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‘Deep roots’

Agriculture, national security and nation-building in northern Australia

Saba Sinai

August 2022

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About the author

Saba Sinai is a lecturer in agriculture at CQUniversity Australia. His teaching and research interests include animal and human health, agricultural risks, agricultural extension and the role of agriculture in foreign and strategic policy.

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Cover image: Sugar cane ready for harvest in northern Queensland, iStockphoto/georgeclerk.

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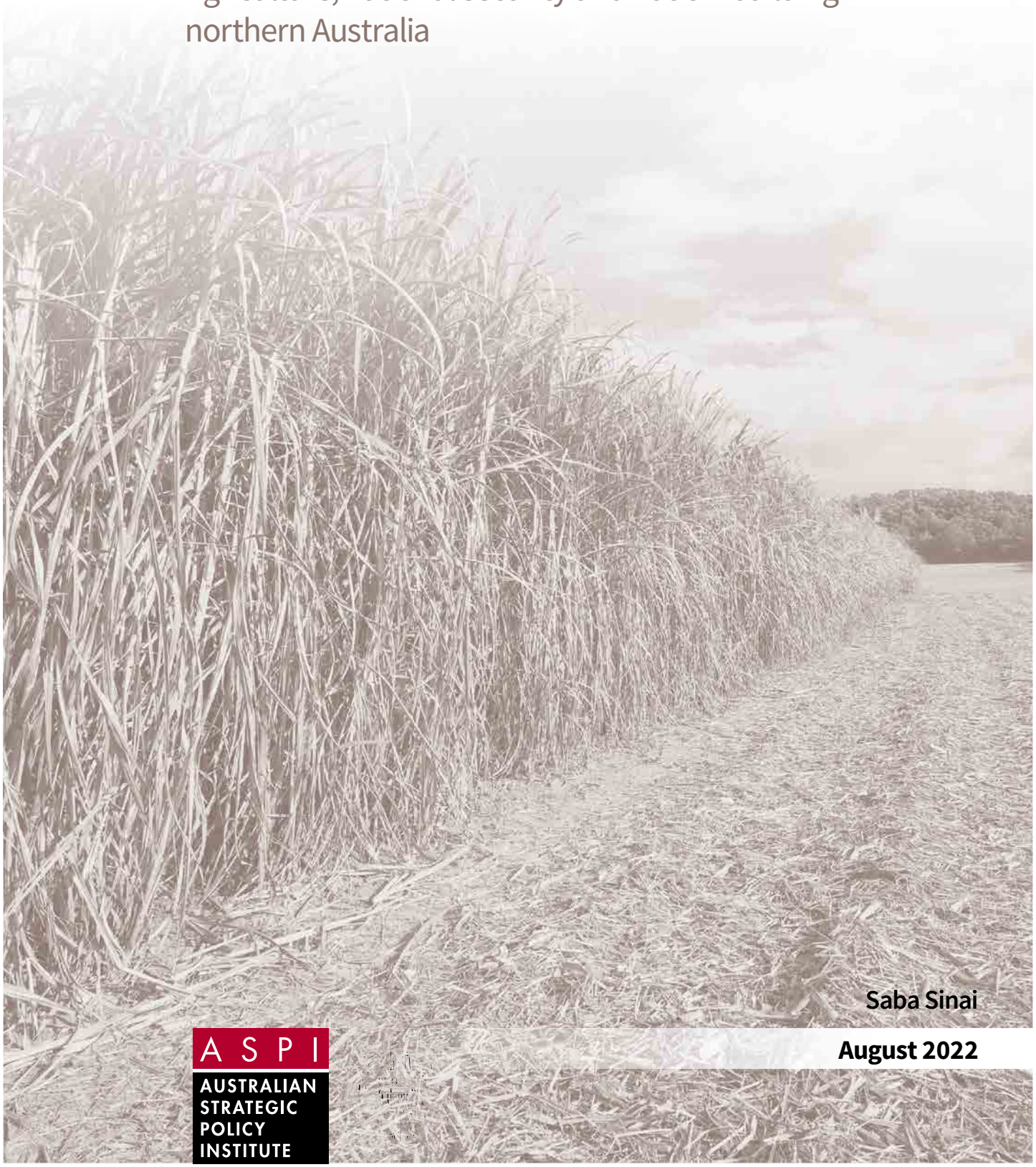

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Executive summary

The agricultural industry in northern Australia is a collision of intersecting priorities, histories and challenges. The industry, the environment (both biophysical and geostrategic) in which it operates and the people connected to it, are dynamic and changing rapidly, but the implications of every change will be felt and so must be considered in myriad dimensions: social, cultural, economic, infrastructural, geostrategic, biophysical.

This report offers a multidisciplinary analysis of the various components that make up and influence the vast and complex agriculture industry network in northern Australia. It examines the economic and historical underpinnings of the agriculture industry we know today; the administration, direction and implementation of agricultural policy and funding across levels of government; the many and varied demographic and cultural characteristics of the northern Australian population; and the evolution of place-based physical and digital infrastructure. The role of infrastructure and infrastructure funding in northern Australia plays a key role in the report's narrative, which outlines the implications for national security, economic prosperity, service delivery, social cohesion and policy implementation if prevailing arrangements aren't reformed to a sufficient standard that addresses contemporary challenges.

The report also examines biosecurity vulnerabilities, mitigation strategies for those vulnerabilities and their strategic and national security implications, and the long-term positioning of the north of Australia as critical for future growth, prosperity and security. The focus on opportunities presented by the north's unique nature throughout the report culminates in a set of recommendations for policymakers to take a unified and big-picture approach across a daunting array of issues and disciplines.

Moving forward, there's a clear need for policy that consults and is informed by primary producers and traditional owners. Genuine engagement in good faith, and with a healthy awareness of the well-founded wariness of large-scale policy intervention originating in urban centres far away from the target zone, serves governments well, while its absence dents credibility and effectiveness.

The report also outlines the requirement for a well-developed plan for nation building across northern Australia, tailored to the region's unique geography, demographics, cultural values and strategic position. The report discusses the need to begin at the community level with a full appreciation for northern Australia's diversity and existing social and economic resources. While the starting point should be at the grassroots, a nation-building plan for northern Australia will be fruitful only if it effectively connects communities to produce a cohesive network of towns and regions that ultimately gives rise to a unified and prosperous north. Central to achieving this will be the capacity of policymakers to coordinate infrastructure based on economic activity. In the agricultural realm, this will necessitate an understanding of the potential of food and fibre supply chains to give rise to infrastructure. A creative vision of agricultural supply chains and a broad view of value-adding possibilities will be critical to maximising this infrastructural output. In line with the Albanese government's aspirations for both domestic manufacturing and infrastructure development, sophisticated agricultural supply chains must be enabled by government investment where the private sector demonstrates genuine commitment to partnership. Given the north's critical role in national security, the strategic value of such infrastructure, including developments such as ports, processing facilities, roads, railways, and research facilities, should feature in the government's decision-making

for investment in addition to the economic benefits that such infrastructure confers. This report sets out a series of recommendations with a focus on social cohesion, acknowledging the different and distinct groups that form the communities in the north; agriculture infrastructure, from obvious physical logistical networks such as railroads and ports to less overt systems that enable investment, minimise barriers to entry and support primary producers to do what they do best. The recommendations have a nation-building mindset, in the sense that comprehensive infrastructure networks are needed for the agricultural industry to continue to contribute to and form an integral part of Australia, far beyond the paddock.

This report suggests:

1. a unified message among all relevant stakeholder groups with awareness of the strategic role of the northern agriculture sector
2. greater investment in agricultural research to grow and protect agricultural industries (prosperity is key to security)
3. greater engagement of Indigenous populations, with genuine appreciation for the role of Indigenous people and their connection and knowledge of land and water as the key to unlocking potential.
4. a cohesive nation-building plan.

Introduction

Agriculture and Australia's cultural and economic history

Australia's history, economy, cultural assets and place in the world are intimately tied up with the production and trade of food and fibre and other natural resources. Reflection on this relationship often invokes visions of a time when Australia rode 'on the sheep's back', buoyed by the value of wool exports mostly to the UK. From that trade flowed economic prosperity, international links, educational initiatives, organisations like the Australian Workers Union and an image of Australia and Australians that has endured decades since the wool industry descended from its legendary zenith. It also afforded Australia important strategic and foreign policy gains, directly and indirectly. Facilitating the export of wool and other commodities in the late 19th century led to the development of seaports, rail lines and other important assets that still exist today.

In 1916–17, at the height of World War I, the demand for service uniforms saw the British Imperial Government purchase the majority of Australia's wool. The commodity became the principal export to Japan in the years following World War II, playing an important role in postwar rapprochement and paving the way for further trade, diplomacy, cultural exchange, and business links.[1] Notwithstanding the significance of the wool industry, agriculture's contribution to Australian economic, diplomatic, strategic and cultural life extends beyond one commodity in one period of time; it has both deep historical roots and an exciting future waiting to be tapped.

Before Australia was called *Australia*, the Indigenous inhabitants of this continent harnessed the power of food and fibre production and trade to safeguard prosperity, advance strategic ends and develop cross-cultural ties. For centuries, a vibrant trading and cultural relationship has been maintained between Torres Strait Islanders and traditional inhabitants of Papua New Guinea.[2]

From at least the 1700s, Macassan trepangers sailed from southern Sulawesi to northeast Arnhem Land in search of sea cucumbers or trepang, which were then sold on to markets in southern China, satisfying demand for the delicacy. Those sailors formed a trading relationship with the Yolngu people, and a dynamic affiliation formed between the two groups, one that transcended the trade of goods to include the exchange of cultural and religious practices as well as language. Aboriginal people would also occasionally return to Makassar with the trepangers.[3]

While Indigenous Australians engaged in a variety of food-producing and food-collecting activities prior to European settlement, including yam cultivation, diverse fisheries, grain harvesting and a range of hunting and gathering methods, the introduction of new species of plants and animals that accompanied European settlement metamorphosed primary production throughout the continent.

Agriculture in Australia today: people and economics

Today, the Australian agricultural landscape is diverse and technologically equipped, enabling the primary industries sector to service the domestic market and, crucially, supply a vast network of international markets. In fact, the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) estimates that

agricultural exports accounted for about $64.8 billion of the estimated $83.1 billion gross value of agricultural production in 2021–22: a record high for Australian agriculture, despite the Covid-19 pandemic. Despite these exports, domestic supply-chain challenges, including through pressures exerted by Covid-19, Russia's invasion of Ukraine and natural hazards, have recently resulted in strained supermarket supply chains across Australia. In January, flooding in northern and central Australia created food shortages across the Northern Territory, despite the territory's large agriculture, forestry and fisheries sector, worth $649 million per annum.

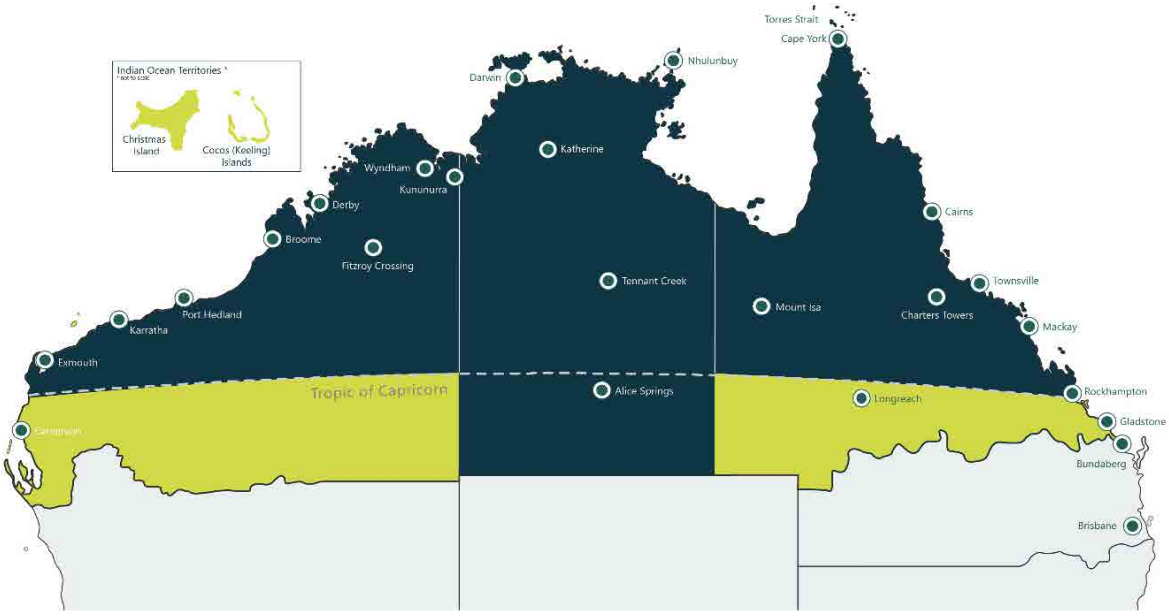
While the primary sector's contribution of 1.9% to Australia's GDP is smaller than other industries (for example, health and education contributes 13.2%, mining 11.5%, and finance 8%[4]), agriculture is an important employer in rural and regional Australia as well as a key industry for maintaining prosperity and food security throughout the country. The transport of agricultural products from farms to processing facilities and then on to shop fronts or ports has also provided a key economic base for the establishment of Australia's transport and logistics infrastructure, particularly in rural and regional areas. Agricultural businesses and their local communities also play an important role in stewardship of the environment and critical infrastructure at a scale that belies the relatively small share of GDP that the sector occupies (agriculture accounts for 55% of Australia's land use, mostly for grazing of native vegetation).

This report describes the nature of agricultural production in northern Australia and its links to the current and future strategic environment of the north. There are various definitions of northern Australia, as demonstrated in Figure 1, but here it's defined as parts of Australia north of the 26th parallel south latitude. If northern Australia is to fulfil the strategic ambitions imagined for it, then agriculture, a major employer with an important historical connection to the north, must be part of this strategic vision. To that end, this report:

- explores a range of risks and opportunities at the intersection between primary production and strategy in northern Australia and outlines Australia's agricultural policy paradigms
- discusses the demographic features of northern Australia's agricultural industry and the role that people can play in advancing social cohesion and strategic policy, acknowledging the profound connection that Indigenous communities have with land and waters
- examines rural discontent and social division and how they must be addressed in order to safeguard the prosperity and security of northern Australia
- describes opportunities for northern Australia's agriculture sector to play a role in forging people-to-people links to advance strategic and foreign policy objectives
- explores the infrastructural landscape in northern Australia and outlines how investment in infrastructure acts as an enabler for more economic activity
- describes the challenges with infrastructure planning in the north, outlining the risks that the *status quo* of disjointed and underfunded infrastructure poses to the region's security and offers an alternative perspective on how northern Australia's culture of resourceful multistakeholder collaboration can be energised to transition from the prevailing *ad hoc* approach to a coordinated strategy that can overcome the challenges of infrastructure development in a sparsely populated region.
- analyses the north's biophysical and biosecurity environment, outlining how proximity to Asia presents opportunities to leverage the Indo-Pacific's buying power to advance Australian agricultural exports and to build people-to-people links to share skills and approaches in tropical, arid and semi-arid agriculture
- outlines how that proximity to the Indo-Pacific exposes northern Australia to biosecurity incursions that threaten Australia's agricultural sector and offers strategies to safeguard the north against the infiltration of potentially devastating agricultural pests and diseases
- considers how the aforementioned challenges and opportunities require the maintenance and development of human capital in northern Australia's agriculture sector and suggests strategies to achieve that.

Finally, this report provides recommendations for harnessing and bolstering northern Australia's agricultural potential to contribute to the region's prosperity, security, and strategic advancement.

Figure 1: There are various definitions of northern Australia (as per the Office of Northern Australia)



Map of Northern Australia
Navy shading *Our North, Our Future: White Paper on Developing Northern Australia (2015)* definition
Green shading *Northern Australia Infrastructure Facility Act (2016)* definition

Source: Office of Northern Australia, online.

Agriculture and economic policy

Over the course of the past few centuries, the share of the labour force engaged in agricultural work and the share of GDP from agriculture have declined in many economies. Factors such as agricultural innovations, particularly the automation of tasks formerly performed by labour, have improved efficiency, and reduced the need for labour-intensive production at scales that existed previously. This is especially true in upper middle- and high-income countries.

World Bank data reveals that globally the share of people employed in agriculture, as a percentage of total employment, decreased from 43.7% in 1991 to 26.8% in 2019. In that same time, the value added per worker in agriculture, forestry and fishing has increased from US$17,000 to US$24,000 across the OECD, where both cereal and meat production have also increased over that period. While in some low-income countries such as Burundi and Somalia agriculture employs upwards of 80% of employed persons, at the other end, across the OECD this is estimated to be 4.8%, and just 2.8% in high-income countries (2.6% in Australia).[5]

While agriculture as a share of the GDP decreases as economies grow and diversify, the sector still delivers important social, economic and environmental outcomes, as noted above. However, the interaction between agriculture and economic policy differs across economies. In low- and lower middle-income countries where the labour market is dominated by primary production, economic policy tends to be closely linked to agricultural policy, with a focus on improving labour productivity while increasing yield to the point of an agricultural surplus that generates capital, using the primary sector as a launching pad for economic transition.[6] 'Agriculture,' wrote Edward Gibbon in *The history of the decline and fall of the Roman Empire,* 'is the foundation of manufactures; since the productions of nature are the materials of art.' This capacity to advance industrialisation through growth in agricultural productivity is readily demonstrated in economies in which improved agricultural productivity has historically led to both agricultural surpluses and the freeing up of labour to occupy other sectors in the economy. Those transitions,

while never free of political, social, economic or environmental challenges, have rarely come about by chance alone, but have instead been facilitated by thoughtful and science-driven policy, and often supported by international development initiatives.

In low- and middle-income countries, agricultural programs increasing crop yield, refining livestock nutrition, developing rural infrastructure, expanding agricultural extension, diversifying livelihoods, improving water efficiency, enhancing biosecurity, and ensuring reproductive success in animal agriculture are just as significant from an economic perspective as they are from a purely agricultural perspective. Here, where the primary sector plays a large (perhaps predominant) role in the economy, transitions to industrialisation often flow through agriculture.

In upper middle- and high-income countries, the story is a little different. Agriculture's share of the GDP, as mentioned above, often trails behind service-based sectors, so the interaction between economic policy and agriculture is less structural than in low-income countries. Here, agricultural policy is more nuanced and has a less significant impact on the whole economy, as the following examples demonstrate.

In Australia, the government's free trade negotiations often seek the reduction or elimination of tariffs and other protectionist instruments on agricultural exports, improving market access for Australian producers. Some infrastructure investments, such as the $100 million Northern Australia Beef Roads Program and the construction of dams, are aimed at increasing agricultural efficiencies and output. That in turn has the effect of generating possibilities for new ventures such as, in the case of 'beef roads', meat-processing facilities, leather tanneries and feedlots. The resultant establishment of feedlots, for example, leads to demand for feed, which can in turn boost demand for local cereal production, and the process continues. Government investment in infrastructure is a key enabler of economic growth in agricultural communities.

Australia's federal government, through the Department of Agriculture, Fisheries and Forestry (DAFF), also collects, administers and disburses agricultural levies and charges. Funds collected from those levies and charges are then invested in industry-specific initiatives such as research, development and extension (RD&E) services and marketing (think: those lamb adverts).

More widescale economic policies also affect agricultural production. Australia's goods and services tax (GST), for example, isn't applied to some goods and services, including fruit or vegetables, meats for human consumption as well as spices, eggs, cooking oils and some dairy products—essential foods. By exempting those goods from the GST, the government, in addition to implementing a range of educational and regulatory initiatives, is able to encourage the consumption of minimally processed food and maintain high levels of food security by encouraging local production.[7] This interaction between agriculture, taxation and public health is just one of many examples that testify to agriculture's capacity to contribute to a variety of social ends, including strategic policy.

When is agriculture bigger than a farm?

Agriculture's role in shaping strategic policy, directly and indirectly, has a long and fascinating history. In fact, human settlement itself began when agriculture replaced hunting and gathering as the predominant method for accessing nutrition.

Some theories assert that early forms of government may have been developed primarily to support agricultural production. The hydraulic theory of civilisation holds that the just distribution of water among farmers in places like Mesopotamia, China and Egypt provided impetus for the development of a bureaucracy, the primary role of which was the centralised control of freshwater allocation. While debate about such origins of governance continues, the role of agriculture in shaping society and strategic policy has been a mainstay of civilisation from the rise of agriculture-enabled human settlements in the Fertile Crescent some 12,000 years ago to the complex global agrifood system that exists today.

History is marked with countless episodes that illustrate this point. Bantu expansion across much of sub-Saharan Africa (c. 3,000 BC), probably occurred because of the advantages that agriculture conferred upon progenitor Bantu populations in West Africa. As a result, Bantu languages and agricultural practices spread westward and southward, contributing to massive demographic and technological change. In the Roman and Byzantine empires, grain supplies, chiefly from North Africa, provided a crucial grain-based social safety net (*cura annonae*) to populations in Rome and later in Constantinople. The loss of North African territories, particularly Egypt, by the Roman and then the Byzantine empires had a significant impact on those realms, in part through reduced grain supplies and thus the deterioration of the safety net it generated.[8] In ancient China, failure to provide tax relief in times of climate-driven food shortages is thought to have contributed to increased war frequency, population decline and dynastic change.[9]

In more contemporary times, perhaps some of the most consequential agriculturally based endeavours were those of the East India Company, which was established in England in 1600. At the outset, this enterprise sought to break the Spanish/Portuguese duopoly that was dominating the maritime trade in spices and other agricultural products between Europe and Asia. After centuries of trade, military expansion, armed conflict, infrastructure development and the subjugation of local populations, the exploits of the East India Company and its successor institutions revolutionised the affairs of South Asia and significantly influenced the course of global affairs.

Other significant global shifts emerged during and after this period as a result of increased demand for agricultural commodities, particularly in Europe and North America, where commodity demand was driven by population growth, agricultural reform, colonial expansionism and industrialisation. In pursuit of products such as rubber, spices, cotton, rice, sugar, silk and opium, nations and rulers across the Western world colonised distant lands, reformulated political structures, and waged war with local inhabitants and other imperial powers. They left in their wake millions of people dislocated and traumatised by slavery, worked to death, subjugated by tyrannical rule, dispossessed, and displaced. Those exploits gave rise to new nation-states, cutting across traditional homelands, fuelling conflict and sowing the seeds for a wave of self-determination movements that swept across Africa, Asia, the Caribbean and the Pacific.

Despite those tumultuous impacts, agricultural production also exerts many constructive influences on human affairs with strategic effects. Advances in primary production have alleviated poverty and food insecurity, contributing to prosperous and stable communities. International cooperation for agricultural development, through institutions such as the UN Food and Agriculture Organization and the International Fund for Agricultural Development, facilitate global agricultural discourse and initiate programs that contribute to peace and security through the provision of agricultural development and food security. Agricultural trade and research connects people across the world, nurturing shared ambitions born of mutual interest. Joint custodianship of cross-jurisdictional natural resources such as rivers and lakes gives rise to multilateral initiatives designed in part to ensure sustainable agriculture for the parties concerned (see, for example, the Danube River Protection Convention).

Northern Australia's vibrant and growing agricultural industry plays a vital role in the unfolding of the region's strategic potential. To fully appreciate that role, policymakers must examine the supply chain beyond the farm, gaining an appreciation for the broader economic role that primary production plays in generating wealth, ensuring food security and community resilience in times of crisis, asserting geopolitical power, developing infrastructure, shaping cultural and spiritual meaning, facilitating diplomacy, advancing intellectual and technical capacity, influencing politics, and building communities. At the centre of such an examination is the agricultural workforce. Primary producers and agribusinesses, as well as the communities that support them, must be empowered to play a role in this vision, leveraging their resources to make what they do bigger than the farm but in a way that aligns with their priorities in the economic, social and environmental domains. Such a task isn't unrealistic for agricultural businesses in Australia, many of which already observe economic trends, supply-chain challenges and geostrategic events to guide production decisions, farm management and planning. Most farms and agribusinesses are large and sophisticated operations, even if they're run and operated predominantly by members of the same family. While family farms are part of the contemporary Australian agricultural landscape, insular, small-scale farms aren't the prevailing setting for food and fibre production. Policymakers should therefore feel comfortable that alignment

between strategic policy objectives and the priorities of these agricultural businesses isn't a significant leap. In fact, what's needed is an approach that ensures the connective tissue between government and primary producers is in place so that both are singing from the same song sheet.

Federal, state and territory policy on agriculture and rural Australia

In Australia, government policy on agriculture is associated with the economic, social and environmental dimensions of primary production, and therefore closely interacts with other policy areas, particularly those concerning rural Australia.

Agriculture, while fulfilling important social and environmental functions, is primarily conceived of as an economic pursuit, and this is reflected in government policy at the state, territory and federal levels. The federal government's Ag2030 plan, which seeks to support the Australian agricultural sector's ambition to achieve $100 billion of production by 2030, reflects the government's view of agriculture as an important sector of the economy.[10] While the plan was developed under the previous Liberal–National government and its continuation lies with the newly elected Labor government, the Albanese government would do well to support it.

Agricultural policy is developed by departments and agencies at the federal and state/territory levels, where implementation is often achieved in collaboration with communities and industry stakeholders (a critical element of policy success).

Agricultural policies can be largely grouped into two domains: growth and protection.

The 'growth' domain includes agricultural policies that enhance economic performance through means such as improved on-farm efficiency, agtech development, marketing, breeding strategies for improved production outcomes, supply-chain development and expanding export markets.

The 'protection' domain includes policies with defensive measures aimed at safeguarding Australian agricultural industries as well as the environmental assets critical to primary production. Aspects of the protection domain include biosecurity arrangements, invasive species control, plant and animal health, farm safety, disaster resilience and compliance with legislation. In a divided world of fragmenting global supply chains and fast-circulating viruses and pathogens, this makes more and more sense.

The growth and protection domains aren't exclusive and can be complementary (for example, strong biosecurity arrangements enhance market access for Australian agricultural exports, and maintaining animal health and welfare leads to better production outcomes).

At the federal level, DAFF works to 'support agriculture, fishery, food and forestry industries. So that they can remain competitive and sustainable'. Although the previous government combined agriculture with water and the environment in one department, the Albanese government dissociated them at the departmental level, also creating the Department of Climate Change, Energy, the Environment and Water. While under the previous arrangements a coalescence of agriculture, water and the environment reflected the Coalition government's view that those three areas share important interactions warranting coordination under a single department, the current configurations under Labor signal shifting conceptions about interactions between agriculture and the environment. While housing the environment with water under the same department has been consistent practice for federal governments of both persuasions over much of the past few decades, the formation of a department that joins these two areas with climate change and energy reflects Labor's view that climate change is both the most immediate threat to the environment and the predominant driving force behind a transition in energy production. This is no surprise to observers of Labor's stated intentions during its time in opposition and is consistent with similar positions held by many left and centre-left political parties. While these are still early days, perhaps the most

significant implication of these departmental changes will be in the water resources space. Water is of course critical to agricultural production, and any significant change in federal water policy, particularly across the Murray–Darling Basin, will affect agricultural industries. The federal government should ensure coordination between the two departments in particular to prevent land-use conflict between conservation and primary production, which both face similar environmental threats from climate change.

DAFF is responsible for a range of functions, many of which relate to Australia's food and fibre trade, including export standards, market access, animal welfare and live exports.

Together with the Department of Health, DAFF also has biosecurity responsibilities at Australia's points of entry and through domestic surveillance efforts. Such biosecurity measures protect Australia's agricultural industry from potentially devastating exotic pathogens and pests, many of which have the potential to severely degrade or altogether extinguish entire industries. DAFF's National Priority Plant Pests list,[11] for example, outlines the 43 microscopic pathogens and invertebrate pests that pose the most significant risk to plants of economic importance. Those plant pests are then the focus of government investment and action in plant biosecurity, with strengthened capacities for in-country surveillance and point-of-entry controls. Similar arrangements exist for communicable diseases of domestic animals, as well as marine pests and invasive plants.

Australian governments have long sought to preserve the country's status as a 'clean and green' agricultural exporter, and strict biosecurity arrangements form a crucial pillar of that reputation. The disease-free status of agricultural exports, together with traceability systems such as the National Livestock Identification System, strengthen Australia's agricultural trade credentials. Those policies have facilitated the development of strong export-oriented industries in the Australian agricultural sector, supported by other policies aimed at market expansion. In this connection, it's been the policy of successive recent federal governments to pursue free trade agreements around the globe. A central element of such agreements has been the reduction of tariffs and export quotas for many agricultural products, and government ministers often cite the benefits of free trade agreements to Australia's agricultural sector as a key benefit of such arrangements. Diversification is a growing imperative in the use of those agreements, given the coercive risks of the China market.

The federal government, through DAFF, also has several agencies with a range of agriculturally relevant responsibilities, such as the Australian Pesticides and Veterinary Medicines Authority, which reviews, registers and regulates agricultural chemicals. Specialised divisions of DAFF, such as ABARES, also perform specific functions that shape and inform the federal government's agricultural and rural policies.

The federal government's commitment to international agreements such as the Ramsar Convention on Wetlands and the Paris Agreement also has implications for Australian agricultural policy. Indeed, the federal Water Act, which provides the legislative framework for the federal government's current Murray–Darling Basin policies, is born out of the wetland protection obligations under the Ramsar Convention (Convention on Wetlands of International Importance Especially as Waterfowl Habitat). Therefore, at the federal as well as state and territory levels, environmental policies often interact with agricultural policies, as producers are custodians of vast natural resources.

The federal government also enacts policies related to Australia's agricultural workforce. The provision of specialised rural and agricultural visa programs seeks to fill the demand for low-skill workers in rural and regional Australia. Of particular prominence have been Australia's Pacific labour mobility programs, such as the Seasonal Worker Programme and the Pacific Australia Labour Mobility (PALM) scheme. These initiatives have helped to fill critical shortages in agricultural industries and have contributed to remittance flows back to workers' countries of origin. The Covid-19 pandemic, which has curtailed international arrivals, has illustrated the importance of these workers to Australia's agricultural sector. The federal government's role in funding tertiary education also provides it with the means to pull the levers of the professional-level agricultural workforce through federal support for universities' agriculture-related degrees and subjects as well as RD&E funding. In June 2020, for example, the

Australian Government announced its Job-ready Graduates Package, which sought to incentivise or disincentivise students' higher education choices and to increase the take-up of degrees that the government identified as having strong current or future employment demand. Agricultural degree programs were identified as crucial to overcome a forecast skills shortage in that sector, and students in federally supported places undertaking agricultural studies pay the lowest possible contribution (Band 1, $3,985). The previous federal government referenced its Ag2030 Plan, mentioned above, as giving impetus to policies that develop human capital for the agriculture sector.

At the state and territory level, variously named government departments across Australia develop and enact agricultural policy, which likewise can be grouped into the 'growth' and 'protection' domains. While this congruence of priorities between federal and state levels provides clarity of objectives (all want efficient, safe, healthy farms that contribute to economic, social and environmental prosperity), the cumulative burden of multiple levels of government on agricultural businesses can be onerous, as a 2016 Productivity Commission inquiry found.[12]

Nevertheless, state and territory governments play important roles for producers in their jurisdictions and tend to largely prioritise domestic issues and opportunities in comparison to the internationally oriented federal government, often by design (for example, animal welfare in live animal exports is the responsibility of the federal government, whereas the states' criminal law responsibilities mean that they enforce breaches of their relevant animal welfare legislation). State and territory policies in areas such as biosecurity, environmental protection, RD&E, rural finance and agricultural infrastructure are often implemented in a localised context, in which change occurs through government engagement with producers, local communities, and other stakeholders.

Like the federal government, state and territory governments seek to encourage agricultural innovation for improving productivity and environmental outcomes. Grant programs, public–private partnerships and research centres, among other initiatives, are geared towards those ends. Both state/territory governments and the federal government also administer disaster relief grants and loans. Such programs mitigate financial challenges for producers, but they represent shared social losses. Australians seem to largely support such measures now, but they may come under scrutiny if such shared social losses are made during economic downturns or recession, while high profits are personalised.

An important tool in the implementation of state and territory agricultural policy is agricultural extension. Agricultural extension is a method of communicating agricultural information to enable change and practice adoption. While it's an approach used by public and private entities, in the realm of government policy, agricultural extension services, such as online training portals and workshops for farmers, provide an important means for translating policy into practice, facilitating the widescale, on-farm implementation of governments' agricultural priorities.

Yet, despite what's generally a cohesive approach to agricultural policy between various layers of government and, for the most part, close cooperation with industry, Australian agriculture has nevertheless been subject to cyber, physical and reputational attacks.

Within Australia, sabotage attacks have sought to undermine agricultural production. In September 2018, a strawberry was found with a needle inserted inside it. What followed was a string of copycat cases and several injuries as well as $160 million in losses for Australian strawberry producers. Various sabotage and trespassing activities by animal-rights activists on farms, abattoirs, feedlots and other facilities have also disrupted Australia's agricultural industries. While people should be free to express their opposition to livestock production practices, such illegal activities threaten farm biosecurity, put lives at risk and exacerbate the urban–rural divide.

Hackers have also launched cyberattacks on Australian food companies. In June 2021, global meat processing company JBS Foods was subjected to a five-day cyberattack, which affected Australian meat processing operations. The attack was terminated after the company, which processes more than 25% of Australia's beef kill, paid the equivalent of A$14.2 million.

State actors have also sought to attack Australia's agricultural industry, particularly through agricultural trade instruments. Just months after Australia responded with sanctions and other diplomatic action against Russia following the downing of Malaysia Airlines flight MH17 over the conflict zone in eastern Ukraine, Russia banned most food imports from Australia and other Western countries. However, most notable of late are the import restrictions and regulations placed on Australian agricultural exports by China. In May 2020, after then Prime Minister Scott Morrison and then Foreign Minister Marise Payne called for an independent international inquiry into the outbreak of Covid-19, China placed anti-dumping and anti-subsidy duties on Australian barley imports with an 80.5% tariff, making Australia's barley exports uncompetitive in China, even if they were allowed entry. That was followed by restrictions, customs challenges, investigations and other measures on the import of Australian wine, rock lobsters, timber, beef and cotton—some of Australia's most iconic and high-value exports. Such moves are expected to continue as China's government uses its economy as a weapon against numerous countries, including Australia.

Strategic context

Australia's agricultural policies are, as mentioned, largely concerned with the economic development of the sector. Yet they also place agriculture in an important strategic space. Robust and resilient food and fibre production systems are critical to political and social stability. Food security, which is enjoyed by most Australians most of the time, along with the provision of other essential physical needs, allows for stable and secure societies—we see with Putin's war in Ukraine that food security can no longer be taken for granted in the world of 2022. Food insecurity, according to the Food and Agriculture Organization, exists when an individual 'lack[s] regular access to enough safe and nutritious food for normal growth and development and an active and healthy life', and is now playing a significant role in social and political upheaval, as well as in exacerbating the fragility of already fragile states.

In his book *Fear of abandonment*, Allan Gyngell describes the connection between food security and political stability in clear terms. He notes that Australian efforts to establish food security in post-World War II South East Asia was 'a political as well as humanitarian issue'.[13] For Australia and its Western allies, the ominous threat of communism loomed large in Southeast Asia, and any discontent in the region could provide fertile ground for the rise of communist governments. By ensuring that 'non-communist Asian states [kept] their people fed',[14] Australia and other Western powers sought to mitigate that security risk.

Recent Covid- and flood-induced food shortages, together with inflation and cost-of-living pressures, have increased food security concerns across the nation. In its *2021 Hunger report*, Foodbank, an Australian food relief organisation, reported that one in six Australian adults experienced food insecurity in the 12 months from July 2020 to July 2021. That number has probably increased with little to no relief to cost-of-living pressures in the months since. Even for people not experiencing food insecurity, the sight of depleted shelves threatens to erode confidence in Australia's supply chains and the capacity of governments to effectively respond to food shortages. While the implications of this for national security are indirect, policymakers would do well to reflect on how domestic food insecurity threatens social cohesion and dissatisfaction—and on how food security does the opposite, including in times of crisis and conflict.

The relationship between agriculture and national security extends beyond the function of food security as a condition for peace and stability. In Australia, agricultural dimensions of national security are multifaceted and largely connected to the international links the country has forged through agricultural trade, investment and development, as well as aspects linking agriculture to cultural or environmental assets, often portrayed through tourism marketing and entertainment media.

In his August 2020 address to the Aspen Security Forum, then Prime Minister Scott Morrison said that Australia was 'continuing to invest in the relationships in the Indo-Pacific to pursue common interests in peace, stability, openness and prosperity'. Morrison followed that remark by referencing both the Australia–Indonesia Free Trade Agreement and the Australia–India Comprehensive Strategic Partnership. Agricultural trade is integral to both agreements, and indeed for many of Australia's trading relationships, particularly in the Indo-Pacific.

Those trading relationships are strengthened by people-to-people links forged between Australian agricultural exporters and their international partners. Engagement and relationship building through those links are powerful tools of diplomacy, developing cross-cultural understanding and mutual interest. The partnerships are instrumental to the development of soft power that enables Australia to project values and shape international affairs, particularly in the Indo-Pacific. As incomes in that region rise, so too does demand for high-quality agricultural products, in a trend that Australian food, fibre and beverage exporters have identified and sought to exploit. To bolster this international market expansion, agricultural industry groups have sought to create a presence in key export countries and regions. For example, Meat and Livestock Australia (MLA), which is a service provider to Australia's red meat industry responsible for marketing and research, has offices across the globe, allowing it to market and represent the Australian red meat industry directly to international consumers. In exporting agricultural goods and by differentiating them as 'Australian' at the consumer end, exporters and producers harness the positive reputation that Australian agricultural goods enjoy, but they also shape perceptions of Australia as a 'clean and green' agricultural exporter with a food-safety reputation underpinned by responsible environmental governance, scientific capacity and supply-chain integrity. Projecting those values strengthens Australia's influence.

Beyond the trade relationship, the academic sphere also contributes to diplomacy through agricultural endeavours. Agricultural research facilitates robust and extensive people-to-people links, connecting Australian researchers, students, universities, research institutes, government departments and businesses to international partners. Advanced technical and scientific expertise in agricultural research has given Australian researchers the capacity to make significant contributions to agricultural science on an international scale through those partnerships. In international agricultural development, primarily driven through the Australian Centre for International Agricultural Research (ACIAR), Australian researchers have made important contributions to socio-economic development advances in partner countries. In this case, people-to-people links are combined with the benefits of improved food security, strengthened livelihoods, gender equality, environmental sustainability, education and other social and economic gains that contribute to prosperity and therefore to security. This is especially true in the Indo-Pacific, where ACIAR works with local partners to improve food security—an important prerequisite for peace and stability.

While it's difficult to know which of these initiatives have resulted in averting conflict and instability in the Indo-Pacific, instances of food insecurity and rural decline in the Indo-Pacific and elsewhere have readily demonstrated that those factors make critical contributions to fragility.

Australian agriculture also contributes to Australia's soft-power projections through entertainment media. In film, television and tourism advertising, images of rural landscapes, farms, cattle stations and vineyards are employed to shape particular notions of Australia. Those portrayals often seek to closely tie Australian society with rural life, harnessing ideas about agrarian values as morally upright and primary production as an economically righteous activity. Depictions of outback Australia in internationally distributed tourism campaigns and Australian films and television also shape particular perceptions of Australia in the minds of overseas audiences. Those depictions are often accompanied by portrayals of resilient yet relaxed Australians, who are capable of taming the country's arid and semi-arid climes to carve out a livelihood in agriculture. A 2016 publication by Screen Australia, *Measuring the cultural value of Australia's screen sector*, reported that international audiences recalled many Australian characters and productions with strong links to rural Australia. Some of the most internationally popular Australian film and television productions feature themes related to Australia's agricultural and rural communities, including *McLeod's Daughters*; *Gallipoli*; *The Adventures of Priscilla, Queen of the Desert*; *Mystery Road*; *Australia*; *Crocodile Dundee*; and *The Sapphires*.

In Australian foreign and strategic policy discourse, the Indo-Pacific region receives the most immediate and pressing attention. It's in this region, which Australia's new Foreign Minister, Penny Wong, calls 'the most vibrant and dynamic region in the world' , where Australia must continue to focus most of its efforts to contribute to peace and ensure national security, and where the aforementioned agricultural approaches can be used to achieve this end. Australia's engagement with the Indo-Pacific enjoys bipartisan support, so changes in government are unlikely to result in disengagement with the region—a key strength of Australia's foreign policy. In fact, the Prime Minister,

as well as ministers in his cabinet with defence, foreign policy and trade portfolios, have spent much of their first few weeks in government bolstering ties in the Indo-Pacific and reaffirming Australia's engagement in the region. The Albanese government's commitment to Indo-Pacific engagement has been underscored in forums such as the Quad Leaders Meeting, the Australia–Indonesia Leaders Meeting, the Australia – New Zealand Leaders Meeting and the Pacific Islands Forum, as well as through Wong's visits throughout the region. Australia's agriculture and food exports have featured in many of those engagements; so, too, have discussions about food security pressures faced in the Indo-Pacific as a result of Russia's invasion of Ukraine. Less than a month after the election, the Australian Government also reiterated its commitment to the liberalisation of agricultural trade as part of the Cairns Group, which is a multilateral interest group of 19 agricultural exporting countries, including seven Indo-Pacific nations. As this engagement in the Indo-Pacific continues to grow, and in view of food-security concerns around the world, agriculture is expected to play an even more significant role in Australia's relations with our neighbours.

Agriculture and national security also have important domestic dimensions that need to be examined, even in relatively stable and secure societies such as Australia. While the reference to food insecurity and political instability made at the beginning of this chapter is unlikely to apply in the Australian context, positive food security adds to Australia's resilience and cohesion in times of crisis and is a required strength should conflict return to our region as it has to Europe. The effects of Putin's war on global food security, together with China's coercive intervention into markets as an exercise of state power and recent supply-chain disruptions because of the Covid-19 pandemic and natural disasters all mean that some thought must be given to how national security can be threatened as well as enhanced by how we approach agriculture policy, investment and production. These include a rural–urban divide, political discontent, disputes over foreign ownership of agricultural land, the social and economic implications of decreased mining activity, and the impacts of climate change, all of which are considered at length in the following chapter.

People

Despite its small population (5% of the national total), northern Australia hosts remarkable demographic diversity. It's home to people from a variety of socio-economic, cultural, ethnic and linguistic backgrounds. The region's educational, professional and political make-up is likewise heterogenous. Both across the north in general and within the region's agricultural sector in particular, the north's demographic diversity presents both risks and opportunities for strategic, social and economic direction.

Around 15% of northern Australia's people identify as Indigenous, compared to 3% nationally. In addition to a comparatively large Indigenous population in northern Australia, the region also has a robust multi-ethnic make-up. Australia's migrant history is well documented, as is the fact that half of all Australians were born overseas or have a parent born overseas. In the 2016 Census, the largest ancestry groupings in both Western Australia and Queensland, the two northern Australian states, was reported as Australian, English, Irish and Scottish. Those groups were also the most common reported in the Northern Territory, plus 'Aboriginal Australian'.

Yet perceptions that non-British or Irish ethnic diversity is only a characteristic of Australia's large, southern urban centres are incorrect. Many communities throughout northern Australia's regional, rural and remote regions are multicultural. While that human diversity is due to several historical, cultural and economic drivers, agriculture has acted as an important pull factor for international migration to northern Australia. Across the region, this is illustrated by distinct communities of migrants that have formed around agricultural production, as well as fisheries and other primary industries.

Italian migrants were instrumental in developing north Queensland's sugarcane industry from the mid-1800s. Japanese, Timorese and Malay divers worked in northern Australia's pearling industry in the late 19th and early 20th centuries. Russian Cossacks who fled the Russian Civil War arrived in Katherine, Northern Territory, where they developed peanut and cotton farms in the early 20th century. The list goes on. More recently, seasonal workers from Papua New Guinea, Timor-Leste and Pacific island nations have been employed across agricultural industries, particularly horticulture, for over a decade and, while not permanent migrants, nevertheless contribute to a more diverse social tapestry.

And, like agricultural industry in the Americas, which relied on the transatlantic slave trade, some agricultural industries in northern Australia also exploited workers through slavery, kidnapping and indentured and forced labour. The practice of blackbirding, through which people from islands in the southwest Pacific were often lured or kidnapped and shipped to Australia to work in primary industries, brought thousands of people to central and north Queensland, mostly for labour in the sugarcane industry. Their descendants are part of today's South Sea islander community, recognised in 1994 by the Commonwealth Government as a 'unique minority group'.[15] More than 6,800 Queenslanders report Australian South Sea islander ancestry, and most of them live in areas defined as northern Australia.

Today, many people in northern Australia can trace their familial lines to ancestors who relocated to northern Australia to work in the primary industries or related sectors. Agriculture continues to be a driver of cultural diversity in northern Australia, continually attracting labour to fill employment across the skill spectrum.

As agricultural development in northern Australia gains pace, driven in part by improved human capital, immigration to the region will affect demographic change as both newly arrived migrants and Australian-born citizens of varied cultural backgrounds fill skills shortages in northern Australia. Combined with a pattern of migration from capital cities to regional centres during the Covid-19 pandemic, demographic changes enrich northern Australia's diversity but also act as a test for social cohesion. Vigilant maintenance of that social cohesion, borne through well thought-out policy development and community leadership, will ensure that the economic or strategic development of northern Australia isn't curtailed by easily avoidable social strain.

Indigenous peoples and northern Australia

Aboriginal and Torres Strait Islander communities have ancient and deep connections to lands and waters in the north, animated by a custodianship of natural resources that's intrinsic to Indigenous identity. Around 15% of northern Australia's population identify as Indigenous, compared to 3% nationally. Aboriginal and/or Torres Strait Islander people directly own or manage 40% of the north's landmass.

For Aboriginal and Torres Strait Islander peoples, land, waters and natural ecosystems have important social, cultural, economic and spiritual significance. While the description offered here can't do justice to the depth of those dynamic relationships, no consideration of northern Australia's population can afford to overlook the importance of Indigenous communities and their connection to lands and waters. What's particularly critical to realise is that, for Indigenous peoples, 'country' is the key to a sense of meaning and belonging. It's in this light, then, that consideration must be given to the legacy of dispossession that European colonialism has left in northern Australia.

A loss of meaning has severe ramifications for social cohesion between communities and for social mobility among members of affected groups. From the perspective of Australian agriculture, attention in this area should be given to the role that agricultural expansionism played (and still plays) in a sense of dispossession among Indigenous peoples and the function that agricultural and environmental initiatives can perform in redressing the cultural, psychological, spiritual and economic impacts of such dispossession.

Illustrating just one of the many instances when Indigenous conceptions of land and natural resource use collided with newly introduced European agricultural models, is the following statement by Dr John von Sturmer, which appears in Australia's Law Reform Commission's *Recognition of Aboriginal customary laws* report:

> Traditional authority was undermined even where there was no dispossession, certainly none of the sort that Aborigines were aware of. This may even be true of pastoral properties where people may have been aware that they're moving into new sorts of relationships but may have continued to believe that they owned/controlled the land. I recall that the people at Aurukun [in north Queensland] with whom I worked were quite shocked when I told them in 1970 that the government, not they, owned the land. And in many of the pastoral properties it seems that Aborigines believed they were 'working' the land in conjunction with the European pastoralists.[16]

By altering the millennia-old relationships that Indigenous peoples enjoyed with the ecosystems under their stewardship, colonial settlement of Australia presented a fundamental distortion of the existing order. Ensuing frontier conflicts are thought to have killed some 60,000 Indigenous people during the 19th and 20th centuries in Queensland alone.[17] Subsequent policies, such as the removal of children from their families, giving rise to successive 'stolen generations', only magnified a sense of severance from country. Those events, intermingled with still persisting patterns of racism and prejudice, have given rise to a devastating disruption to the social, cultural, spiritual and economic advancement of Indigenous peoples that's best described as intergenerational trauma.[18]

The struggle for Indigenous land rights has sought to restore the connections that Aboriginal and Torres Strait Islander peoples share with their lands and water. Northern Australia has been home to some of the most significant advances in those rights as well as other Indigenous rights movements, particularly related to employment and

representation. Agricultural, and particularly pastoral, activity has been intimately associated with nearly every step in this process.

In 1966, the Wave Hill walk-off saw 200 Gurindji stockmen, domestic workers and their families initiate a strike at Wave Hill station in the Northern Territory. Led by Vincent Lingiari, this industrial action and the campaign that followed were a watershed moment for Indigenous land and employment rights.[19]

Perhaps the most well-known event associated with the Indigenous land rights movement was *Mabo v. Queensland*, which was a 1992 decision of the High Court of Australia that recognised the native title of the Meriam people over the island of Mer (Murray Island) in the Torres Strait. The decision also gave broad recognition to the principle of native title for all Indigenous people across Australia, acknowledging precolonial associations between Indigenous peoples and their homelands. The concept of native title is a persistent feature of land-use decisions and debates in northern Australian agricultural discourse. It represents an important element for social cohesion, agricultural development, prosperity and security in northern Australia.

Northern Australia features heavily in ongoing reconciliation initiatives and other efforts to reduce inequality experienced by Aboriginal and Torres Strait Islander people through the National Agreement on Closing the Gap.

Agricultural workforce characteristics: job opportunities and job losses

The agricultural sector in northern Australia is a major employer across the region. The north's main industries include beef cattle, tropical fruit production, vegetable production, aquaculture, fisheries, forestry, grains, cotton, and pulses, and additional niche and game meat industries also make important contributions.

In recent years, both existing and emerging industries have experienced expansion and development, largely facilitated by infrastructure development, skills growth, increased export demand and research-driven improvements to production. Those improvements include protections against plant and animal diseases, advances in agricultural technology (agtech), water-efficiency innovations, northern Australia-adapted crops and livestock and adjusted production timetables. All of these effectively seek to ensure that agricultural production is suited to and optimised for the environmental, economic and social context of northern Australia. Much of this has been captured in the federal government's *Our north, our future: 2021–2026* 'targeted growth' document, which outlines large-scale investment in agriculture and agriculture-supporting initiatives across the north. To enable such initiatives, as well as those executed by state and territory governments or private businesses, landholders and others, has required a quantitative and qualitative transformation in northern Australia's agricultural workforce. Other changes, such as shifts in the commercial make-up of agribusinesses, climate change and foreign investment, have also contributed to changes in the workforce.

While many traditional skills and positions in the north's agricultural workforce remain critical to the industry, such as stockmen in the livestock sector, horticultural labourers for fruit and vegetable harvesting, agronomists and agribusiness consultants, the nature of this work is shifting. So, too, is the relative share of those positions with respect to others. Most of this is driven by the abovementioned factors. For example, the Ord River Agricultural Area in Western Australia's East Kimberley has long been identified as a region with great agricultural capacity, particularly for growing relatively high-value crops such as cotton. However, a lack of scale to make infrastructure development worthwhile, combined with a high burden of disease typical of tropical areas, has long stymied that expansion. Recent success, including in cotton production, has allowed the region to overcome some of those limitations, largely due to locally relevant research that led to improved and localised growing practices that differ from those in eastern Australia's cotton-producing regions. These research-led changes, combined with general crop protection advances in the cotton industry, also led to greater suppression of pest burdens. Cotton in the Ord Valley highlights the benefits of agricultural development led by research to overcome longstanding barriers to agricultural production in the north. It also presents an example of the kind of work that can continue to take place

in northern Australia. To do so, however, requires greater investment and expertise in agricultural science. To both overcome challenges and capitalise on opportunities that northern Australia presents, the agricultural workforce will need to strengthen its scientific and RD&E capacities through both local training initiatives and domestic or international immigration.

Greater adoption of agricultural technology has also brought about a shift in the workforce composition of northern Australia's agricultural sector. This technology includes, for example, the use of drones to monitor and map agricultural assets, remote sensors to collect and transmit weather data, automated pest identification, on-animal GPS to track livestock movements, remote sensing of water resources for livestock and crop production, the use of autonomous robots to control weeds or harvest mangoes, and digital aids on tractors. The emergence of agtech incubators, accelerator programs, research institutes and government-supported agricultural technology initiatives in northern Australia and across the country in general have accelerated the development and adoption of such tools. These programs, like Queensland's AgTech hubs, seek to create collaborative opportunities between a range of agricultural stakeholders to develop and implement agricultural technology innovations and are active across Queensland's share of northern Australia. While initiatives like this create new job opportunities for mechatronics engineers, researchers and other technical professionals in northern Australia, the largest impact is most likely to be changes in the nature of existing work. Here, the existing agricultural workforce will need to further develop digital literacy and the skills to operate and adapt agtech tools to primary production. Other skills, such as those related to people management and environmental stewardship, will need to continue to advance to meet the changing reality in northern Australia. All of these place demands on professional development and capacity-building arrangements in northern Australia's agricultural sector.

While the above workforce shifts paint a largely optimistic picture of agricultural employment in northern Australia, changes across the region may also contribute to job losses or, more accurately, the loss of particular types of jobs. Industries that see an increase in take-up of automation and mechanisation can expect to experience reductions in labour demand in low-skill positions such as fruit and vegetable harvesting. In any case, however, automation in those industries has emerged to fill existing unmet labour supply, rather than emerging as a job replacement strategy. Workers who are unable or unwilling to adapt to the shifting workforce landscape may likewise face grim employment prospects if changes in the nature of work outpace their skill development. Job losses in agriculture, together with demographic changes that arise from the immigration of skilled workers, have the potential to disrupt social cohesion.

While agriculture is a major employer in northern Australia, so too are mining and extractive industries for commodities such as gas, coal, zinc, gold, iron ore, bauxite, manganese and others. Mining and agricultural industries often compete for labour in northern Australia. Many jobs in both sectors require similar trade-based or STEM-based skills. The mining industry's reputation for higher pay, together with the industry's capacity to recruit and train professionals, means that the mining industry often wins out.

According to the Australian Government's *JobOutlook* portal, renumeration for workers in the mining industry is generally higher than for those in the agricultural industry across all skill levels. While the mining of metals and rare earth minerals is likely to remain stable or even to increase, global decarbonisation could, in both the short and long terms, result in a decline in fossil-fuel extraction. As economies seek to achieve carbon neutrality over the course of the next few decades, demand for commodities such as coal is likely to decrease, at least in relative terms.[20] Therefore, and together with automation in mining industries, the number of low- to medium-skilled positions in the mining industry is likely to shrink. Given that so many other sectors of the local economies in such places are also dependent on mining industries, the ripple effects could be catastrophic.

Research by the Centre for Policy Development estimates that up to 300,000 existing Australian jobs are at risk from global decarbonisation (new jobs are also created, of course, but the displaced workers aren't a seamless fit for those jobs). This includes significant job losses in parts of northern Australia such as Central and North Queensland, as well as the Pilbara in Western Australia. Without an adequate plan to transition workers in extractive industries to other jobs, unemployment in some mining communities across northern Australia could rise. The impact on

agriculture will be to increase labour market supply for fewer jobs, which are already not as lucrative as the mining industry. An increase in labour supply is likely to see wages stagnate or decrease. The resulting unemployment, reduced household income and community-wide ramifications left unaddressed may well combine to pose a significant risk to social cohesion, leaving individuals and communities susceptible to political messaging that seeks to mobilise the frustrations of affected people against traditionally scapegoated communities who are blamed for their predicament.

The urban–rural divide

Northern Australia is large but sparsely populated. Apart from centres such as Cairns, Darwin, Mackay, Rockhampton and Townsville, the north mostly consists of small regional centres as well as rural and remote towns and isolated settlements. In an overwhelmingly rural region, then, communities in northern Australia face some different realities from their compatriots in Australia's large cities.

A global trend toward urbanisation, coupled with a gradual decline in the share of the rural population and a reduction in the relative size of the agricultural workforce (noted in the first chapter of this report) has led to what some people call an 'urban–rural divide'. The divide is characterised by both a geographical but also a social, political, cultural and economic division between rural and urban communities. A look at the electoral map in democracies around the world will demonstrate how this often (but not always) plays out politically. Yet, this urban–rural divide shouldn't be conceived of as a broad, generalised polarisation of Australian society. We should reject divisive stereotypes of 'latte-sipping' city dwellers on the one hand and notions of rural towns populated just by farmers and miners on the other. Our nation is far more diverse and nuanced than that, and shared interests and ideas—such as stewardship of our land and environment—connect us.

Urban and rural populations share many characteristics, are beset by many of the same challenges and have similar individual and collective aspirations, not to mention the mixing of populations that eventuates with regular movements of people between urban and rural areas. However, the description of the urban–rural divide here simply serves to illustrate that there are some important distinctions between those realities that, in the context of northern Australia, must inform both risks and opportunities for governments, communities, civil society and businesses.

From an agricultural perspective, this divide can manifest itself in an urban disconnect from the agricultural realities that prevail in rural areas. Gone also are the days when most people had a connection to farming. Devoid of context, certain agricultural practices appear unnecessary to urban, non-agricultural communities. Animal husbandry procedures, pesticide application, genetic modification of crops, the administration of veterinary medicines, feral animal control, water use, animal housing arrangements and other (legal) agricultural practices have become increasingly contentious among consumers in Australia and elsewhere, threatening the agricultural industry's social licence to operate. And, while some contentious practices are phased out through legislation or market forces deployed by shifting consumer values and preferences, phasing others out is unviable for both producers and the consumers who would eventually absorb the cost of maintaining production in an environment of excessive regulatory burden and consumer mistrust. A complete cessation of pesticide application would, for example, have significant impacts on crop production through crop losses and increased labour inputs.

Communicating the necessity of agricultural practices, and the burden of abandoning them, must serve to familiarise the urban public with the reality of particular challenges and the ramifications of drastic changes to production techniques. Of course, where sustainable changes can be made, such as through feeds that reduce methane emissions from cattle, sheep and goats, or through integrated pest-management strategies that reduce pesticide use, they should be pursued and receive greater investment from producers and governments. Likewise, unlawful practices such as worker exploitation and illegal vegetation clearing should be clamped down on, and producers should continue to be in favour of the just resolution of such indiscretions. Failure to do so only

exacerbates the urban–rural divide and can contribute to a culture of suspicion of agriculture among the consuming public, the majority of whom live outside of northern Australia and outside of agricultural communities.

The urban–rural divide is compounded by a feeling of political neglect in regional Australia and a perception that political power is concentrated in urban centres, despite significant investment, including federal government investment in Australia's regions. The states in northern Australia (Queensland and Western Australia) have their capitals in their respective coastal southern corners, leaving state politics exposed to accusations of political neglect of the regions and grievances that the economic output of regional and rural areas is disproportionately exhausted through spending in the cities.

A collection of political parties with agrarian and agrarian/regionalist ideologies seek to represent or employ these frustrations to argue for greater political autonomy. Regionalism in Western Australia has largely been concerned with mobilising the frustrations of perceived abandonment by the rest of Australia, despite the state's disproportionately large contributions to the national economy, mostly thanks to mining. Those sentiments have ebbed and flowed since federation and, while Western Australia's secession from the Commonwealth, dubbed 'Waxit', has rarely been thought of as credible, the frustrations underlying this regionalism are real and should be appropriately considered. The Covid-19 pandemic only exacerbated these differences.

In Queensland, regionalism takes on intrastate characteristics. Political parties such as Katter's Australia Party, which is active across the north of the state and has one member in federal parliament and three members in Queensland's state parliament, asserts that 'the only way to unlock North Queensland's full potential' is the creation of a separate state for North Queensland, arguing that the state's north 'has been treated as South East Queensland's poor cousin'. North Queensland statehood is also part of the declared objectives of the North Queensland First party.

While there would need to be significant sociopolitical shifts before there were any changes to the existing jurisdictional arrangements in Australia, the presence of these movements and parties indicates a public sentiment in some parts of the north that must be acknowledged. In the 1990s, opposition to the Native Title Act, together with increased firearm legislation in the wake of the Port Arthur massacre, grievances about free trade, regulatory burdens and poor service delivery gave rise to the One Nation party as a counter to what were regarded as metropolitan-oriented policies.

Feelings of abandonment, while not strictly urban–rural, play a role in the Northern Territory's political discourse, too. Here, a push for statehood is often driven by feelings of neglect or, as former Chief Minister Adam Giles argued, the territory is 'a second class citizen' with 'second class status'. Giles's Country Liberal Party government (2012–2016) pursued full statehood in part driven by those sentiments of neglect. In a 1998 referendum, territorians voted 51.9% to 48.1% against statehood, retaining territory status, but in 2015, at a meeting of the Council of Australian Governments, state, territory and federal leaders unanimously agreed that the territory should accede to statehood by 1 July 2018: an event that did not come to pass.[21]

At the federal level, the National Party of Australia, which is the junior partner in the Liberal and National coalition, espouses conservative and agrarian values, seeking to represent country voters, including in northern Australia. But perceptions that the National Party doesn't speak to the issues of some rural voters, particularly primary producers, led first to growing popularity of One Nation in the aftermath of the 1996 National Firearms Agreement following the Port Arthur massacre, and more recently to the emergence of the Shooters, Fishers and Farmers Party, which has seats in the parliaments of New South Wales and Victoria.

All of this is to say that northern Australia's predominantly rural and regional make-up makes it subject to the political comings and goings of such political parties who have represented the region, with differing degrees of accuracy.

The risks

Across northern Australia, regionalism, an urban–rural divide, concerns about the future of work, protectionism and opposition to demographic changes threaten to fuel rural discontent. To appreciate the significance of those forces, policymakers should look to recent and historical examples of discontent among rural populations around the world that have caused shifts in the longstanding political order. While rural populations are shrinking relative to urban populations, they nevertheless continue to pack a political punch. Neglecting rural discontent can play a role in political movements against the *status quo*.

In the UK, rural areas in England recorded some of the highest 'Leave' votes in the 2016 Brexit referendum. While other trends and demographic characteristics, such as educational level, median income, socio-economic status and qualification levels, are correlated with voting patterns, and a simplification of the Brexit narrative should be avoided, the role of rural discontent against the prevailing order of UK membership of the EU can't be ignored. In 'Brexit and the politics of the rural', Dr Sally Brooks examines the interactions between rural politics and the Brexit vote. While the paper discusses the complex and multifaceted motivations of voters in the referendum and warns against misconceptions of a simplistic urban–rural split, the author identifies important elements of rurality in shaping Euroscepticism and English (as opposed to British) nationalism in many of the rural areas of England that voted to leave. Political discontent and dissatisfaction with the UK's membership of the EU, shaped by factors such as a rejection of 'urbanity', opposition to increased migration from the EU, rural underinvestment and perceptions that the 'rural way of life' was under threat, are all thought to have contributed to a high proportion of leave votes in some, but not all, rural election areas.[22] While the urban–rural divide contributed to Brexit and while it continues to play a significant role in the UK, it's by no means a universally applicable constant that can always be applied to political equations there or elsewhere.

Just over four months after the Brexit referendum, the 2016 US presidential election delivered an unexpected victory for the Republican nominee, Donald Trump. Again, rural discontent tells part but not all of the story here, and was particularly driven by a perception of reduced service delivery in rural areas, once again resulting in feelings of abandonment by the affected populations. Rural voters have traditionally voted for Republican candidates in the past few decades, so it was no surprise to see similar trends in the 2016 US presidential election. What was perhaps somewhat surprising was the extent to which voters in the industrial Midwest (Illinois, Indiana, Michigan, Ohio, Pennsylvania and Wisconsin) shifted their votes to the Republican candidate, despite delivering victory for President Barack Obama in the 2008 and 2012 elections. This electoral shift occurred in areas that have experienced economic, social and public health declines over the past three decades, resulting in circumstances that left them worse off in 2016 than they had been since the 1980s. In their 2017 paper titled 'More than a rural revolt: landscapes of despair and the 2016 presidential election', Monnat and Brown provide profound analysis of how this disadvantage in rural towns and small cities helped to (but did not exclusively) propel Trump into victory. A perceived abandonment of blue-collar workers by the Democratic Party fuelled an electoral shift towards Trump in areas left disadvantaged after the contraction of American manufacturing.

In non-Western contexts, rural discontent and a perception of economic and social injustice across the urban–rural divide has likewise provided impetus for political upheaval. Perhaps one of the most noteworthy examples of this from the postwar era is the 1979 Islamic Revolution in Iran. Here, economic, social, cultural and religious grievances among the country's conservative rural populace combined with other grievances across the political and socio-economic spectrum to produce an atmosphere of discontent with what was widely regarded as an increasingly pro-Western, secular, disconnected, opulent and repressive monarchy. The shah (king) of Iran had instituted a program of modernisation through the White Revolution, which diluted the power of the clergy, accelerated urbanisation and changed rural economies and social services. The erosion of clerical power, together with rural disadvantage and inequality, mobilised the rural conservative population in opposition to the shah. This despite the shah's rural health and education programs, which ostensibly sought to mitigate inequalities.

Joined by an unlikely collection of groups across the political and social spectrum, the rural conservatives formed a powerful element of the 1979 revolution that ousted the shah and led to the establishment of the Islamic Republic of Iran. Following the revolution, religious conservatives from both urban and rural Iran consolidated their power, marginalised their opponents and repressed other political and religious groups. The subsequent economic and geopolitical ramifications in both the Middle East and across the world have been far-reaching and continue today. For many people in Australia, these case studies will seem detached from the prevailing reality here. By no means are they provided as warnings for what may occur in Australia; rather, they serve as indicators of how an urban–rural divide is about more than just geographic and demographic differences. The social, political and economic divergences between urban and rural realities have profound implications for governments, businesses, communities and other stakeholders, particularly in preventing discontent and implementing reforms of all kinds. In developing northern Australia, those stakeholders must be cognisant of the influence of rural discontent and the implications that such a force can have in obstructing the realisation of strategic imperatives.

As Brexit in the UK, the election of Donald Trump as US President, the 1979 Iranian Islamic Revolution and many other instances demonstrate, rural discontent plays an important but not exclusive role in political upheaval and change. What's important to glean from an Australian perspective is the extent to which declines in health, social and economic outcomes in rural and regional areas can cause political shifts just as much as anxiety over job losses in the mining industry or increased agricultural regulations. In an open democratic system, such electoral shifts could be reasonably expected among discontented communities, and there should be no attempt to stifle citizens' rights to exercise their democratic will. But, in the absence of creative solutions, such discontent is vulnerable to appropriation by actors who seek to channel it towards social division, discrimination and scapegoating, marketing themselves as a panacea to problems real and imagined, and painting minorities or far-off groups as the deserving targets of rage.

Rural discontent in northern Australia has been outlined above, but recent examples highlight the extent to which it has historically provided a potent force for change.

The 'Green Shirts Movement' emerged in mid-2018 among some primary producers in opposition to the Queensland Labor government's native vegetation management laws. The movement, now predominantly with a presence in Western Australia and Queensland, subsequently became a vehicle for other grievances, particularly about environmental regulations affecting agriculture, and successfully mobilised landholders and others in the agricultural sector against what they perceived as regulatory threats to the viability of primary production (so-called 'green tape'). Proponents of the Green Shirts Movement assert that, because maintaining environmental assets and value benefits primary production, farmers are often best placed to be effective stewards of the land they operate on.

The movement is emblematic of the tension that's arisen regarding agricultural use of what are considered public assets such as water, air and biodiversity. The need to maintain food and fibre production with an increasing global population runs parallel to a related need to mitigate climate change through net zero carbon emissions—a goal that various industry bodies, including the National Farmers' Federation, have listed as an aspiration. As the urban–rural divide plays out, those grievances are likely to continue and, in the absence of measured policy, consultative action and innovative solutions, threaten the north's social cohesion.

All of the above demonstrate a pattern of disappointment, often intermingled with a sense of not being consulted, which have come to characterise rural discontent in Australia and elsewhere. These instances highlight the extent to which consultation and participatory involvement in processes of change must be employed by policymakers in order to mitigate threats to social cohesion.

Job losses and economic despair, the marginalisation of ethnic communities, and a loss of meaning through dissociation from country can also give rise to antisocial behaviour and organised crime. Those factors can impede a sense of meaning and belonging among a variety of people in northern Australia. Perturbations to a sense of

meaning give rise to the disintegration of familial and social ties and for individuals leads to 'the unravelling of self-concept, ethnic identity, sense of belonging and sense of citizenship'. In search of belonging, individuals, particularly youth, who have been marginalised through forces of social friction such as racism are susceptible to the pull of illicit organisations and activities that offer a sense of inclusion, which they perceive as having been otherwise denied to them. This is dealt with in greater detail by ASPI's Dr Teagan Westendorf and Dr John Coyne in *Agenda for change 2022*.

These risks to northern Australia's security and therefore prosperity require, as has been stated, a concerted and well thought-out policy response. Agriculture can play a vital role in this.

Supporting social cohesion

The key to safeguarding the north's security and social cohesion is a community-centred approach to decision-making that fundamentally recognises the unique characteristics and needs of each town and region. Northern Australia isn't a monolith. While such an approach may seem resource intensive, the capacity of northern Australian communities and of primary producers across the region to operate innovatively, doing more with less, shouldn't be underestimated. At the same time, innovation and investment in the north should be conceived of as just that—investment and not charity. From a strategic perspective, at a time when northern Australia's strategic position is increasingly evident and critical to national security, unmitigated discontent threatens to alienate sections of the region's population. This has the potential to cascade into an unwillingness to support, and even opposition to, the policy agendas of governments at all levels. A lack of domestic support, particularly in key regions, poses a significant risk to Australia's strategic direction. Involving the north's agricultural communities in decision-making, research and efforts to strike an appropriate balance between production efficiency and environmental sustainability will do much to stem discontent, contribute to prosperity and foster security.

The proper engagement of Indigenous peoples is likewise vital to the realisation of northern Australia's economic and strategic potential and even more critical for the unfolding of agricultural capacity in the region. Without that engagement, efforts to develop a secure and prosperous northern Australia will be severely impeded. This engagement is vital not only because of the invaluable knowledge that Indigenous culture holds, with a capacity to translate that into economic and strategic advances, but because a restoration of this connection to country, to the extent that it's now possible, can serve as a vehicle for strengthening the cultural assets that give rise to meaning among the Indigenous peoples of Australia. Prosperity and security across the north are therefore advanced when reconciliation efforts result in greater fortification of social cohesion, economic mobility and social progress.

Indigenous knowledge can also play a role in developing more locally adapted food and fibre production systems, particularly when this is combined with environmental stewardship, which confers its own benefits to productivity and sustainability.

Agriculturalists have sought to overcome the geophysical and biological challenges that have long beset agricultural production in northern Australia (a topic under more intensive review in a subsequent chapter) through largely technological and agronomic approaches. While those approaches are critical to agricultural expansion and productivity in northern Australia, they largely seek to fit the square peg that's predominantly Eurasian production systems into the round hole that's Australian agricultural land. Indigenous communities, and the knowledge they hold, can help to address this anomaly. Even if particular Indigenous practices and knowledge related to agricultural production existed at different scales and across different timespans from what current production seeks to achieve, important principles can still be extracted from these methods. For example, Indigenous practices in water stewardship can be employed to improve water-use efficiency, particularly in arid and semi-arid northern Australia. Programs such as Victoria's Water, Country and Community Program, which recognise the important connection, practices and values that First Nations peoples hold in regard to water use, should be more readily implemented across the north. This will not only advance social cohesion between Indigenous and non-Indigenous people, but also improve water-use efficiency in an environment with an increasingly volatile rainfall pattern.

Other programs already instituted across northern Australia recognise the unique value of Indigenous knowledge in unlocking the north's economic, environmental, social and strategic potential through primary production and land management. They include Indigenous ranger programs, Indigenous-owned agricultural companies, traditional burning for land management, and the production of naturally derived medicines. The Defence organisation has also realised the power of Indigenous knowledge, most notably through the relatively high proportion of Indigenous soldiers in the three regional force surveillance units responsible for reconnaissance and surveillance across northern Australia.

By building on existing arrangements, particularly in agricultural production and environmental protection, the further engagement of Indigenous Australians will greatly bolster northern Australia's strategic direction. Crucially, that engagement can be successful only if Indigenous peoples are afforded the full agency to engage—the decision must be theirs to make. The knowledge they have tenaciously passed down and protected for over 60,000 years is theirs alone to disseminate. It should be the charge of every other stakeholder in northern Australia to ensure that that agency, which has for many years been denied to First Nations people, is accommodated, and fully exercised, free of external pressure.

Greater demand for agricultural talent across the skill spectrum will be likely to result in an increasingly multicultural workforce in the north's agricultural sector, particularly as labour is mobilised from southern Australia and through international migration. This, as mentioned above, may pose a challenge to social cohesion through ethnic prejudice and scapegoating as a manifestation of manipulated political discontent. Concern about the disintegration of national character through outside influence is an effective trigger for discontent and subsequent political upheaval, even in Australia. Social friction on the basis of ethnicity or culture not only robs the targeted individual of their own opportunities but deprives communities of the benefits of cohesion.

There are workforce benefits, too. An increasingly diverse agricultural workforce acts as a great strength for the sector and the region. Some make the mistake of viewing diversity and inclusion in the workplace as charitable outputs of well-meaning organisations. That view should be rejected.

Diversity contributes to resilience by providing agricultural businesses with a variety of perspectives and experiences that can be applied to offer a fuller picture of reality and a more robust problem-solving capacity. A rejection of prejudice also serves to ensure that an employee is recruited on the basis of talent, rather than any superficial characteristic. Cultural and ethnic diversity likewise provide benefits beyond the individual business or organisation.

For Australia's agricultural sector to reach a farmgate value of $100 billion by 2030, exports must increase. The key to bolstering exports is greater engagement with Asian markets, where consumer purchasing power has grown considerably over the past decade. The north's conditions are also suitable for growing a variety of products that enjoy high demand across Southeast and East Asia, such as tropical fruits, mung beans, buffalo and beef. Trade agreements with Indonesia, ASEAN nations, Japan, China, South Korea and others, as well as not-yet-in-force agreements such as the Australia–India Economic Cooperation and Trade Agreement, create considerable opportunities for Australian primary producers. In fact, agricultural exports have featured heavily in those agreements. Together with growing export opportunities in the Middle East, South America and Europe, these trading relationships require robust people-to-people links and cultural awareness if they're to be fully realised.

The agricultural workforce can also play a role in soft-power diplomacy in the Pacific—a region critical to Australia's strategic position. Technical training and capacity building in agriculture throughout the Pacific, and the work of ACIAR, are significant in this regard. So, too, are the experiences of seasonal workers from Pacific island nations as well as Papua New Guinea and Timor-Leste. Fair working conditions, just treatment, respectful interactions and opportunities for skill development can all contribute to shaping positive views about Australia among workers in the Pacific Australia Labour Mobility scheme. While instances of unfair treatment and worker exploitation should primarily be viewed through the lens of injustice and illegality in industrial relations, producers, industry leaders and

policymakers should be mindful of the impact that such experiences have on Australia's global image, particularly in a foreign policy context in which Australia's adversaries seek to paint the country's international engagement as patronising and imperialist.

In addition to the important labour-supply benefits that these schemes offer, they also provide opportunities for Australia's agricultural sector to engage directly in shaping perceptions, conveying values, projecting influence and forging people-to-people links. Those diplomatic opportunities remain largely untapped. In northern Australia's growing agricultural industries, particularly in horticulture, there exists an opportunity to leverage seasonal worker schemes for these ends.

Service delivery, particularly in health and education, must also be improved across northern Australia. If policymakers want to harness the north's strategic potential, then there must be greater efforts to maintain prosperity through service delivery. We have already discussed how a feeling of neglect and disadvantage regarding health and educational outcomes mobilised discontent in the UK and the US, and the same is possible in Australia. Failure to address these issues hampers not only the north's prosperity and security, but it also stifles the region's strategic potential by engendering in the public a feeling that governments don't deliver and don't work for them—so why should they support strategic policies? Innovative approaches to deliver services to northern Australians must be employed to this end. In this regard, access to high-quality internet connections is critical. If the cost of providing more doctors, nurses, teachers, principals and teachers' aids on the ground is beyond the reach of the relevant governments, then northern Australia's communities must be supported through a regionally catered solution to service delivery. Greater provision of telehealth, empowering communities to take charge of the education of children and multistakeholder investments in education, social services and health are just some of the approaches already in place throughout northern Australia. Governments would do well to consult service providers, community groups and service users in order to enhance such services, which are already a noble pursuit but are made even more critical through a strategic lens.

In the north, many in the agricultural workforce are acutely aware of how global affairs have an impact on primary production. How footage of animal welfare violations in Indonesian abattoirs upends beef supply chains in Australia. How a drought in India drives up demand for central Queensland chickpeas. How $300 million in kickbacks to Saddam Hussein's regime in the AWB Limited oil-for-wheat scandal changed the structure of the Australian wheat industry. How a closer US–Australia relationship and an increasingly chilly Australia–China relationship create market-access challenges for Australian farmers of all types. How a war in Ukraine affects Australian wheat exports and the price of fuel. The list goes on. Because these international phenomena relate directly to on-farm operations, primary producers are motivated to pay heed to them, and therefore many producers are actively aware of these global events of strategic significance, even those unlikely to affect Australia directly. This existing strategic understanding has the potential to be bolstered with more purposeful engagement and direction, ensuring that the people involved in northern Australia's agricultural sector are accorded a place at the table, through which they're afforded greater ownership of the north's collective strategic direction.

Place

Context

Despite encompassing 53% of Australia's landmass, northern Australia is home to around 5% of the country's population. This north–south density imbalance is largely related to climate and terrain realities that make much of northern Australia presently hostile to extensive human habitation. These include large swathes of arid and semi-arid land, hot and humid savannahs, and rainforests. Other more subtle features of this landscape, such as phosphorous-deficient soils through much of northern Australia, have made the predominantly Eurasian production systems that dominate modern Australian agriculture difficult to replicate in the north. This has had the effect of limiting agricultural expansion to an extent that would necessitate the establishment of large population centres to support agricultural activity in northern Australia's interior. Therefore, the region's largest human settlements tend to be located by the coast, in towns and cities such as Darwin, Cairns, Townsville, Mackay, Rockhampton and Karratha, where those geophysical factors are mediated by improved climate and location. Those factors in turn give rise to more favourable infrastructural circumstances, usually involving seaport capacity.

While this is generally no different to the trend that has prevailed in much of southern Australia, the cities and towns that constitute the major centres in northern Australia have populations far smaller than their counterparts in the south such as Brisbane, Sydney, Melbourne, Newcastle, Perth, the Gold Coast and Adelaide. Inland centres in the north likewise have smaller populations than inland centres in the south ('inland' is defined here as more than 75 kilometres from the coast). Northern Australia's largest inland towns are Alice Springs (2018 population estimate: 26,534), Mt Isa (18,588) and Emerald (14,119). In contrast, the largest southern inland centres such as Canberra (457,563), Toowoomba (136,861), Bendigo (99,122), Wagga Wagga (56,442) and the twin cities of Albury–Wodonga (93,603) are far more populated. Northern Australia's strategic potential can't be adequately advanced without considerable population growth.

A significant impediment to this realisation is a prevailing arrangement of infrastructure and service delivery funding that leaves northern Australia devoid of the resources required to accelerate progress towards greater prosperity, security and resilience, allowing the region to survive but not thrive. This predicament leaves the region bereft of effective supply chains and development-supporting infrastructure. Northern Australia's infrastructural deficiency means that Defence operates across the region without sophisticated supply chains, diluting the north's strategic advantage in what becomes an expeditionary setting within Australia. This is an unacceptable situation in an era of increasing strategic uncertainty that creates a number of risks to national security. In the most immediate instance, it leaves Defence with a reduced capacity to operate effectively in a large portion of the country.

At the next level, inadequate investment stunts the north's growth and is a missed opportunity for creating prosperity and the resultant drivers of security, among them population growth and economic opportunities. An infrastructure deficit also sows the seeds for discontent and social friction among a population that feels forgotten. The ultimate result is a congruence of factors that fail to provide northern Australia with the strategic posture that it requires, at best abandoning the region's strategic potential and at worst exposing it

to vulnerabilities. Both public services and infrastructure must be bolstered if the north is to serve its strategic function. This challenge must be addressed expeditiously. As Henry Kissinger notes in his book *World order*, '… history punishes strategic frivolity sooner or later.'

If the vision for a strategically powerful north is to be realised, then the region will require a population large enough to support such ambitions. If agriculture is to play a role in attracting residents to northern Australia in the service of prosperity and population growth, then the traditional barriers to the expansion of food and fibre production in the region must be surpassed, primarily through investment in both research and infrastructure. A few cases provide a glimpse of how agricultural development in northern Australia is driving infrastructure growth and enabling further economic progress.

The expansion of crop production in the Ord River region in Western Australia's East Kimberley (discussed previously) is one such example. In an ASPI piece, *Agriculture can drive infrastructure development in northern Australia*, published in May 2021, I discussed how 'recent success with cotton production has attracted significant investment in transport infrastructure'. Here, the Western Australian, Northern Territory and federal governments have invested in major road upgrades in the region, with the intention of supporting primary production. This includes $18.3 million for the upgrade of Moonamang Road, which links Western Australia to the Northern Territory. This road and others like it will be keys to transporting cotton to a processing facility (cotton gin) presently under construction near Katherine in the Northern Territory. Western Australian and Northern Territory cotton producers have joined in collaboration to raise the facility in Tarwoo Station, north of Katherine. The construction of the gin means that cotton doesn't need to be transported to Queensland for processing. The enabling transport and utility infrastructure, in addition to the presence of commercial and public services in nearby Katherine, are critical to the gin's presence and demonstrate the centrality of public investment in infrastructure to economic growth. Recovered cottonseed (a by-product from cotton processing) can also be sold as cattle feed for the surrounding beef sector. As the economic viability of cotton production in the Northern Territory and Western Australia improves through developments like the Tarwoo Station gin, the justification for additional processing facilities, more services and support industries likewise emerges across the region. In fact, the Northern Australia Infrastructure Facility (NAIF), which is an infrastructure loan initiative of the federal government, has approved a $32 million loan to fund the construction of a gin in the Ord River area. The state government has also supported the project through land, infrastructure and technical capacity. All of this allows agricultural industries in the East Kimberley to benefit from local processing, again with subsequent advantages like those for the proximate beef industry through the provision of cottonseed. This example demonstrates how public investment in infrastructure and research lays the foundation for cascading economic benefits that can contribute to prosperity.

In this regard, NAIF funding plays an important role in the north's infrastructure development. While the NAIF provides benefits to agricultural industries through indirect means such as airport upgrades, capital works at universities, enhancements of health and social services, energy infrastructure development and the expansion of ports that contribute to supply-chain efficiency, service delivery in agricultural communities and the generation of intellectual capital, the NAIF also provides direct loans to primary production projects. In addition to the Kimberley cotton gin mentioned above, the NAIF has provided funding for barramundi farming in the Northern Territory, a beef-processing facility in Queensland and a potash project in Western Australia.

Transport infrastructure for a high-value, high-volume commodity also has important benefits. The Northern Australia Beef Roads program, an initiative of the federal government, is a $100 million road upgrade program across northern Australia's beef cattle producing regions. In addition to improving transport efficiency, sealing roads also reduces dust pollution and mitigates some of the associated animal welfare challenges of transport. In the lead-up to the 2022 election, the Coalition committed $400 million to enhance central Queensland's beef supply chains through the Queensland Beef Corridors in the event that it won the election. Whether or not this initiative will be picked up by the newly elected Labor government is yet to be seen, but it has already produced an important success—regional collaboration.

The development of the Beef Corridors strategic plan was a result of cooperative engagement between seven local councils across Queensland, which regard the Beef Corridor project as 'an investment that unlocks potential that we already know our region holds. Potential for the wider economy, other industries, but most importantly for people and future generations.'[23] This sort of collective effort at the local level must be more widely enabled and leveraged in infrastructure development across northern Australia. While local councils don't possess the large coffers needed to embark on grand nation building, the unique engagement with local communities that this layer of government provides allows for the nuanced thinking and community-based approaches that must characterise infrastructure development in resource-constrained northern Australia.

A critical determinant of food and fibre production in northern Australia is water availability, and here, too, collaboration has been central to recent initiatives to enhance water security and infrastructure across the north. While there's been some tension between the federal and state governments on water-storage infrastructure, there's been fruitful collaboration, too, not just between different layers of government but with local communities, producers and Indigenous peoples and groups. Rockwood Weir, Paradise Dam and the Big Rocks Weir in central and North Queensland, all at various levels of development, have enjoyed multistakeholder support and investment. Yet, water storage remains a key limitation for agricultural expansion in northern Australia.

Collaboration for research, so crucial for effective and viable infrastructure development, is also being developed in the water-security space in northern Australia. Three northern Australian universities (Charles Darwin University, Central Queensland University and James Cook University) have partnered to establish the Northern Australia Universities Alliance to advance research and education throughout the north. Together with the Cooperative Research Centre for Developing Northern Australia, these universities have partnered on a project to 'de-risk the Northern Australia investment and development landscape by improving water sustainability across the region and providing a pathway for the future development of key sectors as well as improving the health and wellbeing of the north's communities.'[24]

Other initiatives, such as agritourism, agricultural manufacturing, on-farm renewable energy projects, agtech developments and food processing facilities can all contribute towards robust agricultural activity that's both enabled by and builds the case for infrastructure development.

Crucially, infrastructure investment in the north, whether it seeks to primarily serve agricultural activity, the mining industry, Defence, tourism, or any other use, must be part of a cohesive, bigger picture plan for nation building—one that, while acknowledging the resource limitations and sparse population of northern Australia, nevertheless draws on the culture of multistakeholder collaboration already in place throughout much of the region. Again, we return to the theme of strategic planning, which must consider the local characteristics of communities throughout northern Australia.

The risks

Failure to develop adequate, resilient and appropriate infrastructure could stymie agricultural development in northern Australia, compromising prosperity and weakening strategic opportunities.

An incohesive plan for infrastructure across the north threatens to create a haphazard cacophony of projects that fail to take advantage of potentially synergistic interactions. As ASPI's Northern Australia Strategic Policy Centre often outlines, a siloed approach to infrastructure development stands in stark contrast to the big-picture nation-building approach required to deliver prosperity in Northern Australia and often results in overspending on projects that could have been far more cost-effective if they were effectively linked together. Just like social cohesion, infrastructural cohesion produces results greater than the sum of its parts.

A lack of local buy-in through infrastructure projects that fail to consult local communities and all appropriate stakeholders also hampers infrastructure development through objections to planning applications, the development of infrastructure that isn't fit for purpose and community grievances that arise as a result of

impingements on cultural or environmental assets. In northern Australia, Defence infrastructure and primary producers have clashed in this space before. In early 2017, plans to expand the Shoalwater Bay Training Area through compulsory acquisition were met by opposition from local graziers. The federal government subsequently ruled out forced land sales after pressure from Queensland state MPs, but the issue highlights the potential land-use conflicts that can arise in regions of increasing strategic importance. While the expansion of both defence and civil/commercial land uses is needed to release the region's strategic potential, they may intersect in highly contested space.

The risk posed by expensive and wasteful infrastructure projects across the north should also be appreciated. In a region where funding for infrastructure is already hard to come by, white elephants and wasteful spending not only redirect investment from more viable projects, but also create mistrust among communities who expect governments to be vigilant guardians of public funds. Project Sea Dragon, which was a proposal for a major prawn farm in the Northern Territory, was recently abandoned after a review by the project's owners, Seafarms, deemed it unviable. The Northern Territory Government invested $56 million in roads to support Project Sea Dragon. While the company seeks to realign the project to proceed with a smaller operation, the Northern Territory Government must now seek to convince taxpayers that the spending was not in vain.[25]

So, too, is there a risk of wasteful spending for infrastructure that's inappropriate for northern Australia's often harsh conditions, which oscillate heavily through time. Extreme heat, high solar irradiance, cyclonic winds and heavy rainfall are all features of northern Australia's climate that often persist at greater levels than in the south (conditions that will only intensify with climate change). Therefore, infrastructure, particularly transport infrastructure, must be appropriately suited to local conditions. Melting bitumen, flooded roads, rain-damaged rail lines and telecommunications, electricity and transport infrastructure affected by cyclones are among the natural hazard impacts on supply chains and livelihoods in northern Australia. There seems to be an acceptance among communities in the north that wet season isolation is an inevitability. While seeking to always circumvent the force of nature would prove expensive and futile, governments should implement more resilience and mitigation strategies.

A key strength for businesses of all kinds is consistency and certainty, both of which are threatened by interrupted supply chains. When Covid-19 and flooding coalesced to contribute to food shortages across the Northern Territory earlier this year, it demonstrated to the public and to governments the vulnerability of 'just in time' supply chains and limited transport corridors susceptible to extreme weather events. Speaking to *ABC News*, Katherine's Chamber of Commerce manager, Colin Abbott, expressed in clear terms the connection between supply-chain resilience and prosperity, saying 'It seems to be a significant issue that if one railway or road is flooded, the whole territory is basically isolated. How can we continue to grow if this keeps happening? I would like to see a continuation of a railway from Mt Isa to Alice so we have extra points of entry, and if we can't do that then we need to look at flood-proofing. We need to look to avoid being in this position.' If the north's prosperity is limited by inappropriate or inadequate supply-chain arrangements, its strategic unfolding will be stunted.[26]

Environmental damage from infrastructure also poses a risk to strategic development. Agricultural activity such as intensive livestock operations, pesticide use and water extraction can cause environmental harm if not properly implemented. So, too, can poorly managed civil infrastructure projects that degrade biodiversity or cause environmental contamination. Both can have the effect of impeding and creating public opposition to development.

A final risk in this regard relates to the protection of critical infrastructure, which provides 'services that are essential for everyday life such as energy, communications, water, transport, health, food and grocery, banking and finance, and the Australian Government.'[27] Critical infrastructure related to the agricultural industry, such as dams, on-farm energy generation, rail and ports are susceptible to cyberattacks, sabotage or physical attack in the event of conflict. While arrangements through the federal government already exist to protect much of this, primary producers and others in the agricultural sector may own private assets approaching a critical-infrastructure status. These may include sizeable water-storage facilities, localised energy production systems, private airstrips and chemical production or storage facilities, yet they might not be included in critical infrastructure protection

arrangements, such as the Department of Home Affairs' Trusted Information Sharing Network. Therefore, these large bits of infrastructure, which might not be considered strategically significant by those who own them, are particularly susceptible to adversarial interference or attack. In the event that such assets are disrupted, that could impede food security or lead to localised disaster. While a few years ago such a risk mightn't have been considered likely, recent times have told us that such complacency amounts to strategic ignorance.

The opportunities: the development of industries

What northern Australia requires for both prosperity and security is a cohesive nation-building plan that takes advantage of the opportunities inherent in the region's power of place, including primary production opportunities. While the approach should be ultimately northern Australia-wide, it must begin with a local and grassroots approach that leverages the unique geographical and demographic strengths and opportunities of each locality, without being ignorant of risks and threats. A tropical fruit value-adding facility makes sense in fruit-growing Far North Queensland, but it would be unwise to place such a thing in Alice Springs. This cohesive plan must link towns to towns and regions to regions, spreading across northern Australia. Just as a freshwater basin like the Murray–Darling Basin links small tributaries together to form an increasingly more voluminous waterway, a cohesive plan for big-picture nation building must ensure that infrastructure projects ultimately connect to create a unified resource for prosperity. The Office of Northern Australia's regional master plans are a good start, but they require more detail and must be part of a northern Australia-wide strategy.

In food and fibre supply chains, centralised infrastructure plays a key role in linking population centres together through two Ps—processing and ports. Facilities such as sugar mills that process sugarcane to produce raw sugar, white sugar, molasses and bagasse are, predictably, located in sugarcane-growing regions. As the examples of cotton discussed above also outline, centralised processing means that transport infrastructure must exist to support the delivery of products from farms to processors. More agricultural production generates the economy of scale required to make processing facilities viable, in turn creating the justification for greater public and private investment in infrastructure. A strategic value should also feature in the calculation here—the economic case for a road, navigable river or rail line is stronger if it has a clear strategic benefit for Defence or other users.

The other focal point for centralisation is ports, including inland ports, seaports and airports. Agriculture across the north is again familiar with this model, but it can be enhanced. Throughout Queensland, for example, west-to-east supply lines run almost parallel to one another up and down the coast. A rail line and an accompanying highway operate from Longreach in the state's central west through to Gladstone in the east, carrying agricultural and mining products to both processing and export facilities. The story is similar in Townsville and to a lesser extent in Bundaberg, Mackay, Cairns and elsewhere. In the other northern Australia jurisdictions, Darwin, Broome, Port Hedland, and Karratha/Dampier fulfil similar functions for the inland. A number of airports and intermodals also provide central locations for facilitating exports. By bolstering transport corridors and enhancing food and fibre export capacity at ports (such as through Darwin International Airport's cold and freight storage and training facility), governments and private businesses, together with communities, create the infrastructure necessary to support agricultural expansion throughout northern Australia.

Both processing facilities and ports contribute to the development of a hub-and-spoke model that can sustain agricultural production in northern Australia. A cohesive nation-building endeavour should link these hubs, each unique to their local circumstances, through the tributary/basin model described above. This physical infrastructure should be supported with digital, energy and telecommunications infrastructure, some of which is dismal across the north and throughout regional Australia in general. It should also leverage the culture of multistakeholder cooperation already characteristic of northern Australia. In just one example, the CQ Inland Port near Emerald in central Queensland is bringing together mining, agriculture and manufacturing industries to create a multi-use intermodal facility at the juncture of two major highways and their parallel rail lines. Separately, these industries and their subsectors that operate or will operate at the CQ Inland Port probably couldn't have sustained such

a project, but together they're able to create an opportunity for many stakeholders. Northern Australia is also home to a number of schools and educational programs with a focus on primary production, including the Juno Program in Tennant Creek, Northern Territory. Education–agriculture dovetailing is another powerful tool for multistakeholder engagement that should be considered in a cohesive nation-building endeavour.

Of course, from a national security perspective, all of this infrastructure contributes to a more favourable transport and logistic environment for Defence in northern Australia and serves to mitigate some of the supply-line issues that would limit movements of Defence assets throughout the north. Infrastructure more appropriately suited to the conditions of northern Australia will also contribute to year-round access (hitherto a challenge owing to flooding in the north's wet season).

The current post-crisis period provides an excellent opportunity for Australia to nation build in a way that aligns with new and emerging arrangements in the country's social and economic order following the initial years of the Covid-19 pandemic. Those trends include supply-chain thinking, work-from-home arrangements, the digital economy, geopolitical shifts and a renewed appreciation for professions and skills that proved critical during the pandemic, including primary production, food processing, cleaning, care workers, retail and hospitality.

Australia's recent federal election, in which the Australian Labor Party, led by Anthony Albanese, was elected to government, replacing the Liberal/National coalition, also presents an opportunity to place infrastructure development at the centre of the discourse on northern Australia's strategic environment. Albanese, who previously served as Minister for Infrastructure and Transport (2007–2013) and Minister for Regional Development and Local Government (2007–2010), has emphasised both his experience with infrastructure projects and his ethos on infrastructure as a driver of prosperity. In a speech to the April 2022 National Farmers' Federation Conference, Albanese remarked, 'If Labor is successful in next month's election, you will find in me someone who understands the critical relationship between productivity-enhancing infrastructure and the success of your industries.' In addition to infrastructure development, a key element of the Albanese government's plan is set to be the development of manufacturing capacity. Together, these factors can strengthen Australia's agricultural supply chains throughout the north and support a more secure region.

Biophysical and biosecurity

Northern Australia's power of place is the basis of the strategic position that it occupies. Directing the region's potential requires a robust appreciation for the depth of that power of place, the opportunities it provides for strategic advancement and the risks that this entails. Certain biological and geographical realities mean that agriculture in the north must proceed with full awareness of the current and emerging risks related to those realities.

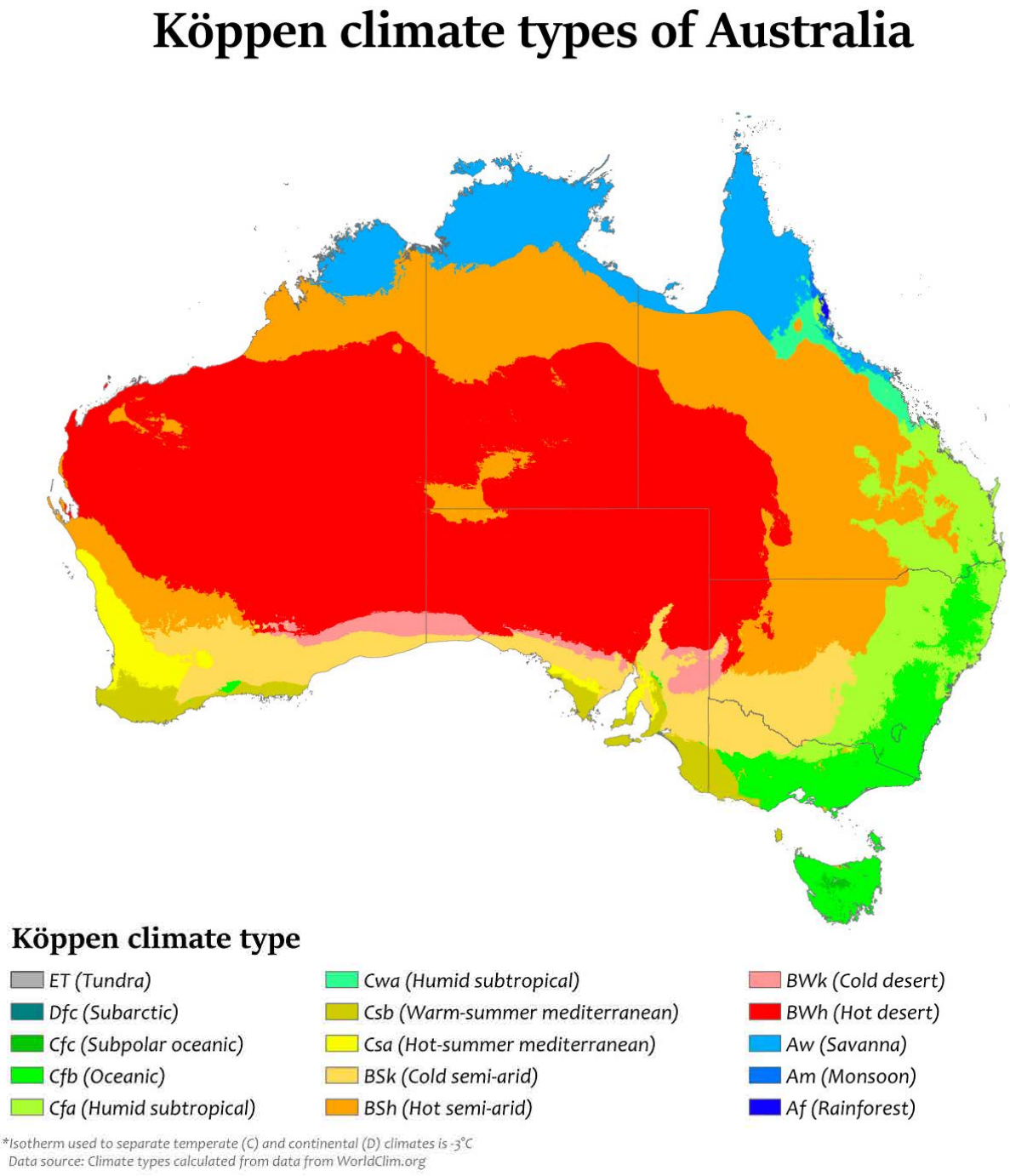
Biophysical features

The first point to make is that northern Australia is climatically, geographically and biologically different from the south. This fact has been discussed in the previos chapters but deserves some more attention here. An examination of the Köppen climate map in Figure 2 demonstrates those differences. The Köppen climate classification arranges geographical regions into one of five climate groups (tropical, dry, temperate, continental and polar), each of which has a number of subclassifications. The groupings reflect the relationship between climate and vegetation in a particular area.

Crucially, as the Köppen climate map demonstrates, northern Australia is home to several climate zones not found in the south. At the intersection of strategy and agriculture, this allows primary producers in northern Australia to produce goods that are familiar to many of our Indo-Pacific neighbours, whose demand for high-quality and safe food presents opportunities for Australian exporters. Beyond that, Australian growers, manufacturers and researchers are presented with an opportunity to export both technical skills and agricultural technology to familiar growing areas. In addition to tropical production systems, the north's arid and semi-arid climes broaden the possibility of engagement, particularly with the Middle East and North and East Africa, towards two different but related strategic ends.

First, petrostates such as the United Arab Emirates (UAE), Bahrain and Saudi Arabia are embarking on ambitious agricultural initiatives. In late 2020, the UAE's Ministry of Climate Change and Environment announced targets to increase crop productivity, irrigation output and urban farming in the decades ahead. Saudi Arabia's Agricultural Development Fund has likewise sought to encourage domestic food production through loans of nearly A$500 billion in 2022 alone. These are excellent opportunities for Australian agriculturalists with vast experience in producing arid- and semi-arid-adapted food and fibre. Engagement in the Middle East not only provides an important economic opportunity, especially one that can spread risk through income diversification for drought-affected producers, but it also drives deeper engagement in a region that has drawn considerable Australian strategic resources, especially over most of the past two decades. On the other hand, in North and East Africa low- and middle-income countries face a combination of drivers of food insecurity, pre-eminently among them climate change, conflict and Covid-19. Drought and agricultural downturns exacerbate existing fragility and play a role in significant strategic challenges, including population displacement. Again, an opportunity exists to engage northern Australian producers in drought-adaptation knowledge sharing to achieve strategic and humanitarian aims. While North and East Africa may seem beyond Australia's strategic sphere, peace and security anywhere should be the concern of any high-aiming nation.

Figure 2: Köppen climate types of Australia



Source: Wikipedia, online.

What the Köppen climate map also reveals is the heavy seasonal rainfall across tropical northern Australia, although many don't need a map to know about that. High precipitation creates challenges for agricultural infrastructure (as noted above) but also exacerbates vulnerability to pest burdens and flooding. Volatile and heavy precipitation poses a barrier to agricultural performance in the north and, again, RD&E and infrastructural improvements can assist producers to navigate this challenge.

Biosecurity

The other power-of-place element concerns biosecurity. Agricultural biosecurity refers to practices designed to protect plants, animals and people from harmful organisms. While it's a measure implemented by producers everywhere, the northern Australian context presents a unique set of factors that combine to intensify the biosecurity challenge. High rainfall and lots of sun mean that biological activity in the tropical north is (literally) buzzing. This creates ideal circumstances for a range of animal and plant pests to thrive. Keeping diseases such as banana-attacking Panama disease and animal diseases such as foot-and-mouth disease, African swine fever and lumpy skin disease out of Australia is a top priority for governments and the primary production sector. These and other diseases can severely damage Australian agriculture through production losses, prevention and treatment costs and denial of market access.

The north's proximity to Asia and the Pacific means it's the most likely route through which plant and animal diseases will enter Australia. In fact, many recent diseases and pests have been first detected in the Torres Strait, where there are frequent movements of goods and people. Various cases, together with the recommendations of a recent Auditor-General's report, highlight the importance of the Torres Strait in maintaining the north's biosecurity, again underscoring the need for participatory engagement with Indigenous peoples as a vehicle for prosperity. Pleasingly, community engagement and the Indigenous Ranger Program are already part of DAFF's approach to biosecurity in the north.

The north's agricultural biosecurity hinges on both the reporting of pests and disease to authorities by the community and producers and adequate government surveillance and response. DAFF, together with state and territory agriculture departments, is active in providing biosecurity arrangements across northern Australia, including through the federal government's Northern Australia Quarantine Strategy. Various surveillance initiatives are in place across the north to monitor for disease incursions, including sentinel cattle herds and surveillance of wild birds for avian influenza. The discovery of canine ehrlichiosis, a tick-transmitted bacterial disease of dogs, in the remote north of Western Australia in May 2020 raises questions about how this previously exotic disease evaded Australia's strict biosecurity arrangements and about how long it persisted in remote communities before it was detected. The disease, since also reported in the Northern Territory, Queensland and South Australia, can cause high morbidity, severe illness and possibly death. In early 2020, the detection of the crop-destroying fall armyworm in the Torres Strait preceded the pest's southern expansion, when it reached Victoria in December of that year. It would be unfair to deem those incursions as purely a failure of Australia's biosecurity authorities, but they highlight the vulnerability of northern Australia as a landing pad for exotic diseases that can spread throughout the country and cause significant damage to agricultural and household animals and plants. Nevertheless, there's room for improvement in the biosecurity defence of northern Australia. A 2019 Auditor-General's report recommended that DAFF's predecessor department (the Department of Agriculture, Water and the Environment) bolster the activities of the Northern Australia Quarantine Strategy. In addition to increased resourcing for enforcement and surveillance, communities' and producers' capacity for identifying and reporting suspected biosecurity incursions must be enhanced. If producers, governments, communities and investors are to have the confidence needed to further develop agriculture in northern Australia, they must be sure that operating in the north won't expose them to the risk of being a speedbump in the southern advance of an exotic disease.

Australia's recent efforts to improve biosecurity in the light of recent outbreaks in Indonesia of both foot-and-mouth disease and lumpy skin disease (two viral diseases of livestock) provide encouraging signs. The federal government's actions in both Australia and overseas to combat those outbreaks and prevent their introduction to Australia reflect a willingness to bolster biosecurity arrangements in the face of threats with potentially devastating economic consequences. In the case of foot-and-mouth disease, an outbreak could cost the Australian economy an estimated $80 billion. Much of the recently announced funding will involve increased biosecurity across northern Australia, including additional biosecurity officials—a recognition once again of the importance of the north to safeguarding Australia's primary production sector.

The north's vulnerability to biosecurity incursions also highlights the extent to which state and non-state actors might seek to disrupt Australia's agricultural sector through a biological attack with something as seemingly minor as a diseased plant or contaminated animal tissue. The African swine fever virus can remain viable in pig meat for weeks and is a major concern for Australian pig producers, given its mortality rate of nearly 100%, which has seen nearly 44 million pigs die around the world since 2018. The major concern is that an initial case of infection would arise in Australia's feral pig population (numbering some 24 million animals and common in northern Australia) and subsequently spread to domestic herds. In fact, so concerning is the threat of African swine fever that tourists seeking to bring pork into Australia without a declaration have been fined, had their visas cancelled and been banned from re-entry into Australia for a number of years. This form of economic disruption, dealt with in far greater detail by Dr John Coyne and Dr Paul Barnes in an ASPI report (*Weapons of mass (economic) disruption: rethinking biosecurity in Australia*), must feature more prominently in the calculation of northern Australia's strategic apparatus. State and non-state actors are no doubt aware of the importance of agriculture for Australia's economy, society and global reputation, and attempts to undermine the sector through biosecurity incursions must be considered as a means for potential attack, however unconventional, by such actors.

The intersections and fault lines

Context

Intensifying great-power competition between the US and China; major territorial disputes in the South China Sea, Kashmir and Aksai Chin; increasing populations throughout the Indo-Pacific; self-determination movements; insurgencies in the Philippines, Thailand and India; a coup d'état in Myanmar; transnational organised crime; the impacts of climate change; the war in Ukraine; rising incomes in Southeast Asia; and a security pact between China and Solomon Islands, among other phenomena, all contribute to an external environment that positions northern Australia as an increasingly important strategic region.

Northern Australia must develop the social, human and infrastructural resources needed to realise its strategic potential. I have argued here that agriculture and associated industries are critical to that vision. Importantly, the agricultural sector is just one among many elements that must coalesce across the north to shore up the region's prosperity and security. For such ends to be achieved, policymakers and communities must be able to map out and negotiate the intersections and fault lines that shape the north's agricultural landscape.

The maintenance and development of human capital in the north's agricultural industries is a cornerstone of this realisation. Human capital refers to 'the skills, knowledge, and experience possessed by an individual or population, viewed in terms of their value or cost to an organisation or country'[28] and relates to both technical and interpersonal skills.

The risks

Without a plan to harness human capital, the enablers of prosperity, security and strategic flourishing that I've outlined in this report can't be realised. Indeed, initiatives mentioned above, such as cotton production in the Kimberley, the inclusion of the Indigenous Ranger Program in biosecurity surveillance, agtech development and the Beef Roads initiative, which all bolster agricultural activity in the north, only came to fruition through harnessing human capital.

Without further investment in and channelling of human capital, the agricultural opportunities available in the north will be squandered, and the challenges of food and fibre production will prove difficult to surmount. While the immediate results will include brain drain, a failure to increase agricultural output, and an inability to cope with workforce changes brought about through automation and digital transformation, the long-term result will be to produce a region unprepared for the strategic exigencies that may be thrust upon it. This strategic frivolity will sooner or later force the hand of policymakers who will rush to shore up northern Australia's communities, infrastructure and institutional arrangements.

The opportunities: maintaining and developing human capital in the decades to come

As I have said, unlocking human capital is pivotal to northern Australia's capacity to navigate the social, cultural, environmental, infrastructural, biological, climatic and geographical features of agriculture throughout the region. Realising this requires investment in training and education in the north, for the north. While this report has discussed the likelihood of increased domestic and international migration to fill skills shortages in the north's agricultural sector, building local skill capacity must be part of the northern Australia agenda.

Higher education, vocational training and professional development in agricultural science, agtech, agribusiness, supply-chain management, food processing, environmental management, agrichemical production, international trade and other areas must be more widely available throughout northern Australia, both for existing populations and for individuals wishing to relocate and take advantage of the region's opportunities. The availability of more local education and training will do much to bolster the human capital needed to operate in northern Australia. Yet it also contributes to the retention of skills and mitigates brain drain away from the region. As research published in the *Medical Journal of Australia* found, general practitioners with 'rural backgrounds or rural experience during undergraduate or postgraduate medical training are more likely to practise in rural areas'.[29]

Of course, the demographic and geographical realities of northern Australia mean that traditional, large-scale and centralised universities and educational institutions aren't always suitable. As is the case with infrastructure development, higher education throughout the north must leverage the region's strengths and find innovative means to overcome limitations. Central Queensland University's Bachelor of Agriculture program, for example, is offered through a mix of face-to-face and online delivery. That arrangement allows students in rural and remote areas beyond the three campuses that host the program (Rockhampton, Bundaberg and Emerald) to nevertheless access an undergraduate agriculture education. Residential schools and mail-out activities provide the necessary practical skills in a model not dissimilar to the hub-and-spokes arrangements for infrastructure described above. Student placements on farms and with agribusinesses, research institutes and other agricultural organisations bolster practical experience. While not limited to students in northern Australia, the degree's delivery model enables students to remain in their remote, rural or regional areas and still access education. The fruits of this approach are already evident. Many of the program's graduates have taken up agricultural positions in the towns they studied in or other rural and remote areas. Opportunities to train and retain professionals throughout northern Australia in agriculture and other disciplines will do much to advance the region's strategic interests.

Professional development for primary producers can also serve the needs of northern Australia's agricultural sector. Agricultural extension (a strategy for knowledge diffusion and practice change in primary production) is foremost among the methods used by governments and others to improve producers' operations (usually from an economic point of view), but extension programs for environmental stewardship, farm safety and social development are increasingly part of the extension landscape. While many successful extension programs are operating across northern Australia, governments and other stakeholders should invest further in this form of enhancing human capital, impelled by both the strategic needs and commercial opportunities in the region.

The development of agricultural industries in northern Australia also provides unique research opportunities. Areas with potential for large-scale agricultural expansion require careful calibration of growing conditions borne through agricultural management, as the example of cotton in the Ord River area demonstrates. New initiatives across northern Australia, such as the development of spice and oilseed industries, present a sort of pioneering research opportunity that not only opens up new commercial prospects but provides researchers and their institutions with the chance to push the boundaries of what's possible in northern Australian production systems.

Enhanced engagement of Indigenous peoples in agriculture and agriculture-related work should also feature in efforts to unlock people power across the north. An appreciation for the existing wealth of knowledge held by Indigenous Australians in land and ecosystem management in northern Australia presents an opportunity to both advance reconciliation and apply a unique cultural connection to country in advancing both the protection and growth domains of agricultural policy. High Indigenous representation in the Army's Regional Force Surveillance Units, together with Indigenous rangers who have participated in biosecurity surveillance to detect invasive species incursions, demonstrates how local knowledge and connection to land and waters serve the north's strategic objectives.

There is also a role for agriculture to play in retaining skilled workers from coalmining who may lose their jobs through decarbonisation. High-value agriculture and agricultural value-add processing facilities developed in the north could absorb some of the job losses that might eventuate in such a scenario. Yet, a simplistic model of 'job swapping' has to be avoided—not all boilermakers are going to want to be mechatronics engineers.

Conclusion and recommendations

Given the context and fault lines highlighted in the previous chapters, this report ends with four key recommendations.

1. Align agricultural development with strategic readiness

Policymakers should foster and promote a unified message to increase the awareness of the strategic role of northern Australia's agricultural communities and industries, without creating over-securitisation of the agricultural sector. In doing so, they must assess whether producers in the region see themselves as part of 'northern Australia' and whether they're adequately aware of the role that they can play in advancing strategic interests.

Such an endeavour would not be a novel one. Many industries have played an active role in geostrategic phenomena. The fossil-fuels industry in particular has been intimately linked with strategic movements in the 20th and 21st centuries not simply because of the innate physical or chemical properties of those resources but because of their importance in advancing economic, political and strategic aspirations. Governments have needed fossil-fuel industries and fossil-fuel industries have needed governments. While the relationship between this industry and geopolitics has been vexed and complicated, it nevertheless demonstrates the possibilities of aligning government and industry priorities for strategic gain. A similar, but more constructive, alignment should be sought between the strategic priorities of governments and the production needs of northern Australia's agriculture sector.

For many primary producers across northern Australia, the broader strategic or geopolitical implications of the agricultural industry are at present unlikely to be important considerations governing day-to-day functions. On-farm activities are, like any other business, largely concerned with maintaining a viable operation and seeking opportunities to develop the business. Even less financially tangible aspects of a producer's mission, such as stewardship of the land and water in their care, maintaining a safe and fair work environment for employees and visitors, exotic pest surveillance and reporting, contributing to global food security, hosting research trials and ensuring a durable social licence to operate are, while noble, still associated with financial sustainability and risk mitigation for the individual business or their wider industry, as are observations of and responses to global supply chains and markets. In short, primary producers rarely seek to embark on initiatives that don't contribute to the viability of their enterprises. That isn't to say that they're apathetic about their environmental and social responsibilities, that they don't have altruistic aspirations, or that they aren't interested in global affairs, but, without a viable farm business, the means to effectively execute responsibilities or pursue beyond-the-farm ends are exhausted.

Policymakers hoping to leverage the possibilities of the north's agricultural sector in pursuit of strategic progress must therefore seek to develop authentic alignment between such ambitions and the priorities of primary producers. Crucially, they must communicate that alignment to northern Australia's agricultural stakeholders, perhaps through approaches used in agricultural extension, which is a model that primary producers are familiar

with. Policymakers must also develop strategies to connect primary producers with the Australian Defence Force and the national intelligence community, particularly the Department of Home Affairs. A useful place to start will be biosecurity and regional trade.

2. Investment in prosperity for security

Governments at all levels should provide greater investment to agricultural RD&E across northern Australia. Such investments not only protect existing industries from threats such as biosecurity incursions but also lead to production advances that can grow the economic base across the region. One crucial element of investment in RD&E is capacity building, and such investments in northern Australia should be particularly focused on supporting the development of human capital that can be deployed throughout the region. This report has clearly described how RD&E initiatives support prosperity, in turn securing northern Australia.

Investment for agricultural innovation and infrastructure must complement this research funding. As this report has highlighted, northern Australia requires greater and smarter investment in agriculture-supporting infrastructure, including in food processing and manufacturing. Those initiatives provide stimulus for agricultural production and contribute to the development of sovereign agricultural capacity (including for critical inputs that are presently imported), diluting the impact of external supply-chain pressures. Governments should also invest in high-value agriculture and agricultural value-add processing facilities to absorb possible job losses that may eventuate as a result of decarbonisation—a process that will have a significant impact on the north's workforce.

So, too, must policymakers harness northern Australia's potential through improved service delivery, lest economic advances are made without commensurate development of the health and social services that support the region's communities.

This underscores a critical point: central to the implementation of all of these recommendations is an approach that avoids fragmentation and siloing. Policymakers should avoid such tendencies if they wish to see prosperity and security in northern Australia and in doing so should draw on the existing culture of multistakeholder collaboration that exists in the north's communities and institutions.

3. Engage with First Nations

Policymakers, together with businesses and industry groups, should bolster their efforts to engage and collaborate with the Indigenous communities in northern Australia, particularly in advancing prosperity through agricultural and environmental initiatives. Central to this is an authentic appreciation of and respect for Indigenous knowledge and connection to country. Efforts should be made to engage Indigenous communities in the development of more locally suitable food and fibre production systems, with clear commercialisation plans if appropriate.

Opportunities to support traditional environmental stewardship practices, such as Indigenous ranger programs, should also receive more support, and options to deploy those practices in the service of biosecurity initiatives should likewise be discussed with Indigenous communities. The recent emergence in Indonesia this year of both foot-and-mouth disease and lumpy skin disease underscore the threats to agricultural biosecurity posed to northern Australia. These potentially devastating animal diseases, just two among many threats to Australia's agricultural sector, must be kept out. Close cooperation with Indigenous communities across northern Australia, particularly throughout the Torres Strait islands, should be a key feature of biosecurity measures.

If social cohesion, economic mobility and social progress are to be the bedrock of security across the north, Aboriginal and Torres Strait Islander peoples must be afforded a seat at the table. The Albanese government's commitment to advance reconciliation, for example through the implementation of the Uluru Statement in full, is a positive step in this direction, and the benefits of reconciliation for prosperity and security in northern Australia must be readily recognised.

4. Develop a cohesive nation-building plan

This report's final recommendation is the implementation of a purposeful, well-designed and cohesive nation-building plan that takes advantage of the opportunities inherent in northern Australia's power of place. Ambitious as this may seem, the strategic imperatives at this point in Australia's history require nothing less. While this nation-building plan should ultimately take shape across northern Australia, it must begin with a local and grassroots approach that leverages the unique geographical and demographic strengths and opportunities of each community across the north.

To achieve that, the federal government, in partnership with state and territory governments, should begin work to develop a body with the mandate to execute the nation-building plan. That body, perhaps a statutory authority, should bring together the diverse threads discussed in this report, combining strategic, economic and social considerations in coordinating efforts to advance the north's prosperity and security. In developing this body, governments should take full stock of the north's existing nation-building ecosystem and ensure the full participation of relevant stakeholders, including in agriculture, health services, mining, tourism, education and defence. It should also complement, and not oppose or duplicate, the work of existing public institutions such as Infrastructure Australia, which is the country's independent infrastructure adviser.

In addition to planning, restoring and connecting infrastructure projects, this body should apply a strategic and economic development lens to northern Australia's infrastructure network and the social, intellectual and economic benefits it confers on the region. Such an approach could both streamline investment and ensure the maximum use of infrastructure and assets by diverse stakeholders across northern Australia. While it should ultimately take a whole-of-region perspective, this body should have the necessary flexibility to engage at the grassroots level, with the creative capacity to link local needs and possibilities to the realisation of the region's strategic unfolding. That's true cohesion, and it will require the governments involved to embrace agility, diversity and ambition—it can't be hamstrung by unnecessary constraints. Readers might reasonably call to mind the award-winning Australian comedy series *Utopia* and the frustrated attempts of the show's Nation Building Authority to make progress against the backdrop of a cacophony of competing voices and forces, in which a lot was said and not much was done. In contrast to the situation that prevailed in *Utopia*, in which a government body was looking for a worthwhile project, northern Australia's infrastructural and agricultural developments are a series of worthwhile projects looking for coherent alignment, and the body proposed here can provide that.

In establishing this body, policymakers would do well to look to statutory authorities such as the Victorian Planning Authority and multijurisdictional bodies such as the Port Authority of New York and New Jersey, ideally creating a combination of both organisations' functions: infrastructure planning, development, risk mitigation and management.

Australia's newly elected Prime Minister, Anthony Albanese, has spoken extensively of his desire to reposition Australia as a 'country that makes things'. The Prime Minister's experience as Minister for Infrastructure and Transport and Minister for Regional Development and Local Government seems pivotal to his view of infrastructure. When Albanese was leader of the opposition, and in particular over the course of the 2022 election campaign, he spoke of his belief in the power of infrastructure to drive development and prosperity, saying 'I'm a builder … If I'm elected Prime Minister, I'll build things in this country. I'll build better infrastructure. I'll build a response to climate change … I'll build the skills capacity of this nation up.' This experience and philosophy, together with the Prime Minister's commitments to enhancing Australia's engagement in the Indo-Pacific, to unite the country, to bolster reconciliation efforts, to lift standards of living and to combat climate change, positions the implementation of a cohesive nation-building plan across northern Australia as an ideal platform for Albanese to execute his government's agenda. Nowhere else will infrastructure investment make a greater impact than across northern Australia, and no time is more opportune or more critical than now.

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Acronyms and abbreviations

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ACIAR	Australian Centre for International Agricultural Research
ASEAN	Association of Southeast Asian Nations
DAFF	Department of Agriculture, Fisheries and Forestry
EU	European Union
GDP	gross domestic product
GST	goods and services tax
NAIF	Northern Australia Infrastructure Facility
OECD	Organisation for Economic Co-operation and Development
RD&E	research, development and extension
STEM	science, technology, engineering and mathematics
UAE	United Arab Emirates

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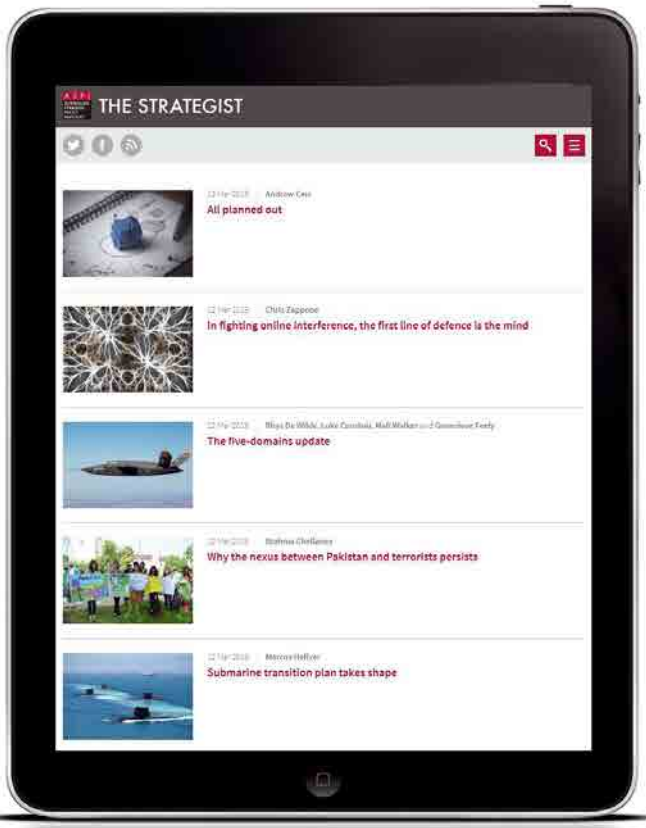

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