

Accounting for agriculture in place-based frameworks for regional development

Discussion paper

Jim Turnour
Connar McShane
Michelle Thompson
Allan Dale
Bruce Prideaux
Margaret Atkinson



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Connar McShane
Michelle Thompson
Allan Dale
Bruce Prideaux
Margaret Atkinson

James Cook University, The Cairns Institute, Cairns

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Contents

1. Introduction	1
1.1 Background	1
1.2 Project objectives.....	1
1.3 Project stages.....	2
1.4 Purpose of this discussion paper	2
1.5 Agriculture in a changing world	2
2. Defining agriculture and its contribution	3
3. Factors that support agriculture’s contribution within a place-based regional development framework	6
3.1 Government policy in agriculture and place-based regional development	6
3.2 Institutions in place-based regional development	7
3.3 Infrastructure in place-based regional development	8
3.4 Human capital and innovation in place-based regional development.....	8
3.5 An integrated approach is critical	8
4. The pilot region: The Wet Tropics of Far North Queensland	10
4.1 A brief history of agriculture in the pilot region	10
4.2 Income, employment and education.....	11
4.3 Industry profile.....	13
4.4 Agriculture	13
4.5 Supply chains	15
4.6 Value-added agriculture	15
5. Future challenges and opportunities for agriculture in the Wet Tropics in the context of national trends and policy	16
5.1 The Asian century	16
5.2 Foreign investment in Australian agriculture	17
5.3 Climate change.....	17
5.4 Environmental and animal welfare regulations impacting agriculture	18
5.5 Biosecurity.....	19
5.6 Agricultural development in Northern Australia	19
5.7 National food plan and regional development.....	20
6. Conclusion	20
7. References	21

1. Introduction

1.1 Background

The Cairns Institute, James Cook University and the Rural Industries Research and Development Corporation have established a project focused on the contribution of agriculture to regional development. Agriculture is important to many regions of Australia contributing directly to regional economies as well as indirectly making social and environmental contributions to regional sustainability. To continue to make this significant contribution agricultural industries have had to adjust to changes in markets, cost structures, government policies and technology as well as environmental risks including drought and natural disasters. How agriculture responds to these changes, however, varies from region to region with some industries remaining static or declining while others have evolved and adapted more readily to change.

It has long been known that regions grow at different rates and this project builds on recent international research (Barca et. al. 2012; OECD, 2006; OECD, 2012) that supports a regional development approach that seeks to maximise the growth potential of all regions in Australia. Understanding how to maximise agriculture's contribution to regional development requires questions to be answered regarding how agriculture fits within a regional development context, what factors underpin agriculture's contribution, how agricultural industries evolve and develop in regions, and how to make the most of opportunities for agriculture to benefit regional economies and communities. Understanding the trends and issues that agricultural and related industries face in this regional 'place based' context can better inform regional and national policy by providing insights into how issues play out in a 'place'. These insights may assist to identify and address constraints to industry development, but also opportunities to facilitate agriculture's contribution to regional development. The project will result in the development of an agriculture development framework to guide policy and practice and the Wet Tropics of Far North Queensland (FNQ) has been identified as a pilot region for the project.

1.2 Project objectives

1. Develop a framework for quantifying and qualifying the contributions that agriculture makes to regional economies and communities, along with identifying constraints and opportunities that face agriculture;
2. Consider scenarios for how agriculture may develop within a region and the institutional arrangements for facilitating change and development and understanding how to maximise the contribution of agriculture to these economies;
3. Identify and explore how regional and national trends are manifest in a 'place-based' context and build strategies to facilitate the development of agriculture for the broader benefit of regions; and
4. Engage Federal, State and regional stakeholders and relevant networks that are involved in decision-making in respect to agriculture and regional development as part of developing the framework so that the research supports the ongoing development of an agenda for agriculture's contribution to regional development particularly in the pilot region.

1.3 Project stages

Stage I: Undertake a literature review that outlines the current state of knowledge and knowledge gaps about agriculture's contribution to regional development. This will include a demographic analysis of agriculture in the pilot region, its history and an exploration of current issues facing the region in the context of international, national and state trends and policy.

Stage II: Development of a discussion paper and stakeholder consultations and a workshop to further flesh out these issues and to seek feedback from key stakeholders on the development of the framework. (This discussion paper forms part of this stage)

Stage III: Based on stages I and II and further field research at the business, industry and regional scale the contribution of agriculture from an economic, environmental and social perspective will be considered and the framework developed.

Stage IV: A final workshop will be held with stakeholders to feed back the research results and fine-tune the framework. The workshop will also inform the development of a strategic agenda for the development of agriculture within the pilot region based on the regional research and the framework.

1.4 Purpose of this discussion paper

The research project recognises that ongoing development and change only occurs if those people directly affected are engaged in the research. This discussion paper as part of Stage II of the project draws out the key issues from a literature review and it aims to promote discussion and engagement around the contribution of agriculture and the role of farmers, community, industry and government in agriculture's development. It draws out key issues in relation to agriculture's contribution to regional economies and communities in terms of the ongoing development of agriculture within a place-based regional development context. It is not meant to provide advice or solutions. Instead it aims to provide a foundation from which participants in the research project can engage in the development of a framework that supports agriculture's ongoing development within a region.

The discussion paper raises questions in three broad areas: defining the contribution of agriculture; factors that support agriculture's contribution; and challenges and opportunities for agriculture. These questions are posed in bold within the discussion paper. They are designed to stimulate further thought and discussion as part of the process of development of the framework.

1.5 Agriculture in a changing world

Agriculture and rural and regional communities are changing as a result of globalisation and economic reforms that are reshaping the Australian economy and society. The 1970s and the advent of globalisation began a shift in government policy that accelerated during the 1980s and 1990s resulting in many agricultural industries being deregulated. Today Australian agriculture is one of the least subsidised and most productive and competitive industries in the world. Industry deregulation, however, combined with declining terms of trade for agriculture has contributed to a continuous decline in the number of farming families and business in Australia over the past 30 years (ABS 2012a).

Australian agriculture is therefore held up as a highly productive and competitive industry and a model of what can be achieved through market deregulation (Zhou 2013), on the one-hand, while on the other hand researchers are reporting that the changing lifestyle of the farm family and viability of the business means that many people are leaving the industry (Cocklin, cited in Cocklin & Dibden 2005; McShane 2012). This has significant ramifications for rural communities that are dependent on farming and agricultural industries to stimulate local economies and contribute to the social life of local communities. Thus, not only has there been a reported decline in numbers of farming families but also general population migration trends from rural to urban areas (ABS 2003). It is in light of these trends that many researchers, industries and organisations are investigating ways to stabilise the sustainability of agriculture and rural communities and identify how agriculture can continue to contribute to the development of rural and regional communities.

At the national level the National Farmers Federation (NFF), agriculture's peak industry body, has released a new *Blueprint for Australian Agriculture*, a sector wide attempt to set out a sustainable path for Australian agriculture to 2020 and beyond (NFF 2013). The Australian Government has developed a National Food Plan as a national framework for agriculture's future development (DAFF 2013) while the Queensland Government is in the process of developing a strategy to double the value of agricultural production by 2040 (DAFF 2012). The Queensland Farmers' Federation (QFF) recently released a guide to *Planning for Healthy Agriculture* that set out the core principles that should be adopted as part of planning if we are to support a prosperous future for agriculture (QFF 2013). These included recognising the value of agriculture to regional economies, protection of the natural resource base for agriculture and avoiding land use fragmentation and conflict to name a few. These plans indicate a renewed focus at the national and state level on the future of agriculture.

Place-based regional development approaches provide an opportunity to build on this national and state planning by recognising that individual regions are unique and that there is a need to maximise the potential of every region based on its competitive advantages (Barca et al. 2012). Regions are diverse in terms of their resources, infrastructure, supply chains, history and organisational capabilities and each of these can be important to the contribution that agriculture can make. Maximising a region's potential, therefore, requires leadership and planning at the local level as well as support at the national and state levels.

2. Defining agriculture and its contribution

The traditional view of agriculture industries is as suppliers of food, fibre, timber and foliage based around individual commodities (QFF 2013). This remains central to defining agriculture but there is increasing recognition of agriculture's contributions to the socio-economic viability of many rural areas, and its contribution to environmental management through ecosystem services (OECD 2001; Marsden & Sonnino 2008; QFF, 2013).

The environmental and rural development contributions of agriculture have been termed non-commodity outputs (OECD 2001). A major challenge in considering agriculture's non-commodity contributions, however, is the lack of established markets through which they can be traded and therefore an inability to put a dollar value on these outputs. How do you reward farmers for

improved environmental management through ecosystem services or value a government policy targeted at rural development if the contribution isn't easily measured in dollar values?

Researchers have identified three broad views of agriculture's contribution that emphasise the varying commodity and non-commodity outputs of agriculture and to some extent represent competing views of agriculture and its future development (Marsden & Sonnino 2008). These three paradigms are agro-industrial, post-productivist and rural development and each is discussed in more detail in the following sections recognising that developing a framework that seeks to quantify and qualify the contribution of agriculture needs to consider these multiple contributions and competing views about the future role of agriculture and its development.

Agro-industrial

The agro-industrial approach to agricultural sustainability aligns with traditional views of agriculture and food, fibre and timber production. This model predominantly focuses on increasing production to meet international demands whilst combating the challenge of competitive market prices. This is mostly achieved through incorporation of new technologies and the provision of monetary incentives for large producers (Marsden 2003) with small farms needing to supplement farm household income through non-agricultural activities (for example, off-farm employment) in order to cope with the demands and competition of the international market (Marsden 2003; Marsden & Sonnino 2008).

The sustainability of the agro-industrial model is being questioned as it relates to farm family businesses (Marsden & Sonnino 2008; Darnhofer 2010; McShane 2012). For instance, Darnhofer (2010) found that although farm families demonstrated flexibility and adaptability in the farm business system through sourcing off-farm income, this was also a source of stress and conflict for the farm family. This finding is supported by McShane (2012) who found that family members who had multiple roles to manage, such as off-farm employment, were more likely to report high levels of distress. Such distress and role conflict places individuals at risk of burnout and job withdrawal (Maslach et al. 2001).

In the FNQ pilot region, deregulation of the tobacco, dairy and sugar industries has seen a decline in the number of small farms and increasing levels of off-farm work to sustain rural businesses (Anderson 2004; Thompson et al. 2010). This is despite the estimated more than \$100 million (sum of individual industry adjustment packages) that has been invested in industry adjustment in FNQ during this period (Griggs, 2002; Thompson et al. 2010).

Post-productivist

The post-productivist approach emphasises farming and agriculture capitalising on the aesthetic beauty of the surrounding environment and adopting environmentally friendly farming practices that protect the natural surroundings and provide ecosystems services (Marsden & Sonnino 2008). One of the limitations to this approach from an agricultural perspective is that it is focused on environmental sustainability rather than the sustainability and function of agriculture for food production (Marsden 2003; Cocklin et al. 2006; Renting et al. 2009). So that while agriculture is facing increasing pressures to become more self-reliant and productive it has to comply with increasing demands for environmental sustainability (Marsden 2003; Lockie & Higgins 2007). Further, as the responsibility for environmental sustainability is placed solely on producers by the wider public, this can create discontent amongst producers (Marsden 2003; Cocklin et al. 2006).

In this regard, in the Wet Tropics pilot region farmers are facing increasing environmental regulations (many related to World Heritage Area protection) and encouragement to engage in community-based environmental management through Landcare and Catchment Management and regional natural resource management bodies. Improving agricultural sustainability and increasing environmental protection, however, produces benefits for the community as well as the farmer and balancing these competing interests may require new policy responses (Lockie & Higgins, 2007).

Rural development

The rural development approach makes a distinct move away from sector or industry-focused agricultural sustainability towards regionally focused or place-based agricultural and rural sustainability (Marsden & Sonnino 2008). The approach considers the multidimensional role of agriculture, particularly highlighting the role it plays in socio-economic sustainability. Thus, agriculture should make multiple contributions through adding income and employment opportunities to the agricultural sector; contributing to the construction of a new agricultural sector that meets the needs of the society; and implying a dramatic change in perspective and use of the rural resources available (Marsden & Sonnino 2008). Further, in the Australian context, agriculture should also take into account the value of land and landscape to Indigenous peoples (Holmes 2010). Some strategies of a rural development approach would include agri-tourism, place/regional branding, value-adding and niche marketing. In some ways, the regional development model of multifunctional agriculture requires an increasing professionalisation of those who work on farms and in rural businesses (Wolf 2008). Within the pilot region this approach to rural development is evident in regional development organisations plans including Regional Development Australia (RDA) and Advance Cairns (Advance Cairns 2011; RDA 2012).

These three approaches emphasise different commodity and non-commodity contributions that agriculture makes to regional development and different opportunities for agriculture's development within a region. To some extent they represent competing views about the role and contribution of agriculture within a region, and different regions may emphasise different approaches.

Is there a need to more broadly recognise the multiple contribution of agriculture in Australia?

How can non-commodity outputs such as rural development and ecosystems services be valued?

Of the three approaches identified, agro-industrial, post-productivist, and rural development, which do you, think best describes current Australian agriculture? What do you think should be the future approach?

What should farmers be responsible for in terms of environmental protection and what are the broader responsibilities of community and government? How are responsibilities currently distributed?

What is the potential for environmental management and protection and to become a new income streams for agriculture in Australia?

3. Factors that support agriculture's contribution within a place-based regional development framework

Determining what factors underpin agriculture's contribution and how factors can limit or enhance agriculture will be important in developing the framework. The OECD (2012) has identified factors that contributed to successful regional development including government policy, sound institutional arrangements, infrastructure, and relatively strong human capital including innovation and entrepreneurship. The Regional Australia Institute (2013) building on international research recently released *Insight*, a framework for considering the competitiveness of regions across Australia. The *Insight* framework consisting of 59 measurable indicators across ten themes recognises that some factors are to a large extent fixed in nature (such as available natural resources and market size) while others can be changed by policy decisions (such as institutions and infrastructure) or at least influenced by policy (such as human capital and labour market efficiency). The contribution of specific industries is not addressed within the *Insight* framework although agriculture, including forestry and commercial fishing and aquaculture, is used within three indicators of regional competitiveness as part of the natural resources theme. The *Insight* framework reflects a growing trend internationally to consider agriculture within a broader regional development context (OECD, 2006).

The following sections discuss in more detail some of these factors in terms of their influence on agriculture's contribution to regional development.

3.1 Government policy in agriculture and place-based regional development

Government agriculture policy has changed from industries being highly regulated based around commodity marketing boards supported by state and federal governments (McKay 1965; Canegrowers 2013) to today where industries are completely deregulated competing on the world market. The shift in agriculture policy began in the 1970s with the establishment of the Bureau of Agricultural Economics and the Industry Assistance Commission (IAC) which made the level of assistance received by industries much more transparent and required industries to increasingly justify the level of assistance they received. This effectively changed the ad hoc approach to policy formation based around powerful industry lobbies that had driven agricultural policy and led to economists becoming increasingly central to policy development (Botterill 2005).

Economy-wide economic reforms built on economic efficiency arguments became the dominant approach (Freebairn 2003). These policies underpinned decisions to deregulate agriculture impacting farmers and communities while making Australian agriculture one of the most highly productive and competitive and least subsidised in the world (Zhou 2013). These economy-wide economic reforms and industry deregulation however, have had significant impacts on many regional communities. This has led governments based on equity arguments to introduced regional development and industry adjustment programs in an attempt to address these problems. This has not necessarily produced the best results in terms of tackling existing problems or meeting the challenges of the future (Regional Australia Institute 2012).

The Regional Development Australia framework is the latest incarnation of Australian and state governments' support for regional development organisations and infrastructure (RDA 2013). Through these regional development programs, federal and state governments have refocused regional development as a local level problem and responsibility, encouraging engagement between local governments, businesses and organisations. This shift in government policy, however, has not been associated with the necessary strategic investments in regional development planning and development with financial power and budgetary control retained at a higher government level (Beer et al. 2005).

Place-based regional development policy approaches seek to move beyond debates about equity and efficiency in regional development policy and are based on an approach that seeks to maximise the development potential of all regions (Tomaney 2010; Barca et al. 2012; OECD, 2012). The starting point for a place-based development is recognition that much of the knowledge needed to fully exploit the potential of a region is not readily available and must be produced anew through a process involving local and external stakeholders. This approach 'builds on local values and the "sense of community"' while remaining open to outside values (Barca et al. 2012, p 147).

3.2 Institutions in place-based regional development

Historically, commodity based industry bodies and businesses have been the main organisations engaged in the development of Australian agriculture. The growing importance of non-commodity outputs and recognition of the multiple contributions of agriculture however, has seen the establishment of new organisations and institutional arrangements over the past few decades. These include regional development organisations and regional natural resource management bodies. These organisations have all been established for different reasons and have different histories and cultures. In some instances roles and responsibilities may be clearly defined while in others they may overlap. These organisations also have different interfaces with government. Industry bodies and businesses have independently elected boards while Regional Development Australia committees are appointed by federal and state Ministers and NRM bodies may be community-based or government appointed. The role of industry bodies has also been changing with the deregulation and the removal of statutory marketing arrangements in agricultural industries.

Industry deregulation and the commercialisation of many government services have created opportunities for private extension service providers and agribusinesses to provide advisory services as part of their sales and marketing. The number of government agricultural extension services has declined and the role of the extension officer has changed from focusing on production issues to more broadly consider farm sustainability and business management issues (Standing Committee on Agriculture, Fisheries and Forestry 2007).

The numbers and roles of different organisations and businesses will vary from region to region as will their capacity. A place-based regional development approach enables this varying industry, business, organisational and government capability to be considered and maximised. It also provides an opportunity for gaps in capability and barriers to agriculture's future contribution to be identified and addressed.

3.3 Infrastructure in place-based regional development

Infrastructure can be critical to agriculture's contribution to regional development. Water infrastructure can facilitate the establishment of new agricultural industries while road and port infrastructure supports connectivity to markets. Infrastructure investments are still central to regional development policy in Australia with the Regional Development Australia Fund established to meet the needs of regional communities.

Although infrastructure is often seen as the main driver of regional development as regions become more developed, there can be a decreasing return on investment from infrastructure. Human capital and innovative capacity can become more important to regional success than infrastructure investment (OECD 2012).

3.4 Human capital and innovation in place-based regional development

Human capital or a region's education and skills base stands out as a major factor in regional success. The presence of large numbers of people with little human capital also appears to weigh down regional growth (OECD 2012). Human capital also contributes to innovation and regions that have developed this innovative capacity through networks of firms, universities, technology centres, and development organisations usually have been able to create a common vision and goals for which they are striving (Cooke 2001; Harmaakorpi 2006). Examples include Silicon Valley, Boston Biotechnology, Baden-Wurttemberg automotive and electronics and engineering regions who Cook (2001) demonstrated were successful because of their regional innovation system. Creating a trusting environment and cohesive and creative communities is critical to supporting regional innovation (Campbell-Ellis 2012).

The priority given to innovation and the role it plays in regional development, however, will vary between regions. It may be the case that in less developed regions a focus on adoption of existing technologies and strengthening human capital and the business environment may be a higher priority (OECD 2012).

3.5 An integrated approach is critical

Despite the importance individually of factors including institutions, infrastructure and human capital to regional success, an integrated approach is critical to successful regional development as the lack of any individual factor may limit a region's capacity to maximise its growth potential. Determining what factors are important, however, requires knowledge that in general is only available in each individual region, so a coordinated regional approach is required. Strong cross-sectoral approaches are also important (OECD 2012) so that although this project is focused on the contribution of agriculture, the engagement of other sectors may be critical to agriculture's success. Synergies between agriculture and tourism and agriculture and energy sectors are obvious examples of potential development opportunities. Regional place-based approaches to development may therefore challenge established institutional structures as the challenges within a region may not be addressed effectively within established organisational silos. Regions may also require outside information and drivers to support new thinking and engagement and to prevent local institutional group-think that can prevent innovation and change (Barca et al, 2012; Campbell-Ellis, 2012).

Kneafsey (2010) identifies three key strategies that need to be considered in adopting a regional place-based framework—rescaling, respacing and reconnecting. Rescaling emphasises the need to shift power to regional centres so that these centres can direct and implement policies that are effective for the region and meets regional needs. This is not necessarily a shift of government but the development of real partnerships at the regional level. As discussed earlier, governments have tended to devolve responsibility to regional development organisations and local governments for regional planning and development while retaining control of programs and funding. This limits capacity at the local regional level to focus on strategic issues as programs and resourcing are set by state and federal governments. Regional development organisations must engage with a range of government agencies and departments and manage an array of small projects increasing administrative loads and transaction costs (Beer et al. 2005). Respacing refers to the regionalisation of foods but not necessarily food networks—developing a market for foods that are known in the region or that are traditional to the region (Kneafsey 2010). For example, King Island is a well-known brand marketed nationally and internationally while Taste of Paradise is a relative new attempt to brand and market produce from Tropical North Queensland. Reconnection, Kneafsey’s final strategy, refers to reconnecting communities with local food networks which emphasise the value and benefit of consuming these products over those from centralised markets. An example of this method is the farmers’ market or Real Foods Network that has been established as part of Taste of Paradise.

What key factors do you believe are critical for agriculture to continue to contribute to regional development?

What roles do industry, business, regional development organisations, NRM bodies, universities etc currently play in agriculture’s contribution to regional development?

Is there a better way to organise roles and responsibilities within a regional development framework to support agriculture’s contribution and development and how could this be achieved?

How does government policy shape agriculture today: regionally, state and nationally?

What new policies are needed to maximise agriculture’s contribution to regional development?

Innovation has been identified as important to regional development. How can innovation in agriculture be supported and what is the role of industry, business, universities, organisations and government in the innovation process?

Does agriculture currently have the human capital (knowledge and skills), or access to these, to embrace broader regional development opportunities?

4. The pilot region: The Wet Tropics of Far North Queensland

This earlier discussion of agriculture's multi-functionality and factors which support regional development will be used as a basis to further develop the framework using the Wet Tropics of Far North Queensland as a pilot region. The following section provides an overview of the region, the contribution of agriculture, and some of the key future trends and challenges for agriculture to further inform this process.

The pilot region of Cairns and surrounds covers an area of 21,414 km², or 1.2% of the total area of Queensland. The boundaries of the pilot region, shown in Figure 4.1, were selected for two reasons. Firstly, to incorporate the main agricultural production areas that surround Cairns city. In addition to Cairns on the eastern coastline, major towns in the pilot region include Mossman and Port Douglas to the north, Tully and Lucinda to the south, and Atherton and Mareeba to the west on the Tablelands. Secondly, the boundaries align with Cairns Statistical Area Level 4 (SA4), allowing statistical data from the Australian Bureau of Statistics (ABS) and Queensland Government's Regional Database to be used to build a socio-demographic, economic and industrial profile of the pilot region.

Located on the far north Queensland coastline, the Cairns (SA4) region is an area of great biodiversity and natural beauty. The region's main industries are tourism, centrally concentrated in the Cairns and Port Douglas areas, and agriculture, which is the main industry in most of the rural townships surrounding Cairns. The natural landscape comprises of mountain ranges, tropical rainforests, sclerophyll forests, coastline, beaches, coral reefs, and good quality agricultural land. Due to the tropical environment, high rainfall is experienced between November and April, also known as the wet season. This closely corresponds with cyclone season, which runs from November to May. The peak tourism season corresponds with the dry, mild winter months between June and October. The region's two main industries—agriculture and tourism—are especially vulnerable to these seasonality patterns, which can significantly impact the region's economy.

4.1 A brief history of agriculture in the pilot region

European settlement in Northern Australia is quite recent with Cairns not founded until 1876 almost 100 years after the settlement in Sydney. Agriculture had difficult beginnings as European settlers learnt about the regions tropical environment and grappled with the economic and climatic challenges of growing crops and raising livestock in a new environment (Courtenay 1978).

Coastal north Queensland was the physically least difficult and economically least peripheral to southern settlements so that by the middle of last century agriculture had become the regions dominant economic driver estimated to account for almost 70% of the Far North Queensland (FNQ) regions gross value of production (RDA 2012). Over the past 50 years it has continued to grow substantially while other industries have also emerged particularly tourism. As a result agriculture's relative importance within the region's economy has declined to less than 20% of the gross value of production (RDA 2012). The sugar, maize and beef industries have remained constants while a number of other industries emerged including tobacco, dairy and horticulture to become significant contributors to the region's economic and social fabric. While horticulture particularly bananas remain significant industries within the region, tobacco has disappeared and dairy has declined significantly over the past decade. As this history establishes the rise and fall of industries has been driven by physical geography and climate, markets, infrastructure and technology and changing

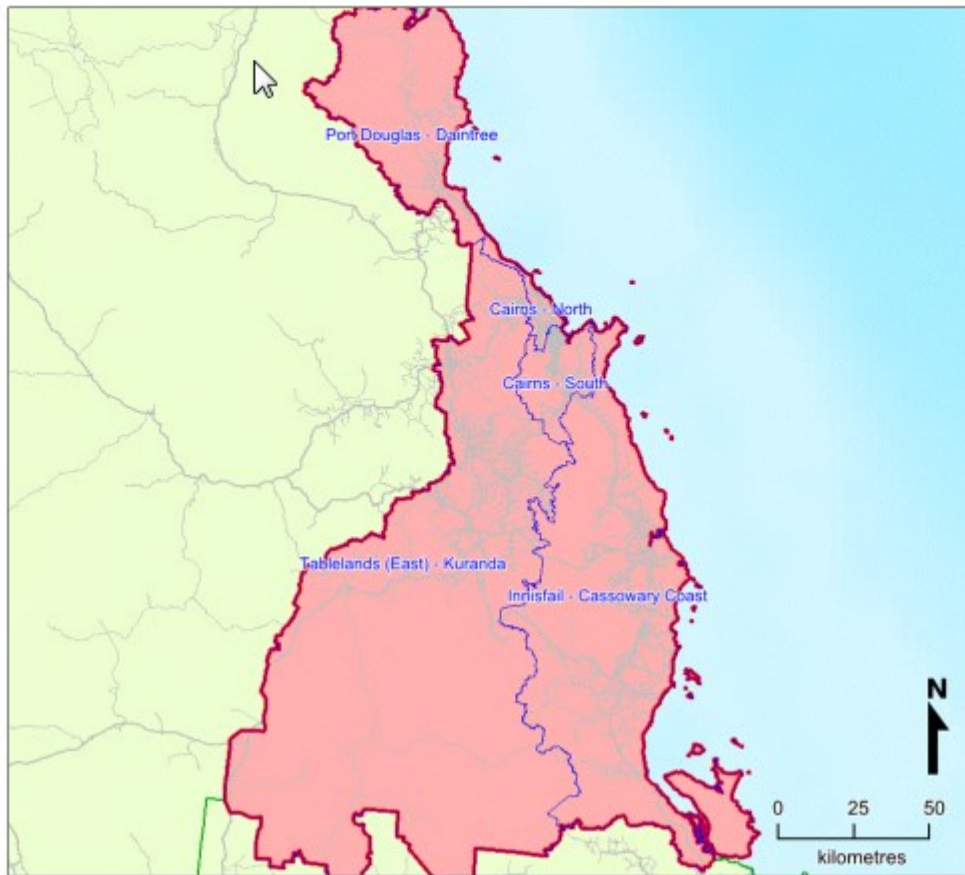
government policy. Understanding this history is useful in helping understand the changing contribution of agriculture within a regional economy and the future role that agriculture may play within a region like the Wet Tropics of FNQ.

4.2 Income, employment and education

Income, employment and education statistics are lower in agriculture dominated parts of the region as compared to urban populated areas. A third (34.0%) of the region's population aged 15 years and over reported a total personal weekly income less than \$400 (\$20,800 per annum) while in the agriculture dominated sub-regions this figure increased to more than 40% (Queensland Treasury & Trade 2013). The region has consistently maintained an elevated unemployment rate which was 8.7% for the December quarter 2012 compared to 5.8% for Queensland. Unemployment was even higher in the agricultural areas with Tablelands (East) - Kuranda at 10.4%. With respect to schooling, just over half (52.2% or 88,492) of the region's population aged 15 years and older stated their highest level of schooling was Year 11 or 12 (or equivalent). In the agricultural dominated areas of Innisfail - Cassowary Coast and Tablelands (East) - Kuranda those completing year 11 or 12 (or equivalent) dropped to 42% and 44.3% respectively (Queensland Treasury & Trade 2013).

Given the importance of human capital to regional success (OECD 2012) and the link between education, employment and income the role of human capital to agriculture's contribution will be an important consideration in further development of the framework.

Figure 4.1. Map of pilot region



Source: Queensland Treasury & Trade (2013).

4.3 Industry profile

Agriculture, forestry and fishing accounted for almost 15% of all businesses in the Cairns (SA4) region. Only the construction industry represents more with 19% of all regional businesses. Agriculture, forestry and fishing industries employed 4.8% of the population in the study region, compared to 2.7% for Queensland. Although not the largest employer in the region agriculture, forestry and fishing industries did have the highest specialisation ratio at 1.75 (Queensland Treasury & Trade 2013). A specialisation ratio higher than 1.0 indicates a higher percentage of employment within that industry compared to the percentage for Queensland. Similarly, the accommodation and food services industry had a specialisation ratio of 1.36. These ratios illustrate the importance of agriculture and tourism to the Cairns (SA4) region, and the regional economy.

The lack of diversification within the region could be considered a weakness as the region may be more prone to external shocks (OECD 2012). Unemployment in Cairns, for example, peaked at 13% following the global financial crisis as it significantly impacted the tourism industry. Within agriculture, sugar cane and bananas dominate the value of production. The history and dominance of particular industries can influence innovative capacity within regional development (Campbell-Ellis 2012). The Hilderbrand Report (2002) for example highlighted a number of cultural challenges to industry reform as part of deregulation within the sugar cane industry. How the dominance of particular industries influences agriculture's contribution and development will be further explored as part of the development of the framework in the Wet Tropics.

4.4 Agriculture

The gross value of agricultural production (GVAP) of the Cairns (SA4) region was \$687 million, or 7% of Queensland's total value of agricultural production (\$9.5 billion) for 2010-2011 (ABS 2012c). The region's crop production had a gross value of \$572 million, and accounted for 11.7% of Queensland's crop production (\$4.9 billion). The importance of the region's agricultural industry to Queensland is further highlighted when comparing the region's contribution to Queensland's GVAP by crop type. The Cairns (SA4) region produced 97% of the total value of Queensland's banana production, and 45% of the total value of potato production (Trestrail et al. 2013). Table 4.1 details the major agriculture industry sectors in the Cairns region by gross value of production compared to Queensland.

Table 4.1 Agriculture industry values and commodities for the Cairns region

MAJOR AGRICULTURAL INDUSTRY SECTORS IN CAIRNS (SA4)	Gross Value		Commodities Produced		
	Cairns \$m	QLD \$m	Area (ha)	Production	Farm Biz
Total agriculture					
Agriculture - Total value (\$)	686.9	9554.5			
Crops - Total value (\$)	571.9	4901.2			
Crops (excluding hay) - Total value (\$)	567.7	4790.2			
Broadacre crops - Other crops					
Broadacre crops - Other crops - Peanuts - Value (\$)	5.6	14.7	1771	6820714kg	31
Broadacre crops - Other crops - Sugar cane - Total value (\$)	184.8	910.3	-	-	-
Broadacre crops - Other crops - Sugar cane - Cut for crushing - Value (\$)	181.4	888.4	60205	4822559t	690
<i>Broadacre crops - Other crops - Sugar cane - Cut for plants - Value (\$)</i>	<i>3.4</i>	<i>22.0</i>	<i>2206</i>	<i>89795t</i>	<i>429</i>
Horticulture - Nurseries, cut flowers and cultivated turf					
Horticulture - Nurseries and cut flowers and cultivated turf - Nurseries - Total value (\$)	13.4	167.9	62	-	72
Horticulture - Nurseries and cut flowers and cultivated turf - Total value (\$)	20.1	293.9	206	-	109
Horticulture - Vegetables for human consumption					
Horticulture - Vegetables for human consumption - Herbs - Value (\$)	1.7	26.7	361748	225116kg	12
Horticulture - Vegetables for human consumption - Lettuce - Total value (\$)	0.2	64.3	14	154497kg	12
Horticulture - Vegetables for human consumption - Potatoes - Total value (\$)	23.1	51.5	1394	37579t	41
Horticulture - Vegetables for human consumption - Pumpkins - Value (\$)	3.6	25.8	223	5815t	36
Horticulture - Vegetables for human consumption - Other vegetables - Value (\$)	4.0	280.7	111	-	38
Horticulture - Fruit					
Horticulture - Fruit - Total value (\$)	317.6	861.6	419275 trees	-	243
Horticulture - Fruit - Citrus fruit - Limes - Value (\$)	8.8	22.1	30251 trees	1941143kg	54
Horticulture - Fruit - Stone fruit - Total value (\$)	0.0	14.8	1527 trees	-	10
Horticulture - Nuts - Macadamia nuts - Value (\$)	0.3	35.4	20975 trees	94t	9
Horticulture - Fruit - Other orchard fruit - Avocados - Value (\$)	14.9	53.2	108369 trees	5687204kg	47
Horticulture - Fruit - Other orchard fruit - Jackfruit - Value (\$)	0.0	0.0	1372	1885kg	12
Horticulture - Fruit - Other orchard fruit - Lychees - Value (\$)	1.5	10.4	36095 trees	220258kg	57
Horticulture - Fruit - Other orchard fruit - Mangoes - Value (\$)	3.8	55.3	109423 trees	1332522kg	67
Horticulture - Fruit - Other orchard fruit - Rambutan - Value (\$)	0.5	0.8	15439 trees	56274kg	39
Horticulture - Fruit - Other orchard fruit - All other orchard fruit n.e.c. - Value (\$)	2.0	13.0	30724 trees	-	54
Horticulture - Fruit - Plantation fruit - Bananas - Value (\$)	273.8	283.1	10921	176642t	213
Horticulture - Fruit - Plantation fruit - Passionfruit - Value (\$)	0.5	8.8	36	109904kg	11
Horticulture - Fruit - Plantation fruit - Papaws/papaya - Value (\$)	5.3	15.9	227	1940511kg	39
Livestock - Livestock slaughtered and other disposals					
Livestock - Livestock slaughtered and other disposals - Cattle and calves - Total value (\$)	51.2	3418.1	-	162193no	830
Livestock - Livestock slaughtered and other disposals - Poultry - Total value (\$)	25.0	395.5	-	1227229no	19
Livestock - Livestock products					
Livestock - Livestock products - Whole milk - Value (\$)	35.2	257.5	-	21939no	95

Adapted from ABS databases. Sources: ABS 2012a; ABS 2012b.

4.5 Supply chains

In the Cairns (SA4) region, produce is distributed via two main types of supply chains. Firstly, agricultural produce is packed and transported to southern markets (wholesalers) for sale to retailers (such as Coles and Woolworths) or the food service sector (such as restaurants). This form of distribution deals with bulk commodities produced from large scale farms, where produce is grown, packed and sent to wholesale markets.

Secondly, a parallel local supply for produce is beginning to emerge on a small scale. To avoid the deficiencies of a long-distance supply chain model, producers may utilise local distributors and wholesalers to supply a local market. The Tropical North Queensland Regional Food Network uses a short supply chain model to enable viable trade of local produce by improving identification of and access to it. The network aims to showcase premium quality produce and value-added foods to help the Cairns region become recognised for its unique food offerings. A community-supported agriculture model has also been developed within the RealFood Network (RFN). This aims to deliver a diversity of locally grown produce to families on a weekly basis through the delivery of RealFood boxes, retail shops and community markets (Real Food Network 2013).

4.6 Value-added agriculture

The sugar industry is the main engine of agricultural value-adding within the region producing raw sugar and a range of other by-products. The sugar industry provides opportunities for innovation with the Mossman Central Mill in recent years developing a low glycaemic sugar product for human consumption (LogiCane 2013). Value-adding to other commodities has occurred in the region, predominantly in the processing of local produce and tourism related activities. However, the economic value of the sector is difficult to establish from the data accessed for the pilot region. Where value-added processing did occur, it was confined to a limited range of crops, such as the drying of fruit, fruit wine production and some drying and chipping of potatoes (Cummins 2010). Although there are many food producers in the region, many are not dependent on local produce or use it to a limited extent. In 2008-2009, there were 43 businesses believed to be processing or value-adding to local produce. The majority of these were relatively small in the far north region and estimated value added is around \$18 million and approximately 130 employees (Cummins 2010). Although the study area of the far north differs from the pilot region, it is indicative of the size and value to the Cairns (SA4) economy.

5. Future challenges and opportunities for agriculture in the Wet Tropics in the context of national trends and policy

Agriculture makes a significant contribution to the region's economy contributing almost \$700 million in gross value in 2012 accounting for more than 15% of local businesses and 4.8% of people employed within the region (ABS 2012b; ABS 2012c; Queensland Treasury & Trade 2013). At present it is difficult to quantify the broader contribution that agriculture makes in non-commodity outputs and this will be considered within the further development of the framework.

The region's peak development organisations, Regional Development Australia Far North Queensland and Torres Strait and Advance Cairns, have identified agriculture as an important priority for future development (Advance Cairns 2011; RDA 2012). The priorities within these plans have been developed as part of a process of industry and community consultation and provide a basis for starting to consider the future priorities for agriculture's development in the region. Key priorities within the RDA and Advance Cairns plans include: value-adding and supply chain development; industry diversification; regulatory reform, particularly as it relates to productivity and environmental outcomes; innovation; research; and development. RDA has identified a Regional Leadership Group to progress implementation of its priorities while Advance Cairns has identified individual agencies or groups who will be responsible for implementation. As well as these regional economic development organisations, a scan of industry-based organisations within the region identified more than 20 separate entities with an interest in agriculture. There is, therefore, strong regional development and industry networks within the pilot region. The roles and responsibilities of organisations were identified as important to regional success in the earlier discussion and the pilot region will provide an opportunity to consider how current intuitional arrangements in the region are supporting agriculture's contribution.

5.1 The Asian century

The *Asian Century White Paper* (Commonwealth of Australia 2013) sets out a framework for Australia's engagement with Asia as the global centre gravitates to our region. The tyranny of distance from major markets in Europe and America is being replaced by the opportunities arising from the emergence of our Asian neighbours. The White Paper identifies opportunities that will arise as the growing middle class increases demands for high quality safe food products. The Wet Tropics of North Queensland's proximity and tropical environment provide it with the opportunity to expand exports of tropical foods into Asia in line with these opportunities. There are potentially significant synergies between agriculture and the tourism industry with Cairns which is an internationally recognised tourism destination. The expanding Chinese tourism industry and increased flights could provide new opportunities for high value produce to be exported to China. Taking advantage of these opportunities will require the development of new capabilities and addressing old challenges including quarantine restrictions and limited supply chains. Mangos are now being exported from the region including to Japan and China but treatment facilities to meet quarantine requirements could provide opportunities for expansion of horticulture exports.

What opportunities are emerging from the Asian century and how can the region maximise those opportunities?

What are the risks of over focusing on Asia at the expense of other markets?

5.2 Foreign investment in Australian agriculture

There is limited information on foreign investment in Australian agriculture with the Australian Bureau of Statistics recent survey providing the best estimate, that 44 million hectares or 11.3% of Australian agriculture is foreign owned (Moir 2011). Foreign investment in Australian agribusiness is larger and has increased following industry deregulation. Around 50% of the milk processed in Australia is now foreign-owned while 60% of sugar refined in Australia is foreign-owned (Moir 2011). Tully Sugar was bought by Top Glory (Australia), a subsidiary of the Chinese state-owned COFCO Corporation (Moir 2011). Foreign ownership has provided important capital investment to restructure Australian agriculture post deregulation and potentially increases opportunities to develop new international supply chains so it is generally considered a positive for Australia. There is, however, concern about the lack of transparency about the level of foreign ownership in Australian agriculture and that too great a concentration of ownership in agricultural supply chain could reduce competition to the detriment of Australian agriculture (Keogh 2012). Tully Sugar have indicated that they are in the process of buying up land to grow cane directly, potentially changing cane growing in the district. Tableland cane farmers are currently in dispute with Marlborough Sugar Factory over the marketing of their sugar highlighting the continuing evolution of the sugar industry post deregulation. There is also emerging interest from foreign investors in the dairy and forestry industry within the Wet Tropics (Dale personal communication 2013).

What is the role of foreign investment in industries post deregulation?

How can the benefits of foreign investment be maximised and any risks minimised?

5.3 Climate change

Climate change will mean that agriculture will need to adapt and change. The impacts will vary across the nation and the adaption strategies will vary between regions and commodities (CSIRO 2012). The Wet Tropics of Far North Queensland has a diversity of climate based on elevation and distance from the coast but is generally hot and humid with a distinct wet season. The climate is naturally variable however climate change is predicted to cause shifts beyond this natural variability. In the Far North Queensland regional temperatures and evaporation are predicted to increase, rainfall decrease and the intensity of tropical cyclones and storm surges increase (Department of Environment and Heritage Protection 2013).

Threats

The threat of increasingly long-lived and intense tropical cyclones is already seeing agriculture adapt in the region. Following the devastation of severe Tropical Cyclone Larry and Yasi some banana growing has shifted to the Atherton Tablelands. Some tropical fruit growers and timber plantations are not being re-established with some farmers believing that that long life-cycle of the crop before an income is received makes the risks too great. Depending on the level of climate change, the increase in temperatures and evaporation may also have impacts on cropping and dairy farming on the Atherton Tablelands which rely on cooler temperatures and a more moderate climate for production.

Opportunities

Climate change brings with it potential increases in yield in some crops including sugar cane due to higher temperatures and greater levels of solar radiation. National and global action on climate change also provides the opportunity for farmers to generate an income through the emerging carbon market. CSIRO estimates this potential market to be valued in the billions in Northern Australia, with three main areas identified: reduced emissions from fire and livestock; increased bio-sequestration in soils and vegetation; and growing feed stocks for biofuel production which provides particular opportunities for the sugar industry (CSIRO 2012). CSIRO identified the need to address policy barriers to a carbon market emerging in Northern Australia including developing more secure property rights to carbon across the variety of tenures and developing a tool-kit of methodologies that enable carbon to be properly accounted for and traded. Realising these opportunities, however, will take time and is dependent on the establishment of a viable carbon market. The Carbon Farming Initiative (CFI) provides opportunities to enable individual farmers and graziers to draw benefits from a carbon market but this will require the pooling of carbon offsets and arrangement to achieve this are not yet established.

Dale et al. (2013) highlights the opportunity for an enhanced role for the regional Natural Resource Management bodies to support agriculture's adaption to climate change and provide a framework to achieve this outcome through new regional planning and governance arrangements.

How does agriculture in the Wet Tropics need to adapt to climate change?

What are the roles and responsibilities of farmers, industry, community and government in this adaptation process?

What opportunities exist for agriculture to generate income from carbon markets in the Wet Tropics and how might this occur?

5.4 Environmental and animal welfare regulations impacting agriculture

Agriculture in the pilot region has also been faced with rapid change as a result of increasing environmental regulation and protection. In 1988 the Commonwealth established the World Heritage Area and banned commercial logging within this region (Wet Tropics Management Authority 2013). In 1999 the Queensland Government introduced the *Vegetation Management Act* effectively banning broad scale tree clearing in Queensland and severely restricting the clearing of regrowth (DERM 2009). Agriculture in the region, particularly the sugar industry, has faced increased environmental scrutiny (Hildebrand 2002) and in 2003 the Queensland and Australian governments established the Reef Plan program targeted at improving water quality entering the Great Barrier Reef lagoon from farm lands. The plan was updated in 2009 and has seen increased regulatory control over the use of agricultural inputs within reef catchments (Queensland Government 2009). The live cattle export suspension and subsequent reduction in Indonesian import quotas have impacted the cattle industry (Bowen 2012) and highlight the increasing concerns over the need for an environmental and social licence to farm in Australia.

This trend highlights a need for agriculture to address increasing community concern around environmental and animal welfare or risk losing community support and market access in the case of live export. These regulatory changes have significant impacts on individual farm businesses but they require industry, regional and national responses.

5.5 Biosecurity

Government policy changes have threatened the banana industry with the Philippines lodging an application to import Cavendish bananas into Australia in 2000 leading to a decade long fight by the banana industry to maintain quarantine restrictions that protect the industry. The industry spent \$2.2 million raised through a levy and led a political campaign fighting Biosecurity Australia's two draft Import Risk Assessments that would have lowered quarantine standards and likely lead to Philippine banana imports (Stephen 2009). The final Import Risk Assessment does not ban banana imports but has ensured that quarantine standards are maintained at a very high level and effectively monitored by Australian Quarantine Officers. To date no further applications to import bananas into Australia from the Philippines have been received (DAFF 2011). Tropical diseases continue to be a significant threat to the banana industry in Queensland with Panama Disease Tropical Strain Race 4 now established in the Northern Territory and continuing to spread despite quarantine restrictions (Carlaw 2012).

Biosecurity threats continue to be a significant issue for agriculture's long term sustainability and competitive advantage and regional communities play an important role in monitoring for pest and diseases. The protection of industries from biosecurity threats from overseas will ensure Australia maintains its clean green reputation for food production.

Can biosecurity be strengthened through place-based regional development frameworks?

What is the role of farmers, communities, industries, regional development organisations and governments in addressing these issues?

5.6 Agricultural development in Northern Australia

The difficulties of farming in Northern Australia are well documented with relatively infertile soils, variable and highly intense rainfall, intense radiation and soil temperatures and pests and diseases combining with distance from major markets and infrastructure constraints all limiting development (Courtenay 1978; Cogle et al. 1991; Chapman et al. 1996). The rise of Asia is bringing markets closer but the physical difficulties of agriculture production still exist.

Debates over the potential for agriculture development, however, continue to persist. The *North Australia Land and Water Taskforce Report* was released in 2009 detailing the available land and water resources in Northern Australia and their potential for further development (North Australia Land and Water Taskforce 2009). The taskforce had peak industry, Indigenous and conservation representation on it and was supported by a CSIRO scientific report providing a good basis for future decision-making. In response to the Taskforce Report a North Australia Ministerial Forum has been established representing the Australian, Queensland, Northern Territory and Western Australian Governments to lead, coordinate and support sustainable development across the region (ONA 2013). Governments have since invested \$17 million in a *Northern Australia Sustainable Futures* (NASF) program incorporating eight components including strategies around the future development of irrigated and mosaic agriculture, meat processing and infrastructure to further research and support northern development (Department of Regional Australia Local Government, Arts and Sport 2013).

Agriculture in the Wet Tropics of North Queensland is well developed compared to the rest of Northern Australia. Development of new agricultural areas and industries, however, provide opportunities to leverage off new supply chains and markets and the political interest that these developments engender.

How can the Wet Tropics leverage off the community and political interest in agricultural development in Northern Australia?

5.7 National food plan and regional development

The Australian Government has just developed a *National Food Plan* releasing an issues paper and subsequently a green paper as part of the consultation process (DAFF 2013). The *National Food Plan* is a higher-order document with the key outcome to ensure Australia has ‘a sustainable, globally competitive, resilient food supply, supporting access to nutritious and affordable food’ (p. 2).

Regional development is identified as one of seven key fuses with 90% of food production jobs and 50% of food processing and manufacturing jobs located in non-urban areas (DAFF 2012). The green paper, however, did not address regional development within a specific section but discusses initiatives including Regional Development Australia Committees and general infrastructure investments. In one place in the 274 page green paper it discusses examples of place-based initiatives to address specific problems and opportunities in the food sector. There is no strategic recognition of the importance of place-based region development as a way to support agriculture and food production.

How can the role of place-based regional development frameworks be strengthened within national policy?

6. Conclusion

This discussion paper highlights the varying contributions that agriculture makes to regional communities and identifies opportunities and barriers to further development. It raises more questions than it answers and is only part of one of the first steps in developing a framework to quantify and qualify the contribution of agriculture to regional development. It is hoped that it has stimulated your thinking and interest in the project. If you would like further information or to comment on this discussion paper please contact:

Jim Turnour
Principal Investigator
The Cairns Institute
James Cook University
Phone: 07 4042 1879
Email: jim.turnour@jcu.edu.au

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