The North Agriculture & The Environment

GAP Taskforce Report

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A Vision for Australia

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Cover photo credits: Ord River irrigated agriculture, CSIRO

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Abstract

This paper discusses regional economic opportunities and environmental implications of agricultural development in northern Australia and outlines a set of metrics to guide private sector investment decisions.

Disclaimer

This document summarises the deliberations of the GAP Taskforce on the North, Agriculture and the Environment - a cross-jurisdictional and multidisciplinary group of stakeholders brought together in 2014 by public policy and implementation institute Global Access Partners.

The report represents the diverse range of views and interests of the individuals and organisations involved. Given the different perspectives of Taskforce members, it should not be assumed that every member would agree with every argument or recommendation in full.

The report has been prepared in good faith on the basis of information available at the time of writing and sources believed to be reliable. However, it should not be used as a substitute for independent professional advice and further consultation with industry experts. Evaluation of the material is the sole responsibility of the reader.

Abbreviations and Acronyms

ABS	Australian Bureau of Statistics
ADF	Australian Defence Force
BSE	Bovine spongiform encephalopathy
CEO	Chief Executive Officer
COAG	Council of Australian Governments
CRC	Cooperative Research Centre
CSG	Coal seam gas
GDP	Gross Domestic Product
IAG	Insurance Australia Group
LGAs	Local Government Areas
NLC	Northern Land Council
NT	Northern Territory
NWI	National Water Initiative
R&D	Research and development
RAI	Regional Australia Institute

Contents

Introduction

The GAP Taskforce on the North, Agriculture and the Environment

In 2014, public policy and implementation institute Global Access Partners assembled a multidisciplinary group of experts and stakeholders to discuss the economic opportunities and environmental implications of agricultural and associated development in northern Australia. The establishment of the GAP Taskforce on the North, Agriculture and the Environment was recommended by the *National Economic Review*: Global Access Partners' 4th Annual Growth Summit in September 2013[1].

This 'Second Track' process[2] was supported by the Department of the Environment and the Department of Agriculture, National Australia Bank, Insurance Australia Group and Deloitte. It was chaired by Ms Gulshan Singh, Manager, Policy and Industry Affairs at Insurance Australia Group, and its proceedings were recorded under the Chatham House rule of non-attribution. The group's inaugural meeting took place on 19 May 2014, with further meetings held on 6 August, 1 October, 19 November, 3 March and 16 July 2015.

The Taskforce examined a wide range of issues to identify investment risks and development opportunities. It assessed the region in its national and international context, comparing locales in the north to others elsewhere in the country, and produced a draft 'investment scorecard' which could be developed to guide prospective investors to suitable areas for activity.

This report is based on those discussions and background material offered by members to inform the debate. In common with other 'Second Track' activities, the Taskforce sought concrete outcomes and commercial opportunities. It did not lobby on behalf of any particular interest, but canvassed a range of opinions in pursuit of a holistic approach. Economic and social benefits will flow from selecting the most promising areas and projects for investment, and 'first mover advantage' should be sought in areas of highest gain and lowest risk. The Taskforce noted the history and barriers to widespread agricultural development and the potential for other sectors in the region to maximise economic and social benefit for all.

The Taskforce response to the White Paper on Developing Northern Australia[3]

The Taskforce welcomed the release of *Our North, Our Future*, the Australian Government's White Paper on developing the north, and underlined its alignments with their own findings and recommendations.

Members accepted the broad thrust of Commonwealth proposals to improve access to the north's natural resources, encourage interest from private investors by reducing regulatory barriers and improve the region's transport infrastructure. They backed government efforts to reduce barriers to employment and improve governance, but also flagged several areas where greater caution or a different approach may be required.

Concessional Loan Initiative

The White Paper outlines plans to offer up to $5 billion in concessional loans to private investors to encourage public-private infrastructure partnerships. However, the inescapable fact that these initiatives would not be economically viable on normal credit terms and the risks posed by their remoteness and reliance on planned, rather than actual, economic growth could leave a future administration with an enormous legacy of bad debt. Investments on such a scale might make sense for mining or gas exploration, but may not be justified by agricultural development in the Northern Territory.

The Taskforce therefore urged the proposed Centre for Cooperative Research (CRC) for Developing Northern Australia to consider the region in its national context and ensure that any development offers net benefit to the country as a whole. Given the scale and risks of public investment, the government should adopt a balanced, holistic approach and ensure that efforts to unlock value in the north do not disadvantage the rest of Australia.

The longstanding failure of Australia's massive superfunds to invest even a small proportion of the funds they manage in northern Australia speaks to the high risks and disputed potential of such schemes, as well as a wider failure for the nation to use its substantial resources to invest in its future.

Insurance Risk

While acknowledging the issue of extreme weather events in the north, the White Paper does not acknowledge the risk which natural perils may pose to development, or the increasing likelihood of extreme weather events due to climate change. Insurance companies, by contrast, are all too aware of the risks which development projects may face in the region and may insist on premiums which render such projects uneconomic. The problem of higher insurance risks and premiums in the north is only referenced in the context of higher business and household living costs in the region, but in reality they could tip the balance against schemes whose original benefit to cost advantage was marginal at least. The Government has contemplated a substantial increase in the region's population, as part of national population growth to perhaps 45 million people by 2060, but the White Paper's failure to properly consider the risk of natural perils, the need for better building codes, sustainable land use planning and threat mitigation could see a repeat of many of the poor planning decisions of the past.

Indigenous Engagement

The Taskforce noted the cautious response from Northern Land Council CEO Joe Morrison to the White Paper's call for more township leases in the Northern Territory. This muted reception was repeated by many Indigenous organisations in the north, and the concerns expressed should be taken into account by policy makers, given the White Paper's acceptance of the need to consult Indigenous people and take their positions into account.

Mr Morrison accepted that the Government's proposals to allow more flexibility in township head leases in the Northern Territory were not an assault on the 'basic integrity' of the Aboriginal Land Rights Act, for example, but the NLC remains opposed to the Government's model of vesting township leases with a Commonwealth officer. The NLC backs the White Paper's suggestion that head leases could also be held by a community entity, representing the traditional owners.

Mr Morrison welcomed the promise of government funds to complete the assessment of Native Title claims and support local Native Title corporations, but warned that the White Paper's proposal to 'simplify' Native Title processes should not be a guise for reducing communal decision-making and the rights of Native Title holders.

The Taskforce welcomes the NLC's broad support for economic development in the north and the need to work with investors and developers, but underlines that Indigenous land owners must engaged before, during and after development as their engagement is critical to the success of any systematic development of northern Australia.

Research Database

While the Taskforce included members with a wide range of different perspectives and interests, they all agreed on the need for nationally consistent and accurate data to facilitate rational debate and allow the utility of investment outcomes to be compared across the country as a whole. The group warns against development proposals which are based on wishful thinking, rather than rigorous scientific analysis and economic cost/benefit analysis, given the expense of the projects and the likelihood that the public purse would be left to cover the cost of failures.

A national database, covering issues of water, weather, natural perils and other relevant factors, should be considered as result. The Commonwealth's existing Nationalmap.gov.au portal could offer a base for an expanded, independent and accessible service to ensure the public and political debate rests on a firm factual foundation. The aggregation of existing and future agricultural case studies into a single database could also inform more rational regional policy and prevent single case studies dependent on local factors being used to justify regional or national policies with disastrous results.

The Taskforce urges the tempering of enthusiasm for northern development with a rational appreciation of the risks and trade-offs involved. If exploiting the region's soil and water resources was as practical and lucrative as some proponents assert, then development would already have occurred and private interests would not rely on government enablement and massive public subsidy. The Taskforce therefore favoured the creation of a permanent, independent body to monitor the effects of development and present their results to government.

Water

While the White Paper recommends the creation of a National Water Infrastructure Development Fund, and allocates $200 million for investment in northern water supplies, the Taskforce believes its commitment to establishing tradeable water rights is far more significant. Dams are highly expensive solutions in much more accessible terrain, with $350 million needed for the Cotter dam in Canberra alone, while creating water rights changes the investment calculation for investors. Rather than concentrate on expensive and environmentally problematic irrigated agriculture schemes, the creation of extra watering points on cattle properties to enable planned rotational grazing could increase the cattle herd while reducing its impact on the landscape.

Soil Improvement and Carbon Sequestration

The need to improve, rather than merely exploit, northern soils is conspicuous from its absence in the White Paper, as are considerations of the risks of climate change. The Taskforce has stressed the potential of relatively inexpensive reforms in farming practices which could improve output while improving soils and sequestering large amounts of carbon. Trials on million hectare grazing properties in the Northern Territory and Queensland have proved their effectiveness, and research for *Soils for Life* suggests that rotational grazing and Indigenous back burning could sequester 170 million tons of carbon per annum within the next decade. Soil carbon should be taken into account in the setting of national emission targets, and sequestration could contribute up to a fifth of the net emission reductions required over the next decade.

Executive Summary & Recommendations

A Balanced Approach

The current government sees northern development as both practical and desirable, and proponents note the region is already growing at twice the national average[4]. Mining generates over $9 billion[5] and beef production $1 billion[6] every year, while the tourism sector is growing.

The Taskforce supports the argument outlined in the *Our North, Our Future* White Paper released in June 2015 that targeted and environmentally responsible investment in agriculture could generate additional income, serve new Asian markets and benefit local communities, as well as investors, farmers and entrepreneurs. The White Paper's proposals to unlock the region's natural resources, encourage private sector investment, invest in transport and other infrastructure, reduce employment barriers and improve regional governance are sound.

However, the Taskforce urges caution over the environmental impact of some development options and warns that such investments are heavily dependent on continued government commitment and public infrastructure investment. The opportunity cost of such spending must be assessed in its federal context, and the Australian Government's ambition to develop the north must embrace all stakeholders to build consensus on common goals and strategies, if real and meaningful progress is to be achieved.

RECOMMENDATION 1. The Government should adopt a holistic, balanced and national approach to northern development. It must ensure the long-term sustainability of the region and secure agreement from all stakeholders on common goals and strategies. Investment decisions should be guided by the latest scientific evidence to unlock the region's value without destroying it. Northern development should benefit the entire nation, given the national investment in its growth.

1.1. Constructive partnerships between all tiers of government, commercial interests and local communities are required to identify, coordinate and complete mutually beneficial and sustainable development in the region.

1.2. A scientifically researched and sustainable balance must be struck between commercial exploitation, ecological health and public benefit. The interests of the nation, local communities and investors will not be served if ecosystems are exploited and public and private funds squandered on schemes with poor long-term prospects of success.

1.3. Income can be generated from a number of sources, including fishing, tourism and mining, as well as agriculture. A diversified economic base will optimise resource use, maximise market opportunities and offer greater long-term security. The impacts of increasing agricultural production on the sensitive landscapes and natural water flows, which tourism and fishing depend upon, should therefore be factored into planning considerations.

1.4. Short-term government subsidies and support will not lead to long-term economic development outcomes.

Tenure & Native Titles

Engagement with Indigenous title owners will be critical to the success of any systematic development of northern Australia. 40% of the Northern Territory is owned by Indigenous interests or is under Native Title, while a third of its population, and potential workforce, are Indigenous. Indigenous representatives and communities increasingly support economic development if they are engaged throughout the process and receive a share of its rewards.

The Taskforce backs the White Paper's recommendation that COAG work to resolve all existing Native Title claims within ten years, the spending of $20.4 million to support effective engagement between Native Title stakeholders and potential investors and the earmarking of $17 million to improve land administration in the Northern Territory.

RECOMMENDATION 2. Engagement with Indigenous people in northern development should be pursued through the planning, implementation and delivery of both overall strategies and individual projects to achieve shared and mutually beneficial development goals.

2.1. Streamlining tenures and regulations to reduce complexity and improve resource planning should be pursued where appropriate.

2.2. Any changes should safeguard the rights of all stakeholders, including local communities and Indigenous land holders, as well as commercial interests and the nation as a whole. Native Title holders can encourage, rather than impede, development if properly consulted and engaged in the planning process and guaranteed a share of future economic benefits.

2.3. Sensible pricing policies and an open discussion of the responsibilities of small groups that choose to live in separated communities need to be put at the top of any developmental plan.

2.4. The views of all Indigenous parties must be included in decision making from the outset since they usually have title to the land. Efforts to 'streamline' the Native Title process outlined in *'Our North, Our Future'* should not be used to bypass or sideline Indigenous interests.

The Beef Industry

The beef industry dominates northern agriculture and, whatever the potential and extent of future irrigation development, improvements in beef yields should form a major part of any northern expansion. Water is as central to beef production as it is to irrigated agriculture, and diverting more water for use on beef farms will require a detailed assessment of local and regional water resources, as well as new technologies and investments to make best use of it. Cattle farming occupies 95% of the north's agricultural land and produces 4% of Australia's carbon dioxide equivalent (CO2-e) emissions[7], but most pastoral leases specifically prohibit practices such as re-vegetation and tree cropping which could sequester carbon effectively.

RECOMMENDATION 3. Improvements in beef yields could form a major part of any northern expansion. The adoption of planned rotational grazing would offer the most effective way to increase output, restore the landscape and soil to health and safeguard the beef industry's future.

3.1. Planned rotational grazing facilitated by an extended grid of watering holes in the region's dominant beef industry would increase yields, reduce stress on the soil, sequester carbon and allow denuded landscapes to recover, if widely and properly applied. Improved production, carbon and land outcomes could generate up to a $1 billion a year in agricultural, employment and environmental gains[8].

3.2. Pastoral leases must be reformed to encourage carbon sequestering practices, such as tree cropping and re-vegetation.

3.3. Wind, solar and locally produced biofuels should power 'clean green' cattle production, and methods for reducing net methane emissions through tree planting and pasture management should be encouraged.

3.4. More cattle should be produced on Indigenous-owned stations and more Indigenous Australians engaged in station management.

3.5. Mosaic irrigation could be encouraged to grow fodder or diversified produce where practical.

Irrigated Horticulture

The North has just 2.5% of the nation's current irrigated farmland[9]. Extending the area under cultivation and irrigation will help Australia meet growing regional demand for premium and value-added food products and benefit local communities. However, such developments must be assessed for their impact on natural ecosystems and other productive sectors, and minimise damage to the land to ensure long-term commercial and ecological viability.

RECOMMENDATION 4. Proposals for extended irrigation schemes in the north should be assessed in the light of the physical characteristics of specific catchment areas as these have a crucial impact on the economic viability and ecological sustainability of such projects. [10]

4.1. The region's commodity-based production should form a base for the pursuit of premium, specialised and value-added produce to target niche markets at home and abroad.

4.2. Consideration of agricultural developments and the public infrastructure required to support them should include the ecological and opportunity costs of doing so, and their effect on other sectors in the north and investment elsewhere in the country.

4.3. New agricultural developments should minimise their risk of erosion, weed infestations and feral animal invasions.

Sustainability

The flood plains near river systems favoured for agricultural development are also rich in biodiversity. Pressure on native flora and fauna will inevitably be exacerbated by habitat reduction or degradation caused by expanded irrigation schemes. Long-term agricultural productivity, and growth in other sectors marked for development such as tourism, are depended on healthy ecosystems. Development plans therefore must protect water flows and soils, maintain biodiversity and control carbon emissions. The cultural knowledge of the traditional owners of the land regarding weather, farming and water should contribute to scientific research and conservation practices to produce better outcomes.

Feral animals, such as wild cats, pigs, camels, toads, fire ants and foxes, are spreading north and create serious environmental problems. The loss of millions of quolls to feral predators reduces the nutritional value of the soils, and a national assessment of the damage they cause should be undertaken.

RECOMMENDATION 5. Development plans in the north should protect water flows and soils, maintain biodiversity and limit carbon emissions as well as pursuing economic goals and increased agricultural output.

5.1. The environmental impacts on relatively pristine water resources and frail and arid northern soils of major development schemes should be properly assessed, and agricultural practices should protect the land's resilience.

5.2. Serious environmental problems have been caused by unsuitable and unsustainable agricultural development elsewhere in the country, to the detriment of long-term agricultural productivity, and the same mistakes should not be repeated.

5.3. Engaging Indigenous people in landscape and fire management through carbon credit schemes will conserve native flora and fauna and reduce the uncontrolled savannah fires which account for up to 3% of Australia's yearly greenhouse emissions.[11]

5.4. The environmental damage caused by feral animals in the northern Australia must monitored and addressed with greater vigour.

5.5. An extension of agricultural development should be accompanied by an expansion of the area protected in national parks and developed for tourism and other non-damaging but high-value activities.

Water

The North receives over 60% of Australia's rain[12], nourishing natural ecosystems and the region's tourism and fishing industries, as well as its agriculture. Less than 6% of the region's water is exploited for commercial and human purposes[13], but if this figure is increased, care must be taken to protect the interests of all stakeholders and the region's rich, but fragile, environment. For many years, the Northern Territory has lagged behind the rest of Australia on water management issues, and its water plans need to be further developed with input from a broad range of interests and disciplines. Reliance on subsidised or unsustainable water resources has led to long-term agricultural and ecological decline elsewhere in Australia, and such mistakes should not be repeated.

RECOMMENDATION 6. The allocation of water to different interests must be planned and regulated in compliance with the principles of the National Water Initiative (NWI) to ensure it remains available on sustainable ecological and commercial terms.

6.1. Methods to assess the size and sustainability of water resources and the effects of agricultural use on other interests should be improved and monitoring of their effects continued.

6.2. Groundwater extraction should proceed with caution, given its profound effect on the environment and other uses.

6.3. Water plans require input from a wide range of interests and disciplines and should be integrated with land use plans.

6.4. Water plans should include easy-to-measure performance indicators to encourage public understanding and accountability.

6.5. Water plans must be properly enforced and subject to regular reassessment and adaptation if required by new evidence or social, economic or environmental change.

6.6. The use of drip irrigation and other modern techniques to minimise waste and evaporation of water should be preferred to more wasteful and environmentally damaging methods wherever possible.

Soil

The soils of northern Australia tend to be thin, poor in nutrients and prone to erosion in heavy tropical rains if disturbed. Such soils have a limited water holding capacity and often form a surface crust which inhibits rain absorption and increases evaporation to the atmosphere. The most fertile regions, nourished by sediments in monsoonal flood plains, can be vulnerable to irrigation salination, while cattle grazing areas can suffer erosion through overuse. A lack of local data can hamper calculations of potential agricultural productivity and ecological reliance, and more research is required to identify suitable sites for cultivation.

RECOMMENDATION 7. The characteristics of the soils in northern Australia must be researched and understood before development is undertaken to ensure productive and sustainable outcomes.

7.1. Soils in the north can be improved through responsible and more productive farming techniques, and close consideration given to the appropriate land use.

7.2 Planned rotational grazing methods should be employed to reduce stress on the soil and promote vegetative regeneration.

7.3. Greater soil mapping will be critical for agricultural development in the north.

Investment

Wary of risk and uncertainty, private equity have long ignored the north for more accessible opportunities in the south or more lucrative ones abroad. Processed meat and allied sectors are garnering more interest as new export opportunities develop, opened by free trade agreements and driven by Asia's expanding middle class. The small scale of extant irrigated agriculture should not detract from the larger opportunities available, but the failure of previous projects and development drives a fear of wavering government support and the logistical difficulties of undertaking remote schemes mean that convincing evidence balancing risk and reward must be presented for private dollars to back lofty public exhortations.

RECOMMENDATION 8. Government should encourage private investors to drive growth in northern Australia, rather than invest public money to bear the risk of private profit seeking. 'Investment scorecards' would help entrepreneurs, businesspeople and investors assess the relative merits of areas in the north and give both investors and regions seeking such investment a basis on which to prioritise action and proceed.

8.1. Private investment in agricultural production must be based on quantitative assessments of risks and opportunities, as a process of trial and error is prohibitively costly and will deter involvement by new investors.

8.2. Private investors need to show how they will meet environmental standards.

8.3. Support for private investment through public infrastructure should come at the price of measurable social and ecological goals to be achieved by commercial entities, with meaningful penalties imposed if they are not.

8.4. 'Investment scorecards' should be developed in consultation with the industry to highlight the factors and characteristics of a particular region that prospective investors might prioritise when assessing places to expand their operations.

8.5. The government should reassess the legislation governing superfund investments and encourage superfund investment in the north in consultation with stakeholders.

Transport

The White Paper pledges $600 million for new road projects alone, and efforts to improve the region's limited road, rail, port and air facilities will absorb a significant fraction of the $5 billion earmarked for concessional loans to the private sector. The Taskforce agrees that poor transport options increase costs and reduce the quantity, quality and value of outputs, but the high costs of improving such infrastructure must be balanced against the likely economic benefits of doing so and alternative needs and options elsewhere in the country.

RECOMMENDATION 9. Infrastructure improvements in the north should initially focus on improving the use of existing infrastructure to minimise costs and maximise economic benefits. The creation of costly 'white elephants' will only deter future investment if they prove under-used.

9.1. Given the high cost of expanding transport capacity in remote areas and the need to ease the economically damaging congestion suffered by Australia's bustling cities, infrastructure improvement should concentrate on optimising use and efficiency of existing infrastructure.

9.2. Computing tools should be used to highlight points of inefficiency in existing infrastructure and suggest strategies to reduce transport costs, while similar analysis can identify investments to deliver maximum strategic benefit at minimum cost.

9.3. A more fundamental rethinking of transport logistics will require a systematic analysis of the north's value chains to create structural efficiencies.

'Liveability'

Australia is one of the most urbanised societies on earth, with nearly 90% of Australians living in urban areas.[14] Attracting the skilled labour and professionals required by a more developed, modern and diverse economy to remote northern regions remains a challenge, as does retaining ambitious and capable young people raised in the locality.

RECOMMENDATION 10. Plans for economic development of the north should include 'the human factor', if they are to succeed in improving people's lives and investment outcomes.

10.1. While greater economic activity will encourage population growth and greater human capital in the long term, initial attention must be paid to improving 'liveability' issues to encourage skilled workers to move north and for locals to stay.

10.2. Although large agricultural schemes may employ relatively few workers once completed, the creation of a stronger and more diversified economy depends on equal attention being paid to the social sphere.

10.3. Appreciation of 'liveability' factors such as education, the cost of living, transport links and other social amenity factors cannot be underestimated, nor the importance of investment in them ignored.

Governance and Planning

Given the different government, community, commercial, recreational and agricultural stakeholders involved and the range of environmental, agricultural, economic and social factors which new development will affect, a coordinated and holistic approach is required to gain and retain broad support and positive momentum.

RECOMMENDATON 11. The Government should establish a permanent and independent multidisciplinary body to monitor the effects of northern development. This would facilitate the integration of new technologies and thinking into future development plans, while maintaining long-term focus on community benefit and environmental sustainability.

11.1. The permanent body should focus on energy, agriculture, resources and the environment and assess new development proposals and their potential environmental, health and local economic impacts. It can support and advise the CRC for Developing Northern Australia on issues relevant to agricultural development of the north and help engage the business community in CRC's research activities.

11.2. Government departments and other stakeholders should coordinate their efforts to locate and quantify risks and opportunities to develop the full potential of the region as a whole for the benefit of all Australians.

11.3. If the benefits of development appear to be reaped by a handful of developers at great public and environmental cost, then public – and therefore government – support for development should not be sustained.

11.4. Planning must be broader than merely authorising new dams or road improvements. Value chains must be reconfigured and disparate elements united to ensure success.

Focused Research

While the Taskforce supports the White Paper's promise of an 'infrastructure projects pipeline' to keep companies informed of potential projects and development schemes, there is a much broader need for accurate and accessible data to inform decision making. Unlocking the full potential of the north without causing unacceptable environmental damage or incurring major financial risk requires an evidence-based appreciation of the significant regulatory, logistical, economic and ecological challenges involved to guard against missteps and focus attention on the greatest opportunities. The spending must be informed by impartial and rigorous scientific evidence, cost-benefit analysis and an appreciation of local strengths and weaknesses to ensure commercial and ecological viability over the long term. A considerable body of existing research and evidence points to the difficult of northern development, and a single report, even one as authoritative as *'Our North, Our Future'*, must be balanced against the weight of scientific consensus and economic reality.

The Taskforce therefore welcomes the White Paper's acknowledgement of the need for greater certainty and data regarding the land, soil and water resources suitable for agricultural use and underlines the importance of using this evidence to assess investment opportunities, inform decision making and plan development.

RECOMMENDATION 12. A national database of consistent, comparable and accurate data covering land, water, soils, weather, natural perils and other factors should be developed, building on the National Map Open Data Initiative, to allow a rational assessment of the potential of the north compared to other areas.

12.1. Improved collection, combination and analysis of climate, water and soil data is required to identify suitable areas for development and improve investor confidence. Their interaction and response to different forms of development and the ability of the landscape to adapt to changed practices need to be better understood, and the results adopted.

12.2. All sources of information on climate, water, soil and other factors should be combined into a detailed and constantly updated national database to inform land use planning and rational decision making in the public interest.

12.3. The comparison of areas in the north with analogues in the south could highlight strategies for success.

12.4. Further consultation with industry partners and investors could inform more detailed 'investment scorecards' to highlight the factors vital to attracting investment and growth.

12.5. The CRC for Developing Northern Australia should focus on the north in the context of the whole of Australia, to ensure northern development is supported without disadvantaging the rest of the country.

Investment Scorecard

Entrepreneurs will always seek the most attractive option based on a range of factors beyond broad government objectives. Other things being equal, they will tend to prefer investment opportunities in known and accessible regions. For a robust and convincing case to be made for Northern Investment, therefore, its desirability should not be assumed as the starting point for debate, but emerge – if justified by the evidence – at its conclusion. Government measures to encourage private investment will prove a costly failure if commercial interest ends as soon as the incentives dry up.

Trial and error is a prohibitively costly and inherently flawed approach for assessing the risks of agricultural production, given the variables involved. Rational investment decisions rely on the quantification and assessment of opportunities and risks. Data on water, soils, and climate can be combined to this end to estimate agricultural production through simulation modelling, helping farmers, planners and investors identify the potential rewards and risks of production at local and regional scales.

Notwithstanding the problems outlined in this report, city-based investors are likely to have overlooked newly emerging possibilities out of their locale and comfort zone. Under-developed regional centres anywhere in the country can offer better returns than the saturated and intensely competitive state capitals. The key for Northern regions and towns to attract that investment is identified in offering the right mix of factors which will improve its odds of success.

Primary and secondary stakeholders will examine a different mix of factors before deciding on investment or expansion, and large and small firms will have different needs. Investors, farmers and other stakeholders all have their own risk profiles and so a 'one size fits all' approach to encouraging investment will be less productive than a tailored strategy if a particular form of investment or growth is the goal.

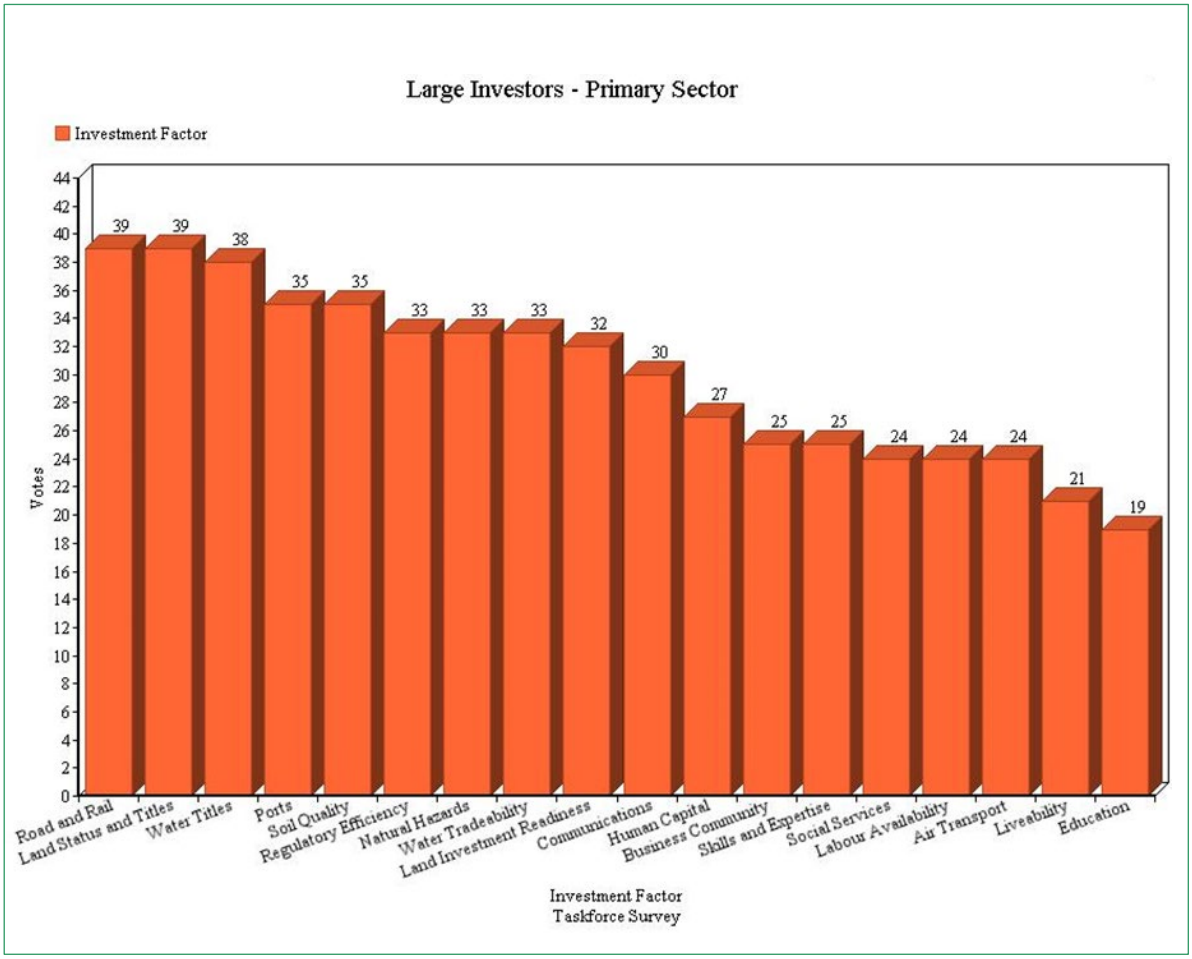
Members of the GAP Taskforce on the North, Agriculture and the Environment, representing a wide range of expertise and interest, developed a preliminary scorecard to highlight the factors large and small primary and secondary producers might prioritise. This approach gives both investors and regions seeking such investment a basis on which to prioritise action and proceed. Members rated the relative importance of a comprehensive

list of factors from 1 (low) to 5 (high) for each use case, and the results are aggregated later in this chapter.

Policy makers seeking to attract particular kinds of investment – be it a major primary development in agriculture or developing a new industrial park of small firms – would be advised to concentrate on improving the factors which rank highly for their target industry. Although the figures in this report are merely a proof of concept, this scorecard approach might be expanded through surveys of investors and producers, to ascertain their requirements more precisely. Such scorecards could also help entrepreneurs, businesspeople and investors assess the relative merits of areas in the north or elsewhere when assessing places to expand their operations.

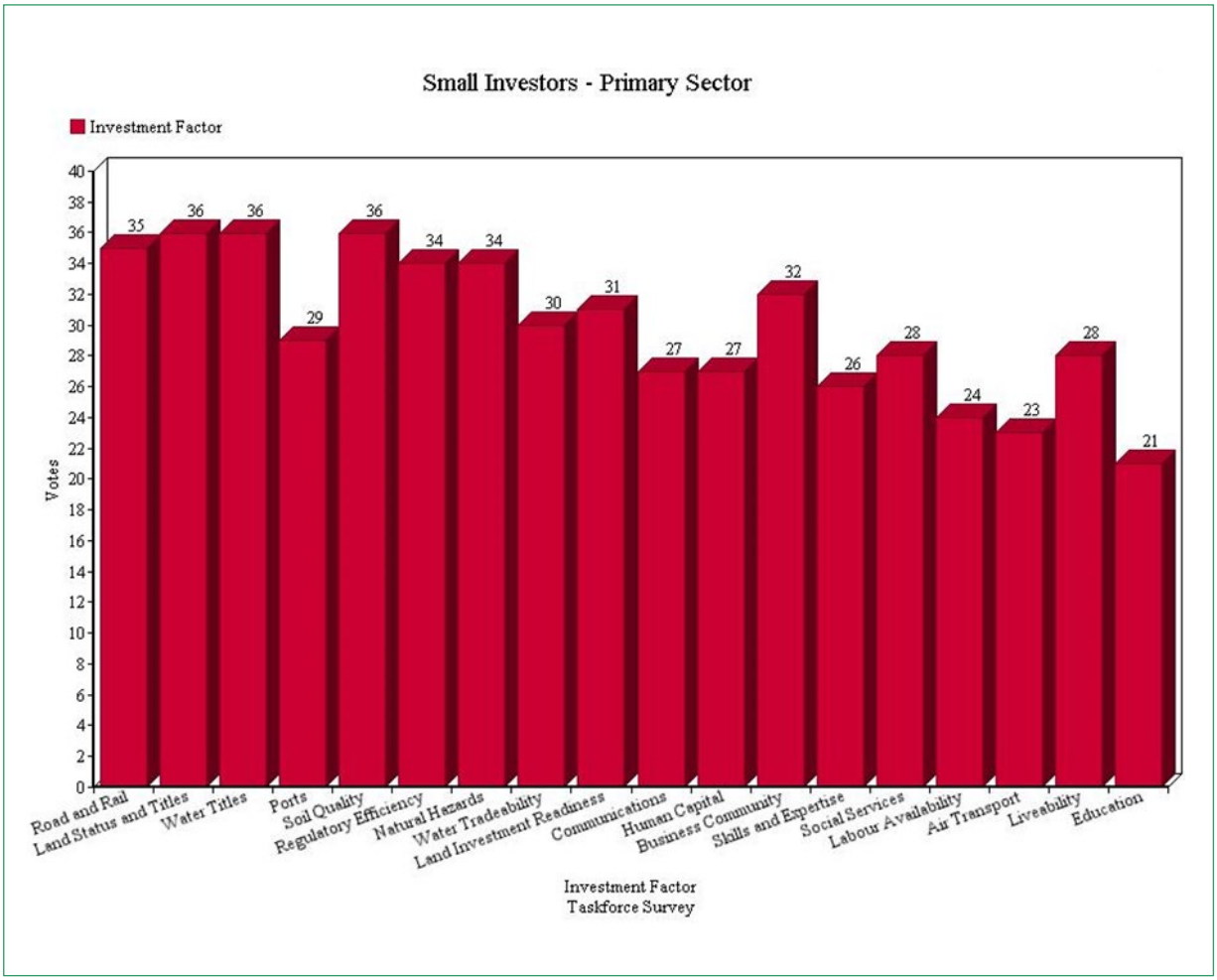
In completing their scorecards, members noted that while irrigated agriculture at scale can add considerable value in certain carefully selected areas, water in itself does not guarantee positive financial returns. Neither is the expansion of productive capacity necessarily an end in itself. The supply chains required to support such investment will need re-thinking, and new infrastructure requirements will vary significantly between regions. Supply chains and processing facilities are required in the Ord river schemes, for example, while water is the major issue in the Flinders and Gilbert developments. Processing facilities will be urgently required where production is at scale, given the size of such schemes and the problems involved in transporting raw goods to existing processing plant. Producers must look to add value to their products, with the beef industry an obvious example, and new markets must be sought and developed for the high value products they produce. All stakeholders need to look for integration opportunities to improve economies of scale and resilience, as climatic or other shocks must be anticipated and planned for, particularly in a project's vulnerable early years. Skilled labour and agribusiness services are important factors for success, but the whole system must be managed properly and scaled up gradually to succeed.

Large Investors – Primary Sector



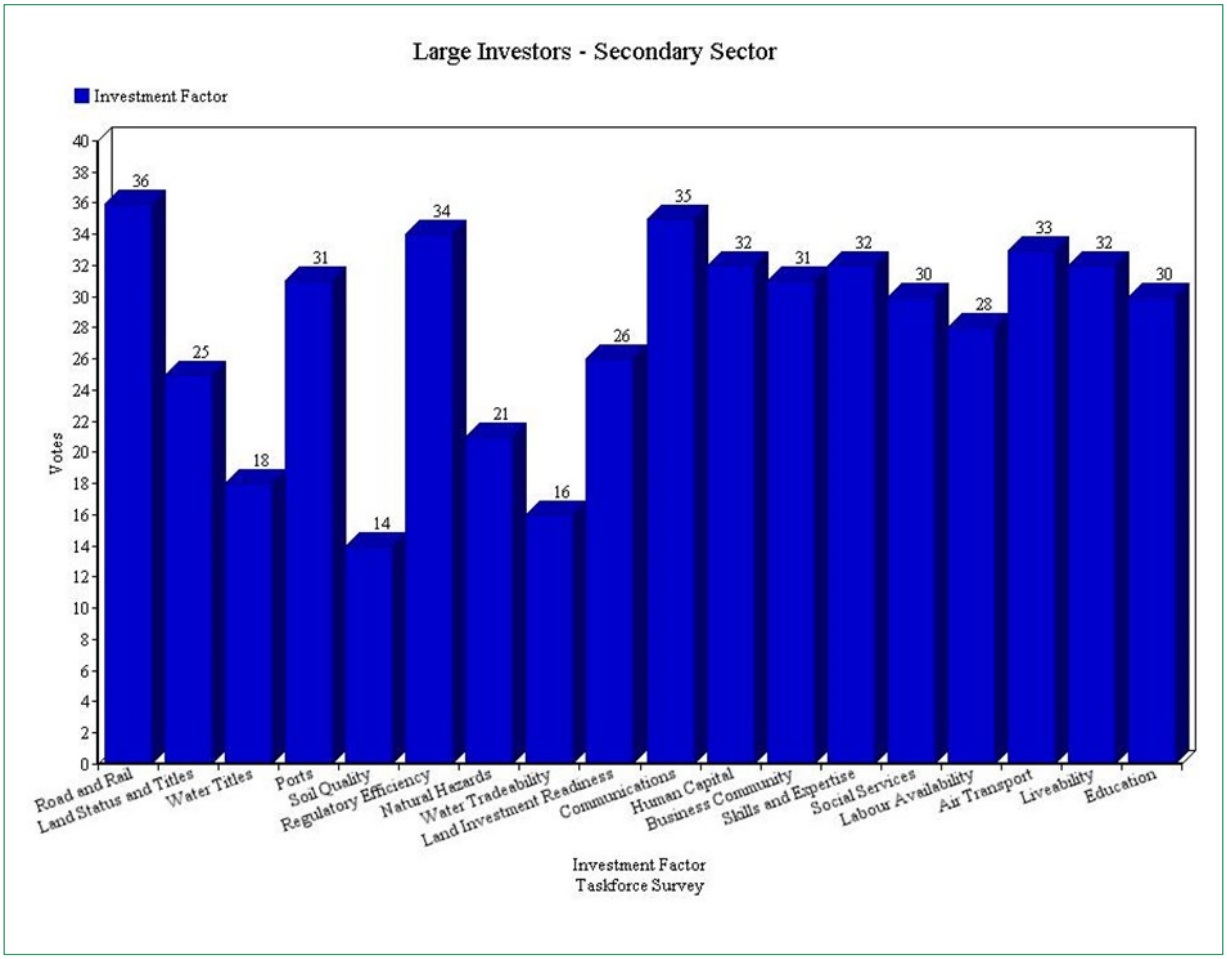
Major investors in the primary sector will prioritise road and rail infrastructure, land status and water titles. Ports, soil quality, regulatory efficiency and natural hazards are also of concern. Issues such as labour availability, social services, liveability and education are lesser problems, given the relatively small workforces involved, once large primary projects are completed and in production.

Small Investors – Primary Sector



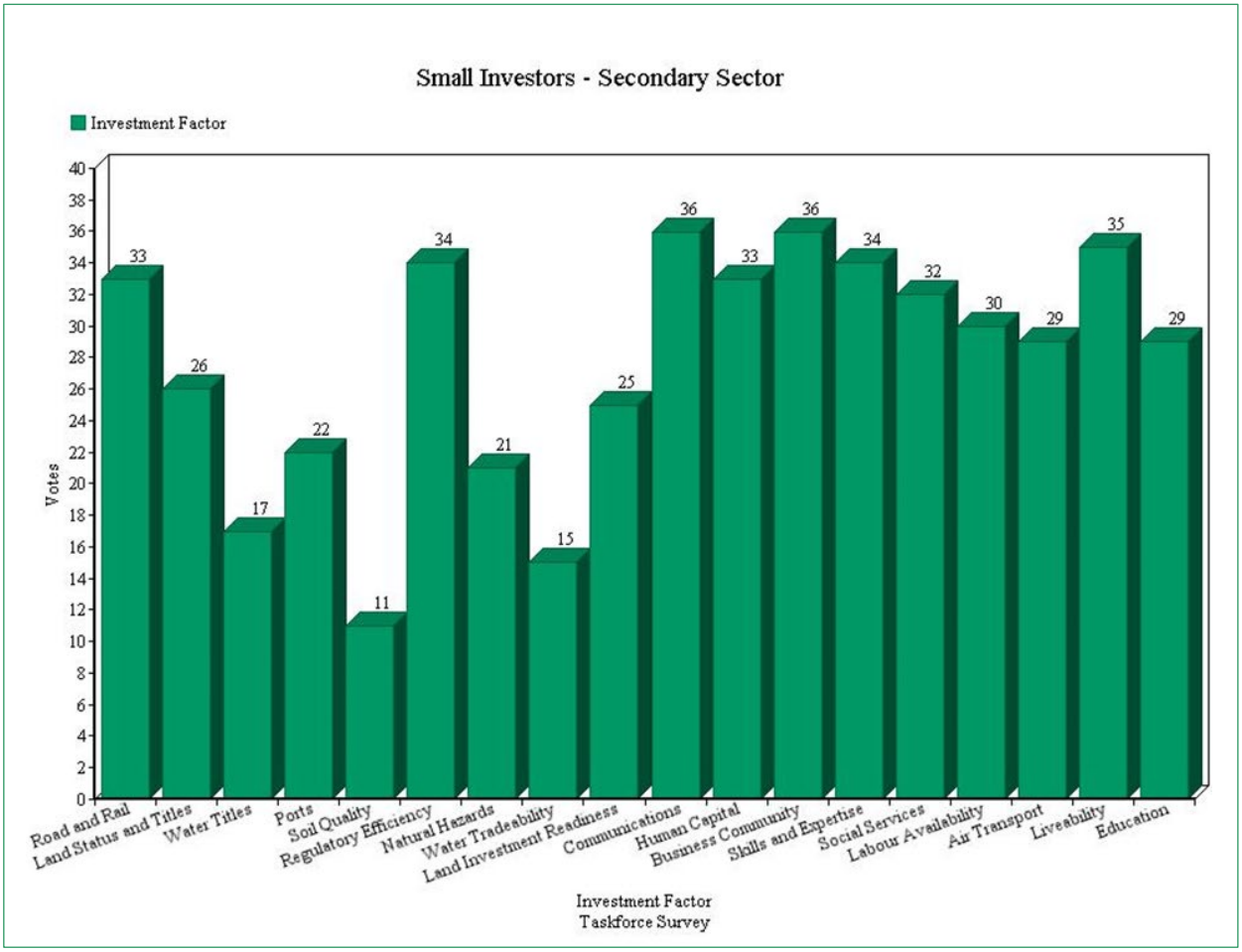
Small investors in the primary sector will also concentrate on land and water titles and soil quality in the agricultural sphere. The importance of a strong local business community and the 'liveability' of the area are more important to small firms than their larger brethren, not least because their owners are more likely to live in the local area, rather than control it from afar.

Large Investors – Secondary Sector



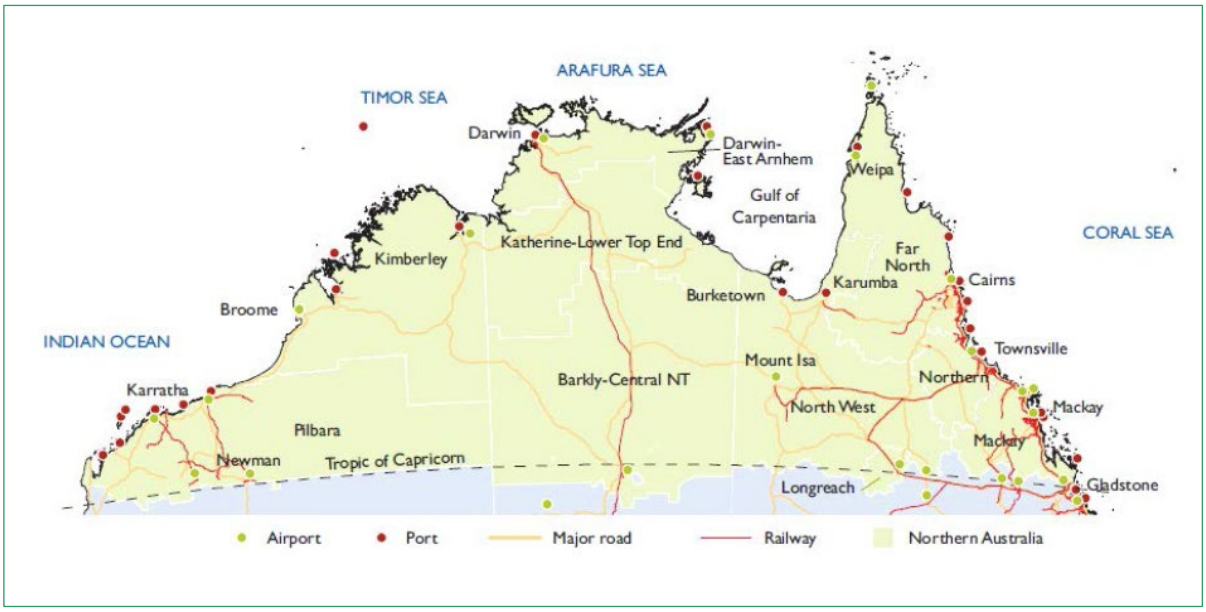
Substantial investors in the secondary sector will rely to a much greater extent on a larger workforce willing to live in the area and therefore prize factors such as labour availability, skills and expertise, communications, social services, liveability and education over those largely irrelevant to their needs such as land status, soil quality and water issues.

Small Investors – Secondary Sector



Small investors in the secondary sector prioritise 'human factors' to the greatest degree, again due to their reliance on a skilled and settled workforce and the greater likelihood that the owners of such businesses would live in the locale. Communications, human capital, the strength of the local business community and liveability are therefore the most important factors, although road and rail links remain important too.

Northern Australia



Picture 1. Map from The Coalition's 2030 Vision for Developing Northern Australia, June 2013

In accordance with the terms of reference for the Government's White Paper[15], this report assumes 'the north' to encompass all Australian territory north of the Tropic of Capricorn. This area includes vast swathes of Western Australia and Queensland as well as the Northern Territory, covers around 3,000,000 km^2 and is home to one million people.

The modern settlement and development of Australia has always favoured its eastern, southern and western coasts, rather than the vast interior to the north. Seeking the most temperate latitudes to impose the agricultural techniques and lifestyles they were familiar with, waves of British and European immigrants shunned the north's rugged terrain, hostile climate and threat of tropical disease. The failure of early agricultural adventures and the nation's long-standing, and only recently abandoned, focus on trading with the Anglosphere, rather than its Asian-Pacific neighbours, also centred attention elsewhere. However, the breath-taking rise of Asian economies in recent decades has produced a large middle class with the resources to supplement traditional staples with imported food, while more diverse waves of migrants to Australia have weakened cultural ties with 'the old countries'. Northern Australia is now close to these new foreign markets, just as it was distant from

domestic markets in the past. Although many of the factors which have dissuaded development in the past remain, investment in new transport infrastructure will reduce transportation costs to ports and airports and open access to new markets in the north.

Proponents of development see northern Australia as a vast expanse of valuable mineral, land and water resources ripe for exploitation by agro-business interests to boost Australian exports and trade. Its mining resources are already being developed, and already account for 9% of the region's GDP, with major new projects such as CSG in Queensland entering production. These interests call for public and private investment to extend irrigated agriculture and improve the transport, water management and other infrastructure required to support it, although governments over the last decade have sought to shift the burden of investment towards the private sector. Acknowledging the dearth of private interest in the past, they argue that if a sustained government commitment was expressed in dollars as well as words, a surge of private investment would follow benefit the region and the nation as a whole.

Sceptics of the case for investment point to the continued failure of development schemes from the 1800s to the 1980s, the region's poor soils and environmental fragility, or the higher and less risky returns which similar investment would generate elsewhere. Environmentalists, business interests and communities argue that the north's pristine state should be treasured and preserved for the sake of the planet and argue that its increasingly lucrative tourist trade would be damaged by agriculture's impact on biodiversity and natural water flows.

Both sides of the debate point to northern Australia's sparse population, clustered like the rest of the nation in a few major regional centres such as Broome, Darwin, Townsville and Cairns, and lack of previous development as supporting their claims. While opponents of development insist that the long-standing barriers to development — from the north's isolation, lack of population and limited infrastructure to its seasonal and climatic extremes — remain as pertinent as ever, proponents of development argue that new economic circumstances and agricultural techniques should see it become a producer of high-value agricultural products for Australia, Asia and beyond. Environmentalists argue that climate change increases the importance of preserving the region's natural heritage and increases agricultural risks, while developers believe that drought elsewhere in the nation underlines the importance of opening new lands.

The region's thriving interests in fishing, mining, tourism, health and education are cited as evidence that irrigated agricultural development is either practical and desirable or unnecessary and counter-productive. Cairns and Townsville host campuses of James Cook University, for example, including the Australian Institute of Tropical Health and Medicine, while The National Critical Care and Trauma Response Centre is based in Darwin. Huge mining developments in the Pilbara, Gladstone and Mackay have underpinned Australian growth for the last fifteen years and buttressed the nation from the financial storms suffered by other developed nations.

It is easy for the citizens of 'the lucky country' to grow complacent in their isolation from the troubles of the world and resource boom prosperity, but a lack of adversity in the recent past is not proof against it in the near future. Asia offers new markets, but those dynamic and increasingly sophisticated economies are also poised to disrupt Australia's professional and service sector as swiftly as they dispatched its manufacturing base. Australia must develop its human resource base to compete at both home and abroad in terms of services as in every other sector, rather than view Asian growth as a goldmine or a threat in isolation.

Australia's long resource boom may be drawing to a close as China continues to secure and develop its own supplies of raw materials from Africa, South America and other parts of Asia, while Australia continues to grapple with the costs of production through many parts of the extraction chain.

Australia sees itself as a dynamic and pioneering nation and its relatively small population has always prospered by exploiting its wide landscapes and abundant natural resources. The North offers a new physical frontier to partner the new vistas of scientific endeavour or productive efficiency extolled in every plan for the future. Australia has benefitted from a series of transformational economic developments in the past and growth in the north could be the next step in the nation's development. However, while developers continue to advocate irrigated agricultural schemes provided there is public money at risk and private profit to be made, none of the independent reports produced over recent years have concluded that agriculture could or should play a major role in this growth,

Recent Proposals

Political and economic imperatives from southern Australia have long driven the push for expansion in the north. The development of northern Australia formed a major plank of the Coalition's plans for government.

A Green Paper released in June 2014[16] emphasises the region's relative proximity to burgeoning markets in Asia. Darwin is closer to Jakarta than Sydney, and 55% of Australian exports were shipped from northern ports in 2012-2013. Asia's fast-expanding middle class offer an increasingly affluent market for the premium foods and health, education and tourist services the region is well placed to produce. Development would build on long-established energy, mining, tourist and agricultural sectors — regional production topped $5 billion in 2010-2011— to create new opportunities for local communities.

Diversifying and strengthening the region's economy would also benefit its significant and growing Indigenous population, not least in a growing tourist industry attracted by its internationally renowned areas of natural beauty.

The Coalition's White Paper intends to *"set out a clear, well-defined and timely policy platform for realising the full economic potential of the north, including a plan for implementing these policies over the next two, five, 10 and 20 years*"[17]. It will *"explore ways to capitalise on the region's strengths, provide the best regulatory and economic environment for business and identify critical infrastructure for long-term growth, public and private planning and investment"*.

The Vision for 2030 (June 2013)

The Coalition published its initial '2030 Vision for Developing Northern Australia' while still in opposition in June 2013[18]. It termed the north 'the next frontier' and outlined its ambition to develop its natural, geographic and strategic assets to create jobs, income and wealth for the region and the nation as a whole. Given Australia's higher labour costs than its regional competitors, it stressed the need to compete on quality in every sphere. Positioning the north as a 'food bowl' of premium produce could contribute to a doubling of Australian agricultural output in fifteen years.

It also envisioned increasing the tourist economy to welcome 2 million visitors every year and build an energy export industry worth $150 billion with an emphasis on 'clean and efficient' production. It called for the establishment of 'world class medical centres of excellence', in part by allocating funds from the foreign aid budget to train medical personnel in Darwin, Cairns and Townsville. It also saw an 'education hub' of world class vocational and tertiary campuses, increasing Australian exports of technical agricultural and industrial skills to $7 billion per year.

The vision acknowledged the need for a strong policy platform to encourage long-term sustainable development and called for improved governance. Key urban areas such as Darwin, Cairns, Townsville and Karratha should be expanded, land legislation modernised with the removal of non-pastoral restrictions on leasehold and better infrastructure and water supplies provided, including upgrading Queensland's Bruce Highway. Such development would require buy-in from private investors as well as government support and meet strict requirements and key performance indicators to deliver effective results.

The paper vowed action on excessive red tape, high taxes, Labor's carbon levy, investment uncertainty, uncoordinated policy and hoped the creation of a 'Northern Australia Strategic Partnership' would coordinate decision making, encourage population growth in existing urban centres and upgrade roads, rail, power, ports and airports.

Green Paper (June 2014)

Building on the Vision paper, the newly elected Coalition government published a Green Paper offering six avenues for northern development and inviting comment from individuals, businesses and communities in June 2014. Its proposals would expand output in the traditional sectors of energy, mining and agriculture, encourage economic diversification and exploit the potential of northern Australia's relative proximity to fast developing Asian markets. They included:

- Planning and prioritising the development of economic infrastructure and leveraging private sector investment to fund it
- Improving land use and access through more flexible and longer-term tenure, greater cross-jurisdictional consistency, more efficient Native Title procedures and the reduction of barriers to development faced by Indigenous Australians

- Utilising water resources more effectively through researching water systems, building dams and other infrastructure, reforming water management and encouraging functional water markets
- Strengthening the business environment and encouraging investment by boosting the region's population and pool of labour, reducing bureaucracy and promoting trade with Asia
- Nurturing education, research and innovation in the region by building research networks, bolstering labour and industry skills and opening access to international education and training markets
- Improving governance through better co-ordination of public and private activities, greater community engagement and building local capacity.

It also advocated reducing restrictions faced by Indigenous landowners to use their land to generate growth and employment.

The proposals were welcomed by farming organisations, but criticised by conservation groups[19]. The Australian Conservation Foundation restated its belief that the north remains unsuitable for 'big irrigated agriculture' due to a long dry season, poor soils, uncertain water availability and long distances to markets. The Wilderness Society warned that major dams and agriculture schemes would destroy northern Australia's landscapes and wildlife and opposed the pursuit of a "*discredited business model of building dams to convert northern Australia into a vast irrigated agriculture project to grow food for Asia*". It favoured the nurturing of a 'thriving economy' driven by sustainable agriculture, the arts and tourism, while the Greens underlined the importance of sustainable development in partnership with Indigenous peoples.

'Pivot North' (September 2014)

A Joint Select Committee on Northern Australia, chaired by the Hon. Warren Entsch MP, held public hearings in 2014 to explore the potential for developing the region's mineral, energy, agricultural, tourism, defence and other industries. The Committee delivered its *Pivot North* report to Parliament in September 2014. The report assesses wider issues such as Indigenous communities, liveability and the environment, as well as trade and production. It acknowledges the oft cited barriers to growth, including the north's sparse population, high costs, scant infrastructure and restrictive regulation. Its 40 recommendations include

the sealing of specific roads, including Queensland's Bruce Highway, the Hann Highway between Cairns to Melbourne and the Tanami Road linking the Kimberly to Central and South Australia. Upgrading the Tanami Road would cut 1,100 kilometres — and 17 hours — from the journey from the Kimberley to South Australia, for example, linking communities and opportunities in the mining and pastoral communities. It also outlined measures to encourage private sector investment, expand the region's workforce, reform regulation, expand power production and distribution to build more dams and weirs to develop the land. Measures for improved governance would include a dedicated Department of Northern Australian Development covering Western Australia, Northern Territory and Queensland.

While the 2009 Northern Australia Land and Water Science Review[20] rejected wholesale dam building projects and argued that only 30 – 60,000 more hectares could be sustainably and responsibly irrigated, *Pivot North* encourages the Government to fund and develop a wider range of irrigation and water schemes, but critics have argued that its focus on immediate economic returns gives little consideration to the long term sustainability and environmental advisability of this approach. Each scheme must still present a strong cost-benefit case, have been scientifically proven to be sustainable and remain consistent with the National Water Policy. Opportunities include using the Flinders River and O'Connell Creek to irrigate the black soil plains of Queensland and building a dam in Urannah to provide water for mining in the Bowen and Galilee Basins, irrigation in Bowen and for industry at Abbot Point. The report supports the Nullinga Dam proposal to supply water to Cairns and its agriculture, while raising the dam wall at Eden Bann Weir in Rockhampton would enable a major development of horticulture produce for export to Asia in line with Coalition plans. A rigorous cost benefit analysis of such schemes should be undertaken before action is taken, however. Carte blanche should not be given to individual projects which may have less immediate benefit, and higher long term costs, than their proponents may admit to, whatever their synergy with overall government thinking.

Major privately funded agriculture schemes, such as the $2 billion Integrated Food and Energy Development project on the Gilbert River in the Gulf country of northern Queensland[21], still reply on the provision of public infrastructure. Their proponents emphasise the importance of major projects to encourage the development of smaller businesses around them, as well as produce horticultural products at scale. However, these massive proposals have been criticised for their impact on shallow and infertile soils, their

monopolisation of water allocations in their catchment, and their deleterious impacts on the environment and other stakeholders down river.

Although a wet tropics CRC and an irrigated agriculture CRC have already been undertaken, *Pivot North* also recommends the establishment of a cooperative research centre for northern agriculture, pooling the expertise of government entities, scientific agencies and the universities to boost the region's development. This proposal is supported by the governments of Queensland, Western Australia and the Northern Territory, the Rural Industries Research and Development Corporation and a number of major educational institutions, all of whom stand to benefit from its acceptance and success.

White Paper (June 2015)

The Federal Government released its long awaited White Paper on the economic development of northern Australia on 18 June 2015. The document highlights the strategic importance and economic potential of northern Australia and recognises that there have been many failed plans and projects in the north.[22]

Our North, Our Future outlines a comprehensive strategy to develop the region's natural resources and create an 'economic powerhouse' by encouraging investment, improving infrastructure and streamlining governance. Reflecting the scale, complexity and ambition of the task, the report assumes the strategy will be put in place over the next twenty years.

Our North, Our Future identifies five strategies to achieve its goals by enabling better use of natural resources, the encouragement of private sector investment, public investment in transport and other infrastructure, better job mobility, and streamlined governance and Native Title arrangements.

Given the importance of Native Title in the region, the White Paper echoes recommendations made by the Australian Law Reform Commission a fortnight before its release to streamline Native Title processes and allow Native Title rights to include trading rights and commercial activities. The paper argues that economic development can be stalled by complicated Native Title processes and the lack of adequate land administration frameworks in some Indigenous communities. It proposes their reform through discussions at COAG and the resolution of all claims within a decade, and offers $20.4 million to support engagement between investors and Native Title holders with a view to using

exclusive Native Title rights for commercial purposes. An additional $17 million will improve land administration in the Northern Territory and support the negotiation of 99-year township leases on Aboriginal land.

The Government is also looking to expand agricultural production by encouraging commercial development of the region's water resources. The paper outlines a range of measures to increase access to the region's rivers and aquifers for cattle and irrigated farming. It offers a set of principles to enable the access to water resources by pastoral leaseholders and allocates $200 million of public expenditure to build new water infrastructure in the north. The Productivity Commission is also asked to produce a report on deficiencies in fisheries and aquaculture regulations by the end of 2016[23].

In common with other aspects of government business policy, the White Paper looks to foster innovation, connect investors with opportunities and reduce red tape and administrative barriers. The North is seen as Australia's gateway to trade with Asia and the tropics, and the paper details a $2.5 million initiative to improve contacts with Indonesia, Papua New Guinea and East Timor.

Much larger sums are allocated to improvements to physical and transport infrastructure to solve the problems caused by the size and remote nature of the region. The paper proposes public-private partnerships backed by up to $5 billion in concessional loansthrough the northern Australian Infrastructure Facility, with $600 million for new and improved roads , $100 million for better cattle supply chains and $5 million for analysing freight rail proposals. It also envisions an infrastructure projects pipeline to inform businesses about potential projects.

The paper encourages Indigenous and foreign worker employment through a number of measures and looks to build a workforce with 'valuable, transferable and recognisable skills'. A variety of relevant government agencies are given fresh responsibilities alongside measures to improve their relationships and create a more holistic approach to workforce planning.

The paper acknowledges that these plans will continue to evolve through ongoing consultation with public, private and Indigenous stakeholders. Current activities, including the agreement of cut price loans for infrastructure projects and the announcement of road improvements supported by the $600 million roads fund, will be followed by the establishment of tradeable water access rights in priority catchments and 'substantial

progress' in the first tranche of major infrastructure projects by 2020. All existing Native Title claims should be finalised by 2025, with increasing development of pastoral, Indigenous and Native Title land by 2030 and the establishment of modern infrastructure, low-cost regulatory frameworks and more investment projects by 2035.

Agricultural Development in the North

20% of Australia lies above the tropic of Capricorn. It receives over 60% of the nation's rainfall - more than 2 million gigalitres a year - although it has only 2.5% of the nation's irrigated land[24]. Pioneering efforts from the 1800s were largely unsuccessful, and through the 1960s, 1970s and 1980s, a number of large agricultural development projects failed. Early research was based on small plots which invited an over-optimistic view of its wider potential. Although farming techniques have made much progress, many environmental constraints to agriculture in the north remain, including its extremes of climate and season, thin and vulnerable soil, and pests and diseases.

Agriculture is dominated by the beef industry, with the region supporting a third of Australia's cattle[25], but a wide range of conditions and farming traditions are in play across this vast expanse. The broad concept of developing the north must therefore be broken down into a series of individual decisions based on local circumstances and form part of a holistic economic, social and environmental policy approach.

Markets at Home and Abroad

The Northern Territory would benefit from new approaches to increase yields on existing farms and reduce the toll on the land, as well as greater diversity of production. There are no barriers to the adoption of more productive and environmentally friendly methods by private agricultural operations, except a lack of exposure to new techniques and a natural tendency towards conservatism. However, the factors which have inhibited development in the past are still as stubborn as ever, and new challenges in the form of increased concern about ecological impacts must be addressed. A focus on new markets for produce in Asia should not distract from the problems caused by a lack of market rigour in Australian supply. The problems facing agriculture in the north are significant, and while drought and other problems in the south may encourage northern investment, they may also caution against creating more problems than they solve. Drought and other weather events can also affect the north, with rice schemes failing over the last five years due to insufficient rainfall. Substantial public investment to create new agricultural areas might lead to calls for extended public subsidy to maintain them if they prove incapable of self-support. Many parts of Australian agriculture are highly efficient, but just as firms, and

indeed whole industries, are allowed to fail if they cannot compete, so less efficient farmers, or those in marginal sectors or drought ridden areas, might be allowed to fail, rather than be buoyed with endless compensation. A 'sink or swim' approach would encourage the adoption of more efficient, and perhaps environmentally appropriate, methods, rather than subsidise and support inefficient, unviable or outdated ones. A winnowing out of inefficient producers would allow more forward-thinking operators to come to the fore in northern Australia and elsewhere. Farmers must be encouraged to invest the profits of their boom harvests to improve the resilience of their farms in harder times, but in the end they must stand or fail by their own efforts. For all the talk of risk dissuading investment, encouraging private expansion by guaranteeing public subsidy in any circumstance will drain national wealth, rather than improve it. Careful research is therefore required to ensure new schemes have a good chance of success.

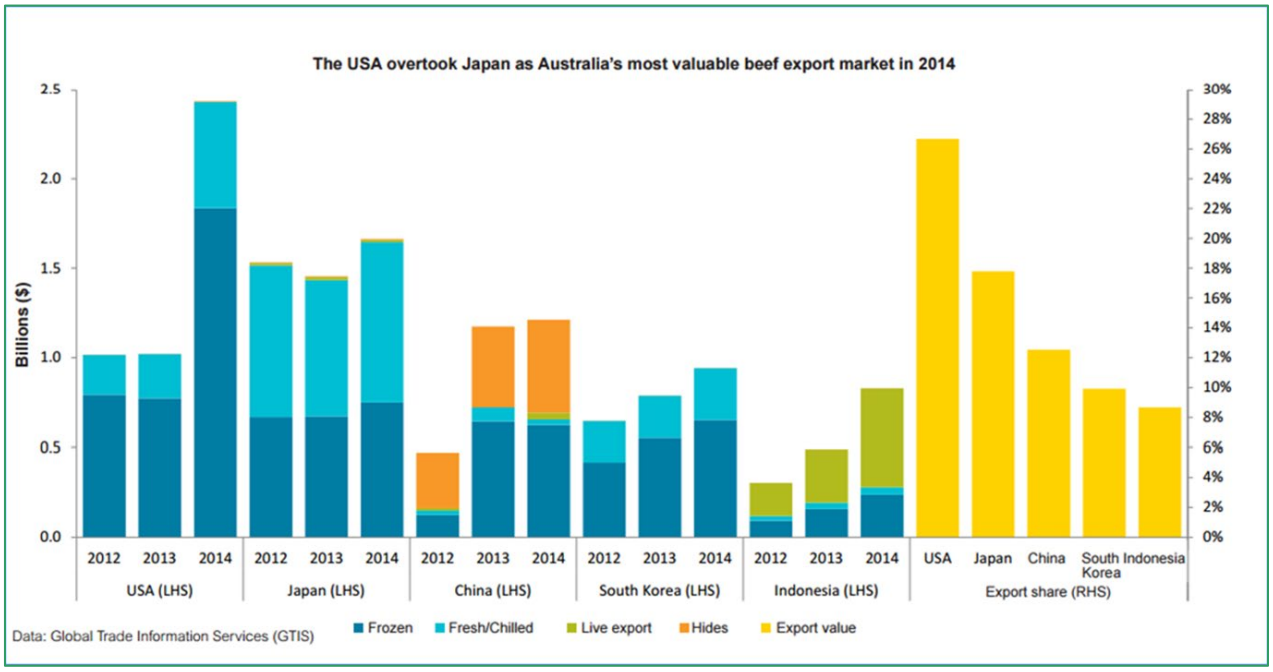
Asia's Food Bowl or Delicatessen?

Proponents of expanded agricultural development in the north argue that expanding the area under cultivation and improving the productivity of existing farmland would help feed Asia's growing population, exploit new markets created by its newly prosperous and growing middle class and offset the falling terms of trade faced by domestic farmers.

The Coalition is right to stress that Australia cannot become Asia's 'food bowl' and should aim instead to be its 'delicatessen', meeting 1-2% of total Asian demand through developing niche but highly profitable markets. Although its agriculture, particularly in the north, has traditionally been based on bulk, rather than specialised or value-added production, Australia cannot play 'the commodity card' as India, Asia, Africa and South America are quickly modernising and increasing their agricultural productivity and have much lower costs. As Asia moves from traditional peasant farming to more modern systems making better use of its arable land, it will increase its capacity to satisfy its own demand for staple products. Investment in specialised, high-quality, niche goods should therefore have priority in the north, with marketing and distribution provisions as important as actual production. 'Top of the range' tropical fruit production around Cairns is already successful because its well-developed air freight capacity allows goods to be exported straight to Japan or Shanghai. Investment in beef farms in the Northern Territory or apples in the Ord will have far greater value if combined with premium marketing and value-added processing as New Zealand agriculture shows.

The Beef Industry

Cattle farming dominates the land and agricultural economy of northern Australia. Northern Australia holds a third of the nation's 26.2 million herd[26], and 5% of its workforce are employed in the industry.[27] 95% of its agricultural land is used for cattle grazing, and beef generates three quarters of its agricultural earnings. Beef is Australia's second largest agricultural sector overall, and the nation is the world's second largest beef exporter with trade worth over $8 billion every year. [28]



Picture 2. Australian beef export, 2015 Rural Bank report[29]

Annual productivity in the beef industry is growing at 3.6%[30], and export growth is set to continue as a growing Asian middle class incorporates more meat into its diet. In addition to improving cattle yields on existing grazed land, further growth could be generated by finishing cattle – fattening them to slaughtering size – and processing meat near its sources in the north, rather than transporting them to southern feedlots.

Beef farmers could also increase and diversify their output by small-scale irrigated fodder production[31], or high-value horticultural produce for export to Asia. Other possibilities include grains, forestry and bio-fuels. Greater diversity of production would reduce the

risks of relying on a single commodity. Outbreaks of foot and mouth disease and scares over BSE[32] damaged livestock production in Britain, for example, and another Asian economic crisis could cut its growing appetite for niche and premium food. Mixed farming could also maximise the productivity of existing labour and capital.

Unlike the massive irrigation schemes proposed for horticulture in the Ord River and elsewhere, the infrastructure required to support these developments and the ecological disruption they cause would be relatively limited. Small-scale mosaic irrigation, scattered throughout the landscape, should therefore be considered on existing farms as well as mass schemes to create new ones.

The northern cattle industry generates 4% of Australia's greenhouse gas emissions[33]. The methane produced by cattle traps 25 times more heat in the atmosphere than carbon dioxide, although it is less persistent and is removed by natural processes over time. As the northern beef industry contributes just 0.1% of the nation's GDP, it has a clear responsibility to reduce its emissions. Mitigation measures, including the re-vegetation of overgrazed areas, forestry and the production of biofuels should therefore be incentivised and encouraged. Unfortunately, most pastoral leases specifically prohibit such practices, and these must be reformed to allow a greater diversity of production for the farmer and reduction of greenhouse gas emissions for the benefit of all. As outlined below, an intensification of the beef industry, based on small-scale irrigated cattle-feed production and fenced 'stands and graze' feeding systems would increase yields by allowing the fattening of stock during the dry season and offer environmental benefits.

Increasing Yields while Sequestering Carbon

The Australian agricultural landscape has suffered from i overzealous land clearing, unsustainable irrigation, overgrazing and the indiscriminate use of chemicals. The structural and carbon integrity of many agricultural soils has been damaged or destroyed, and new development should therefore aim to restore the health of existing agricultural land as well as opening new areas in a sustainable and responsible fashion. Such environmental considerations are not a hindrance to long-term farming productivity, but a pre-requisite. A holistic approach will ensure domestic food security, increase foreign exports and tackle

the climate change which imperils food production world-wide by sequestering CO2 back into the soil, rather than releasing it, and gain the support of other stakeholders.

Given rising demand, environmental degradation and the threat of climate change, global agriculture must continue to increase production while using less land, water and energy. Farming practices which deplete the environment they depend on may generate profit in the short term, but will undermine their own viability in the future unless more enlightened methods are found. Agribusiness will play a major role in Australia's future, as it has in the past. The Queensland Government hopes to double the state's agricultural output by 2040, for example, but this target merely echoes expected overall growth in the nation's GDP and sustainability has to be remembered as a core issue if the cattle industry and other sectors are to maintain and increase production over the long term. Offering short-term compensation to farmers facing long-term drought may only postpone their adoption of better dry land farming practices or delay the departure of unviable properties from the industry. The building of resilience is as important for the nation as it is for individuals, and so investment in agricultural development should increase the land's resilience. Risk is the major factor which inhibits business confidence and investment. Building the resilience of the land is the best way to reduce the risks of agricultural production and therefore increase private equity interest and investment in it.

Farming practices which sequester carbon into the soil by improving root growth and retain more native vegetation would build more resilient landscapes which can recover more quickly from flood and fire and withstand both short-term weather fluctuations and long-term climate change. Environmentally friendly farming methods offer a 'win-win' for all stakeholders, improving yields while regenerating the land they depend on to increase production still further in the future. Australia is still a major per capita carbon polluter. Wildfires produce twice as much carbon dioxide as all of Australia's power stations and industry combined. Farming practices which absorb carbon from the atmosphere would add value to development propositions and gain support from the environmental lobbyists who might otherwise oppose them.

Given the huge size of the north's cattle industry, the adoption of planned rotational grazing could offer the most effective way to increase output through investment in water infrastructure. Although most of the region's cattle are left free to roam vast paddocks, they inevitably tend to cluster around a few watering holes. The herds graze the area around them bare, causing soil erosion and loss of carbon, and increasing the land's susceptibility to

extremes of drought or flood. The instillation of piped water systems would allow a staggered series of watering places to be opened and closed, moving herds on to allow areas to recover. A combination of remote sensing technology, more watering points and other simple technological approaches has proven highly effective on several large cattle stations. Two to five times more cattle can be carried on a given area, and 1-2 tons of carbon can be sequestered every year per hectare for a century or more.

This approach offers a major opportunity in northern Australia which is not covered in the current Coalition approach. Decades of over-grazing has ruined the landscape in many areas, turning expanses which once supported lush natural vegetation into virtual deserts by exposing their thin and fragile soils. Planned rotational grazing will restore the landscape to health, protecting its soils and safeguard the beef industry's future.

Major General Michael Jeffery's *Soils for Life* group[34] has worked on schemes to introduce more remotely controlled watering points across northern Australia to boost yields, promote carbon retention and reduce soil erosion. Telecom companies such as Telstra have indicated their interest in providing the remote sensing needed for several thousand additional water points. Beetaloo, a million hectare cattle property on the Northern Territory's Barkly Tablelands, has doubled its carrying capacity to 100,000 head by establishing smaller paddocks and installing more watering posts over the past decade[35]. Intensive cell grazing, in which stock need walk no further than 2 km before finding water, could be applied to 300 million hectares in the north, greatly increasing yields and productivity while sequestering at least 300 million tons of carbon every year. Beetaloo produces twice as much beef as its neighbours at 70% of the cost while suffering fewer wildfires. Wildfires burn 30-70 million hectares every year in the north – releasing twice as much carbon as Australia's industry and coal fired power stations combined. Reducing such emissions by through improved farming methods would be far cheaper than capturing carbon dioxide from power stations or other proposed engineering schemes. Indeed, modified management of the grasslands involving rotational cattle grazing and planned Indigenous burning to reduce wildfires could balance all of Australia's emissions from consuming fossil fuels.

Unlike some proposed agricultural schemes, this approach is backed by scientific evidence and long-standing practical examples. Investment to create the water infrastructure required should therefore be encouraged, with trials held to demonstrate the concept in different regions and mentoring programmes outlining the benefits to station managers. The

labour force required is already in situ and merely requires training in new techniques and access to the required technology.

Irrigated Agriculture

Irrigation has been practised by farmers around the world for at least 5 millennia, but despite the ubiquity of the practice and long history of the idea, it has often proved unsustainable in particular locales, particularly due to the appropriateness of the soil type to support and sustain the practice. Irrigation can aggregate salt, wash out nutrients and deprive surrounding areas of water while waterlogging itself. These and other issues tend to develop slowly but remorselessly over time, to the long-term and sometimes permanent detriment of agricultural productivity and environmental health. These long-term costs and risks of irrigation must therefore be assessed alongside the initial costs, risks and benefits of irrigated development.

Irrigated agriculture contributes $160 million to the north's economy[36] and employs 1.3% of its workforce.[37] A doubling of this area would generate 1,400 more jobs and almost $180 million of additional economic activity.[38] Crops that could be grown in newly irrigated areas include annuals such as vegetables, melons, grain sorghum, maize, rice, cotton, mung beans, soybeans, sesame and peanuts.[39] Perennial fruit production could include mango, bananas, citrus, papayas, lychees and other fruit trees while there is considerable scope for forestry to produce timber and biofuel, provide shelter and shade and high-value fragrance oils.[40] As noted, pasture can also be irrigated to produce fodder crops for livestock on cattle farms.

Several northern areas have already seen some degree of irrigated development. After being rescued from their initial financial difficulties by the massive injection of government funds, the Ord River floodplains in Western Australia have seen major projects begin to produce melons, vegetables and sandalwood, while output in the Katherine–Douglas–Daly region of the Northern Territory includes maize, peanuts and animal feed. Queensland's Mitchell catchment offers peanuts, avocados, bananas, grass seed, stone fruits, coffee, tea tree, sugar cane, navy beans, citrus, mangos, macadamia nuts and grapes, while smaller areas around Broome and Derby in Western Australia produce mangoes, melons and vegetables.

There is too little rain in the dry season, and too much in the wet, for natural cropping to be practical in most areas, but all these crops can produce viable yields when artificially irrigated in the dry. 90% of the region's rain falls in the wet season[41] and waterlogs or floods the land, damages crops, erodes soils and bogs down farm machinery, leaving dry season irrigation as the only alternative. However, such schemes consume far more water than their counterparts in the south due to higher rates of evaporation from leaves and soil and harsher climactic conditions. The use of drip irrigation and other modern techniques to minimise waste and evaporation should therefore be preferred wherever possible.

Although proponents of horticultural development claim that millions of acres of northern Australia could theoretically be farmed, practical restraints in water supply mean that only 60,000-120,000 additional hectares may be suitable for dry season irrigation. [42] Irrigated agriculture might expand by a factor of two or four, compared to its current extent, but broader agricultural development must depend on improved dry land farming techniques, forestry and other approaches.

Accepting these restrictions and several important environmental caveats, there are several reasons why agricultural development in northern Australia should be explored. As with rotational cell grazing in the cattle industry, enlightened, ecologically responsible land management could improve native soils, and while land clearing will inevitably affect local ecosystems, well-managed farms could benefit plants and animals in the surrounding area by making water and food resources more available, and actively managing fires. The fruits of irrigation should create jobs and income for local communities not only on the land, but support industries supplying farm equipment, transportation and infrastructure and local canning or processing plants.

Mosaic Irrigation

Although the need for huge schemes and massive levels of investment is often presented as self-evident, critics argue that irrigation-based farming on a smaller scale would be the best approach.

As previously noted, grazing properties can irrigate suitable patches of land to grow fodder for their animals, safeguarding themselves against drought on the range and offer alternative income streams through high-value niche horticulture. Some commentators

advocate farm schemes based on groundwater pumped from aquifers, rather than surface water trapped behind the large and expensive new dams required for large schemes such as the Ord River Irrigation Area. These proponents argue that existing aquifers could support a large number of small-scale irrigation developments spread across the landscape in a sustainable 'mosaic', as the amount required by any particular farm would be relatively modest. However, private farmers could already adopt these techniques and their failure to do so suggests that they are uneconomic without substantial public subsidy.

Due to the small and scattered areas it would consume, mosaic irrigated agriculture could reduce the problems of soil erosion, salination and chemical runoff associated with large scale schemes. Irrigation can increase soil salinity when minerals and salts, dissolved in the water and found in fertilisers, gradually build up in the soil, but can also occur when a local water table rises and brings dissolved salts to the surface. Scattered irrigated areas will have less impact on the water table around them, but, as with other approaches, they should only be permitted in areas where research and soil maps indicate such problems are unlikely to occur.

Investment, production and environmental mishaps suffered when 'learning by doing' will be less costly in localised mosaic irrigation, compared with the profound, widespread and long-lasting impact of land management mistakes made in larger irrigated areas. The smaller scale of mosaic agriculture also reduces the cost of irrigation infrastructure, placing it within reach of private investors and private farmers, rather than requiring the government support of larger dam-based schemes.

Mosaic irrigation would still have a negative impact on biodiversity, and may require more roads than larger centralised irrigation schemes. A higher number of irrigated areas spread out across the north, rather than concentrated in a few areas of mass irrigation, would also increase the risk of introducing pest insects and weeds into the surrounding environment.

However, while scattering intensive agriculture over a wide range of grazing properties would reduce the formation of industry 'hubs', the growing of stock feed and other crops on cattle farms would spread its benefits to far greater numbers of farmers and, by boosting the quality, quantity and availability of stock feed supplies, improve productivity in the sector which overwhelmingly dominates agriculture in the north.

Environmental Constraints

Water

Water is central to life and an issue for the whole of Australia. Secure, reliable and sustainable access to water is the key not only to the expansion of livestock or irrigated farming, but to the region's communities, ecology and other productive sectors. The relative lack of exploitation of its water resources by agricultural interests - in contrast to the highly managed and exploited river systems in the rest of the country – appear to offer significant scope for more irrigated agriculture in its flood plains, but any change of use will have wider consequences.

The North has over 50 rivers, many of which run only in the wet season. Most retain their natural flows, unencumbered by dams and weirs, although there are already around 30 major dams in the region. Although the two million gigalitres which fall on the north in an average year is an oft-quoted figure, it is less often emphasised that much of this rainfall is restricted to the coast and falls almost entirely from November to April. Average figures can also mislead as the variation between years is substantial and unpredictable. Given high rates of evaporation and plant transpiration, northern Australia uses more water than it receives in all but two months of the year. Opportunities for dams and delivery channels are severely constrained by the coastal nature of rainfall and river basin geography. Aquifers may hold vast stores of water but are quickly denuded, particularly when starved of the natural flows they depend on for replenishment.

The North's water sustains globally important areas of wilderness, estuaries important to the fishing industry and Indigenous lifestyles. It is disingenuous to pretend these natural flows are 'wasted'; indeed, such arguments are uncomfortably reminiscent of earlier notions of *terra nullius* which justified settlement practices in the past for which the nation is still apologising. Some resources are already overused: Katherine's Tindal aquifer is already over-exploited for agriculture, for example, and its extraction is being reduced under the Great Artesian Basin Sustainability Initiative.[43]

Diverting more water from existing to agricultural use could affect ecological health and Indigenous wellbeing and have serious consequences for the region's valuable fishing and tourist industries.

Commercial fishing produces over a quarter of a billion dollars a year[44], for example, and the catch of prawns, barramundi and threadfin is entirely dependent on freshwater flows into the region's estuaries. Reducing flows to estuaries would harm a fishing industry which generates as much income or more than the north's existing acreage of irrigated agriculture.

Water is equally important to the region's abundant wildlife, and altering or reducing flows could have significant impacts on biodiversity. Increased groundwater extraction could reduce flows in the Daly and Roper rivers in the Northern Territory and dry up the billabongs vital to sustaining life during the dry season. The clearing and cultivation of flood plains could destroy some of the richest ecosystems on the planet and release significant quantities of CO_2. Denuding areas of natural beauty of their natural water supply would damage the tourist industry whose expansion forms a major part of Coalition plans.

The wildlife in riparian zones is already affected by overgrazing, erosion and degradation by cattle, invasive species such as cane toads, pigs and buffalo, the growth of weeds and run off from agricultural fertilisers and sewage, herbicides and pesticides. Land clearing — and mining — also increases sediment and levels of pollution, while the construction of more dams and weirs may fragment native fish habitats and encourage introduced species that can tolerate human disturbance to invade. Increasing salinity from irrigated agriculture will also affect fish stocks and breeding.

All water is used for one purpose or another, and shifting use towards agricultural development would inevitably reduce the amounts available for other valuable activities and resources. Planning calculations must take these wider affects into account. Local communities, and Australia as a whole, will not benefit if expensive short-term agricultural development comes at a high long-term cost to other regional sectors and internationally important resources.

The CSIRO review of land and water science[45] examining opportunities for agricultural expansion in 2009 warned against wholesale water exploitation and called for rigorous scientific appraisal of ecological costs as well as agricultural benefits. It argued that 600 gigalitres could be found to irrigate up to 60,000 hectares of new agricultural developments, as part of an overall water use strategy in line with the NWI. The report urged caution in modifying pristine landscapes and floodplains, damaging Indigenous

economic and cultural activity and depleting natural river flows on which wildlife, tourism and fisheries depend. The long-standing degradation of the Murray-Darling system may make the north appear a richer area for development, given its relative size and untapped resources, but new opportunities in the north should not repeat southern blunders. A new age of development should define itself in accordance with modern concepts of ecological sustainability.

The exploitation of the north's water resources cannot follow the 'riparian doctrine' of British common law which gave early Australian landholders free reign to extract and use the water on or adjoining their land regardless of its impacts on others. Nor can it contain itself to the consideration of engineering solutions to maximise agricultural development without heed of environmental or other consequences as pursued by the centralised control of water assets by state governments, from the Victorian Irrigation Act of 1886 through most of the 20th century. If water extraction is allowed without strict calculation of public costs or revenue, it will be over-allocated at below cost, leading to waste, over-use and the creation of yet another agricultural lobby reliant on public subsidy. Such policies created serious ecological, engineering and financial problems in the south, and the principles of integrated management adopted to remedy them since the 1990s should not be abandoned in a rush for growth on 'the new frontier'.

A clear, comprehensive and manageable policy framework for the north's river basins must be agreed between all stakeholders before development begins.

The NWI sought to ensure that precious water resources are shared for the public good, balance the interests of all stakeholders and address long-term ecological concerns. Agreed by all state governments, it stresses the need to reduce extraction from over-exploited waterways and aquifers, preserve water for environmental and public needs and protect areas of high ecological importance. Its stress on Indigenous water access and Native Title rights is particularly relevant to northern Australia. However, many local plans still suffer from a lack of information and understanding of complex and subtle interplay of water and the environment and the impact of change.

While the costs of storage, extraction and distribution are more likely to fall on private developers in the north, water resources must still be assessed and managed as holistic ecological, economic and social systems[46]. The success of irrigation schemes in Tasmania not only points to alternative areas for investment, but underlines the need for partnership between all interests for success.

Tasmania quantified the value derived from enhancing water security through the creation of tradable water entitlements, which were then sold to the market by the government to finance a part of the capital costs. This approach also allowed irrigators to influence the scale and form of the infrastructure whose upkeep they are expected to pay for, as per the National Water Initiative. Water infrastructure in northern Australia should pass this test, too. There is little point in the government building water infrastructure which its operators cannot afford to maintain.

Although tradable entitlements have become important in the Murray-Darling Basin and helped tackle some of its serious problems, Northern and Western Australia are still to embrace the concept more than a decade after the launch of the NWI. Such economic instruments must be used more widely to overcome some of the problems of public subsidy.

Water storage

Agricultural exploitation of the north has been limited by the extremes of its wet and dry seasons. The wet, from November to April, sees heavy falls, with little or no rainfall in the remainder of the year. Proposals to build large dams on any waterways are extremely expensive and can have major environmental implications, and locations suitable for such schemes in the north are few in number and located some distance from potential agricultural land. The pumping of water into shallow natural aquifers during the wet season and its reclamation during the dry has therefore been proposed as an alternative; as such schemes have been undertaken with some success elsewhere. Such proposals accept that passive recharging would be more economic than active pumping but argue that artificial pumping would still be significantly cheaper and less ecologically disruptive than the building of dams. However, research by the CSIRO suggests that 'there is little potential to replenish shallow aquifers' through managed aquifer recharge.

Shallow aquifers 'fill and spill' with the seasons and the time, during the dry season, when they have the capacity to accept more water is therefore inevitably the time when there is no surface water to be had. In addition, much of the terrain has a hard laterite crust, limiting the usefulness of inexpensive infiltration pits which would be dug to fill with rain during the wet season and infiltrate the aquifer. More expensive injection wells would therefore be required, potentially tipping the already marginal

balance of economic viability against the operation. Yields from pressure injection would be greater than passive methods, however, and could justify the higher capital and operational costs. Such projects would have to be assessed on a case by case basis, given their reliance on local conditions and potential agricultural gain. Salisbury in South Australia offers an example of such a scheme in successful operation.

Soil

Infrastructure, technology and innovation are at the forefront of the debate regarding Australia's future, but life in the country relies on healthy soils. Maintaining and improving soil quality is essential in agriculture, but, as with water, is equally important for biodiversity and ecological sustainability. Australia's geological stability means its ancient soils lack the minerals churned up by volcanism and glaciers in Europe and North America, and those in the north have been weathered by heavy tropical rains for millennia. They tend to contain relatively little organic material and retain only a fraction of the rain they receive. These soils are fragile and, when denuded of natural vegetation by grazing or clearing and disturbed by domesticated animals, are prone to erosion by wind and rain. Such soils tend to form an impervious crust in the dry season, reducing the effectiveness of irrigation.

The poverty of the soil beyond the floodplains, alongside the region's remoteness from major population centres and its extremes of season, climate and weather, explain its limited exploitation for horticulture. Although new technology and techniques can ameliorate some of these problems, the root issues remain. Bodies such as the Australian Soil Resource Information System have assessed small areas for their agricultural potential since the Second World War, but detailed information is still limited to small areas which may give a misleading view of the overall picture. Just as early settlers in the region mistook the relative lushness of undisturbed areas for proof that such land could support European farming techniques, so the most optimistic assessment of the most fertile plains should not be relied upon in planning for the region as a whole.

Agriculture everywhere in the world tends to favour flat land with rich soils and abundant water. The North is no different and so development schemes have focused on the Daley River basin in the Northern Territory, Western Australia's Fitzroy River, the Ord river in the Kimberley and western Cape York in Queensland. However, other factors on flood

plains, such as their vulnerability to flooding, must also be taken into account, and the area which can be sustainably cultivated without outlandish investment, unattractive risk or serious ecological damage is limited. Large projects in the Ord River, for example, are still hampered by poor access in the wet season, nutrient depletion and increasing salination. Soils with a poor ability to hold water also increase the run-off of fertilisers, herbicides and pesticides into streams and rivers, contaminating natural environments on which the livelihood of fishermen and tourist operators depend.

Agricultural development must be preceded and supported by the assessment and long-term monitoring of soil condition and effects. This will help to identify the impacts of land degradation processes, such as land clearing and irrigation and signal the need for early intervention and adjustment of land management practices if required. The development of accurate yet affordable local soil maps, as championed by CSIRO, will enable investors to identify areas suitable for development and avoid those which are not, while helping public authorities to safeguard regions of particular ecological sensitivity or value. An integrated national policy to protect and improve Australia's soils and landscapes, balancing agricultural, environmental and social needs, would enable sustainable and enlightened management. This should be empowered by the collection and analysis of a wider range of more detailed data using modern technology. While CSIRO and the States and Territories should continue to improve and extend their soil maps, drones and satellite photography can track fires and changes in water and vegetation every few days. All sources of information should be combined into a detailed and constantly updated database to inform land use planning and rational decision making in the public interest. Such data aggregation techniques could also be exported overseas.

The soils of northern Australia should not be exploited, exposed and abandoned in a modern application of primitive 'slash and burn' techniques. If long-term growth and prosperity is to be achieved, the soil must be nurtured by development, rather than destroyed. Protecting and regenerating the soil will reduce risk for farmers and investors and secure yields in the future[47].

Weather

Extreme weather events are an element of risk throughout the country. Storms, floods and cyclones can devastate entire agricultural areas, and while such events have always occurred, their incidence and severity may increase with climate change. Northern cyclones and tide surges may become more intense, threatening the growing population of Townsville and other towns in Northern Queensland, while the arid winds of the dry season could intensify in the Northern Territory, threatening ever more intense bush fires.

Australia's vulnerably to extreme weather events and its recent spate of floods, storms and droughts should inform a cautious approach to expensive development in potentially vulnerable areas. An area's exposure to the effects of climate change and shifting weather patterns offers another area to score in the development of 'investment scorecards', as detailed in this report. A great deal of data is collected by research bodies, insurers and government departments and should be integrated to reduce the risk of developing areas prone to such threats.

Diverse Sources of Growth

Mining

Mining in northern Australia generates ten times the value of its agriculture and has considerable scope for further expansion. It is a significant industry in the Northern Territory and at the heart of the state government's plans[48] to generate wealth and create jobs.

Although dependent on demand from China and the rest of Asia and affected by fluctuations in financial markets and local factors, mining for base metals and bauxite should continue to grow in long-established areas such as the North-West Mineral Province and the Western Cape regions of Queensland, while new areas of interest include the rich mineral resources of the Kimberley. The development of offshore gas fields and their associated onshore infrastructure will also be strong, while reserves of copper and uranium could also be exploited.

While most mining operations are undertaken in remote locations, several northern towns rely heavily on the mining industry. These include Mt Isa, Weipa and Cloncurry in Queensland; Jabiru, Alyangula and Nhulunbuy in the Northern Territory and Kununurra in the Kimberley. However, the adoption of 'fly-in fly-out' operations from the 1990s has reduced the infrastructure associated with new developments. The loss of copper smelters at Mount Isa and Townsville which proved uneconomic in the face of international competititon was a blow to their localities, and over a thousand jobs were lost when Rio Tinto shut its large alumina refinery at Gove in 2014. Conversely, mining companies increasingly employ local labour and contractors where they can, rather than pay higher salaries to attract workers from elsewhere.

Relations between mining companies and Indigenous peoples have improved substantially since the passage of the Native Title Act 1993 and better industry efforts to give Indigenous people employment and business development opportunities. There should be continued efforts to leverage greater benefits from mining developments for remote Indigenous communities, as more than 80% of mineral value in the Northern Territory comes from mining on Aboriginal-owned land.[49] Around a third of Aboriginal land is being explored or under negotiation for its mining potential.

Although mining does damage the local environment, its effects are localised as the industry absorbs only half a percent of the region's land. The ecological effects of mining are subject to stringent legislation, in contrast to cattle grazing, and resource companies fund environmental management schemes in return for extraction rights and public goodwill. Graziers can benefit from mining-led investment in water extraction, remote sensing and other technology. Mining corporations are also leading the deployment of autonomous transport and other technology which will have increasing applications in the agricultural sphere.

Closer alignment with regional planning processes and greater coordination of development in mining regions, such as the Western Cape and North West Queensland, would allow more effective use and management of energy and water resource and minimise or ameliorate damage to the environment. Planning must also encompass the consequences when local mining operations close. Initial economic gains should be used to invest for the long term through infrastructure, workforce skills and a diversified economic base.

Tourism

Tourism and hospitality is one of the five industries in northern Australia with the most potential for growth identified in the Australian Government's 2015 White Paper. and already generates a tenth of the region's income and employment. The Coalition has set a goal of 2 million international visitors to the north by 2030, a figure which appears achievable as Northern Queensland already attracts almost 1.5 million a year. Tourism relies on clean waterways, good fishing, natural landscapes, abundant wildlife, plentiful seafood and an experience of Indigenous and European cultural history, all of which should be safeguarded in plans for wider agricultural development.

Given the complex and extensive interactions between water catchments and the ecosystems they support, the effects of greater water extraction for irrigated agriculture on aquifers, rivers and estuaries could be felt hundreds of miles away. Plans to attract higher tourist numbers must therefore inevitably incorporate planning for region-wide environmental protection, including the World Heritage-listed rainforests of the tropics or Queensland's Great Barrier Reef whose corals are already compromised by agricultural runoff from the region's sugar industry.

While the north attracts younger thrill seekers from home and abroad and tourists from Japan, China and Korea, a significant and increasing proportion of visitors to the Kimberley in Western Australia are domestic, child-free self-drive travellers in their forties, fifties and sixties. Tourism can be developed not only by promoting new activities in existing tourist areas and opening new areas to tourism, but by marketing these attractions to new tranches of people. Whatever their differences, all these visitors are attracted by the north's pristine areas of outstanding natural beauty and therefore they, and their free spending time in the region, will be lost if such landscapes are damaged by commercial and agricultural activity elsewhere.

Natural flows of water are as central to the health and prospects of the tourist industry as their exploitation is to the expansion of irrigated agriculture. Far from such water being 'wasted', it is the resource which creates the imposing landscapes of the national parks and nourishes the fishing and wildlife which tourists come to experience. Recreational fishing for mud crabs, prawns, barramundi, king threadfin, grunter, mackerels and sharks all depend on natural flows, while groundwater extraction can lower water tables and destroy the wetlands which attract bird-watching tourists.

The growth of tourism, like agriculture, depends in part on the provision of better infrastructure and services. The improvement of government-funded major roads in the region will serve the interests of both, while better, privately funded camping and accommodation facilities will encourage more visitors. Other improvements could be made at modest cost to improve the visitor experience. Better signs, more fuel and food outlets; more parking bays at popular sites and improved waste disposal facilities can make a significant difference and boost visitor returns and recommendations to their friends. Fees for publically funded amenities such as waste disposal, boat ramps and parking could cover these extra costs. Tourism creates more service job opportunities for local people than massive agricultural developments, bolstering local economies and encouraging positive attitudes.

Increasing tourist numbers will have less environmental impact than agriculture or mining, and the industry has an interest in preserving the region's natural beauty. Tourism requires relatively small amounts of land clearing, for example, and increased levels of water use are unlikely to have permanent negative impacts on waterways.

Issues and Opportunities

The costs and benefits of northern development schemes should be tested against objective evidence before they are implemented, given their potential burden on the public purse, risks to private investors and long-term environmental consequences. A wide range of issues, barriers and opportunities must be considered to optimise outcomes for all. The impacts and benefits to the rest of Australia also need to be considered. There are many sectors where investment could generate growth, and massive irrigation schemes are not the only option for change.

While properly researched and targeted agricultural developments could help achieve the government's goals, the underlying factors which have inhibited horticulture in the north for two hundred years are not dispersed with a wave of a policy paper. Investment opportunities exist, but they must compete in a competitive commercial marketplace for private funds and with other pressing public needs at a time of greatly constrained public spending.

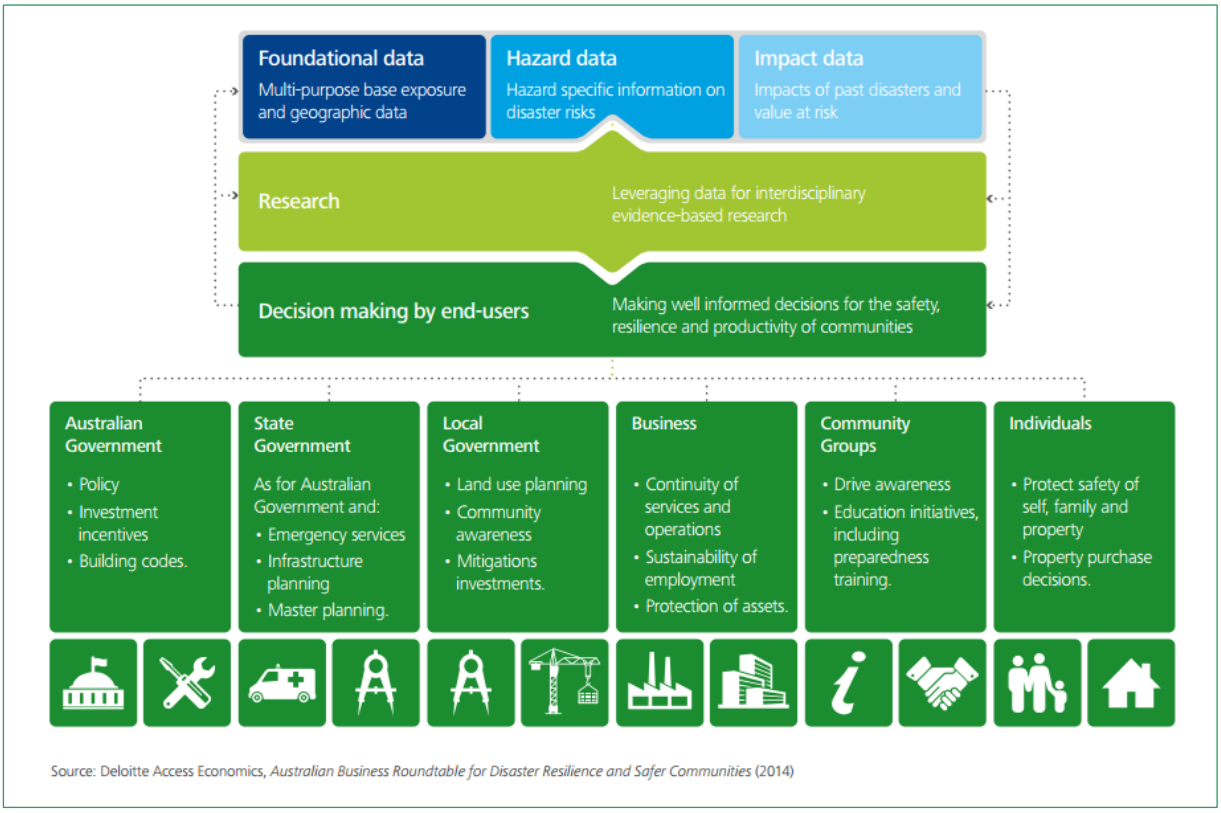
The vast bulk of Australia's population and horticultural production is based in the south, and electoral and economic realities may refocus attention there before wider plans for the north move beyond the drawing board. Growth across northern Australia in many sectors is already strong – running at twice the national average – and this ongoing expansion may prove more significant and sustainable in the longer term.

National Database

The Government's White Paper emphasises the need for greater data and certainty to encourage investment. The National Map Open Data Initiative has been enhanced with a northern Australia layer which gives users access to a single platform for State, Territory and Commonwealth geospatial datasets relating to the region. It will provide information on land, water, infrastructure, broadband access, population and more. The NT Government is investing $12 million to map, describe and report on the land, soil and water resources suitable for agricultural use across a range of land tenures, including pastoral leasehold land, Aboriginal Land Trusts, Crown and private land. This information will provide greater investor confidence and de-risk potential developments. The Government will invest $75 million in the CRC for Developing Northern Australia to help

business, government and researchers to work together to find northern solutions to northern problems.[50]

Deloitte's 2014 paper *Building an open platform for natural disaster resilience decisions* provides a comprehensive framework required for optimal decision-making on resilience investments.[51]



Picture 3: Data and research inputs for optimal decision-making on resilience investments, Deloitte

Policy Coordination

The Australian Department of the Environment is looking at ways to reduce red tape and green tape impediments to development. However, in a rush to fast-track agricultural schemes, it should not be forgotten that such legislation exists to protect environmental standards. CSIRO's Northern Australia Land and Water Science Review 2009[52] did not find that issues between State, Territory and Commonwealth Government would hamper

joint approaches to water management across jurisdictional lines, and similar cooperation should be sought on other issues.

For all the painstaking efforts to overcome them, legislative and regulatory inconsistencies between states, and between states and federal policies, still hamper trade and development around Australia. The changes wrought by a fresh administration also inevitably affect businesses which depended in part on a previous policy regime. Such problems are by no means confined to the north. Goulburn has seen significant investment in wind energy which is now at risk because of a review of renewable energy targets. All too often it is short-term political advantage in a marginal seat which drives public investment decisions, rather than any rational calculation of an area's potential or its place in an integrated national development scheme.

The most productive and successful commercial irrigation scheme in the last five years occurred in Tasmania. The Tasmanian scheme succeeded because central and state government and the irrigation industry collaborated in rolling out substantial new developments. The Tasmanian experience should be instructive for the north, the history of which is littered with failed schemes undertaken by isolated stakeholders. Given the costs and complexities involved, an integrated approach offers a much greater chance of sustainable success. To gain and maintain broad community support, investment outcomes must be consistent with a range of state and federal policy priorities and commitments, including biodiversity, landscape resilience and Indigenous development.

Indigenous Community Engagement

Indigenous rights, culture and aspirations must form an integral part of any holistic approach to northern development. Indigenous people have lived in the region for 40,000 years and account for a third of the Northern Territory's population, yet their interests and voices are still marginalised in development discussions.

The engagement with the Indigenous land owners will be critical to success of any systematic development of northern Australia, because:

- Around 45% of the Northern Territory and around 85% of the Territory's coastline is Aboriginal freehold land. Almost all of the remainder of the Northern

Territory, excluding cities and major towns, is subject to positive Native Title determinations or claims.
- Almost all of northern Western Australia is subject to positive Native Title determinations or claims, as is a significant proportion of northern Queensland
- Each of these States or Territories also has heritage or sacred sites legislation that provides protection to Aboriginal sacred sites.

Accordingly, Indigenous people are crucial stakeholders in any discussion about the development of northern Australia. Whether they are the freehold or exclusive Native Title owners, and thus have a veto right over any development, non-exclusive Native Title holders who may have a right to negotiate in relation to development or because they are the custodians of a sacred site and therefore play a role in development decisions, they must be included in planning and decision making throughout.

Agricultural and other development schemes must consider indigenous Interests alongside their own commercial calculations. The benefits and costs of change to Indigenous communities must be balanced alongside other ecological and economic priorities, and local Indigenous people must be included in the planning and operation of schemes as well as receive a fair share of its benefits to secure their support. Economic and social benefits such as training and employment schemes should be a part of contract negotiations, for example, alongside incremental profit payments.

While the White Paper on Developing Northern Australia focused on the complexity of land tenure arrangements as a major factor slowing or discouraging progress, development can and does occur within the existing land tenure framework. Indigenous people often welcome investment , provided they are engaged from the outside and shared development goals produce joint benefits. If Indigenous people support a project, then the veto or negotiation rights held by them will not present a barrier to development. A highly efficient government leasing project in the Northern Territory in 2012, for example, saw thousands of leases relating to all government infrastructure in all major communities rolled out in an extremely short timeframe.[53]

Indigenous people are not and never have been a homogenous group, although they are commonly referred to as a collection. Views and attitudes may vary widely between different communities, settlements or family groups with regard to development or any other issue. Whatever their individual views or interests, however, Indigenous Australians

tend to agree on the importance of avoiding damage to the land or sacred sites, want their voices heard and acted upon in decision making and to benefit from developments on their land and exploitation of its resources. Since 2013, Aboriginal organisations have increasingly supported economic development on their lands and have taken steps with joint venture partners, but they underline they want to benefit from upstream economic opportunities. Not only does engaging with, and encouraging the involvement of, Indigenous people in any plans for the development of northern Australia fulfil the Commonwealth's Indigenous affairs strategy of increasing economic participation, it is therefore a necessary precursor to use of that land.

Land and water tenures in the north can be complicated by overlapping claims or legal rights and the evolution of new water and carbon schemes. Tenures can vary between different jurisdictions, and the resulting uncertainty remains a barrier to investment, although cooperation in water management shows what can be achieved through well-intentioned partnerships across political boundaries. In addition to issues of social justice, water and property rights, the co-management of resources and environmental protection, the basic needs of Indigenous people also remain vital goals for development. When the spending of vast sums on new irrigation schemes for horticulture is contemplated, it should be remembered that some Indigenous communities in the north still lack access to clean, safe drinking water. As well as improved provision, however, sensible pricing policies and an open discussion of the responsibilities of small groups that choose to live in separated communities are a necessity. While Native Title does not grant exclusive water rights to the land's traditional owners, Indigenous lifestyles often depend on natural and unspoilt resources of fresh and salt water.

The proper use of the north's resources should improve the social and economic conditions of traditional settlements and help to 'Close the Gap' between Indigenous people and their fellow Australians. Conversely, if an approach is taken where Indigenous people are consulted with as an afterthought in land use planning, rather than as a major stakeholder, conflict, delay and complexity will inevitably delay development. Government, commercial and Indigenous interests will all benefit from cooperation and a willingness to share decision making and rewards will maximise utility and returns for all stakeholders.

Ecological Impacts

While its wider agricultural potential remains uncertain and contested, vast sweeps of northern Australia, from Cape York to the Kimberley are internationally renowned for their unique and largely unspoiled ecosystems. Just 6% of this area is currently protected from development in national parks[54], and while governments are often urged to 'think big' by developers, they have another responsibility to 'think big' in terms of protecting such areas for the global community. Ecosystems which have evolved over millions of years can be permanently damaged or destroyed by hasty and ill-conceived development, and while investors will move on from one failed scheme to richer pickings elsewhere, the effects on local communities can be permanent. Coalition plans for the region underplay the region's environmental importance or its central role in attracting and increasing the lucrative domestic and international tourist trade. Tourism tends to create more local employment opportunities than modern mechanised agro-business and has a far smaller ecological footprint. Similarly, agricultural development would affect Indigenous livelihoods and land management. Carbon sequestration projects, such as those underway through Arhmen Land, Kimberley and Cape York, and the techniques involved in rotational cell grazing offer alternative ways of unlocking value in such land without degrading it.

Intensive agriculture based on irrigation results in vegetation clearing and habitat fragmentation. Large scale clearing can cause localised declines and extinctions of species while feral animals and pests tend to spread from agricultural areas into surrounding ecosystems. The most attractive areas for agricultural development tend to have the greatest biodiversity and, given the problems which are caused by unwise land and water management elsewhere in the country, properly applied policies for responsible land management are required.

As 94% of the north is not protected, many ecosystems and habitats are under threat. An extension of agricultural development should be accompanied by an expansion of the area protected in national parks and developed for tourism and other non-damaging but high-value activities. Even an area as large as Kakadu National Park is not large enough to protect the full ecosystem which it depends upon, and just as developers call for vision and scale in their schemes, so equal imagination should be shown in the realm of conservation.

Climate Change

The direct effects of man-made climate change are likely to render the north's hostile and variable climate even more difficult for cropping. However, the same climatic factors may increase pressure to develop the north if long-standing drought tightens its grip on the south and demand for Australian food exports grows if production declines elsewhere in Asia. Higher prices for its produce may make the development of marginal land more economically attractive, despite its practical and ecological viability decreasing. This will increase both the risks and rewards of development, raising the stakes for both governments and developers alike.

Comparative Advantage

Sustainable regional development cannot depend on the success or failure of competitive supplications to central government for more money. Undue reliance on the public purse creates a culture of dependency, atrophies local initiative and responsibility and leaves regions bereft when such support is withdrawn, whether they are remote Indigenous communities or modern agro-business schemes. Regions across Australia, including the north, must identify and strengthen their own comparative advantages. These are far broader than mere geo-physical resources and can be self-generated through better managed regulation and investment in education and skills.

Strategies to improve competitiveness should not be reduced to driving down wages to minimise costs. Australia will never be able to undercut wages in Asia, and the point of economic growth is to enrich, rather than impoverish, the population. Comparative advantages evolve over time, and new opportunities must be seized with despatch as their lifespan is brief in today's fast-moving global economy.

Australia should not lock itself into relying on certain industries, however easy or superficially attractive that may appear. Any sector can stumble in the near future, whatever its current strength, as the unexpectedly early slowing of the mining boom shows. The success of Australian tourism and education in attracting Chinese customers shows the value of a diverse and dynamic national portfolio. The greatest comparative advantage of all may be nimbleness in response to change.

Defence

Australia takes pride in its ability to defend itself without undue reliance on its traditional allies, and the rise of Chinese naval power underlines the importance of maintaining Australia's military capacity. The problems caused by organised people smuggling from nations to the north are also likely to grow over time, whatever the status of international agreements or more draconian internment solutions. These threats demand the maintenance and perhaps expansion of the Australian Defence Force's presence in the north, given the region's strategic significance in national defence. As well as controlling strategic air and sea approaches, the ADF's presence in the north facilitates its contributions to emergency and humanitarian relief at home and abroad, supporting the stability on which exports and economic growth depend.

The ADF has maintained a base in Darwin since 1934 and remains a significant landholder, investor, local service contractor and employer in the region. It is directly responsible for 8% of the Northern Territory's GDP[55], and indirectly generates the same amount again through its activities. Bases in Katherine and Queensland's Townsville make substantial contributions to their local economy, and the establishment of a similar establishment near Broome in Western Australia would have similar benefits as well as boosting national security.

Improved civilian infrastructure, including railways, pipelines, roads and ports would also benefit ADF operations, and closer consultation and cooperation between civil and military authorities would improve planning, investment and use. Plans for civilian development could be assessed for their military utility, for example, as well as their environmental impact. Authorities in the Northern Territory encourage the clustering of industrial development around military establishments for the benefit of all stakeholders as a driver of future growth.

The expansion of military training grounds in the north could also be contemplated, with calculations of benefit including their protection from more invasive development. The Yampi Sound Training Area retains high biodiversity due to the elimination of feral animals, its sanctity from grazing, relatively low military use and the ADF's strict environmental protocols.

The ADF is the largest employer of Indigenous Australians in the Northern Territory and supports Indigenous communities through community assistance programmes which have surveyed and improved housing, water, sewage and power as well as roads and airfields. The number and funding of such projects could be increased to improve Indigenous amenities and human capital.

Domestic Investment

Pressure for development on economically or environmentally marginal lands often follows the boom-bust cycles of national and international economies. Private investment inevitably follows that same pattern, and the history of the region shows that interest is usually driven by external factors, rather than its inherent potential. Security – be it national, food, economic or energy security – tends to drive recurring bouts of government interest, but the lack of safe and predictable private profit in these distant and challenging lands constantly inhibits major commercial attention. This leads to grand plans being made, but petering out when governments change or their agenda moves on as they are not internally driven and supported by commercial self-interest.

As a result, Australian investors still show little interest in the north beyond its dominant resources sector. They see more attractive options elsewhere, both domestically and abroad, and fear the risks of substantial engagement. A dearth of successful examples in the past and a failure to comprehend the new opportunities of the future, combined with suspicion over long-term government commitment and the difficulty of executing remote schemes, means that strong evidence-based arguments will have to be made to encourage private capital to support a Coalition drive in the region. Many northern farmers lack access to the capital required to invest in improving their own productivity, and so the lack of certainty and confidence which inhibits outside investors must be overcome.

Securing significant new investment in northern agriculture may depend on more than selling the scale of opportunities there and minimising the risks that attend them. Much of the development which has taken place over the last hundred years has been subsidised or generated its income in ways which had little to do with agricultural yields. Many high-profile private agricultural companies had business models which depended on large profits from rising property values and share prices and enthusiastic government support. The

failure of such companies when the bubble burst or the government lost interest is a recurring theme in the north's economic history.

However, the past cannot be relied upon to predict the future. The commercial potential of high value exports to Asia's rapidly expanding middle class is increasing interest and involvement of investors. Private investors are particularly interested in packaged foods and meat businesses and they account for almost four fifths of global private equity deals in the sector. TPG Capital purchased Ingham Enterprises, one of Australia's biggest poultry producers, for $880 million in June 2013[56], and other buy-outs are occurring. Given the north's position as a major beef producer and the opportunities for reducing transport costs and adding value by finishing cattle and processing the meat in the region, the north is ideally placed to encourage more investment in its meat production and processing capacity. Such buyers tend to look for companies with strong brands which can improve their portfolios and sell into Asia. Australia's trade agreements with Japan, South Korea and China have boosted opportunities for Australian cheese, beef, horticulture and wine and will make these companies more attractive to foreign investors. Private equity firms have also show interest in food distribution businesses, with Bright Foods Group acquiring 75% of Food Holdings from CHAMP Private Equity for about $516 million[57].

Direct investment in major irrigation schemes – in contrast to rotational cell grazing or mosaic irrigation - requires large sums of both private and public investment to succeed, given the size and remoteness of the locations involved and their lack of existing infrastructure. Relatively few investors have the means to contemplate these major projects alone and so depend upon other investors whose commitment or motives they may not entirely trust. Entrepreneurs will not risk their money, if safer and equally lucrative opportunities can be found elsewhere. It is a bold decision maker who chooses such options when there are established markets, extensive infrastructure and skilled workforces freely available in more developed and accessible areas to the south.

If the risk profile of agricultural investment in the north could be substantially altered, investment could flow in, given the market opportunities and resources available. A host of recent proposals have been made, but they tend to depend on generous levels of government investment which is unlikely to be forthcoming. Proposals which revolve around the public purse bearing the lion's share of the costs while private investors reap the rewards with minimal risk to their equity will certainly secure short term commercial interest, but history shows they produce little long-term benefit.

Every political generation tends to underestimate the complexity and difficulties of the issues involved and believe their 'fresh approach' will overcome the fundamental problems which defeated their predecessors. A new 'vision' must offer more than revamped justifications for developments which failed on the ground when attempted before.

A rational investment strategy for both the public and private sphere should begin by considering why northern Australia should be focused upon, given the needs, proven capabilities and potential of other regions. Agriculture in the north has undoubted scope, but plans for its development tend to beg the question of why commercial investors did not find them viable before. Major mining companies require no government green lights or white papers to make profit from mining ore, but the question in other sectors is whether a dollar invested in the north would earn more than the same amount invested with less risk elsewhere.

Data analysis of a major bank's agricultural lending in 2010 shows that returns from the top 20% of farmers were significant, and that an investment portfolio of agricultural investment, cash and shares could produce respectable returns for relatively low risk. However, the business case collapsed when considering the lower performing 80% of farms. Traditional methods of northern beef production can only support relatively low levels of financial gearing, underlining the need for improved methods, such as intensive cell grazing, to boost yields.

Ultimately, capital will flow to meet opportunity in a free economy, and growth will flourish at the intersection of technological knowhow and financial opportunity. Government provisions and incentives can prepare the ground, but enterprises must succeed or fail by their own merits. There is little point ending the subsidy of failing manufacturing firms only to create new supplicants in the agricultural sector. Cooperative projects between all levels of government, commercial investors and local communities could revitalise not only the north, but the entire Australian federation; however, they must be commercially viable propositions which produce public benefit as well as private gain.

Food Security

Humankind's primary concern has always been the security of its food supply, and concerns about food security in the 1960s led to an earlier spate of calls and projects for northern development. While concerns of mass famine in the developing world have abated as population growth declines and agricultural production increases, new issues of climate change have returned the issue to the political agenda. If existing areas of prime agricultural land are threatened by the effects of climate change and unsustainable management practices, further irrigated cropping in northern Australia could become a more viable option for farmers and investors.

Fire Management

Indigenous groups have developed new income streams by returning to traditional burning methods to reduce the frequency and intensity of late season wildfires. Uncontrolled conflagrations at the end of the dry season can destroy huge areas of native vegetation and release vast quantities of carbon dioxide to the atmosphere. Controlled early season burns can break up vulnerable areas, and Indigenous people are often best placed to undertake them. The Australian Government supports further measures to breathe life into these initiatives, perhaps the only climate change measure with bipartisan support. The shift from Labor's fixed carbon price to an auction for credits has created some uncertainty for such schemes, but a more dynamic market should encourage the activity to the benefit of local communities, traditional owners, and the local and global environment.

The Indigenous Land Corporation has sold 80,000 carbon credits to Caltex for over half a million dollars since 2011[58], for example, through a savannah burning and carbon farming project on its Fish River station. A more dynamic carbon market, including a public Emissions Reduction Fund to buy credits from such projects at a benchmarked price established by reverse auctions, should encourage their spread.

Partnerships between industry groups looking to reduce carbon liabilities and Indigenous land managers have proved successful in West Arnhem Land. Fire abatement funded by credits bought by Darwin Liquefied Natural Gas has reduced aggregate greenhouse emissions, created job and education opportunities for Indigenous rangers and improved conservation outcomes for native plants and animals.

Foreign Investment

A 2012 report by McKinsey Global Institute predicted that that Indonesia could become the world's seventh largest economy by 2030[59]. The Government's White Paper notes that Indonesian investment in northern Australia's cattle exporting facilities strengthens mutual understanding as well as stablising access to Indonesian markets. The second largest country in East Asia, Indonesia is of growing political and economic importance and its proximity to the north makes it particularly relevant to its development.

China is investing billions of dollars in development within its own borders, building the equivalent of a new city every few weeks, and is buying vast swathes of resources, political influence and mineral rights around the world. Recent proposals for agricultural development in Australia have ranged in cost from $500 million to $1.85 billion, much of it required from private investors, and so foreign investment from China and elsewhere is inevitable, if they are to succeed. Given the shortage of regional capital and long-standing lack of interest shown by Australian superannuation funds in domestic investment, the securing of substantial foreign investment, particularly from China, is fundamental to the success of northern development schemes.

Significant Chinese investors, buoyed by remarkable economic growth at home and their dominance of manufacturing assembly and export markets, are demonstrably interested in new areas to invest in and view Australia as an attractive destination[60]. Furthermore, Chinese investors often operate differently to western norms and, having profited greatly by dynamic growth and decision making in recent years, are much more willing to take on risk than their more cautious western counterparts. Asian investors look to diversify their interests and have plenty of capital to invest in seemingly unrelated or speculative schemes - a Chinese coal company might invest in a vineyard or aquaculture, for example.

The free-spending and risk-taking nature of some major Asian investors can also lead to their exploitation, rather than automatic access to the right kinds of opportunities. They have often been lined up with projects with poor prospects of success, a process convenient for those promoting a particular scheme in the short term, but likely to dissuade further investment elsewhere. Investors who have bought into publically supported projects with the assumption that they would be well planned and viable are unlikely to repeat their mistake if this proves not to be the case.

The attraction of such interest cannot be taken for granted, and Australia's business and social environment must be made more welcoming for them. Australia is still seen as suspicious of Asian investment in agriculture and in particular land sales. Although local communities which would directly benefit tend to be less hostile than southern metropolitans who do not, it is at the federal level where strategic decisions are made. The resistance to major foreign agricultural investment tends to ignore the reality that the resource industry is already 70% foreign owned; however, the consequences of handing large areas of prime agricultural land to interests ultimately controlled by an expansionist, self-interested and potentially hostile foreign power cannot be brushed away as inconsequential or irrelevant to the Australian national interest.

Free Trade

A continued pursuit of global and bilateral free trade agreements is vital to northern development as it will open further markets for its produce in the future. The recently signed free trade agreements with Japan, South Korea and China offer new opportunities, and agreements with more countries should be sought in the future. The inclination towards cultural insularity and economic protectionism has declined in recent years, but not completely abated, and the Government must steadfastly ignore the pleas of particular interest groups in favour of free trade principles which ultimately benefit the whole nation.

Insurance

High insurance premiums symptomatic of the north's exposure to natural perils contribute to high cost of living in the region. Insurance supports long-term economic growth and plays a critical role in underpinning economic development, investment and innovation. The provision of adequate levels of general insurance cover, access and availability in the region is heavily influenced by where and how development occurs.

Future development should be risk-appropriate and adapt to weather volatility, in combination with additional measures to increase community resilience. Consideration should be given to the frequency and severity natural perils in the region, and of the social and economic impacts of natural disasters.

Better assessment of insurance risks, prompted by more research, further examples of successful projects and greater competition for insurance cover, could reduce the burden. The adoption of resilient and context-appropriate infrastructure and approaches by developers should also be acknowledged, and therefore encouraged, by insurers in the shape of lower premiums. Lessons must be learned from poor planning and development decisions in other regions and risks and insurance premiums reduced by more modern approaches. Northern Australia could offer a 'blank slate' for planning and development tailored to Australia's weather and climate, rather than a repeat of the past.

The following chapter was contributed by Insurance Australia Group. It draws on the data from the 2014 submission by NRMA Insurance and CGU to the Joint Select Committee on northern Australia.

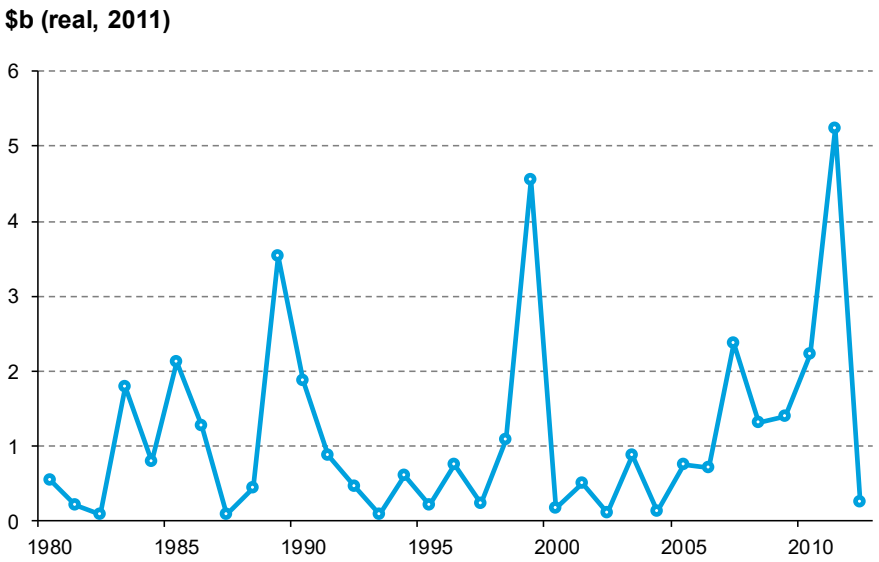
NORTHERN AUSTRALIA AND INSURANCE

As the strategy for the development of Australia's North is created, an important consideration will be ensuring that people and property are adequately protected from the risks of extreme weather events which are specific to northern Australia.. Uptake of appropriate insurance is also dependent on the community's understanding of the risks it is exposed to. Ultimately, our recommendations centre on building a resilient society in northern Australia to limit the social and economic impacts of natural perils.

In Australia, there has been an upward trend in natural disaster costs, particularly since 2000 (refer to graphs below). The natural disasters of the past five years in Australia have caused billions of dollars of damage to private property and public infrastructure. Even before the events of the last five years, Australia's annual average of insured losses due to natural perils was estimated at around $1 billion.

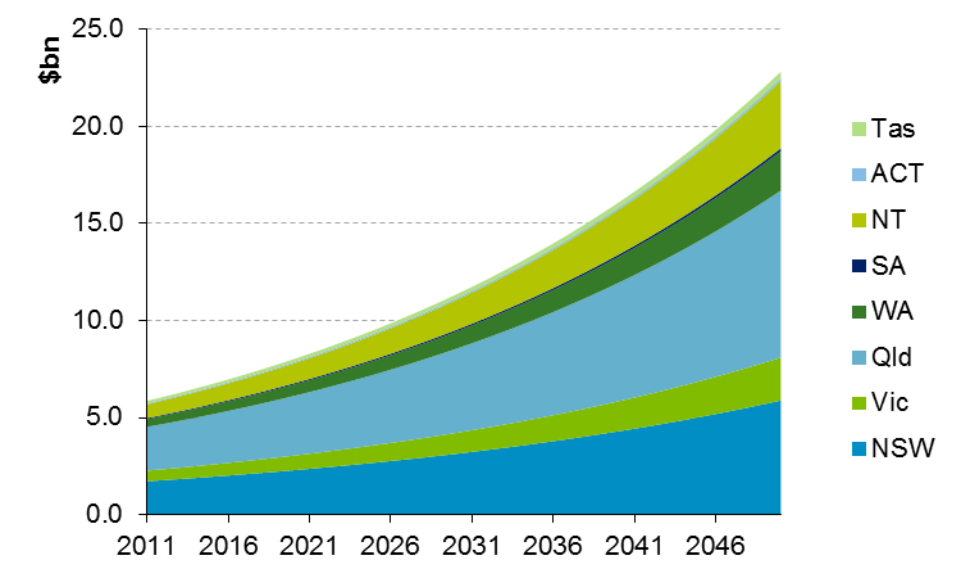
A focus on North Queensland (NQ) can help illustrate how development decisions can directly influence the cost of insurance. We believe the lessons learnt in North Queensland are pertinent to the other areas of northern Australia.

Insured costs of natural disasters, 1980-2012



Source: Insurance Council of Australia (2013)

Forecast of total economic cost of natural disasters: 2011 - 2050



Source: Deloitte Access Economics, Building our Nation's Resilience to Natural Disasters, Australian Business Roundtable for Disaster Resilience and Safer Communities, 2011.

North Queensland – Case Study

"North Queensland" is defined as the Marlborough region around Rockhampton, together with areas in and around Mackay, Proserpine, Townsville, Ingham and Cairns.

Flooding and tropical cyclones are Queensland's most damaging natural hazards, accounting for about 72% of all building damage and 95% of all fatalities between 1900 and 2011. Damages to buildings from storms were responsible for a further 27% of damage. Flooding alone accounts for 50% of building losses and 43% of fatalities. Most flood damage (82%) has occurred in NQ and Southeast Queensland. Most fatalities from natural hazards have occurred in NQ due to cyclonic winds and storms.

NQ has experienced a number of high-frequency, high-impact events including; Tropical Cyclone Larry (2006), Tropical Cyclone Yasi (2011), Storms and Floods of Oswald (2013), and the Mackay Floods (2008). While Queensland has long been exposed to natural hazards, the frequency of extreme weather events and their level of destruction appear to have risen significantly since 2006.

The Australian and Queensland Governments have incurred over $7.5 billion in reconstruction and recovery costs related to the 2010-11 Queensland floods and Cyclone Yasi. Insurers have paid out more than $3.7 billion to policyholders for the same events.

The increased economic and community impact of natural perils in Queensland is due to increases in population density and property development, especially in areas that are prone to natural disasters such as coastal areas as seen across South East Queensland, as well as regional centres such as Townsville, Cairns and Rockhampton. This means that weather events have a higher economic impact on communities as there are a significant numbers of properties to damage. In addition to the growing number of properties, the increasing value of building and contents and risk-inappropriate construction play a role.

The lessons learned in North Queensland can be applied to northern Australia more broadly.

Policy development in northern Australia should consider the current affordability challenges facing the insurance industry in high-risk areas. These can be addressed in the long term; however, solutions to manage immediate insurance needs are still being explored.

Building a resilient northern Australia

There are a number of key considerations that need to be taken into account when planning for growth and development in northern Australia. The below considerations have been developed from the lessons learnt from NQ:

1. Understanding the risk of natural hazards including access to flood mapping and related data

Reliable access to data and levels of risk ensures appropriate mitigation and retrofitting works can be implemented across the highest risk areas and properties. This reduces the risk and extent of damage for given types of severe weather events. This requires a comprehensive knowledge of the status of the built environment – such as building locations and attributes, and an understanding of mitigation activities such as the raising of flood levees.

An understanding of the built environment can assist in modifying building codes and developing regionally specific stringent codes in sub-regions found to be particularly vulnerable to certain types of damage, such as river flood or cyclones.

2. Building Standards

Our post-event analysis of building damage after a number of major natural disasters indicates there is a crucial role for government to support community resilience by ensuring that new buildings in "at-risk" areas are constructed to withstand hazards such as tropical cyclones, storm surge, severe storms, hailstorms, bushfires and flood.

Until now, building code standards have focused in principle on protecting life and safety. There is scope to enhance building standards so that they also cost-effectively protect the property itself. It is important that building standards are adjusted to withstand extreme weather events based on post natural disaster research.

3. Planning Codes

Risk-appropriate land use planning and zoning will be critical to any strategy

to develop northern Australia. Land that is, or becomes, an unacceptable risk from hazards such as tropical cyclones, severe storms, hailstorms, bushfires and flood should not be zoned for residential or commercial use. Without sound and consistent government controls, there is little to prevent ongoing building in locations of extreme vulnerability.

A critical element of land use planning will be to ensure that the expected impact of climate change on the level of risk in a location is included the assessment of the vulnerability of an area before it is zoned for construction. Assessment of the current level of vulnerability is likely to be insufficient over the lifetime of a building under many climate change scenarios.

Some of the strategies focusing on protecting life and built property are achieved through land use planning and zoning instruments. Strategies include deep setback of buildings from rivers/shorelines; relocation of buildings or infrastructure (including capacity for emergency relocation of demountable buildings); and enhanced monitoring, emergency warning and evacuation procedures. Additional measures available include investment in permanent engineering structures such as flood barriers, canals, dykes, pumps, levees, and importation of fill; plantings (such as dune grasses, mangroves) to absorb water and/or stabilise erosion-prone surfaces; sacrifice of land and land buyback schemes.

4. Hazard mitigation infrastructure funding/ investment

There is a growing body of evidence that investment in mitigation strategies reduces the cost of reconstruction. There must be greater emphasis on building community resilience to extreme weather events by significantly boosting investment in natural hazard mitigation infrastructure including levees, barrages, flood gates and improved drainage that will protect assets like homes and businesses, and lower the cost of risk.

The emergency management community generally accepts that one dollar spent on mitigation can save at least two dollars in recovery costs. Australian Government spending on mitigation initiatives represents around only 3% of what it spends on post-disaster recovery and reconstruction.

Figure 9: FY	Mitigation and resilience[9]	Recovery and reconstruction*[8]
09/10	$21.6M	$402M
10/11	$25.2M	$997M
11/12	$25.7M	$3.8B
12/13	$26.1M	$451.3M
13/14	$21.6M	$1.94B
14/15	$21.6M	$1.16B
15/16	$21.6M	n/a

5. Post disaster financial incentives for more resilient repairs

Consideration needs to be given to an economically viable mechanism to encourage people affected by a natural disaster to have repairs completed that will reduce the chances of a recurrence of similar damage in a subsequent severe weather event. Currently, typical insurance policies replace like with like, and so a damaged insured building is returned to the same level of vulnerability.

6. Community education

Non-insurance and underinsurance continues to be a widespread problem in the community, even outside the segments in which affordability is an issue. A 2012 study indicated around 9% of homeowners were without at least one of building or contents insurance and almost 40% of non-homeowners do not have contents insurance. While a rational calculation of costs and benefits does not necessarily require the purchase of insurance, over a third of the

residents affected by the October 2013 Blue Mountains bushfires were underinsured.

Insurance education can help address the problem of underinsurance by promoting the value of insurance. NRMA Insurance and CGU Insurance have been involved in a number of education initiatives, including You Tube videos, seminars for non-English speaking customers, a web-based learning resource for high school students on disaster preparedness and insurance through the Australian Financial Review online platform and the Get Ready Queensland program with the Queensland Government.

Labour and 'Liveability'

The success of any business ultimately depends on the people within it, rather than the natural or investment resources at their disposal. The human factor in northern development is, like everything else, largely a product of its remote geography. Irrespective of the opportunity, the more remote the project, the less likely it is to succeed, given the difficulty of enticing professionals to go there or finding suitably qualified workers locally. Although local labour can be employed for many everyday operations, businesses often rely on a few key people, and if these are lost, they can be hard to replace, given the shallow nature of the regional talent pool. Vastly profitable mining companies can afford to pay high wages to attract the necessary talent and expertise to their remote seats of operations, but projects with lower margins will not have that luxury.

Studies by the Organisation for Economic Co-operation and Development and similar organisations into regional development habitually stress the importance of investing in the people who live there. Sydney and Melbourne are a long way from the Northern Territory and cannot be relied upon to provide its skilled workforce. Nor should they, for the point of northern development should be to enrich and improve its communities, as well as the nation. Businesses and services based elsewhere have little incentive to expand into northern regions bereft of population, and so investment is hampered in the north as much by its shortage of people as its remoteness or lack of infrastructure.

The absence of such businesses and services further reduces the attractiveness and 'liveability' of northern towns to the experienced managers and engineers required by new projects. It would be far easier to attract the right calibre of people at more reasonable rates to a new project in Goulburn, for example, than a comparatively far-flung region in the north. Building roads and dams to attract private investment will not work if such projects fail for a lack of skilled workers. Such employees are by definition in demand elsewhere and able to maintain a good standard of living. Their choice of workplace, and more pertinently where to settle their families, is therefore driven by social and family factors, rather than the prospects of the actual job.

The difficulty of attracting doctors, teachers and other vital professionals to such regions is widely recognised, and the problems of staffing regulatory bodies and other public or private organisations there are no less acute. The more marginal or remote the project,

the more vital properly skilled and experienced staff are to its success, but the less likely they are to want to go there.

The problem facing major irrigated agricultural schemes may be simpler to remedy, as highly paid, short-term contracts may be sufficient to get them underway and they employ relatively few people once established. Indeed modern agricultural machinery is increasingly autonomous or remotely controlled, with drones, robots, unmanned tractors and remote sensors undertaking many tasks which once required a local labour force. While this obviates staffing problems to some degree, it also undermines the argument that such projects and the public infrastructure spending they depend on benefit local communities or tackle high rates of regional unemployment. In the end, the rapid development of autonomous devices linked through the 'internet of things' may see Northern development achieved by drone overseers, robot labourers and self-driven trucks in the future where humans have failed in the past.

Liveability is a 'chicken and egg' issue as it improves with the scale and additional infrastructure which only more population can bring. The more people move to a place, the more liveable it becomes. The North is a vast and varied region, and some of its locations are inevitably more attractive than others. Building service and industrial development in successful towns such as Cairns, Broome or Townsville may prove the most effective approach in the promotion of businesses which still rely on people.

Leveraging Public Benefit

Private proponents of development argue that additional government expenditure is required to trigger or support private equity investment in the region. However, the opportunity cost of such spending and the public benefit it may benefit must be part of any rational assessment of their case. Governments should at the very least negotiate from a position of strength to secure firm and measurable commitments from commercial entities to support positive social, community and ecological goals and increase support for such investments among all stakeholders. At the start of the Ord river Stage 2 expansion, for example, Western Australia's state government explicitly linked $300 million of infrastructure improvements to the achievement of certain local social outcomes.[61] If Indigenous employment and school targets had not been achieved, then no more capital funding would have been provided. However, while developers often promise public and

community benefits in submissions for government support, there is often a lack of official or independent assessment of their results. Furthermore, there is no study that suggests the substantial public funds invested in Ord Stage 2 have been an economically productive investment. Given their reliance on public support for the success of their investment, commercial investors retained a powerful incentive to achieve these wider social goals. This linking of social outcomes and government infrastructure investment should be expanded throughout the region to build the north. Concrete targets and delivery targets are required however, with meaningful penalties if they are missed.

Markets

The limited scale of northern agriculture beyond the beef industry today can obscure the visibility of larger market opportunities, which in turn deters on and off farm investment. While the north could theoretically produce higher quantities of any number of staple or commodity goods, from annual crops and perennial fruits to rice and cotton, the consensus that specific Asian markets should be targeted with high-value products promoted as premium goods should be acted upon. However, while such niche markets are the 'cream', their long-term financial sustainability requires their underpinning by a substantial layer of commodity-based 'cake'.

While the north is closer to Asian markets than agriculture in the south, this advantage is turned on its head if its produce must still be transported vast distances to southern processors and export ports. As much value as possible should therefore be added to this produce near to its source of supply. Growing animal fodder through mosaic irrigation, for example, to fatten cattle for market on the farm, then processing it locally and exporting it from local airstrips or ports may be more practical and profitable than growing soft fruit which must be transported south for packaging and export. The pursuit of agricultural options such as forestry, which does not require expensive irrigation but could make use of the vast expanse of land available – should also be encouraged, given the constant demand for wood. Developers encourage investors to embrace new ways of thinking, but must themselves consider fresh ideas and alternative options to develop land and maximise its productivity. Just as European methods of farming failed or caused great environmental damage when applied to southern Australia in the past, so southern approaches to farming must be modified or abandoned when thinking of exploiting the very different climates of the north.

A growing number of businesses are working to identify market and trading options for farms and their supporting services, complementing the efforts of organisations, including the Australian Bureau of Agricultural and Resource Economics, CSIRO, state governments, Rural Industries Research Development Corporation, and Regional Development Australia. The biophysical challenges facing development in the north, including the uncertainties around water, soils and agricultural potential outlined in depth in this report, could well be overcome, but without appropriate markets and business models to supply them, such efforts would be wasted.

Rezoning

Developers often argue that growth can be generated without great public expense by rezoning a rural location as a commercial or urban space to encourage private investment. Such rezoning offers a swift prospect of capital gains for initial investors, kick-starting interest and involvement. Money raised from initial land sales could also be reinvested in community projects. An integrated approach could include opportunities for capital gains to attract initial investors, with development contracts insisting on provisions to benefit the community.

The upgrading of roads and expansion of tourism proposed by the Coalition and others would create economically lucrative rezoning opportunities. The Chilean government has successfully used deregulation and rezoning to encourage agriculture, forestry and commercial development, for example. The Lower Hunter Regional Strategy in NSW created a development corridor of residential and commercial rezoning, with developers willing to give up parcels of land for preservation in a natural state to maintain biodiversity as part of the deal. The scheme ultimately foundered in the courts, but developments in Huntley are still going ahead, and similar approaches might be tried in the north to meld commercial, social and ecological interests towards a common goal.

Growth centres in Bathurst, Orange and elsewhere have been created by rezoning, and similar action in and around Cairns could generate growth and income which could then be reinvested in more remote regions. More examples of practical success in the north might encourage interest from wary Australian investors. However, such investors would still expect cheap land and publically provided infrastructure before they invested money in a

project, and the costs and benefits of such proposals to the community and public purse must be carefully weighed before they are offered to commercial interests.

Schools

Any number of studies in Australia and abroad suggest that the quality of an area's primary and secondary schools can be used to determine its wider failure or success in the future. The Regional Australia Institute (RAI) measures access to education under the heading of 'infrastructure and essential services' and assesses school performance as well as technical training as part of 'human capital'. Investment in the north's education services is therefore required to improve local standards and give its citizens hope of a better life, as well as attract more swathes of foreign students. Such spending will be as important as the building of roads or dams to drive long-term growth and prosperity.

On a broader note, it could be argued that long-term public support for agriculture and the north will depend on the overwhelmingly suburban and urban school children of the south being imbued with knowledge and respect for a way of life they have little practical contact with. The nation's schools could help reconnect urban Australia with its rural roots by running well-managed vegetable gardens to teach children basic horticultural skills and the importance of looking after its soil. Such small steps might spark an interest in the land and agriculture and, perhaps, a career in the northern farming industry.

Transport Infrastructure

The lack of modern road and rail links in the north to transfer goods to market is frequently cited as a barrier to growth and investment. Most agricultural produce is transported by road, rather than rail, and the region's ports are not optimised for handling agricultural products. Long distances increase the cost of farming inputs and reduce the quality and value of vegetables and fruit. Transport can also account for a third of the price of Australian livestock. As previously noted, the costs of time and distance in exporting northern agricultural goods to Australia's major container ports in Sydney and Melbourne would more than eliminate the north's natural advantage of proximity to Asian consumers.

Rather than build expensive new roads to transport livestock long distances, the building of new meat and food processing plant nearer their supply might be appropriate and linked to the development of more accessible ports. Analysis in the Flinders and Gilbert catchments of Northern Queensland shows that proximity to processing facilities such as mills and gins can make or break agricultural competitiveness. The problems of distance should be solved by the most cost effective means, rather than assuming the need for a new road and developing ways to justify it. More efficient use of existing infrastructure and the building of local processing plants may offer an affordable and practical key to unlocking value in the north, although commercial interests may prefer to lobby for the improvement of long stretches of highway at public expense, rather than invest their own money in local processing facilities.

Computing tools can highlight pinch points and suggest strategies to reduce transport costs by optimising use of available infrastructure. Similar analysis can also identify investments to deliver maximum strategic benefit at minimum cost. However, a more fundamental rethinking of transport logistics will require a systematic analysis of the north's value chains to create structural efficiencies. The first-ever comprehensive audit of northern Australia's infrastructure was released by Infrastructure Australia on 8 May 2015[62], outlining a 15-year plan for the extra capacity required to support the region's economic activity and growth.

Regional Comparisons

The GAP Taskforce outlined and compared the relative competitiveness of six Australian regions with broadly similar characteristics - Mt Gambier, Goulburn, Wollongong, Katherine, Broome and Cairns - based on data from the RAI.

The RAI Regional Competitiveness Index is based on 59 nationally comparable indicators and allows comparisons to be made across state boundaries and between regional and metropolitan districts.

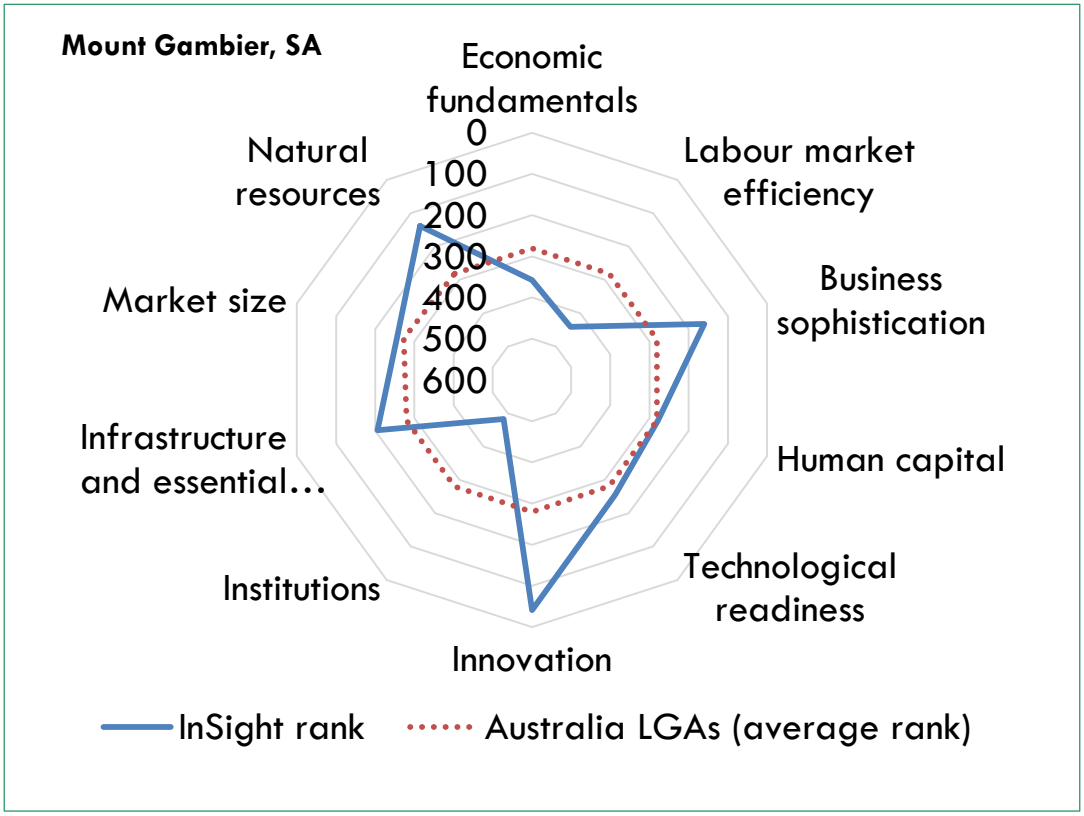
Discussions of investment in the north always tend to drift to considerations of the South, given the difficulties involved. This fact must be faced as the north must compete for public and private investment with the rest of the country to succeed. The factors for success which have helped areas in the south of the country flourish in comparison with others could also be applicable in the north and should therefore be studied.

In addition to the examples outlined below, Townsville and Gladstone offer positive examples of urban growth over the last 15 years, with much of its expansion generated endogenously as the local economy gains momentum, rather than as a result of any particularly outside plan, initiative or investment. Kununurra in far north Western Australia represents another non-mining, non-city, and non-university town success story, showing that independent growth can be achieved if conditions are right.

The results of the analysis are shown in graphical form for easy comparison. Such graphs could be compiled for any region of prospective investment in the north and compared against the factors investors look for – as outlined in the previous section – to highlight locations where investor needs and local resources dovetail. They also highlight particular regional strengths and weaknesses which need rectifying.

Although widely dispersed around the nation, each of the six chosen areas could be seen as underdeveloped or economically depressed and may require significant investment to release its unrealised potential. Each town is important in its locale and ranks highly in competitive indicators that are difficult to influence, including market size, human capital and natural resources.

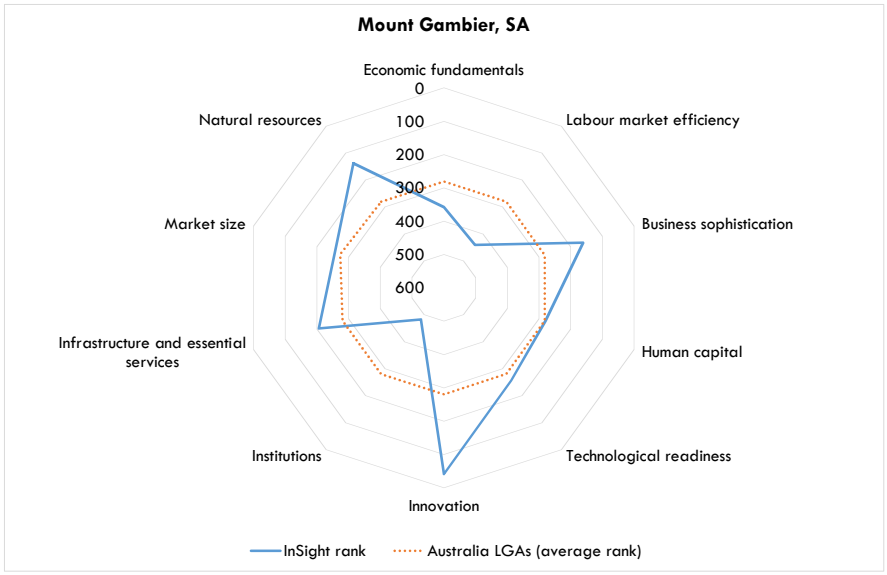
Mount Gambier, South Australia



Mount Gambier in South Australia ranks highly in innovation due to the presence of the University of South Australia and allied knowledge institutions., In common with many regional areas, suffers high youth unemployment. More research must be done to explain the lack of correlation between its high levels of innovation and average human capital. The measures of innovation in the RAI Index tend to focus on research and development in the public sector, rather than the private sphere, and so may understate commercial potential. RAI is looking to augment its data through case studies and real-time information from social media. Time lags and historical factors should also be taken into account. The 'technological readiness' of Mount Gambier is measured in terms of internet connectivity, rather than mobile links, and IT expertise. Internet connectivity tends to decline outside metropolitan areas, although the satellite connections provided by the mining industry in the Pilbara and other regions are highly capable.

Mount Gambier

	InSight rank	Australia LGAs (average rank)
Economic fundamentals	358	281
Labour market efficiency	441	281
Business sophistication	160	281
Human capital	279	281
Technological readiness	256	281
Innovation	41	280
Institutions	483	280
Infrastructure and essential services	206	280
Market size	256	273
Natural resources	138	281



Population	25249

Economic Fundamentals

Building approvals per capita	$0.46
Average income	$38,843

Labour Market Efficiency

Unemployment	7%
Youth unemployment	15%
Labour force participation	77%
Skilled labour	23%
Welfare dependency	21%

Business Sophistication

Economic diversification	160/560
Dominance of large employers	5.7%
Exporters, importers, wholesalers	218/560

Human Capital

Technical qualification	34.4%
Early school leavers	65.4%
Health	63.2%
Early childhood performance	19.2%
School performance - primary	20.2%
School performance - secondary	20.2%

Infrastructure & Essential Services

Road infrastructure	33/560
Access to secondary schools	130/560
Access to allied health services	201/560

Institutions

Public service	4.2%
Local government expenditure per capita	n/a

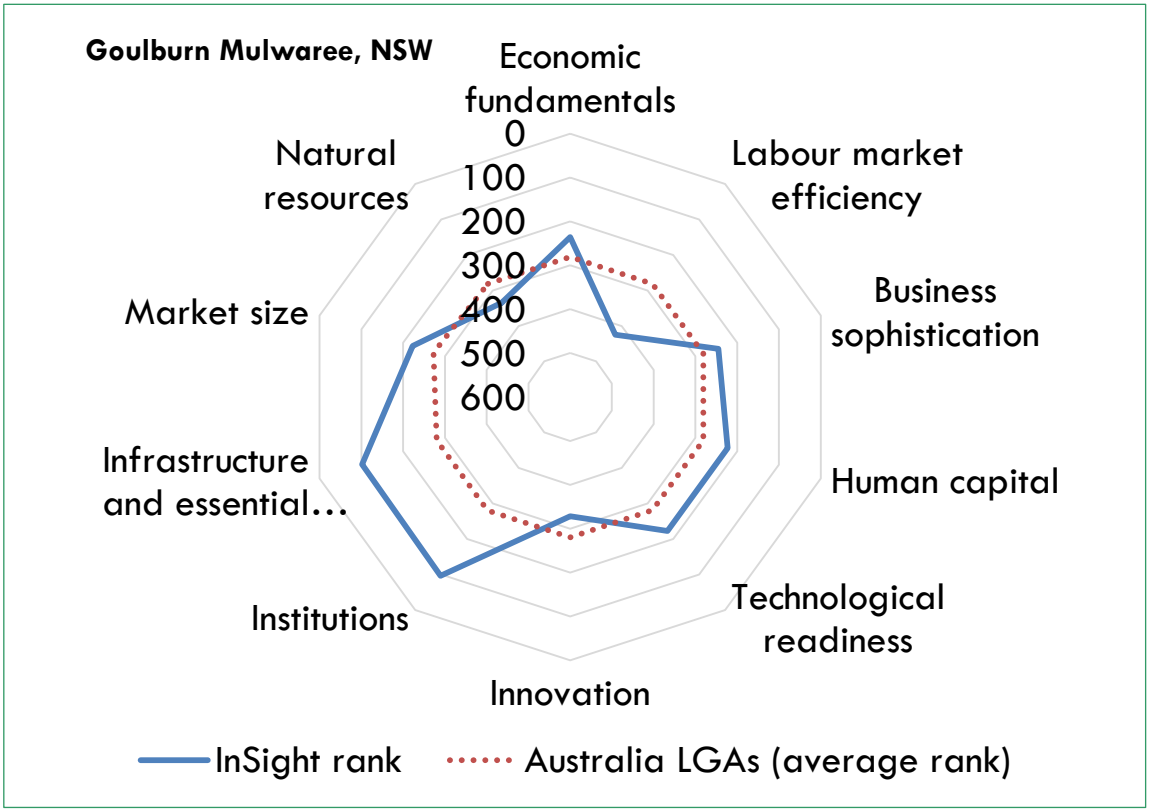
Technological Readiness

Broadband connections	59.1%

Innovation

Human resources in science and technology	1.7%
Human resources in science and technology	391/560

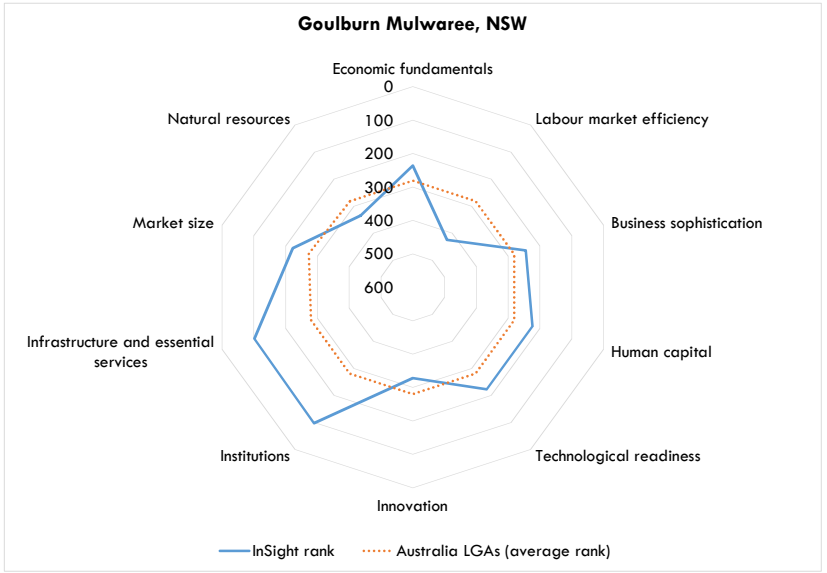
Goulburn, New South Wales



Goulburn in New South Wales was compared to Orange in another RAI case study. It has a high level of local government and good essential services, but its labour market efficiency is poor and it experiences significant youth unemployment and welfare dependency. Goulburn and Orange share many characteristics, but while the local government of Orange has shown confidence in the future and actively marketed itself as a tourist destination for Sydneysiders, Goulburn has remained more insular and nostalgic for a lost age of higher wool prices. Goulburn typifies the decline suffered by many regions which become dependent on lobbying Macquarie Street for new public institutions to supplement an exhausted traditional economy instead of generating new opportunities themselves.

Goulburn Mulwaree

	InSight rank	Australia LGAs (average rank)
Economic fundamentals	236	281
Labour market efficiency	425	281
Business sophistication	245	281
Human capital	223	281
Technological readiness	223	281
Innovation	328	280
Institutions	97	280
Infrastructure and essential services	102	280
Market size	223	273
Natural resources	335	281



Population	27480

Economic Fundamentals

Building approvals per capita	$0.75
Average income	$41,873

Labour Market Efficiency

Unemployment	5.8%
Youth unemployment	11.3%
Labour force participation	73.6%
Skilled labour	24.1%
Welfare dependency	22.6%

Business Sophistication

Economic diversification	162/560
Dominance of large employers	2.8%
Exporters, importers, wholesalers	185/560

Human Capital

Technical qualification	37.4%
Early school leavers	61.8%
Health	61.9%
Early childhood performance	19.8%
School performance - primary	31.2%
School performance - secondary	16.6%

Infrastructure & Essential Services

Road infrastructure	366/56
Access to secondary schools	228/560
Access to allied health services	57/560

Institutions

Public service	10.8%
Local government expenditure per capita	$1,548

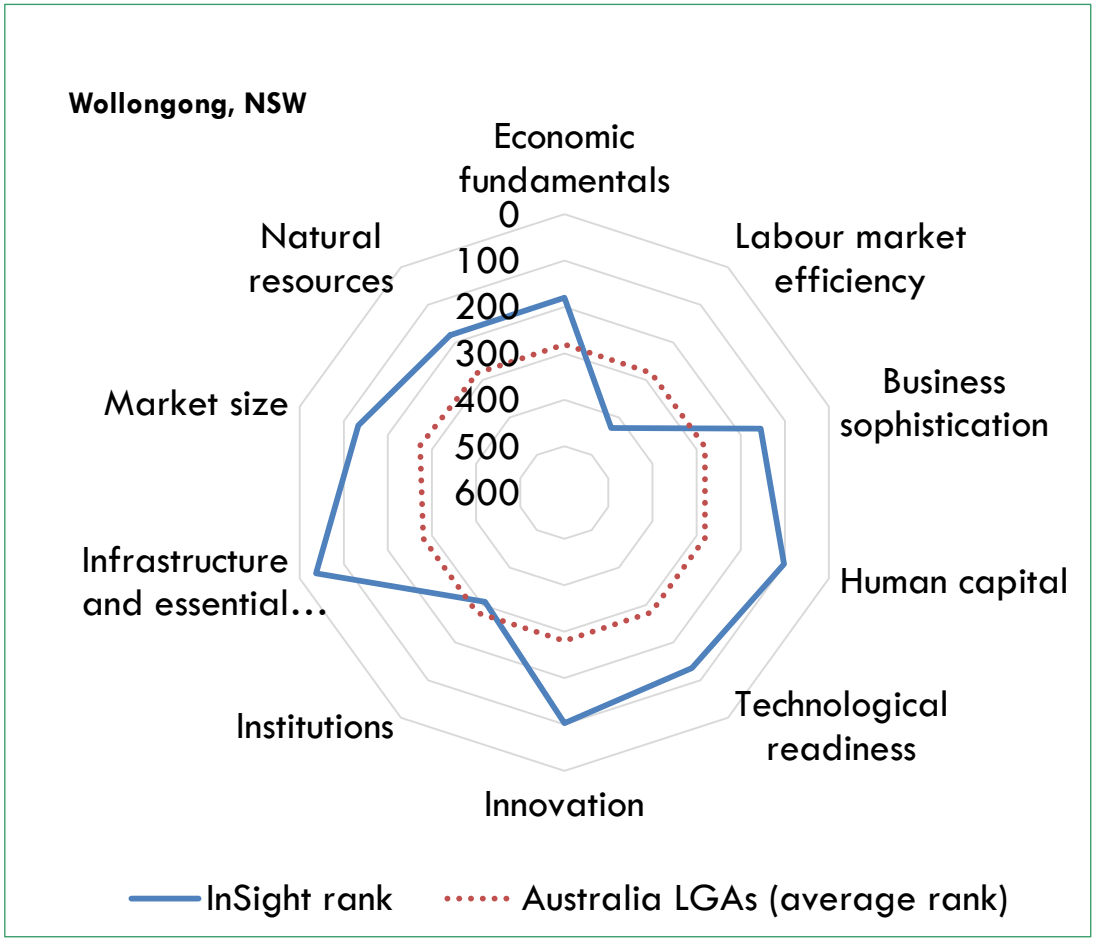
Technological Readiness

Broadband connections	60.6%

Innovation

Human resources in science and technology	2.3%
Human resources in science and technology	283/560

Wollongong, New South Wales

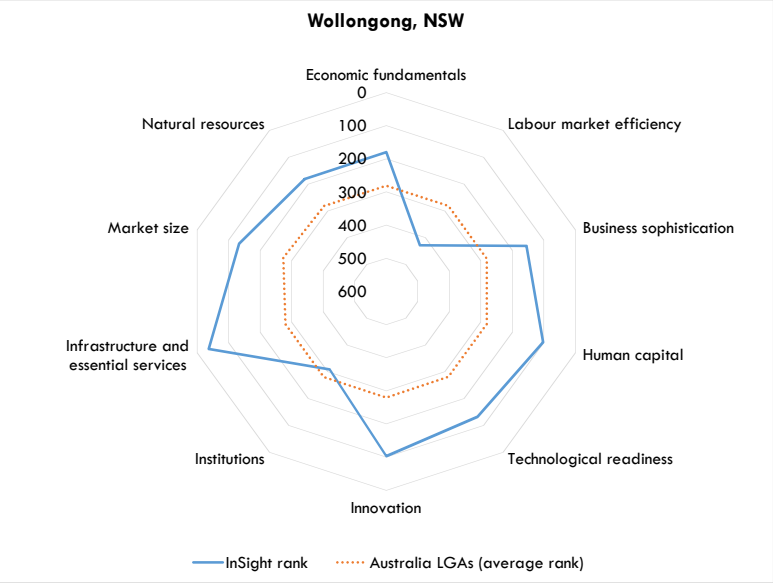


Wollongong in NSW performs well, due in part to its proximity to Sydney. Metropolitan districts place a lower value on local government – seeing it mainly in terms of rubbish collection and other services – while rural areas value it more highly due to a greater reliance for employment on public service institutions and a closer relationship to councillors. Wollongong has a high rate of youth employment and significant potential for growth, depending on how outward looking it chooses to be. However, it may be drift into becoming a 'dormitory' area for Sydney, and the RAI figures suggest a relatively low level of innovation, notwithstanding its long-standing university. This may again be a product of the RAI's concentration on public sector investment and the limitations of the index to capture private sector partnerships, technology and commercialisation.

Wollongong

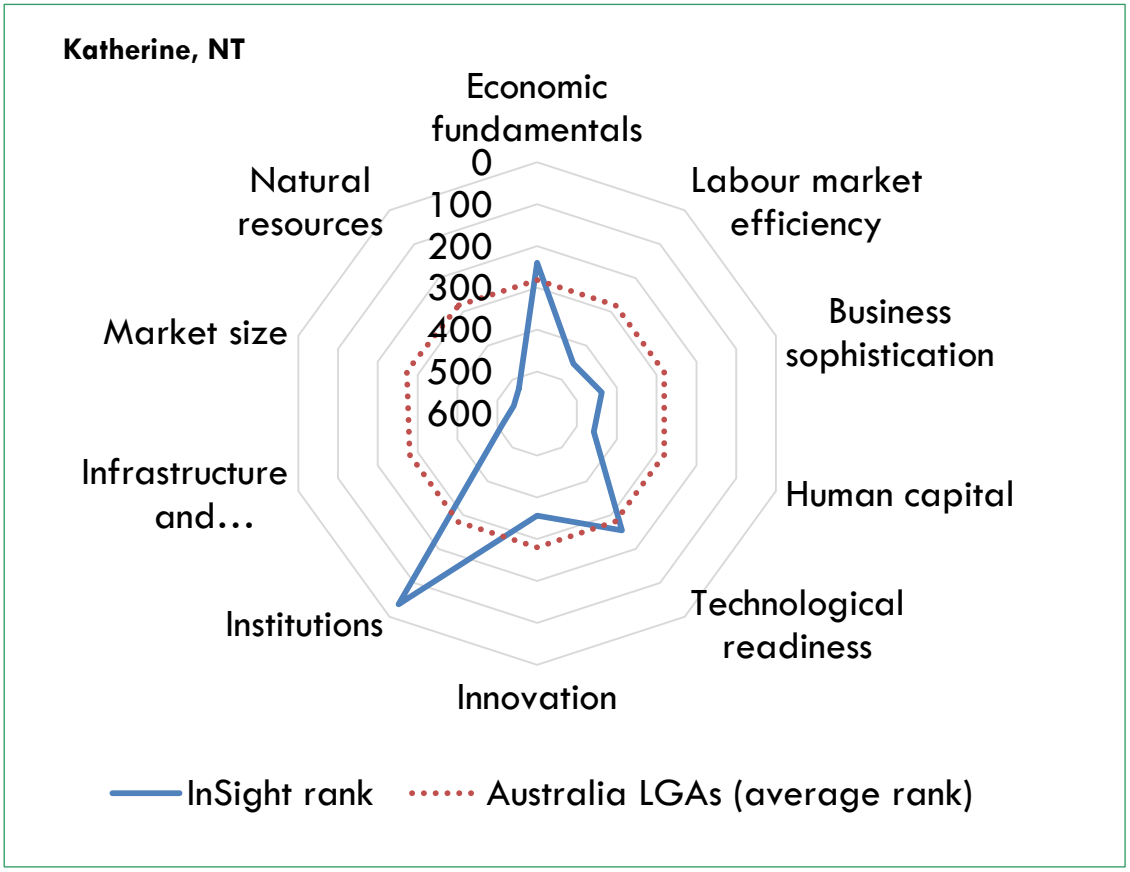
	InSight rank	Australia LGAs (average rank)
Economic fundamentals	180	281
Labour market efficiency	428	281
Business sophistication	155	281
Human capital	102	281
Technological readiness	132	281
Innovation	103	280
Institutions	309	280
Infrastructure and essential services	37	280
Market size	133	273
Natural resources	181	281

Population	192419
Economic Fundamentals	
Building approvals per capita	$0.77
Average income	$48,392
Labour Market Efficiency	
Unemployment	7.0%
Youth unemployment	15.8%
Labour force participation	71.1%
Skilled labour	30.1%
Welfare dependency	19.8%
Business Sophistication	
Economic diversification	52/560
Dominance of large employers	4.3%
Exporters, importers, wholesalers	208/560
Human Capital	
Technical qualification	36.0%
Early school leavers	53.1%
Health	58.7%
Early childhood performance	18.3%
School performance - primary	38.4%
School performance - secondary	23.0%



Infrastructure & Essential Services	
Road infrastructure	89/560
Access to secondary schools	169/560
Access to allied health services	107/560
Institutions	
Public service	6.5%
Local government expenditure per capita	$1,146
Technological Readiness	
Broadband connections	66.1%
Innovation	
Human resources in science and technology	5.2%
Human resources in science and technology	98/560

Katherine, Northern Territory



Katherine in the Northern Territory differs from other towns in the study in its high density of public institutions, large Indigenous community and domination by agriculture. Indicators such as human capital, educational achievement and health issues are well below average, reflected in a low level of business efficiency, high welfare dependency and high levels of unemployment. The region offers agro-business opportunities for the future, but the graph highlights the deficiencies in other factors which may lead investors elsewhere.

Katherine

	InSight rank	Australia LGAs (average rank)
Economic fundamentals	240	281
Labour market efficiency	453	281
Business sophistication	438	281
Human capital	458	281
Technological readiness	255	281
Innovation	356	280
Institutions	37	280
Infrastructure and essential services	512	280
Market size	541	273
Natural resources	526	281

Population	9185

Economic Fundamentals

Building approvals per capita	$0.65
Average income	$45,738

Labour Market Efficiency

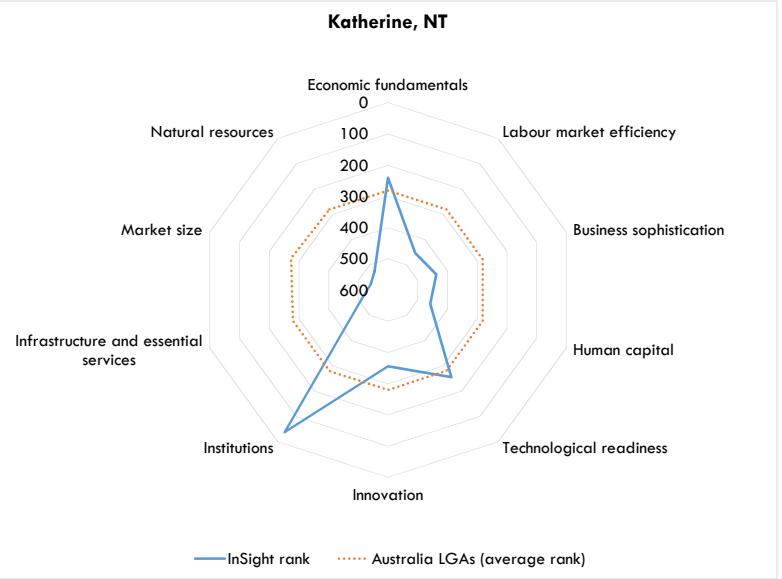
Unemployment	6.1%
Youth unemployment	11.2%
Labour force participation	72.6%
Skilled labour	26.7%
Welfare dependency	25.9%

Business Sophistication

Economic diversification	312/560
Dominance of large employers	3.3%
Exporters, importers, wholesalers	353/560

Human Capital

Technical qualification	31.2%
Early school leavers	53.6%
Health	65.0%
Early childhood performance	41.6%
School performance - primary	15.8%
School performance - secondary	14.7%



Infrastructure & Essential Services

Road infrastructure	157/560
Access to secondary schools	191/560
Access to allied health services	79/560

Institutions

Public service	23.9%
Local government expenditure per capita	$1,426

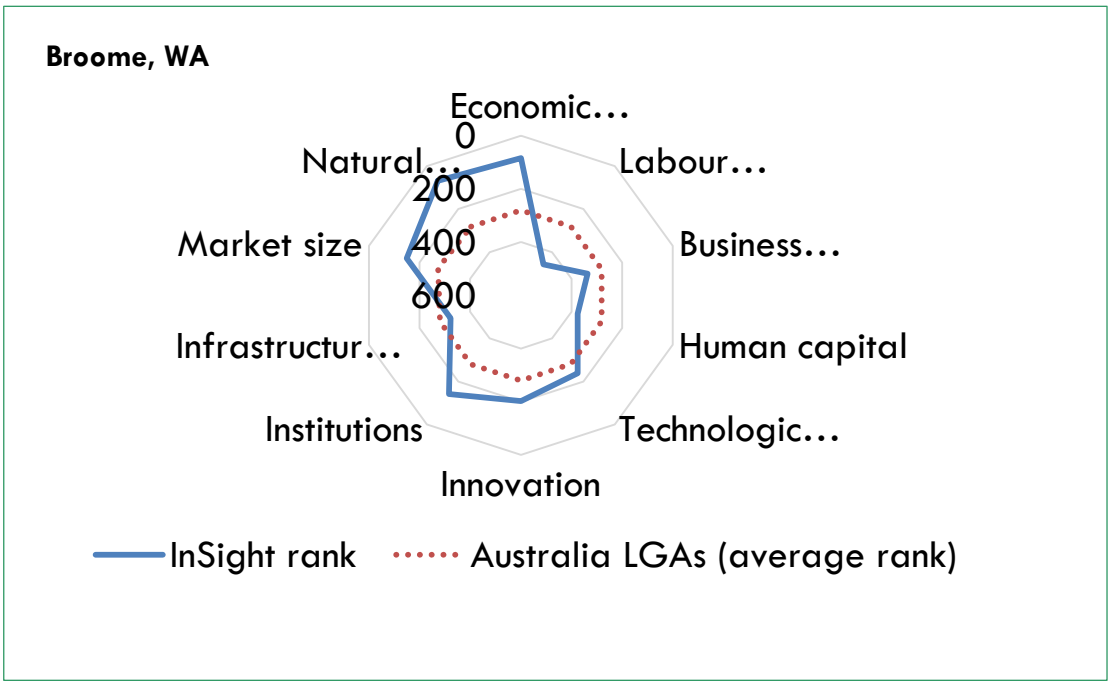
Technological Readiness

Broadband connections	58.0%

Innovation

Human resources in science and technology	2.1%
Human resources in science and technology	322/560

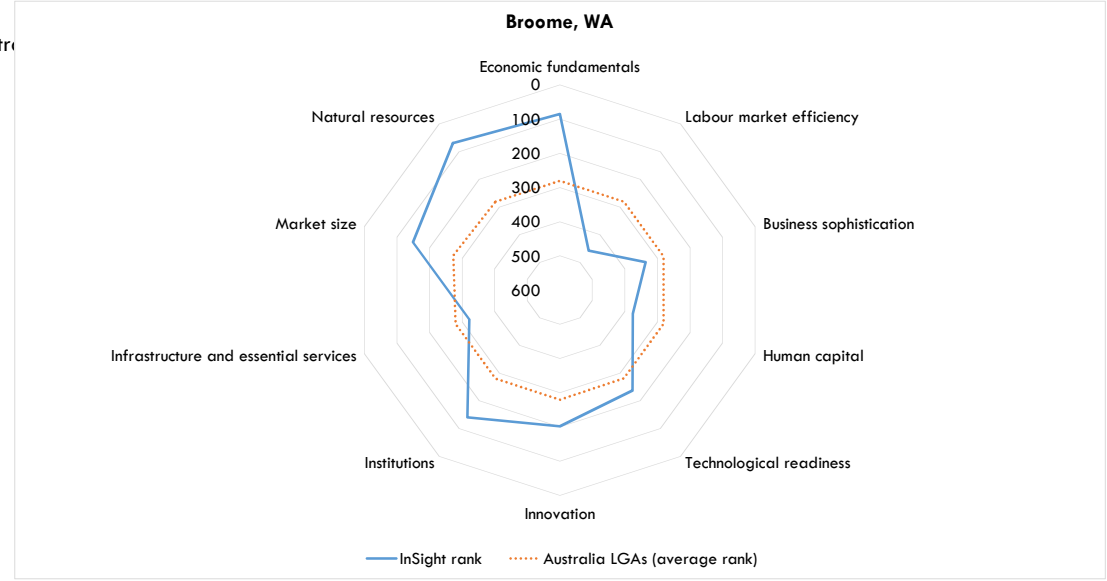
Broome, Western Australia



Broome in Western Australia has not benefitted from the mining boom in Pilbara to a significant extent and endures high levels of unemployment and welfare dependency. On a brighter note, its economic fundamentals are strong and the region has significant potential for growth and activity. It has better access to technology than Katherine, for example, and typifies an area which investors might choose over ostensibly similar but more remote areas elsewhere in the north.

Broome

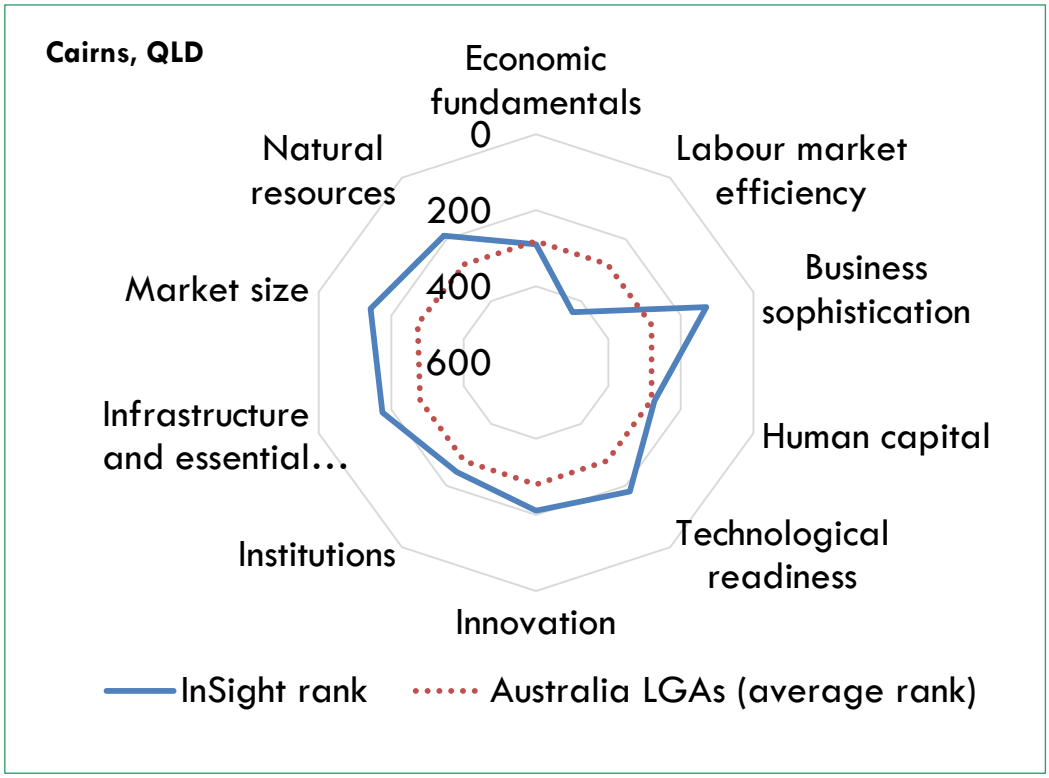
	InSight rank	Austr
Economic fundamentals	85	
Labour market efficiency	457	
Business sophistication	336	
Human capital	376	
Technological readiness	238	
Innovation	202	
Institutions	141	
Infrastructure and essential services	322	
Market size	149	
Natural resources	69	



Population	14998
Economic Fundamentals	
Building approvals per capita	$1.35
Average income	$45,723
Labour Market Efficiency	
Unemployment	4.7%
Youth unemployment	12.4%
Labour force participation	69.8%
Skilled labour	31.1%
Welfare dependency	27.7%
Business Sophistication	
Economic diversification	10/560
Dominance of large employers	3.7%
Exporters, importers, wholesalers	334/560
Human Capital	
Technical qualification	30.1%
Early school leavers	47.1%
Health	64.9%
Early childhood performance	29.5%
School performance - primary	16.7%
School performance - secondary	13.5%

Infrastructure & Essential Services	
Road infrastructure	455/560
Access to secondary schools	361/560
Access to allied health services	140/560
Institutions	
Public service	8.4%
Local government expenditure per capita	n/a
Technological Readiness	
Broadband connections	61.9%
Innovation	
Human resources in science and technology	2.5%
Human resources in science and technology	258/560

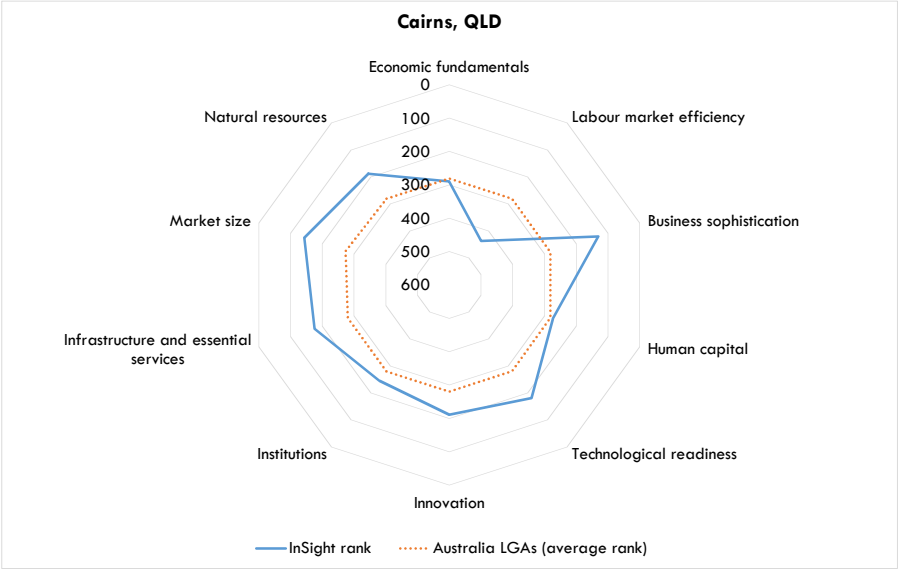
Cairns, Queensland



Cairns in Queensland is above average in all respects – including infrastructure, technological access and business sophistication – except youth unemployment. It is the lynchpin of a diverse region with high potential for growth, as is Townsville, given its university. Resources include arable land as well as minerals and energy. Given the Coalition's plans to encourage 2 million tourist visits a year to the north, Cairn's fame as a centre for adventure tourism for domestic and international visitors is a strong source of current revenue and offers major opportunities for the future.

Cairns

	InSight rank	Australia LGAs (average rank)
Economic fundamentals	290	281
Labour market efficiency	437	281
Business sophistication	130	281
Human capital	273	281
Technological readiness	181	281
Innovation	211	280
Institutions	245	280
Infrastructure and essential services	176	280
Market size	143	273
Natural resources	188	281



	Cairns
Population	156,170
Economic Fundamentals	
Building approvals per capita	$0.59
Average income	$41,228
Labour Market Efficiency	
Unemployment	7%
Youth unemployment	13%
Labour force participation	75%
Skilled labour	27%
Welfare dependency	24%
Business Sophistication	
Economic diversification	87/560
Dominance of large employers	3.9%
Exporters, importers, wholesalers	156/560
Human Capital	
Technical qualification	35%
Early school leavers	46%
Health	66%
Early childhood performance	27%
School performance - primary	27%
School performance - secondary	19%

Infrastructure & Essential Services	
Road infrastructure	123/560
Access to secondary schools	237/560
Access to allied health services	163/560
Institutions	
Public service	8%
Local government expenditure per capita	$1,863
Technological Readiness	
Broadband connections	63%
Innovation	
Human resources in science and technology	3%
Human resources in science and technology	*147/560*

Expanding Survey Methodology

Whatever their enthusiasm or scepticism over the merits of developing the north, most commentators agree that more research is required to inform the decisions of investors, public policy makers and local communities. Northern development rests on a complex matrix of public and private investment, local and federal government action and local involvement. For investment to be successful, all stakeholders must agree it is worthwhile. Rushing into large and expensive schemes with high levels of risk or adverse effects on other sectors will do nothing to foster the steady and ongoing development of northern Australia's mining, tourism, education and health services Such research should not only inform federal decision makers about the pros and cons of development, but also help the investment community assess regional opportunities and constraints. The scorecard approach could produce digestible and practical information if a wide enough range of stakeholders were consulted. Time and funds are finite resources and stakeholders must prioritise factors and consider opportunity costs.

Conclusion

Many reports on developing the region have come and gone with much fanfare, but with little long-lasting results. Such reports tend to strike poses of excessive optimism or undue pessimism due to pre-existing agendas or the understandable urge to make an impact where many have failed before. Northern Australia has had money poured into it over many decades for many projects. Grants Commission processes have given the Northern Territory access to large subsidies, when calculated on a per capita basis, to underwrite public investments. Many of these schemes have failed to generate the benefits promised for them, however, with success tending to develop more organically around large mining ventures, tourism and purposeful location of some higher education institutes. While the government outlined its plans for additional investment in '*Our North, Our Future*', it did not offer a compelling case why public investment would work in the future where it had failed in the past. Arguments for and against northern development have tended to ignore the question of why the debate is required.

In truth, the region is neither a 'hopeless basket case' of arid expanses and scant human resources, nor a tropical 'nirvana' of abundant natural resources on the doorstep of a booming Asian economy. It is a region of Australia, with strengths, weaknesses and potential like any other, and viewing the region as if it were still a distant and alien colony somehow divorced from the rest of the nation is a large part of the problem.

Peter Stone, the Project Director of Northern Australia Development, argues for the huge potential of northern development, although he cautions that while the barriers to success can be overcome, it will take a combined and concerted effort from a number of interested parties over a substantial length of time. Capitalising on the resources of the north will always have its challenges and detractors. Opposition should not obscure the significance of the social, economic, regulatory and biophysical pitfalls that lay ahead. Unlocking significant new investment in irrigated agriculture requires confidence about the scale of opportunities, but also an honest appreciation of the costs and risks that attend them.

CSIRO has developed tools for assessing development opportunities and the merits of exploiting them. They argue that the Flinders and Gilbert catchments of northern Australia could increase the north's irrigated agriculture by a third. These and other tools and

approaches should be applied across all of northern Australian to help identify its sweet spots and quagmires.

The North is too often viewed and discussed as a homogeneous, undifferentiated whole, when in truth it is as varied and particular as anywhere else. Discussions of its potential should focus on the local and concrete, rather than the abstract and the whole. Further research should leverage the knowledge of R&D initiatives from other areas of Australia and not attempt to 'pick winners' – that is the job of the entrepreneur. Rather, it should offer public and private stakeholders more guidance about where and how such investment can most usefully be made. In all of these considerations, however, the needs of its local inhabitants and the land they call home should be prioritised. We are custodians of the land, and not its masters. We should grow the land for our children, not ourselves.

In the very long term – or perhaps sooner than we think – the resources we depend on will run low or we will transcend our need for them with new technology. History suggests that while individual cultures will suffer and decline through the former, the human race will succeed through the latter approach. The creation of a 'circular economy' in which waste is minimised and value created through virtual means may render some of this discussion irrelevant.

At present, there are few paths to help people transition to new modes of operation, so they cling to the inefficient methods and outdated industries they have always relied on. The economy naturally shifts and regenerates over time, but the new economy is changing faster than ever and destroying or transforming a host of industries. The north will not be immune to such change, nor should it be, but development must build on its unique character, rather than destroy it.

Ultimately the complexity and plethora of issues to be addressed in the sustainable development of northern Australia should not be used as an excuse for inaction. Rather, all stakeholders have a responsibility to research, understand and manage the issues in order to achieve a balanced set of outcomes that enhances the region's economic, social and environmental wellbeing to the benefit of the nation as a whole.

Taskforce Membership

Chair

Gulshan Singh - Manager, Policy and Industry Affairs, Insurance Australia Group

Jack Archer - Deputy CEO Regional Australia Institute

Stephen Bartos - Executive Director, Canberra ACIL Allen Consulting

Olga Bodrova - Research Director Global Access Partners

Glen Brennan - Head of Indigenous Finance and Development, NAB

Peter Carre – Principal BioHub

Sasha Courville - Project Director, Natural Value Strategy Finance and Strategy, National Australia Bank

Rebecca Cross - Deputy Secretary Department of the Prime Minister & Cabinet

Robert Crompton - Chief Executive Officer Optias

Peter Fritz AM - Group Managing Director, TCG Group. Chairman, Global Access Partners

Catherine Fritz-Kalish - Managing Director Global Access Partners

Chris Fry - Chief Executive Officer Indigenous Business Australia

Dr John Hewson AM - Chairman, Shartru Capital

Dr James Horne - Principal James Horne and Associates

Geraint Hudson - National Business Development Manager, Herbert Smith Freehills

Dr Bill Hurditch – Director The Fifth Estate

Major General Michael Jeffery AC CVO MC – Chairman Soils for Life

George Karagiannakis - Head of Government & Industry Relations NRMA Insurance, SGIO, SGIC, IMA. Insurance Australia Group

Sam Lipski – Chairman The Pratt Foundation

Su McCluskey - Chief Executive Officer Regional Australia Institute

Rob McConnel - Corporate Finance Partner National Industry Leader, Agribusiness Deloitte Australia

Tony Slatyer - First Assistant Secretary Water Reform Division Department of the Environment

Dr Ian Smart - Chief Operating Officer, Optias

Warwick Watkins - Director, WW & Associates

Dr John White - Executive Director Ignite Energy Resources

Rod Wiese - Managing Director Storm Consulting

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