantly must achieve reliable high volumes to access these markets even for premium products.	



Cotton trials in Kununurra, WA.

Research program 2:
Supporting new and developing industries in Northern Australia – Projects listed are GST exclusive

Project name and description	Project participants	Research locations	Total CRC funding	Total project value
Developing a broadacre cropping sector in north Queensland will work with existing and new grain growers, and the agribusiness sector, within the Gulf River catchments to develop local cropping systems and agronomic skills.	Qld Department of Agriculture Fisheries and The trustee for Fry Bloodline TM Trust	Georgetown, Qld	CRCNA co-investment \$299,989 Grains Research and Development Corporation co-investment \$300,000	\$1,581,959
Developing an oilseed industry in Northern Australia aims to identify a range of adapted oilseed crops that can reach commercial capacity and be a high-value component of a north Australia cropping system.	Savannah Ag Consulting, Olive Vale Pastoral, The Lakelands Farming Trust, MSF Sugar	Laura, Lakeland, Cairns, Innisfail, Walkamin	CRCNA co-investment \$299,989 Grains Research and Development Corporation co-investment \$300,000	\$1,520,500
Enabling a Traditional Australia medicinal plants agribusiness will establish a new agribusiness in Northern Australia based on native medicinal plants.	Integria Healthcare, Traditional Homeland Enterprises, Menzies School of Health Research, University of Queensland	Brisbane, Berrimah, Darwin, Tiwi	\$363,636	\$1,142,032
Improving the efficiency of Kakadu Plum/Gubinge value chains to grow a robust and sustainable industry will enhance the quality and supply of Kakadu Plum/Gubinge in Indigenous communities in Northern Australia.	Queensland Alliance for Agriculture and Food Innovation – University of Queensland, Traditional Homeland Enterprise, Charles Darwin University	Twin Lakes Cultural Park, Karajarri Native Title Holders Aboriginal Corporation, Lombadina Aboriginal Corporation, and Yawuru Native Title Holders Aboriginal Corporation, Wild Orchid Kakadu Plum Pty Ltd, Woodycupaldiya via Daly River, NT	\$454,545	\$2,276,370
Spicing up Northern Australia with high-value condiment crops will undertake field trials to test the suitability of these spices to real-world operating systems and develop agronomic advice to support grower adoption.	Central Queensland University, Agriventis Technologies, Rockhampton Regional Council, T.R.A.P Services, Burdekin Bowen Integrated Floodplain Management Committee, Foxwell Farming, G & IJ Kennedy, Kennedy Valley Farming, NT Department of Primary Industry and Resources, WA Department of Primary Industry and Regional Development	Rockhampton, Biloela, Burdekin, Tully, Katherine, Darwin, Kununurra	\$300,000	\$1,211,334
Cherabin aquaculture production as an enabler for Indigenous business development will develop and implement hatchery and grow-out technology of freshwater prawns.	North Regional TAFE, Emama Nguda Aboriginal Corporation	Broome, Kununurra	\$90,909	\$2,293,312



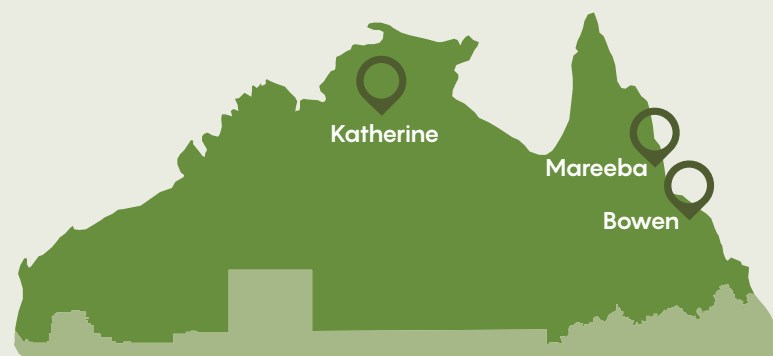
Sorghum growing in Far North Queensland.

Research program 3: Investing in production and supply chain innovation in Northern Australia

Projects listed are GST exclusive

Project name and description	Project participants	Research locations	Total CRC funding	Total project value
Strengthening Northern Australia's horticultural sector through assessing protected cropping will bring industry stakeholders and government organisations across Northern QLD, NT, and WA to help growers identify new investments to scale up to commercially viable protected cropping enterprises.	Qld Department of Agriculture and Fisheries, WA Department of Primary Industries and Regional Development, Carnarvon Growers Association, NT Farmers Association, Cravo Australia P/L, Port of Townsville Ltd, Pirrone Brothers Produce	Townsville, Bowen, Gumlu, Ayr, Perth, Carnarvon, Lake Bennett (NT),	\$100,000	\$443,045
Smart supply chains will focus on developing and implementing a solution to measuring the quality of food as it moves through the supply chain using blockchain technology.	T-Provenance, Growcom, Manbulloo Ltd	Adelaide, Katherine, Burdekin, Mareeba	\$272,727	\$427,273
Transforming mango futures will trial commercial-scale new intensive orchard techniques.	Qld Department of Agriculture and Fisheries, Manbulloo Ltd, BJM Enterprises, Australian Mango Industry Association	Mareeba, Ayr, Katherine	\$500,000	\$1,182,179
Biosecurity in Northern Australian prawn aquaculture is a comprehensive biosecurity audit of prawn aquaculture farms seeking to identify known and unknown pathogens and develop risk management strategies for industry.	James Cook University, Australian Prawn Farmers Association	Mossman, Cardwell, Ayr, Logan	\$309,091	\$690,755
Sustainable export supply chains for Calypso mangoes to China will identify and see to resolve quality constraints which impact on supply chain confidence and profitability into China.	Perfection Fresh, Qld Department of Agriculture and Fisheries, University of Queensland	Katherine, Mataranka, Litchfield Shire, Mareeba, Dimbulah, Ayr, Bundaberg	\$952,471	\$2,245,551

Case study 3: Transforming mango futures



Participants

- Department of Agriculture and Fisheries, Queensland (DAF Qld)
- Manbulloo Ltd
- BJM Enterprises Pty Ltd
- Australian Mango Industry Association

Total project value

\$1,182,179

CRCNA funding

\$500,000

Project Overview

This project will transform the productivity and profitability of the Australian mango industry through the research, development and extension of next-generation, economically-proven, innovative mango production systems. These practices include high planting density, canopy training and light capture, trellising, new varieties, and precision management technologies.

New intensive management systems will also incorporate advances made through mango genetics. The project will identify systems tailored for existing commercial varieties, as well as three new Kensington Pride hybrid varieties, released recently from the National Mango Breeding Program.

“Adoption of intensive mango management systems is likely to be a game-changer for the Australian mango industry.”

– Geoff Dickinson, Project lead DAF QLD

At a glance

- Production : 50% Qld, 45% NT, 3% WA, 2% other
- National value of production is \$200 million per annum in 2017
- National production volume was 62,000 tonnes per annum in 2017
- 12% of this production is exported, and volumes are increasing.
- Major export markets are Hong Kong (47%), Singapore (16%), New Zealand (12%) and UAE (10%)

Preliminary research findings

Trees planted, thriving and expected to reach maturity within 5 to 6 years.

- Three, half-hectare trial sites, comprising of a variety of four ‘best-bet’ intensive mango orchard systems, including high-density and trellis designs have been planted using the current commercial mango varieties Kensington Pride (KP) and R2E2, and two new mango varieties NMBP1243 and NMBP4069 are established in Bowen, Mareeba and Katherine.

New economic analysis indicates costs of operating high-density mango systems on commercial-scale are lower than earlier estimates.

- Lower costs reflect savings achieved from the critical mass of these more extensive plantings and from the greater operational efficiencies achieved within well-resourced large commercial mango orchards and by experienced orchard managers and staff.



“This CRCNA project will create impact for national industry growth in Northern Australia, driving productivity improvements, industry resilience and enabling the growth of existing and new domestic and export markets.”

– Geoff Dickinson, Project lead DAF QLD

Significant productivity gains – up to 5 times more fruit per tree, depending on the variety.

Trees grown on a trellis system have demonstrated better light utilisation and less vigour.

- Trellised trees can be planted closer together and spend less energy growing leaves and more on producing fruit.
- Trees grown on a trellis have also shown more resilience to strong winds and cyclonic conditions because of the supportive structure.
- The high-density system is well suited to landlocked properties or areas with limited land or water resources.



Research program 4:

Building industry and community capacity in Northern Australia

Projects listed are GST exclusive

Project name and description	Project participants	Research locations	Total CRC funding	Total project value
Business on Country: Land use diversification on the Indigenous Estate focuses on developing a framework for north Australian development and fee for services sector across the Indigenous Estate.	North Australian Indigenous Land and Sea Management Alliance, Charles Darwin University, Nature Conservation Australia Trust, Northern Land Council	Darwin, Broome, Cairns	\$363,636	\$1,000,177
Building horticulture production knowledge and capacity within Indigenous enterprise will train and Indigenous workforce to grow market crops and transfer knowledge to traditional bush foods.	Growcom, Mungalla Aboriginal Business Corporation, Gudjuda Aboriginal Reference Group	Home Hill, Ingham	\$52,363	\$185,091

Research program 5:

Developing Northern Australian health service delivery and models of care

Projects listed are GST exclusive

Project name and description	Project participants	Research locations	Total CRC funding	Total project value
Establishing eye screening services to prevent avoidable blindness will Implement new eye screening cameras and train staff in remote health service locations.	CSIRO, Qld Dept Health, Laynapuy Homelands Aboriginal Corporation, Marthakal Homeland and Resource Centre Aboriginal Corporation	Mt Isa, Thursday Island, Yirrkala, Nhulunbuy, Galiwinku	\$800,000	\$1,636,362



Tiwi Island football grand final.

Photo: Shaana McNaught



Research program 6: Building education, training, and research capacity across Northern Australia

The CRCNA’s Education Program focuses on building this strategic capacity in the areas of agriculture, food, and health service delivery and Traditional Owner-led business development in these areas. The program aims to attract, upskill and retain local researchers to ensure the Northern Australian agricultural, health service delivery and TO-led industries maintain their competitive advantage.

The CRCNA Education Program is delivered across three key areas, as outlined below:

1
Postgraduate students

Providing generous scholarships for Postgraduate students (Masters and PhD) to study in Northern Australia. Scholarship amounts are up to \$50,000 p.a.

2
Workforce development

Providing professional and workplace development opportunities for current students or early and mid-career researchers.

3
Vocational or undergraduate student development

Providing opportunities for work experience in Northern Australia for vocational or undergraduate students.



Rock oyster trial site, Flying Foam Passage on Murujuga (Burrup Peninsula), WA.

Photo: Steven Gill, Maxima



Wild rice farming,
Northern Territory

Photo: CSIRO

Project pipeline

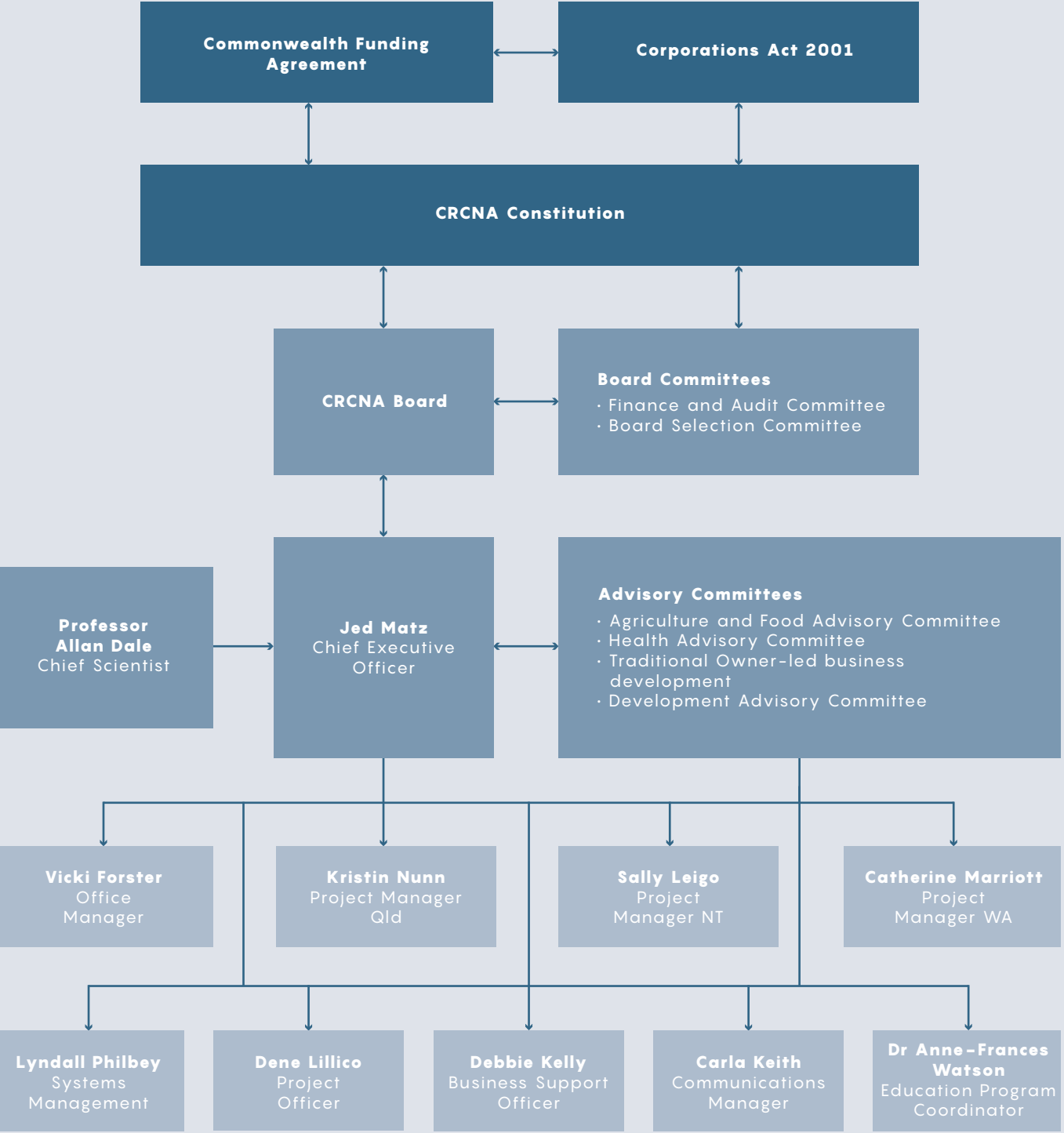
Projects listed here have secured CRCNA funding but are yet to be contracted as at 30 June 2019.

Project name and description	CRCNA funding commitment
Identifying policy and regulatory barriers to development – Queensland, Northern Territory and Western Australia Governments will work with the NASONG to examine critical constraints and propose innovative policy solutions which facilitate agricultural development while achieving significant environmental and social outcomes for northern Australian communities. The Northern Territory project commenced in October 2019.	\$200,000
Developing NT cropping sector will coordinate and accelerate the establishment of large scale broadacre irrigating cropping in the NT.	\$310,257
Northern Australia broadacre cropping situational analysis will deliver a supply chain gap analysis and sector capacity baseline study to assist in guiding future investment, strategy development and planning.	\$250,000
Northern Australian Tropical Rock Oyster research and development is seeking to develop a Tropical Rock Oyster industry in the Northern Territory and Western Australia (contracted September 2019).	\$1,200,000
Improving supply chains of Kimberley barramundi will seek to enhance the genetics of fingerlings.	\$600,000
Situational analysis project will undertake SWOT of current industry and examine future opportunities.	\$150,000
Health services sector situational analysis will focus on improving digital health service delivery and examine policies and planning to deliver enhanced communication, infrastructure and health service delivery models in Northern Australia (contracted July 2019).	\$149,534
Growing high-value food and fibre exports from Northern Australia develop technical support across a range of crops and products to grow exports from Darwin airport.	\$1,000,000
North Queensland supply chain study – Phase 2 will deliver an action plan to implement the outcomes and recommendations from the three regional supply chain projects with Greater Whitsunday Alliance, Advance Cairns and Townsville Enterprise.	\$180,000
De-risking broadacre cropping options for northern Queensland will coordinate and accelerate the establishment of a large scale broadacre irrigating cropping agribusiness in northern Australia (contracted August 2019).	\$234,395
Co-mapping on Country will work with Traditional Owners to identify place-based development opportunities for Traditional Owners in the Northern Territory	\$400,000



Cotton growing in the Ord, WA

Organisational structure



CRCNA Board



Sheriden Morris

Chair

Sheriden is currently the Managing Director and Company Secretary of the Cairns-based non-profit Reef and Rainforest Research Centre (RRRC) and Deputy Chair of Citizens of the Great Barrier Reef.

Sheriden has extensive experience in environmental research and monitoring management, aquaculture development, agricultural science and agronomy in the sugar cane and banana industries of Far North Queensland and served as a Director of Wetland Care Australia and has previously worked with CSIRO and Great Barrier Reef Marine Park Authority (GBRMPA).

As an extensive contributor to land and sea management policy, Sheriden has also spearheaded the development and implementation of an innovative aid development programme on Australia's northern borderlands with Papua New Guinea.

Board term: 2017–2022



Cr John Wharton AM

Councillor John Wharton AM is Mayor of the Richmond Shire Council. He received a Member of the Order of Australia Award and Centenary Medal for his service to the community of North-West Queensland and local government. He is the Director of his own company, Wharton & Co Pty Ltd and is a registered Real Estate Agent.

John is recognised nationally for his commitment to community service through local government, regional development, natural resource management and primary industry organisations. In 2007 he was awarded a Member of the Order of Australia Award for his service to the community of north-west Queensland. He also received the Centenary Medal for distinguished service to local government.

Board term: 2017–2021



Don McDonald AM, OBE

Deputy Chair

Don is the Chair of MHD Pty Ltd—a family owned beef cattle operation in Cloncurry in north-west Queensland. Don has previously held Board positions with the Australian Agricultural Company Ltd, Queensland Industry Development Corporation, Kidson Gold Mines Ltd, CSIRO, ATEC Rail Group and the Queensland Royal Flying Doctors.

Don is recognised nationally for his commitment to regional issues. In 1988 he was awarded an OBE for his services to the community, in 2001 Don was awarded a Centenary Medal, and then in 2006 he was awarded a Member of the Order of Australia Award.

Board term: 2017–2019



Cr Peter Long

Peter is Mayor of the City of Karratha. A professional engineer and environmental scientist, Peter has instigated and managed a range of businesses in the environmental and engineering fields and has served on several Boards including the West Pilbara Institute, St Luke's Collage (Chair), Biosequest Australia and Worley Astron (Chair).

Board term: 2017–2022



Tracey Hayes

Tracey is Chair of the Darwin Waterfront Corporation, a member of the Order of Australia Honours Council, a Director of the Australia Indonesia Institute, and the North Queensland Livestock Industry Recovery Agency.

A long-term Territorian, pastoralist, pilot, Justice of the Peace and small business owner, Tracey was the first female Chief Executive Officer of the Northern Territory Cattlemen's Association and was tasked with leading the billion-dollar NT pastoral industry.

Tracey has a Global Executive Master of Business from the University of Sydney, studied Business Management and Rangeland Management with The University of Queensland and has continued her Agribusiness studies with the Harvard Business School short course program.

Board term: 2017–2020



John Bearne

John has substantial experience as Chair and Director of numerous commercial and not-for-profit organisations including Townsville Hospital Health Service (Chair), Tropical Health Academic Research Centre (Chair), the Jezzine Barracks Community Trust (Director), the Australian Technical College of North Queensland (Director) and Yumba Meta (Director). He is a Member of the Townsville Health Research Ethics Committee, was formerly the President of the Townsville Chamber of Commerce and is a Life Member of Townsville Enterprise Ltd.

Board term: 2017–2019



Melissa George

Melissa is a Wulgurukaba Traditional Owner with traditional connections to Magnetic Island and the greater Townsville region and is actively involved in protecting and managing land and sea through the empowerment of Traditional Owners' cultural law and obligations to care for country.

Melissa has previously worked as the Chief Executive Officer of the North Australia Indigenous Land and Sea Management Alliance (NAISMA) and served as a Director of the Great Barrier Reef Management Park Authority Board and Bush Heritage Australia and continues to work as a Ministerial advisor for the Federal Government on environmental and Indigenous issues.

Board term: 2017–2019



Elephant Rock, Kununurra, WA



**“Major, long-term research
impacts driving towards a
vibrant Northern Australia.”**



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