NSW GOVERNMENT | Department of Primary Industries

Agriculture Industry Snapshot for Planning

Northern Rivers Sub Region

August 2020

The gross value of agricultural production in the Northern Rivers Sub Region (NR) was over $525.9m (ABS 2015/16). This shows how important the Sub Region is for the State's agricultural industry. However, the expansion of residential and lifestyle development has incrementally pushed farming out of some areas and makes it difficult for remaining producers to operate. Farmers and value-adding industries in Sub Region must deal with increased land use conflict, inflated land prices plus additional, lengthy and costly planning requirements due to competing interests and competing urban land uses. Despite these challenges, the region has potential to grow and support agriculture, particularly intensive agriculture. This is highly important given expected population growth of the region and adjoining South East Queensland.

Purpose of this profile

To develop effective land use planning policy for agricultural industries it is important to understand their location, the reasons why they exist in that location, the opportunities they may take advantage of and the challenges they face. This profile details the key agricultural industries in the Northern Rivers and their interactions with suppliers, processing facilities and markets.

Identifying the significance of agriculture allows its recognition and management in land use planning by Councils. By providing the evidence base for strategic planning, agricultural land and local agriculturally-based economies can be protected and supported in planning instruments.

It is important for the region to retain agricultural production in a local setting. The benefits for both farmers and urbanising populations are evident through reduced food miles and provenance, and amenity, research and tourism opportunities.

The region's agricultural industries operate in an environment of increasingly global competition and opportunities, external challenges and changing land use. This profile will inform local council's strategic planning for these key agricultural industries considering their linkages to infrastructure and secondary industries throughout the region. Land use planning in the region is guided by the North Coast Regional Plan 2036 (2017). The Regional Plan has clear directions for the need to identify, protect and appropriately capitalise on the region's agricultural industries, infrastructure and rural land. Further to this, the combination of ideal growing conditions, proximity to 3.6m people in South East Queensland and 302,000 people in the region provide transformative agriculture and value adding opportunities.

Agriculture in the Northern Rivers Sub Region

The Northern Rivers Sub Region is 20,706km^2 in area, or 4% of NSW. The Sub Region is home to approximately 302,649 people (ABS, 2016). Agriculture is active in all Councils of Ballina, Byron, Clarence Valley, Kyogle, Lismore, Richmond Valley and Tweed.

Although one of the more populated NSW regions, the Northern Rivers Sub Region makes a relatively significant contribution to agricultural production in NSW. The following table shows the Gross Value of Production (GVP) and percentage share of agricultural output for the Sub Region for each of the top industries. These industries alone account for 84% of all agriculture in the Northern Rivers Sub Region.

Industry	Gross Value of Production ($)	% share of NR total	Number of businesses	% share of NSW
Beef	$142m	27.0%	1,356	5.5%
Fruit & nuts	$106.1m	20.2%	506	17.3%
Broadacre crops	$86.9m	16.5%	428	1.7%
Dairy	$62.0m	11.8%	132	10.4%
Poultry (meat)	$57.2m	10.9%	14	6.5%
Nurseries, cut flowers or cultivated turf	$46.4m	8.8%	90	15.5%
All other agriculture	$25.2m	5.0%		0.8%
Total	**$525.9m**	**100%**		**4.0%**

Source: ABS 2015 – 16 (note: some businesses cover multiple industries)

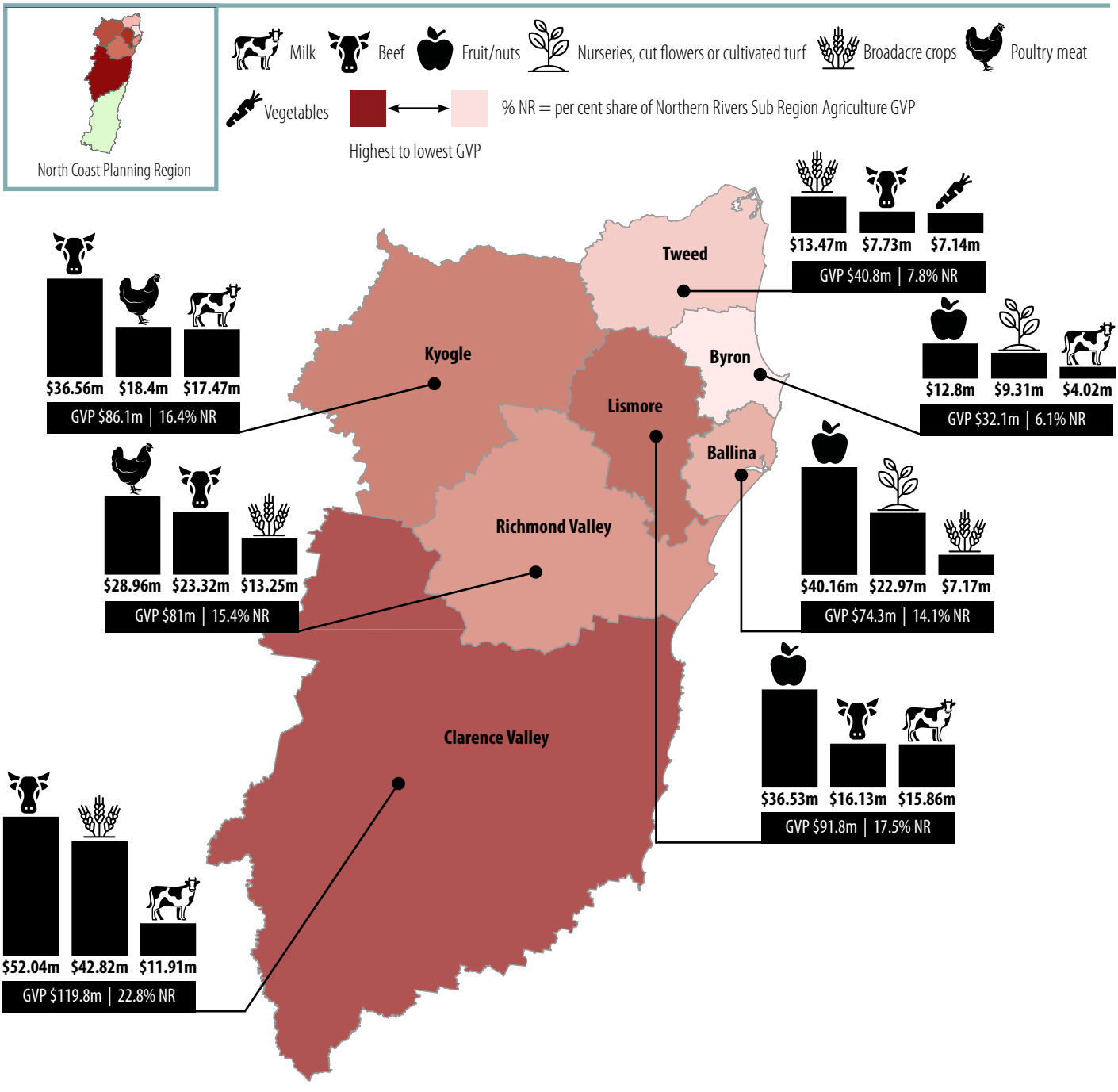
Beef production is the dominant industry in terms of GVP, contributing 27% of the Sub Region's output. The beef industry nationally is worth $12.3 billion annually, being 19% of all meat consumed in Australia (Ranieri, 2019). Fruit and nuts in the Northern Rivers Sub Region contribute 17.3% to NSW's total production and 48% of the North Coast Region. Within this category, macadamias dominate being over 92% of NSW production. Nurseries, cut flowers or cultivated turf contribute 15.5% of NSW's production, sugarcane provides 96.9% of NSW production, and milk and poultry, 10.4% and 6.5% of state production respectively. Other dominant industries include vegetable production producing $11.8m and the pork industry which supplies 4.2% of the State's pork ($9.0m GVP).

Employment

Agriculture employs over 4,806 people across the Northern Rivers Sub Region (ABS, 2015/16). The biggest employer is cattle and grain farming (34.4%) followed by the fruit and nut industries (23.0%) and nursery and floriculture production (8.0%). The LGAs with the highest agriculture employment are Lismore (19.6%) and Clarence Valley (16.9%) These are people employed in the primary production of agriculture and do not include the vast workforce within the key secondary industries. It does not include employees that are hired on a seasonal basis that were not working in the Northern Rivers Sub Region at the time of the ABS census.

Local government distribution

The following map shows the local government areas (LGA's) in the region and agricultural GVP. The biggest individual contribution is Clarence Valley Council followed by Kyogle Council.



Agricultural highlights of the Northern Rivers Sub Region

Farming in the Northern Rivers Sub Region provides benefits and opportunities for producers and urban populations. By sustaining agriculture close to large cities (the peri-urban area), there are advantages for farmers ranging from opportunities with market differentiation and alternative income streams, access to labour, resources and materials, and opportunities to grow high value crops which benefit from market proximity (reduced food miles and spoilage).

This section highlights the prominent industries for the Northern Rivers Sub Region, with further detail provided in Appendix 1.

Beef

The beef industry is a major contributor to agricultural production in the Northern Rivers region. The gross value of production of beef in the Northern Rivers was $142m in 2015/16 accounting for 5.5% of NSW production (ABS 2015/16).

The beef industry consistently remains a major employer in the region, along the whole supply chain, including growing, transport, refrigeration, processing and production (RDA 2015).

The Northern Cooperative Meat Company (NCMC), Australia's largest meat processing Co-operative, is located in the region supporting the beef, pork and other meat industries. NCMC is 100% member owned. The NCMC facilities include a red meat processing facility and tannery located at Casino, and a pork processing facility at Booyong (Byron LGA). These facilities are perfectly positioned to draw livestock from some of the best farming regions in Australia and are within close proximity to the Port of Brisbane, a major export hub (NCMC 2020).

- The Casino Service Processing facility processes up to 9,000 animals per week across two processing floors (beef and veal) and exports to more than 20 countries (NCMC 2020).
- Casino Hide Tannery (CHT) is part of the NCMC group, processing hides from green through to wet blue leather. Established in 1975, CHT was one of the first tanneries in Australia dedicated to the tanning of cattle hides for export. The tannery is one of the larger installations in Australia, with the capacity to convert over 900,000 cattle hides each year (CHT 2020).

The Northern Rivers Sub Region proximity to markets including local saleyards at Casino, Grafton, Lismore and Murwillumbah are critical to the continued viability of the industry within the region. The Northern Rivers Livestock Exchange on the outskirts of Casino is the largest livestock trading facility in northern NSW serving a producer catchment well beyond the Sub Region including, parts of the Mid-North Coast, the western slopes of the Northern Inland and some producers from South East Queensland (RDA 2015).

Industry requirements

The Northern Rivers has ideal conditions for pasture fed cattle production given the climate, high rainfall and access to both a local international processing facility (NCMC at Casino) and the JBS processing facility at Dinmore, in South East Queensland. Producers require scale of land holdings and room to expand operations. Access to processors, saleyards, transport and a suitable workforce are also important.

The key inputs for the beef industry are:

- feed, mainly rain fed pasture and/or seasonal supplementary grain/hay
- suitable fencing and infrastructure
- road access for feed and livestock transport
- reliable water supply
- access to labour
- access to processing facilities and saleyards
- ability to expand or intensify operations to increase scale without interruption from non-farming residents.

The NSW North Coast is highly susceptible to flooding. It is important that grazing properties have a good balance of sloped country in association to alluvial flats to ensure adequate flood refuge is provided. While the fertile soils of the alluvial flats can produce quality pasture, flatter land can also be susceptible to frosts so access to hilly country can also ensure continued access to more palatable pastures during winter months.

Fruit and nuts

The Northern Rivers Sub Region is home to many key fruit and nut industries for NSW. The most significant to the State's production is macadamias followed by bananas and avocados.

Category	Key industry	GVP	% share of NSW
Fruit & nuts (excluding grapes)	Macadamias	$80.6m	92.9%
	Avocadoes	$8.7m	24.3%
	Blueberries	$6.3m	5.4%
	Bananas	$2.7m	42.8%
	Mangoes	$123,890	36.9%

Macadamia nuts are the fourth largest Australian horticultural export. The macadamia plant originated in the coastal areas of northern NSW and south east Queensland. In 2016 the Northern Rivers Sub Region produced 40% of Australian production. The region has plantations with more than three million trees over 9,700ha of land, with 490 producers (AMS 2020). The expansion of the industry is limited due to urban encroachment in the coastal hinterland, resulting in the industry spreading into other areas including the coastal floodplain.

The Northern Rivers Sub Region has six macadamia processing plants, which process nuts from growing regions around Australia. These include MWT Foods and Swiss Gourmet in Alstonville Estate & Waliz Nuts, at Newrybar; Macadamias Direct at Dunoon; Marquis Macadamias at Alphadale, near Lismore; and Pacific Farm Services at Brooklet, near Bangalow.

Industry requirements

The industry relies on machinery and irrigation equipment suppliers, mechanics, freight and logistics industries, competent trades and rural supply stores.

The key inputs for the macadamia industry are:

- well drained, fertile, deep soils on slopes less than 15%
- a temperate frost-free climate without excessive temperatures and winds
- access to transport and processing industries
- access to workforce
- reliable water supply
- ability to expand operations including buffers with non-compatible land uses.

Broadacre crops - sugarcane

Sugarcane is worth over $2 billion to the Australian economy and is the second largest export crop following wheat. More than 96% of NSW's sugar production occurs in the Northern Rivers Sub Region on over 34,000ha predominantly located in the Tweed, Richmond and Clarence Valley LGAs (NSW Sugar 2020). Processing mills are located at Condong (Tweed LGA) and Broadwater and Harwood in Clarence Valley LGA. A sugar refinery is also located at Harwood. The industry is under increasing pressure from urban development and changing agricultural land uses.

Industry requirements

Sugarcane growing requires unconstrained, relatively flat, well drained land. Other requirements are:

- appropriate and maintained drainage infrastructure
- access to processing facilities
- transport links
- access to workforce
- ability to maintain critical mass and expand operations
- value adding opportunities for by products.

Dairy industry

The dairy industry in the region was established in 1870 and is characterised by family owned and operated farms producing milk for national and export markets. The industry produced $62m in GVP in 2015/16 which is 10.4% of NSW's dairy GVP for that year. The biophysical characteristics of the Northern Rivers Region are ideal for pasture-based dairying. The farmer-owned Norco dairy co-operative head office is based in Lismore along with Norco's ice-cream processing facility.

Value-add industries derived from dairy products such as artisan cheesemaking are also emerging, examples including Nimbin Valley Dairy (Lismore LGA); Tweed Valley Farmhouse Cheeses and Cheeses Love You (Tweed LGA).

The Northern Rivers Sub Region dairy industry however has experienced a fall in farm numbers following changes in farm gate prices. This has encouraged a shift to larger more intensive operations with greater economies of scale.

Industry requirements

Farmland in the region is also in demand for rural lifestyle development which is incompatible with dairying. The industry therefore needs policy support through land use planning to manage potential land use conflict from incompatible land uses.

Other key requirements include:

- access to supplementary feed, water and electricity supply
- access to workforce
- access to processors and export markets
- suitable road and bridge infrastructure and access to transport
- ability to increase scale and intensity of operations.

Poultry

Demand for poultry meat continues to grow across NSW (DPI, 2019) and there is pressure on farms to increase supply. Poultry farming in the Northern Rivers Sub Region was worth more than $57m in 2015/16 with the majority of farms located in the Richmond Valley, Lismore and Kyogle LGAs. While historically important to the Sub Region, the processing capacity for the poultry industry has recently changed. Processing was largely serviced by South East Queensland and a local processing facility located at West Byron. The West Byron facility closed in 2014 and supply contracts with Queensland based processors have expired and will not be renewed. This is largely as a result of structural changes to the Queensland industry and efficiency losses associated with the distances needed to travel to processing plants from the Sub Region's farms.

With the removal of broiler production opportunities in the region, remaining growers are considering opportunities for re-purposing their existing infrastructure and new ventures may emerge. Poultry value-add industries continue to operate in the region. Specialised Chicken, based in Murwillumbah, in the Tweed LGA are wholesale chicken specialists supplying businesses throughout Australia. Specialised Chicken manufacture fresh raw and value-added chicken and other meat products (Specialised Chicken 2020).

Nurseries/cut flowers/turf

The nursery industry is an important industry for the Northern Rivers Sub Region, worth $46.4m in GVP in 2015/16 when combined with cut flowers and turf. The category represents 15.5% of NSW GVP and nurseries alone represent more than a quarter of the State's production with $37.3m GVP. The industry is critical to the region's commercial horticultural industry as well as providing products for the domestic gardening and landscape industry.

Industry requirements

The nursery industry relies on many of the similar secondary industries as the other agricultural industries in the region being machinery and irrigation equipment suppliers, mechanics, freight and logistics industries, competent trades and rural supply stores. The industry also requires specialist potting mix suppliers and suppliers of pots and associated equipment, which are readily transportable and available

Northern Rivers Regional assets for agriculture

Supporting industries and infrastructure

Before agricultural produce makes it to market, there are inputs such as fertiliser, fuel, technical support services such as agronomists, vets and mechanics, processing facilities such as abattoirs, packing plants, cleaning facilities, transport access and infrastructure, etc. The unfettered access to infrastructure and supporting industries is critical to the ongoing production of food and fibre from agriculture. Some key secondary industries include abattoirs, tanneries, milk processors, mills and saleyards.

The Northern Rivers Region's agricultural industries have a comprehensive and diverse supply of support services and infrastructure in proximity. The interactions of these agricultural industries with their secondary industries is a critical consideration in planning for agricultural land uses.

Climate

The Bureau of Meteorology characterises the Northern Rivers Sub Region climate zone as sub-tropical with warm summers, cool winters and high rainfall, especially near the coast. Average rainfall on the coast is over 1,600mm and 800-1,200mm on the Great Dividing Range. This combined with biophysical assets such as water and soils, supports a diverse agricultural industry with regional specialisations in horticultural, milk, nursery and sugarcane production. It will be increasingly important to protect land and resources that support agriculture in the region to enable sustained production of specialised agriculture enterprises against the future risks of climate change.

Soils

The unique and inherent biophysical assets of the Northern Rivers Sub Region are well recognised. The development of the soil landscape in the Northern Rivers has been heavily influenced by the Mt Warning shield volcano producing rich volcanic soils that are highly productive and suitable for a wide variety of agricultural commodities. The landscape is also highly influenced by the major river systems that flow through the region associated with the Tweed, Richmond and Clarence rivers. Expansive alluvial floodplains dominate the lower reaches of these systems. These soils combined with the climate and rainfall assets of the region provide the ideal attributes for agricultural production of broadacre crops such as sugar cane and soya beans.

The need to protect the region's biophysical assets for current and future agricultural production has been a long-term initiative of the NSW Government. The Northern Rivers Farmland Protection Project 2005 identified those farmlands with the highest quality biophysical attributes for food production. This mapping was updated in 2020 to include an infill area west of Kyogle. Provisions are included within the planning system to protect this land from urban and rural residential encroachment.

Locational advantage

The proximity of the region to South East Queensland and local markets and processing centres provided by the M1 Pacific Motorway allows for specialisation in food manufacturing and production of highly perishable fresh products such as dairy and vegetables. Commuting infrastructure in the region enables access to a skilled workforce to service food manufacturing and agribusiness. Rising interest in Australian agriculture is linked to awareness of food production systems, reducing 'food miles' and buying locally, as well as demand for fresh (seasonality) and high nutritional quality of food consumed ('clean and green'). It is also recognised that agricultural land provides ecosystem services, food security and other benefits for urbanising communities that warrant its support and preservation through planning instruments, despite inherent difficulties with coexistence with urban sprawl (Brinkley, C, 2012). The Northern Rivers Sub Region has reciprocal advantages for producers providing these services with markets, export potential, access to supply chain and value adding.

Infrastructure

The Northern Rivers Sub Region lies at the crossroads of key transport links connecting NSW and Queensland. Its major road links are the Pacific Highway, Bruxner Highway and Summerland Way. The region is effectively positioned close to the Brisbane markets and Port of Brisbane and future travel time cuts from Pacific Highway upgrades will reduce transport times to Sydney markets. Ballina acts as the Region's main airport with daily services to Newcastle, Melbourne and Sydney. Lismore Airport provides services to Sydney and Grafton. While beyond the Region, the Gold Coast International Airport provides an important alternative for connections to domestic and overseas markets (NR REDS). The Port of Yamba is a key asset in the region and is currently used for agricultural exports, with potential to expand the capacity to other forms of agricultural produce. Freight infrastructure includes warehousing and logistics in the Northern Rivers region, servicing ports and air services in Ballina, Grafton and over the border in South East Queensland. This infrastructure and connections give the region a competitive advantage.

Entrepreneurialism

A report by the NBN in 2017 referenced an 'entrepreneurial energy and enterprise' across the Northern Rivers Sub Region. The report identified the region as one of the most progressive parts of Australia attracting progressive thinkers and entrepreneurs. There are many examples of innovation and entrepreneurialism within the agricultural, food and beverage sector throughout the region including in technological advances, food processing, distilleries etc. This is highly important for the region particularly given the high level of historical fragmentation of agricultural land and the need for farmers to diversify incomes to remain viable on smaller holdings.

Challenges for agriculture in the Northern Rivers Sub Region and planning solutions

Agricultural land is a finite resource, particularly in the Norther Rivers Sub Region where decades of fragmentation has adversely affected agriculture. This section highlights some of the challenges faced and planning solutions.

Historic land use planning

Historical planning policy has not strategically valued and protected rural land in peri-urban areas, instead regarding it as 'urban land in waiting' (Houston, 1993).The absence of dedicated planning policy for agriculture has resulted in Local Environmental Plans (LEPs) across the state, that do not support agriculture in practice. Agriculture has spatial, biophysical and production criteria that can be similar to industrial development, especially intensive industries. However, in LEPs industrial zones are located in dedicated areas with development controls managing incompatible development. In contrast, rural planning provisions often allow incompatible development and subdivision that affect farm amalgamations, expansion or intensification plans and ultimately restrict a farmer's ability to make a living.

This trend if it continues can mean that:

- over time less land will be available for agricultural production within close proximity to regional towns and cities such as Lismore, Grafton and Ballina
- the external impacts on the remaining agricultural activities will need more specialised management at the urban fringe
- some agricultural activity may be displaced and may leave the region altogether, as evidenced by the dairy and poultry industry moving from metropolitan regions to other regions.

Planning solution

Future land use planning must recognise the importance of agriculture to society and the economy and also that the land and resources on which agriculture depend need to be protected and managed to enable continued use of the land for agriculture. The above challenges can lead to the following adverse impacts for agriculture if they continue to occur:

- **Inflated land prices** prevent farm expansion as residential land values are in a different market to agricultural land values.
- **Differing expectations**: Complaints are made to authorities from neighbouring residents about legal farming activities such as traffic movements, dust, noise, odour etc., resulting in adjustments being required to operations.
- **Loss of critical mass**: Urban encroachment gradually results in the loss of farmland and supporting services (a critical mass required for commercial viability), requiring farmers to source further afield.
- **Uncertainty**: Land use conflict and the variable impacts on farming makes it difficult to plan for future investment in the industry. Pressures of encroaching development often result in farmers either selling land for non-rural uses or continuing to farm with the issue of land use conflict.

Statutory land use decision making

The time and cost involved in the development approval process can constrain the capacity of agriculture industries to quickly respond to market forces. Intensive agriculture land uses often require extensive site and impact assessments from specialist consultants and state agencies, while perceived environmental impacts on neighbouring properties can raise concerns in a community about the potential impact of intensive agricultural land use.

Planning solution

Clear development controls which specify requirements for intensive agricultural development, and non-agricultural developments near existing agricultural land uses, are integral to minimizing community concerns and avoiding unnecessary cost and delays. Consistent requirements for information to support development applications can also streamline the application process for proponents and assist consent authorities to manage community expectations. It is important for both the agricultural industry and the community that the development approval process results in well managed agricultural land uses in the right location to enable the continued use of the land for agricultural production for the benefit of the wider community.

Land use conflict

With a change in the social landscape of rural areas, conflict emerges from the presence of two different 'types' of rural residents, farmers and lifestylers, who cohabit within the rural zones for different reasons - production versus amenity (Askland et al 2019). Expansion of urban land uses and rural residential housing in rural areas creates potential for land use conflict with agricultural land uses. This in turn places pressure on producers to adjust their normal farming practices to minimise impacts which can increase costs and threaten viability.

Agricultural producers also need protection from the pressures that urbanisation brings to provide them with certainty and confidence to invest in new technologies to intensify their farming operations and ensure that their enterprises remain viable. There remains a shared responsibility across all levels of government, industry and the community to value the importance of agriculture in food and fibre production, to protect high quality agricultural lands from further fragmentation and encroachment of non-compatible land uses, and to ensure agricultural activities are lawful and adhere to best management practice.

Planning solution

Planning policy and controls which prevent land uses in rural areas that are incompatible with agriculture can minimise the potential for land use conflict. Planning controls which require adequate buffer distances between land uses can mitigate potential impacts from agricultural land uses.

Urban encroachment and competing land uses

High quality agricultural land in the Northern Rivers Sub Region is a finite resource and agricultural resources experience high spatial constraints. Agricultural production is already characterised by intensive and high value enterprises. The ongoing conversion of agricultural land to other non-agricultural land uses is creating major constraints to local food production. When additional land is not available for expansion of farming operations the only way to increase productivity is intensification of operations, a process which can increase the potential impacts of agriculture on surrounding non-agricultural land uses. Additionally, indirect limitations on the ability for agricultural land uses to expand to remain viable, reduces their ability to adapt to changing externalities such as climate change and both domestic and international market forces.

The land use zones that apply to the land on which agriculture occurs permit a wide range of other land uses. As population growth requires increased residential development there will be pressure to use rural land on the periphery of urban areas to accommodate residential development and other urban land uses. This competition for rural land on which agriculture can occur can lead to increased land prices and uncertainty for agricultural industries and investors. This competition for land often results in dislocation and transfer of agriculture to other areas, sometimes at great personal cost to producers and their industry.

Planning solution

Planning controls which limit the range of non-agricultural land uses that are permissible in zones applied to agricultural land can prevent the encroachment of urban land uses on agriculture. Clear and robust strategic planning policy and land use strategies are important to guide future urban growth to locations where it will not have adverse impacts on agriculture.

Land fragmentation

Rural zoned land for agriculture (Primary Production -RU1, Rural landscape - RU2 and Rural Small Holdings -RU4 zones) make up only approximately 58% of the Northern Rivers Sub Region. Rural land in the region is characterised by a highly fragmented land use pattern. Analysis of rural land in the Region found that:

- 30% is comprised of less than 5 hectares in size
- 30% is between 5 and 20 hectares
- 18% is between 20 and 40 hectares
- 16% is between 40 and 100 hectares
- 6% is greater than 100 hectares in size.

As noted, adverse impacts on agriculture can occur where there is a high degree of land fragmentation. Undersized rural lot sizes result in increased land prices as competition from non-agricultural land uses arise. Small rural lot sizes limit the ability of new agricultural enterprises to achieve required buffer distances or expand their operations. Expansion of agricultural operations in a fragmented rural landscape often means significant investment to purchase additional land. When additional land is not available for expansion producers usually increase productivity via intensification of operations, a process which can increase the potential impacts on nearby non-agricultural land uses or require significant investment to mitigate potential impacts.

Planning solution

Planning policy which sets an appropriate minimum lot size and prevents the further subdivision of rural land, except where there is a demonstrated agricultural need, can prevent the adverse impacts of land fragmentation.

Critical mass

All agricultural industries have a critical level of production which ensures the economic viability of the enterprise. Where secondary industries rely on a minimum volume of agricultural product to remain viable it is imperative for the industry in that region to maintain that critical mass for the benefit of all agricultural industries. This is important for the agricultural industries as well as the related supply chain, including ancillary services, infrastructure, markets, processing facilities and related industries. An example industry includes the critical mass of sugarcane production within the sub region that is required to supply the region's three sugar mills. This is under threat from rural residential and urban encroachment and an emerging threat from the conversion of sugar cane lands to macadamias and other agricultural commodities.

Planning solution

When land use planning decisions have the potential to affect one aspect of the agricultural supply chain it has the potential to threaten the entire industry in a region. Land use planning needs to recognise that it is not only agricultural land with excellent biophysical characteristics that needs to be retained for agricultural purposes, but also those key secondary supporting industries which may be located on lower quality agricultural land which are still potentially impacted by encroaching non-agricultural land uses.

Other challenges

Climate change

The NSW North Coast is regularly impacted by natural disasters, particularly storms and floods. It is therefore important to maintain critical mass across the region to enable continued supplies of specialised agricultural commodities in the event of localised natural disasters.

Severe fire weather is projected to increase in the region by 2030 mainly in summer and spring (NSW Office of Environment and Heritage, 2014). These changes will have implications for animal and plant agricultural systems, particularly temperature increases.

Biosecurity

Rural land in the region is exposed to pests and diseases that could threaten agriculture, the environment and community safety. Biosecurity hazards are managed by the NSW Government through North Coast Local Land Services. The combination of residential areas, greenfield sites and intensive agriculture results in serious pests such as foxes, wild dogs, pigs, deer, cats, rabbits and goats. Numerous pest plant species are already in the landscape and have a large impact on remnant vegetation and rural land.

The existing level of land fragmentation and resulting small lot sizes in the Northern Rivers Sub Region means it is more difficult for an agricultural producer to control the activities occurring within the necessary biosecurity buffer. Biosecurity resilience will depend on operational factors and this can result in increased costs (Agrology, 2018).

Social licence

A social license to operate refers to the perceptions of local stakeholders that an industry that operates in a given area or region is socially acceptable or legitimate.

It is important for agricultural industries to maintain a social licence for their operations. The agriculture industry's right to farm agricultural land and retain access to water needs to be balanced with responsible and ethical land and livestock management and adherence to best practice operations to minimise the potential for adverse environmental impacts. Producers can help to protect their social licence by open communication, education and positive contributions to their communities. Connecting with local markets and demonstrating low food miles and the importance of local food security can assist in maintaining a social licence for agriculture in a region. Further detail can be found in the NSW Government Right to Farm Policy.

Changing markets and economic conditions

Agriculture is vulnerable to changes in markets and economic conditions. Long lead times for crop production and the need for extensive capital and infrastructure investment to change commodity or farming systems means agricultural land uses are not capable of quickly adapting to changing markets and economic conditions. Due to the global market for agricultural produce, farmers in Australia are often price takers which can have significant adverse impacts on smaller operations.

Opportunities for agriculture in the Northern Rivers Sub Region and planning levers

Agriculture is beneficial for communities on many levels: providing ecosystem services, scenic values, open 'green space', value-adding including renewables and a range of benefits through reduced food miles, education, research and food provenance. It supports a supply chain that generates substantial productivity and employment across local, regional and national scales. Proximity to South East Queensland and coastal regions and connections via the Pacific Highway, airports, the Port of Yamba and the North Coast rail line place the region in a competitive advantage. This section identifies practical landuse planning approaches and opportunities for agriculture in the region and some planning considerations to help implement them.

Intensification

Productivity growth is central to the performance and international competitiveness of Australia's agricultural sector. Where the ability to expand operations onto additional land is not available, intensification of agricultural operations is essential to increasing productivity.

Most commercially viable agricultural operations in the region are intensive operations such as dairy and horticulture. Improvements in technology and reductions in capital costs mean that intensification is viable. Some intensive agricultural operations can more closely resemble manufacturing processes as they occur in expansive sheds where climatic conditions are controlled and impacts from noise and odour mitigated.

Intensive agricultural operations usually need to establish infrastructure such as sheds, greenhouses, netting or vehicle access which requires significant capital investment. To secure this capital and see a return on the investment, businesses need certainty that production will be unencumbered by land use planning changes for approximately 25 years.

Beef is the highest value agricultural product in the region, however horticultural production has the potential to increase, along with emerging industries such as native bush foods. Reversal of the decline of dairy is also possible, given the region's climatic suitability and history of production however, milk pricing and high input costs continue to be a constraint.

More intensive vegetable production is also feasible in the region. The highly intensive nature of these operations enables high revenue generation per given production area making them a viable option for limited (high value) land. If integration with onsite energy generation and a circular economy can be achieved they will become increasingly efficient and economically viable and have the potential for significant production increases (Agrology, 2018).

Planning levers to support intensification

a. Certainty in strategic planning policy and land use planning controls for intensive agricultural operations and neighbouring land can provide the appropriate investment environment for industry expansion.

b. Rural land use strategy development is key to understanding the needs of various agricultural industries and investigating opportunities and mechanisms to support intensive agricultural industries through LEP controls.

c. LEP zones and provisions should be applied over intensive agricultural precincts; with land use tables structured to permit intensive agriculture and related industries while prohibiting incompatible land uses such as residential accommodation, tourist and visitor accommodation, commercial, heavy industrial and recreational activities.

d. Minimum lot sizes should be large enough to limit fragmentation of agricultural land, incorporate industry requirements, enable expansion of existing agricultural industries and provide for adequate buffers to incompatible land uses.

Food security

The recognition of the importance of the need for fresh food to be available locally for the health of the community is a key opportunity for the region. The ability to produce fresh food locally reduces food miles, reduces the cost of the food thereby making it more available for more people and avoids the development of food 'deserts' (Dukes, 2019). There is a marketing opportunity for food producers to leverage the benefits of local food production to differentiate their product in the market. The population of South East Queensland is expected to grow by a further 60% by 2050, and the projected population increase for the Northern Rivers Region will increase demand for food and fibre. In combination these factors will lead to a higher value of agricultural production in peri-urban areas.

Planning levers to increase food security

a. Strategic planning for rural land must ensure productive land is identified and protective mechanisms provided through the planning framework to enable provision for expansion of farms for intensive production, food security and education purposes.

b. Councils should zone agricultural land for primary production and only permit agriculture and a narrow range of supporting land uses in that zone.

c. Some forms of horticulture may be a suitable permissible use in a range of zones, with opportunities for associated agri-tourism and roadside stalls.

d. Minimum lot sizes should be large enough to limit fragmentation of agricultural land, incorporate industry requirements, enable expansion of existing agricultural industries and provide for adequate buffers to incompatible land uses.

Non-Planning levers to increase food security

e. An education program will assist councils in delivery of planning mechanisms to protect agriculture.

Diversification and value-adding

Proximity to South East Queensland and biophysical assets of coastlines, hinterland, mountains, rainfall, volcanic soils and productive farming means that the Northern Rivers Sub Region is well positioned to capitalise on growing community interest in food provenance and agri-tourism.

Value-adding agricultural produce and farm gate sales provide the opportunity to increase or augment the income generated from agricultural production. The simplest example of these diversification approaches is a roadside stall to sell excess produce direct to the community while more elaborate processing facilities, such as cheese manufacturing will require significant capital investment and the development of new skills but have the potential to significantly improve the economic viability of agricultural operations.

Agri-tourism and food tourism have substantial economic impacts on local economies and provide one way to improve the incomes and potential economic viability of small farms and rural communities (Mason and O'Mahoney 2007). Farmers markets are also attracting regional visitors willing to pay premium prices for fresh, good quality local produce (Mason and O'Mahoney 2007) (see ABARES 2010).

There is a strong presence of farmers markets in the region. The regional farmers markets were considered a key enabler of agri-tourism in the Northern Rivers Sub Region. In addition to providing an outlet for farmers to sell produce, the farmers markets in the region were seen as an important marketing strategy for farm businesses in the region through the opportunity they provide for direct interaction with the consumer (ABARES 2010). These ancillary land uses should not compromise the agricultural production being undertaken on the land and agricultural production should be the primary land use. The region provides an opportunity to promote NSW's 'clean and green' production to the world through the high levels of tourism by the region.

Planning levers for diversification and value adding

a. Farmers markets ('markets' as defined by the Standard Instrument LEP) should be permissible and encouraged by councils in appropriate urban and open space zones.

b. Agri-tourism (farm stays, bed and breakfast accommodation) should be associated with and complement the continued agricultural production on the land.

c. Agri-tourism should be directed away from intensive agricultural operations or precincts.

Non-planning levers for diversification and value adding

d. Intensive agricultural production precincts and businesses may be used for education of the community and tourists around how food supply chains work.

e. Roadside stalls, artisan food and drink industries and cellar door premises all offer opportunities to promote NSW's clean green image to the international tourism market.

f. Farmers markets could prioritise locally grown or made produce to support local growers.

Peri-urban farming, amenity, promotion and education

The region is uniquely positioned to provide promotion and education opportunities for the broader agricultural industry. On a local scale agriculture in the region will provide further opportunity for education of communities on how their food is produced and the challenges facing farmers. This education is important for consumers who might not otherwise understand how their food is produced and the intricacies of the food production chain.

Urban farming is important in promoting the contribution of agriculture to the supply of fresh food, reducing food miles, providing an alternative supply of food and greening an area. Informal production systems such as community gardens, market gardens, orchards, bee keeping, edible streetscapes and verge gardens can be important contributors to food security and amenity and an important means of educating the community.

Planning levers for peri-urban farming

a. Urban land capable of small-scale agricultural production should be identified and facilitated through the planning framework. Suitable locations might include flood prone areas and open space networks.

b. Small scale information and education facilities should be a permissible land use on agricultural land to enable producers to educate the community on how food supply chains work.

Non-planning levers for peri-urban farming

c. Consider encouraging food bearing vegetation in landscape plans and open space networks.

Circular economies

A circular economy is one that exchanges the typical cycle of make, use, dispose in favour of maximising re-use and recycling. The longer materials and resources are in use, the more value is extracted from them. The circular economy concept is best, and most often, applied in relation to resource consumption and regeneration.

For the agricultural industry a circular economy presents possibilities for significant efficiencies and input cost reductions through energy generation and smart grid distribution; innovative off-grid energy solutions; recycled water use; and opportunities for renewables and waste solutions.

Planning levers to facilitate circular economies

a. Primary production zones should permit resource recovery facilities as a means of reusing waste products while also restricting incompatible uses to prevent rural land use conflict.

b. Minimum lot sizes should account for a potential increase in the need for land area requirements as farming trends towards circular economies. Reuse of effluent and other products on farm to vertically integrate farm inputs and outputs may result in additional and diversified production areas on farm. In the region an example might be the reuse of intensive livestock (beef or poultry) manure/litter as a fertiliser substrate for cropping or horticulture use.

Planning toolkit

Best practice land use planning for agriculture includes recognition of the industry as a significant contributor economically, environmentally and culturally, providing recognition and management through all levels of the planning framework. Dedicated land use zones, provisions and minimum lot sizes are available to Councils and can effectively support primary production even in contested areas. This section highlights the parts of the planning system to facilitate this.

Strategic planning

Local strategic planning statement

A local strategic planning statement (LSPS) identifies the vision and trends for agriculture in an LGA and sets out the direction for agricultural land uses for the next 20 years. It is important that agriculture, the land it depends upon and the infrastructure and other secondary industries which interact with agricultural land uses are considered at this initial strategic planning stage. The LSPS should explain the economic contribution that agriculture makes to the local economy and reflect the community's expectations for the provision of food and fibre locally. Further information can be found in the following DPI guideline Local Strategic Planning Statements – Agricultural Planning Advice for Councils.

Local rural land use strategy

The North Coast Regional Plan sets out the framework and expectations for preparation of local land use strategies in the Northern Rivers Sub Region. The agricultural component of a land use strategy should identify the agricultural industries in the LGA and the land on which they are located. This is also an effective tool in communicating to the community the scale and importance of agriculture in the LGA. It assists in identifying areas of agricultural land which should be protected from incompatible land uses.

A rural land use strategy will identify the linkages primary industries have with secondary industries, infrastructure and other components of the production chain to ensure a holistic picture of the agriculture-related industry. The strategy will clarify the relationship of rural land with residential development and specify the circumstances in which additional fragmentation and residential development may or may not be appropriate. The strategy will also assess the policy framework including existing LEP provisions and make recommendations to retire and/or remove redundant provisions concerning rural subdivision and residential development.

Local environmental plan (LEP)

A LEP allows councils to tailor planning controls to address the issues facing agricultural industries in their LGAs. A LEP is informed by the rural land use strategy. The following are mechanisms that can result in positive outcomes for agriculture:

Land use zones: The RU1 Primary Production or RU4 Primary Production Small Lots zones are the most appropriate zones to apply to land which is currently used for agriculture and/or is suited to future agricultural land uses. The RU2 Rural Landscape zones may contain lesser quality lands but are also an important feature for some agricultural industries.

Land use zone objectives and tables: The use of specific zones for agricultural land allows the zone objectives to be specific to agricultural land uses and require other permissible land uses to be compatible with agriculture.

Limiting Permissible Land Uses: LEPs can reduce the potential for land use conflict by restricting the range of permissible land uses where incompatible with agriculture. This is executed by careful construction of land use tables for RU1 Primary Production, RU2 Rural Landscape and RU4 Primary Production Small Lots zones. Councils should review the permissible land uses in rural zones applied to agricultural land or where agricultural industries are located to prevent inappropriate land uses and limit potential for land use conflict.

Minimum lot sizes: The minimum lot size specified in an LEP for rural land needs to be of a scale to prevent fragmentation into lots which cannot support typical agricultural land uses. Generally larger minimum lot sizes facilitate the establishment of larger and more appropriate buffer distance between potentially conflicting land uses. Larger lot sizes also enable expansion or diversification of the agricultural activities without the need to purchase additional land which can be an economically prohibitive option for farm expansion. While it can often be difficult to execute, the breaking of the nexus between minimum lot size and dwellings is a way to prevent new settlement on rural land, and a positive advance in promoting agriculture and preventing future rural land use conflict.

Development control plans and other approaches

Development control plans (DCP)

A DCP for rural zones should include practical guidance for agricultural land uses. A DCP can specify buffer distances to be applied to all land uses, both agricultural and non-agricultural, to ensure that new land uses do not increase the potential for land use conflict with existing neighbouring properties. Guidance on appropriate buffer distances is provided in the Department's Buffer Zones to Reduce Land Use Conflict with Agriculture - An Interim Guideline.

Novel approaches

In some cases, despite strong policy guidance and enforcement, Councils may encounter issues and forces that require both planning approaches and non-planning advocacy. For example, under the current legislative framework, Councils can:

- Set up a rural industry liaison committee to establish links between council and farmers and provide a forum for discussion of the issues facing agriculture in the LGA.
- Propose a highly contested area as a special planning precinct with planning provisions to protect from incompatible land uses

Industry can provide advocacy through active involvement in land use planning decision making and strategic planning to raise the profile of agriculture. The land use planning system is only one mechanism available to reduce the potential for land use conflict. Agricultural industries can decrease the potential for land use conflict by adopting industry best practice operations which at best eliminate or reduce the impact of their operations on neighbouring land owners. Similarly, clear communication with neighbouring properties and an education program targeting sensitive neighbours can help increase understanding of the reasons for some agricultural practices and prevent nuisance complaints.

References

ABARES 2018, Agricultural Commodities - June Quarter 2018, Department of Australian and Water Resources, Australian Government.

ARENA 2017, How a waste product from the sugar industry could soon power the trucks that carry it://arena.gov.au/blog/how-a-waste-product-from-the-sugar-industry-could-soon-power-the-trucks-that-carry-it/

Agrology 2019, Cost of Production analysis – Hightech Glasshouse Production in Australia December 2019 https://www.wcaa.sydney/agribusiness

Australian Banana Growers Council Inc. 2020, https://abgc.org.au/our-industry/

Australian Blueberry Growers Association (ABGA) n.d., Australian Blueberry Industry Strategic Investment Plan 2018-2022, ABGA, Lindendale NSW

Australian Macadamia Society 2020, https://www.australianmacadamias.org/industry/about/about-themacadamia- industry

Australian Trade and Investment Commission (Austrade) 2017, Investment Opportunities in Australian Agribusiness and Food, Australian Government.

Avocados Australia 2019, Facts at a Glance 2018/19 for the Australian Avocado Industry, Hort Innovation.

Avocados Australia 2020, https://avocado.org.au/

Brinkley, C, 2012, Evaluating the Benefits of Peri-Urban Agriculture, Journal of Planning Literature, 2012 Aug; 27(3):259–269.

Bureau of Meteorology, 2020, Climate Guide for North Coast, http://www.bom.gov.au/climate/climate-guides/guides/

Casino Hide Tanners (CHT) 2020, http://casinohidetanners.com.au/

Dairy Australia 2019a, https://www.dairyaustralia.com.au/industry/farm-facts/dairy-at-a-glance

Dairy Australia 2019b, https://www.dairy.com.au/our-industry-and-people/our-regions

Dairy Australia 2019c, https://www.dairyaustralia.com.au/industry/production-and-sales/production-summary

Dairy Australia 2019d, https://www.dairyaustralia.com.au/industry/farm-facts/cows-and-farms

Department of Primary Industries, Local Strategic Planning Statements, https://www.dpi.nsw.gov.au/data/assets/pdf_file/0005/849857/dpi-ag-advice-to-assist-councils-to-preparelocal-strategic-planning-statements.pdf

Department of Primary Industries (DPI) 2005, Macadamia Culture in NSW Primefact 5, DPI, NSW.

Dukes, S. 2019. Dinner Plans. A review of the role of city planning in maintaining food security. Unpublished thesis.

Fletcher, S. 2015, Strategic Plan for the Development of the Pork Industry within the Northern Rivers Region, Trade and Investment and Northern Co-operative Meat Company, NSW.

Future Directions, Localising food production: Urban Agriculture in Australia, 2015, http://www.futuredirections.org.au/publication/localising-food-production-urban-agriculture-inaustralia/

Goodall, A. (2018), Right to Farm- Agricultural Land Use Survey: Final Report, Institute for Public Policy and Governance, University of Technology Sydney, Sydney; prepared for the NSW Department of Primary Industries.

Meat and Livestock Australia (MLA) 2018, Fast Facts Australia's Beef Industry, MLA, Australia.

Norco 2018, https://www.norco.com.au/, Lismore NSW.

NSW Canegrowers 2016, The Burning Question, Why is Sugarcane in NSW Burnt Before it is Havested?, Sunshine Sugar and NSW Canegrowers, NSW.

NSW Office of Environment and Heritage (OEH) 2017, Horticulture mapping to improve biosecurity focus - Banana production in NSW, OEH, Sydney.

Pinnacle Agribusiness 2018, Banana Enterprise Performance Comparison, HIA

Regional Development Australia, Northern Rivers n.d., Blueberry Industry Business Barriers Review NSW Northern Rivers, RDA, Lismore NSW

Regional Development Australia (RDA) 2015, Northern Rivers Beef: Industry Snapshot, Northern Rivers RDA, Lismore.

Richmond River Historical Society, n.d. https://www.richhistory.org.au/lismore-history/district-history/dairying/, Lismore NSW.

Southern Cross University (SCU) 2019, Social License and Sustainability Transitions in the Northern Rivers Macadamia Industry, SCU Lismore, NSW.

Specialised Chicken 2020, https://specialisedchicken.com.au/Sunshine Sugar 2020,

Squires, R., Stillman, S., Whitehead, R. 2014, Flood Ready Cane Farming Strategic Plan for the North Coast Region of NSW, Department of Primary Industries, Wollongbar NSW.

State of New South Wales (Department of Primary Industries) 2006, Primefact 195 Blueberry Production in Northern NSW, NSW Government, NSW.

Stillman, S., Stow, W., Whitehead, R. 2014, Flood Ready Dairying Strategic Plan for the North Coast Region of NSW, NSW Department of Primary Industries, Wollongbar, NSW.

Sugar Australia 2018, https://www.sugaraustralia.com.au/

The Australian Macadamia Society (AMS) 2019, 2018 Year Book Australian Macadamias, AMS Lismore, NSW.

The Australian Macadamia Society (AMS) n.d., AMS Factsheet Northern Rivers, NSW, AMS Lismore, NSW.

Weinert, M. 2017, Final Report The NSW Banana Industry Development Officer, Horticulture Innovation Australia, Sydney.

Beef

The gross value of Australian cattle and calf production (including live cattle exports) in 2017/18 was $11.4 billion (ABARES 2018). Australia exports beef and veal to some 78 countries across the world and employs over 191,800 people (MLA 2018). The beef cattle industry is a major contributor to agricultural production in the Northern Rivers region. The gross value of production of cattle and calves for slaughter in the Northern Rivers Sub Region was $142m in 2015/16 accounting for 5.5% of NSW production (ABS). Beef is the most significant contributor to LGA agricultural production in the Clarence Valley at $52m and Kyogle at $36.5m. It also accounts for a significant percentage of agricultural production within the Richmond Valley and Tweed local government areas.

Meat processing commenced in the Sub Region in the early 1900's with an abattoir located at Byron Bay. In 1933 the Northern Cooperative Meat Company (NCMC) was established at Casino and remains a major international processing facility and employer within the region. Beef producers also supply to the JBS Dinmore meat processing facility in South East Queensland, the largest meat processing facility in the southern hemisphere (RDA 2015).

Distribution of beef producers by local government area

LGA	Gross Value of Production ($)	% share of NR beef	% share of NSW
Ballina (A)	$2.2m	1.60%	0.90%
Byron (A)	$3.9m	2.80%	0.20%
Clarence Valley (A)	$52m	36.70%	2.00%
Kyogle (A)	$36.6m	25.80%	1.40%
Lismore (C)	$16.1m	11.30%	0.60%
Richmond Valley (A)	$23.3m	16.40%	0.90%
Tweed (A)	$7.7m	5.40%	0.30%
Total	**$142m**		

Locational requirements

Beef production in the Northern Rivers is largely pasture-based. The beef industry is spread across the entire region. The region utilises both temperate and tropical breeds given the diverse range of pasture lands and climatic conditions.

The Northern Rivers provides ideal conditions for cattle production given the climate, high rainfall and access to both a local international processing facility (NCMC at Casino) and the JBS facility in South East Queensland. The region's proximity to markets including local saleyards at Casino, Grafton, Lismore and Murwillumbah are critical to the continued viability of the industry within the region.

Critical mass is crucial for the ongoing viability of the industry across the region and within NSW given variations in seasonal conditions across the state. The Northern Rivers and wider North Coast region provides a locational advantage within NSW given the high average rainfall for the area. The sub-region can generally maintain production when many other parts of the state are in drought and therefore provides an important breeding area for re-stockers.

Challenges

On a sub-regional level, the beef industry faces high price variability and input costs; land fragmentation and subsequent high land prices for rural land impacting the ability for farmers to consolidate and expand; increased land use conflict risk from residential encroachment; heightened animal welfare, environmental and biosecurity considerations; and viability issues on smaller holdings.

Given that beef production can occur on 'lesser' quality agricultural lands there is often an argument from proponents wishing to develop such land, that the land has 'no agricultural value' as it is 'only suitable for grazing'. This argument fails to recognise the importance of livestock industries to the economy and the impacts that the cumulative loss of this land can have to critical mass considerations and the ability of farms to expand to ensure operations remain viable.

Land prices

The changing use of agricultural land to residential, particularly rural lifestyle has increased property prices substantially in the Northern Rivers Sub Region. This makes is very difficult for new entrants into the industry to purchase land within the region or for existing producers to expand.

Land use conflict

New residents to rural areas can bring new ideals or perceptions of living in rural areas. A lack of understanding of agricultural practices can lead to complaints over noise (tractors, motorbikes, weaning of calves), dust, spray and straying cattle. There have been many disagreements over boundary fencing responsibilities in the region and domestic dog attacks of livestock have been increasing.

The industry is also under pressure from various environmental groups to prevent cattle from accessing waterways. While this has proven benefits for waterway health and farm production, the capital cost and on-going maintenance that are imposed on the land holder is substantially more than any grants or assistance on offer hence adoptions is low.

Flooding

The NSW North Coast is highly susceptible to flooding. It is important that grazing properties have a good balance of sloped country in association to alluvial flats to ensure adequate flood refuge is provided. While the fertile soils of the alluvial flats can produce quality pasture, flatter land can also be susceptible to frosts so access to hilly country can also ensure continued access to more palatable pastures during winter months.

This is an important land use planning consideration when considering rezoning applications. Often flood areas will be identified as residue agricultural lands given development constraints. It is important to ensure that appropriate flood refuge areas are provided for as part of the development concept plan to enable any livestock activities to be conducted on the remaining land.

Biosecurity

Noxious weeds are an ongoing challenge for rural landowners, particularly those in the beef industry as they are often the owners of large tracts of land that require ongoing management of weed species. The costs of weed control including product purchase and time, can be substantial and can impact on profitability. This is also a major challenge for producers on smaller holdings located in high lifestyle areas where these neighbouring landowners may be unaware of their biosecurity responsibilities or are 'weekenders' and often absentees.

Opportunities

Austrade identified the following opportunities for the Australian beef industry in 2017:

- developing integrated supply chains through joint ventures to supply growing export markets
- developing value-added meat exports based on grass-fed, organic and provenance attributes
- commercialising world-leading sensing and objective measurement technologies in processing to improve cost-competitiveness of supply chains (Austrade, 2017).

Fruit and nuts

Distribution of fruit and nut producers by local government area

LGA	Gross Value of Production ($)	% share of NR fruit and nuts	% share of NSW
Ballina (A)	$40.2m	42.30%	6.50%
Byron (A)	$1.8m	1.90%	0.30%
Clarence Valley (A)	$5.9m	6.20%	1.00%
Kyogle (A)	$5.5m	5.80%	0.90%
Lismore (C)	$36.5m	38.40%	5.90%
Tweed (A)	$4.4m	4.60%	0.70%
Total	**$95.1m**		

Macadamia nuts

Macadamia nuts are the fourth largest Australian horticultural export. There are more than 700 growers across three states, producing around 50,000 tonnes per year, with 70% of the crop exported to more than 40 countries. Key export markets are Japan, Korea, Taiwan, China, Europe and North America however the Australian domestic market is the highest consumer (AMS 2020). The farm gate value of the Australian macadamia industry is valued at $286.5m (2016), factory gate is $321m and retail value is estimated at $576m (AMS 2020).

Australia is the recognised global market leader of macadamia nut production with a reputation for its high-quality product and world's best production practices. Australian macadamia growers invest $2m per year in research and development (AMS 2020).

In 2016, the Northern Rivers Sub Region produced 19,250 tonnes in-shell. Based on this tonnage, the farm gate value was approximately $110m with a factory gate value of $128.5m and a retail value of $230m. More than three million trees are planted across 9,700ha in the area. Macadamias remain important to the local economy and there are 490 growers who produce an estimated 40% of total industry production (AMS n.d).

"While many farms are long established and still producing good annual returns, the expansion of the industry is limited in the hinterland areas. As a result, the industry has spread further south into the Clarence Valley, and a small number of growers are establishing plantations on the coastal floodplain" (AMS n.d).

Locational requirements

Macadamia is the most successful Australian native plant developed as a commercial food crop. The two major botanical varieties Macadamia tetraphylla and Macadamia integrifolia originate from coastal areas of northern NSW and south east Queensland respectively. Natural hybrids of the two species can be found near the NSW-QLD border (DPI 2005).

Macadamias will grow on a wide range of soils but perform best on well-drained soils, preferably 1-2m deep and high in organic matter. Although macadamias will grow on steep hill sides and rocky sites, slopes of 15% or less are preferred for commercial operations. Machinery operation, cultural and harvesting operations are difficult and costly on sloping sites (DPI 2005).

Macadamias grow well in a climate where there are distinct wet and dry seasons. Irrigation is essential in the early tree establishment phase. In low rainfall areas, particularly if evaporation rates are high, irrigation is needed during dry periods usually from October to March. Five megalitres per hectare is suggested, so access to permanent water is important (DPI 2005).

Buffers are an important part of a broader farm management plan aimed at managing potential off-farm impacts and compliance with all relevant regulations and industry standards. Buffers should also be part of broader strategic plan for a locality particularly where additional urban development is being planned. This will assist in reducing land use conflict risk.

Secondary industries

Production of macadamias involves a wide range of machinery and equipment. Typical farm operations include mowing or slashing between rows, application of fertiliser, application of pesticides to control pest and disease, and harvesting of the nut. Post-harvest operations include dehusking, nut sorting, nut storage and subsequent transport of nut to processors. It is important that orchards are located close to processing plants and transport routes. Six processors are located within the Northern Rivers Sub Region. The industry is reliant on a number of ancillary industries that are also utilised by other agricultural enterprises. The industries relate to machinery and irrigation equipment suppliers, mechanics, and rural supply stores.

Challenges

Loss of land access

Land loss to residential development is a significant challenge for the industry. The encroachment of urban and rural residential land into growing areas, particularly within the hinterland areas, is impacting on the industry's ability to maintain areas under production and to develop new areas. This has seen the industry start to expand onto floodplains. This presents its own set of challenges, including flood risk, soil acidity and drainage constraints, as well as potential cumulative impacts to the sugarcane industry as macadamia farms establish on lands traditionally under sugarcane.

Land prices

The changing use of agricultural land to residential, particularly rural lifestyle has increased property prices substantially in the Northern Rivers area. This makes cultivation very difficult for new entrants into the industry to purchase land within the region or for existing growers to expand.

Land use conflicts

The industry is particularly vulnerable to land use conflict risk. Urban and rural residential encroachment increases the potential for increased land use complaints as the competing land uses of commercial agricultural production and lifestyle amenity co-share the rural landscape. Agricultural practices such as pesticide spraying often fuel neighbourly land use complaints.

A report by Southern Cross University in 2019 identified that levels of community support for the industry vary depending on a range of factors including location, timing of activities, demographics and size of farm.

Opportunities

Export

Countries seeking high protein meat alternatives such as India provide opportunities for further export.

Floodplain development

Further research into macadamia production on floodplains is providing greater information on managing production issues and also identifying added environmental benefits to alternative land uses

Avocados

NSW contributes to 14% of Australia's avocado production (Avocados Australia 2019). The NSW Northern Rivers Sub Region contributes 24.3% of the state's gross value of avocado production at $8.7m. The industry is highly important to the local economies of Ballina and Kyogle LGA's and to a lesser extent Lismore, Tweed and Byron. "Hass is the main avocado variety, and is produced almost all year round. In 2018/19 Hass represented 81% of production. Shepard, which is harvested in Queensland through late Summer and Autumn, made up 16% of production, and at that time of year, is the dominant Australian variety on the market" (Avocados Australia 2019).

Trends

"Australia produced just over 85,546 tonnes of avocados in 2018/19, which was 11% more than the previous year. Australian production is forecast to increase strongly over the next few years, with at least 115,000 tonnes per annum expected to be produced by 2025" (Avocados Australia 2019).

Locational requirements

Avocados require a rich, deep, free draining soil. Plants are susceptible to frost and wind and will become water stressed in dry times hence supplementary irrigation will be required. Soil mounding can be used to improve soil depth and drainage. "Most avocados are sold to wholesale markets in the capital cities, however some larger growers sell directly to major supermarkets or alternatively sell to packers or agents who consolidate produce from a number of growers to ensure consistent supply to a supermarket. Smaller growers may sell at farmers markets or at roadside stalls" (Avocados Australia 2019).

Secondary industries

The industry is reliant on a number of ancillary industries. Nurseries are important to the supply of trees for growers. Other industries that provide support to or are supported by the avocado industry relate to machinery and irrigation equipment suppliers, mechanics, research and development organisations, and rural supply stores.

Challenges

Labour

Avocados are labour intensive given the need for manual harvesting and tree maintenance. Access to labour can be a challenge for growers.

Climate change risk

Avocados are highly susceptible to wind damage and hail hence storms can have a devastating impact to farms. Maintaining critical mass across growing regions is therefore important to mitigating the risk.

Opportunities

Local provenance and supply

For some growers, marketing and distributing their product locally can reduce input costs and inequities associated with multi-national retailers. With an increasing focus on buying locally and knowing the provenance behind the food, opportunities exist for growers to consider local markets.

Export

Increased investment in air freight will further support export opportunities to Asia.

Blueberries

NSW accounts for more than 90% of Australia's blueberry production with over 80% of NSW production occurring within the North Coast Region. Blueberry production in the NSW North Coast has increased significantly over the past decade. This growth has been driven by domestic consumer demand for fresh blueberries, new varieties, technical advances and opportunities for export markets. Plantings have expanded to new areas to take advantage of a late and early season picking with the aim of increasing supply to year-round.

Large farms have been established in Clarence Valley and Kyogle LGAs and smaller farms within the Richmond Valley and in Alstonville/Brooklet areas further north. In 2015/16, the blueberry industry in the Northern Rivers sub-region generated $6.3m GVP (ABS 2015-16).

Trends

Blueberry production increased substantially between 2014 and 2018 from 5,500 tonne in 2014 to 17,000 tonnes in the financial year ending June 2018. The number of new plantings of blueberries within the NSW North Coast has reduced in the last 12-18 months. The Australian domestic demand may not grow substantially beyond its current performance and this will affect the viability of some marginal producers. Berry variety and farm management will play a dominant role in determining the success of blueberry growing in the future. Potential for weakening returns over time and price fluctuations may occur, especially for smaller growers as supply increases and the domestic market saturates (RDA n.d.).

Locational requirements

Blueberries prefer a deep, well-drained acidic soil, high in organic matter. Blueberries will grow on a variety of soils however acidity and drainage are important factors. For this reason, blueberries are generally grown on mounds or in pots where these factors can be controlled. Planting on gentle slopes with a north to north-easterly aspect is preferable to enable access to more sunlight hours, support drainage requirements and reduce frost potential.

Growers have increasingly moved to protective tunnels or netting to protect blueberry crops from adverse weather conditions and birds, while simultaneously, allowing for improved productivity and consistency of fruit quality. Visual amenity impacts related to these structures has caused significant tensions between growers and other residents in and around peri-urban areas which provides locational advantages to areas further away from urban and rural-residential properties.

Secondary industries

The largest blueberry farm in the Clarence Valley has over 100ha of land under production. It was previously owned by Golden Eagle, a Canadian company that also acquired the old Grafton abattoir site given its cold storage capability (RDA n.d.). Mountain Blue is the largest blueberry farm in the Kyogle Shire with 150ha of blueberry production. The farm is supported by its own packing shed in Tabulam which also packages blueberries for another grower at Fairy Hill, near Casino. There is also a packhouse at Brooklet within Ballina Shire.

The blueberry industry is reliant on a number of ancillary industries that are also utilised by other agricultural enterprises. The industries relate to machinery and irrigation equipment suppliers, mechanics, and rural supply stores.

Challenges

Land use planning challenges associated with the industry relate predominantly to land use conflict (industry environmental practices and community education around lawful agricultural practices), appropriate siting of blueberry farms, encroachment of urban and rural residential development, seasonal worker accommodation, water availability and security, adequate infrastructure and telecommunications, and biosecurity.

Labour

Blueberries are a manually picked fruit that requires a large workforce throughout the growing season. This is particularly important for the establishment of larger farms. In some cases, when a new farm comes into production this can mean there is a need to accommodate 600 to 700 workers from the start of the first harvest (RDA n.d.).

Water security

Given the water requirements for blueberries, water security and reliability can be a problem particular with uncertainty around licensing and competition for water from other industries. It is important that water use and water quality considerations are taken into account when planning for a blueberry operation.

Road infrastructure

Overall the industry is well served in the region for major arterial roads through the continued upgrades to the Pacific Highway and the new Clarence River Bridge at Grafton (when completed). Infrastructure that is closer to actual growing properties however requires further consideration, e.g. the need to consider load capacities for bridge replacements and rural road upgrades (RDA n.d.).

Communication infrastructure

The lack of good communication services (landlines, mobile and good quality internet) is a major impediment to business.

Biosecurity

Maintaining Australia's biosecurity defences is critical to the long-term prosperity of the blueberry industry. Spotted winged drosophila is a serious pest because it attacks healthy ripening fruit as well as damaged or split fruit. This pest is found around the world and in most of the blueberry industry competitor growing regions. An incursion of this pest would be catastrophic to a large part of Australian horticulture (DPI 2006).

Opportunities

The Australian Blueberry Growers Association (ABGA) identified the following opportunities within the industry's strategic plan 2018-22:

- increase in supply provides capacity to meet demand in counter seasonal export markets
- growing recognition by consumers of the positive health attributes of blueberries
- consumer demand for consistent quality fruit, including look, colour and taste
- move towards integrated pest management and reduced inputs for production
- availability of technology to improve productivity at all stages of value chain
- increasing consumer demand for safe, clean food
- establishment of a stronger national representation and communication

Regional Development Australia (RDA) in their report 'Blueberry Industry Business Barriers Review NSW Northern Rivers' indicated that growing areas to the north of the (NSW North Coast) region in the Clarence Valley and around Tabulam should be encouraged as they are likely to be located away from populated areas thereby avoiding many of the issues confronting landlocked orchards such as those in the Woolgoolga area to the south.

Bananas

The Northern Rivers Sub Region contributed $2.7m GVP to the economy in 2015/16 and 42.8% of NSW's banana production through its growing areas in the Tweed and Brunswick valleys, Lismore and Ballina (ABS). A land use mapping project in 2017, identified 507 banana plots across 344 properties and 1,453ha within NSW. 207 properties were identified within the Northern Rivers covering 102.5ha (OEH 2017).

In addition to the areas currently growing bananas in NSW (based on the best available information), OEH has identified an additional 162 areas, where it is likely that bananas were grown on commercial scale since 2000 (OEH 2017).

The majority of growers in the Northern Rivers sell bananas locally through roadside stalls and farmers' markets rather than through the central markets, however several local ripeners/ distributors sell fruit to supermarket chains in the Ballina/ Lismore and Tweed districts. Fruit is also sold into the central markets in Brisbane and Sydney (Weinert, M. 2017).

Trends

Difficult seasonal conditions and low returns have impacted the banana industry in the Northern Rivers in recent years. Costs of production and lack of competitiveness with North Queensland continues to see more growers leave the industry each year. However there is a new generation of growers entering the market in the region keen to establish new varieties and take advantage of the unique opportunities that the Northern Rivers presents.

Locational requirements

Bananas grow best in fertile soils, frost-free sites, sheltered from strong winds with safe all weather access, erosion control and drainage. Growth is very limited below 13°C and chlorophyll is damaged below 6°C.

The ideal range for soil pH is 5.5 to 6.5. The soil should also be of reasonable depth to allow development of strong root systems. Bananas grow much more consistently if they are not water stressed (Weinert, M. 2017).

Secondary industries

The industry is reliant on a number of ancillary industries. The industries relate to machinery and irrigation equipment suppliers, mechanics, and rural supply stores.

Challenges

Biosecurity

In a 2017 survey undertaken by NSW DPI for HIA funded project, Banana weevil borer was identified as the major constraint to NSW banana production. 25% infestation from weevils can impact yield by 30% (Weinert, M. 2017). Avoiding the introduction of Panama disease (caused by the fungus Fusarium oxysporum f. sp. *cubense*) is important to all banana growers.

Climate change

Weather events such as east coast lows, hail storms, severe winds and drought can pose a significant challenge for growers in the region. Learnings from preparedness and recovery efforts in north Queensland could assist the NSW industry. Growers with access to irrigation supplies could also value from resources and training to optimise their systems (Weinert, M 2017).

Input costs

The industry is subject to high input costs including fertilisers and herbicides which can impact on profits.

Opportunities

NSW bananas are well known for their excellent taste and eating qualities and are sought after by certain market sectors, especially high quality, excellent tasting Lady Fingers.

Niche marketing opportunities, renewed interest by the chain stores in sourcing local fruit for a growing population along the NSW north coast and a core of young progressive growers in the industry provide a sound basis for the industry's future (Weinert 2017).

Broadacre cropping sugarcane

Australians consumes one million tonnes of raw sugar each year. The Australian sugar industry is worth over $2 billion to the Australian economy and is the second largest export crop (trailing only wheat). Sugar is a global commodity and highly competitive market. Australia exports almost 85% of its raw sugar, making it the second largest exporter in the world. The Australian sugar industry generates more than 40,000 direct and in-direct jobs (Sugar Australia 2018).

The GVP of sugarcane production in the Northern Rivers Sub Region in 2015/16 was $71.9m. Sunshine Sugar operate the three sugar mills in the region and is the retail brand for the NSW sugar industry. It is 100% Australian owned. Sunshine Sugar employs over 600 direct and 500 indirect staff and have a grower base of over 500 farmers (Sunshine Sugar 2020).

Sugar cane in the Northern Rivers Sub Region is primarily grown in a two year cycle due to the sub-tropical climate and environmental conditions. Between 65-70% of tonnage harvested is two-year cane. Typically Condong farmers will harvest 67% of their farm each year, with Broadwater and Harwood Farmers harvesting around 50-55% of their farm annually. The main planting months are August – September (Condong) and September – October (Broadwater and Harwood). Harvesting occurs from mid-June to late November or early December (Squires, Stillman & Whitehead 2014).

Distribution of broadacre crop (sugarcane) producers by local government area

LGA	Gross Value of Production ($)	% share of NR broadacre cropping	% share of NSW
Ballina (A)	$6.4m	8.90%	8.60%
Clarence Valley (A)	$37.3m	51.90%	50.10%
Lismore (C)	$5.5m	7.70%	7.50%
Richmond Valley (A)	$8.7m	12.10%	11.70%
Tweed (A)	$13.0m	18.10%	17.50%
Total	**$71.9m**		

Trends

Sugar Prices are impacted by the importing of international sugar. Weather is also a big factor on determining crop size and quality. Some cane lands are being lost to other industries, e.g. macadamias, and to residential land. The cumulative impact of the loss of this land on the critical mass for the industry is an important consideration for the ongoing viability of the industry.

Locational requirements

The Northern Rivers is well suited for sugarcane production. Sugar cane prefers a tropical or sub-tropical climate, well-drained soils (with a water-table usually kept at least 0.6m below the soil surface) and relatively flat land. Much of the cane land in NSW is low lying and often close to high tide level, Considerable drainage infrastructure exists in cane growing areas throughout the region to assist with the drainage of these areas.

Secondary industries

The industry is supported by the three sugar mills, a refinery and co-generation plants. Sugarcane is a very versatile commodity. Sunshine sugar sells raw and refined sugar to over 300 customers nationally across all types of manufacturing (Sunshine Sugar 2020). Lots of alternative products can be made including refined sugar, molasses, cane juice, alcohol, mulch and wastewater treatment. Other industries that support or are supported by the sugar industry include manufacturing, transport, harvest contractors, farm machinery suppliers and mechanics, fertiliser suppliers, distilleries, rural stores and agronomists. Soy bean, rice and corn crops are also grown as a fallow crop between plantings.

Challenges

Loss of agricultural land

Traditional cane lands are under increasing pressure from urban and rural-residential development both from loss of land and the impacts of encroaching development, e.g. changed hydrological flow patterns affecting the duration crops are submerged during floods, and increased land use complaints. Other agricultural industries, e.g. macadamia, are also establishing on the floodplain with some growers removing cane crops to plant macadamia trees or other alternatives. The cumulative loss of this land impacts the critical mass required to support the supplies to the sugar mill.

Weather events

Cane crops are highly susceptible to weather events, particularly floods. Long periods of inundation can impact cane production. Three consecutive rainfall events in 2013 caused extensive flooding across the cane growing areas. Regional damage to the cane industry was reported as approximately $69m (Poel 2014).

Cane burning

Many growers in the region undertake cane burning to reduce leaf prior to harvest. This can lead to complaints relating to smoke and ash during these times. Sugar cane burning is a legal farming practice in New South Wales when undertaken in accordance with the *Rural Fires Act 1997* and *Environmental Planning and Assessment Act 1979*. Whilst green harvesting is common practice in Queensland, fewer growers undertake green harvesting in New South Wales due to the different environmental conditions (NSW Canegrowers 2016). Growers that do green harvest will remove and bale the trash as a secondary income however there is a limited market for this product. Research is being undertaken into alternative uses for the trash (NSW Canegrowers 2016).

Opportunities

Brand recognition

As the only 100% Australian owned and grown producer of raw and refined sugar, there is an opportunity for greater brand recognition for the industry in the region.

Diversification/innovation

Given the versatility of sugarcane, the industry has considerable opportunity for innovation and diversification. Examples include low GI sugar, distilleries and renewable energy. The industry continues to investigate alternative uses for cane trash and to maximise returns on everything produced. The industry has the advantage of relatively short distances from farm to mill, which makes biogas a possibility to replace diesel in the haul trucks. Opportunities exist across all of the process streams including cane, trash, fibre, juices and syrups both in milling and refining (ARENA 2017).

Dairy

Dairying is Australia's fourth largest rural industry. National farm gate production was worth $4.4 billion in 2017-18 with 8,795 million litres produced. The dairy industry employs 46,200 people nationally and exports 35% of product to Asian markets including greater China, Japan, Singapore, Malaysia and Indonesia (Dairy Australia 2019a). Dairy production in NSW accounted for approximately 9% of national milk production in 2016/17 with around 794 million litres of milk produced.

The gross value of milk production in the Northern Rivers Sub Region in 2015/16 was $61.9 million or 10.4% of NSW's annual production (ABS). Together with the Mid North Coast, the region is the second largest milk producing region in the State. The average dairy farm size in the region is 193 head (Dairy Australia 2019b).The first dairy operation in the Northern Rivers is credited to have been established in 1870 at a property at Fairy Hill, near Kyogle (Richmond River Historical Society, n.d.). The Northern Rivers dairy industry is characterised by family-owned and operated dairy farms producing milk year round for the domestic fresh milk market and an increasing export market to Asian countries.

The 100% farmer owned dairy-cooperative, Norco, is based in the Northern Rivers with an annual milk production of 195 million litres in 2019. There are 214 dairy farms in northern New South Wales and South East Queensland supplying milk through Norco and the cooperative turned over $603m in 2019 and employed 834 staff (Norco 2020).

Distribution of dairy producers by local government area

LGA	Gross Value of Production ($)	% share of NR dairy	% share of NSW
Ballina	$0.4m	0.57%	0.06%
Byron	$4.0m	6.48%	0.68%
Clarence Valley	$11.9m	19.23%	2.01%
Kyogle	$17.5m	28.20%	2.94%
Lismore	$15.9m	25.59%	2.67%
Richmond Valley	$8.8m	14.13%	1.47%
Tweed	$3.6m	5.80%	0.60%
Total	**$62m**		**10.44%**

Trends

"Since 1979/80 the number of dairy farms in Australia has fallen by almost three quarters, to 5,213 in 2018/19. The trend in farm numbers has previously followed changes in farmgate milk prices from season to season. Strong prices tend to either slow the rate of attrition or even reverse the long-term trend.

At times of low farmgate milk prices, farmers choose to leave the industry or else cease dairying operations in favour of other farming activities, such as beef cattle farming. Other factors, such as challenging seasonal conditions also affect exits from the industry. This was evident in 2018/19 following a challenging year on farm.

Changing business practices have encouraged a shift to larger, more intensive operating systems with greater economies of scale. While the number of farms across Australia has decreased, the average herd size is growing. In 1985 the average herd size was 93 cows and in 2018/19 it had grown to 276. There is also an emerging trend of large farm operations of more than 1,000 dairy cattle " (Dairy Australia 2019d).

These national trends are also representative for the Northern Rivers. Around 48% of manufactured product (in milk equivalent terms) was exported and the remaining 52% sold on the Australian market in 2018/19. This contrasts with drinking milk, where most was consumed in the domestic market.

Cheese is consistently the major product stream, accounting for 38% of Australia's milk production. Recent increases in cheese production capacity suggest that this will become the case even more so in the future. Drinking milk and skim milk powder/butter production were the two next largest users of milk, accounting for 28% and 21% of Australian milk (Dairy Australia 2019c).

Locational requirements

The climate and biophysical characteristics of the Northern Rivers Sub Region are ideal for dairying and allow the industry to be predominantly pasture-based. Most farms are in coastal areas where pasture growth is generally reliant on rainfall. 'Dairy production is commonly based on grazing of tropical grasses to provide feed over summer-autumn with temperate grasses re-sown annually to provide feed for winter-spring. Conserved fodder and purchased feeds are used to fill seasonal feed gaps and to support herds in times of flood (Stillman, Stow & Whitehead 2014).

The 2019 Dairy Australia National Dairy Farmer Survey showed that nearly all dairy farmers engaged in some level of supplementary feeding. In 2018/19 the national average was around 1.6 tonnes per cow per year. (Dairy Australia 2019d). Access to supplementary feed supplies is therefore highly important to the industry.

The Northern Rivers has a relatively high rainfall however access to irrigation water and water allocations are important during dry times.

Challenges

The trends in milk production in the Northern Rivers Sub Region indicate that fragmentation of rural land, small lot sizes, the difficulty in expanding farm operations to increase productivity and labour costs for smaller farms are the predominant challenges for the dairy industry. This is because land suited for the dairy industry is also well suited to a range of other enterprises and is or could be potentially used for other agricultural purposes such as beef cattle or horses.

Statewide dairy industry pressures include:

- the increasing cost of fuel and power (affecting irrigation and transport cost, milking operations and feed costs)
- high capital costs to enter the industry due to the infrastructure required and cost of building a quality herd
- the rationalisation of milk processing capacity and the lack of processing capacity for surplus milk
- supermarket pricing policies that restrict market access and farm milk prices urban and rural residential (lifestyle) developments that inflate the price of suitable dairy lands and increase the risk of land use conflicts.

Pork

The pork industry contributed more than $5.2 billion to Australia's GVP in 2015/16. The pork industry supports more than 36,000 full-time equivalent jobs across Australia. The GVP for the pork industry in the Northern Rivers Sub Region was $9m in 2015/16. The majority of pork produced within the region is processed through the Booyong abattoir. Located in Byron LGA, the processing facility specialises in the manufacture and distribution of quality pork and value added pork products to local and global markets. It is an export accredited processing facility.

Distribution of pork producers by local government area

LGA	Gross Value of Production ($)	% share of NR pork	% share of NSW
Kyogle (A)	$2.8m	31.60%	1.30%
Lismore (C)	$1.2m	13.80%	0.60%
Richmond Valley (A)	$4.3m	47.70%	2%
Total	**$9m**		

Trends

The industry has faced decline over the last decade due to a number of factors including increased costs of production, domestic and international competition, and changes in environmental assessment and licence requirements (Fletcher, S. 2015).

There has been a considerable decline in the number of pork producers, identifying the trend for closure of smaller piggeries and replacement with large-scale commercial operations.

This trend has occurred within the NSW Northern Rivers region with a reduction in the number of small family-run operations, often those in conjunction with other agricultural activities such as dairying.

Locational requirements

With good management and site selection pork production growth remains an opportunity for the Northern Rivers Sub Region region given the accredited export processing facility, close proximity to domestic markets including within the region and south-east Queensland/Brisbane; water availability, transport links and availability of labour.

The region also has locational advantages with:

- recognition of the region for its 'clean and green' image with respect to local produce
- successful product marketing campaigns for other local producers such as macadamias, and regional campaigns such as Northern Rivers Food and Northern Rivers Food Links
- a number of local growers and value adders have established successful product markets at premium prices (Fletcher, S 2015).

Secondary Industries

The main source of food for pigs is cereal grains such as wheat, barley and sorghum. The industry relies on these grain inputs sourced predominantly from North Western NSW and South East Queensland and some from within the region. The pork industry also supports processing facilities, butchers, restaurants, supermarkets and producers of niche pork products such as Bangalow Sweet Pork based in Byron LGA.

Challenges

The Northern Rivers region has a number of environmental issues, which can present challenges for pork producers. In particular, the high rainfall, relatively warm conditions with high humidity, the sloping topography and drainage networks upon many of the farms combine to create the potential for environmental degradation, particularly water degradation. Growers manage this by maintaining good standards of environmental care with respect to the various farm practices in particular effluent management, treatment and irrigation.

Vegetables

Vegetable production occurs throughout the Northern Rivers Sub Region, generally on the more fertile soils and where adequate water is available. The majority of vegetable production occurs in the Tweed LGA. The Cudgen Plateau within the Tweed LGA produces around 30% of Australia's sweet potatoes as a fresh market product (Dennien, S. QDAF pers comm 2019). The plateau is identified as state significant farmland and includes some of the state's most versatile soils with regard to agricultural production.

There is a continuing trend in the Australian vegetable industry towards fewer, larger farms. With these larger farms able to benefit from economies of scale and re-invest their larger profits (in dollar terms) into land, machinery and other working capital, they are able to continue expanding their operations to service an increasing market (Ausveg 2020). However within the Northern Rivers there is an increasing number of landowners on smaller farms growing vegetables, particularly targeting the local organic market at premium prices. Consumers in the region are highly motivated to purchase product that is considered to have been grown sustainably and with minimal travel miles. Therefore many of the smaller farms supply local farmers markets and independent supermarkets and retailers. Roadside stalls also frequent the region.

Distribution of vegetable production by local government area

LGA	Gross Value of Production ($)	% share of NR vegetables	% share of NSW
Ballina (A)	$1.2m	10.50%	0.30%
Clarence Valley (A)	$1.4m	12.10%	0.30%
Lismore (C)	$1.5m	12.70%	0.40%
Tweed (A)	$7.1m	60.80%	1.70%
Total	**$11.7m**		

Trends

The number of Australian vegetable farms fluctuates considerably from year to year, with many farms growing vegetables when prices or seasonal conditions make it a profitable enterprise, and switching to other crops in other years. In 2016/17, the change was also attributable to a drop in the number of smaller farms (those planting less than 20 hectares).

Secondary Industries

The vegetable industry, both the protected cropping and inground variants, are reliant on a number of ancillary industries. The industries require packing facilities, machinery and irrigation equipment suppliers, mechanics, freight – logistics, competent trades, agronomy or extension services and rural supply stores.

Challenges

Urbanisation

The industry is facing increasing pressures of urbanisation and rural residential developments.

Opportunities

Agri-tourism

There a number of opportunities for niche enterprises such as organic farming, agri-tourism, farmers' markets, or farm trails. The location benefits from close proximity to South East Queensland where residents from these areas can visit for the rural atmosphere.

Food security

Current global activities has highlighted the importance of food security and alternative markets for supplying fresh food into homes. Fruit and vegetable box delivery is an increasing market opportunity for growers in the region.

Nurseries, cut flowers and turf

The nursery industry is an important industry for the Northern Rivers worth $46.4 million in GVP in 2015/16 when combined with cut flowers and turf. The category represents 15.5% of NSW GVP and nurseries alone represent over a quarter of the State's production with $37.3 million GVP. The industry is critical to the region's commercial horticultural industry as well as providing products for the domestic gardening and landscape industry.

Distribution of nursery, cut flower and turf growers by local government area

LGA	Gross Value of Production ($)	% share of NR nurseries, cut flowers and turf	% share of NSW
Ballina (A)	$23m	49.40%	7.70%
Byron (A)	$9.3m	20.00%	3.10%
Clarence Valley (A)	$3.7m	8.00%	1.20%
Kyogle (A)	$1.5m	3.30%	0.50%
Lismore (C)	$3.6m	7.80%	1.20%
Richmond Valley (A)			
Tweed (A)	$4.5m	9.60%	1.50%
Total	**$46.5m**		

Trends

Protected cropping

Intensification of production through protected cropping is considered to be the future of production as it allows for greater control of growing conditions, minimises use of chemicals and allows for higher yields from a small area of land.

Technology

As with most industries today the nursery industry is adopting new technology to improve efficiency and quality of production. As the cost of this technology decreases and productivity improves it is expected there will be an improvement in the economic viability of these nursery operations.

Indoor nurseries

Outdoor production is being replaced by indoor production systems due to efficiencies in water use, quality control and better yields.

Secondary industries

The nursery industry in the Northern Rivers Sub Region relies on many of the similar secondary industries as the other agricultural industries in the region. The industries does however require specialist potting mix suppliers and a supplier of pots and associated equipment.

Challenges

Increased urbanisation

Increased urbanisation and rural residential developments have resulted in an increase in the price of rural land which is an impediment to new entrants to the nursery industry or the expansion of existing operations. Urban encroachment and use of rural land for rural residential purposes also generates increased potential for land use conflict between horticultural operations sensitive land uses such as residential and tourism land uses.

Land use conflict

One of the major threats to the continued operation of nursery enterprises in the Northern Rivers region is land use conflict arising from increased urban encroachment. There are a number of case studies relating to this with complaints often leading to increased consent conditions for nursery operators.

Skilled labour force

Participants of the nursery industry consider the sector to be an attractive industry due to the conditions, pay and ease of access, however they have identified also the lack of skilled and willing labour is a challenge to the nursery industry.

Water availability

Water availability is critical to the nursery industry. As climate change impacts rainfall patterns increased dry periods will place pressure on operations. The ability for operators to maximise water rights may affect the viability of some nursery operations. These impacts may be somewhat offset by the trend towards protected cropping and indoor nurseries where management of water supply is easier.

Opportunities

Protected cropping

There is potential to improve production using protected cropping methods. Investment into protected cropping infrastructure enables more efficient water use, better management of pests and diseases and the advantage of being able to grow products out of season.

A reliable water supply, telecommunications and good electricity and gas supplies provide suitable requirements as protected cropping enterprises are not dependent on soil fertility. Sites which are relatively flat and cleared are preferred for glasshouse construction to avoid the need for expensive clearing and landform modification.

Associated industries

There are a number of emerging industries such as specialist plant breeding enterprises which specialise in propagation, that could improve efficiency and may increase the value of the nursery industry in the region.

Acknowledgments:

Information for this profile was sourced from publicly available statistical and spatial data. This is supported by industry intelligence from NSW DPI staff and industry reports. Compiled by the NSW DPI Agricultural Landuse Planning Team. Special acknowledgement to Elton Consulting for editing and Epiphany-PR for graphic design. The Snapshot will be reviewed once updated ABS data on an LGA level is publicly available.

NSW GOVERNMENT Department of Primary Industries

For further information please contact us via email: landuse.ag@dpi.nsw.gov.au or visit our website: www.dpi.nsw.gov.au/agriculture/lup