

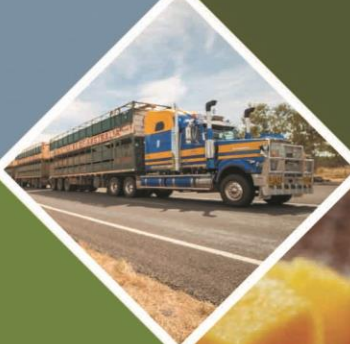
**NORTHERN HEALTH
SERVICE DELIVERY**



**AGRICULTURE
& FOOD**



**TRADITIONAL
OWNER-LED
DEVELOPMENT**



**Facilitating Quality
Agricultural
Development in
Northern Queensland**

New Policy Directions

Allan Dale and Amber Marshall





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ISBN 978-1-922437-12-9

Acknowledgments

This research is funded by the CRC for Developing Northern Australia (CRCNA) and supported by the Cooperative Research Centres Program, an Australian Government initiative. The CRCNA also acknowledges the support of its investment partners: the Western Australian, Northern Territory and Queensland Governments. The research has also been supported by the Rural Economies Centre of Excellence (RECoE); a research consortium funded by the Queensland Department of Agriculture and Fisheries (DAF).

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The CRCNA recognises the value of knowledge exchange and the importance of objective peer review. It is committed to encouraging and supporting its research teams in this regard.

The authors confirm that this document has been reviewed and approved by the project's steering committee and by two independent peer reviewers. These peer reviewers evaluated its originality, methodology, rigour, compliance with ethical guidelines, conclusions against results, and conformity with the principles of the [Australian Code for the Responsible Conduct of Research](#) (NHMRC 2018), and they provided constructive feedback which was considered and addressed by the authors.



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Table of contents

List of Tables and Figures	3
Acronyms	4
Project Participants	6
EXECUTIVE SUMMARY	7
PART 1: INTRODUCTION & METHODOLOGY	8
1.1 Introduction: The Agricultural Development Challenge	9
1.2 Research Methodology	10
1.3 Agricultural Development in Northern Queensland	12
PART 2. POLICY & LITERATURE REVIEW	26
2.1 Current Policy Frameworks Supporting Northern Agricultural Development	27
2.2 Current Policies Regulating Agricultural Development	29
2.3 Current Frameworks for Setting Agricultural Development Priorities	33
PART 3: RESEARCH RESULTS	36
3.1 Risks and Opportunities that Investors Need to Manage	37
3.2 Perceptions of Our Current System of Investment Attraction and Approval	40
3.3 Case Studies of Planning, Assessment and Approval	46
3.4 Innovative Models for Improved Agricultural Planning and Assessment	49
PART 4: CONCLUSIONS & RECOMMENDATIONS	56
4.1 Positive Pathways to Increase Agricultural Development Investment	57
4.2 Conclusions and Strategic Recommendations	64
References	70
Appendix 1: Terms of Reference Agreed With Queensland Government	75
Appendix 2: Interview questions	78
Appendix 3: Survey questions	79
Appendix 4: The location, scale and scope of existing water developments in northern Queensland	84



List of Tables

Table 1: Interview participants	11
Table 2: Survey participants	11
Table 3: The location, scale and scope of proposed and emerging new water developments in northern Queensland.	15
Table 4: Responsibilities for progressing key delivery pathways across stakeholders and context	63
Table 5: Key solutions and pathways to impact	66

List of Figures

Figure 1: Competitive advantages for agricultural investment in Northern Australia (PWC, 2020).	133
Figure 2: Proposed and newly approved water resource developments in northern Queensland.	200
Figure 3: Agricultural development investor information requirements (PWC, 2020).	37
Figure 4: Survey responses rating severity of risk/impediment to agricultural development in northern Queensland.	38
Figure 5: Survey responses rating experiences dealing with regulatory requirement.	39
Figure 6: Survey responses about what local, State and Commonwealth Governments should do to prioritise, de-risk and broker sustainable agriculture and aquaculture.	45
Figure 7: Textual analysis of the responses a survey question about additional things Industry should do in facilitating sustainable agricultural and aquacultural development.	46
Figure 8: The integrative framework used to translate research finding into response pathways and strategic recommendations.....	48



Acronyms

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ADA	Aquaculture Development Area
ALRC	Australian Law reform Commission
ANAO	Australian National Audit Office
ASEAN	Association of Southeast Asian Nations
BCR	Benefit-Cost Ratio
CEFC	Clean Energy Finance Corporation
COAG	Council of Australian Governments
CRDC	Cotton Research and Development Corporation
COWG	COAG Seniors officers Working Group
CRCNA	Cooperative Research Centre for Developing Northern Australia
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAF	Department of Agriculture and Fisheries (Qld)
DAWE	Department of Agriculture, Water and Environment (Australia)
DILGP	Department of Infrastructure, Local Government and Planning (Australia)
DNRME	Department of Natural Resources, Mines and Energy (Qld)
DSDMIP	Department of State Development, Manufacturing, Innovation and Planning (Qld)
EIS	Environmental Impact Statement
EOI	Expression of Interest
EPBC Act	Environment Protection and Biodiversity Conservation Act
EPP	Environmental Protection Policy (Qld)
FGARA	Flinders and Gilbert Studies
FIAL	Food Innovation Australian
GBR	Great Barrier Reef
GFCQ	GasFields Commission Queensland
GQAL	Good Quality Agricultural Lands
GRDC	Grain Research and Development Corporation
GVP	Gross Value Product
IAR	Impact Assessment Report
JCU	James Cook University
MDIA	Mareeba-Dimbulah Irrigation Area
MDWSS	Mareeba-Dimbulah Water Supply Scheme
MLA	Meat and Livestock Australia
MNES	Matters of National Environmental Significance
NAIF	Northern Australia Infrastructure Fund
NAWRA	Northern Australia Water Resource Assessment



NFF	National Farmers' Federation
NQWIA	North Queensland Water Infrastructure Authority
NRM	Natural Resource Management
NWI	National Water Initiative
NWIA	Northern Water Infrastructure Authority
NWGA	National Water Grid Authority
NWIDF	National Water Infrastructure Development Fund
OGBR	Office of the Great Barrier Reef (Qld)
PAA	Priority Agricultural Area
PALU	Priority Agricultural Land Use
PWC	Price Waterhouse Coopers
R&D	Research and Development
RDA	Regional Development Australia
QBWOS	Queensland Bulk Water Opportunities Statement
QFF	Queensland Farmers' Federation
QRIDA	Queensland Rural and Industry Development Authority
QUT	Queensland University of Technology
RECoE	Rural Economies Centre of Excellence
RIC	Regional Investment Corporation
ROSI	Roads of Strategic Importance
SARA	State Assessment and Referral Agency
SCA	Strategic Cropping Area
SEA	Strategic Environmental Area
SPP	State Planning Policy (Qld)
SRA	Sugar Research Australia
TIQ	Trade and Investment Queensland



Project Participants

James Cook University



Queensland University of Technology



Rural Economies Centre of Excellence





EXECUTIVE SUMMARY

The CRCNA's first *State of the North Report* identified that, within well-known logistical and resource-based limits, there are major opportunities for growing the value of agriculture in northern Queensland. Several supply chain and sectoral analyses commissioned by the CRCNA, however, show that landholders, agricultural investors, and the wider community have communicated their frustration with the processes for prioritising, planning, assessing and approving new development. For agricultural developers, a clear, low-risk pipeline of new and sustainable agricultural opportunities progressing towards investment is not readily accessible. Equally, a recent audit and review of the operation of the Commonwealth's *Environment Protection and Biodiversity Conservation Act* suggests that current regulatory arrangements might not be adequately protecting environmental values. Both development and community interests have raised specific concerns about impediments to new investment *and* the achievement of sustainable agricultural development in northern Queensland as follows:

1. *Biodiversity and vegetation management*: Lack of policy clarity about **where** sustainable agricultural development will be acceptable to three levels of government and the community, both in terms of impacts of terrestrial biodiversity and water quality flowing into the Great Barrier Reef lagoon;
2. *Water allocations and licensing*: At the catchment scale, a lack of policy and procedural clarity about **who will be able to benefit** from water allocation and water release processes and trading and **what type of development** will meet the needs of environmental flows;
3. *Land tenure*: **Complexity in tenure resolution** and property diversification processes to deliver productivity improvements and investment security for Traditional Owners, pastoralists and others;
4. *Insufficient infrastructure, supply and value chain planning*: Limited scale-relevant and demand-driven planning to meet **infrastructure, biosecurity, services and labour requirements**; and
5. *Quality capital attraction*: **Visionary public policy framing to attract quality forms of equity and debt capital** into highly integrated, low impact and value-rich agricultural production systems.

This report explores and defines these known but complex problems, but finds that the overall system of prioritising, planning, assessing, approving and monitoring compliance in northern Queensland cannot be described as fundamentally broken. The research does, however, find that to achieve investment and sustainable agricultural outcomes, significant effort is needed to address dilemmas that arise from:

- A lack of **clearly articulated agricultural development priorities** across northern Queensland, including a focus on better use of existing water schemes and the sequencing of new development;
- **Poor frameworks for integrated, collaborative planning at the catchment or sub-regional** scale between governments, the private sector and the community to progress agricultural development;
- **Fragmented and sometimes conflicting policy and process settings** in project assessment and approval that are unable to resolve tensions (and opportunities) concerning development, the environment, and Indigenous interests in northern Queensland landscapes; and
- **A limited focus on raising the capacity of agricultural development interests** to develop and prosecute investment-ready proposals that can easily achieve their regulatory obligations.

This report optimistically suggests that, by progressively building upon existing infrastructure and knowledge, visionary development of sustainable agriculture in northern Queensland could contribute to national water security. Water and energy security will jointly be crucial to building economic resilience post-COVID and in the wake of structural change in the State's resources sector. With innovative approaches, agricultural, environmental and Indigenous interests in development can be reconciled. Without the resolution of these issues, however, further investment in positive, private sector-led agricultural development **will continue to face procedural inefficiencies, conflict and investment uncertainty**. This research suggests the need to implement and to evaluate some of the following solutions:

- Commonwealth, State and local governments working together with industry, investors and community interests to **set targets for and to prioritise agricultural development in northern Queensland**, with a focus on building a 30-year vision and effectively sequencing development;
- The development of **new collaborative planning models in priority agricultural development areas** that use existing legislative frameworks to resolve significant water conflict, vegetation and biodiversity management, native title and tenure resolution, and infrastructure and services planning;
- The development of **improved brokerage, assessment and approval approaches and targeted regulatory improvements** to better de-risk priority landscapes to attract suitable investment; and
- **Lifting the investment readiness of landholders/investors** to progress sustainable agriculture.



PART 1: INTRODUCTION & METHODOLOGY





1.1 Introduction: The Agricultural Development Challenge

There are strong local, State and Commonwealth Government, industry and community aspirations for agricultural development in northern Queensland. Indeed, the development of Northern Australia has long been a national aspiration with a recent resurgence of focus (Dale et al., 2020). At the highest level, these aspirations are made clear in the *Whitepaper on Developing Northern Australia* (Australian Government, 2015a). After three years of active implementation, it remains clear that the northern development agenda is critical to a more prosperous and secure future for many regions and all Australians (ASB, 2019). At the same time, the nation and all jurisdictions expect a high standard of protection of key environmental and cultural values in Northern Australian landscapes and catchments. Progress on facilitating sustainable agricultural development, however, has faced many challenges. Significant risks and barriers still inhibit the successful journey from agricultural development concepts to investment and sustainable operation.

In this context, agricultural development is a general term related to a variety of agricultural and aquacultural expansion processes and practices that create entirely new production systems and/or increase the value of current production systems. Examples include the development of new irrigated and dryland cropping systems; horticulture; the emergence of new agricultural service; and the intensification of cattle production. Such developments might involve public or private investment, and traverse a range of planning, assessment and approval processes. In all cases, agricultural development in Northern Australia, and northern Queensland in particular, needs to occur in an economically, socially and environmentally beneficial way. It must also contribute to an increasingly diverse, integrated and value-rich agricultural processing and services economy. Further in this context, the term *de-risking* refers to the way that policies, regulations and operational planning, assessment and approval processes (of both governments and agricultural development investors) aid or enable sustainable and legitimate investment in agricultural development.

Governments at all levels have a facilitative role in setting the policy frameworks for, and actively attracting investment for agricultural development in, the existing agricultural estate and greenfield districts. Good governance and policy frameworks are vital in supporting regional, rural and agricultural development. Consistent with a renewed governmental focus on “regions” and “place” in reframing quality policy making, it is important for Commonwealth, State and local governments to empower rural communities to guide, facilitate and monitor progress towards their agricultural development priorities. This need to improve the interface between policy, regulation and investment decisions in regional Australia was explicitly recognised in the Productivity Commission’s recent report into regional development (Productivity Commission, 2017). While few solutions were proffered, this finding was reinforced by a key thought-piece by AgriFutures which identified “unresponsive regulation” as a risk to growing agriculture nationally (ACIL Allen, 2019). In considering this, it is equally necessary to keep Queensland’s regions and rural communities both investing locally while also drawing on investment from across the rest of the nation and the world. This requires investment certainty, provided by strong policy frameworks agreed across Commonwealth, State and local government scales, and stronger foundations for regional self-determinism.

Over the last three decades, Queensland has undertaken significant policy and regulatory reform to improve decision making that might deliver strategic direction and improved security for agricultural investors (e.g. establishing statutory approaches to the allocation of water rights, improved mechanisms to resolve tenure insecurities, etc.). Many regulations have also been established to protect and better manage environmental values and natural resources. In many cases, these reforms have emerged from the need to meet international, Commonwealth and State policy and strategic obligations (e.g. reform required under COAG’s National Water Initiative (NWI) or the Commonwealth’s *Environmental Protection and Biodiversity Conservation Act*). Partly as a result, decisions now often require separate consideration of both Commonwealth and State legislative obligations, especially if a decision is made under some form of bilateral agreement. While governments accept these global and bilateral obligations, there is evidence that the processes and approaches for de-risking landscapes for agricultural investment *and* environmental protection remain quite problematic within the regions (e.g. see Cobcroft et al., 2020; Chilcott et al., 2020; ST Strategic Services and Pivotal Point Strategic Directions, 2020).

Importantly, there is considerable evidence, however, that this wider range of policy and regulatory settings might not be effectively and adequately delivering protection of the north’s environmental and cultural values. In respect to Commonwealth responsibilities in this field, this problem has been most recently recognised through the Commonwealth Auditor General’s report in respect to referrals, assessments and approvals of controlled actions under the *Environment Protection and Biodiversity Conservation Act*. In an unambiguous



statement, the report states that “despite being subject to multiple reviews, audits and parliamentary inquiries since the commencement of the Act, the Department of Agriculture, Water and the Environment’s administration of referrals, assessments and approvals of controlled actions under the EPBC Act is not effective” (ANAO, 2020, p.8). Particular concerns related to the application of risk analysis, approval conditioning, compliance, conflicts of interest, and general procedural governance. While the report seeks to address quite specific procedural requirements under the Act, there are broader and more strategic tensions within the wider context in which the Act is administered, leading to a similarly critical independent review of the Act (Samuel, 2020). These tensions, which often relate to the landscape scale resolution of development/environment interactions, suggest more could be done to resolve incongruence between agricultural, Indigenous and environmental values and interests in the north (Dale, 2014).

As a consequence, this study explores how effectively our current processes (from national to local scales) for prioritising and facilitating agricultural development planning, assessment, approval and investment are working in and for northern Queensland. It also analyses the consequent governance, policy and delivery frameworks for attracting investment in sustainable agricultural development. The study is based on a literature review, context mapping, workshops, interviews, and surveys with relevant government, industry and community stakeholders. The research also explores how other jurisdictions (globally and nationally) are tackling similar problems. This leads to a series of recommendations to improve the wider system of de-risking places for agricultural investment in the north. In doing so, the project aims to benefit local, State and Commonwealth Governments, investors and other stakeholders in working together to better attract and manage agricultural development.

1.2 Research Methodology

This research is one of three studies commissioned by the CRCNA to investigate de-risking for agricultural development in Northern Australia. The Western Australia study is being undertaken by the Western Australian Government. In the Northern Territory, the CRCNA and Northern Territory Government jointly appointed a consultant (NAJA Business Consulting Services) to complete the work. In Queensland, James Cook University (JCU) and the Queensland University of Technology (QUT) have undertaken the work on behalf of CRCNA in close consultation with Queensland Government, industry and the community sector.

Clear and open lines of communication were maintained between the CRCNA, JCU, QUT and Queensland Government throughout the process. This included consultation on research scope (see Appendix 1), identification of key participants, and interview and survey questions. The project plan was assessed by JCU’s Ethics Committee and the research carried out with a commitment to confidentiality and rigour.

Data collection and analysis were undertaken in three phases:

- **Phase 1: Literature review** - A thorough review of the academic and grey literature (policy, legislation, industry reports, feasibility studies, etc.) was undertaken about existing and proposed agricultural water developments (large and small) in catchments across northern Queensland. The review canvassed the contextual challenges and opportunities for such developments and explored the potential agricultural areas that could be made available under specific schemes;
- **Phase 2: Data collection** - Data collection was undertaken through interviews and a survey. Interviews with targeted representatives from industry, community and governments, across sectors and roles, were undertaken via video/phone and lasted approximately 45 minutes each. The interview questions appear in Appendix 2. The survey was distributed to a wider range of representatives from industry and the community using professional networks and social media. A summary of participants appears in Tables 2 & 3 and survey questions are outlined in Appendix 3;
- **Phase 3: Data analysis** – Interview data were analysed using theoretical coding techniques (Flick, 2006). This involved manually sorting the data (interview summaries and survey responses) into initial themes drawn from the questions asked of participants. Themes for the ‘barriers’ and ‘enablers’ for agricultural development, for example, were established based on participant responses. During a recurrent process of visiting and revisiting the data, impressions, associations, questions and ideas were noted and thematically grouped. This process of abstraction led to insights that form the basis our findings. Survey data were analysed by the survey software (Survey Monkey)



to produce the graphs included in this report. These graphs were interpreted using insights from the literature review and interviews.

The findings are presented in this report along key themes and priorities that emerged from the data collection and analysis (Flick, 2006). This report was shared in draft with all participants, as well as key stakeholders from the Queensland and Commonwealth Governments. Feedback was integrated into the final document.

Table 1: Interview participants, n=41.

Sector	Number of interviewees	Characteristics
Primary producers	5	Range of industries including aquaculture, horticulture, sugar and beef.
Industry & non-government	12	Range of organisations including State and Commonwealth advocacy and peak bodies representing agriculture, aquaculture, water, the environment and Indigenous interests.
Financial & consulting institutions	5	Range of local and national service providers including major banks and small agricultural consultancies.
State Government agencies	8	DNRME, DSDMIP, DAF
Commonwealth agencies and agricultural finance bodies	11	NQWIA, NAIF, RIC, CEFC, DAWE

Table 2: Survey participants, n = 35.

Sector	Number of respondents	Range of roles and occupations
Agricultural processing	1	<ul style="list-style-type: none"> • Business owner (9) • Consultant (7) • Industry development officer (5) • Employee/contractor (4) • Industry/sector advocate (4) • Industry supplier (1) • Other (5)
Agricultural logistics	1	
Aquaculture	1	
Broadacre cropping	2	
Horticulture	8	
Forestry	2	
Livestock	1	
Environmental or social impact management	8	
Other	11 (Planning, development, marketing, supply chains)	



Arising from this methodology, this report progresses along the following structure. We introduce the work by outlining the agricultural development opportunity and limitations in northern Queensland. We then explore the policy frameworks that both support and regulate agricultural development in the region. This leads to an analysis of the way that agricultural development is prioritised across the north. We then overview the risks and opportunities that investors need to manage to achieve successful development outcomes. The core findings of our interview and survey work are then used to unpack stakeholder perceptions of the current system of prioritising, planning, assessing and approving agricultural development. This is followed by a wider exploration of innovative approaches to this complex problem in the wider Australian context. In a overall synthesis of the evidence explored, we then propose potential positive pathways for improving this complex system. The paper then concludes with a series of conclusions and strategic recommendations.

1.3 Agricultural Development in Northern Queensland

Northern Queensland's Competitive Advantage for Agricultural Investment

Ever since the publication of *The Northern Myth* in the 1970s (Davidson 1972), it has been long understood that agricultural development in the wider Northern Australian context is fraught with challenges. Harsh environments, the tyranny of distance, and limited access to infrastructure and labour have significantly constrained many bold visions and development attempts in the past. Significantly, Ash (2014) reviews the dynamic pathways of past developments, and the need for developers to generally start small, innovate, and grow through the successive lessons derived from both success and failure. Many developments and their feasibility studies have tended to initially focus on a few crops. Ultimately, however, through the complex issues faced, different phases of development (that may have been difficult to predict) generally emerge. Many crops and mixtures of options are often explored that were never considered in the planning stages. Overall, Ash (2014) shows that for development to be successful, all factors relating to climate, soils, agronomy, pests, farm operations, management, planning, supply chains and markets need to be considered in a comprehensive system-scale design. Indeed, Ash considered that particular attention needs to be paid to scaling up at a considered pace and being prepared for reasonable lags before achieving positive returns. Work of this nature has explore previous assessments of the fundamental factors that have led to both success and failure of water supply schemes in Northern Australia, including key factors such as:

- Sourcing the capital investment to support the high cost and generally low or delayed emergence of returns of 'greenfields' agricultural development;
- Cost-effectively and sustainably growing crops in relatively untested northern environments and getting them to market via efficient supply chains;
- Establishing new, demand driven and viable export markets for crops and products that may not yet be effectively accommodated by the global commodities trade; and
- New and emerging market disruptions such as COVID-19 and global trade tensions.

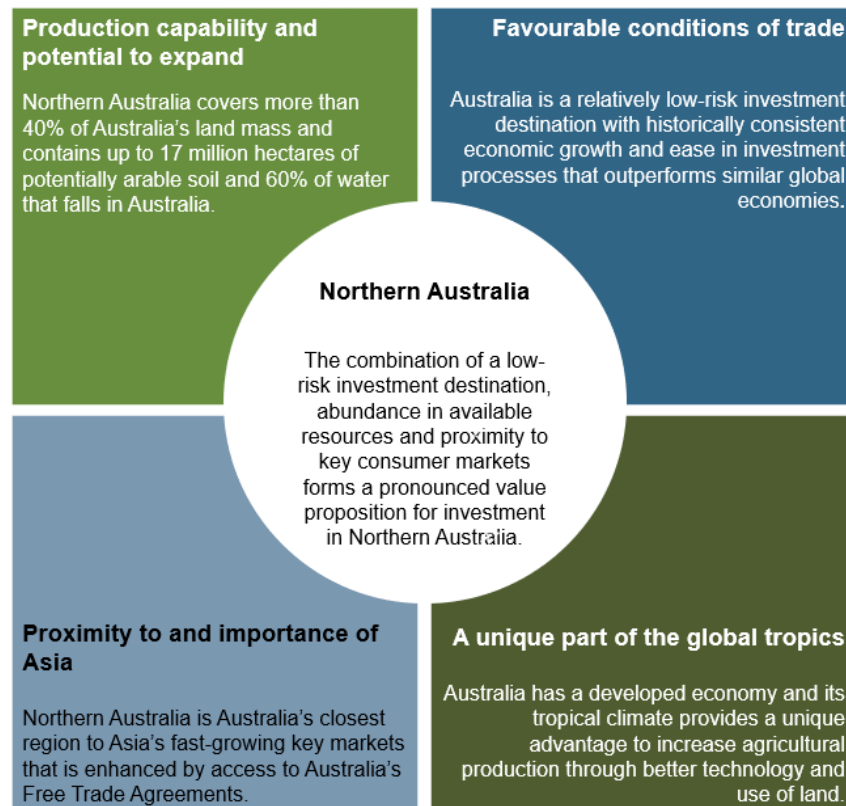
With this complexity in mind, several recent and strategic CRCNA-funded investments have reiterated the general challenges, but have also reviewed the emerging competitive advantage Northern Australia has in progressing further agricultural development (e.g. see Cavaye et al., 2018). Because northern Queensland has more productive land, a higher population and more developed policy frameworks than northern Western Australia (WA) and the Northern Territory (NT), competitive advantages applicable to Northern Australia generally apply more favourably in northern Queensland. Northern Queensland, however, suffers some level of investment disadvantage relative to more developed parts of the agricultural landscape in other Australian jurisdictions. Research undertaken by Price Waterhouse Coopers (PWC, 2020) has identified Northern Australia's agriculture sector as a major contributor to the national economy, with the annual value of production in the region exceeding \$7 billion in 2018. Encompassing more than 40% of the Australian land mass, PWC (2020) consider that the attractiveness of Northern Australia as an investment location rests with the diversity of agriculture across the region. For this reason, the availability of productive land and more importantly, available water resources, makes northern Queensland a particularly attractive option for potential investors looking to capitalise on growing global food demand.

PWC (2020) unpacks Northern Australia's generalised competitive advantages in the agricultural development space (see Figure 1) relative to other parts of Australia and the global tropics. While noting that



harvestable water potential identified cannot always be matched to suitable soils, in the context of national discussions on the importance of growth post-COVID northern Queensland may play a very significant role. A recent thought piece by AgriFutures (ACIL Allen, 2019) suggests that, with the right support, the national agricultural sector could reach the National Farmers' Federation's target of \$100 billion in value relative to a current projected baseline growth trajectory of \$84.3 billion. At this point, agriculture remains Australia's fastest growing primary sector and is second only to mining in terms of its importance to the national economy, contributing more than \$63 billion or 2.3% to Australia's GDP in 2016-17 (ACIL Allen, 2019).

Figure 1: Competitive advantages for agricultural investment in Northern Australia (PWC, 2020).



Building on the PWC (2020) findings, particular advantages for northern Queensland include:

- **Production capability and the potential to expand:** Northern Queensland's abundance of natural resources, combined with more detailed water allocation and vegetation planning, positions the region to meet the global demand and investment appetite for agricultural development. Core capabilities include sugar cane, aquaculture, horticulture and forestry, and a globally recognised expertise in tropical fruits such as mango and avocados (Cao et al., 2020). Given the availability of land and water supplies, there are significant opportunities for cross-sectoral integration of effort, and value-adding activities can be investigated to expand the industry's productivity;
- **Favourable conditions for trade:** More generally, Australia is characterised as an attractive investment destination, being ranked 18th out of 190 economies for ease of doing business and 5th in the world for economic freedom (PWC, 2020). PWC (2020) also identified that the Australian economy is AAA rated, with a stable outlook by all three global rating agencies; and
- **Proximity to and importance of Asia and the Pacific:** Northern Queensland has unique advantages compared to other northern jurisdictions. It is the nation's closest region to Asia's key markets, and has international airports (Cairns and Townsville) and major seaports along the east coast (and potentially in the Torres Strait and western Cape York Peninsula). For this reason, particularly Asian

investors see Queensland as an attractive investment destination, and six of the top 20 source countries for Australian foreign investment are in Asia (PWC, 2020).

Given the above opportunities for growing agriculture in northern Queensland, this report considers three distinctly different contexts within which critical investment decision making for new agricultural development tends to occur. These three contexts include:

1. De-risking major **new** (water-based) infrastructure projects for agricultural development;
2. De-risking collaborative decisions to increase development investment in **existing** (water-based) agricultural development schemes; and
3. De-risking the decisions of existing individual property owners or new property purchasers to **intensify/diversify** their production efforts beyond major water-based schemes.

These three contexts are unpacked below to understand their relative importance to the current de-risking process in northern Queensland.

New Water Development Scheme Opportunities

After a long hiatus since the 1990s, there are significant (emerging and actual) new water-based development proposals in northern Queensland. This has, in part, been driven by: water resource planning; increasing demand for water from the irrigation sector (particularly in southern Australia); and the release of Commonwealth and State grant programs for undertaking feasibility assessment, business case building, and impact assessment of new water storages (e.g. the National Water Infrastructure Development Fund). Broadly, however, several integrated factors are driving this surge in water development interest in northern Queensland. These include several key economic and social factors that beckon a fresh look at the nation-building role of water-based agricultural development, leading to approaches that take advantage of available and stable water resources in northern Queensland. These factors include:

- The recently increased profile of drought as a significant risk to the stability of rural economies;
- The near full-use of available water resources for productive agriculture, other consumptive uses, and environmental purposes in some parts of southern Australia (and a limited few in the north);
- Increasing recognition of large quantities of underused water in existing schemes and management areas across Queensland (as demonstrated by DNRME's Underutilised Water Partnership Project);
- The need to address the decline of remote and rural economies and high property debt levels (with localised exceptions) throughout Queensland's hinterland (often linked to managerial capacities);
- Potential threats to the resilience of many rural and remote regions as highlighted through the diverse impacts of the economic crisis sparked by the COVID-19 pandemic;
- A bipartisan and bilateral policy environment (e.g. the *Developing Northern Australia Whitepaper*) supporting the expansion of agriculture;
- Massively expanding opportunities in value-added agricultural markets for northern Queensland, and new confidence in key pastoral/cropping and horticultural agronomies; and
- Queensland's economic dependency on coal as a key economic driver and the potential for significant disruption in these markets in the coming decades.

Under the policy and investment settings provided by the bilateral and bipartisan *Whitepaper for Developing Northern Australia*, over the past three years, an entirely new cohort of medium to significant water development opportunities have been identified and assessed to varying degrees across Queensland's coastal hinterland and inland regions. This package of proposals ranges from the very significant Hells Gate Dam proposal, down to more fit for purpose local schemes. If progressed well, for the first time in some 30 years in northern Queensland (since the demise of the Queensland Water Resources Commission), there is a wide spectrum of similar and potentially linkable water development opportunities, enabling a nationally-significant, socially acceptable and progressive works program to be established over a 30 to 50 year period. Many of these developments, however, still face significant planning, assessment and approval challenges, even where construction is underway. Not all proposed developments can and will be able to progress to full impact assessment and construction. Table 3 and Figure 2 identify key components of these water development proposals and their current status.



Table 3: The location, scale and scope of proposed and emerging new water developments in northern Queensland.

Legend: Orange = concept proposal, Yellow = Feasibility & Business case, Green = Approved & in construction).

Region/Catchment	Project	Storage, Yield and BCR	Potential Ag Area	Project Status
Mitchell Catchment	Mitchell River Dam Options	Varies across proposed options. No cost estimates or Benefit Cost Return (BCR) currently available.	From 140,000 to 200,000 ha are potentially available for agriculture ¹ . The 4 most cost-effective major instream dam options identified in the Mitchell catchment are capable of delivering approximately 2,800 GL in 85% of years, which is sufficient water to irrigate 140,000 ha of sugarcane ¹ .	Four dam development options and innovative storage approaches have been identified under the CSIRO NAWRA study, but have not yet progressed to Preliminary Business Cases. These proposals are also currently not well aligned to existing water planning for the catchment.
Normanby Catchment	Lakeland Irrigation Scheme (noting this would be an inter-basin transfer from the Palmer River into the Normanby catchment.	The Preliminary Business Case suggests a storage capacity of up to 395,050 ML and a yield of up to 47,210 ML/year at a cost of up to \$498,947,000 and a BCR from 1.04 to 1.61. The Palmer River Dam Option is now being considered (BCR: 1.57) ² .	Water capture and storage potentially servicing from 8,000 to 15,000 ha of high value horticulture in the Lakeland area.	A Strategic Business case and Technical Feasibility Report completed in 2019 ² . An additional \$10 million commitment has been made by the Commonwealth Government to the Lakeland Irrigation Area Business Case and Approvals Feasibility Study ³ . The proposal would require adjustment of the current water plan for this catchment.

¹ CSIRO (2018). *Water resource assessment for the Mitchell catchment: An overview report to the Australian Government from the CSIRO Northern Australia Water Resource Assessment*. Australian Government, Department of Infrastructure, Regional Development and Cities, Canberra.

² SMEC (2019). *Lakeland Irrigation Area Project: Strategic Business Case, Technical feasibility report for preferred option*. Prepared for Regional Development Australia Far North Queensland, Cairns. Retrieved from: <https://www.rdatropicalnorth.org.au/about/initiatives/lakeland-irrigation-scheme/>

³ National Water Grid Authority (2020). *Feasibility studies*. Australian Government, Canberra. Retrieved from: <https://www.nationalwatergrid.gov.au/nwi-development-fund/feasibility-studies>



Walsh Catchment	Nullinga Dam and other options.	Reference projects place the yield at between 58,000 and 74,000ML/year (the Walsh River catchment is approximately 80,000 ML/year). BCR not available.	Option 4 (Nullinga Dam for Agricultural Use) could deliver up to 9,900 hectares of suitable land for irrigated agriculture adjacent to the Walsh River within the existing MDWSS area (from the proposed Nullinga Dam wall to the end of the Dimbulah area). Analysis of soil suitability mapping has identified over 53,000 ha for agriculture ⁴ .	The Nullinga Dam Feasibility Study was completed under a \$5million commitment by the Commonwealth Government. ³ The Preliminary Business Case has been released and progressed to full Business Case, suggesting a poor BCR for this proposal.
Johnstone/Barron Catchments	North Johnstone River Diversion Scheme	If environmental, storage and delivery constraints can be mitigated, could support allocations of 30,000 ML/year ⁴ .	Not yet available.	One of many options considered in the Nullinga Dam Detailed Business Case. It is in conceptual phase, to be reviewed by DMRME. ⁴
	North Johnstone Water Transfer Proposal	The catchment would be diverted by three dams on the Beatrice River, Dirran Creek & North Johnstone: ⁵ (i) Beatrice River Dam yield: 89,000ML/year; (ii) Dirran Creek Dam expected yield of 95000ML/yr;(iii) North Johnstone River Dam yield: 200,000 ML/yr.	Not yet available.	Informal proposal only at this point.
Upper Herbert Catchment	Southern Atherton Tablelands Irrigation Project	The proposed Woodleigh Dam (with a 35,000 ML capacity and 98.5% water reliability) would transition land from beef to high value crops and hydro power. ⁶ Has a BCR of 0.91 ⁷ .	Up to 10,000 ha for avocados, sugarcane, maize, sorghum, soya bean and mangoes ⁶ .	A Preliminary Business Case has been finalised for water capture servicing the Southern Atherton Tablelands. The Tableland Regional Council is seeking an investment of \$7.2 million via the NWIDF to progress this project ⁶ .

⁴ Building Queensland & Sunwater (2019). *Nullinga Dam and Mareeba Dimbulah Water Supply Scheme Improvements detailed business case*. Brisbane. Retrieved from: <https://buildingqueensland.qld.gov.au/business-case/nullinga-dam-detailed-business-case/>

⁵ Kidner, G. & May, L. (2020). Informal proposal to local mayors. Unpublished Word and PowerPoint documents. Received via email, 20 May, 2020.

⁶ Advance Cairns (n.d.). *Dams and water security*. Advance Cairns, Cairns. Retrieved from: <https://www.advancecairns.com/project/dams-and-water-security/>

⁷ Aurecon (2019). *Tablelands Irrigation Project: Preliminary business case*. Aurecon, Cairns.



Gilbert Catchment	Gilbert River Irrigation Project	In 2015, the general unallocated water reserves in Gilbert River Catchment was 467,000ML ⁸ . Storage and yield figures and BCR currently not available.	Etheridge Shire (ESC) seeks a catchment general water reserve of 390,000 ML and to construct a scheme distributing 200,000ML of high reliability ag water. ⁹ Some 28,564ha of irrigable land has been identified and further downstream ¹⁰ .	ESC is formulating the Detailed Business Case under the Qld Maturing the Infrastructure Pipeline Program Stage 2 (MIPP2). The Case will align with the Building Queensland Business Case Development Framework and is now completed ¹¹ .
Flinders River Catchment	Hughenden Irrigation Project	The concept is to create a suitable “off-stream” water storage of 200,000ML, with 84,000 ML/year yield at 80% reliability ¹² . BCR currently not available.	This proposal is intended to provide for an irrigation area of up to 10,000ha of diversified crops, over the extensive grasslands on the southern side of Flinders ¹² .	A Preliminary Business Case (funded under the MIP Scheme) was due for submission in Feb. 2020 ¹² . Some \$180m was committed by the Commonwealth (NQWIA managed) for construction ¹³ .
Flinders River Catchment	15 Mile Irrigated Agricultural Development Project.	Various water sources (river diversion, surface water, overland flow dams and hillside dams) with a yield of up to 4,458 ML/year at a reliability of 80-100% ¹⁴ . BCR not currently available.	Some 305.7 ha of developable land are being targeted for high value horticultural crops for grapes, citrus and avocado ¹⁴ .	In 2018 the \$47 million project was declared a coordinated project by the Queensland Government ¹⁵ and was expected to be completed in 2020. Works are ongoing.

⁸ DNRME (2018). *Minister’s performance assessment report - Water Plan (Gulf) 2007*, May 2018. Retrieved from:

<https://www.etheridge.qld.gov.au/downloads/file/404/gulf-m-1-pdf>

⁹ Etheridge Shire Council (ESC) (2019). *Gilbert River Irrigation Project: Project brief*. ESC, Georgetown. Retrieved from:

<https://www.etheridge.qld.gov.au/downloads/file/599/gilbert-river-irrigation-project-brief>

¹⁰ Far North Queensland Regional Organisation of Councils (FNQROC) (n.d.). *Priority projects overview and recommendation: Gilbert River Irrigation Project*, FNQROC, Cairns. Retrieved from:

<https://www.fnqroc.qld.gov.au/files/media/original/004/24e/77b/53b/Gilbert-River-Irrigation-Project.pdf>

¹¹ Etheridge Shire Council (ESC) (n.d.). *Gilbert River Agricultural Project*, ESC, Georgetown. Retrieved from:

<https://www.etheridge.qld.gov.au/development/economic-development/gilbert-river-agricultural-scheme>

¹² Hughenden Irrigation Project Corporation (HIPCo) (n.d.). *Project details: Ensuring the sustainability of the Flinders region*. HIPCo, Hughenden. Retrieved from:

<https://hipco.com.au/project-details/>

¹³ National Water Grid Authority (2020). *Feasibility studies*. Australian Government, Canberra. Retrieved from: <https://www.nationalwatergrid.gov.au/nwi-development-fund/feasibility-studies>

¹⁴ GHD (2019). *15 Mile Irrigation Project impact assessment report*, GHD, Brisbane, Retrieved from:

<http://eisdocs.dsdip.qld.gov.au/15%20Mile%20Irrigated%20Agricultural%20Development/Final%20IAR/15-mile-irrigated-agricultural-development-project-iar.pdf>

¹⁵ Qld Government (2019). *15 Mile Irrigated Ag Development project: Overview*. DSDMI&P, Brisbane. Retrieved from: <http://www.dsdmip.qld.gov.au/coordinator-general/assessments-and-approvals/coordinated-projects/completed-projects/15-mile-irrigated-agricultural-development-project.html>



Burdekin Catchment	Hells Gate Dam and associated weirs (including Big Rock Weir).	The total proposal includes storage of 2,110 GL, with a potential BCR between 1.4 and 0.68 ¹⁶ . Big Rocks Weir (10,000 ML) will likely progress to construction.	If fully developed, the total Hells Gate concept could enable up to 50,000 ha of high value irrigated agriculture ¹⁶ .	Some \$24 million has been committed by the Commonwealth to the Hells Gates Dam and Big Rocks Weir Feasibility Study, managed by the NQWIA ¹⁷ . Detailed Business Case due in 2022 ¹⁹ , though the State has also recently committed to contribute to Big Rocks Weir.
	Burdekin Falls Dam Raising	Raising the existing dam wall by 2 m would increase the full supply volume of the dam from 1,860,000 ML to 2,450,000 ML (32% increase) ¹⁸ .	Under the maximum expansion, the percentage of irrigated land in the regional catchment would increase from 3.6% to 5.3% (with a maximum possible new development of 5,994 ha). This increase would be primarily at the expense of grazing land ¹⁸ .	The Queensland Government approved the development of a Detailed Business Case in September 2019. A detailed Business Case underway, to be approved in 2021 and project completed by 2025 ¹⁹ . SunWater has released an EOI for an Environmental Impact Statement Consultant (May 2020).
Bowen-Broken River Catchment	Urannah Water Scheme	1,500,000 ML water storage ²⁰ , with a yield of between 70,000 and 150,000 ML/year and a BCR of 0.9 (option 1) ²¹ .	Up to 20,000ha of future agricultural land ²¹ .	Preliminary Business Case was completed in 2019. The Commonwealth Government has committed \$10 million to Business Case and Approvals Feasibility Study ¹⁷ . Urannah Dam was declared a coordinated project by the Coordinator-General in May 2020.

¹⁶ SMEC (2018) *Hells Gates Dam Feasibility Study: Feasibility report*. Townsville Enterprise, Townsville. Retrieved from: https://s3-ap-southeast-2.amazonaws.com/os-data-2/townsvilleenterprise-com-au/documents/hells_gates_dam_-_executive_summary.pdf

¹⁷ National Water Grid Authority (n.d.). *Feasibility studies*. Australian Government, Canberra. Retrieved from: <https://www.nationalwatergrid.gov.au/nwi-development-fund/feasibility-studies>

¹⁸ EM&SMEC (2018). *Burdekin Falls Dam raising: Feasibility report*. DSDIM&P, Brisbane. Retrieved from: <https://qldgov.softlinkhosting.com.au/liberty/opac/search.do?mode=ADVANCED&sortDirection=ASC&corporation=DERM&sortField=relevanceRanking&action=search&anonymous=true&queryTerm=423139&includeNonPhysicalItems=true&operator=AND#>

¹⁹ Queensland Government (2019). Queensland bulk water opportunities statement: Part B – 2018-19 Program update. Queensland Government, DNRME, Brisbane. Retrieved from: https://www.dnrme.qld.gov.au/_data/assets/pdf_file/0009/1470546/bulk-water-opportunities-program-update.pdf

²⁰ Bowen River Utilities (BRU) (n.d.). *Benefits for North Queensland*. BRU, Bowen. Retrieved from: <https://bowenriverutilities.com/#benefits-for-nq>

²¹ Bowen Collinsville Enterprise (2019). *Urannah Water Scheme preliminary case*. Queensland Government, Brisbane. Retrieved from: <https://qldgov.softlinkhosting.com.au/liberty/opac/search.do?mode=ADVANCED&sortDirection=ASC&corporation=DERM&sortField=relevanceRanking&action=search&anonymous=true&queryTerm=424140&includeNonPhysicalItems=true&operator=AND#>



Fitzroy River catchment	Rookwood Weir (Lower Fitzroy River Infrastructure Project)	The weir capable of supplying 76,000 ML/year, (42,000 for agriculture ²²). Some 117,290 ML storage with a BCR of 0.6 (central case 'best estimate' ²³).	Rookwood Weir could support some 45,000 ha irrigated crops ²⁴ .	Rookwood Weir is a \$352.2 million project, \$176.1 million committed by the Commonwealth Government and is under procurement. ²⁴ Construction tender to go to market in July 2020. Distribution is not part of plan at this time.
	Nathan Dam	While just outside of northern Queensland, this is an 888,312-ML dam, with an annual yield of 66,011 ML ²⁵ . BCR not available.	Nathan Dam could support over 6,000ha of additional agriculture (assuming 10 ML/ha). The dam will provide greater reliability of supply for downstream irrigators within existing allocations.	The Commonwealth Minister for the Environment and Energy approved the project on 13 July 2017, with conditions including a restriction on new water for agriculture ²⁶ . A detailed Business Case was completed in June 2019, finding high cost relative to demand. ²⁷

²² Australia & New Zealand Infrastructure Pipeline (ANZIP) (2019). Lower Fitzroy Infrastructure Project – Rookwood Weir. Infrastructure Partnerships Australia, Sydney. Retrieved from: <https://infrastructurepipeline.org/project/lower-fitzroy-infrastructure-project---rookwood-weir/>

²³ Building Queensland (BQ) (2017). Lower Fitzroy River Infrastructure Project: Detailed business case. BQ, Brisbane. Retrieved from: https://qldgov.softlinkhosting.com.au/liberty/opac/search.do?mode=ADVANCED&sortDirection=ASC&sortField=relevanceRanking&action=search&queryTerm=423153&includeNonPhysicalItems=true&operator=AND&_open=1#

²⁴ Queensland Government (n.d.). *Rookwood Weir irrigated crop potential – Land suitability maps*. Department of Agriculture and Fisheries, Brisbane. Retrieved from: <https://www.daf.qld.gov.au/business-priorities/agriculture/sustainable/rookwood-weir>

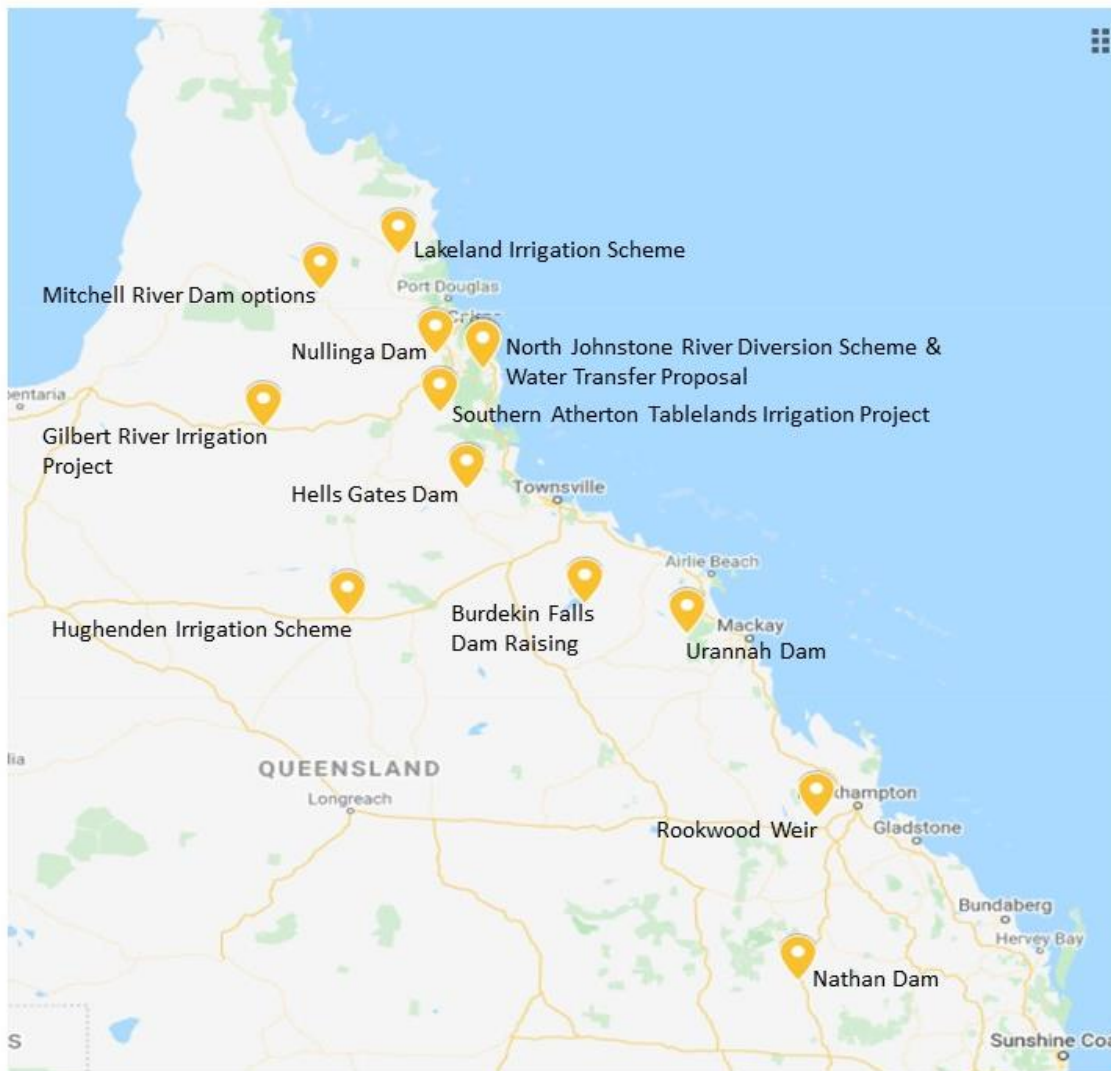
²⁵ Queensland Government (2019). *Nathan Dam and pipelines*. State Development, Manufacturing, Infrastructure and Planning, Brisbane. Retrieved from: www.statedevelopment.qld.gov.au/coordinator-general/assessments-and-approvals/coordinated-projects/completed-projects/nathan-dam-and-pipelines.html

²⁶ Sunwater (n.d.) *Nathan Dam and Pipelines Project*, Mareeba. Retrieved from: <https://www.sunwater.com.au/projects/nathan-dam-and-pipelines-project/>

²⁷ Queensland Government (2019). *Queensland bulk water opportunities statement: Part B – 2018-19 Program update*. DMRME, Brisbane. Retrieved from: https://www.dnrme.qld.gov.au/_data/assets/pdf_file/0009/1470546/bulk-water-opportunities-program-update.pdf

Together, these proposals have the potential to deliver unprecedented agricultural development in northern Queensland. Several factors, however, are likely to result in only some of these proposals progressing to full development (e.g., the sustainable limits on water extraction, market and logistical limitations, etc.). With many projects having a Benefit-Cost Ratio (BCR) close to 1, however, proponents will generally be seeking limited Commonwealth, State and private sector investment in dam and water supply infrastructure development (i.e. versus land development for agriculture). Generally, these projects are being advocated in isolation and by different regional interests. With stiff competition for financial resources and water, and with no collaborative Commonwealth/State strategy, it is likely these projects will come online spasmodically, in part, or not at all. This significantly reinforces the need for greater prioritization effort across government and industry sectors.

Figure 2: Proposed and newly approved water resource developments in northern Queensland.



Potential Growth in Existing Irrigated and Cropping-Based Agricultural Schemes

Queensland has had an extensive history of development in irrigated agriculture in the north. With the introduction of Water Resource Plans and water trading frameworks under the COAG-derived *National Water Initiative* and the related Queensland *Water Act 2000*, there has been a steadily growing level of agricultural production, which has also increased water prices in some locations.



These developments are occurring within existing farming systems that generally require less complicated or no specific additional development planning, assessment and approval. However, as water availability decreases (i.e. available water being converted to use) and the price of water increases, strategic decision making must necessarily shift from individual water users to wider and more collective decisions among stakeholders within the scheme. Indeed, the Queensland Farmers' Federation (QFF) is becoming increasingly concerned about the under-use of existing allocated irrigation entitlements, or the lack of value being achieved through each megalitre of water used. To give a sense of the water currently available in the northern Queensland context, Appendix 4 identifies the key components of existing water development schemes and their current status in relation to agricultural development investment.

Since 2000, water-related legislation has helped drive productivity in northern Queensland's agricultural sectors. The Queensland *Water Act 2000* provided a focus on water security, ecosystem health, and water use efficiency and conservation. This legislation delivered on the COAG intent of national water reform, best articulated through the National Water Initiative (NWI) (2004). Three key legislative objectives included:

- Achieving lower bound pricing (or better) for infrastructure services and a move to upper bound pricing where practicable;
- Establishment of an independent economic regulator with an appropriate role in the review of price settings associated with infrastructure; and
- Separation of water planning and management functions from the roles of service delivery.

All three objectives have been progressed (to varying degrees), which has improved growth and efficiency in irrigated agricultural productivity in Australia; with New South Wales, Victoria and Queensland all having met the actions set out in the NWI. Consistent with the concerns raised by QFF above, however, the Commonwealth Government considers that "there is scope to refine Queensland's arrangements to deliver better outcomes" (Australian Government, 2017a, p. 244). On the other hand, farmers and irrigators groups report that programs focused on improving water use efficiency in the irrigation sector are "generally effective in improving farm efficiency and productivity" (Australian Government, 2017b, p. 23). Increasing effort in this space has also seen the Queensland Government to articulate clearer investment prioritization principles through the Queensland Bulk Water Opportunities Statement (QBWOS) discussed later.

Through more effective statutory approaches to water resource planning under the legislation, the shift to volumetric licensing, and the establishment of clearer frameworks for water trading, northern Queensland has seen significant agricultural productivity improvements. In general, while still early days, a more proactive approach to on-farm and scheme-wide approaches to productivity improvement have emerged. In the Mareeba-Dimbulah Water Supply Scheme (MDWSS), for example, water demand has been continuing to grow at 3.4% per annum over the last decade (Cummings, n.d.). While this is not yet common in northern Queensland, as on-farm efficiencies have grown across the globe and the nation, so too have more collaborative and scheme-wide approaches to improving efficiencies. For example, the Mareeba Dimbulah Irrigation Area's (MDIA) Efficiency Improvement Project has delivered planned efficiency improvements at a scheme level, and the project involves the installation of automated control gates at the Bibbohra storage (completed July 2019). On the back of increasing water demand and cost, this is one of five sub-projects within the scheme aimed to improve operating efficiency and reduce water losses by up to 8000 ML, thereby boosting the local economy by providing more water for irrigators (Queensland Government, 2019a, p.15).

Consistent with QFF's calls for greater use of under-used water, further significant productive uses for water in irrigated agriculture have been identified at the State level. For example, Queensland Government's Rural Water Management Program (Queensland Government, 2020a) aims to achieve strengthened water measurement, transparent water information, an enhanced regulatory approach, robust compliance, and optimisation of water markets. Various projects in this program, to be completed by 2025, build upon policy reform and technology to make better use of existing resources (e.g. coupling new water measurement processes with water information systems that provide timely and transparent information for irrigators). Queensland's Water Markets Optimisation Strategy is scheduled for release by the end of 2020.

Despite these emerging improvements, much more could be done at the scheme level to increase both the use of under-used irrigation waters and the value delivered. The effectiveness of using a mixture of policy approaches and technologies to increase agricultural productivity is increasingly being demonstrated in other countries. Productivity improving options include progressing crop agronomy/improvement, value-adding and processing within the region, and new transport and export opportunities. In the Netherlands, for example, a



combination of techniques and increased data collection on soil fertility, soil moisture, water buffering capacity and irrigation informs an “integrated approach” to water and agrifood development. New and easily accessible technologies, such as direct crop monitoring and geo-information, give farmers better insight into their water resources (Dutch Water, 2020). A recent Australian thought piece, *Going Dutch: Opportunities for the Australia agri-food sector* (KPMG, 2018) suggests that while the Netherlands is 185th the size of Australia, it produces some 810 times more export earnings per hectare and nearly three times more agri-food export earnings. While the Australian and Dutch contexts differ greatly, it is important to note that the Dutch success story is attributed to the country having a strong sustainable agriculture mission seeking twice the food for half the resources. This is underpinned by a national commitment to collaboration through open innovation, co-investment and clustering. The Dutch actively cluster complementary businesses and institutions, together with solution-focused scaling, and they prioritise the achievement of sustainability and social license. Within the northern Queensland context, with strong research institutions (universities, CSIRO, etc.) and an innovative farm sector, there are opportunities to implement similar integrated approaches to increase productivity with existing resources.

Intensification, Development and Diversification in the Pastoral Estate

Pastoral agriculture in Queensland accounts for 86% of the State’s land use (Queensland Government, 2018). Pastoralists are responsible for managing very large areas of lands, and it can be challenging to balance expectations and requirements for biodiversity, biosecurity and productivity (Chilcott et al., 2020). As beef production largely relies on water from the natural environment (i.e. rainfall and managed local surface and groundwater sources), climate variability and drought are key factors that impact the sustainable growth and efficiency of grazing properties in northern Queensland. Much research and development (R&D) has addressed challenges associated with pasture and forage management, and information and tools have been made available to pastoralists. Meat and Livestock Australia (MLA), for example, provides many evidence-based tools to prepare for drought, ascertaining rainfall and measuring soil moisture (MLA, 2020).

The average profitability of farms in Australia’s beef industry has been relatively low for many years in comparison to other agricultural sectors. ABARES farm survey results indicate that average annual productivity growth in the beef industry between 1977–78 and 2012–13 was moderate (1.3%), and lower than in the cropping industry (1.5%) but faster than in the sheep industry (0.2%) (Jackson & Valle, 2015). Productivity improvements in this industry were partly realised through improved pastures, the introduction of supplements and licks, herd genetics and disease management. Higher levels of productivity through herd improvement, operating expenditure, labour efficiency, operating scale, income and cost of production are characteristic of the top 25% of beef producers (often corporate), who produce 59% of all beef in Northern Australia (Chilcott et al., 2020). A lack of uptake of R&D by other producers, particularly some small family-owned operations, is negatively affecting the productivity growth and hence profitability of northern beef producers (Holmes et al., 2017 in Chilcott et al., 2020). Indeed, in 2019 MLA established a Producer Adoption Reference Group to address on-farm R&D adoption issues to increase productivity gains and profitability. While there is still work to be done in ensuring that digital (and other) technologies are designed and deployed to deliver benefit at farm scale, there will still be challenges to future uptake on grazing properties, including the lack of affordable internet and low levels of digital ability (Marshall et al., 2019).

Localised efforts to support R&D adoption in the northern Queensland beef sector are being undertaken through Queensland Government’s Northern Beef Team. More widely, support through regional NRM and industry bodies is also important, particularly through voluntary, industry-led processes that help graziers to identify improved practices, which can help improve the long-term profitability of their enterprise. The North West Queensland Economic Diversification Strategy’s implementation plan has allocated resources to Queensland’s Department of Agriculture and Fisheries (DAF) to expand both dryland and irrigated agriculture in that sub-region (QDSDMIP, 2019). The Northern Gulf Resource Management Group’s E-Beef program also supports producers by demonstrating how technology can support timely management decisions that enhance pastures, ground cover soils, land condition, business profitability and adaptability. Large expenditure on the adoption of practices to improve water quality in Reef catchments has also occurred through Commonwealth and State programs.

Where water resources are concerned, there is increasing interest in locally sourced ‘mosaic irrigation’ for on-farm production of feed and related products. It is suggested that, based on available groundwater, mosaic irrigation in northern Australia could produce 2.4 million tonnes of forage to turn off over 200,000 head of cattle per year (Grice et al., 2013). The industry, however, is consistently reporting difficulties in



securing appropriate approvals for minor development aspirations at farm scale. This is where the interface with development planning, assessment and approval becomes important. From an industry perspective, while available R&D exists, lack of policy clarity limits sustainable adoption and development. In this context, Grice et al. (2013) concluded that the following support from governments would be required to help develop small-scale irrigation in northern Australia beef enterprises:

- Streamlining of various development planning and approvals processes;
- Progressing water resource planning in ways that benefit the beef sector and ensuring that it allows for dispersed small water licences to be allocated;
- Ongoing research, development and extension in farming and irrigation systems that are adapted to northern Australia that complement beef business models;
- Investment in the acquisition and analysis of digital soils mapping and the proving of groundwater resources and availability;
- Encouraging collaborative arrangements between commercial famers and graziers to overcome skills shortages from the latter;
- Facilitating connections with potential (third-party) investors; and
- Improving within-government coordination and collaboration to support development.

Growth and Efficiency Improvement in the Aquaculture Sector

In 2017, Northern Australia's aquaculture's Gross Value Product (GVP) was \$223 million, predominantly barramundi (13%), prawns (12%) and pearls (31%) (Cobcroft et al., 2020). Recently in Queensland, the total value of the aquaculture industry increased by 3.7%, with the value of production increasing from \$114.2 million in 2017–18 to \$118.4 million in 2018–19 (Schofield, 2020). Jobs in Queensland aquaculture increased by 18.7% during the 2018–19 financial year, with 525 full-time positions rising to 623. In the same year, the Cairns region accounted for almost half of Queensland's production and value.

Cobcroft et al. (2020) show that productivity and efficiency gains in Queensland's aquaculture sector have emerged through genetic and breeding technologies, alternative food production and other innovations. In 2016, for example, Pacific Reef Fisheries partnered with algae technology company MDB to create international export products with aquaculture waste (TIQ, 2016). CSIRO also developed Novacq™, a bioactive aquafeed ingredient, produced via the bio-conversion of low value plant waste from agriculture. Trials showed prawns fed with Novacq™ grow on average 20–30% faster, are healthier and can be produced with no wild fish products in their diet, a world-first achievement in sustainability (CSIRO, 2015). Recent productivity gains in black tiger prawn production has contributed \$73.5 million (CSIRO, 2015).

In their analysis of the broader Northern Australia aquaculture sector, Cobcroft et al. (2020, p.10) observe that "key challenges to the industry include regulatory burden and environmental risks (for barramundi), absence of breeding programs and brood stock supply and quality (for prawns), and environmental risks and disease (for pearl oysters)". Broader, industry-wide barriers to greater productivity and profitability also include commercial and market challenges, weather conditions and variability, high cost of inputs, lack of infrastructure, and knowledge and skills shortages. The authors consider that, to date, growth of the northern aquaculture sector, which accounts for around 17% of national value, has been slow, dispersed and uncoordinated. However, if these challenges could be overcome, particularly in Queensland, the northern Australia aquaculture industry could reasonably expand five-fold by 2030 (Cobcroft et al., 2020).

In this optimistic view, northern Queensland is tipped to have the potential to become an international epicentre of aquacultural activity; and there is already evidence of this. In the Queensland Trade and Investment Strategy 2017–2022, (TIQ, 2017) aquaculture was identified as a key, high-value product for the State's food and agribusiness industry. Accordingly, six land-based Aquaculture Development Areas (ADAs) were created in Central and North Queensland in 2019 (TIQ, 2019; Queensland Government, 2019b). Marine-based aquaculture also has potential in less populated areas where competing activities such as boating, fishing and tourism can be minimised (Queensland Competition Authority, 2014). Gold Coast Marine Aquaculture's expansion to Mossman in 2018 is testament to recent investment in northern Queensland as is the recent expansion of the Tassal Group to the north-west of Mackay.

Why We Need a Policy Framework for Agricultural Development in Northern Queensland

The above literature review shows the very significant opportunity for sustainable agricultural development in northern Queensland, both in the greenfield context and in existing agricultural schemes. There remains, however, significant under-utilisation of the land, water, infrastructure and other resources already available to underpin this development. Broadly, there are several substantial reasons why at least a 30-year national and state-wide focus on significant, value-rich, sustainable and resource-efficient agricultural development in northern Queensland is both necessary and desirable. These reasons include:

- At the national level, the need for **Australian agriculture to increase its annual resilience** in the face of significant and increasing climate variability. A more inter-connected approach to creating high-security water for agricultural development in northern Queensland could deliver a significant national benefit as southern agricultural operations look to spread their risk;
- The need to be able to **increase diversity in the northern Queensland economy**, particularly in the face of major transitions likely in the mining and tourism sectors, and more recently as a foundation for economic recovery post-COVID-19;
- The need to continue to strengthen the **economic and social wellbeing of Queensland's regions**;
- The need to support **Queensland's Traditional Owners to achieve their economic development aspirations** in the emerging post-native title determination era; and
- Through the need to protect Reef water quality, reduce emissions, and protect terrestrial biodiversity, the opportunity to develop significant **knowledge-based and value-added depth to our agricultural economy**, including accessible emerging global ecosystem service markets.

In the last few years, there have been several key calls for more planned and target-based approaches to increasing agriculture's contribution to the national economy. These have included:

- The Commonwealth's *Agricultural Competitiveness Whitepaper* (Australian Government, 2015b);
- Clear national targets emerging from the National Farmers' Federation (NFF) and their partnerships with key players in the R&D sector (i.e. the previously mentioned target of \$100 billion in value relative to a current projected baseline growth trajectory of \$84.3 billion);
- Calls from the head of Food Leaders Australia for a new focus on getting the most value out of water development in Queensland (McConnell, 2020); and
- NFF's recent strong call for a focus on agricultural development as a key driver in post COVID-19 economic recovery, including a focus on red tape reduction, environmental reform, agricultural innovation, improved market access, regionalization, and job creation (NFF, 2020; Murphy, 2020).

Several government-based policy documents have sought to promote agricultural development in northern Queensland in the past, including the above-mentioned documents, the *Queensland's Agricultural Strategy* (Queensland Government, 2013), and the *Whitepaper on Developing Northern Australia* (Australian Government, 2015a). The Queensland Agricultural Strategy sought to double the size of the agricultural sector by 2040 through pathways focused on increasing resource and market access, supply chain growth, and minimising the cost of production.

More recently, the emerging *Growing for Queensland Strategy* is seeking to drive new thinking into the challenge of increasing value in the agribusiness and food sector (DAF, 2019). While aspirational, generally these approaches have yet to deliver cohesive and substantive changes in the context of de-risked investment opportunity in northern Queensland. Instead, a context-focused approach is required to reach broad national objectives in practice on the ground.

Any new northern Queensland-focused approach should be genuinely visionary, long term, engaged and delivered. Key features of any such approach should include:

- An established 30-year time frame, independently facilitated, and a genuine partnership-based framework between three levels of government, industry and community sector interests;
- A strong focus on the development of genuine and achievable targets, and a willingness to prioritise effort where it will be genuinely sustainable and deliver the greatest social and economic benefits;
- Real, stable and adaptive delivery systems to address the foundation barriers to investment identified elsewhere in this research;

- Strong involvement of universities and the research/knowledge sector to ensure that the greatest innovation, productivity, sustainability and value is achieved in the development process; and
- A focus on jointly monitoring success and adapting approaches as required.

Experiences from other jurisdictions such as the Dutch agricultural development model, New Zealand's national approach to its agricultural competitiveness, and the Tasmanian irrigation model, suggest that this type of approach is not just possible but will indeed be critical in such a sensitive environmental context. For this reason, we look deeply at some of these experiences later in this document.



PART 2. POLICY & LITERATURE REVIEW





2.1 Current Policy Frameworks Supporting Northern Agricultural Development

While the above section calls for a much stronger and a more cohesive policy and strategy framework for the development of sustainable agriculture in northern Queensland, it must be remembered that there are already a swathe and Commonwealth and Queensland Government policies and programs that support agriculture in the north. Thinking about what the future might look like, as such, requires a clear understanding of the arrangements that exist now. This section outlines the current system for supporting sustainable agricultural development at all scales, before the next section unpacks the system of regulating agricultural development. Understanding both of these issues then enables examination of the processes for prioritizing agricultural development in the northern Queensland context. With this background in place, this research piece (through the literature, interviews and surveys) then analyses how the current overall system of governance (inclusive of the existing policy, program and regulatory frameworks) are delivering investment in sustainable agricultural development in northern Queensland.

Northern Development Whitepaper

The development of Northern Australia, particularly in the agricultural context, has long been a national aspiration; one more recently brought into focus through the *Whitepaper on Developing Northern Australia* (Australian Government, 2015a). The Whitepaper formed an essential part of the Commonwealth's wider collaborative plan to build a strong, prosperous economy and a safe, secure Australia (Dale et al. 2020). The plan has always considered that the north's future will rely on northern Australians, local innovation, new infrastructure, and the region's proximity to the Asia-Pacific. Indeed, its focus has included building strategic roads, telecommunications and water infrastructure; all with the intention of reducing the costs of doing business in the north and making it a more attractive place to invest, work and live.

There has been considerable effort and many tangible outcomes from the implementation of the Whitepaper (Australian Government, 2018). Key features of the program of importance to agriculture include:

- The Northern Australian Infrastructure Facility (NAIF);
- The Roads of Strategic Importance (ROSI), Strategic Roads and Beef Packages;
- Key labour market programs;
- Establishment of the Collaborative Research Centre for Northern Australia (CRCNA); and the
- The Northern Australian component of the National Water Infrastructure Development Fund (NWIDF).

Implementation of the Whitepaper is now under a significant review and refresh.

The Commonwealth Agricultural Competitiveness Whitepaper

Released in July 2015, the Whitepaper detailed the Commonwealth's plan to grow agriculture through some \$4 billion investment in farmers and the industry. It stated that opportunities for the sector are enormous, and that Australia is well placed for the future. The paper's five priority areas included improved regulation and taxation, better infrastructure and water, improved drought risk management, access to advanced technologies and practices, and improved access to premium markets (Australian Government, 2015).

The National Water Infrastructure Development Fund

In 2015, the Commonwealth announced the establishment of the *National Water Infrastructure Development Fund (NWIDF)*, arising in part from the *Developing Northern Australia* and the *Agricultural Competitiveness Whitepapers*. The NWIDF provides funding to accelerate the planning and construction of water infrastructure projects to enhance water security and to help stimulate regional economic growth, including through irrigated agriculture. In late 2018, additional funds from the NWIDF were announced by the Commonwealth Government. In Queensland, funding arrangements and proponents are now in place and feasibility assessments have commenced (e.g. the Hells Gates Dam Scheme and Big Rocks Weir Project). The Lakelands Irrigation Area Business Case, also funded by the NWIDF, was developing a full project scope and at the time of writing. There have been capital contributions offered towards the Mareeba-Dimbulah Water Supply Scheme modernisation. Funding offers are subject to establishing the necessary agreements between the Commonwealth and Queensland Governments and subsequent agreements with proponents delivering the studies/projects (Queensland Government, 2019a).



Queensland State Agricultural Development Policies

In 2013, a previous Queensland Government established a vision and strategy to double agriculture (then worth \$13.6 billion to the state economy) by 2040. The strategy committed the government to work with industry, researchers and stakeholders to focus efforts on addressing four key pathways: (i) securing and increasing resource availability; (ii) driving productivity growth across the supply chain; (iii) securing and increasing market access; and (iv) minimising the costs of production (Queensland Government, 2013). Strong implementation arrangements to deliver the plan failed to materialise, and the plan lapsed following a change of State Government in 2015. The Queensland Government is currently involved in a deep engagement process in developing the new *Growing for Queensland* policy framework for agricultural development across the State. This framework seeks to “enable the sector to be innovative, responsive and sustainable in the face of extraordinary opportunities and challenges”. The strategy recognized that the opportunities for growth in agribusiness and food industries are significant and expanding, but that there was a need to continue to enhance productivity to remain competitive globally. Key implementation priorities have included a focus on promotion, biosecurity and food security (DAF, 2019).

Water Development and Other Infrastructure Planning Activities

While the Commonwealth sets national water management policies (such as the National Water Initiative), the Queensland Government is generally responsible for managing water through legislation, water planning and allocation, infrastructure funding and asset management. In respect to broader infrastructure, again, the Commonwealth Government sets national infrastructure management policies and priorities (e.g. the National Infrastructure Audit). With the exception of communications (e.g. through examples such as the National Broadband Network and Satellite communications), the Queensland Government is also generally responsible for managing roads, rail, and energy. This is achieved via appropriate legislation, infrastructure planning and allocation, infrastructure funding and asset management. Local government also plays a critical role in infrastructure provision at the local scale (particularly roads and urban water infrastructure).

Property Rights and Land Tenure Management Systems

The Queensland *Land Act 1994* requires land administered by the crown to be managed for the benefit of the wider community of Queensland (DNR&M 2013). Some 60% of the State, mostly in the north, is owned and managed by the State Government under an array of lessees administered under the act. There is a frequent tension between private, public and traditional owner interests in this estate, with industry generally preferring greater tenure security. AgForce (2020), for example, suggests that freehold land is a prerequisite to attract many forms of investment in agriculture. With many perpetual leases now transitioning to freehold, industry is of the view that the term lease estate requires further attention if the State is to encourage continued industry and rural community development (AgForce, 2020). The act requires, however, that a range of broader community interests in the estate need to be effectively managed in tenure/use decisions.

Federal and Queensland Government Programs Supporting Agricultural Development

Across the Commonwealth and the Queensland Governments, there are a variety of programs supporting agricultural development. This section does not seek to list all of these in detail, but rather to give an indication of the types of programs that are available. These include grants, concessional loans, taxation concessions, and disaster response arrangements. Grants based systems supporting agricultural development are extensive and at least include things like the Queensland Government’s *Back to Work Program*. Concessional loan facilities supporting agriculture at least include those run through:

- The Clean Energy Finance Corporation’s (CEFC) small scale asset finance programs;
- The Regional Investment Corporation (RIC); and
- The Queensland Rural Industries Development Agency (QRIDA).

Finally, there are extensive disaster response mechanisms across both governments supporting agriculture through the nation’s national disaster and drought response arrangements. Through DAF, for example, producers in drought declared areas who qualify for support can access water infrastructure rebates and freight subsidies. The *Queensland Government Drought and Climate Adaptation Program* supports research and development projects to improve seasonal forecasting, and the provision of tools and systems that support producers and farm managers in their decision making. Projects are managed and funded through partnerships with government, university and industry partners (Queensland Government, 2020b).



Research, Development and Knowledge Management

Likewise, this section seeks not to overview all research, development and extension facilities supporting agricultural development in northern Queensland. However, these broadly include:

- Industry/government funded Research and Development Corporations, including Meat and Livestock Australia (MLA), the Grain Research and Development Corporation (GRDC), the Cotton Research and Development Corporation (CRDC), Sugar Research Australia (SRA) and AgriFutures Australia;
- Collaborative Research Centres (CRCs) and Growth Centres such as the CRC for Developing Northern Australia, the Future Food Systems CRC, and Food Innovation Australian (FIAL); and
- A significant number of agricultural research providers, including DAF, CSIRO, ABARES, Universities and Productivity Boards and private agricultural consultants.

The Regional Natural Resource Management System

In support of sustainable natural resource management across northern Queensland, the Commonwealth and the Queensland Government's support the operation of regional natural resource management (NRM) boards. Dale et al. (2020) recount that community-based regional NRM bodies were formalised to develop regional NRM plans to guide more local action on landscape scale NRM issues from 2000 onwards. Within these modified or new structures, consequent projects (devised at cross-regional, regional, catchment and local levels) have been delivered through local community-based groups and other capable parties.

2.2 Current Policies Regulating Agricultural Development

While the above section outlines Commonwealth and State policies and programs that support agriculture in northern Queensland, this section outlines the current system for regulating agricultural development.

State Development Coordination

Agricultural development projects that the Queensland Minister for State Development considers to be of State significance under the *State Development and Public Works Organisation Act 1971* can be called in and managed as a "coordinated project". Agricultural projects can be either of State or regional significance as determined by the Coordinator-General. To be called in, project proposals are required to meet established criteria relating to jobs, benefits, etc. It is important to note that the relevant feasibility studies undertaken are assessed in relation to exiting legislation, but that the Coordinator General decides the application of the rules and sets the relevant conditions.

While not inexpensive, the process offers a more cohesive level of State support in agricultural development project assessment and approval. Under the Act, an Environmental Impact Statement (EIS) can be prepared in accordance with State Government-set terms of reference. As would be expected, EIS's explore the current environment of the project area, the potential impacts, and proposals to avoid, mitigate or offset those impacts. An Impact Assessment Report (IAR) process may be used if the Coordinator-General is satisfied that the environmental effects of the project do not require assessment via the full EIS process. An IAR may be used for well-defined, low-medium risk projects where the likely impacts are highly predictable and the proponent has well-defined proposals to avoid, minimise, mitigate and/or offset those impacts through accepted best-practice in that industry. The IAR has no formal terms of reference and is focused on the key locations that may be subject to adverse impacts if projects are not well managed (QDSDT&I 2020).

State-wide Policies, Regional Strategic Plans, Planning Schemes and Development Approval

Under the Queensland *Planning Act 2016*, Queensland's State Planning Policy (SPP) provides a consolidated and comprehensive view of the State's interests in land use planning and development. The SPP sets out the matters that must be addressed in local government planning schemes and regional plans. Agriculture has been identified as a State interest under the 'economic growth' theme of the SPP. The State's interest in agriculture is that planning protects the resources on which agriculture depends and supports the long-term viability and growth of the agriculture sector. This includes promoting and optimising agricultural development and increasing production in key areas. A detailed, non-statutory guideline has been developed to help local governments integrate the State's interest for agriculture into their planning schemes (DAF, 2020). It should be noted that Good Quality Agricultural Land (GQAL) elements in the SPP, however, remain largely unaltered and are based on technical material established in the late 1980s early



1990s. An updated review of the Policy regarding protection of actual GQAL (with a wider definition) and promotion of rural/agricultural land uses seems appropriate at this stage.

Queensland Government is now developing a suite of 'new generation' regional plans. The role of these regional plans is to identify and interpret the State's interests in land use planning and development, as identified in the SPP, for particular regions. There may be future opportunities for agriculture developments being identified through regional plans which are based on local government areas (i.e. not catchments). Regional plans define regional outcomes and identify regional policies to achieve these outcomes. They guide land use planning and development decisions in a region and are prepared in collaboration with the wider community, local government and key industry groups. Under Queensland's planning legislation, the SPP and regional plans perform complementary roles, with regional plans providing the basis for prioritising, qualifying or resolving the State's interests in a particular region, as necessary (DAF, 2020).

The *Regional Planning Interests Act 2014* gives effect to policies about matters of State interest identified in regional plans and to other regional planning matters identified in the legislation. The Act is administered by the planning section of Queensland Treasury. It identifies four areas of regional interest: a priority agricultural area (PAA); a priority living area (PLA); the strategic cropping area (SCA); and a strategic environmental area (SEA). It also regulates significant private water infrastructure projects. A key purpose of the Act is to manage both the impact and coexistence of resource activities, and other specifically regulated activities. DAF is an assessing agency for PAAs. DAF assesses applications to carry out resource activities in PAAs against criteria that are prescribed under the *Regional Planning Interests Regulation 2014*. The aim of the assessment process is to achieve effective coexistence of resource activities and agricultural activities within a PAA by promoting negotiated agreements with landowners, protecting Priority Agricultural Land Uses (PALUs), and managing impacts at both the property and regional scale (DAF, 2020). PALUs are defined in regional plans, and may include certain types of dryland agriculture and plantations, irrigated agriculture and plantations, and intensive horticulture.

Water Planning and Allocation

Water plans are developed under the Queensland *Water Act 2000* to sustainably manage and allocate water resources across the state. Water plans may apply to rivers, lakes and springs, overland flow and underground water. These plans are tailored to each area to balance the needs of water users (e.g. towns, agriculture and other industries, cultural and environment needs). Water for consumptive uses are allocated under these plans and can be granted through water licences and water allocations (which can be tradable). A certain amount of water is often reserved as unallocated water (Queensland Government, 2020c).

Vegetation Planning and Protection

In Queensland, vegetation planning and management is covered under the *Vegetation Management Act 1999*. Works assessment under the *State Development and Public Work Organisation Act* or the *Planning Act* may trigger requirements under the *Vegetation Management Act*. The *State Policy for Vegetation Management* has been prepared in accordance with Section 10 of the *Vegetation Management Act* and states the outcomes for vegetation management and actions proposed to achieve those outcomes. It provides a framework for decision making under the Act, including the following:

- Making accepted development vegetation clearing codes;
- Making area management plans;
- Making and amending maps, including regulated vegetation management maps and property maps of assessable vegetation;
- Making a determination of clearing for a relevant purpose;
- Establishing and implementing assessment benchmarks; and
- Providing special consideration for significant community projects (Queensland Government, 2019c).

Biodiversity Management

Biodiversity considerations related to agricultural development are managed through both the Commonwealth's *Environmental Protection and Biodiversity Conservation Act* and the Queensland Government's *Nature Conservation Act*. The *Environment Protection and Biodiversity Conservation Act 1999* (the *EPBC Act*) is the Commonwealth Government's central piece of environmental legislation (Australian Government, n.d.). It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places. These are defined in the Act as matters



of national environmental significance (MNES). Of relevance to northern Queensland, these include world heritage properties, national heritage places, wetlands of international importance, nationally threatened species and ecological communities, migratory species, the Great Barrier Reef Marine Park, and water resources related to coal seam gas development and large coal mining. The *EPBC Act* aims to balance the protection of these crucial environmental and cultural values with our society's economic and social needs by creating a legal framework and decision-making processes based on the guiding principles of ecologically sustainable development. Specifically, the Act aims to:

- Provide for the protection of the environment, especially MNES;
- Conserve Australia's biodiversity;
- Protect biodiversity internationally by controlling the international movement of wildlife;
- Provide a streamlined environmental assessment and approvals process for MNES;
- Protect our world and national heritage; and
- Promote ecologically sustainable development.

If developers conclude that they might have a significant impact on any MNES, then they need to apply for approval to proceed under the *EPBC Act*. This approval process is in addition to any State or local government approvals that might be required. When a proponent wants an action assessed for environmental impacts under the *EPBC Act*, they must refer the project to the Australian Department of Agriculture, Water and the Environment. This 'referral' is then released to the public, as well as relevant State, Territory and Commonwealth ministers, for comment on whether the project will have a significant MNES impact (DAW&E, 2020). The minister (or delegate) then decides whether the likely environmental impacts of the project are such that it should be assessed under the *EPBC Act*. There are five different levels of assessment, depending on the significance of the project. Each level involves considering technical information assembled by the proponent and comments made by the public. Once a project has been assessed by the Department, it makes a recommendation to the minister or delegate on whether the project should be approved. In addition to considering potential impacts on MNES, in making a decision, the minister also considers the social and economic impact of the project (DAW&E, 2020).

Alternatively, the Queensland *Nature Conservation Act 1992* provides the framework for the creation and management of protected areas including national parks, conservation parks, resources reserves, nature refuges, coordinated conservation areas, wilderness areas, world heritage management areas, international agreement areas, and protection of native species. The regulations under this Act provide detailed rules regulating activities in protected areas and a permit and licensing system for the taking or keeping of native wildlife. These regulations include the *Nature Conservation (Administration) Regulation 2006* and the *Nature Conservation (Wildlife Management) Regulation 2006*. Farming activities can trigger implications for the Act if they impinge on protected areas and species of concern (Caxton Legal Centre, 2016). This Act also regulates activities on private land (and road reserves and other public land outside protected areas) that may impact protected plants and/or species and/or habitat. In this context, there is trigger mapping under this legislation that will trigger defined approvals processes. Trigger mapping, however, is incredibly broad and captures large areas throughout the State.

Land Administration, Tenure and Native Title Interests in Land

A significant part of the State is not freehold; therefore, under the *Queensland Land Act*, leasehold-based properties are often subject to a range of relevant lease conditions of relevance to agricultural development. Additionally, as the State progresses towards a post-determination era, Australia's national policy attention in relation to Indigenous land rights is seeking to improve the efficiency of current native title processes, the need to support traditional owners in using these rights and drawing benefit from them, and meeting the completely new challenges facing traditional owners post-determination (COAGSOWG, 2015; James Cook University & CSIRO, 2013). Consequently, on 10 October 2014 the Council of Commonwealth Governments (COAG) announced an urgent "investigation into Indigenous land administration and use, to enable traditional owners to readily attract private sector investment and finance to develop their own land with new industries and businesses in order to provide jobs and economic advancement for Indigenous people" (COAGSOWG, 2015, p 1). Key findings included recommendations to support Indigenous peoples' use of their rights in land and waters for economic development. COAG identified five key areas where governments should focus their efforts (COAGSOWG, 2015, p1):

- Gaining efficiencies and improving effectiveness in the process of recognising rights;
- Supporting bankable interests in land;
- Improving the process for doing business on Indigenous land and land subject to native title;
- Investing in the building blocks of land administration; and
- Building capable and accountable land holding and representative bodies.

Linked with this work, COAGSOWG (2015) also identified several parallel Commonwealth processes that could influence this agenda. These included the following: (i) The Australian Law Reform Commission (ALRC) reported on a two year inquiry into the connection, joinder and authorisation aspects of the *Native Title Act 1993* (Australian Law Reform Commission, 2015); (ii) the Australian Human Rights Commission (Australian Human Rights Commission, 2015) facilitated Indigenous Leaders Roundtable on Property Rights in Broome on facilitating economic development within the Indigenous estate (Aboriginal and Torres Strait Islander Social Justice Commissioner, 2015); (iii) the Forrest Review considered improvements that could be made to help create parity between Indigenous and other Australians, including through development on Indigenous land and land subject to native title (Forrest, 2014); and (iv) Deloitte Access Economics' Review investigated the roles and functions of native title organisations (Deloitte Access Economics, 2014).

Cultural Heritage Planning and Protection

The *Queensland Heritage Act 1992* creates a framework to protect places or objects of cultural heritage significance for aesthetic, architectural, historic, scientific, social or technological reasons in Queensland. In practice, the Act mainly protects built European heritage such as historic buildings. It does not generally protect Indigenous cultural heritage (Caxton Legal Centre, 2016). Consequently, it tends to have a limited impact on agricultural development. Local built heritage may also be protected at a local government level. Some local government planning schemes specifically recognise heritage places. Of more importance to agricultural development in northern Queensland, the *Aboriginal Cultural Heritage Act 2003* (Qld) and the *Torres Strait Islander Cultural Heritage Act 2003* provides a framework for the protection of Aboriginal and Torres Strait Islander cultural heritage in the landscape. The main mechanism through which each Act operates is a list of places and artefacts of heritage significance. These Acts also create offences such as breach of the cultural heritage duty of care. This requires a person carrying out an activity to take all reasonable and practicable measures to ensure the activity does not harm Aboriginal cultural heritage. The Commonwealth's *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* also provides for the protection of significant Aboriginal areas and declared objects by the Environment Minister, an authorised officer, or an inspector (Caxton Legal Centre, 2020). Specific broad-scale legislation of importance to development in Cape York Peninsula is covered under Queensland's *Cape York Heritage Act 2007*.

Water Quality Protection and New Reef Regulations

Queensland's *Environmental Protection (Great Barrier Reef Protection Measures) and Other Legislation Amendment Bill* was passed in 2019 to address all land-based sources of water pollution to the Great Barrier Reef (GBR), though COVID-related delays to implementation are likely. The Bill includes all industrial and agricultural activities that release nutrients and sediment across all six Reef regions (Cape York, Wet Tropics, Burdekin, Mackay Whitsunday, Fitzroy and Burnett Mary). The regulations will be rolled out over three years with different Reef regions and different commodities regulated at different stages to provide time for producers and industry to transition. The legislation has the following requirements:

- Minimum practice standards will apply to all sugarcane, grazing, banana, grains and horticulture production across five of the six Reef regions (excluding Cape York), with commencement staged over three years from when the laws come into effect;
- Producers will need to keep records of soil tests and fertiliser and agricultural chemicals applied;
- Advisers will need to keep records of advice provided;
- New and expanded cropping or horticulture in all six Reef regions will require an environmental authority subject to conditions to minimise impacts to water quality; and
- New, expanded or intensified industrial development must not increase nutrient and sediment pollutant loads (OGBR, 2019).

With this legislation now coming into effect, it will become one of the most important regulatory arrangements influencing how agriculture is assessed, approved and conditioned in northern Queensland.



Foreign Investment and Taxation-Related Regulation

Finally, it is important to remember that agriculture is regulated through several layers of foreign investment and taxation-based regulations. While these are generally administered through Commonwealth legislation, the State has additional taxation responsibilities of relevance to agriculture (e.g. stamp duty/land taxes).

2.3 Current Frameworks for Setting Agricultural Development Priorities

It is clear that there are significant policy signals both supporting and regulating agricultural development in northern Queensland across the Commonwealth, State and local government levels. In this section, however, we seek to unpack the line of sight between high level policy and program aspirations, the process of prioritisation of areas of geographic focus for governmental effort, and the prioritisation of actual government and industry investment in agriculture. In doing so, there is value in further considering where agricultural development is actually occurring within Queensland relative to these priorities. We find that, despite the plethora of existing and new agricultural development concepts in the north of Queensland, there are few broadly partnered and place-based approaches to prioritising progressive or sequenced agricultural development. Perhaps more surprising though is that there are no less than eight somewhat fragmented approaches for prioritising agricultural development efforts across the region, which are outlined below.

Aquaculture Development Areas

and-based marine aquaculture development areas (ADAs) have been identified by DAF to promote and grow a sustainable aquaculture industry in Queensland. ADAs help identify areas with the potential for land-based marine aquaculture development and provide investors with a list of areas suitable for aquaculture development. Investors are not limited to ADAs and have the option to explore other areas of Queensland for land-based marine aquaculture development (Queensland Government, 2020d). ADAs are located in coastal areas where marine species can be cultivated in earthen ponds that require access to seawater. Queensland Government identified ADAs in response to the Queensland Competition Authority's review of aquaculture regulation in Queensland (Queensland Government, 2020d). The review endorsed several recommendations in order to expand aquaculture. To identify ADAs, the State consulted with the aquaculture industry, government agencies and local councils, using a well-defined planning methodology that applied several selection criteria including:

- Physical criteria that included necessary features for aquaculture infrastructure, such as land with suitable elevation, topography and distance to seawater access;
- Environmental criteria that included potential ecological impacts of the aquaculture development, such as impacts on protected areas; and
- Planning criteria that addressed tenure issues and compatibility with State regional plans and local government planning schemes.

ADA sites satisfy the requirements for operating an aquaculture business with minimal environmental and land-use constraints, though certain constraints still exist. The ADA identification process completes a number of due diligence considerations for investors considering locations for aquaculture operations. Under an ADA, aquaculture development is still required to undergo assessment under the Queensland *Planning Act* including vegetation management, discharge of tail water, prevention of escapees by flooding, etc.

Priorities for Water Resource Planning

Water resource planning under the Queensland *Water Act* has largely been completed, though there is a continuous cycle of review and update associated with these plans, and well as filling new planning gaps (e.g. the recent completion of the Cape York Water Resource Plan). In the early years, the process for planning was informed by priorities for agricultural development or environmental protection (such as the risk of over-allocation of water resources in the Murray Darling). As such, high demand agricultural catchments were generally completed first, while those catchments with less development pressure have tended to be completed in more recent years. With most of the water resources planning now having been completed across the State, the resulting plans can support or help inform the prioritisation of agricultural development activities across northern Queensland, rather than drive it.



Coordinated Projects, State Development Areas and Economic Development Zones.

The declaration of coordinated projects under the Queensland *State Development Act 1971* tends to be proponent-driven rather than informed by any strong sense of development prioritisation by the Queensland Government. If large agricultural development projects are declared as being “coordinated projects” under the Act, there is not necessarily a clear region-wide consideration of its relative importance compared to other significant agricultural development projects across the north.

The Bulk Water Prioritisation Process.

A regular update of the Queensland Bulk Water Opportunities Statement (QBWOS) was recently completed in 2019. The resultant document outlines the State’s framework for sustainable regional economic development through better use of existing bulk water infrastructure, and prioritising effective investment in new infrastructure. Now in its third annual release, the QBWOS helps to facilitate discussion with the community and the water sector about water security planning, including demand management, optimal use of existing supplies, and future bulk water infrastructure supply options to support growth and economic development in regional communities. One objective and strength of the prioritisation process is to maximise the economic development deliverable through limited government resources. The QBWOS provides:

- A clear statement of Queensland Government’s objectives for its investment in bulk water supply infrastructure, and the principles that underpin these objectives;
- An annual update on initiatives that deepen value obtained from the State’s water resources and water infrastructure investments; and
- Background and contextual information, including a current account of bulk water use and latent capacity across the State, and the roles and responsibilities of the various entities that contribute to the effective use of Queensland’s bulk water resources.

This process produces one of five documents arising from the State Infrastructure Plan (Queensland Government, 2016), and effectively prioritises State policy and investment effort across water development schemes. Through the QBWOS, there has been significant work to date on potential infrastructure options. However, the process also has a range of competing prioritisation foci, including dam safety, municipal water supply, and water for the resources, industrial and irrigation sectors. It does not necessarily provide a basis for the State to prioritise effort in supporting agricultural development.

In the context of the QBWOS, which sets higher level prioritisation principles, the Department of Natural Resources, Mines and Energy (DNRME) is itself currently prioritising new agricultural water projects in Queensland. This is an important, but internally focused process to inform Queensland Government thinking about the way it could allocate resources towards agricultural water infrastructure development.

Sunwater’s Water Planning Prioritisation Process

Sunwater is northern Queensland’s largest water service provider. In the context of the water supply schemes that it operates, Sunwater has worked to develop a *Regional Blueprint* as a strategy to increase availability of water in its existing water supply schemes. These regionally-engaged and prioritised processes examine opportunities for new water projects to generate economic prosperity and address future customer needs, as well as adapt to the impacts of climate change (see Sunwater, 2019). These processes inform the organisation’s strategic and operational priorities.

Prioritisation for Agricultural Development Case Management

DAF has increasingly been seeking to provide more coordinated servicing for agricultural development proponents, but this tends to be information and facilitation service support for all comers rather than being provided through a more focused strategy. This does not mean to say, however, some emerging place-based issues might drive more support for some areas over others, as has recently happened in the North West Queensland Mineral Province. Recent and positive initiatives in a stronger case management approach have emerged (e.g. the case management or concierge approach to supporting Tassal’s aquaculture investment in the Mackay Whitsunday region). While strongly supported by industry, this approach, like the declaration of Coordinated Projects under the *State Development Act*, tends to be responsive or proponent-driven rather than prioritised across competing investments that could equally ask for this service to be activated.

Commonwealth Prioritisation For Water and Agricultural Resources Assessment

Over the past 10 years there have been significant decisions made by the Commonwealth Government about resourcing for water resource assessment and water resource project assessment, mostly allocated under the Northern Australian component of the *National Water Infrastructure Fund*. Resourcing has supported the Flinders and Gilbert Studies (FGARA), the significant Northern Australian Water Resource Assessment (NAWRA), and several water development feasibility studies awarded through open calls for proposals. These investments have substantively boosted collective effort in progressing new agricultural development in northern Queensland. They were, however, not prioritised in any cohesive way through negotiation with the State Government, communities and the private sector. Most notable was the NAWRA focus on assessment of the Mitchell Catchment without clear private sector demand for development. While NAWRA delivered very competent information about development potential, there are many competing water resource development priorities within northern Queensland that could also have been progressed. In short, while the Commonwealth's investment has been ground-breaking, more could have been done to use these resources to drive a stronger priority-led agenda negotiated between interests. The formation of the Commonwealth's Northern Water Infrastructure Authority (NWIA) and the National Water Grid Authority (NWGA) may help address these issues in future, presenting opportunities for a more bilateral approach.

Local Government Prioritisation of Agricultural Development

Local governments are often strong champions of agricultural development prioritisation in their regions. They may apply a number of strategies to progress this, including articulating intent in their Corporate or Community Plans, Economic Development Strategies, or at least recognising and incentivising agricultural development in their Planning Schemes (including the identification and protection of Good Quality Agricultural Land (GQAL) mentioned above). An exceptional example of how local government can effectively lead this type of approach exists with the proactive role Flinders Shire Council played in securing a coordinated project approach under the *State Development Act* and actively developing an agricultural development precinct (15 Mile) through the provision of available land and water resources (Furner, 2019). In general, however, rural and remote councils rarely have significant resources available to actively progress strong investment framing for agriculture through their available planning instruments.

Within the local planning scheme context, *Priority Agricultural Development Areas* can also be recognised by local governments, rather than being identified or prioritised by Commonwealth or State interests. As such, where the concept has indeed been used by local government, they reflect the very localised views of agricultural development across some 77 local governments in Queensland. GQALs, however, are identified through the *State Planning Policy*, and these are then identified and protected through regional plans and local planning schemes. Notably, regulation of GQALs is not necessarily a signal for strategic prioritisation of agricultural development effort.

Where Does the Leadership Sit and Who Prioritises?

The above analysis shows that there are no less than eight processes that, in one form or another, prioritise Commonwealth, State and local government effort for agricultural development. The overall system, however, is one characterised by lots of separate effort with limited resources. This is a chaotic prioritisation system that, without some degree of reform, will struggle to facilitate transformative and high-quality investment in agricultural development through northern Queensland. Key features of the system include:

- Very limited coordinated effort between Commonwealth, State and local government efforts;
- Strong knowledge sets to enable multi-criteria based decision making within the State Government;
- A number of statutory prioritisation mechanisms that spatially identify agricultural opportunities, but that currently do little to facilitate the coordinated infrastructure and investment required;
- Few frameworks for driving cross-government cooperation and private sector involvement; and
- The lack of an overall, integrative mechanism for prioritising and aligned combined work efforts.

With a limited coordinated and purpose-driven approach to prioritising effort, it is unlikely that the key policy aspirations of the *Whitepaper on Developing Northern Australia* will deliver on its intent.



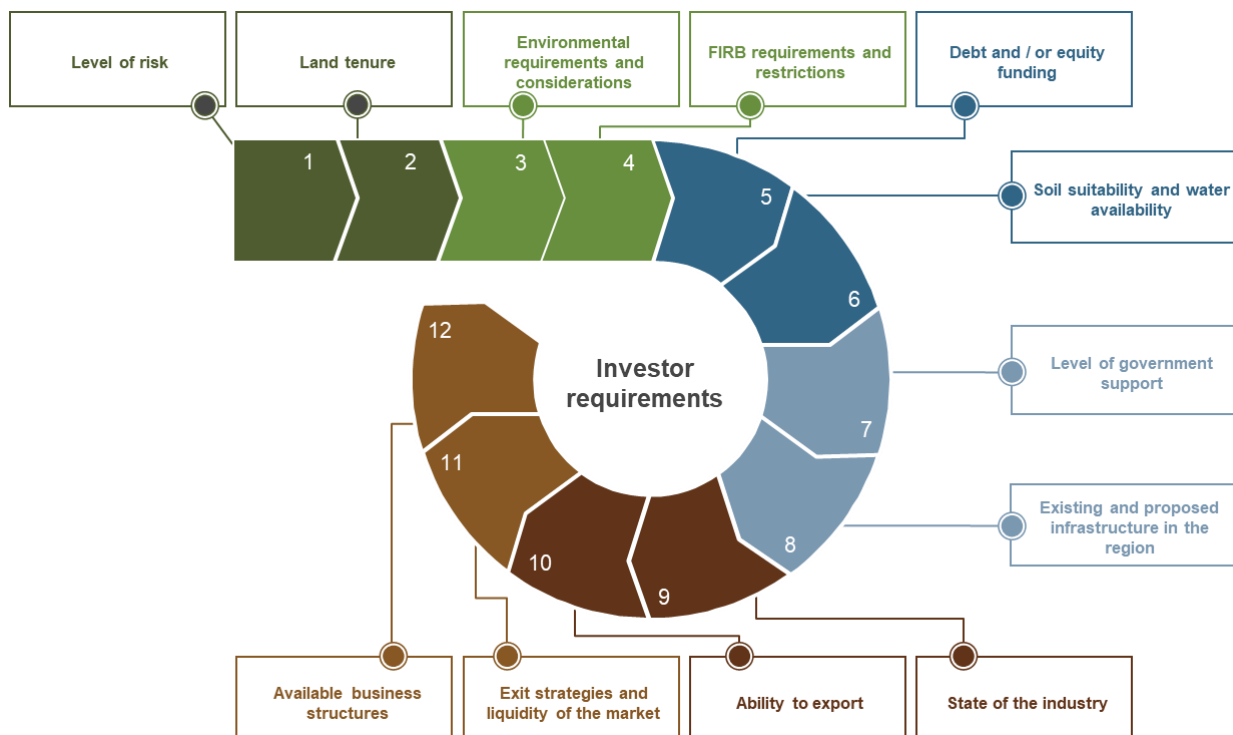
PART 3: RESEARCH RESULTS



3.1 Risks and Opportunities that Investors Need to Manage

PWC (2020) has undertaken a significant amount of work exploring the potential agricultural development investment interest in northern Australia and the key risk-based issues that various types of investors consider to be important in the context of that investment. PWC (2020) explains that, as a basis for determining economic returns and viability, investors require various types of information to make informed decisions. It considers that the type of investor has an impact on the importance of each type of information, however, the information required is generally similar across most agricultural investor types. Information requirements are also based on the relative importance of the current barriers to investment, consultations with key stakeholders, and general investment requirements. Some of the key generic information or knowledge requirements are shown in Figure 3.

Figure 3: Agricultural development investor information requirements (PWC, 2020).



With these knowledge-based requirements having been clearly established through the PWC work, the following unpacks some of these key thematic investment risks and priorities identified from the viewpoint of the wider community. We first outline the key risks or impediments to investment in sustainable agriculture, inclusive of some of the issues that were raised during the interviews and surveys.

Overview of Survey Responses

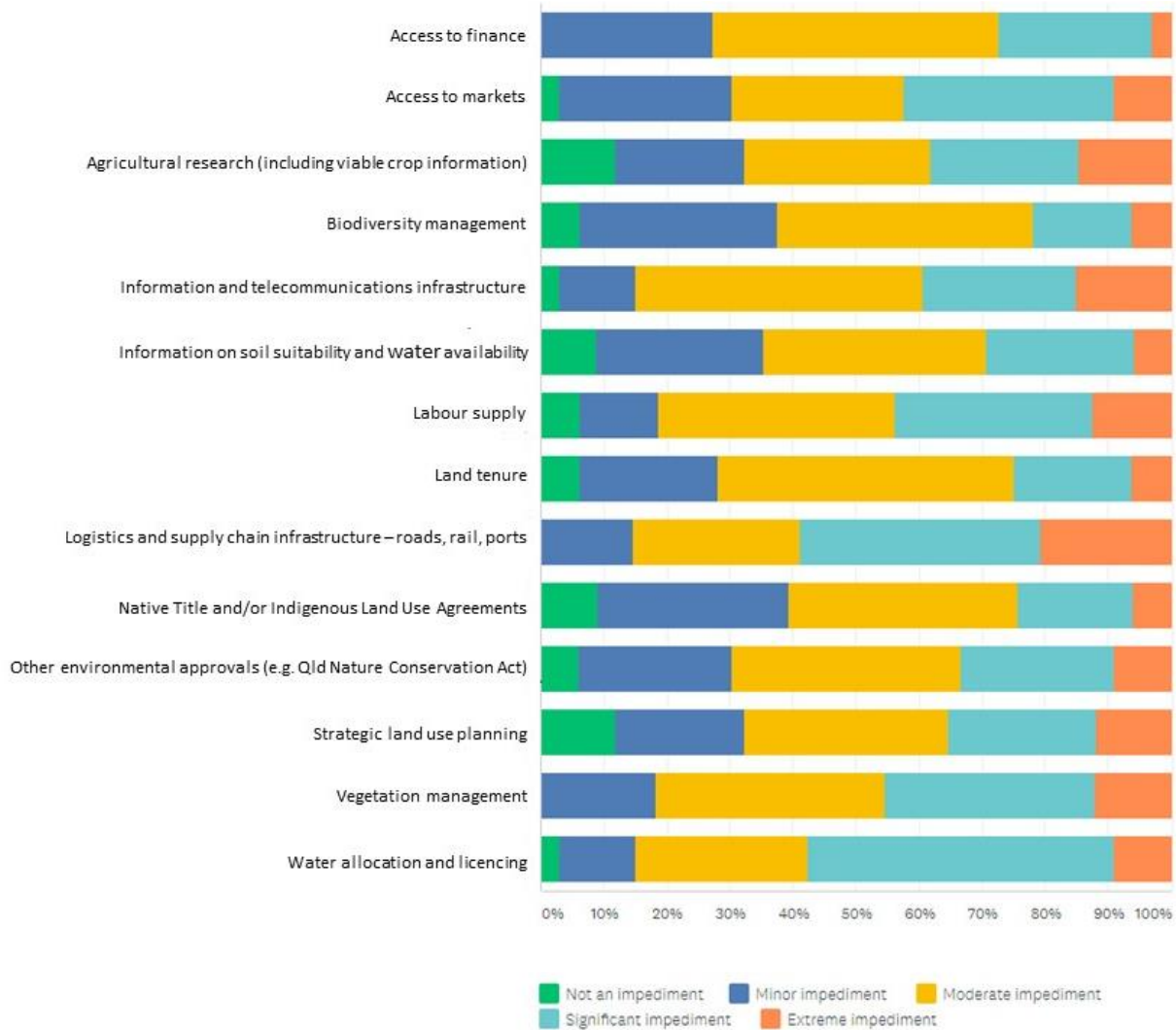
Our research generally confirmed that each of the risk areas identified by PWC are relevant to the northern Queensland context. Survey data in particular provided more nuanced insights into the specific risks to agricultural investment in northern Queensland. Several impediments were identified in the literature review and preliminary discussions with Queensland Government and other stakeholders. Then, survey respondents were asked to rate the severity of potential impediments to agricultural and aquacultural development. Figure 4 shows that **logistics and supply chains, vegetation management and water allocation** are the top three impediments, with approximately 50% respondents saying these impediments were either 'significant' or 'extreme'. **Labour supply and access to markets** were also notable risks to agricultural development investment, with 40% of respondents rating these as either 'significant' or 'extreme'.

Figure 4 further shows that all listed risks were considered to be an impediment of some sort. For all items, at least 60% of respondents said the risk was at least a 'moderate' impediment. Conversely, responses



suggesting that some risks are ‘not an impediment’ were limited (i.e. no more than 10% of responses for each item suggested that there was no impediment associated with it).

Figure 4: Survey responses rating severity of risk/impediment to agricultural development.

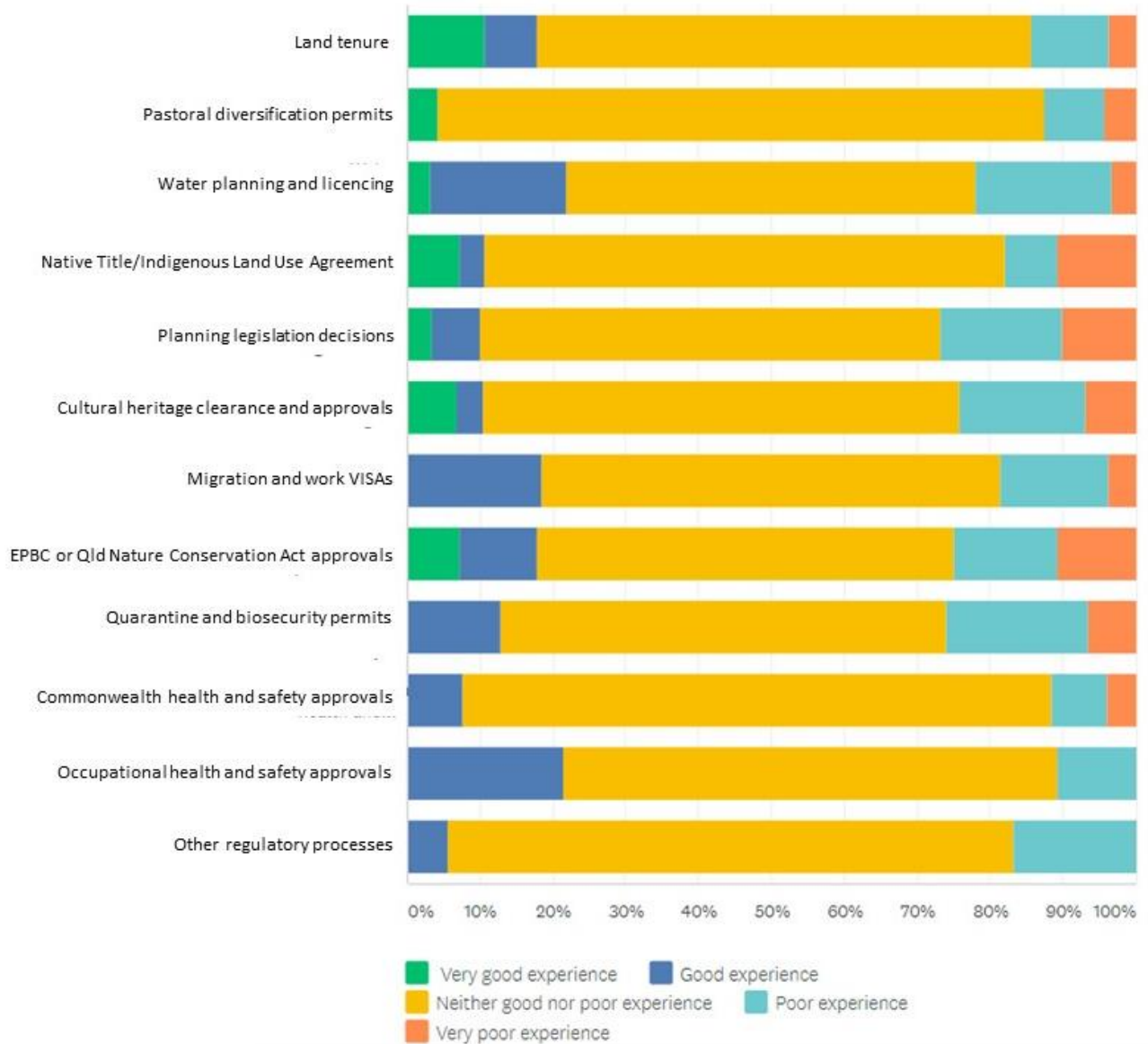


The survey also sought feedback from respondents about experiences engaging with the necessary processes to negotiate risks and impediments to development. Again, from a pre-determined list, survey respondents rated their experiences with different processes from ‘very good’ to ‘very poor’. Figure 5 shows that respondents often felt ambivalent about their experiences (neither good nor bad). In the face of this ambivalence, it can be difficult to identify where the greatest issues exist in the system. On the other hand, we can also deduce that processes for agricultural development in Queensland do work in many cases, and that governance systems can be navigated to achieve development goals.

In the context of the interviews and literature review, we interpret these results as being indicative of proponents lacking clear pathways to development. As will be discussed further below, research participants said they can often feel lost and frustrated because mechanisms for strategic planning, resource allocation, and prioritisation are inaccessible or absent from the development coordination process. More specifically, there is often a lack of active facilitation by governments to assist proponents to navigate the various legislation, regulation and policies across the various departments that must be involved. Notably, the most polarised experiences (indicated by a higher number of both ‘very good’ and ‘very poor’ experiences) relate to water planning and licencing. We suggest this may be because of the binary experiences of those with and those without access to existing water and water distribution infrastructure.



Figure 5: Survey responses rating experiences dealing with regulatory requirement.



Overall, the survey results suggest that investors and proponents face several risks and significant challenges to their sustainable agricultural development ambitions, often in parallel. By drawing on some comments made by survey respondents, we now provide more specific insights into various aspects of the development processes that can present challenges for proponents:

- *Planning context* - Governments must navigate a complex line between guiding sustainable agriculture planning and administering competitive assessments in an unbiased and transparent manner. This can lead to a nexus where proponents seek guidance from governments (Commonwealth, State and local) that governments can be unwilling to provide for various reasons. Some respondents said that they struggle to understand governments' priorities, which could help strategically guide their investments. Others suggested that the planning context (in which governments have a role to help set the appropriate conditions for investment) would benefit from planning and coordination across the value-chain. While some respondents felt that "synergies and lateral strategic opportunities are not always obvious", the goal should be to achieve the most



- optimal outcome for the greatest number of stakeholders possible (even though not everyone can be satisfied with the outcome in all cases). This is applicable to water allocation and security strategies;
- *Government interface and processing* - Respondents observed that working with several State and local governments, and across different departments, can present challenges. Approvals processes can be lengthy and expensive. As one respondent said, “red tape strangles projects”. Faster-track options such as use of the Coordinator-General can be effective, but proponents of projects going through regular approvals processes can become confused and disillusioned. Other respondents commented that some junior staff who deal directly with proponents may not have the skills, knowledge or inter/cross-departmental influence to effectively progress applications;
 - *Environmental management* - At the Commonwealth level, several respondents cited the *EPBC Act* as being problematic for several reasons, such as lack of enforcement. Others noted inconsistencies and duplication between Commonwealth and State environmental management policies, namely the *EPBC Act*, *Vegetation Management Act (Qld)*, and the *Nature Conservation Act (Qld)*. The lack of timely decisions on environmental matters was also cited as an area of frustration. In particular, legislation and regulation in relation to the Great Barrier Reef were considered to be highly contested, with some sectors arguing for tighter controls and compliance, and others suggesting that the current regulations (i.e. zero net emissions) are too prohibitive and not conducive to all sectors;
 - *Indigenous land and cultural interests* - Some respondents reported good experiences in relation to policy developments that relate to Indigenous interests in land. Others noted tenure-related complications. One Indigenous-related respondent, for example, noted that Aboriginal freehold land provides opportunities for secure development, yet transferring land into investable tenure forms can be an unnecessarily lengthy process. Also, Indigenous development interests considered that Traditional Owner institutions can lack the capacities and resources needed in preparing for the assessment of their developments (as is often also the case in the pastoral sector); and
 - *Knowledge supporting decision making* - Respondents noted that limited agronomic knowledge and skills on-farm can be an impediment to sustainable agricultural development. Smaller private developments often lack knowledge and skills needed to progress development approval and can be reluctant to pay for consultants, leading to increased costs and problems. Moreover, it is not always cost-effective to access consultants on a project by project basis, especially in remote areas. While continued R&D is important, respondents said a greater challenge is the uptake of R&D.

3.2 Perceptions of Our Current System of Investment Attraction and Approval

Perceptions and experiences of investment attraction and approval in northern Queensland were garnered through the literature review, surveys and interviews. Here we mainly draw on interview data to share our findings regarding four key questions:

1. Where do you think the top three priority places for agricultural and aquacultural development in northern Queensland are?;
2. What factors are getting in the way of attracting new investment in agriculture and aquaculture in northern Queensland?;
3. What factors are supporting new investment in agriculture/aquaculture in northern Queensland?; and
4. How might the system or process of de-risking or supporting agricultural and aquacultural investment be improved?

We conclude this section by considering who is responsible for instituting changes, and the possible role of governments in de-risking agricultural investment in northern Queensland.

Priority Regions and Sectors

In response to the question of where agricultural/aquacultural investment would be most strategically directed, two key themes emerged: (i) building on existing infrastructure to expand operations; and (ii) undertaking new development in well-resourced and supportive contexts.

First, respondents almost universally said that investment should be focused on building on and making use of existing infrastructure to expand production (e.g. through improved water distribution, scheme



augmentation, market establishment, etc.). This was primarily about using existing infrastructure to its full capacity and leveraging nearby resources and services to intensify production. This could include:

- Making use of the substantial amount of existing unallocated bulk water (i.e. the cost benefit estimates of existing systems is usually based on 100% water use);
- Improving efficiency of existing irrigation systems through, for example, on-farm water recycling;
- Adopting new technologies (e.g. sensors, drones, etc.) and big data to support decision making;
- Diversifying crops using mixed/mosaic cropping methods (e.g. beef/sorghum);
- Adopting circular farming methodologies (e.g. aquaculture/algae; sugar/biofuel);
- Bolstering production in less risky/impactful sectors (e.g. horticulture/aquaculture may have fewer inherent environmental risks than dryland agriculture in some locations); and
- Leveraging/expanding existing supply chains, including labour, land tenure and markets.

Respondents said that, in many cases, it can be more productive and cost-effective to develop brownfield rather than greenfield sites. They also considered that incremental growth can be less risky and more sustainable and lucrative than servicing major upfront capital costs in new areas. Respondents also made suggestions about where *not* to develop, such as where there is high risk to the Great Barrier Reef.

Second, respondents said that any new developments should occur in places which sequence well with existing agricultural supports and should rely on the development of genuine, strong business cases. Key considerations for establishing greenfield water/agricultural developments include:

- Ensuring access to established supply chains and markets/exports;
- Minimised or reduced environmental impact;
- Establishment of a strong social license to operate;
- Ensuring there is equity of water resource distribution;
- Ensuring access to labour/skills/knowledge; and
- Catering for the need to provide tenure security.

Respondents specifically suggested that well developed mapping overlays (e.g. soils, rainfall, vegetation and biodiversity) could be used to prioritise where new development is possible, viable and desirable. Moreover, many respondents considered that new developments should be more locally and farmer-led, with end-user demand well established in the early phases of planning. Others considered that agricultural developments should also be targeted towards economic and social outcomes, such as bolstering Indigenous-led enterprise and developing new products and markets (e.g. cotton in the north).

What Parts of the System are Working Well?

Despite the various barriers and challenges, agricultural development *is* occurring across northern Queensland. In response to the question about factors that are supporting agricultural investment in northern Queensland, insights emerged under four themes: (i) innovation, research and development; (ii) organisational and financial supports; (iii) policy, planning and regulatory reforms; (iv) and development building on existing infrastructural foundations.

First, respondents said that there are several agricultural entrepreneurs who are adapting to contextual challenges and opportunities, including becoming early adopters of new technologies. Southern farmers are moving north in search of more secure water, and they are establishing crops that have not before been grown at scale the north. New aquacultural enterprises are also thriving in the north, and farmers are adopting mosaic farming techniques to diversify and intensify their production. Many of these innovations are underpinned by world-leading research being undertaken in the north and across Australia in institutions such as the CSIRO, CQU and JCU. Under ideal conditions, research also informs on-farm decision-making for existing and expanding operations. Furthermore, expertise relating to water and agricultural development is potentially an international export itself. Some respondents said, however, that knowledge is not easily attained by, or distributed to, producers in a timely fashion.

Second, some organisational, financial and regulatory supports are becoming increasingly available from a range of commercial or financial entities. Some finance institutions, for example, have developed a diversity of products that cater to the agricultural sector (e.g. RABO, NAB, ANZ), and they are incorporating sustainability criteria into their products. Government-funded relief packages for farmers and concessional loans (not enjoyed by other industries) are appreciated and are effective in many instances, however respondents felt that they need to be administered more flexibly to have maximum impact.

Thirdly, respondents also noted some welcome reforms to policy, planning and regulation. It is generally strongly agreed that the development of water resource plans and associated strategies provide direction to investors. Recently-instated rolling leases on pastoral land also provide certainty for proponents. More broadly, there appears to be inter-governmental support for Queensland having established a stronger agricultural development policy and planning framework relative to the other jurisdictions (NT and WA).

Finally, some developments are leveraging existing infrastructural foundations, such as roads and port facilities, that have been built up over recent decades. There have also been important improvements to livability, skills development and social/health infrastructure that support economic development, including in agriculture and aquaculture. Respondents said there is an appetite for development and consolidation of pastoral assets, and incremental growth in several segments and markets. Infrastructure development to support agriculture and aquaculture should remain a priority in northern Queensland, such as sealing the Peninsula Development Road (in progress), and there are opportunities to further work with Infrastructure Australia to fill gaps.

What Parts of the System are Not Working Well?

In response to the question about what the barriers are to sustainable agricultural development, different insights emerged in four key areas: (i) finance and investors; (ii) legislation and regulation; (iii) governance and planning; and (iv) context and culture of farming.

First, respondents considered that it can be difficult for farmers to access the necessary finance to establish or expand their enterprise. Contributing factors include:

- Expensive operating costs;
- Financial strain owing to external factors (e.g. drought);
- Inherent risk in expanding;
- Under-developed financial literacy (e.g. pricing of outputs, strategic vision); and
- Costly planning and approval processes.

The research also identified a gap in support in the finance system for small-medium agricultural enterprises. The Northern Australia Infrastructure Fund (NAIF), for example, is levered toward larger developments. Moreover, banks and other institutions that do lend to individuals need to meet responsible lending rules, and may not be in a position to loan.

It can also be difficult for investors (both domestic and international) to navigate northern Queensland's development, commercial and regulatory landscape, and therefore make informed investments. Respondents said that in the absence of centralised information, investors struggle to assess opportunities, risk and the comparative advantage of options. This is leading some investors to focus their attention on less complex interstate or overseas contexts (e.g. ASEAN countries). Also, international investors can struggle to understand contextual issues specific to northern Australia (roads, telecommunications, long distances, etc.).

Second, proponents can struggle to navigate complex Commonwealth and State level legislation and regulation. At the Commonwealth level, several respondents said the *EPBC Act* is problematic (also see Deane et al., 2020). While there is bilateral support for the legislation, there are governance issues (which are addressed in the recent review) including misalignment with State and Territory legislation, which creates the duplication of approvals. There are also non-compliance issues, perhaps owing to a lack of enforcement. At the State level, many respondents suggested that the *Vegetation Management Act* is too prohibitive.

Overall, respondents expressed frustration with conflicts, unresponsiveness and duplication between the Commonwealth and Queensland Governments, especially in relation to land use classifications, environmental regulations and cultural heritage rules. Several respondents considered that the interpretation and application of regulations varies across sectors, making it difficult for proponents to understand their responsibilities. On the other hand, State Government agencies noted that proponents often submit (knowingly and unknowingly) non-compliant applications, which causes unnecessary backlogs in the approvals process.

Third, respondents suggested that current governance and planning frameworks for sustainable agricultural development in the north are ineffective. At the strategic level, respondents said that political agendas tend to motivate decision-making about infrastructure investment, rather than prioritised efforts based on science



and consultation. Unlike the mining and gas industries, several respondents considered that there does not seem to be a unified approach to agricultural development at Commonwealth or State levels. Others commented that feasibility studies are expensive, ad hoc and take years to complete. In relation to effective investment prioritisation, several respondents suggested that ad hoc applications from independent proponents can undermine all-of-catchment planning and resource management. Composing robust business cases can be complex, costly and lengthy, and engaging consultants to assist can be expensive. Moreover, respondents said that when approval applications are submitted, the outcomes can often be quite doubtful, which deters investors from committing capital to projects in the founding stages of the development process.

Fourth, the context and culture of farming in northern Queensland presents challenges to sustainable agricultural investment and development. Environmental factors include climate variability and unpredictability (e.g. water, soils); threats to the Great Barrier Reef; and legacy environmental degradation. Conversely, the drought in southern Australia is driving farmers to invest in Northern Australia, which has greater rainfall and water security, presenting strategic opportunities for Queensland industry and Government. Respondents suggested that these opportunities may be stifled by cultural factors including: siloed industries; emphasis on competition over collaboration and coordination; traditions of farming one product/reluctance to diversify; and deficiency in end-to-end farm business skills for modern contexts.

Priorities for System Improvement

The key areas for improvement identified by respondents were: (i) 'big picture' policy settings; (ii) regional coordination; (iii) streamlining policy and legislation; and (iv) incentivising innovation and sustainable practices.

First, respondents said that a high-level vision and strategy for agricultural development in northern Queensland would greatly assist proponents to assess opportunities and risks associated with various investments. Moreover, a development strategy would help ensure that investments are made in the most viable and lucrative locations, while protecting environmental and cultural values. This strategy should explicitly support agricultural development across governments and jurisdictions by setting, delivering and monitoring targets (e.g. growing the value of agricultural production). Respondents considered that such a strategy, and associated policy, legislation and regulation, could be a first step to centralising information for investors, by gathering and re-packaging development requirements for explicit industries and development project types. This could be supported by an investor chaperoning/brokering capacity to explicitly service potential investors in northern Queensland.

Second, respondents advocated for industry-led, government supported approaches to regional or sub-catchment coordination of agricultural and water developments. Creating mechanisms by which cooperatives of proponents can organise to articulate and execute developments together would help relieve risk from individual proponents, and contribute to more effective use of resources. Respondents stressed that government involvement (both State and Commonwealth) is essential, but coordination processes could be more independently facilitated to ensure the set strategic directions meet the needs of different interests. Mechanisms to facilitate this strategy could build upon existing place-based approaches to planning for a whole-of-catchment resource management strategies with a commitment to triple bottom line outcomes. This more community-led development approach would enable regions/catchments to leverage strengths and mitigate risks, and promote cooperation rather than competition between local farmers.

Third, respondents suggested that streamlining policy and legislation could be best achieved by setting a visible and strategic vision for water and agricultural development in northern Queensland, as described above. Governments should work together to define desired outcomes and priorities (for water, development, environmental, conservation, social/cultural values) and then formulate policy and legislative refinements that supports the achievement of long-term targets. This should include clear delineation between the roles of the Commonwealth (e.g. oversight and benchmark setting) and States (e.g. administration and processing). More specifically, respondents called for governments to link planning and resource approval systems into broad land use planning, and to set clear ecological ambitions and constraints. Moreover, respondents observed that, currently, developments are assessed as feasible (or not) according to a very narrow economic logic (i.e. cost benefit ratio). This could be improved by incorporating genuine triple bottom line factors into the initial assessment. In relation to specific mechanisms to support proponents to meet their obligations, several respondents advocated for management practice accreditation



to be collated for each sector/industry. This would enable specific and appropriate expectations to be set for different types of development, and provide clearer guidelines to proponents that 'make sense' for their business. Other respondents suggested that Commonwealth and State-employed case managers could guide proponents through all applications, ensuring consistency and compliance across departments.

Fourth and finally, respondents suggested that industry could benefit from strategic integration of innovative products and marketing into new and existing industry and agricultural operations. Proponents, for example, could be offered education and support to leverage biodiversity and carbon markets in agricultural markets and supply chains, and to invest in small scale operations that cater to niche markets. To further promote sustainable development, it was considered that governments could do more to incentivise and/or reward farmers to meet sustainability targets that exceed legislative or duty of care obligations.

Who is Responsible for System Improvement?

Considering the above insights about barriers and enablers of agricultural development and the suggested priorities for improvement, we now consider who is responsible for such system improvement and what should be done. In the online survey, respondents were asked to consider what local, State and Commonwealth governments should do to prioritise, de-risk and broker sustainable agriculture and aquaculture. Figure 6 shows responses for a selection of possible activities that governments could be involved in. Respondents felt most strongly that governments should 'have a can-do culture within and between governments/departments that process permits and approvals' (i.e. some 60% of respondents said governments *must* do this). Likewise, the nature of interactions between proponents and bureaucrats, and its impact on the smooth flow of processes and outcomes, was raised by several interviewees.

Figure 6 also suggests that there is an expectation that governments do or could play important roles in: supporting biosecurity and risk management (including cross-border biosecurity with other State governments); investing in improved public infrastructure, such as roads, rail and ports (i.e. some 80% of respondents said governments *must* or *should* do these things). While interviewees strongly agreed that critical infrastructure is an important responsibility of governments, biosecurity did not emerge as a strong theme (perhaps because proponents were more focused on thinking about experiences of planning and establishing developments, rather than operating them).

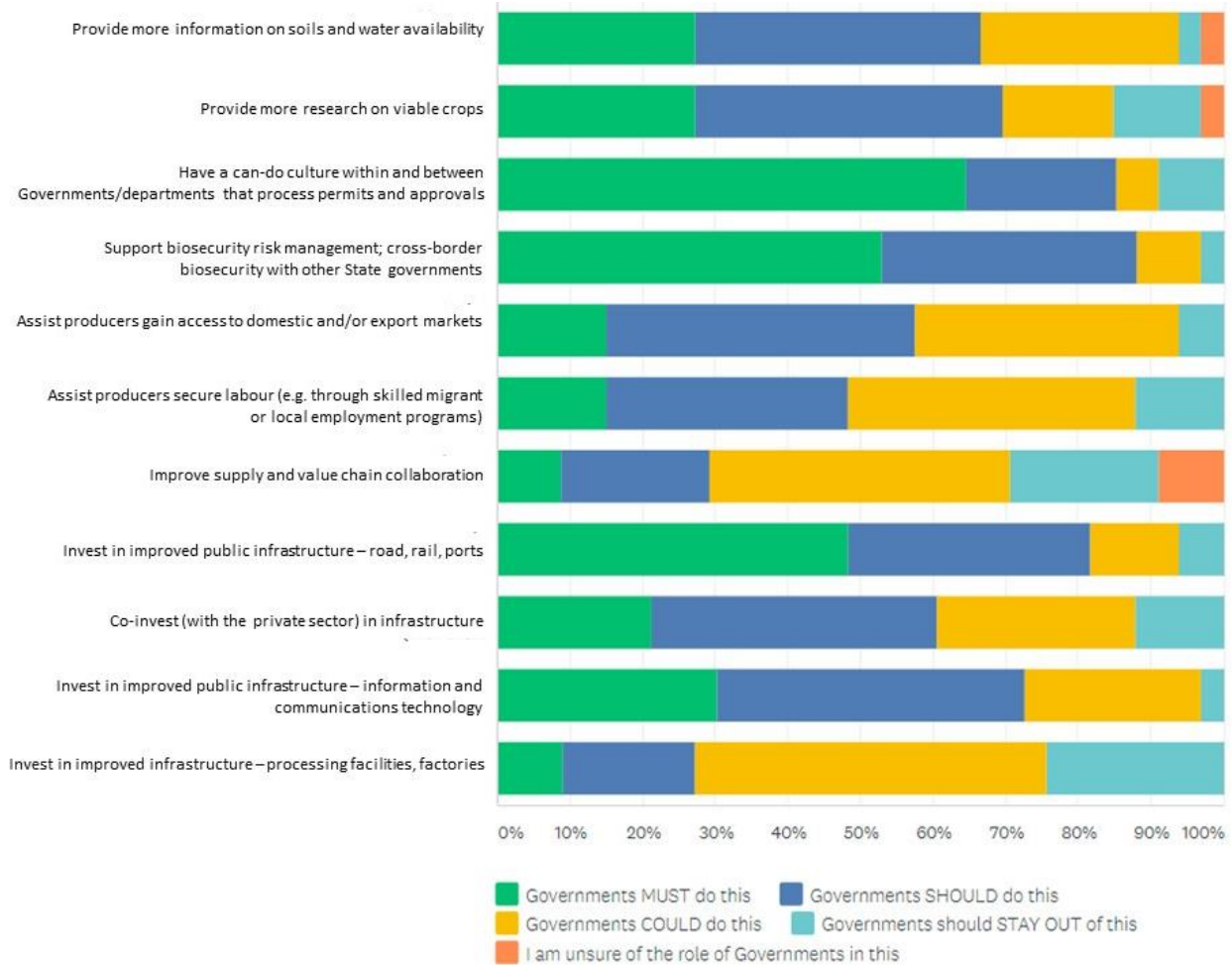
Respondents were divided on what governments should *not* be doing. This was particularly evident for 'investing in improved infrastructure for processing facilities and factories'. This disparity could have arisen from differing views about the level of financial assistance governments should give to private enterprise. The interviews support this thesis, with many respondents seeking greater assistance to access markets and co-investment arrangements, rather than direct or fully subsidised investment by government.

The survey also asked respondents about what additional things industry could/should do to facilitate sustainable agricultural and aquacultural development. In free-text fields, respondents made their own suggestions. Figure 7 shows a simple textual analysis of the responses. There are three key themes emerging from the most frequently appearing words.

First, related words such as *market*, *product* and *affordable* reflect a sentiment that industry has a significant role to play in establishing the means to get products to customers through robust, cost-effective supply chains. One respondent observed that, "often growers are distant from the actual customer and what they want, and as far as I am aware, every customer is wanting more traceability on product/company/culture claims." Streamlining the processes for getting products to markets, and adding value for customers, could be achieved by more open communication and information sharing across regions and sectors (e.g. sharing supply chains and machinery and/or processing/packing facilities). It was considered that new technologies such as blockchain can also assist.



Figure 6: Survey responses about what local, State and Commonwealth Governments should do to prioritise, de-risk and broker sustainable agriculture and aquaculture.



Second, related words such as *sustainable*, *environment* and *change* reflect a sentiment that industry should commit to environmentally sound practices to ensure a bright future for water resources and agricultural/aquacultural development. As one respondent said, “invest in regenerative, sustainable agriculture, recognise the threat of climate change on agriculture in Australia and work towards better action by our government on reducing our emissions to reduce the risks Australia faces from climate change in the future.” Several interviewees considered this could be achieved through a variety of mechanisms such as voluntary practice adoption, third party certification efforts and cross-sector knowledge sharing.

Third, related words such as *collaboration*, *commitment* and *genuine* reflect a sentiment that industry needs to work in partnership with all stakeholders, including governments, for agricultural development to be successful in northern Queensland. Collaboration between stakeholders from multiple sectors could extend to co-investment in research and development, infrastructure, and workforce training. There was further a common sentiment that industry should not overly rely on government intervention and funding. As one respondent said, “while there are some market failures that government should identify and respond to, industry should largely take responsibility for its own future”.



Figure 7: Textual analysis of the responses a survey question about additional things industry should do in facilitating sustainable agricultural and aquacultural development.



In conclusion, the research found that de-risking agricultural investment in northern Queensland requires collaboration between governments and industry, with each taking responsibility for their roles in the system. Broadly speaking, governments should strategically engage and set the policy and regulatory context(s) from within which industry can autonomously craft and execute its own future. These iterative processes require continuously improving approaches and genuine, open communication across stakeholder groups. Indeed, the recommendations emerging from this research are predicated on the principle that, at every scale and stage in the development process, stakeholders need to work together to define shared goals and mutual outcomes that ‘work’ in context. This coordination should be undertaken in ways that establish the partnerships needed for integrated governance and planning processes that support sustainable and equitable development in the north.

3.3 Case Studies of Planning, Assessment and Approval

The following case studies are intended to unpack actual experiences that are directly or indirectly relevant to agricultural development planning, assessment and approval in northern Queensland. Each case study delivers lessons of importance to the findings and improvement pathways developed later in this report. We have attempted to explore experiences that deliver insights in respect to the three key development contexts being explored by this research: (i) new water development, (ii) raising production and productivity within existing water schemes, and (iii) general development undertaken at the property scale.

Case Study: Rookwood Weir – A New Build in Progress

The Rockhampton region as a community is building on its economic, social and environmental assets to create a stronger economy (Dale et al., 2019). In achieving this, the region is seeking to deliver greater benefit from every additional megalitre of water brought online for new agriculture. At the same time, increasing water prices and declining water availability are driving renewed interest from other irrigation regions in southern Australia. In a strong sign of the region’s capacity to service new agricultural markets, and to further harness the economic opportunities from new water sources, the Commonwealth and Queensland Governments have collectively agreed to fund the \$352 million construction of Rookwood Weir

on the Fitzroy River. The Weir could deliver up to 42,000ML of water to help generate agricultural industry, as well as support urban and industrial growth and water security (76,000 ML in total). This will be in addition to the existing storages found between the Barrage and Rookwood Weir (Barrage 60,150 ML and Eden Bann Weir 26,260 ML), enabling the transition of land to the production of priority demand-led products. With the exception of the Paradise Dam, the Fitzroy Agricultural Corridor is the first major new irrigation development in Queensland for a generation, but achieving economic, social and environmental resilience will mean making every drop of water work hard for the community.

The governance associated with moving from concept to development, however, has been fragmented, leaving no clear frameworks for collaboration between the community, local government, the private sector, Sunwater, and the State and Commonwealth Governments. This is despite the case that a new approach is needed, as agricultural development comes with a series of previously silent challenges. New Queensland Government regulations for water run-off from farms seeks to achieve no net decline in Great Barrier Reef (GBR) water quality. Higher infrastructure, energy and general farming input costs are likely. Consumer markets demand increasingly higher product standards. Consequently, the most significant challenge for the development of agriculture will be effective management of water allocations to enable higher value and much more efficient, low impact agricultural ventures and supply chains (Dale et al., 2019).

To assist in this transition, in partnership with the State Government and other players, the region has established the *Making Water Work* initiative (see Dale et al., 2019 for details). To deliver the best possible outcomes from agricultural development, the initiative will explore, scope and map:

- The required agricultural supply chain visions and potential production system models;
- Visionary land use and infrastructure planning that can deliver on this promise, optimising effort and including innovative road, airport, port and communications solutions;
- Integration with reliable, affordable and low-carbon energy/waste management options;
- Catering for protected cropping, smaller scale farming and farm services innovation; and
- Next generation production system practices that meet the new GBR regulations.

Combined with new and more efficient supply and value chains, waste reduction and energy sector thinking, the opportunity exists for the region to lead the way in new and exciting developments in these approaches. New thinking and technologies present great opportunities to shift towards a more circularised economy and more integrated and value-rich supply chains in the agricultural sector. These include new techniques in the design and management of new agricultural lands, nutrient extraction in aquaculture, and the potential for greater integration of feed production, soil enhancement and nutrient reuse between sectors.

Key lessons emerging from this case study include:

- The need for stronger frameworks for collaboration between the community, private sectors, local government, water asset managers, and the State and Commonwealth Governments in project option testing and design; and
- With significant new pressures facing rural communities and Reef catchment areas in particular, much more inclusive planning about ensuring that new schemes deliver the highest value, diverse and most integrated agricultural development model possible behind the emerging water infrastructure.

Case Study: Increasing Value and Efficiency in the Mareeba-Dimbulah Irrigation Area (MDIA)

The MDIA was established in the 1950s, creating a significant economic opportunity for irrigation-based agriculture in the Atherton Tablelands. The Barron River Water Resource Plan and Resource Operating Plan was completed in 2010. Since that time, and with increased trading in the system, growth in agricultural water demand has increased by 3.4% per annum (Cummings, n.d.). Water prices have also grown over that time. While individual farmers are increasingly taking more informed decisions to guide their investment, it is clear that more collaborative decisions are now needed across the scheme to:

- Assess and analyse the trends in water use and price;
- Explore and analyse options to improve water availability and to reduce price-based risks; and
- Agree to the codesign of effective solutions that will deliver strong local and regional outcomes.



In this context, real opportunities to increase water supply include: new developments outside the scheme (e.g. through new water schemes such as the proposed North Johnstone Transfer Project); developments to supplement the scheme (e.g. through current work progressing to line distribution channels within the system); increasing water use efficiencies (e.g. via R&D or practice improvement); and improved approaches to water trading. While decisions concerning these issues involve irrigators, Sunwater, the State and Commonwealth Governments, Councils, researchers and others, there are currently no clear whole-of-scheme collaborative frameworks for posing, comparing and progressing these options. Activities to progress these ideas tend to be happening in isolation, which might not deliver the most cost-effective approaches to increasing productivity and profitability. This could mean resources are not being allocated efficiently and/or quality opportunities are not being explored.

Key lessons emerging from this case study suggest that, in existing water schemes:

- The presence of existing infrastructure, labor markets, supply chains and farming capacity, means dollars spent in improving water access can be much more effective than greenfield development;
- There is significant potential to explore multiple types of opportunities to improve water availability, water price, and productivity emerging from every megalitre of water; and
- There is a need for stronger frameworks for collaboration between the community, private sectors, local government, water asset managers, and the State and Commonwealth Governments in scheme-specific proposal development, option testing, design, finance and implementation.

Case Study: Investor Experiences in Property Scale Development

Our research interviews sought to gain insight into the firsthand experiences of primary producers in seeking to purchase, expand or increase productivity in operations in northern Queensland. Here, we provide three farm-scale case studies representing the pastoral, dryland cropping and aquaculture sectors, and we conclude with some cross-sectoral lessons for the future.

First, a fifth-generation cattle producer in central Queensland has sought to expand and diversify their operations over the last 20 years. These developments are focused on introducing irrigated crops, meaning that the expanded operations rely on increased water availability and water security. The interviewee intends to invest several millions of dollars in the next 3-4 years to expand current irrigation infrastructure centred on increasing fodder availability for cattle. While this proponent has successfully diversified into mosaic agriculture, they are concerned that there is a general lack of farming experience in the pastoral industry in this region. The interviewee considers that this might prevent broadscale uptake of similar practices. Notwithstanding significant material risks and barriers to development (namely securing access to water, energy, land, finance, etc.), the interviewee considers that producers who have only ever farmed cattle often lack the confidence, knowledge, skills and support to experiment with new agricultural commodities. As the proponent of an expanding business, the interviewee considers that more education and extension work, such as MLA's demonstration sites, could help producers see what is possible and to create improved pathways for transition.

Second, a representative of the horticultural industry in the Whitsunday region imparted their experience of producing increased quantities of vegetables. Local producers are shifting their focus from low-value sugar products to high-value crops through diversification and innovation. Key barriers identified include access to water, capital and markets, as well as a lack of information and data to inform decision making about the transition into higher value crops. The interviewee considered that it is essential that producers have more transparent access to science-based knowledge and mapping tools to help identify what will grow best and where. Moreover, support is required for local producers to formulate strategies to get products to market (supply chain support), and to establish a brand, reputation and direction for the region (local supply chain collaboration). The interviewee considered that leveraging the existing infrastructure and development approval processes associated with the region's resources sector would enable the development of robust supply chains and could assist producers to sustainably develop their businesses and the region.

Third, an aquacultural development specialist who has assisted an established company to create a new fish facility in Far North Queensland shared their experiences. This land-based operation was highly innovative and required substantial investment of time and capital into planning and approvals at the Commonwealth, State and local government levels. The interviewee suggested that there are disconnects between Commonwealth policy and State legislation about environmental standards, making them difficult to navigate. They considered that this was particularly problematic in the context of new regulation associated



with the GBR. The interviewee observed that while the policy goal is clear, the regulatory pathway to achieve zero net-emissions is not. The interviewee was of the view that the policy has come ahead of the full development of evidence-based regulations. More broadly, however, they considered that the State Assessment and Referral Agency (SARA) process was relatively effective in helping to identify, in a coordinated way, cross-departmental concurrence and approval requirements.

From all of the above mentioned these case studies and other producer interviews, key lessons for the future of property-scale development approval improvement (across sectors) include the following:

- For innovation and diversification, producers need to be engaged and supported in their communities to adopt new practices and technologies. A place-based approach to identifying early adopters and supporting new enterprises (e.g. finance packages, extension programs) could assist whole regions to grow together, creating economic and social value;
- Relatedly, producers require support and education to make decisions about the best agricultural products to develop, and producers need to mobilise as a region to identify domestic and global demand, and to strategically develop supply chains to meet the need. Methods of achieving this need to be science- and data-driven, and governments and industry must work together to provide the platforms and supports necessary for farmer-led development in northern Queensland; and to uphold necessarily high standards for sustainable development, having a centralised and well facilitated point of interface between proponents and government is desirable. This would enable proponents to access/consider all their responsibilities in tandem, and to work through any competing requirements before spending time and money pursuing action that may contradict other regulations. The concierge or case management model of government service was often supported.

3.4 Innovative Models for Improved Agricultural Planning and Assessment

As previously identified, this research suggests that there are three distinctly different contexts that need to be well considered before effective problem solving can commence. As such, the following section unpacks new and innovative approaches being trialled in other jurisdictions with respect to each of these three important but different decision-making contexts. The de-risking challenges in each of these contexts is quite different, though there are some solutions that may have relevance to all three contexts.

Supporting Greenfield Water Development Schemes

i) The Tasmanian Irrigation Model

In partnership with the Commonwealth Government, the Tasmanian Government established a well governed policy and delivery approach for strategic water development for agriculture. Within the context of well-planned and allocated water resources, it is focused on the prioritisation of a clear project and works development program, and a very open and risk-focused approach to project development in deep partnership across Commonwealth, State, community and industry players. To progress investment plans, three jointly funded tranches of investment have been progressively rolled out. In recent years, more than \$160 million has been invested by State and Commonwealth Governments and participating farmers in five (Tranche 2) irrigation schemes, creating 28,000 megalitres of new water entitlements in the Southern Highlands, Swan, Duck, Scottsdale and North Esk districts. Additional irrigation headlines Tasmania's future infrastructure priorities within the *Pipeline to Prosperity (Tranche 3) Irrigation Program* recently submitted to Infrastructure Australia (Barnett, 2018).

Pipeline to Prosperity includes another 10 potential development schemes state-wide with a capital cost of up to \$496 million. The program would return an estimated \$114 million each year to the agriculture sector, and the Tasmanian economy more broadly, with an ongoing employment stimulus of over 3,900 direct and indirect full-time equivalents, in addition to construction jobs. The program provides more water resources to allow farmers to not only invest in higher value crops and to improve farm productivity, but also provides water certainty at critical growth times, and mitigates against dry seasons. The continued development of these water resources has been considered to be central to the State's *Agri Food Plan*, with a target to grow the agricultural sector to \$10 billion per year by 2050 (Barnett, 2018).

The important story behind this case study is the increased productivity and growth within the agricultural sector arising from the approach taken. There has been a particularly good outcome in respect to the dairy



industry (which has now grown to nearly 11% of the nation's overall dairy production). The introduction of irrigation has resolved a productivity constraint within the dairy production cycle, has reduced the difficulties associated with keeping productivity even, and has delivered nearly 97% water security. Through discussions with stakeholders involved in the management of this system, we have identified several key design features that have contributed to these successes:

- The existence and operation of a strong and evidence-based irrigators' cooperative within the system (and in this case a Farmers Co-op of around 850 vocal producers). It is important to note that in the northern Queensland context, there are few irrigators in proposed new development areas;
- The independence of Tasmanian Irrigation and the independence of the proponent body from Government. Tasmanian Irrigation takes a strong, systematic and risk-based leadership approach focussed on cost-efficiency and genuine trust-building with the sector. The Board is skills-based, with clear risk analysis, commercial and irrigation capability. The strategic purpose of the organisation is to progress irrigation development within a clear social license that ensures wide public support;
- While independent from governments, the model enables Tasmanian Irrigation's leadership to have appropriate and open door access to both Commonwealth and State ministers, as well as a focus on building cooperative and coordinated relationships with the relevant State and Commonwealth agencies. The resulting prioritisation and strong business case building approach has enabled the negotiation of a progressive and stable series of bilateral investment tranches;
- The shared focus on managing all potential risks facing new schemes openly, and ensuring the schemes are economically viable. Additionally, the business models being developed have been based on a multiple benefit approach, including water development scheme uses such as recreation, sediment management, flood mitigation, environmental improvement and employment/social benefit;
- Stronger and early water tender processes that have identified those irrigators who invested capital early in the design process, and established the foundation for irrigator collaboration from the outset;
- The emphasis on the quality of the public and statutory processes for water allocation in Tasmania, the scoping of clearly available water development opportunities within those allocations, and the exploration of all potential options for developing that water;

Experiences from this model also strike a cautionary note on the likelihood that the *Environment Protection and Biodiversity Conservation Act* may place increasing constraints on irrigation opportunities, and the importance of a credible proponent or development organisation. The model strongly illustrates a think-act-do-review approach to the development of each scheme, with each success building on the successes of the previous one.

ii) The Emu Swamp Dam Model (South Eastern Queensland)

The Emu Swamp Dam (Granite Belt Irrigation) Project is an approved 12,074 megalitre irrigation dam and water-supply scheme on the Severn River near Stanthorpe. It will provide water to local farms via a 117 kilometre piped network. The Emu Swamp Dam could provide up to 3,900 megalitres of water to local farmers annually. The distribution network will include solar power generation and large-scale battery storage to power the pumps. The project will create 700 long-term jobs in farming and support other industries, while boosting the region's agricultural production capabilities by some \$68 million. More importantly, it is a modest development that was evaluated as having a high Benefit-Cost Ratio (BCR) that would strongly improve sustainable water yield in a drought-vulnerable region (Walker, 2020).

The negotiation of scheme development funding rested on the private sector strongly owning the development concept and investing some \$23.4m on the back of the strong BCR. The Commonwealth Government committed \$42m for water infrastructure and a further \$5m for associated road works, and the State committed some \$13.6m. Granite Belt Water has been established as a company limited by guarantee to lead and operationalise the project and to contract and hold the assets. While additional dam safety issues now need to be reviewed, Granite Belt Water is preparing to develop and release tender documents for construction of the dam, and contracts for the region's irrigators who wish to secure water from the facility.

Through discussions with key stakeholders involved in this system, several important process issues in the design of the development have been identified as having contributed to its success to date:



- This was a small, sustainable and viable water development based on high value horticultural crops;
- The capacity of Granite Belt Water to get users involved and invested in the design and financing of the infrastructure has been considered critical. The private sector had clear early expectations of what they were prepared to pay per megalitre of water. There was also a clear vision of high value crops that would be able to make best use of the water available (in this case vegetables and fruit);
- There have been very open processes of option assessment and a thorough review of the potential risks associated with the business case. This led to good engagement and robust design in the project planning and assessment process. Even so, however, further risk issues related to dam safety will still need to be resolved going forward;
- The project development process was originally led by a steering committee that later, following careful consideration of the preferred governance arrangements, led to the formation of Granite Belt Water (a company limited by guarantee). Throughout the process, there was a strong focus on getting the right skills/people involved in the steering arrangements;
- As with many scheme development projects, the original projected costs were very high, but by opening up the project development process to exploring all the available design options, much more viable options emerged. There remains a strong desire and intention to further develop the project within the constraints of the available budget;
- Throughout the project development process, there was a strong focus on clarifying and prioritising what the community was seeking to achieve. This led to more open thinking within the community about fit for purpose water development rather than large and costly proposals; and

Key constraints of the project included: the current lack of water-focussed engineers for the modern era; difficulties in getting different levels of government combining their efforts into a coordinated and collaborative approach; and the need for the proponent (a small institution) to take on major financial risks at key process points. In short, as a key process driver, the local Chamber of Commerce was open to rigorous review, and this led to the solid business case with sound fundamentals and a commitment from the users.

iii) Experiences From New Development in the Mining and Gas Sectors

During our interviews, and also in related research in the NT and northern WA, comments were frequently made that there may be de-risking lessons for the mining and petroleum sector that could be applied usefully in respect to agricultural development in northern Queensland. As one of the nation's strongest economic performers and representing more than half of Australian exports, at the national level, there is a clearly a strong policy focus on providing strategic support for the resources sector. A *National Resources Statement* (see Australian Government, 2020) supports a clear vision and five key goals, including:

- Delivering the most globally attractive and competitive investment destination for resources projects;
- Developing new resources, industries and markets;
- Investing in new technologies and approaches, especially to deliver better environmental outcomes;
- Creating well-paid, secure jobs; and
- Supporting communities to ensure they receive benefits from developing Australian resources.

Key features of this system at the national level include the Commonwealth Government:

- Supporting the mining equipment, technology and services sector via Industry Growth Centres;
- Encouraging investment in prioritised offshore petroleum exploration and opening up new regions;
- Leading Australia's efforts to grow the critical minerals sector in priority regions;
- Representing and advocating for the resources sector in trade agreements;
- Providing open access to precompetitive geological and geophysical data and analysis from Geoscience Australia;
- Identifying and developing responses to issues affecting onshore resources; and
- Progressing higher level oil and gas policy reform.

At the Queensland level, there is also a strong policy, assessment and compliance architecture in place for supporting mineral and gas exploration and development. The Department of Natural Resources, Mines and Energy is responsible for granting authorities to prospect and mining leases. The Department of Environment and Science is the administering authority under the *Environmental Protection Act 1994*. It approves eligibility criteria and conditions for environmentally relevant activities associated with mining (Queensland Audit Office, 2020). Key features of this system include:

- The capacity for developments of State significance to be called in under Queensland's *State Development Act 1971*;
- Well-developed policies for mining and exploration licence assessment and approvals;
- A strong system of tenure management associated with mining and native title resolution;
- Establishment of the GasFields Commission Queensland in 2013 as an independent statutory body with powers and functions set out in the *Gasfields Commission Act 2013*; and
- Strong systems of bonding for the management of legacy environmental issues.

While not without its problems, through discussions with stakeholders involved in this system, several key design features have been identified as having contributed to its successes as follows.

- A strong national framework for supporting the resources industry, but particularly through the knowledge supplied through Geosciences Australia. In this context, there is a particular focus on determining (and in some cases preventing the sterilisation of) mineral and gas resources;
- When significant conflict emerged in the context of the gas industry over recent decades, a significant national and state-wide effort was made to see these conflicts resolved through mechanisms such as the Queensland GasFields Commission Queensland (GFCQ, 2017);
- Strong cross-sector efforts in the mining industry from the 1990s onwards have enabled the sector to improve, protect and promote its social license to operate;
- There are strong systems of impact monitoring and compliance within the sector; and
- There are somewhat clearer development assessment and coordination approaches under mining industry development assessment processes. For example, Queensland's Environment Protection Policy - Mining (EPP) was well negotiated with industry during the 1990s and continuously improved.

In general, the resources sector has the planning capacity and the resources available to undertake high quality mine planning, community engagement and environmental assessment. Even at the corporate level, the agricultural sector rarely has this historical experience and the necessary resources at their disposal. This suggests the need for greater capacity within the sector, and also a greater role for the public sector in supporting the business of de-risking investment in agricultural development.

iv) Summary in De-risking for New Schemes

In looking across these models in other jurisdictions and geographies, there appears to be some consistent principles and approaches applied that contribute to achieving successful agricultural investment and development. Importantly at the outset, however, it appears that Queensland's current governance arrangements for water development may need to be sharpened. In the 'old days' of state-determined water development priorities, the Queensland Water Resources Commission led and delivered the development process. While the *Water Act 2000* refocussed the role of the State on water resource planning and allocation, Sunwater was also established to manage the existing and new water assets, but was not necessarily responsible for leading the new water development agenda. After almost 30 years of limited water development in Queensland, it seems clear that the private sector, or local communities, are by themselves not always well placed to take full responsibility for leading new water development. This means new and shared models of governance need be established if we are to see new sustainable development.

Some of the identified key principles and approaches for success include the following:

- Strong bilateral and even trilateral cooperation in prioritising and committing to particular water developments, including coordination with associated Commonwealth processes and plans;
- Strong community and particularly private sector ownership of the scheme development concept;



- The need to keep local government as a strong partner in business case development and deployment part of the project;
- The need to have an appropriately empowered actor in the system with responsibility for leading the process of strategic planning, development co-design, delivery and operation;
- The need for very robust and open processes underpinning risk assessment and management in design of the business case, engineering co-design, and ultimately the identification of lower construction costs. This means having the right people and stakeholders involved in the design phase and being prepared to tackle any issues emerging through effective process facilitation;
- The need to keep regulations offering environmental protection accompanied by a more facilitated process of ensuring environmentally and socially sensitive design, and the coordinated resolution of multiple regulatory and tenure requirements;
- The need for a strong and fair engagement with the traditional owners, communities and interests that are potentially impacted by the development; and
- Within the proponent organisation, the need for strong corporate structures associated with decision making to avoid political interference. These organisations must also strongly manage conflicts of interest (e.g. a tendency towards skills-based corporate structures);

Once projects become larger scale and with less viable BCRs, asset ownership becomes more likely to fall to the responsibility of the State. The Queensland Government, however, does not have a strong development-focussed fit-for-purpose institutional arrangement for driving development in partnership with the community and the private sector. Responsibility tends to fall back to SunWater as the asset manager, which is a historically different role to a development leader.

Increasing Development Investment in Existing Agricultural Development Schemes

i) Summary of place-based approaches to water allocation and management

An extensive literature in the social, economic and environmental sciences raise the effectiveness of collaborative and place-based approaches to problem solving. These approaches are particularly well known in the NRM literature, dealing with key issues such as water allocation, water quality management, soil-erosion management, integrated pest management, and other areas. These approaches are often referred to as place-based or collective impact approaches (Dale et al., 2020).

Throughout this research, several interviewees raised the importance of catchment or local scale collaboration to improve the productivity of under-utilised water in existing water schemes. Through the literature and via discussions with several stakeholders in existing water schemes or systems, key lessons have included the following:

- A well-defined geographic and issue-based problem context is needed (e.g. increasing water available for irrigation purposed in a particular scheme area);
- All key stakeholders (but particularly governments, water asset managers, irrigators and private sector investors) need to be able to work together with a clear common vision focused on achieving the best possible outcomes from water available within the scheme;
- For a collective approach to problem solving, each of the key players must take responsibility for doing what is required in the context of the collectively agreed water use vision and strategies;
- Well established and monitored outcome benchmarks that the key stakeholders in the scheme are seeking to achieve are needed (e.g. water security benchmarks, water price thresholds, etc.);
- There needs to be strong, inclusive and well informed irrigator forums or associations; and
- Development and continuous refinement of a trusted evidence/science base, and an adaptive culture that allows strategy refinement when agreed goals are not being achieved, are required.

Within priority areas, collective and area-based planning and problem resolution is needed to resolve intractable and potentially disastrous problems emerging for water scheme participants (e.g. unsustainable water price rises leading to the collapse of water use, significant diminution of water security, etc.).

De-risking for Individual Property Owners (Existing, New and Prospective)

i) Experiences From the Field in Property Development

Building on lessons emerging from related de-risking projects in the NT and northern WA, and drawing on experiences from within Queensland and other jurisdictions, some consistent strategies that support de-risking for investment at property scale include some of the following:

- *Collaborative approaches to information and data management* - Several examples of area-based approaches to information management have relevance to supporting local properties and producers to prepare for development assessment and approval processes. Examples include the recently released Toowoomba Ag Tec Hub (Jones, 2020) and the Herbert River Information Centre (HRIC) (Delai and Packer, 2002). These models take collective approaches to information and information software management at an area-based scale, reducing the cost to individual landholders;
- *Journey maps for traversing development approval* - Several interview participants raised the importance of governments and industry developing clear “journey maps” that support landholders to traverse complex and, at times, poorly coordinated development approval processes. Good examples of journey maps and support products targeted at the agricultural sector are, however, difficult to find and their currency is quickly superseded with regular process or personnel changes. Some time ago The Queensland Farmers Federation (QFF) undertook the Rural Planning Project, including a planning toolkit and other publications to assist farmers, planners and policy makers, providing a range of information on planning for a healthy agriculture sector (QFF, 2020);
- *Grants supporting development planning and feasibility* - Across the north, several examples exist of government-based grants or concessional finance to test the feasibility of development opportunities at property scale and to progress these to development approval;
- *A diversity of financial support* - More recently, a diversity of support has emerged for grant-based and concessional finance that supports agricultural development and property scale. Opportunities noted during this research included concessional and other finance opportunities from the QRIDA, the RIC, the CEFC and the NAIF. With a diversity of opportunities now available, there is a greater need to more clearly communicate them and differentiate their value at the property scale. Greater opportunities for cooperation between these facilities and the private sector is also possible.

ii) Integrated State Policies Supporting Agriculture

At a very broad level, the decisions of property owners to invest in agriculture are indeed bolstered by the Commonwealth and the State having explicit policy and program support aimed at lifting investment in agriculture. At the Commonwealth level, this is exemplified through a cohesive response to the *Whitepaper on Agricultural Competitiveness*. Another relevant example of this approach is the previous Western Australian Government’s Royalties for Region’s funded initiative *Seizing the Opportunity Agriculture*. This was a \$350million initiative aimed at helping to enable the agricultural sector to seize the opportunity of rising global demand and strengthen regional communities where agriculture was a major economic activity. The program was designed help to promote local products and attract new investment in agriculture, as well as build business skills, bolster research and development, and create efficient supply chains. The State Government partnered with the agricultural sector to direct Royalties for Regions investment across 15 significant programs (WA Government, n.d.).

iii) Summary of De-risking at the Property Scale

Again, in looking across these models and experiences in other jurisdictions and geographies, there appears to be some consistent principles and approaches applied that contribute to achieving successful agricultural investment and development at the property scale. These include the need for:

- Clear Commonwealth and State level policy and program frameworks supporting agriculture;
- A lead agent at national, state, regional or local level focused on attracting and fostering new agricultural development (third-party investor case management);
- Integrated, comprehensive, continuously improving and easily accessed knowledge bases to assist investors in accessing and using both assessment data (natural resource, economic and social) and relevant research and development;



- Clear journey or process maps that are regularly updated and accessible;
- Proactive investment in lifting the capacity of landholders to be investment-ready;
- Active research, development and extension frameworks supporting new production systems and approaches in landscapes that are targeted for development; and
- An efficient mix of public and private sector extension services.



PART 4: CONCLUSIONS & RECOMMENDATIONS





4.1 Positive Pathways to Increase Agricultural Development Investment

From the knowledge emerging from the literature, survey, interviews and case studies, the following outlines a series of positive pathways to increase sustainable agricultural development. These pathways have been tested and refined through feedback from interviewees and active workshops with regional and State level government agents associated with agricultural development planning assessment and approval processes.

Prioritise and Focus Our Agricultural Development Efforts

Our current system for prioritising and facilitating agricultural development is highly fragmented, sending few clear messages to the private sector or to the community about where and how Queensland will actively support new agricultural development investment. Our research suggests that this is significantly impinging new agricultural investment in each of our three development contexts.

- For **new water development schemes**, there are now at least nine proposals of significance with a wide range of project champions. If considered together, it is not likely that all of these developments could be progressed, nor is there a clear framework for prioritising, progressing, learning from and improving effort. We predict this will generally mean slow, stop-start progression of most of these proposals, and a decreased likelihood of potentially viable projects progressing to investment.
- In respect to **increasing development from existing schemes**, apart from some limited scheme enhancement proposals (e.g. lining channels in the MDIA), most of the development effort is emerging from within the private sector to utilise existing allocated water and land resources. Steadily increasing water prices in some places suggests that while previous planning has facilitated investment, renewed effort is needed to frame and scope scheme-level enhancement effort. As in the new scheme context, there is ad hoc planning and support for collaborative, place-based effort to increase water availability and to put downward pressure on prices within existing schemes.
- In respect to supporting **development or intensification on individual properties**, there again generally remains no clear processes for prioritising or facilitating this effort. Consequently, individual property owners consistently report frustration with processes for on-property development approval.

Despite this lack of strategy and prioritised focus, through the Northern Australian component of the *National Water Infrastructure Development Fund*, progress on analysing, assessing, and developing business cases and impact studies for new or enhanced water schemes is progressing. This, however, is occurring in a fragmented way, at a slow pace, and with significant risk of these processes stopping and stalling at various times. There are also poor strategic linkages to potentially positive synergies in the energy sector. Some coordinative progress has, however, been made at the Commonwealth scale through the formation of the North Queensland Water Infrastructure Authority. It is also fair to say that good results are being achieved when proponents/developers have the capacity needed to navigate approvals, and in cases where a strong case management approach is applied to support progress along the investment pathway (e.g. see the Tassal Aquaculture example in PWC, 2020).

Based on the above, the following key reform pathways are recommended for consideration.

- **Pathway 1:** Based on economic, social and environmental criteria, the Queensland Government could work collaboratively with the Commonwealth, industry, the engineering profession and the research community to develop a *Strategic Agricultural Development and Investment Framework*, with a prioritised, resourced and adaptive program of facilitative works. This should account for all three development contexts considered in this study, and enable strong linkages to the energy, tourism and advanced manufacturing sectors. It should establish the basis for cost-sharing of infrastructure and robust feasibility/business case assessment that properly factors in true costs and variability in production from one year to the next due to climate, pests, etc.
- **Pathway 2:** Based on the above framework, the Queensland Government could establish an appropriate, professional but development-focussed institution to ensure appropriate governance and asset management risks are coordinated and managed for new water development infrastructure based on similar principles to Tasmania's *Pipeline to Prosperity Program*.

Actively Plan and Deliver New Ag Development Projects as Collaborative Learning Experiments

While there is a strong multilateral and bipartisan aspiration in the *Whitepaper on Developing Northern Australia* to secure the expansion of agriculture in particular priority locations, solutions to key policy, regulatory and regional development challenges at the Commonwealth, State and Territory level need to be prioritised and resolved in a better governed and stronger collaborative approach. Much more serious collaborative governance frameworks are required to ensure all development options and associated risks are appropriately considered, to ensure effective community engagement, and to make sure the final models of governance and ownership of new schemes are developed from the outset.

Documented failings in the development of Paradise Dam in the Bundaberg region suggest there is evidence of a lack of collaborative governance between governments, the private sector and the community in the strategic framing of the investment environment (Marie and Goetz, 2020). Our research suggests the same preconditions for governance failure could exist in other water development proposals across northern Queensland. This risk: (i) reduces the likelihood that new or enhanced schemes (that are both viable and sustainable) will reach development completion; (ii) increases the time to achieve completion; and (iii) increases the chance of failures or inefficiencies in the operation of the finalised scheme. Alternatively, there are several examples of how to govern the water development process better from the outset (e.g. Tasmanian Irrigation, etc.). We need to effectively view every new development as a learning experience that contributes to continuous improvement in the development process across the balance of northern agricultural development schemes. If we took a “learning experiment” approach to all new development schemes, the key processes that need renewed and innovative attention would at least include:

- The development of improved processes and approaches aimed at collaboratively scoping and de-risking priority prospective areas for development (across environmental, economic, social, cultural and infrastructural risks) in ways that openly explore and compare all development options available, robustly codesign the most attractive and cost-effective options, and attract the best possible private sector investment in the consequent agricultural development;
- Better codesign of the model of scheme governance and asset ownership and management;
- Enabling the codesign of new collaborative development models for the improved brokerage of investment in agricultural development, including more coordinated approaches to identifying, attracting and progressing investment from agricultural development interests; and
- The progressive sharing of these lessons into the next areas prioritised for development.

We suggest that trusted third-party facilitation of this approach is the key to success. To drive the approach, a strong *Agricultural Development Partnership* could be established between the Queensland and Commonwealth Government, willing agricultural development communities, CRCNA, and an appropriate team of research/innovation providers. This partnership would:

- Focus shared attention on a limited number of emerging agricultural development schemes as “learning experiments” and as new approaches to agricultural development; and
- Establish a strong partnership agreement between the parties that represents a time-limited (maybe 5 years) commitment to collaboratively and adaptively plan to explore new and innovative approaches to development assessment and approval.

Some of the proposed information required for this arrangement could emerge through the Northern Australian node of the cross-hub NESP investment currently in development. Under this approach, there would be value in similar arrangements being established in both the NT and WA, and through NASONG, clear cross-jurisdictional knowledge sharing could then be established. This could result in structured Commonwealth/State/NT agreements about the development and implementation of a continuously improving work program (based on prioritised effort).

- **Pathway 3:** Form a strong *Agricultural Development Partnership* between the Queensland and Commonwealth Governments, agricultural development communities and industries, CRCNA and an appropriate team of research/innovation providers. The partnership would collaboratively design, trial and evaluate new approaches to de-risking priority agricultural developments, resulting in a continuously improving program of works in and beyond the trials.
- **Pathway 4:** To support the sharing of learnings across schemes, it is recommended that the Partnership or CRCNA host a stable and well facilitated network of knowledge sharing (and a shared

program of networking improvement efforts) across all new water developments and all efforts to enhance existing agricultural development schemes. This in itself could help deliver greater whole-of-state or cross-regional development efficiencies. Examples include the potential for exploring bulk purchasing opportunities for construction inputs, sharing new engineering technologies, or conceptualising and exploring the engineering possibilities of creating a more integrated water grid across existing and new water developments in northern Queensland.

- **Pathway 5:** Support the emergence of an ongoing *Northern Queensland (or potentially even a Northern Australian) Irrigators Forum* to progressively identify those irrigators that may see themselves as potential investors in the future of the north, and encourage a strong culture of responsible and sustainable approaches to water use and investment.
- **Pathway 6:** Support building of the capacities of landholders and investors to develop and progress quality agricultural development proposals. This can be developed by either building capacity within the farming sector, or by providing enough training so that producers or other local investors can at least identify the skills needed to take on agricultural development.

Key Reforms Required in Relation to the Operation of the EPBC in Northern Queensland

The *Environment Protection and Biodiversity Conservation Act 1999* frequently has been identified as presenting concerns from both communities and industry in the agricultural development space. There is a current review of the *EPBC* (Samuel, 2020). It is timely that this research will be able to inform the review of Australia's primary national environmental law. Based on this research and other emerging CRCNA research investments (see Dale et al., 2020), six key issues have been identified as being crucial to the future operation of the *EPBC Act* as it relates to agricultural (and broader) development in northern Queensland.

a) The need to increase capacity of the jurisdictions in development assessment.

Part of the original intent of the *EPBC Act* was to establish a national framework for consistency in assessment and approval *across* the jurisdictions, but also to ensure the standards of development assessment were increased *within* the jurisdictions (as per the *Intergovernmental Agreement on the Environment 1992*). Over many years, frequently due to a lack of capacity in the jurisdictions and a consequent lack of trust between Commonwealth, State and Territory Governments, there has been a tendency for the Commonwealth to take more control over the development assessment process than less. As the *EPBC Review Discussion Paper* notes, over time the "Commonwealth's role has become more expansive, driven in large part through the evolving nature of our federated system of government and Australia's international commitments".

Dale (2017) suggested that increasing centralisation in the operation of the *EPBC* has two unintended consequences on the development approval system and investment. Firstly, this trend has failed to increase the development assessment capacities of decision makers at the most appropriate level (i.e. the State/Territory level). Secondly, this trend increases the decision making responsibilities of the Commonwealth, but often without increased resources to undertake rapid/effective assessment. This tension increases the risk of policy incongruence between three levels of government, with implications for both investors and local communities. It can contribute to a lack of strategic focus in development assessment.

- **Pathway 7:** In the context of the current review of the *Whitepaper on Developing Northern Australia* and *EPBC Review*, the Queensland and Commonwealth Governments (and the WA/NT Governments) could bilaterally negotiate a *Northern Australian Package* of actions/incentives aimed at increasing the development assessment capacities of the jurisdictions within agreed standards.

b) The lack of available data to inform planning and assessment.

Northern Australia generally suffers a deficit of basic biodiversity and landscape-based knowledge to underpin rigorous and fair assessment of agricultural development. In the absence of this data, there is a significant and increased burden on investors to redress knowledge gaps. This project-by-project approach is poorly coordinated and results in poorly accessible/synthesised data. This situation increases the risk that *Matters of National Environmental Significance (MNES)* may be over-looked in the development assessment process. Just as importantly, it also often results in an overly cautious approach to assessment and significant sunk costs for investors. It can also potentially result in advanced development projects being scuttled late in the assessment process. As PWC (2020) suggests, this situation creates a significant disincentive to investment. Indeed, to help address this issue, we understand that five National Environment



Sciences Program (NESP) hubs are currently working with the Commonwealth to create an *Integrated Knowledge Building* approach to supporting Northern Australian development. Their suggested approach could help State and Territory Governments and industry to overcome the significant knowledge deficits that currently hamper the prioritisation of areas most suitable for development, as well as enable better signalling of environmental and cultural risks within landscapes early within industry's investment decision making. They suggest that a trusted and more shared knowledge of these risks enables more locally driven approaches to landscape scale, project and property-scale planning, as well as the development of an early and robust set of management principles/practices to reduce these risks.

- **Pathway 8:** Ensure that Commonwealth allocation of resources into the future NESP hubs specifically provides substantive focus on the need to better de-risk development decision making in the northern Australian landscape. This should at least include filling substantive data gaps related to biodiversity and water, support for multi-criteria-based approaches to identifying priority agricultural development areas, and improved approaches to development planning and assessment.

c) Limited frameworks for the emergence of employment-rich ecosystem service markets.

One of the most significant opportunities for greater economic and employment outcomes in both the pastoral landscape and northern Indigenous communities can emerge from the delivery of environmental offsets under regulated, voluntary and government purchased ecosystem services and/or offsets (see Dale, 2014). An emerging CRCNA research investment has already identified the opportunities emerging from global and national markets and for northern Australian land managers (NAILSMA, 2019). Clear policy can help deliver these outcomes and optimise the application of offsetting in the context of the *EPBC*. There have, however, been key concerns raised about the clarity and integrity of the current offsets framework (as it is progressed under several pieces of legislation). These concerns would need to be resolved if an emerging offsets market is to deliver benefit within the northern Australian landscape. The Offsets interaction between *EPBC* at a Commonwealth level, and the environmental offsets requirements at a State level, are complex and there are variances between the State's *Environmental Protection Act*, *Nature Conservation Act* and *Vegetation Management Act*. This involves a lack of harmony between MNES and Matters of State Environmental Significance and definitional problems concerning "discrete areas" to be offset. Even professional consultants find these are complicated issues as, between State and Commonwealth interests, many worthy projects cannot be scaled up. Comparatively, large corporate players in the mining sector that can manage offsets have often different financial levers to pull compared to agriculture.

- **Pathway 9:** The Commonwealth should work proactively with the CRCNA, the Indigenous and pastoral sectors, and the WA, NT and Queensland Governments to conceptualise a stronger ecosystem services policy and investment framework for Northern Australia. This would create new industry and employment opportunities for traditional owners, pastoralists and other landholders, streamline processes for the framing, negotiation and delivery of offsets under the *EPBC*, and align these offsets to other ecosystem service market opportunities in the regulated/voluntary sectors.

d) Increased inclusion of socio-economic impact in *EPBC* deliberations

Significant concerns raised by industry and the community in relation to the operation of the *EPBC* often reflect the lack of informed consideration of socio-economic impacts of the Commonwealth's assessment recommendations and decisions. The single disciplinary focus on biophysical considerations is inconsistent with the definition of the term "environment" within the legislation. Dale et al. (2002) document the implications of not properly integrating socio-economic impact assessment capacities within development assessment and approval process and in institutions charged with environmental decision making. Integrating socio-economic impact assessment capacities within the Commonwealth's processes could result in considerations and solutions that find more win-win outcomes within decision making processes.

- **Pathway 10:** Establish a social impact assessment referral and advisory capacity in association with those parts of the Department of Agriculture, Water and the Environment responsible for administering the *EPBC* assessment process. This would ensure that assessment and approval tasks associated with the Act are cognisant of social and economic risks and opportunities for communities receiving development and for development investors.



Continue Investment for New Water Assessment and Development

The *Whitepaper on Developing Northern Australia* identified several economic challenges, especially a lack of water resource assessment underpinning development planning at the catchment level. This posed a barrier to water infrastructure development, and some \$467.2 million was committed to water infrastructure feasibility studies and construction in Northern Australia. The application of this fund has been extremely successful, with development committed and several new, positive preliminary business case developments looking to progress to full business case development and impact assessment. The recently completed \$15 million Northern Australia Water Resource Assessment (NAWRA) also has investigated and identified the potential of water and soil resources to support increased primary production in three priority Northern Australian catchments. Despite some defined Northern Australian outcomes from the more recent Commonwealth Government announcement of the expansion of the *National Water Infrastructure Development Fund* by more than half a billion dollars, a second defined tranche of Northern Australian-specific investment (for ongoing studies and new capital development) would offer substantial benefit. Given the success of this past approach, continuation and expansion of this effort should be considered as a priority in the current refresh of the *Whitepaper on Developing Northern Australia*.

- **Pathway 11:** Through the current refresh of the *Whitepaper on Developing Northern Australia*, establish a second tranche of the northern component of the *National Water Infrastructure Development Fund*. This should support local communities and industries to undertake the planning required to ensure the highest and best value use of water once a commitment to construction has been made, ensuring new developments provide affordable water and deliver maximum economic benefit. With continuation and expansion of the original water infrastructure investment, a stronger bilateral approach to agreeing on shared investment priorities and the development of a cohesive and long-term work plan for implementation (based on current studies) could also be established.

Building a Better Governance Model for Development Coordination in New Water Development

Even if there is an improved institutional basis for leading the agricultural development process, there will still be cultural and operational issues associated with how the Queensland Government facilitates and coordinates responses to major agricultural development proposals. Indeed, given the significance of economic growth possible through the development of high security agricultural water, the argument could be made for a 30-year focus of collaborative efforts across Government. Given the scale and importance of increasing water security as a national issue, a significant nation-building response is required.

A major factor confounding the development assessment and approval process is the difficulty faced by both investors and communities in navigating both Commonwealth and State/Territory aspects of the development assessment and approval system, particularly once the *EPBC Act* has been triggered. This problem can be complicated by several issues, including: (i) the lack of a strong, bilaterally agreed single point of interface between the shared assessment processes and the developer; (ii) rapid turnover of assessment staff, particularly in the Commonwealth; (iii) the resolution of assessment problems sometimes being handled by inexperienced staff at junior levels; and (iv) a lack of clear procedures to deal with problems faced by developers (e.g. offset procedures). Despite these problems, other States (e.g. WA) are becoming increasingly interested in the potential role and application of Queensland's *State Development Act* in facilitating coordinated project assessment. There is real value in priority new agricultural development being declared coordinated projects under the Act, but even so, modifications to the current system are needed.

- **Pathway 12:** Routinely declare significant and priority agricultural development areas as coordinated projects under the *State Development Act*, and complement this with resources for a dedicated Deputy Coordinator General being appointed in northern Queensland to facilitate this important and nationally significant 30-year program of works.
- **Pathway 13:** The Commonwealth could widen the mandate of the Northern Queensland Water Development Authority to work cooperatively with the Queensland Government on facilitating a prioritised 30-year program of strategic agricultural development works.



- **Pathway 14:** Within coordinated projects, both Governments could increasingly explore the potential application of models that include the use of independent and competent “third party facilitators” in ensuring healthy governance of the planning, development assessment, and approval process.

Coordinated Approaches to Supply and Value Chain Development at Sector and Regional Scales

Recent supply chain analyses for Northern Australian agriculture suggests there is significant unmet demand for typical agricultural products across key markets. A huge challenge for the development of agriculture in the north, however, remains the under-development of higher value and more efficient, low impact agricultural ventures and supply chains, whether they be large or small in scale. Through the emerging evidence and experience in facilitating this work, it is becoming clear that the Commonwealth, State and Territory Governments will increasingly need to invest more strategically, and in a more coordinated way, in further supply chain analysis (e.g. better understanding supply chain potentials and logistics) and development (e.g. targeted investment in key supply chain collaboration building, strategic planning activities and infrastructure building). The key activities required could cover four key stages in supply chain development, though these stages often are highly iterative within any supply chain (sector or placed-based):

- *Stage 1* - Supply Chain Research and Analysis;
- *Stage 2* - Supply Chain Governance, Partnership and Strategy Building;
- *Stage 3* - Feasibility Assessment for Critical Supply Chain Infrastructure; and
- *Stage 4* - Strategy Implementation, Infrastructure Investment Brokerage and Monitoring.

Stage 1 activities can be funded within the current CRCNA investment remit under its existing Commonwealth Funding Agreement. However, there are no clear investment streams available for *Stages 2 through 4*. Because of the generally immature investment environment and lack of scale in Northern Australia, there is a strong need for government investment to help facilitate the development of collaborative supply chains through these early stages. With the establishment of strong governance arrangements in the formative years, however, these supply chain collaborations can become strongly self-sustaining over time. The approach could first be trialled in the agricultural development space but could then be extended into other sectors in future years (e.g. tourism, tropical knowledge, health and other human services, etc.).

The work associated with this funding should be strongly linked (i.e. *Stage 4* brokerage) to the ongoing and targeted deployment of key infrastructure investment and financing mechanisms already in place, including private sector finance mechanisms and the NAIF, the National Water Infrastructure Development Fund, the National Drought and North Queensland Flood Response and Recovery Agency, the RIC, the CEFC, the QRIDA, the Roads of Strategic Importance initiative (ROSI), Regional Development Australia (RDA)-linked infrastructure grants, and associated State/Territory-based infrastructure grants and loans.

- **Pathway 15:** As an outcome for the current refresh of the Northern Australian agenda, the Commonwealth could establish a *Northern Australian Supply Chain Development Fund* to further progress Stages 2 and 3 of the supply and value chain development process, either within regions, across regions, and within and across sectors.
- **Pathway 16:** Consistent with the findings of the recent NAIF review, the Commonwealth could support additional integrated effort within and across the operations of funding and finance institutions (i.e. RDAs, CEFC, the RIC, NAIF) and relevant State agencies to respond collaboratively and in an integrated way with emerging supply chain development and feasibility processes, particularly when it comes to supporting the emergence of transformational development opportunities. The targeted expansion of concessional and/or equity finance arrangements could help across smaller projects, including earlier collaboration from the NAIF and other financiers.

Responsibilities for the progression of these potential pathways can be differentially allocated across the Commonwealth and State Governments and industry. Their relevance also varies across the three development contexts covered in this report. Table 4 seeks to clarify these distinctions.



Table 4: Responsibilities for progressing key delivery pathways across stakeholders and context.

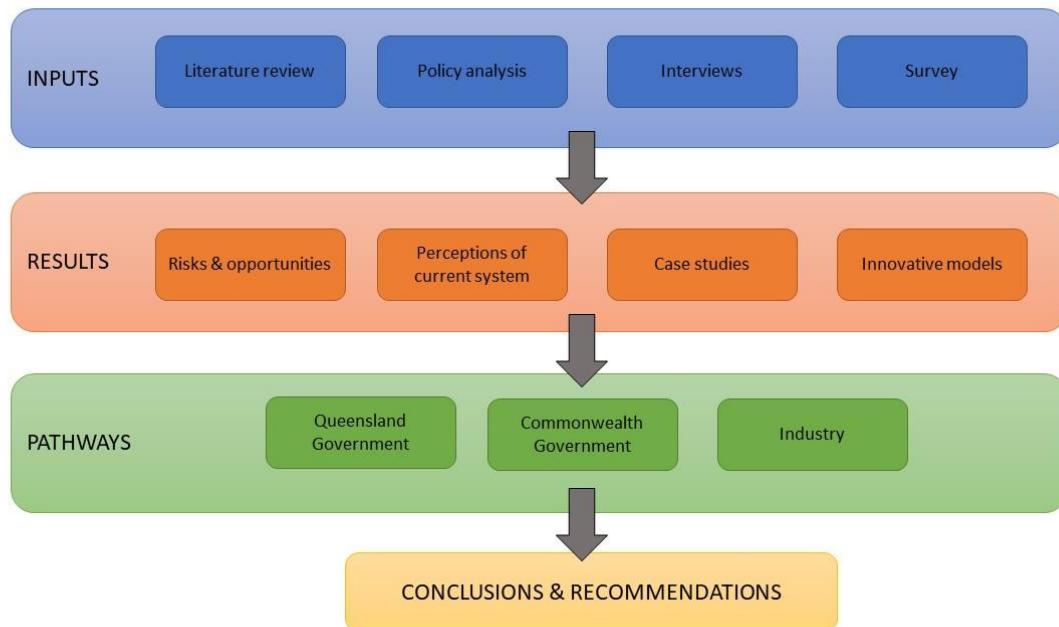
Legend: Context 1 refers to new water scheme development. Context 2 refers to further developing existing water schemes. Context 3 refers to the intensification of development at farm scale.

QUEENSLAND GOVERNMENT	CON-TEXT	COMMONWEALTH GOVERNMENT	CON-TEXT	INDUSTRY	CON-TEXT
Pathway 1: Work collaboratively with the Commonwealth, industry, the engineering profession and the research community to develop a <i>Strategic Agricultural Development and Investment Framework</i> .	1 2 3	Pathway 8: Ensure investment in future NESP hubs focuses on better de-risking development decisions in the north (e.g. fill data gaps).	1 2 3	Pathway 3: Form a strong <i>Agricultural Development Partnership</i> across Governments, agricultural development communities and industries, CRCNA and an appropriate team of research/innovation providers.	1 2 3
Pathway 2: Establish an institution to ensure appropriate governance and asset management risks are coordinated and managed for new water development.	1	Pathway 9: Work with the CRCNA, the Indigenous and pastoral sectors, and the WA, NT & QLD Governments to conceptualise a stronger policy and investment framework for Northern Australia.	1 2	Pathway 4: The <i>Agricultural Development Partnership</i> or CRCNA should host a stable network of knowledge sharing.	1 2 3
Pathway 7: Negotiate a <i>Northern Australian Package</i> of actions and incentives aimed at increasing the development assessment capacities of the jurisdictions within agreed standards.	1 2 3	Pathway 10: Establish a social impact assessment referral and advisory capacity in association with those parts of the DAWE responsible for administering the EPBC assessment process.	1 2 3	Pathway 5: Support the emergence of an ongoing <i>Northern Queensland</i> (or potentially even a Northern Australian) <i>Irrigators Forum</i> .	1 2
Pathway 12: Routinely declare significant and priority agricultural development areas as coordinated projects under the <i>State Development Act</i> , and resource a Deputy Coordinator General.	1 2 3	Pathway 11: Establish a second tranche of the northern component of the <i>National Water Infrastructure Development Fund</i> .	2 3	Pathway 6: Support capacity-building of landholders and investors to develop and progress quality agricultural development proposals.	1 2 3
Pathway 14: Within coordinated projects, explore use of independent and competent “third party facilitators”.	1 2 3	Pathway 13: Widen the mandate of the <i>Northern Queensland Water Development Authority</i> to work with the Queensland Government to facilitate 30-year program of strategic agricultural development.	1 2		
		Pathway 15: Establish a <i>Northern Australian Supply Chain Development Fund</i> to progress supply and value chain development either within regions, across regions, and within and across sectors.	2 3		
		Pathway 16: Support additional integrated effort within and across funding and finance institutions (i.e. RDAs, CEFC, the RIC, NAIF) and relevant State agencies.	2 3		

4.2 Conclusions and Strategic Recommendations

This research explored and defined the complex problem facing agricultural development prioritisation, planning, assessment, approval and compliance in northern Queensland. To get to the conclusions and strategic level recommendations articulated below, the previous analysis and the consideration of potential response pathways was brought together using the integrative framework outlined below in Figure 8.

Figure 8: The integrative framework used to translate research findings into response pathways and strategic recommendations.



Overall, across this research, a strong preference was identified for first focusing development on the more effective use of available water resources. While new water development was supported, most research participants considered that this needed to be sequenced upon other existing or emerging foundational infrastructure. The research also fundamentally found that the current and overarching system of prioritising, planning, assessing and approving new agricultural development (in all three of the development contexts considered), cannot be described as being fundamentally broken. To achieve investment and sustainable agricultural outcomes, however, real effort will be needed to address serious dilemmas that arise from:

- A lack of **clearly articulated agricultural development priorities** across northern Queensland, including less than optimal use of existing water schemes and poor sequencing of new development;
- **Poor frameworks for integrated, collaborative planning** at the catchment or sub-regional scale between governments, the private sector and the community to progress agricultural development;
- **Fragmented and sometimes conflicting policy and process settings** in project assessment and approval that are unable to resolve tensions (and opportunities) concerning development, the environment, and Indigenous interests in northern Queensland landscapes; and
- **A limited focus on raising the capacity of agricultural development interests** to develop and prosecute investment-ready proposals that can easily achieve their regulatory obligations.

While recognising the significant constraints facing agricultural development in northern Queensland, this research optimistically suggests that agricultural, environmental, and Indigenous interests in development can often be reconciled in the region. Without the resolution of these issues, however, further investment in positive, private, sector-led agricultural development will continue to face procedural inefficiencies, conflict, and investment uncertainty. While wide cooperation is now emerging between the CRCNA and the



Queensland, WA and NT Governments, and industry to support the development of new, but sustainable, agricultural development activity in the north, broad directions from this unfolding work suggest the need to implement and evaluate some of the following solutions:

- Commonwealth, State and local governments working together with industry, investors and community interests to **set targets for and prioritise key agricultural development in northern Queensland**, with a strong focus on sequencing development around existing infrastructure;
- The development of **new collaborative planning models in priority agricultural development areas** to apply existing legislative frameworks to resolve significant water conflict, vegetation and biodiversity management, native title and tenure resolution, and infrastructure and services planning;
- The development of **improved assessment and approval practices and targeted regulatory improvements** aimed at de-risking priority landscapes (across environmental, social and infrastructural risks) in ways that can attract suitable investment/development; and
- **Lifting the investment readiness of landholders** and investors and the capacity of planning services providers to progress sustainable agricultural development.

Table 5 draws together all the key threads derived from the research to consider bold initiatives that need to be considered behind each of these solutions, the key implementation pathways, and likely impacts. These recommendations are necessarily higher level at this point, and are intended to serve to frame discussion between CRCNA, the Queensland Government, the Commonwealth, industry and other key players with a significant stake in the future development of agriculture in northern Queensland. From the start of 2021, further partnership-based strategic CRCNA research investment will also be negotiated and progressed to support further development and implementation of these recommendations.

Table 5: Key solutions and pathways to impact

Key Solutions and Features	Key Players	Critical Implementation Pathways	Intended Impacts
<p>Set targets for and prioritise agricultural development in northern Queensland:</p> <ul style="list-style-type: none"> • A strong partnership involving the State, Commonwealth and local governments, key industries, the finance and investment sector, the research sector, Traditional Owners and the environment sector. • Needs to be based on clear role definitions and agreed principles for investing in significant infrastructure. • Needs to be based on at least a 30-year vision, be target-oriented, inclusive and with adaptive 5-year work plans. • Should be embedded within a higher level strategic intent and infrastructure prioritisation roadmap for broader development of Northern Australia. • Should also seek to enable strong economic integration between sectors, but particularly energy, tourism and advanced manufacturing. 	<p>Commonwealth Queensland Government</p> <p>Local Government</p> <p>Industry Peaks</p> <p>Traditional Owners</p> <p>Investors.</p> <p>Finance Sector</p> <p>Environment Sector</p>	<ul style="list-style-type: none"> • Form a strong northern Queensland <i>Agricultural Development Partnership</i> to develop a <i>Strategic Agricultural Development and Investment Framework</i>, including Commonwealth and State agencies, key industries, Indigenous and environmental interests, CRCNA and universities. • Improve the existence and integration of northern Queensland-wide water, soils, vegetation, biodiversity, cultural, economic, services, infrastructure and agronomic data sets, prioritisation and decision support tools through NESP and other means. • Identify and prioritise key regions and more targeted agricultural development areas to enable integrated, place-based agricultural development planning and delivery. Support more effective trade-off analysis and establish a clear social licence for agricultural development at region or catchment scales. • Encourage the emergence of a <i>Northern Queensland</i> (or potentially even a Northern Australian) <i>Irrigators Forum</i> to progressively identify those irrigation sector players that may see themselves as potential investors embedded in the future of the north, and to encourage a strong culture of responsible and sustainable approaches to water use and investment. • In the context of the current review of the <i>Whitepaper on Developing Northern Australia</i> and the <i>EPBC Review</i>, the Queensland and Commonwealth Governments (and potentially the WA and NT Governments) could bilaterally negotiate a <i>Northern Australian Package</i> of actions and incentives aimed at increasing the 	<ul style="list-style-type: none"> • Triple the value of agricultural production across northern Queensland over a 30-year period. • Maintain and, where possible, improve environmental values across northern Queensland through high quality development approval/management. • Increase the economic viability of at least 10 significant northern Queensland sub-regions. • A significant lift in Indigenous-led agricultural development and employment in northern Queensland.



		<p>development assessment capacities of the State and landholders within agreed standards.</p> <ul style="list-style-type: none"> • Through the current refresh of the <i>Whitepaper on Developing Northern Australia</i>, establish a second tranche of the northern component of the <i>National Water Infrastructure Development Fund</i>. • The Commonwealth could widen the mandate of the <i>Northern Queensland Water Development Authority</i> or the <i>Water Grid Authority</i> to work cooperatively with the Queensland Government on facilitating a prioritised 30-year program of strategic agricultural development works. • As an outcome for the current refresh of the Northern Australian agenda, the Commonwealth could establish a <i>Northern Australian Supply Chain Development Fund</i> to further progress Stages 2 and 3 of the supply and value chain development process, either within regions, across regions, and within and across sectors. 	
<p>Develop, implement and continuously improve new collaborative planning models in priority agricultural development areas:</p> <ul style="list-style-type: none"> • Progressed and trialled in priority agricultural development areas. • Established at scales that make sense from a production system, catchment, social and ecological standpoint. • Involves three levels of government, key industry sectors, environmental and Indigenous interests and universities. • Third party facilitated and jointly monitored and evaluated. 	<p>Commonwealth Queensland Government Local Government Industry Peaks Investors Traditional Owners Finance Sector Environment Sector Research Sector</p>	<ul style="list-style-type: none"> • In priority agricultural development areas, establish and trail new <i>Agricultural Development Planning</i> models to agree the most effective production system model and development targets, to resolve identified water, biodiversity, cultural and tenure conflicts, and to progress the required infrastructure. • Improve the existence and integration of northern area-specific water, soils, vegetation, biodiversity, cultural, economic, services, infrastructure and agronomic data sets, prioritisation and decision support tools through NESP and other means. • Through the current review of the <i>Whitepaper on Developing Northern Australia</i>, Commonwealth to establish a purpose-built <i>Supply Chain Development Fund</i> for northern Australia. 	<ul style="list-style-type: none"> • A 25% reduced lodgement of applications that fundamentally do not meet regulatory obligations. • Reduced administrative costs and timelines for government in proposal assessment. • A 100% increase in the value of agricultural development over 30 years.



<p>Improved assessment and approval approaches and targeted regulatory improvements:</p> <ul style="list-style-type: none"> • Involves three levels of government, key industry sectors, environmental and Indigenous interests and universities. • Where possible, third party facilitated and jointly monitored and evaluated. 	<p>Commonwealth Queensland Government Local Government Industry Peaks Investors Traditional Owners Finance Sector Environ Sector Research Sector</p>	<ul style="list-style-type: none"> • Declare significant infrastructure and agricultural development projects in priority agricultural development areas as coordinated projects. • Embed a Deputy Coordinator General in northern Queensland to oversee/broker coordinated agricultural projects. • Establish a professional and development-focussed institution to ensure appropriate governance and asset management risks are assessed, coordinated and managed for new water development infrastructure based on similar principles to Tasmania's <i>Pipeline to Prosperity Program</i>. • Establish a strong team of <i>Development Account Managers</i> in DAF to provide third-party facilitation support for significant property-based agricultural development proposals. • Government, industry and the research sector to co-design a practical set of acceptable solutions that can be applied to new agriculture and aquaculture development in GBR catchments. • Establish a social impact assessment referral and advisory capacity in association with those parts of the Department of Agriculture, Water and the Environment responsible for administering the <i>EPBC</i> assessment process. • Commonwealth Government to implement key recommendations arising from the EPBC review. • Partner universities, CSIRO and the CRCNA to establish a program of journey maps and practices-based research and improvement for development assessment processes for agricultural development. 	<ul style="list-style-type: none"> • A 50% reduced transaction cost for development proponents in progressing from concept to development approval. • Reduced administrative costs and timelines for government in proposal assessment. • A 50% reduction in the risk of non-use or under-use of water provided by State, Commonwealth and private sector investment. • A 150% increase in agricultural development over 30 years.
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<p>Lifting the investment readiness of landholders and investors and the capacity of planning service providers:</p> <ul style="list-style-type: none"> • Needs to focus on lifting capacity through landholders, and indirectly through the consultancy sector. • Range of tools needs to be assessed, trialled and refined, including training, mentoring, grants and feasibility studies. • Effort also needs to be strongly integrated with the finance sector. • Should involve the development of practical cases that demonstrate pathways to achieve agricultural production whilst ensuring regulatory compliance. • Efforts should build on the DAF <i>Growing for Queensland</i> Strategy. 	<p>Commonwealth Queensland Government Local Government Producers Finance Sector Traditional Owners</p>	<ul style="list-style-type: none"> • Apply the above-mentioned team of trained <i>Development Account Managers</i> in DAF to provide third-party facilitation support for significant property-based agricultural development proposals. • Provide well-targeted training and mentoring, the development of process-journey mapping tools, and grants programs aimed at supporting landholders to establish strong development business cases and assessment proposals. • Build on the proposed Indigenous Reference Group model for Regional Business Hubs to support traditional owner-led and other development proposals. • Improve the existence and landholder accessibility of water, soils, vegetation, biodiversity, cultural, economic, services, infrastructure and agronomic data sets, research and decision support tools through NESP, CRCNA Investor Data Tool, and other means. • Consistent with the findings of the recent NAIF review, the Commonwealth could support additional integrated effort within and across the operations of funding and finance institutions (i.e. RDAs, CEFC, the RIC, and NAIF) and relevant State agencies to respond collaboratively and in an integrated way with emerging supply chain development processes and feasibility. 	<ul style="list-style-type: none"> • A 25% reduced lodgement of applications that do not meet regulatory obligations. • Reduced administrative costs and timelines for government in proposal assessment. • A 50% increase in agricultural development over 30 years.
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Appendix 1: Terms of Reference Agreed With Queensland Government



CRCNA Project: De-risking Priority Opportunities for Agricultural Investment in North Queensland: Scope for Research Services

Project Name:

Prioritising, de-risking and brokering agricultural development in Queensland

Project Start Date: January 2020

Project End Date: June 2020

Background and Project Overview:

This CRCNA-led, Queensland-focussed project is part of a wider collaboration between the CRCNA and the Northern Territory, Queensland and Western Australian Governments to support the development of new agricultural activity (both in new and existing agricultural areas) across northern Australia.

The CRCNA plays an important role in ensuring northern Australia remains competitive, productive and sustainable through agricultural research and development. Along with the NT, Qld and WA Governments, the CRCNA is committed to realising the vision of the Australian Government's *Our North, Our Future: Whitepaper on Developing Northern Australia*. There is a strong bilateral and bipartisan aspiration in the *Whitepaper* to secure the expansion of agricultural development but challenges exist. Solutions to key policy, regulatory, budgetary and regional development challenges at the Commonwealth, State/Territory level need consideration, analysis, solution building and resolution. Given the existence of significant public and private investment interest in agriculture in northern Australia, but limited progression towards on ground activity, it is important that the CRCNA work closely with the jurisdictions to research improved approaches to facilitating agricultural development.

In this context, *agricultural development* is a general term related to a variety of agricultural or aquaculture expansion practices which create entirely new production systems, and/or increase the value of current production systems. Examples include the development of new irrigated and dryland cropping systems, horticulture, the emergence of new agricultural services and the intensification of cattle production. Such development might include public or private investment and utilise a range of assessment and approval processes. In all cases, agricultural development in northern Australia needs to occur in an economic, socially and environmentally beneficial way.

Through recent and detailed workshops in each of the three jurisdictions (NT, Qld and WA), a set of priorities has emerged to jointly explore collaborative research approaches to supporting:

1. The review of approaches to prioritising development opportunities (inclusive of both new and existing agricultural areas) to help determine a preferred priority agricultural development opportunity for further research support;
2. Within this priority agricultural development opportunity, a detailed case study approach will identify key risks associated with attracting investment, including data limitations, regulatory challenges, social capacity and infrastructure limitations. The case study will document a pathway to development through exploring improved approaches to the way these risks are managed. This will involve the deep engagement of key stakeholders to identify issues and solutions; and
3. The exploration and development of new, innovative and appropriate models for coordinated brokerage of investment in agricultural development.

By focusing strategic effort on exploring issues constraining development in a priority agricultural development opportunity in Queensland, this project will closely engage the Queensland Government, the Commonwealth and other stakeholders. Through the project, the CRCNA will explore the key issues at hand and explore innovative and Queensland-specific policy, regulatory and other solutions to facilitate agricultural development. Doing so must also achieve environmental and social outcomes which help maintain northern Australia's market advantage.

This CRCNA-led project is part of a series of targeted research projects commissioned by the CRCNA seeking to de-risk the agricultural investment process in the north. Similar efforts are being undertaken in Western Australia and the NT, and the lessons emerging will be shared across the jurisdictions via the NASONG Network. Another related project that is currently progressing aims to support Austrade to prioritise potential approaches in identifying, attracting and supporting key investors with agricultural development interests in northern Australia. This second piece of work is anticipated to be completed in early 2020 and will occur concurrently with this project.

The CRCNA will lead and deliver the project, with close engagement/consultation with Government and other stakeholders to inform the research. Any future initiatives arising from the research would be subject to Queensland Government agreement/approval.

Description of Research Required:

The project will require strong engagement with key agencies from the Queensland Government and relevant stakeholders. To achieve this, the CRCNA will coordinate this engagement through Wayne Hall, Executive Director, Agri-Science Queensland (DAF). Within this context, the NQ Ag Projects State Agency Committee will also be engaged during the course of the project.

The research will involve four key components:

- 1) *Briefly reviewing existing approaches to prioritising agricultural development; and identifying any opportunity for further analysis regarding de-risking for investment.*
 - a. Briefly review and assess northern Australia's competitive advantage in agriculture and current trends related to this competitive advantage;
 - b. Concisely review and synthesise existing information and approaches about potential agricultural development opportunities across Queensland;
 - c. Drawing on a wider expertise set, engage with the Queensland Government in refining an appropriate list of significant priority agriculture development opportunities; and
 - d. Identify the criteria for selection and prioritise an appropriate case study for further exploration of the de-risking of agricultural development effort.
- 2) *Scoping improved processes and approaches for de-risking investment in a priority agricultural development case study.*
 - a. Using the priority key case study opportunity selected, characterise and analyse the current processes for identifying and resolving: key land, water, Aboriginal, tenure, workforce, service support, supply chain and infrastructure risks; processes for determining the most appropriate



agricultural development model/s; and other processes for progressing business case development, project assessment and development approval. The risk of infrastructure being built where no investor demand exists also needs to be considered as a risk to be managed;

- b. Present these learnings to key agencies and stakeholders and support the co-design of more streamlined approaches to progressing new investment in the case study; and
- c. Develop/co-design and cost a common program (or pathway) of active de-risking processes required to successfully progress the case study development opportunity to investment/development stages (and defining key roles and responsibilities).

3) *Exploring and developing innovative models for brokering new agricultural investment.*

- a. Characterise (with stakeholder input) and analyse the current processes used to broker the progression of significant agricultural development opportunities and investment;
- b. Using defined experiences from within and beyond Queensland (and beyond the agricultural sector), characterise and analyse current known innovative processes and approaches for brokering the progression of significant new development investment; and
- c. Present core findings to key agencies and stakeholders and engage to co-design and propose more streamlined, innovative and new approaches to brokering/securing new investment in agriculture in both greenfield and brownfield contexts.

4) *Towards a joined up or shared approach across northern Australia*

Working closely with NASONG partners, contribute towards:

- a. The Commonwealth and all three jurisdictions exploring and refining an agreed set of common principles and processes to effectively lead and facilitate agricultural development prioritisation, progression, approval and investment brokerage; and
- b. The exploration of shared solutions to the key priority opportunities and challenges, including preliminary costings and staging for next step policy, research and budgetary investments needed to secure improved development pathways to progress investment in northern agriculture.

By mid-2020, this project is intended to contribute to the CRCNA and NASONG framing of a clear *Stage II development pathways proposal* (with a 3-year implementation timeframe).



Appendix 2: Interview questions

1. Tell us a little bit about your role and experience in the business of facilitating agricultural or aquaculture development in northern Queensland?
2. Where do you think the top three priority places for agricultural and aquacultural development in northern Queensland are?
3. What factors are getting in the way of attracting new investment in agriculture and aquaculture in northern Queensland?
4. What factors are supporting new investment in agriculture and aquaculture in northern Queensland?
5. Have you got some detailed case experiences of agricultural or aquacultural development planning, assessment and approval you can share?
6. How might the system or process of de-risking or supporting agricultural and aquacultural investment be improved?
7. Are there any other key players we should contact or interview?



Appendix 3: Survey questions

De-risking agricultural investment in North Queensland (Industry and non-government survey)

* 1. What sectors of production, processing, distribution and/or marketing are you involved with?

- Agricultural processing
- Agricultural logistics (including transport)
- Aquaculture
- Broadacre cropping
- Biofuels
- Horticulture
- Forestry
- Niche products
- Livestock
- Environmental or social impact management
- Other (please specify)

* 2. What best describes your role in the sector?

- Business owner
- Consultant
- Employee, worker, contractor
- Industry development officer
- Industry supplier
- Labour provider
- Industry or sector advocacy
- Other (please specify)



* 3. The following issues have been identified as potential impediments to agricultural and aquacultural development in North Queensland. Please rate the significance of each based on your knowledge and understanding of the industry and sustainable development practice.

	Not an impediment	Minor impediment	Moderate impediment	Significant impediment	Extreme impediment
Strategic land use planning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Land tenure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Water allocation and licencing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vegetation management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biodiversity management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other environmental approvals (e.g. Queensland Nature Conservation Act)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Native Title and/or Indigenous Land Use Agreements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information on soil suitability and water availability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Agricultural research (including viable crop information)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Logistics and supply chain infrastructure - roads, rail, ports	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information and telecommunications infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Labour supply	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to markets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to finance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify)					



* 4. Have you had experience dealing with the following regulatory requirements? If so, can you rate your experience of the process? For example: time taken, provision of technical information, government agency staff support, etc.

	Very good experience	Good experience	Neither good nor poor experience	Poor experience	Very poor experience
Land tenure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pastoral diversification permits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Water planning and licencing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Native Title/Indigenous Land Use Agreement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Planning legislation decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cultural heritage clearance and approvals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Migration and work VISAs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EPBC or Queensland Nature Conservation Act approvals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quarantine and biosecurity permits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Commonwealth health and safety approvals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Occupational health and safety approvals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other regulatory processes (please explain below)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If you indicated poor or very poor experience for any item, please provide more details.



* 5. What could Local, State and Commonwealth Governments do to prioritise, de-risk and broker sustainable agriculture and aquaculture development?

	Governments MUST do this	Governments SHOULD do this	Governments COULD do this	Governments should STAY OUT of this	I am unsure of the role of Governments in this
Provide more information on soils and water availability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provide more research on viable crops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Have a can-do culture within and between Governments/departments that process permits and approvals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Support biosecurity risk management; crossborder biosecurity with other State governments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assist producers gain access to domestic and/or export markets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assist producers secure labour (e.g. through skilled migrant or local employment programs)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improve supply and value chain collaboration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Invest in improved public infrastructure - road, rail, ports	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Co-invest (with the private sector) in infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Invest in improved infrastructure - information and communications technology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Invest in improved infrastructure - processing facilities, factories	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Do you have any other comments/suggestions for Governments in facilitating sustainable agricultural and aquacultural development?



6. If Governments undertook what is suggested in question 5, what impact could it have on your business? e.g. increase employment (number of jobs), increase investment (\$ amount), increase value in agricultural output (quantify if possible)

7. Are there additional things Industry should do in facilitating sustainable agricultural and aquacultural development?

8. If you would like us to contact you to discuss your responses, please provide your email address below. Your email address will not be shared with anyone outside of the research team.

Email Address

Prev

Done

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See how easy it is to [create a survey](#).



Appendix 4: The location, scale and scope of existing water developments in northern Queensland

Queensland Water Plan Areas	Project	Storage	Agricultural value	Possible future allocations for agriculture
Cape York	Cape York draft water plan (2018) for surface and underground water. Catchments: Archer, Coleman, Ducie, Embley, Endeavour, Holroyd, Jacky Jacky, Jardine, Jeannie, Lockhart, Normanby, Olive–Pascoe, Stewart, Watson, Wenlock.	25,000ML strategic unallocated water available according to draft plan ²⁸ .	Water used for agriculture, mining, industry and town water ¹ .	25,000ML strategic unallocated reserves available in water plan area (more in Cape York Peninsula Heritage Area and General reserve types) ¹ .
Wet Tropics (Mossman)	Raw water from Rex Creek and Little Falls Creek in Mossman Catchment.	Douglas Shire Council holds water licences with annual entitlements of 4,800 ML/a and 630 ML/a to take raw water from Rex Creek and Little Falls Creek, respectively.	The agricultural sector holds water licences authorising the take of 3,274 ML/a of water from the Mossman Catchment area ²⁹ . Mackay Sugar Ltd holds approximately 60% of the volume licensed from the Mossman Catchment.	As at mid-2018, 3,000 ML/a of unallocated water was potentially available in the Mossman Catchment ² .
Mitchell	Area comprised of Mitchell, Lynd, Walsh (part), Alice and Palmer rivers and their tributaries ³⁰ .	Total licensed water in plan area is 540.5ML, representing 6.5% of available entitlement ³ .	10,000 ha produces fruit, nuts and vegetables, and 5000 ha is broadacre cropping, mostly sugarcane. Beef cattle enterprises account for 95% of land use ³¹ .	A total of 70,000 megalitres (ML) of unallocated water was reserved to meet future demands ³ .

²⁸ Queensland Government (2019). *Cape York Water Plan – Minister’s Considerations Report*. DNRME, Brisbane.

²⁹ Queensland Government & Douglas Shire (2018). *Mossman and Port Douglas regional water supply security assessment*. DNRME. Retrieved from: https://www.dnrme.qld.gov.au/_data/assets/pdf_file/0019/1412137/mossman-port-douglas-rwssa.pdf

³⁰ Queensland Government (2019). *Minister’s Performance Assessment Report - Water Plan (Mitchell) 2007*. DNRME, Brisbane.

³¹ Ash, Laing, MacLeod, Paini, Palmer, Poulton, Prestwidge, Stokes, Watson, Webster & Yeates (2018). *Agricultural viability: Mitchell catchment. A technical report from the CSIRO Northern Australia Water Resource Assessment*, part of the National Water Infrastructure



				See Nullinga Dam and Lakeland Irrigation Area studies. Also, possible expansion of cotton.
Barron	Mareeba Dimbulah Water Supply Scheme - <i>Tinaroo Falls Dam</i> - <i>Irrigation channel system</i>	Full supply volume is 438,920 ML ³² Barron Water Management Area also supplies 7,090 ML/a of unsupplemented water allocations to agriculture in Atherton region ³³ .	Area irrigated by the distribution system is about 17,000 hectares, sourced from Tinaroo Falls dam on the Barron River ³⁴ Sugar cane, bananas, mangoes avocados, papaya, lychees, citrus, coffee, tea trees and also a wide range of vegetable crops.	Unallocated water reserve is 4,300ML ⁸ . Unallocated reserves can partially facilitate further expansion and diversification of agriculture ³⁵ .
Gulf	Staaten, Gilbert, Norman, Flinders, Leichardt and Nicholson rivers, Settlement Creek and the Morning Inlet catchments ³⁶ .	Allocated water (Julius & Moondarra Dams) (2010-2017) included 75,150ML.	The major uses of water in the plan area are mines around Mount Isa, pockets of localised irrigated agriculture, tourism, commercial and recreational fishing. ⁹	Unallocated water reserves (2015) were 729,782ML. ⁹
Burdekin Basin	Burdekin Haughton Water Supply Scheme - <i>Burdekin Dam</i> - <i>Clare Weir</i> - <i>Giru Weir</i> - <i>Val Bird Weir</i>	Combined full supply volume 1,877,540ML ³⁷ <i>1,860,000ML</i> <i>15,900ML</i> <i>1,025ML</i> <i>615ML</i>	The scheme irrigates about 50,000 ha of farmland through 387 km of channels and pipelines and 366 km of drains ⁴ .	543,744ML is unallocated water in plan area ³⁸

Development Fund: Water Resource Assessments, CSIRO, Australia

³² SunWater (n.d.). *Water supply schemes*. Retrieved from: https://storagelevels.sunwater.com.au/win/reports/win_storages.htm

³³ Queensland Government & Tablelands Regional Council (2019) *Atherton regional water supply security assessment*. Retrieved from:

https://www.dnrme.qld.gov.au/_data/assets/pdf_file/0011/1466894/atherton-rwssa.pdf

³⁴ LMA Support Services Pty Ltd (n.d.). *Mareeba-Dimbulah distribution system*, Retrieved from: <https://lmairrigation.com.au/schemes/investigationschemes/mareeba-dimbulah/>

³⁵ Queensland Government (2019). *Minister's performance assessment report: Water plan (Baron)*. DNRME, Brisbane.

³⁶ Queensland Government (2018). *Gulf Water Plan – Minister's Performance Assessment Report*. DNRME, Brisbane.

³⁷ SunWater (n.d.). *Burdekin Haughton Water Supply Scheme*. Retrieved from <https://www.sunwater.com.au/schemes/burdekin-haughton/>

³⁸ Queensland Government (2018). *Minister's Performance Assessment Report – Water Plan (Burdekin Basin) – June 2019*, DNRME, Brisbane.



	<p>Bowen Broken Water Supply Scheme</p> <ul style="list-style-type: none"> - <i>Eungella Dam</i> - <i>Bowen River Weir</i> 	<p>Full supply volume</p> <p>113,419ML³⁹.</p> <p>112,476 ML</p> <p>943 ML</p>	<p>The scheme principally services coal mines in the Bowen Basin, as well as the urban water supply for Collinsville/Scottsville, Glendon and Moranbah.</p> <p>Water is also fed into the Bowen River, where it is used by landholders for irrigation and stock and domestic purposes⁵.</p>	
Whitsunday	<p>Proserpine River Water Supply Scheme</p> <ul style="list-style-type: none"> - <i>Peter Faust Dam</i> 	<p>Peter Faust Dam capacity of 491,000ML⁴⁰</p> <p>Ag-related allocations:</p> <ul style="list-style-type: none"> - Wilmar Sugar Australia Ltd holds 550 ML/a to supply the Proserpine Sugar Mill. - 40 876 ML/a of medium priority water allocations managed under the Proserpine River WSS, which are mostly used for agricultural purposes⁴¹. 	<p>The scheme supplies water for sugarcane irrigation and urban water to the townships of Bowen, Proserpine, Airlie Beach and Midge Point.</p>	<p>28,300ML unallocated reserves within plan area.</p>
Pioneer Valley	<p>Pioneer River Water Supply Scheme</p> <ul style="list-style-type: none"> - <i>Teemburra Dam</i> - <i>Dumbleton Weir</i> - <i>Marian Weir</i> - <i>Mirani Wer</i> 	<p>Total full supply volume</p> <p>160,379ML⁹</p> <p>147,556 ML</p> <p>6,108 ML</p> <p>3,985 ML</p> <p>2,730 ML</p>	<p>The Pioneer River Scheme provides a reliable supply of water for urban, industrial and agricultural users around Mackay and neighbouring districts⁴².</p>	<p>14,500ML unallocated reserves in plan area⁴⁴.</p>

³⁹ SunWater (n.d.). *Bowen Broken Rivers Water Supply Scheme*. Retrieved from: <https://www.sunwater.com.au/schemes/bowen-broken-rivers/#:~:text=Bowen%20Broken%20Rivers%20Water%20Supply%20Scheme,in%20the%20Bowen%20Basin%20coalfields>.

⁴⁰ QCA (n.d.). *Proserpine River*, Retrieved from <https://www.qca.org.au/project/rural-water/sunwater-irrigation-prices/sunwater-supply-schemes/proserpine-river/>

⁴¹ Queensland Government (2016). *Whitsunday regional water supply security assessment*, Department of Energy and Water Supply. Retrieved from: https://www.dnrme.qld.gov.au/_data/assets/pdf_file/0004/393961/whitsunday-rwssa.pdf

⁴² SunWater (n.d.) *Pioneer River Water Supply Scheme*, Retrieved from: <https://www.sunwater.com.au/schemes/pioneer-river/>

⁴⁴ Queensland Government (2019). *Minister's Performance Assessment Report – Water Plan (Pioneer Valley) – May 2019*, DNRME, Brisbane.



			47,357 ML/a of high-class B allocations mostly used to supply agricultural and irrigation demands ⁴³ .	
	Eton Water Supply Scheme - <i>Kinchant Dam</i>	Full supply volume 72,235ML ⁹	Irrigation water primarily for sugar cane.	
Fitzroy Basin	Fitzroy Barrage Water Supply Scheme	Entitlements of 62,000ML (2013-2018) at about 40% uptake ⁴⁵	Mining, agriculture, etc. industry and urban supplies are supported by the plan. ¹⁶ Irrigation water for cotton, citrus, grapes, wheat, pulse crops, sorghum, maize, lucerne, oats, barley and sunflowers.	Some 222,400ML of water is reserved and in plan area. ⁴⁵
	Lower Fitzroy Water Supply Scheme - <i>Eden Bann Weir</i>	Full supply volume 35,983ML ⁴⁶		
	Dawson Valley Water Supply Scheme - <i>Glebe Weir</i> - <i>Gyranda Weir</i> - <i>Moura Weir</i> - <i>Moura Offstream Storage</i> - <i>Neville Hewitt Weir</i> - <i>Theodore Weir</i>	Total full supply volume 60,956ML ⁴⁶ <i>17,706 ML</i> <i>16,499 ML</i> <i>7,700 ML</i> <i>3,645 ML</i> <i>10,646 ML</i> <i>4,760 ML</i>		
	Nogoa Mackenzie Water Supply Scheme - <i>Fairbairn Dam</i> - <i>Bedord Weir</i> - <i>Bingegang Weir</i> - <i>Tartus Weir</i>	Total full supply volume 1,339,162ML ⁴⁶ <i>1,301,129ML</i> <i>17,973 ML</i> <i>8,060 ML</i> <i>12,000 ML</i>		

⁴³ Queensland Government (2017). *Mackay regional water supply security assessment*, Department of Energy and Water Supply, Retrieved from: https://www.dnrme.qld.gov.au/_data/assets/pdf_file/0003/1265196/mackay-rwssa.pdf

⁴⁵ Queensland Government (2018). *Minister's Performance Assessment Report – Water Plan (Fitzroy Basin) December 2018*, DNRME, Brisbane.

⁴⁶ SunWater (n.d.). *Water supply schemes*. Retrieved from: https://storagelevels.sunwater.com.au/win/reports/win_storages.htm



	Callide Valley Water Supply Scheme - Callide Dam - Kroomit Dam	Total full supply volume of 150,970ML. ⁴⁶ 136,370 ML 14,600 ML		
Boyne River Basin	Awoonga Water Supply Scheme (Awoonga Dam)	Full supply volume 777,000ML ⁴⁷ .		21,643ML unallocated reserve in water plan area ⁴⁸
Cooper Creek	Surface and underground water (Great Artesian Basin) ⁴⁹	Annual flows in Cooper Creek (at Nappa Merrie) range from zero (0) to a maximum recorded of 13,451,399 ML in 1974, with a median flow of 365,000 ML per year. There is no declared metered entitlement area and no requirement for metering in the plan area ⁴⁹ .	Water is predominantly used for town water supply and grazing, with limited irrigated agriculture ⁴⁹ .	2,189ML unallocated reserve in water plan area ⁴⁹ . Longreach Regional Council are looking at options for future water security, including potential raising of the weir (details TBA).
Georgina & Diamantina	Surface and underground water (Lake Eyre Basin and Great Artesian Basin) ⁵⁰	Annual median flows at Diamantina River at Diamantina Lakes is 900,000ML. There are no metered entitlements in the plan area.	Water is predominately used for grazing and town water supply. Stock routes in the catchment are serviced by water bores. There is very little irrigated agriculture within the plan area.	13,500ML of reserve water in the plan area.

⁴⁷ Queensland Government (2015). *Awoonga Water Supply Scheme Resource Operations Licence*. Retrieved from: https://www.dnrme.qld.gov.au/_data/assets/pdf_file/0011/249698/awoonga-rol.pdf

⁴⁸ Queensland Government (2019). *Minister's performance assessment report - Water plan (Boyne River Basin) 2013*. DNRME, Brisbane.

⁴⁹ Queensland Government (2019). *Minister's performance assessment report - Water plan (Cooper Creek) 2011*. DNRME, Brisbane.

⁵⁰ Queensland Government (2019). *Minister's performance assessment report - Water plan (Georgina and Diamantina) 2004*. DNRME, Brisbane.