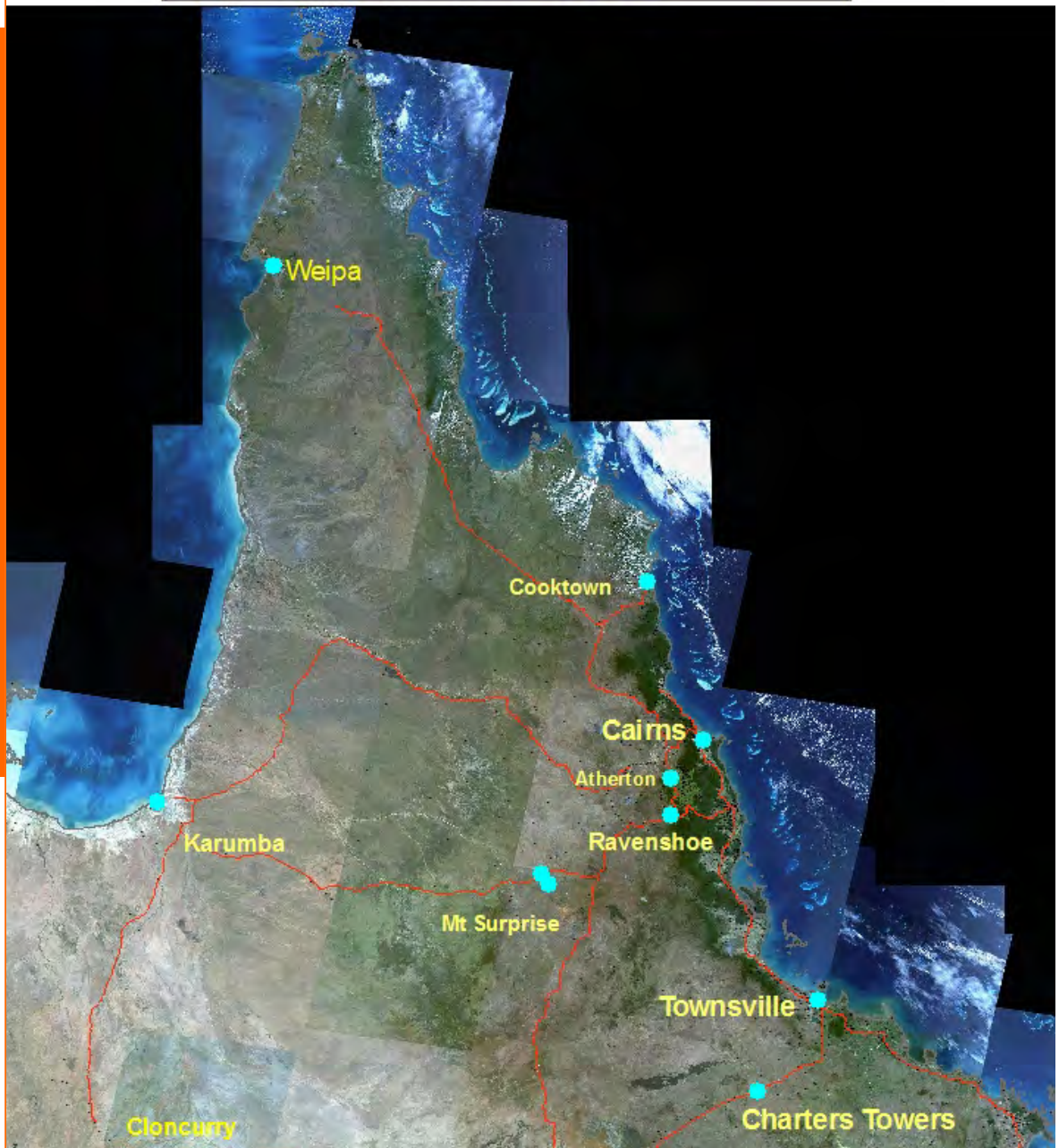


The Department of Employment, Economic Development & Innovation

Queensland Primary Industries & Fisheries' north region

An analysis from the top

North Queensland, Australia



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The Department of Employment, Economic Development and Innovation seeks to maximise the economic potential of Queensland's primary industries on a sustainable basis.

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It is against this backdrop, which includes,

- the largest section of the Great Barrier Reef Marine Park,
- one of only four RAMSAR listed wetlands in the state, and
- the World Heritage Wet Tropics areas extending from Cooktown to Townsville,

that we, as a department, support primary industries which contribute commodities valued at an estimated \$20410 million or 25% of the Queensland’s farm gate production.

The major agricultural industries of the region are presented in Table 1.

Table 1. Major agricultural industries and \$ value for year range 2005/06

Agricultural Commodity	Value (\$M)
Beef cattle	530
Sugar	570
Fisheries and aquaculture	201
Pigs and poultry	27
Horticulture	590
Dairy	30
Forestry - plant and native	3
Other	90
TOTAL	\$2041M

Within this region we have defined five distinct sub-regions built around the regional shire boundaries (see Figure 2). These sub-regions are:

- **Dry Tropics** – includes Burdekin, Townsville, and Charters Towers
- **Wet Tropics** – includes Hinchinbrook, Cassowary Coast, and Cairns
- **Atherton Tablelands** – includes part of Tablelands
- **Cape York** – includes Cook, Aurukun, Torres and part of Carpentaria
- **Gulf** – includes Burke, Mornington, part of Carpentaria, Croydon, Etheridge and part of Tablelands.

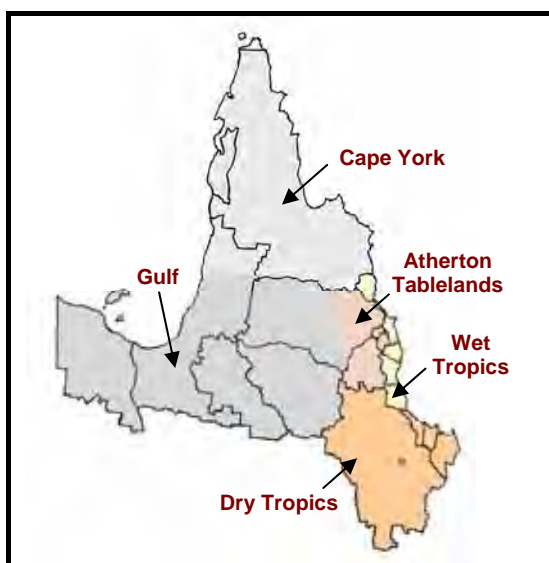


Figure 2. Sub-regions of QPIF’s North Region

An Overview of the Sub-Regions

Dry Tropics

Coastal areas

The extensive deltas, levees and flood plains which dominate the landscape in the coastal sections of this sub-region are typically gently sloping alluvial plains which lead to mangrove and salt flats along the lower coastal areas.

Groundwater was a major driver for early agricultural development in the area. Currently, two water boards manage the recharge to the groundwater system in the Burdekin Delta to maintain groundwater levels and prevent seawater encroachment. About 43150 hectares of deep, fertile, sandy, clay loam soils support the irrigated production of sugar cane. Producers are now beginning to establish rotations and diversify into alternate crops. The area has specialised vegetable and mango farmers.

The Burdekin River Irrigation Area, consisting of approximately 35000 hectares, was established in 1988 with the construction of the Burdekin Falls Dam. The scheme is developed on heavy clay flood plain soils that have been used for rice production, but are now predominantly used for sugar cane.

Approximately 8 million tonne of sugar cane is crushed annually by four mills owned by CSR in the Lower Burdekin area. The area produces about 25% of the Queensland sugar cane crop.

Other areas of the coastal plain grow horticultural crops – both vegetable and tree crops – based on access to groundwater supplies. The coastal plains are also a major mango production area.

Interest in major prawn and finfish aquaculture developments is continuing to grow in this sub-region. Three extensive aquaculture enterprises, at various stages of development, will cover an area of approximately 285 hectares.

Table 2. Burdekin agricultural profile – 2007/08

Summary				Harvesting Seasonality											
Agricultural activity	Area (ha)	Volume sold	Gross Revenue (\$)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1 Beans (fresh)	800.00	9,611.11 Tonnes	12,456,000.00												
2 Capsiums	130.00	3,744.00 Tonnes	7,020,000.00												
3 Cattle	943,903.00	20,532.00 Head	8,614,395.00												
4 Cotton	760.00	5,320.00 Bales	2,282,280.00												
5 Eggplant	100.00	5,000.00 Tonnes	10,000,000.00												
6 Grapes (table)	50.00	868.06 Tonnes	2,500,000.00												
7 Pumpkins	700.00	8,400.00 Tonnes	5,628,000.00												
8 Mangoes	1,500.00	22,050.00 Tonnes	50,715,000.00												
9 Maize	3,000.00	22,500.00 Tonnes	6,750,000.00												
10 Mung Beans	400.00	500.00 Tonnes	430,500.00												
11 Navy beans	350.00	525.00 Tonnes	472,500.00												
12 Rock/honeydew melons	400.00	17,857.14 Tonnes	15,810,000.00												
13 Soya beans	2,000.00	5,000.00 Tonnes	2,500,000.00												
14 Sweet corn	800.00	11,111.11 Tonnes	11,064,000.00												
15 Sugar	83,815.20	8,225,064.96 Tonnes	254,170,957.39												
16 Watermelons	340.00	12,750.00 Tonnes	10,200,000.00												
17 Zucchini	100.00	1,600.00 Tonnes	3,842,000.00												
	1,039,148.20		\$404,455,632.39	<i>Note some areas double cropped</i>											

Rangelands

To the west the topography changes with the occurrence of the Uplands region. This elevated and undulating landscape forms grazing lands on generally less fertile gradational earths and shallow duplex soils. These soils are susceptible to erosion where there is limited ground cover. The area is within both the Brigalow Belt North and Einasleigh Uplands vegetation communities and is characterised as woodland and savannah rangelands. Over 70% of the area still retains remnant woody vegetation. Urban settlement is scant, with Charters Towers the major centre and small rural villages of less than 200 people.

The rangelands predominantly support an extensive cattle industry, although isolated pockets of irrigated farming occur. The area is a major producer of store cattle for the live cattle export market and the southern fattening trade.

Improvements in beef production have relied on the infusion of *Bos indicus* cattle, the introduction of the legume *Stylosanthes* spp and supplementary feeding for both improved fertility and production. Woody weeds that have proliferated since early gold mining are a threat to the productive use of the land. The area is under close scrutiny in relation to sediment losses causing water quality deterioration to the Great Barrier Reef Lagoon.

Opportune cropping of cotton and other cash crops occurs in the Belyando-Suttor catchments when river flows enable flood harvesting of water into large on-farm storage areas.

Historically, gold, tin and more recently nickel mining are important extractive industries in the region and account for the major minerals produced in the sub-region.

Table 3. Average temperatures and rainfall for selected sites in the Dry Tropics sub-region

Sub-region	Temperature		Rainfall		
	Max °C	Min °C	Average (mm)	Decile 9 (mm)	Decile 1 (mm)
<i>Dry Tropics</i>					
Twin Hills	30.5	15.2	615.4	928.6	327.9
Bowen	28.6	19.8	952.0	1737.7	483.0
Ayr	28.9	17.8	954.4	1486.8	484.9
Collinsville	29.9	16.2	718	1139.91	460.5
Charters Towers	30.1	17.1	659.5	1003.2	352.7
Townsville	28.8	19.7	1144.1	1761.6	597.8
Average	29.47	17.63	840.57	1342.97	451.13

Wet Tropics

The climate of the Wet Tropics is unique in Australia. Rainfall is the distinguishing feature of the Wet Tropics. The annual rainfall is variable and seasonal and is dominated by major depressions, monsoon troughs and cyclones. Cyclones are common between December and April, with a frequency of four to six per year of which, on average, two cross the coast.

This sub-region is dominated by rugged mountain ranges, which include the highest mountains in Queensland. The mountains and some of the associated lower hills and undulating plains which receive a high and consistent rainfall (>2000mm), historically support an extremely diverse array of the lush, complex, tropical mesophyll rainforest and vine forests. Approximately 900000 hectares are now protected by the Wet Tropics World Heritage Area and are an important tourist destination and nature conservation area.

Table 4. Average temperatures and rainfall for selected sites in the Wet Tropics sub-region

Sub-region	Temperature		Rainfall		
	Max °C	Min °C	Average (mm)	Decile 9 (mm)	Decile 1 (mm)
Wet Tropics					
Cardwell	28.8	18.8	2130.7	2972.5	1385.7
South Johnstone	28.0	19.0	3332.2	4568.7	2167.8
Innisfail	27.9	19.2	3580.0	4765.6	2574.3
Cairns	28.9	20.7	2023.2	2785.8	1362.6
Port Douglas	27.9	20.6	2009.2	2751.5	1268.2
Average	28.3	19.66	2615.06	3568.82	1751.72

Mangrove, samphire, beach vine forests and other communities occur on the saline estuarine plains and adjacent coastal landscapes. The major occurrence of wetlands is on the littoral shores, the alluvial and colluvial back plains, floodplains, stream deltas and permanent fast flowing streams. Within this sub-region eighteen sites covering more than 1.8 million hectares are considered to be of environmental importance to Queensland and three sites covering 61470 hectares are of national importance.

The deep red kandosol soils support both rainforest and eucalyptus forests. These areas were harvested historically for timber from about the 1880s. After clearing, the soils are favourable for cropping but are subject to water erosion problems on slopes. Substantial areas currently support sugar cane, which is now grown using a green cane trash blanket approach to minimise soil erosion.

Table 5. Wet Tropics agricultural profile – 2007/08

Summary				Seasonality											
Agricultural activity	Area (ha)	Volume sold	Gross Revenue (\$)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1 Aquaculture	312.90	1,712.20 Tonnes	20,986,659.00	■	■	■	■	■	■	■	■	■	■	■	■
2 Banana	9,080.00	290,687.04 Tonnes	381,761,489.45	■	■	■	■	■	■	■	■	■	■	■	■
3 Cattle industry	474,633.00	36,050.00 Head	24,730,300.00		■	■	■	■	■	■	■	■	■	■	■
4 Durian	100.00				■	■	■								
5 Grass/legume seed	175.00	290.88 Tonnes	584,575.14					■	■	■	■	■			
6 Longans	50.00				■	■	■								
7 Lychee	120.00	648.00 Tonnes	3,240,000.00										■	■	■
8 Mangosteen	50.00														
9 Other Tropical Tree Fruits	100.00				■	■	■								
10 Papaya	70.00	7,371.00 Tonnes	9,639,000.00	■	■	■	■	■	■	■	■	■	■	■	■
11 Passionfruit	120.00	1,798.28 Tonnes	3,275,439.30	■	■	■	■	■	■	■	■	■	■	■	■
12 Pumpkins	100.00	3,000.00 Tonnes	2,250,000.00					■	■	■	■	■			
13 Rambutan	170.00				■	■	■								
14 Sugar	128,142.70	9,789,600.00 Tonnes	266,698,777.92						■	■	■	■	■	■	■
15 Watermelon	60.00	2,250.00 Tonnes	1,800,000.00					■	■	■	■	■			
	613,283.60		\$714,966,240.81												

Dermosols occur mostly on the humid coastal areas and historically supported eucalyptus and melaleuca woodlands. Sugar, bananas and tropical fruits are grown on the coastal lowlands. Less than 5% of crops use irrigation.

Sugar cane has been grown as a monoculture with reducing yields and sugar content. The adoption of legumes such as soybeans in the rotation is improving productivity. Bananas have increased in area, with over 90% of the Australian crop produced in the sub-region.

Timber production is relatively small when compared to the rest of the state but is of importance to a number of smaller communities in the sub-region. The current spot sale of 150000m³ in the Cardwell district will be evaluated, with a view to developing further longer-term timber sales in the region. Recently, companies with long term investment portfolios have been investing in land for timber plantations that will result in competition for sugar cane.

Aquaculture is increasing in popularity with the expansion of barramundi farms.

A major fishing fleet operates off the coast from Cairns and Innisfail.

Atherton Tablelands

The Atherton Tablelands sub-region is an elevated plateau consisting of the Atherton and Evelyn Tablelands and the Mareeba region. It has an average altitude of 750m above sea level, ranging from around 1100m on the ranges in the east to 450m at Mareeba.

Climate (both rainfall and temperature) varies across the Atherton Tablelands as a result of the change in altitude. Areas on the Atherton Tablelands can experience occasional frosts during winter.

Table 6. Average temperature and rainfall for selected sites in the Atherton Tablelands sub-region

Sub-region	Temperature		Rainfall		
	Max °C	Min °C	Average (mm)	Decile 9 (mm)	Decile 1 (mm)
<i>Atherton Tablelands</i>					
Herberton	25.4	14.4	1146.8	1619.6	724.3
Atherton	26.0	14.5	1413.4	2062.6	990.6
Kairi	25.2	15.6	1278.3	1958.7	789.2
Dimbulah	31.5	16.6	787.4	1140.4	475.5
Walkamin	27.2	17.0	1034.8	1463.7	644.1
Mareeba	28.8	16.1	922.7	1349.1	583.9
Average	27.35	15.7	1097.23	1619.6	701.27

The Atherton Tablelands sub-region encompasses the western fringe of the Wet Tropics bioregion and the northern aspects of the Einasleigh bioregion. The extensive plateau area, with basalt derived fertile soils, supports both eucalypt and rainforest vegetation. Before clearing, a mosaic of closed forest communities dominated the region on the basaltic soils of higher rainfall and open eucalypt forests, and woodlands occurred in the drier sections. Areas of the rainforest are now protected through their inclusion in the Wet Tropics World Heritage Area. The World Heritage areas include National Parks, State Forests and other crown land, as well as leasehold and freehold land. The World Heritage area covers approximately 10% of the Atherton Tablelands with much of this area being State Forest Reserve, of which about 5000 hectares are protected.

Permanent freshwater systems of crater lakes and swamps occur on the Atherton Tablelands. The major wetland areas of national significance are the crater lakes of Barrine and Eacham, comprising around 160 hectares. The man-made Lake Tinaroo provides for a variety of recreational activities and complements the ecological values of the area.

Climate varies markedly across the Atherton Tablelands as a result of the change in altitude and the Great Dividing Range. As you move northward rain decreases and average temperatures increase. Soil types also show a marked variation and reflect the underlying geology.

The well structured, high clay, red soils (ferrosols) near Atherton are very fertile and versatile and a variety of crops are grown on these soils. Historically, these soils have produced rain grown maize, peanuts, navy beans and potatoes in rotation, with some areas having small supplies of groundwater for supplementary irrigation. More recently, high value horticultural crops such as avocados and bananas have been grown where temperatures are suitable and supplementary irrigation is available. Groundwater in some areas is now fully committed.

Grain crops are utilised within the dairy and stockfeed industries.

Other crops produced in the granite derived, sandy loam soils include a wide range of field and horticultural crops. Tropical pasture seed and hay are produced in the region.

Restructuring in the tobacco, dairy and tea tree industries has posed significant challenges for this sub-region in the recent past, resulting in the exit of the tobacco industry

The Mareeba-Dimbulah Irrigation Area (MDIA) covers 41500 hectares, of which 22150 hectares is supplied by water from Lake Tinaroo. Lake Tinaroo has an annual yield of 205000ML available for irrigation. There are about 402 farms supplied by a channel system and another 395 farms take water by private diversion from supplemented streams.

The MDIA was originally developed for the production of tobacco and pastures in the 1960s. The average farm size of 40 hectares is relatively small in the historic tobacco growing regions with subsequent difficulties in maintaining viability when the tobacco industry ceased in 2000. Many diversified into horticulture, especially mangoes, lychees and some lifestyle horticulture where soils were suitable. Most of these crops are spray, micro-spray or trickle irrigated.

The area is identified as being suitable for coffee production, with four plantations established.

Table 7. Atherton Tablelands agricultural profile – 2007/08

Summary				Seasonality											
Agricultural activity	Area (ha)	Volume sold	Gross Revenue (\$)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1 Avocado	749.33	6,744.00 Tonnes	22,929,600.00												
2 Banana	735.00	19,767.00 Tonnes	33,195,461.54												
3 Cattle industry	40,000.00	21,700.00 Head	23,173,495.76												
4 Citrus	310.00	5,649.44 Tonnes	7,388,335.20												
5 Coffee	220.00	330.00 Tonnes	1,815,000.00												
6 Dairy	12,480.00	75,160,800.00 Litres	37,580,400.00												
7 Grass/legume seed	3,916.56	2,356.30 Tonnes	12,959,650.00												
8 Hay	3,000.00	150,000.00 Bales	3,000,000.00												
9 Longans	134.75	1,042.29 Tonnes	5,211,456.25												
10 Lychee	322.65	1,887.50 Tonnes	9,437,493.51												
11 Maize	5,000.00	35,000.00 Tonnes	9,398,550.00												
12 Mango	2,492.43	26,170.54 Tonnes	53,200,970.27												
13 Papaya	162.00	17,058.60 Tonnes	22,307,400.00												
14 Peanuts	1,500.00	7,050.00 Tonnes	5,781,000.00												
15 Potatoes	2,348.00	82,180.00 Tonnes	50,746,150.00												
16 Pork	20.00	13,638.00 Head	3,685,762.00												
17 Poultry	40.00	8,000,000.00 Head	4,456,000.00												
18 Pumpkins	180.00	5,400.00 Tonnes	4,050,000.00												
19 Sugar	7,400.00	666,000.00 Tonnes	19,086,228.00												
20 Tea	750.00	2,625.00 Tonnes	2,625,000.00												
21 Watermelon	80.00	3,000.00 Tonnes	2,400,000.00												
	81,840.73		\$334,427,952.52												

These sugar cane crops are flood irrigated, but there is an increase in the adoption of low pressure irrigation systems. The Tableland Mill crushes the sugar cane to syrup standard before the syrup is railed to Babinda and South Johnstone for producing crystalline sugar.

On the hilly areas and high rainfall areas near Malanda and Ravenshoe dairying is an established industry, with a processing plant based at Malanda. About 80 dairy farms supply the factory.

Agricultural industries in the area have been very dynamic. There is an increasing interest in a demographic change, as the aging population looks at lifestyle changes and undertaking hobby farming on the Atherton Tablelands. Water is also becoming a limiting factor, as Cairns' population increases and requires water from Lake Tinaroo. Water trading is in place on the Atherton Tablelands and this may influence agriculture production.

Timber production has been a traditional land use while state soft wood plantations exist on the Atherton Tablelands, especially in the Atherton-Herberton areas.

Gulf

The sub-region is characterised by the extensive alluvial plains of the large river systems that drain the area to the northern coastline. These areas support mainly blue grass (*Dicanthium* spp) grasslands and various open woodlands dominated by species such as coolabah (*E. microtheca*), gidgee (*A. cambagei*) and paperbark (*Melaleuca* spp).

Along the coast are extensive estuarine areas and floodplains supporting mangroves, sedgeland and grasslands, providing important wetland habitat. Gently sloping sandstone tablelands along the eastern margin of the region support a variety of eucalyptus woodlands and lancewood (*A. shirleyi*) low open forests. The region is in the Gulf Plains bioregion.

The major occurrences of wetlands are on the plains and littoral shores of the Gulf. Aggregations of 15 sites (1071770 hectares) have environmental importance to Queensland and three sites have importance nationally. The Southern Gulf Aggregation (553380 hectares) is a potential RAMSAR site.

The index of socio-economic disadvantage is a measure of an area's disadvantage relative to other areas. Using this index, the Gulf region is generally significantly disadvantaged when compared to other local government areas across Queensland with many of the local government areas are in the top 10% of the most disadvantaged areas of Queensland.

Land tenure in the Gulf region is mainly pastoral leases, Aboriginal land, nature reserves and mining leases, with a relatively small area of freehold land. Leases are managed by both pastoral companies and individuals. Many leases in the Gulf will be due for renewal in the next 5-10 years and will be subject to the new leasehold land conditions and monitoring requirements. Native title and Indigenous land use agreements may be more important in future negotiations.

The dominant land use on large pastoral leases is cattle grazing on native pastures at low stocking rates and with relatively few improvements.

A combination of *Bos indicus* cross cattle and use of supplements have increased herd numbers and productivity since the 1970s. Further improvement through better management strategies such as early weaning and targeted supplementation could improve productivity. Live export facilities and port infrastructure were installed in Karumba in 1994 with significant benefits.

The World Wildlife Fund and Queensland Conservation Council are pushing for the area to be a "wild area". Four 'wild rivers' are declared within the region.

The Gulf water resource plan identifies potential for expansion of irrigation for horticulture on the Gilbert River.

The Gulf area is heavily dependent upon primary industries with low levels of value-adding activity.

The Gulf lies within a strongly mineralised geological area and forms part of the North West Mineral Province, which contains substantial resources of gold, base metals and other industrial metals and gemstones.

Gold was previously mined at Kidston, but this has subsequently ceased. Georgetown has recognised deposits of uranium and this may become important in time depending upon State and Commonwealth government policies.

Four main commercial fisheries are established in the Gulf:

- northern prawn fishery
- estuarine and inshore net fishery
- line fishery
- crab fishery.

The northern prawn fishery (trawl) is Australia’s most valuable Commonwealth fishery, with a gross value of production in excess of \$90 million. The production fluctuates widely and is significantly influenced by flood events and the health of the mangrove ecosystem and coastal seagrass systems. The estuarine and inshore net fishery has approximately 85 licensed commercial fishermen and has historically targeted barramundi. Recreational fisheries are also significant.

Table 8. Average temperatures and rainfall for selected sites in the Gulf sub-region

Sub-region	Temperature		Rainfall		
	Max °C	Min °C	Average (mm)	Decile 9 (mm)	Decile 1 (mm)
<i>Gulf</i>					
Croydon	33.9	20.4	732.3	1026.2	434.6
Georgetown	32.6	18.4	819.6	1199.8	462.4
Burketown	32.3	20.0	767.2	1218.2	377.1
Normanton	33.4	21.4	919.7	1303.5	535.2
Karumba	30.8	20.2	911.3	1236.9	567.5
Average	32.6	20.08	830.02	1196.92	475.36

Cape York

The Cape York sub-region has two distinct seasons, a reliable wet season when rainfall is received, followed by a longer dry season.

Table 9. Average temperatures and rainfall for selected sites in the Cape York sub-region

Sub-region	Temperature		Rainfall		
	Max °C	Min °C	Average (mm)	Decile 9 (mm)	Decile 1 (mm)
<i>Cape York</i>					
Cooktown	29.5	21.7	1706.2	2382.7	1316.7
Coen	31.1	20.8	1191.7	1539.8	699.3
Moreton Telegraph	32.0	20.0	1386.3	1671.1	983.1
Lockhart River	29.8	21.8	2129.6	3012.0	1453.9
Weipa	32.3	21.8	1767.8	2294.9	1259.6
Old Mapoon	32.5	20.7	1563.3	2173.3	1097.6
Thursday Island	30.2	24.2	1716.5	2123.8	1230.1
Average	31.06	21.57	1637.34	2171.09	1148.61

Much of the region is dominated by gently undulating plains and plateaus with relatively deep sandy earth but low nutrient status soils. The dominant vegetation is 'savannah woodlands' – typically Darwin stringy bark (*Eucalyptus tetradonta*) and related eucalyptus species with tall grass understorey. Lower lying areas often support paperbark (*Melaleuca viridiflora*) woodlands. Closer to the coast there are estuarine and alluvial plains supporting a range of mangroves, wetlands, vine forests, fringing woodlands, grasslands and a diverse array of other coastal formations. Mainly sandstone, but also older volcanic geologies, form ranges and low hills supporting *Eucalyptus* spp and *Corymbia* spp woodlands and scattered mixed species of vine forests.

The major occurrence of terrestrial wetlands is on the massive and littoral shores of the Gulf of Carpentaria, Endeavour Strait, Newcastle Bay and Princess Charlotte Bay. Perched swamps and springs occur on elevated sandstones of the Laura Basin. A total area of 24448660 hectares, consisting of 23 sites, has been assessed as important terrestrial wetlands for Queensland, of which 10 sites (1296470 hectares) are of national significance.

Pastoral leases, conservation reserves and Deed of Grant in Trust (Aboriginal land) cover most of the region. The region is considered to be in a relatively natural state, with the dominant land use being cattle grazing on natural pastures, tourism, nature conservation, traditional land use and mining. There is a current and growing interest in establishing economically viable developments to support the indigenous communities and residents in the region. The pastoral leases are gradually not being renewed and land tenure resolution processes are seeing an increase in both indigenous ownership and conservation reserves.

The Cape and Torres Strait are important buffer zones and quarantine surveillance areas relating to risks of exotic disease from Papua New Guinea. There is a cattle exclusion zone about 50km from the tip of Cape York and sentinel animals are in place to monitor for diseases such as Japanese encephalitis.

The northern area has had a number of rivers declared as 'wild rivers' areas.

The QPIF Presence

QPIF staff provide support to primary industries in this region through a network of 26 centres. This service oriented network includes laboratories (4), research stations (7) and office complexes across the region with the Regional Office located in Townsville.



Figure 3. QPIF offices in North Queensland

Facility Attributes

Ayr

Ayr Research Station

The Ayr Research Station is located on 43 hectares of arable river loam in the centre of the Burdekin. The site incorporates the research station and the district office of the Department of Employment, Economic Development and Innovation.

The Station was established in 1945 to produce fresh vegetables for the armed forces.

Today this facility provides research, development and extension tailored to the dry tropics through the development of integrated pest and disease management in horticulture crops along with extension to the beef industry. The key services delivered from this facility include:

- plant protection, including entomology and pathology diagnostic services
- addressing mango growing and marketing issues
- handling QPIF Business Information Centre/client inquiries on horticulture/agriculture crops and beef
- providing media support for the dry tropics and wider area.

Research station activities focus on experimental and contract research in fruit and vegetable production, including:

- profitability and sustainability (mango, tomatoes, capsicum, cucurbits, organics, vetiver grass)
- plant breeding (winter sorghum, navy beans, soybean)
- commercial cropping (sorghum seed, sunflower, maize)
- risk management (biosecurity and plant pests).

The site is well suited to research for the expanding horticultural cropping industries that are seeking to exploit the distinct advantages of the Burdekin district. The facility is fully utilised and has strong linkages with industry.

Experimental and contract commercial crops are grown at Ayr Research Station for chemical and seed companies and the CSIRO. They include cotton, tomatoes, sorghum breeding, sunflower, maize and edible soybean.

Ayr Research Station is also home to a mango gene pool of more than 280 different varieties. A separate orchard is a collection of Kensington Pride mango trees from all over Queensland.

The research station is also used as the venue for the biennial North Queensland Horticultural Expo.

Swans Lagoon Beef Cattle Research Station

The Swans Lagoon Beef Cattle Research Station is a key resource servicing the Beef Cooperative Research Centre (Beef CRC) and QPIF bull breeding and genetics technology projects. It is the only coastal grazing research station in Queensland and is structured to deliver services to beef producers in collaboration with industry.

Target research into tropical beef production includes:

- profitability and sustainability (production and environmental)
- risk management (supplementary feeding, phosphorous and mineral deficiency)
- reproduction and calf wastage.

This facility is highly representative of the tropical dry savannas typical of ironbark country with grazing and cultivation land systems. It is situated close to local beef markets and supported by the Ayr and Charters Towers facilities.

The site also includes staff residences for on site security, a conference room and visitors quarters. The dedicated cattle herd and property infrastructure supports viable collaborative research projects. The cattle herd at Swan's Lagoon is trading profitably in the department's livestock trading account.

Cairns

Boating and Fisheries Patrol

In the North region, Boating and Fisheries Patrol are based in Cairns at Tingira Street, which abuts Smith's Creek.

Field patrols are conducted throughout the north from Ayr to the Torres Strait and into the Gulf of Carpentaria. The role of the patrols is to educate the public on marine safety and fisheries rules and regulations both for amateurs, charter operators and commercial fishing operations. Education on marine safety and fisheries rules and regulations are also conducted through schools, boat shows, displays and club events.

The North Region vessel fleet consists of the following boats:

- 1 x 25 metre vessel
- 2 x 12 metre vessels
- 5 x 6-9 metre vessels
- 5 x 5-6 metre vessels
- 15 x 4.3 meters and under vessels.

Other Boating and Fisheries Patrol offices

Boating and Fisheries Patrol officers are stationed at the following locations through out the North Region:

- Cairns
- Ingham
- Karumba
- Port Douglas
- Thursday Island
- Townsville
- Weipa.

Northern Fisheries Centre

The Northern Fisheries Centre, Cairns, is located south-east of the Cairns CBD at 38-40 Tingira Street, Portsmith. The Centre was opened in 1981, with the state of the art Aquaculture and Stock Enhancement Facility opening in December, 2002. The Centre has a wharf with adequate length for visiting vessels and operates two vessels, the 18m trawler 'Gwendolyn May' and the smaller 7.8m vessel 'Pearl Bay'.

Recent research and development

Aquaculture

- Marine fin fish (estuary cod and flowery cod) research and development into aquaculture development. Also provides fingerlings to industry with funding by ACIAR.
- Tropical rock lobsters – research and development into aquaculture development.
- Extension material and technical advice is available for anyone planning a new aquaculture facility.

Fish restocking group

- Barramundi – the Centre currently stocks approximately 250000 barramundi fingerlings in waterways to enhance recreational fishing.
- Stocked species includes barramundi and mangrove jack. Many stock species are micro tagged with cheek implants to provide vital information.

Long term monitoring group

- Fish stocks monitored include barramundi, mud crabs, freshwater fishes, reef fish and Spanish mackerel. In southern areas the program includes mullet, tailor, saucer scallops and spanner crabs.

Marine ecology group

- This involves pure and applied research to provide for fisheries resource sustainability – includes seagrasses, mangroves and coastal management.

Marine pests group

- Conducts surveys throughout Australian ports to determine distribution and abundance of introduced exotic species.
- QPIF in conjunction with the Animals Cooperative Research Centre is undertaking a project to learn more about the biology of tilapia populations in North Queensland.

Redden Street

The Cairns QPIF Redden Street office is situated in an industrial area, south-east of the Cairns CBD. QPIF staff moved to this site in January 1998.

Recent research and development

- Animal health and animal biosecurity (Northwatch).
- Animal welfare – promotion and advancement of animal welfare standards in the North Region and contribution to regional services, training and extension.
- Biosecurity – surveillance for exotic pests and diseases from Miriwinni (south of Cairns) to the Torres Strait. This includes regulatory activity to ensure control and containments of pests and diseases.
- Electric ant control.
- Emerging food technologies – includes market research projects for local primary industries and industry development projects including facilitating new industry groups, trade data and industry assistance.
- Fruit and vegetables – includes the development of phytosanitary treatments and the supply chain management for temperate, sub-tropical and tropical fruit and vegetables, plus the focus on supply chain solutions to fruit and vegetable producers.
- Fruit fly – includes research and blocking in the Torres Strait (Biosecurity).
- Future cane – change agents in the areas of business skill development with the focus on delivering services to the sugar cane industry and delivering healthy alternative products from sugar cane.
- Mango Reference Database – a CD-ROM on all available Australian mango research results and information.
- Media – includes press releases, articles and updates.
- Plant pathology – includes diagnostic support for plant biosecurity.
- Yellow crazy ant control.

Charters Towers

Charter Towers Research and Operation Centre

The Charters Towers Research and Operational Centre is located on the northern outskirts of Charters Towers, 110km south-west of Townsville.

The current Charters Towers facility was opened in May 2000. It provides a range of QPIF services to the beef industry and the rural communities of the former Dalrymple Shire² and adjacent areas.

The Wambiana Grazing Trials, which deal with managing a grazing operation sustainably and profitably in a variable environment, are coordinated from the Charters Towers site.

Recent research and development

- Grazing land management, profitable and sustainable grazing systems and the value in beef project.
- Beef cattle nutrition and fertility.
- Beef management strategies including variable stocking rates and the use of seasonal weather forecasts.

Tropical Weeds Research Centre

Opened in 1985, the Tropical Weeds Research Centre (TWRC) is situated in Charters Towers. The TWRC has built a strong reputation for its tropical pest research, particularly in the fields of integrated weed management, Class 1 weeds and feral pig management. Approximately 20 officers work out of Charters Towers on pest issues associated with the Dry Tropics. A small satellite group of 4-5 staff are based at the Centre for Wet Tropics Agriculture near South Johnstone to undertake pest research in the “Wet Tropics” bioregion of North Queensland.

The Tropical Weeds Research Centre is located on some 16 hectares of land on the edge of Charters Towers. While many research activities are carried out directly on collaborators’ properties, the Research Centre offers a range of important research facilities including three glasshouses, shade houses and plant rearing shade tunnels, chemistry, entomology, seed and zoology laboratories, a chemical storage facility, a large workshop and a conference room.

Scientific staff at the Tropical Weeds Research Centre contribute to three state-wide research activities undertaken within the science group of Biosecurity Queensland:

- Integrated Weed Management – The TWRC specialises in undertaking large scale integrated research trials on declared weeds to develop cost effective management strategies. The Centre is also well known for developing effective herbicide applications for priority weeds and undertaking ecological studies. The mass rearing and release of approved biological control agents is also undertaken for weeds located in North Queensland.
- Landscape protection and restoration – Scientists at the TWRC support eradication programs undertaken by QPIF on Class 1 declared weeds. These weeds are generally not widely distributed in Queensland but have the potential to become very serious pests if allowed to spread. Researchers identify effective control options, study the weeds’ ecology/biology and monitor progress of eradication programs. A second focus is on improving our understanding of the ecology of weeds threatening the Wet Tropics of North Queensland in order to assist the development of preventative measures and restoration practices following control activities.
- Pest animal management – The TWRC pest animal group conducts research into the management and control of North Queensland’s most destructive pest animal species. Current research projects are quantifying the impacts of and improving management options to control feral pigs and investigating control options for feral deer in the Wet Tropics.

² The former Dalrymple Shire is now part of the Charters Towers Regional Council.

Kairi Research Station

Kairi Research Station was founded in 1912 and was originally a State Farm. It occupies 244 hectares on the shores of Lake Tinaroo on the Atherton Tablelands.

Recent research and development

- Agroforestry – timber production and shade in cattle trials for liveweight gain.
- Beef – fire projects, carrying capacity, marketing, grazing management, land care and part of the Value in Beef project.
- Cropping systems – evaluating crop rotations and reduced tillage.
- Dairy – pasture improvement (pinto peanut pastures) and stocking rates.
- Maize – hybrid breeding.
- Peanuts – breeding; better natural oil composition.
- Sugar cane – Future Cane project.
- Sweetcorn – virus resistance and hybrid breeding.
- Sweet potato – pathogen tested planting material trials.
- Kairi Research Station is an official Bureau of Meteorology weather station.

Malanda

Malanda is approximately 75km south-west of Cairns on the Atherton Tablelands.

The office in Malanda is shared with the Department of Communities and Queensland Health.

QPIF services provided from Malanda are:

- Veterinary science – cattle diseases, hoof care, bird flu monitoring, autopsies of dead birds
- Stock inspection – monitoring of NLIS, animal welfare, audit of hormone growth promotants, restricted animal material audits (animal feed) and brand advice.

Mareeba

Mareeba is located 65km west of Cairns on the dry Mareeba-Dimbulah plain.

The Mareeba office, now known as the Centre for Tropical Agriculture, was opened in September 1979 to provide a wide range of QPIF services to the Atherton Tablelands, the Gulf and Cape York communities. The Centre has extensive greenhouses, glasshouses and laboratories.

In 2004 a Physical Containment Level 2 laboratory (PC2) was opened, within which is a molecular marker laboratory. Extensive plant pathology and mango genomics work is undertaken within the molecular marker laboratory.

The key services delivered from this Centre include:

- Handling QPIF Business Information Centre/client inquiries on livestock property registrations, NLIS, stock movements, etc for clients based throughout the North region
- Handling QPIF Business Information Centre/client inquiries on horticultural and agricultural crops
- Plant protection, including entomology and pathology diagnostic services
- Sale of publications/posters, waybill books, PHAC books, etc.

An ideal location for small conferences, the 'Mitchell Room' has modern facilities and equipment for meetings, workshops and conferences.

The Mareeba Centre also has a client friendly Information Centre and an extensive agricultural library collection.

Recent research and development

Animal science

- Beef cattle – improved pastures and land management.

Biosecurity

- Animal biosecurity – regulatory, emergency response and animal welfare.
- Plant biosecurity – regulatory, emergency response, audit and inspection.

Entomology

- Fruit – fruit fly management and attractants.
- Fruit piercing moth control.
- Mango – seed weevil research and control and gall midge pests.
- Taxonomic research – coleoptera and insect identification.

Horticulture

- Avocados – disease management.
- Coffee – quality evaluation.
- Developing projects – work with industry to develop new projects.
- Longans – crop reliability and improving production.
- Lychees – crop reliability and improving production.
- Macadamias – treatment for abnormal tree growth.
- Mango – breeding of new varieties; nutrition work.
- Papaya – breeding of new varieties.
- Rambutans – improving fruit set.

Plant pathology

- Bacterial diseases – general crops.
- Bananas – leaf diseases and diagnostics.
- Mango – anthracnose and leaf/fruit diseases.
- Peanuts – soil borne and foliar diseases.

Plant science

- Bio-based products, molecular farming and bio-fuels.
- Emerging technology – DNA techniques on native sandalwood, African mahogany and lychee growth.

Southedge Research Station

The 125 hectare Southedge Research Station lies 7km north-west of Mareeba and 45km west of Cairns.

Southedge was established as a tobacco research station in 1969 and was integral to the development of that industry until 2002. In the mid 1980s Southedge Research Station fostered the expansion of many new horticulture crops in the area including coffee, citrus, mangoes, bananas, lychees, navy beans, sweet potatoes and pumpkins.

Southedge Research Station is an official Bureau of Meteorology weather station.

Recent research and development

- Bio-industrial crops – trials and crop studies.
- Biofumigation studies.
- Industrial hemp – evaluation of fibre crops.
- Kenaf – evaluation of fibre crops.
- Mango – breeding and genomics program.
- Mango industry – disease and pest management options.
- Ornamental foliage – development of new crops.
- Papaya – breeding and genomics program.
- Peanuts – evaluation of new varieties.
- Stevia – trials and evaluation.
- Sugar cane – development and supply of new varieties.
- Tropical fruit trees – maintenance of gene pools.

South Johnstone

The South Johnstone Centre for Wet Tropical Agriculture is established on a 47 hectare site on the South Johnstone River approximately 10km south-west of Innisfail. This site, combined with a 7 hectare leased block, enables agricultural research to be undertaken on the representative soil types of the Wet Tropics region.

South Johnstone first began as a sugar cane research station in 1917. In 1935 it became a Bureau of Tropical Agriculture research station. In 1995 QPIF staff moved into a newly built complex at the entrance to the site.

This facility incorporates the district administration office, research station and laboratory facilities in support of the wet tropical agricultural production systems and boasts a post-entry quarantine glasshouse which meets AQIS standards.

Research activities align with the needs of the established banana, papaya and tropical tree fruit industries as well as amenity horticulture and cocoa. The Centre has proven research expertise in the areas of soil health, nematology, plant pathology and entomology. The Centre for Wet Tropics Agriculture also provides a base for Biosecurity program staff and an administration centre for the district.

Recent research and development

- Banana trials regarding fertiliser treatment and varieties.
- Research and extension on lychees, rambutans, exotic tropical fruits and bananas.
- Bananas – research on the cause of banana speckle.
- Cocoa research trials in conjunction with Cadbury-Schweppes and the Rural Industries Research and Development Corporation regarding the viability of an Australian cocoa industry.

- Phytophthora diseases research on paw paws and durians.
- Taro – industry development including a library of taro literature.
- Taro – disease survey.
- Soil health

Townsville

The QPIF Townsville site comprises the department's regional and district office and the Tropical Aquatic and Animal Health Laboratory (formerly the Oonoonba Veterinary Laboratory).

The Oonoonba Veterinary Laboratory, as it was then called, was first established in 1911 to provide quarantine, research and disease investigation support for livestock industries in the north. In 1972 the original laboratory was destroyed by fire. The laboratory was rebuilt in 1977.

This facility provides a centre for both regional directorate and district office administrative and corporate functions, housing Biosecurity, Fisheries and Regional Delivery management and program staff. The modern facilities are in good condition and are highly accessible to rural and partnering agencies and industry clients.

The Tropical Aquatic and Animal Health laboratory is a NATA accredited Veterinary Diagnostic Laboratory that provides a full range of Veterinary diagnostic and research testing to support National and State Disease Surveillance, Quarantine Surveillance, Disease Accreditation and Eradication Programs.

The discipline sections and the scientific work undertaken are as follows:

- Veterinary pathology – gross and microscopic pathology of terrestrial and aquatic animals; research on pathogenesis of infectious disease
- Bacteriology – isolation and identification of bacteria, fungi, mycoplasmas and algae using traditional and molecular methods and blue-green algal and botulinum toxicity testing
- Virology – isolation and identification of viruses of terrestrial and aquatic animals using traditional and molecular methods
- Serology – full range of serological testing for infectious agents of terrestrial animals
- Parasitology/Entomology – identification and surveillance of parasites, insect pests and vectors of terrestrial and aquatic animals
- Molecular Biology – molecular testing for pathogens of terrestrial and aquatic animal species; development of new molecular diagnostic methods.

The site includes a PC2 laboratory, conference facilities, dedicated crocodile/intensive animal research and animal handling infrastructure as well as five 4.2ML aquaculture ponds suitable for finfish fingerling production and brood stock rearing.

The site has close proximity to the Townsville CBD and key government agencies and stakeholders. It provides a central North Queensland location for regional management, is close to major transport links for rapid response and is located in close proximity to key research and development agencies in North Queensland including James Cook University, CSIRO, Australian Institute of Marine Science and Great Barrier Reef Marine Park Authority.

Walkamin Research Station

Walkamin Research Station is a 259 hectare site located 12km south of Mareeba. It is situated on Mareeba granites and Hodgkinson metamorphic and level to undulating basalt soils.

Walkamin Research Station was established in late 1959 in conjunction with the Queensland Water Resources Commission. Walkamin's main purpose was to evaluate the economic use of irrigation water from Tinaroo Dam on the tobacco soils of the Mareeba-Dimbulah Irrigation Area.

Walkamin Research Station is an official Bureau of Meteorology weather station.

Recent research and development

- Beef – seed production research and development. The development of native grasses, the regeneration of forage germplasm and the application of forage plants.
- Cattle grazing – agistment only.
- Coffee – gene pool of ten coffee varieties.
- Entomology – research on fruit fly, fruit spotting bug and the fruit piercing moth on tropical orchard crops.
- Fisheries – sustainable aquaculture using minimal water and eliminating discharge to the environment along with the development of sustainable subsistence aquaculture in Papua New Guinea. Projects funded by ACIAR and RIRDC.
- Forestry – dry land forestry trials on sandalwood, Corymbia hybrids and African mahogany.
- Operation Farm Clear, which was set up to help farmers clear damage done by Cyclone Larry, was based at Walkamin.

Other Offices

QPIF offices are also located at Coen, Normanton and Georgetown.

Industry Profiles

Beef Industry

Beef production is a significant contributor to the North Queensland economy. There are approximately 2.5 million head grazing on an estimated 2000 holdings covering approximately 40 million hectares. About 750000 head are turned off annually with a farm gate value of \$543 million.

The herd is predominately *Bos indicus* but is being increasingly infused with British and European genetics to better meet modern market requirements. The North Queensland herd represents 22% of Queensland's total and 10% of the national total.

The northern beef industry consists of a diverse range of cattle grazing enterprises with extensive cattle breeding and growing operations across the Burdekin and Upper Herbert regions, the Gulf of Carpentaria and Cape York Peninsula, as well as more intensive breeding, growing and fattening operations closer to the high rainfall areas adjacent to the east coast.

Major markets in the north include the live cattle export trade from the ports of Townsville, Mourilyan and Karumba, the export abattoir at Townsville, and local domestic abattoirs. Some finished animals are sent for processing to Mackay. Large numbers of store animals are sold and/or moved to grass and crop fattening or to backgrounding or feedlot operations in the south.

Several feedlots have been recently established in North Queensland with varying success. Lack of competition from processors, inadequate management expertise, high freight costs and, more recently, high feed prices and low fat cattle prices are impediments.

There has been a significant trend over recent years of southern beef producers buying large breeding properties in the north due to reliable wet season rainfall and per unit costs for land for expansion. This has contributed to a rapid rise in land prices.

Australia's disease free status has seen an increase in demand for our boxed beef and live exports across both domestic and export markets. QPIF contributes to protecting the industry through the efforts of Biosecurity Queensland.

Some 23 research, development and extension and 12 biosecurity staff work across the region on various projects focussing on profitable production technologies, flexible marketing strategies, sustainable land management and industry security.

In extensive grazing areas, projects focus on improving production efficiencies (increased reproductive efficiency, increased growth rate and reduced death rates) and improving natural resource condition.

On the endowed grazing lands, projects focus on minimising costs per kilogram of liveweight gain, growth rates and genetic effects on eating quality and minimising impacts of grazing on the Great Barrier Reef lagoon.

Research facilities

QPIF owns research stations at Swans Lagoon, Kairi and Walkamin in North Queensland at which beef industry research and development has been conducted.

Swans Lagoon, south-west of Ayr in the northern dry tropics, is a nationally renowned research facility recognised for practical and innovative research. Quality research has been conducted for over 40 years covering industry issues such as wet and dry season supplementation, weaner feeding and molasses production mixes, breeder herd, bull management and grazing land management. Indeed, research, development and extension staff are recognised worldwide as leaders in the field of tropical beef production technology.

The research station at Walkamin is used to develop world renowned pasture seed production technologies as well as beef production from irrigated pastures.

At Kairi beef production from intensively developed exotic sown pastures was researched, as well as feeding technologies to produce high eating quality beef.

Morganbury Alliance

The wet coastal and Atherton Tablelands areas of Far North Queensland are areas of high, reliable rainfall and high quality exotic pastures. It is capable of producing good weight for age cattle for the North Queensland domestic market.

In the late 1990s, QPIF staff facilitated the formation of a supply chain alliance (Morganbury Alliance) between local beef producers and the Morganbury Meat Company based near Atherton.

This alliance now supplies 60 outlets between Cooktown and Bowen. A key to the success of the alliance was support from QPIF in the formative years for training of producers in meeting market specifications and responding to feedback between consumer, abattoir and producer.

At the 2007 Red Meat Industry Awards at the Brisbane Exhibition, the Morganbury Alliance was awarded the Agforce Innovative Supply Chain Award.

QPIF's role in the success of this alliance was well recognised.

Beef statistics 2008

Estimated total cattle numbers	1.9 million head
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Dry Tropics

Table 10. Summary of the Burdekin Shire beef industry – 2007/08

Area under production* (ha)	Cattle numbers*	Trading entities*	Approximate turn off numbers*
943903.6	68441	182	17800

* Adjusted to more than 20ha of land, reserve areas and other.

Table 11. Summary of the former Dalrymple Shire beef industry – 2007/08

Area under production (ha)	Cattle numbers	Trading entities	Approximate turn off numbers
Not available	149000	100	38000

Wet Tropics

Table 12. Summary of the Wet Tropics beef industry – 2007/08

Area under production* (ha)	Cattle numbers*	Trading entities*	Approximate turn off numbers*
381729.22	73421	571	19100

* Adjusted to more than 20ha of land, reserve areas and other.

Atherton Tablelands

Table 13. Summary of the Atherton Tablelands beef industry – 2007/08

Area under production (ha)	Cattle numbers	Trading entities	Approximate turn off numbers
Not available	250000	260	70000

Cape York

Table 14. Summary of the Cape York beef industry – 2007/08

Area under production* (ha)	Cattle numbers*	Trading entities*	Approximate turn off numbers*
36882522.87	153644	220	39900

* Adjusted to more than 20ha of land, reserve areas and other.

Gulf

Table 15. Summary of the Gulf beef industry – 2007/08

Area under production* (ha)	Cattle numbers*	Trading entities*	Approximate turn off numbers*
129647763.14	1177347	277	306000

* Adjusted to more than 20ha of land, reserve areas and other.

Markets

The main domestic markets for fattened North Queensland beef cattle are the regional retail chains and the butcher trade.

As at January 2008, beef producers were experiencing falling prices, with feeding costs continuing to rise.

The main export markets for beef cattle from North Queensland are either processed boxed beef or live cattle.

The main export markets for boxed beef are Japan, South Korea and the United States of America.

The main export markets for live cattle are Indonesia, Malaysia, the Philippines and the Middle East.

Live cattle exports

Australia's live cattle numbers for the year to July 2007 were approximately 415000 head, which is 13% up on 2006 figures. Of these, 95628 head were shipped to Indonesia.

Other exports

Australian beef exports for 2006/07 were a record 973880 tonnes, 3% higher than the previous record in 2004/05.

In 2006/07, Australia's main export destinations were 403000 tonnes to Japan, 302000 tonnes to the United States of America and 156000 tonnes to South Korea.

Source: Bernie English & Greg Mason, QPIF

Dairy Industry

The dairy industry in North Queensland is based on the Atherton Tablelands and is centred on the towns of Atherton, Malanda, Millaa Millaa and Ravenshoe.

There are currently 78 registered dairy farms supplying the main milk processing factory, Dairy Farmers Ltd, which is in Malanda.

Currently the average farm in the region milks about 220 cows, producing 960000 litres.

Another three farms supply a small certified organic/bio-dynamic milk processor called Mungalli. The Mungalli Creek dairy near Millaa Millaa makes cheese and yoghurt for tourists. The Mungalli organic/bio-dynamic milk is based on the ideas of Rudolf Steiner (1861-1925).

The dairy industry employs approximately 260 people directly on farms with another 410 people in the processing sector.

Friesian cattle are the predominant breed of dairy cattle for milk production.

Dairy Farmers Ltd has the capacity to process about 160 million litres of milk yearly. Currently they are processing 80-82 million litres per year.

Dairy Farmers also produce flavoured milk.

Threats to the industry include farm profitability, lack of confidence in the industry, excess workloads and stress. Larger herd owners have identified recruitment of employees, current feeding systems and processes of business management as priorities.

Atherton Tablelands' milk is recognised for the absence of "oceanic taint" due to the tropical feed base and management systems and was recognised in 2006 as the best tasting milk in the country – Grand Dairy Awards Champion Product, 2006.

A milk price increase was announced on 23 November 2007. From 1 December 2007, the base price for the Far Northern region increased to 41.75¢ per litre. From 1 January 1 2008, the base price increased to 42.75¢ per litre.

Table 16. Summary of Atherton Tablelands dairy industry – 2007/08

Total area under production	12480ha
Total milking herd	22152 head
Number of farming business units	78
Average production	6022.5L/ha
Average farm gate price	\$0.50/L
Average land value	\$15000/ha
Total annual production	75160800L
Farm gate Industry gross income	\$37580400

There has been considerable focus on the stabilization of production in the region through a local industry initiative called "Grow Malanda".

The competitive advantage of the Atherton Tablelands is the ability to produce milk cost effectively from rain grown tropical pastures and molasses.

The Atherton Tablelands has the potential to attract more dairy farmers to the region because of this competitive advantage. Dairy Farmers has the capacity for more producers.

All the milk produced on the Atherton Tablelands is for domestic consumption and is sold to the major food chains.

Source: Peter Spies & Greg Mason, QPIF; Howard Smith, Dairy Farmers

Emerging/Small Industries

There are a number of emerging industries in North Queensland. Listed here are some of the more prominent ones.

Biofuels and bioenergy

Biofuels and bioenergy is an emerging industry in tropical Far North Queensland, but has great potential to be a significant industry sector in the near future. Private sector interests are looking at developing a range of bioenergy and biofuel projects (bioethanol, biodiesel, and biogas) from a suite of renewable agricultural feedstock or biomass. These crop-based feedstocks either already exist (e.g. sugar cane/bagasse, banana waste) or will need to be grown as dedicated energy crops in the region.

Biofuels are a sub-set of the broader bio-based industry, where renewable biological and agricultural resources (bioresources – as opposed to fossil fuel resources) are synthesised through innovative technologies and processes to produce a range of non-traditional and environmentally sustainable bio-products for the domestic and global markets.

Biogas

Growcom is developing a banana waste to energy project at Bush Holdings, a banana property near Tully. Significant quantities of banana waste from the farm's packing shed (unsuitable for mainstream consumer markets) are broken down and sent to a purpose built anaerobic digester to produce methane. Once technically and economically viable, the ultimate aim is to replicate this on other farms so that a ready supply of affordable and renewable natural gas could be produced to power farm machinery in the region and thus help to reduce on-farm production costs.

Bioenergy

Sugar mills have been utilising bagasse for power generation for over 100 years. However, modernising sugar mill infrastructure and increasing resource utilisation will enable a considerable increase in the generation of green electricity from bagasse in the future. For example, in 2005 CSR spent over \$160 million to upgrade the Pioneer Mill in the Burdekin with modern cogeneration equipment that increased its capacity from 7.2MW to 68MW. The plant now produces 260GW of electricity per annum, generating revenues in excess of \$15 million a year. The plant provides enough renewable electricity to power 38000 households, resulting in greenhouse gas emissions reductions of 260000 tonnes per annum. Bioenergy could conceivably supply up to 30% of Australia's electricity needs by 2050. No other industry is as well placed to benefit from this opportunity than the sugar cane industry.

Bioethanol

The sugar cane industry, and sugar mills specifically, stand to reap significant benefits from the production of bioethanol from sugar cane juice and bagasse in the near future. Given its biophysical attributes (land, water and sunshine) the Burdekin region, together with its centrally located mills, is ideally suited to bioethanol production. The potential market for ethanol in Australia is substantial and government policy will remain a key factor, as the ethanol industry could be worth up to \$1.5 billion and generate in excess of 6000 jobs in all sectors of the Queensland economy by 2010. Moreover, the advent of second generation cellulosic technology will allow the sugar industry in Far North Queensland to become extremely competitive in the areas of biofuels production from bagasse and other fibrous agricultural residues in the foreseeable future.

Biodiesel

There have been significant interests from a number of local and international entrepreneurs wanting to develop annual and perennial oil crops in the region in recent years. Of these, three perennials – *Jatropha curcas* (physic nut), *Milletia pinnata* (pongam tree) and the oil palm – have been the subject of considerable scrutiny, but remain to be demonstrated commercially. Opportunities for high-yielding annual oil crops like mustard, peanuts and new strains of soybeans could be usefully grown as rotational crops in existing farming systems in the region. Potential areas for development of these crops include grazing and indigenous lands on Cape York Peninsula, the coastal Wet Tropics and the Atherton Tablelands, as well as the Dry Tropics and savannahs. There is also tremendous potential to develop biodiesel production from micro-algae.

Source: Peter Holden, QPIF

Carbon trading

Carbon trading is the planting of trees (sequestered carbon) to off-set carbon emissions.

International trading in carbon credits is already underway but Australia has not been involved due to its decision not to ratify the Kyoto Protocol. The Australian government signed the Kyoto Protocol in March 2008 and can therefore take advantage of international carbon trading.

Currently there is no Australia-wide trading system governing emissions. However, voluntary corporate activity and unilateral action by some states (New South Wales) has stimulated the emergence of a carbon trading market in Australia. A national scheme should be operating by 2010.

Source: Colin Hunt

Cassava

A company called Cass Tech Ltd plans to grow cassava on 6000 hectares in the Home Hill area of the Burdekin. The long term goal of Cass Tech Limited is to develop a cassava plant to convert cassava starch into bioplastics.

Cass Tech will be bringing out a specialist from Columbia in early 2009 to act as a consultant.

Source: Notes from a meeting between Ministers Mulherin and Wallace and a Cass Tech delegation regarding cassava (25 November 2008)

Cheese

There are three cheese makers on the Atherton Tablelands and one in Cairns.

Mungalli Creek Dairy near Millaa Millaa is serviced by three dairy farmers using organic pastures to produce organic bio-dynamic milk. They have been making cheese for seven years and produce havarti, quark, ricotta, fetta and cheddar cheeses.

Dairy Farmers at Malanda produces stretch mozzarella cheese.

Frank Gallo, on the Atherton Tablelands, specialises in European gourmet cheeses.

Vannella in Cairns makes a wide variety of Italian cheeses from both cow and buffalo milk.

Source: Mungalli Creek Dairy; Dairy Farmers; Frank Gallo; Judy Noller, QPIF

Cocoa

In 2000 QPIF began cocoa trials in North Queensland. The trials were on two 1 hectare plots, on land at Mossman and South Johnstone Research Station, using hybrid cocoa seed from Papua New Guinea. The trials were in response to Cadbury Schweppes' concerns about risks to the world cocoa supply and an interest in potential production in a developed economy.

Funding for the trial was provided by Cadbury Schweppes Australia and the Rural Industries Research and Development Corporation (RIRDC).

Large corporate identities are interested in supporting commercial trials with growers in the Innisfail area with assistance and on-going advice from QPIF.

Currently six farms (15 hectares) in the Mossman area, three farms (8 hectares) in the Innisfail area and one farm (1 hectare) in the Ingham area are growing cocoa. Virtually all the planted area is at the pre-production stage.

The QPIF trials ended in 2007.

QPIF is producing a publication called 'Cocoa Growing Guide for Australia' that will include all the findings and experience gained from the trial.

Source: Yan Diczbalis, QPIF

Cotton

One year of commercial trials is currently underway in the Burdekin on approximately 760 hectares of sugar cane land, with 12 growers participating.

QPIF is running a research program in conjunction with the trials called the 'Burdekin Cotton Evaluation Program'. This will study crop yield potential, agronomic issues, tar-water sampling and extension.

Two growers independent of the above have moved into the Burdekin area and have already planted cotton. One farm has 620 acres of cotton planted while the other has 500 acres planted.

There is a major concern in the Burdekin from vegetable growers that cotton crops will host the pest white fly.

Table 17. Summary of Burdekin cotton industry – 2007/08

Total area under production	760ha
Number of farming business units	12
Average production	7 bales/ha
Average farm gate price	\$429.00/bale
Total production	5320 bales
Farm gate Industry gross income	\$2282280

Source: Paul Grundy & Greg Mason, QPIF

Mangosteens

Mangosteen (*Garcinia mangostana* L) is a member of the Guttiferae family and was first introduced into North Queensland in the early 1970s. This "queen of the tropical fruit" is visually appealing and very tasty.

The industry is small, with approximately 23500 trees in the ground. The main producing area is from Cooktown to Tully, with a small amount of production around Darwin in the Northern Territory. There are three varieties in North Queensland, with only a small variation between them.

Heavy production occurs between February and April, with lighter production from October to January. Yields are variable but mature trees can produce an average of around 30kg per tree.

Mangosteen is propagated from seed. The seeds, however, do not remain viable for long. The general lead time for fruit production is from eight to ten years.

In North Queensland mangosteens are grown in the Wet Tropics in the Babinda and Silkwood areas.

Estimates from 2005 put the value of the tiny mangosteen industry at just \$750000.

However, ambitious projections say that industry values will jump to \$6 million by 2010.

Projections are based on current plantings and newly planted trees with wholesale prices of \$6.50/kg to \$8.00/kg for fresh fruit.

Markets for North Queensland mangosteens include Melbourne, Brisbane, Sydney and Adelaide.

Source: Good Fruit and Vegetable Grower, January 2008; Tropical Fruits Growers Handbook, DPI&F, 1995

Paper

A paper producing plant is due to open at Walkamin on the Atherton Tablelands by mid-2009. The plant is a joint venture between Papyrus Australia Technology and World Future Fibre Pty Limited. The technology at the Walkamin plant will convert banana trunks into paper and other fibre products.

The plant is expected to produce 20000 tonnes of decorative veneer, paper and fibre products per year.

Source: Tablelands Advertiser, 11 February 2009

Rice

A taskforce established by the government has been looking to shift Australian farming to the north, where there is more rainfall. The Rice Growers Association told the taskforce that it would embrace rice farming in the north if the right varieties could be found.

A previous rice industry in North Queensland, based around the Burdekin and on the Atherton Tablelands, folded in the late 1980s.

Representatives of Sunrice and the New South Wales' Department of Primary Industries visited Mareeba in late November 2007 and spoke to ex-rice growers and the manager of Sunwater regarding water usage, how much weight per hectare, varieties and price per bushel of rice.

Rice farming is largely based in New South Wales and Victoria, where approximately 100000 hectares are under rice production.

Source: The Australian, 11 January 2008; Claudio De Faveri, QPIF

Taro

In North Queensland taro is grown in the Wet Tropics, with a smaller production base on the Atherton Tablelands.

The main variety of taro grown is the Bun Long variety.

The rise in importance of taro is mainly attributed to the increase in the Asian and Pacific Islander population.

Current Australian production of taro is estimated to be 1000 tonnes with an estimated market value of around \$3.5 million.

The niche marketing of taro is well into the development process. Taro chips can be promoted as being healthier than potato chips because taro absorbs less cooking oil during the frying process.

A taro crisp factory has been established at Babinda using Bun Long taro. The factory, producing potato, taro and cassava crisps, hopes to be in operation later this year (2008).

Source: Jeff Daniells, QPIF

Field Crop Industries

The major North Queensland field crop industries are maize, sugar cane and peanuts.

The maize industry is mainly confined to the dry tropics of the Atherton Tablelands, Lakeland and the Burdekin Shire.

The peanut industry is mainly confined to the dry tropics of the Atherton Tablelands.

The sugar industry in North Queensland is mainly confined to the wet tropical coast from Ayr north to Mossman with a small amount of sugar cane produced on the dry tropics of the Atherton Tablelands.

Another field crop is sorghum, which is mainly grown at Lakeland, Georgetown and the Mt Garnet areas, with approximately 1500 hectares of sorghum under production. Sorghum is predominantly used for forage.

Smaller field crop production includes mung beans, navy beans and soybeans.

A profile of major field crops

Maize

In North Queensland maize is grown as a small-acre crop around the Atherton Tablelands and as a broad-acre crop at Lakeland and in the Burdekin.

On the Atherton Tablelands QPIF hybrid-maize accounted for about 90% of the area planted by virtue of their superior diseases resistance over proprietary (private company) hybrids.

In the Burdekin private company hybrids have a 90% share of the plantings because diseases resistance is not as critical a requirement as it is in summer crops on the Atherton Tablelands. In the Burdekin maize is sometimes used as a rotational crop for sugar production. It is also seen as having a high growth potential and as a good rotational crop with sugar, cotton and soybeans.

The Atherton Tablelands has a suitable climate with reliable rainfall, irrigation supply and experienced growers plus the support of QPIF staff who have world standard expertise in maize breeding. Maize also rotates well with other Atherton Tablelands crops such as peanuts and potatoes.

The main buyers and users of maize are local stockfeed manufacturers.

Approximately 20% of the Atherton Tablelands crop goes to silage for dairy and beef production while the bulk of the Burdekin crop is used in a beef feedlot.

Most of the maize crop is planted in December and January for harvesting from June to August.

Trials on the Atherton Tablelands in 2007 revealed that the latest hybrids to emanate from the QPIF breeding program yielded 17% more grain than the AT1 variety.

Funding for maize research is shared almost equally between the Grains Research Development Council (GRDC) and QPIF.

Funds from QPIF are accrued from a combination of royalties from seed sales of its hybrids, fee for service for testing private hybrids and a voluntary contribution from the local seed production group.

If the breeding research of maize is continued the average yield of about eight tonnes per hectare can be raised to 10 tonnes per hectare in the next 5 to 10 years, with top commercial yields increasing from nine tonnes per hectare to 12 tonnes per hectare.

Table 18. Summary of Burdekin maize industry – 2007/08

Total area under production	3000ha
Total production	22500t
Number of farming business units	50
Average production	7.5t/ha
Average farm gate price	\$300.00/t
Total production	22500t
Farm gate Industry gross income	\$6750000

Table 19. Summary of Atherton Tablelands maize industry – 2007/08

Total area under production	5000ha
Total production	35000t
Number of farming business units	45
Average production	7t/ha
Average farm gate price	\$280/t
Average land value	\$20000/ha
Farm gate Industry gross income	\$9398550

Source: Ian Martin & Greg Mason, QPIF

Mung beans

In North Queensland the mung bean industry is mainly based in the Burdekin.

Mung beans should ideally be planted in late July to early August in North Queensland. The crop has a short growing cycle of 12 weeks, making it a potential constant cash flow crop.

Popular varieties of mung bean include the Crystal, Satin II, Green Diamond, Emerald, Satin and Delta varieties.

Crystal and Satin II are preferred for late planting due to their degree of resistance to powdery mildew.

Major pests of the mung bean are the green vegetable bug, the redbanded shield bug, the bean podborer, the green and brown mired, and the *Helicoverpa armigera* and *Helicoverpa punctigera* insects.

Major diseases include powdery mildew, charcoal rot, tan spot, halo blight, gummy pod, legume little leaf, puffy pod disorder and tobacco streak virus.

World mung bean prices are largely determined by both volume of production and quality of the crops in China and Burma.

Mung beans are not traded in bulk shipments like wheat, sorghum or barley.

Mung beans are a popular vegetable in Asian culture.

Table 20. Summary of Burdekin mung bean industry – 2007/08

Total area under production	400ha
Total production	500t
Number of farming business units	20
Average production	1.25t/ha
Average farm gate price	\$1076.25/t
Total production	500t
Farm gate Industry gross income	\$430500

Source: QPIF website; Greg Mason, QPIF

Navy beans

The main location for navy beans in North Queensland is the Atherton Tablelands around Walkamin, Mareeba, Dimbulah and Innot Hot Springs and the Burdekin.

The navy bean season in North Queensland extends from July to November.

The main variety of navy bean in North Queensland is the Spearfelt variety.

The main market for navy beans is the baked bean market.

Navy bean production in North Queensland is reliable and consistently of a high quality. All navy beans grown in the North Region are of food grade standard and are used within the food industry.

Table 21. Summary of Burdekin navy bean industry – 2007/08

Total area under production	350ha
Total production	525t
Number of farming business units	20
Average production	1.5t/ha
Average farm gate price	\$900.00/t
Total production	525t
Farm gate Industry gross income	\$472500

Source: Greg Mason, QPIF; Chris Horsburgh ex DPI&F

Peanuts

The peanut industry in North Queensland is located in the dry tropics of the Atherton Tablelands with minor production in the Burdekin Shire.

The main varieties of peanuts grown are NC7, SO95R and Chifley.

The main season for peanuts is in April and May.

There are two primary peanut processing companies in Australia – Cromptons and the Peanut Company of Australia (PCA). In Far North Queensland PCA purchases 90% of peanuts grown.

The main export markets are New Zealand, Japan and the UK.

Peanuts are increasingly being used as a break crop in sugar cane cropping. Break crops are used as an interruption in the cycle of sugar cane pests and diseases which can live in the soil and plant root systems. Peanuts, as a legume, also return nitrogen to the soil.

A recent two year peanut breeding trial funded by QPIF and the Grains Research Development Council (GRDC) resulted in a new variety of peanut called Sutherland, which is a Hi Oleic peanut. Hi Oleic peanuts are much lower in saturated and polyunsaturated fats. Hi Oleic peanuts are also referred to as “extended shelf life” peanuts.

Table 22. Summary of Atherton Tablelands peanut industry – 2007/08

Total area under production	1500ha
Total production	7050t
Number of farming business units	34
Average production	4.7t/ha
Average farm gate price	\$820/t
Average land value	20000.00/ha
Farm gate Industry gross income	\$5781000

Source: Michael Hughes & Greg Mason, QPIF

Soybeans

Soybeans are native to south-west Asia. It is an annual herb belonging to the pea family. In North Queensland the soybean industry is based in the Burdekin.

Soybeans are used to produce vegetable oils, processed foods such as tofu and soymilk, and soymeal for animal feeds. Australia is a net importer of soybeans and in 2005 imported US\$70 million in soybeans and soymeal products. US\$6 million of soy products were exported for the same period.

Soybeans can provide both green manure and grain crop benefits in crop rotations, with symbiotic nitrogen fixation adding to soil fertility and sustainability in an overall cropping system.

At present only one variety of soybean, Leichhardt, is particularly suited to the wet tropics. Stuart is a new CSIRO-bred variety that was released in 2005/06, with limited seed availability.

There are two main markets for soybean grain – crushing-grade grain for oil, and culinary-grade grain for the edible trade. Soymeal for stockfeed is a by-product of the crushing process.

Benefits of a soybean rotation

Soybean crops grown in rotation with sugar cane:

- break the long term sugar cane monoculture
- are the best adapted grain legume for rotation in a sugar cane production system
- will generally increase yields by 15-30% in the following sugar cane crop, with benefits being realised for up to 3 to 4 years
- improve soil physical structure, promote healthier soil in terms of soil biota and reduce weeds, pests and diseases
- fix copious amounts of nitrogen, including up to 100kg of nitrogen per hectare in below ground portions, which is available to the cane crop over a prolonged period
- present an opportunity for a positive cash flow (approximate gross margin \$200 per hectare) during the fallow period.

Planting times for seed of the Leichhardt and Stuart varieties is April to mid-June. For green manure soybean planting time is mid-November to January and for grain soybean planting time is late December to January.

The pod sucking bug and the green vegetable bug are the main insect pests of soybean in North Queensland.

Diseases of soybean include seedling root rot, charcoal rot, sclerotinia stem rot, downey mildew and bacterial blight. The Leichhardt variety of soybean is suspect to rust.

Expansion of the soybean crop is expected to occur due to the new oil plant being constructed in the Home Hill area.

Table 23. Summary of Burdekin soybean industry – 2007/08

Total area under production	2000ha
Total production	5000t
Number of farming business units	75
Average production	2.5t/ha
Average farm gate price	\$500.00/t
Total production	5000t
Farm gate Industry gross income	\$2500000

Source: QPIF website; Greg Mason, QPIF

Sugar cane

The sugar industry in North Queensland is located in the Dry Tropics (Burdekin Shire), Wet Tropics (Ingham, Tully, Innisfail, Cairns and Mossman) and irrigated parts of the Atherton Tablelands.

Almost 95% of Australia's total sugar production comes from Queensland. The total area of sugar cane cut for crushing in 2005/06 was 406000 hectares. Queensland was the main growing state with 384000 hectares. The total quantity of sugar cane crushed in 2005/06 was 38 million tonnes. In Queensland 35.3 million tonnes were crushed.

Source: Australian Bureau of Statistics

Varieties of sugar cane grown in each region are regulated under the provisions of the *Sugar Industry Act 1999*.

The sugar crushing season extends over a five or six month period. Harvesting generally starts in June and ends in early December.

Approximately 15-20% of raw sugar produced in Queensland is sold to domestic consumers.

Over 25 countries purchase Queensland sugar. The major markets for sugar from North Queensland are South Korea, Japan, Malaysia, Canada and Taiwan. Approximately 85% of Queensland's sugar crop is exported.

The gross value of the 2007 Queensland sugar cane crop was forecast at \$735 million, which is 32% lower than in 2006. This is due to a drop in world sugar prices.

Yields in Commercial Cane Sugar (CCS – the level of sugar recoverable from cane) are generally higher in North Queensland than sugar cane grown in Central and Southern Queensland.

The sugar industry in North Queensland operates under different mill areas. These vary in production size and sometimes incorporate more than one mill.

There is a suggestion that the sugar production area in the Burdekin may decrease and be replaced by other crops such as cotton and field crops.

Mill areas

Mossman mill area

The Mossman Central Mill receives the majority of its cane from the former Douglas Shire³ and some from the former Mareeba Shire⁴.

The cane production in the former Port Douglas Shire is land locked as cane producing land has been taken over by urbanisation and tourism driven enterprises.

The area is also well protected by environmental issues with large amounts fully protected by World Heritage classification.

Consequently, the mill is under threat because of a depletion of producers.

Table 24. Summary of Mossman mill area sugar industry – 2007/08

Total area under production	7263ha
Total production (cane)	561226t
Number of farming business units	95
Average production	77t/ha
Average farm gate price	\$26.96/t
Average CCS	13.16
Farm gate sugar cane price	\$26.96
Farm gate Industry gross income	\$15129979

Atherton Tablelands mill area

This area takes in the production on the Atherton Tablelands and processes cane to the syrup stage, which is then transported to the Babinda and Mulgrave Mills by rail for further processing.

The Tableland Mill is working at capacity and has no plans to increase its production activity.

Table 25. Summary of Atherton Tablelands mill area sugar industry – 2007/08

Total area under production	7400ha
Total production (cane)	666000t
Number of farming business units	65
Average production	90t/ha
Average farm gate price	\$320/t
Average land value	\$15000/ha
Average CCS	13.75
Farm gate sugar cane price	\$28.66
Farm gate Industry gross income	\$19086228

³ The former Douglas Shire is now part of the Cairns Regional Council.

⁴ The former Mareeba Shire is now part of the Tablelands Regional Council.

Mulgrave mill area

This mill is located at Gordonvale, 25km south of Cairns, with the main growing areas south of Edmonton.

The mill area is land locked and faces the problems of urban expansion as Cairns proceeds with a building boom. This has already occurred at Edmonton, which is fast becoming a suburb of Cairns.

Table 26. Summary of Mulgrave mill area sugar industry – 2007/08

Total area under production	13009ha
Total production (cane)	1101127t
Number of farming business units	181
Average production	77t/ha
Average farm gate price	\$27.42/t
Average CCS	13.32
Farm gate sugar cane price	\$27.42
Farm gate Industry gross income	\$30192461.90

South Johnstone and Babinda mill areas

The South Johnstone Mill combines three distinct areas of cane production, which are located to the south. These areas are around the former Cardwell Shire⁵ and from the Atherton Tablelands.

The Mourilyan Mill was destroyed by tropical Cyclone Larry in 2006 and never rebuilt. South Johnstone Mill now processes part of the tonnage that was sent to the Mourilyan Mill.

The Babinda Mill processes the rest of the Mourilyan tonnage with some areas previously used to grow sugar cane diversifying into other crops such as bananas.

Table 27. Summary of South Johnstone and Babinda mill areas sugar industry – 2007/08

Total area under production	29112ha
Total production (cane)	1910236t
Number of farming business units	394
Average production	65.62t/ha
Average farm gate price	\$24.77/t
Average land value (\$/ha)	\$15000
Average CCS	12.4
Farm gate sugar cane price	\$24.77
Farm gate Industry gross income	\$47316546

Tully mill area

The Tully Mill area sources its cane from the former Cardwell Shire and some of the former Johnstone Shire⁶. It is one of the few areas that has the ability to expand and is not land locked or threatened by urban encroachment.

⁵ The former Cardwell Shire is now part of the Cassowary Coast Regional Council.

⁶ The former Johnstone Shire is now part of the Cassowary Coast Regional Council.

Table 28. Summary of Tully mill area sugar industry – 2007/08

Total area under production	21600ha
Total production (cane)	1930000t
Number of farming business units	219
Average production	75t/ha
Average farm gate price	\$26.21/t
Average land value (\$/ha)	\$15000
Average CCS	12.9
Farm gate sugar cane price	\$26.21
Farm gate Industry gross income	\$50585300

Herbert mill area

The Victoria and Macknade Mills are located in the Hinchinbrook Shire with a small amount of cane now being developed in the Thuringowa area.

The Victoria Mill is one of the biggest in the world and has the capacity to handle extra cane, but this is being hampered by development constraints.

Table 29. Summary of Herbert mill area sugar industry – 2007/08

Total area under production	57158.7ha
Total production (cane)	4287011t
Number of farming business units	899
Average production	75t/ha
Average farm gate price	\$28.80/t
Average land value (\$/ha)	\$25000
Average CCS	13.8
Farm gate sugar cane price	\$28.80
Farm gate Industry gross income	\$123474491

Burdekin mill area

This area includes the Invicta, Pioneer, Kalima and Inkerman Mills which are supplied by cane produced in the Burdekin Shire.

The cane is irrigated from the Burdekin River Irrigation project that, in turn, is connected to the Burdekin Falls Dam or the delta areas that use groundwater.

The Burdekin cane growing region has been slow to take up the concept of green harvest.

Table 30. Summary of Burdekin mill area sugar industry – 2007/08

Total area under production	83815.2ha
Total area harvested	69846ha
Total production (cane)	8225065t
Number of farming business units	782
Average production	117.76t/ha
Average farm gate price	\$320.00/t
Average CCS	14.88
Farm gate sugar cane price	\$30.90
Farm gate Industry gross income	\$254170957

Sugar Yield Decline Joint Venture Program

The Future Cane project promotes research results that were developed from the Sugar Yield Decline Joint Venture Program (SYDJVP). The Program, started in July 1993, continued for 12 years as two six-year projects. A three year project is still in progress.

In conjunction with BSES Limited, QPIF is promoting SYDJVP recommendations, which include controlled traffic, zero tillage and legume fallows like peanuts and soybeans.

Source: Neil Sing & Greg Mason, QPIF

Fisheries

Commercial fisheries

Commercial fish catches in North Queensland operate in the eastern half of the Gulf of Carpentaria (GOC) and the Great Barrier Reef Marine Park (GBRMP).

Queensland commercial fisheries are a significant contributor to the national and state economy. In value they rank third among Australia's fisheries, and eight among all Queensland primary producers.

A large range of marine species are caught. Some of the most important species in value are barramundi, coral trout, red emperor, mud crabs, spanner crabs, banana prawns, endeavour prawns, king prawns, tiger prawns, shark, Spanish mackerel, blue swimmer crabs, grey mackerel, threadfin and scallops.

The majority of the catch is sold as fresh seafood while some is exported and sold interstate.

Fishery areas, fishing methods and target species are all subject to government control to ensure that the fishing industry is sustainable.

All commercial fishers including crabbers and trawler operators must collate data on each day's catch, the time spent fishing and the area fished. There is a legal obligation to record this information in a daily logbook.

The Developmental Finfish Trawl Fishery (DFTF) that operates in the Gulf of Carpentaria is a limited-entry, quota-managed trawl fishery that has operated since June 1998.

Forecasts indicate that for 2006/07 there will be a decline in the value of wild-harvest fishing.

Table 31. Summary of Gulf fishing industry – 2007[#]

Fishing Method	Data	Year					
		2002	2003	2004	2005	2006	2007
Total summary of all methods	Sum of boats	124	122	112	107	113	107
	Sum of total days	16388	15994	14886	13116	14240	13644
	Sum of catch/year (t)	2596	2376	2561	2275	2222	2101
	Sum of GVP (\$m)	17	15	16	15	16	15
Line	Sum of boats	37	34	27	31	27	29
	Sum of total days	1240	1260	929	1171	928	1152
	Sum of catch/year (t)	214	197	211	251	208	273
	Sum of GVP (\$m)	2	1	1	2	1	2
Net	Sum of boats	96	92	94	86	88	88
	Sum of total days	12241	11820	11994	9714	10915	9911
	Sum of catch/year (t)	2205	2031	2204	1860	1858	1697
	Sum of GVP (\$m)	13	11	12	10	12	11
Pot	Sum of boats	83	84	78	71	77	73
	Sum of total days	6063	7337	6113	6006	5470	5035
	Sum of catch/year (t)	175	147	145	162	156	129
	Sum of GVP (\$m)	3	2	2	3	2	2

[#] Queensland State Government Fisheries, not Commonwealth

Table 32. Summary of Cape York east coast fishing industry – 2007[#]

Fishing Method	Data	Year					
		2002	2003	2004	2005	2006	2007
Total summary of all methods	Sum of boats	314	299	238	221	184	151
	Sum of total days	21309	19283	15720	13931	12594	9160
	Sum of catch/year (t)	3208	3201	2657	2400	2394	1587
	Sum of GVP (\$m)	41	40	37	35	36	25
Line	Sum of boats	114	103	56	40	33	37
	Sum of total days	5325	3773	2022	1552	1175	1467
	Sum of catch/year (t)	630	451	221	168	147	198
	Sum of GVP (\$m)	10	8	4	4	4	5
Net	Sum of boats	40	39	44	26	17	26
	Sum of total days	1477	1439	1342	697	639	1170
	Sum of catch/year (t)	409	391	224	102	146	276
	Sum of GVP (\$m)	2	2	1	0	1	1
Pot	Sum of boats	23	23	26	17	14	21
	Sum of total days	1017	1549	1665	1179	903	1103
	Sum of catch/year (t)	33	46	56	45	37	45
	Sum of GVP (\$m)	1	1	1	1	1	1
Trawl	Sum of boats	171	171	138	145	120	79
	Sum of total days	13059	12888	10803	10085	8905	4453
	Sum of catch/year (t)	2022	2210	1975	1950	1864	836
	Sum of GVP (\$m)	24	26	24	24	23	10

[#] Queensland State Government Fisheries, not Commonwealth

Table 33. Summary of Wet Tropics (Cooktown to Cardwell) fishing industry – 2007[#]

Fishing Method	Data	Year					
		2002	2003	2004	2005	2006	2007
Total summary of all methods	Sum of boats	458	423	349	307	281	246
	Sum of total days	22982	21334	17094	14280	12802	11935
	Sum of catch/year (t)	2221	2054	1779	1432	1442	1190
	Sum of GVP (\$m)	27	24	19	16	15	13
Line	Sum of boats	233	206	142	115	105	114
	Sum of total days	11289	8726	4578	3867	2842	3301
	Sum of catch/year (t)	1150	887	408	322	248	297
	Sum of GVP (\$m)	16	13	6	5	4	5
Net	Sum of boats	72	79	75	69	63	58
	Sum of total days	2200	2929	3326	2556	2805	2938
	Sum of catch/year (t)	287	422	528	432	491	501
	Sum of GVP (\$m)	1	2	2	2	2	2
Pot	Sum of boats	54	68	70	49	56	52
	Sum of total days	4054	5238	4741	4274	4276	3889
	Sum of catch/year (t)	68	97	90	86	98	86
	Sum of GVP (\$m)	1	2	1	1	2	1
Trawl	Sum of boats	204	187	158	147	127	88
	Sum of total days	5948	5284	5240	4078	3404	2257
	Sum of catch/year (t)	716	647	753	591	605	306
	Sum of GVP (\$m)	9	8	9	8	8	4

[#] Queensland State Government Fisheries, not Commonwealth

Table 34. Summary of Dry Tropics north (Cardwell – Ayr) fishing industry – 2007[#]

Fishing Method	Data	Year					
		2002	2003	2004	2005	2006	2007
Total summary of all methods	Sum of boats	381	376	302	232	197	195
	Sum of total days	19446	19906	14692	11823	10110	10150
	Sum of catch/year (t)	2366	2561	1848	1503	1198	1157
	Sum of GVP (\$m)	34	35	24	21	17	15
Line	Sum of boats	187	176	126	87	90	81
	Sum of total days	7395	7692	4311	3232	3003	2846
	Sum of catch/year (t)	949	1063	542	405	353	349
	Sum of GVP (\$m)	18	19	11	9	7	7
Net	Sum of boats	60	59	60	36	40	51
	Sum of total days	2504	3103	2797	1689	1651	1565
	Sum of catch/year (t)	392	499	496	380	305	335
	Sum of GVP (\$m)	2	2	2	2	1	2
Pot	Sum of boats	34	42	42	28	31	36
	Sum of total days	2472	2876	2463	1837	1700	2070
	Sum of catch/year (t)	41	69	68	52	53	54
	Sum of GVP (\$m)	1	1	1	1	1	1
Trawl	Sum of boats	175	170	127	109	71	68
	Sum of total days	7640	7289	5715	5320	3961	3936
	Sum of catch/year (t)	984	929	739	665	487	419
	Sum of GVP (\$m)	14	13	10	9	8	6

[#] Queensland State Government Fisheries, not Commonwealth

Table 35. Summary of Dry Tropics south (Ayr – Proserpine) fishing industry – 2007[#]

Fishing Method	Data	Year					
		2002	2003	2004	2005	2006	2007
Total summary of all methods	Sum of boats	296	290	235	181	150	160
	Sum of total days	13542	12689	9252	6853	5686	6405
	Sum of catch/year (t)	1633	1562	1160	835	570	722
	Sum of GVP (\$m)	23	21	15	12	9	11
Line	Sum of boats	141	129	100	66	71	73
	Sum of total days	5468	5132	3238	2542	2271	2363
	Sum of catch/year (t)	726	687	437	365	326	400
	Sum of GVP (\$m)	14	13	8	8	7	8
Net	Sum of boats	56	58	47	39	34	45
	Sum of total days	2122	2109	1930	1288	1006	1224
	Sum of catch/year (t)	379	405	328	224	134	186
	Sum of GVP (\$m)	2	2	1	1	1	1
Pot	Sum of boats	37	44	33	24	30	30
	Sum of total days	2497	2576	2250	1978	2251	2490
	Sum of catch/year (t)	52	44	38	40	51	45
	Sum of GVP (\$m)	1	1	1	1	1	1
Trawl	Sum of boats	138	132	106	85	49	51
	Sum of total days	3928	3425	2365	1282	397	572
	Sum of catch/year (t)	471	421	348	201	57	87
	Sum of GVP (\$m)	7	6	4	2	1	1

[#] Queensland State Government Fisheries, not Commonwealth

Table 36. Summary of all fishing industry activity – 2007[#]

Fishing Method	Data	Year					
		2002	2003	2004	2005	2006	2007
Total summary of all methods	Sum of boats	847	816	724	611	570	545
	Sum of total days	93583	89133	71522	59911	55386	51267
	Sum of catch/year (t)	12023	11753	10006	8446	7826	6757
	Sum of GVP (\$m)	142	135	112	98	92	79
Line	Sum of boats	421	389	290	218	212	220
	Sum of total days	30710	26579	15077	12364	10218	11127
	Sum of catch/year (t)	3669	3285	1820	1511	1283	1517
	Sum of GVP (\$m)	60	53	32	28	23	27
Net	Sum of boats	264	263	255	213	207	222
	Sum of total days	20541	21397	21389	15944	17016	16808
	Sum of catch/year (t)	3672	3749	3781	2998	2935	2995
	Sum of GVP (\$m)	19	18	19	15	16	16
Pot	Sum of boats	190	209	200	158	171	180
	Sum of total days	16103	19575	17232	15274	14598	14586
	Sum of catch/year (t)	368	403	396	385	394	360
	Sum of GVP (\$m)	6	6	6	6	6	6
Trawl	Sum of boats	311	295	260	228	183	146
	Sum of total days	30579	28881	24123	20770	16667	11217
	Sum of catch/year (t)	4194	4208	3816	3409	3014	1648
	Sum of GVP (\$m)	54	54	48	43	39	21

[#] Queensland State Government Fisheries, not Commonwealth

Aquaculture

Prawns, barramundi and redclaw are the main species grown in North Queensland aquaculture.

The total ponded area in North Queensland is approximately 489 hectares. It is valued at \$44.8 million and employs approximately 366 people.

Barramundi

Table 37. Summary of barramundi industry – 2007/08

Total area under production	140.9ha
Total production	1170t
Number of farming business units	18
Average production	8.3t/ha
Average farm gate price	\$8.82/kg
Total farms	43
Farm gate Industry gross income	\$10323804

Prawns

Table 38. Summary of prawn industry – 2007/08

Total area under production	132.7ha
Total production	479t
Number of farming business units	6
Average production	3.61t/ha
Average farm gate price	\$14.61/kg
Total farms	16
Farm gate Industry gross income	\$7000450

Redclaw

Table 39. Summary of redclaw industry – 2007/08

Total area under production	30.1ha
Total production	38.5t
Number of farming business units	8
Average production	1.288t/ha
Average farm gate price	\$14.24/kg
Total farms	33
Farm gate Industry gross income	\$548159

Other aquaculture activities

A new addition to North Queensland aquaculture is the first ever pond reared flowery cod. The flowery cod were matured in cages in secure ponds at QPIF's Townsville facility for almost 12 months and were harvested in December 2007. The next stage for development of the flowery cod is to supply fingerlings to commercial aquaculture enterprises.

The Queensland grouper, an estuarine fish that goes out to sea to spawn, is another new addition to North Queensland aquaculture. Once a spawning population is established at QPIF's Northern Fisheries Centre the fingerlings will be available to supply the Queensland aquaculture industry.

Other industries include eels, pearls and other fish species.

Table 40. Summary of other aquaculture activities (eels, pearls and other fish species) – 2007/08

Total area under production	9.2ha
Total production	24.7t
Number of farming business units	9
Average production	2.68t/ha
Average farm gate price	\$126.08/kg
Total farms	41
Farm gate Industry gross income	\$3114246

Source: Ross Lobegeiger & Greg Mason, QPIF

Forestry

The North Queensland commercial forestry industry is based in the Wet Tropics and on Cape York.

The majority of timber plantations are managed by Managed Investment Schemes (MIS) such as Rewards, Integrated Tree Cropping, Great Southern Limited and Northern Tropical Timbers.

The main timber species planted in North Queensland are African mahogany, red mahogany, teak and sandalwood.

Other timbers planted are hoop pine and Caribbean pine.

African mahogany (*Khaya senegalensis*)

African mahogany is a high valued timber used for cabinet woods, etc.

In recent years shire councils, including Charters Towers Regional Council and the former Mareeba Shire Council, have investigated the use of plantations to efficiently recycle municipal effluent and have adopted African mahogany as an important component of these systems.

Numerous private landowners have invested their own money into well managed African mahogany plantings.

The area of the African mahogany estate in North Queensland is estimated as follows:

- Northern Tropical Timber plantations – 355 hectares
- Comalco – 165 hectares
- Private landowners – 156 hectares
- QPIF trials – 12 hectares.

Red mahogany

Red mahogany is mainly used for structural housing timbers.

Sandalwood

Sandalwood oil is mainly used for pharmaceuticals and perfumes (e.g. Chanel No. 5).

Teak

Teak is a high value timber used for cabinet woods, etc.

Other timber crops

Hoop pine is grown on the Atherton Tablelands, with approximately 3000 hectares valued at \$45/m³.

Caribbean pine is grown near Cardwell, Ingham, Kuranda and on the Atherton Tablelands, with approximately 12000 hectares valued at \$30/m³.

Wet Tropics

In the Wet Tropics red mahogany and teak are grown.

Integrated Tree Cropping grows 1000 hectares of red mahogany near Cardwell, yielding 27.5m³/ha, valued at \$112/m³. Rewards grow 400 hectares of teak, yielding 14.25m³/ha, valued at \$161/m³.

Estimated additional industry growth in 2007/08

- Integrated Tree Cropping growing 1500 hectares of red mahogany.
- Rewards growing 400 hectares of teak.
- Great Southern Limited growing 2000 hectares of teak.
- Tree rotation length is:
 - ~ Red mahogany: 18 years
 - ~ Teak: 20 years.

Cape York

On Cape York African mahogany and teak are grown near Cooktown. African mahogany is also used on mine rehabilitation sites at Weipa.

In 2007, Northern Tropical Timbers grew 355 hectares of African mahogany, yielding 18.5m³/ha at approximately \$400/m³. Integrated Tree Cropping grew 455 hectares of teak, yielding 14.25m³/ha at approximately \$161/m³.

Estimated additional industry growth in 2007/08

- Integrated Tree Cropping is planning to grow 600 hectares of sandalwood at 800kg/ha valued at \$40/kg.
- The tree rotation length is:
 - ~ African mahogany: 15-20 years
 - ~ Sandalwood: 15-20 years
 - ~ Teak: 20 years

Source: Geoff Dickinson, QPIF

Horticulture Industries

Horticultural crops in the North Region are grown in two distinct climatic areas – the dry tropics and the wet tropics. The dry tropics refer to areas between the Tropics of Capricorn and Cancer, which have a dominant summer rainfall and a pronounced and extended dry season. The dry tropics in the North Region consist of the Burdekin basin, Townsville and the Atherton Tablelands west of Cairns. The wet tropics, which have a more extensive rainfall pattern, consists of the coastal littoral from Cardwell, north of Townsville to Cooktown and Cape York Peninsula.

The North Region produces a wide range of horticultural crops ranging from tropical fruits such as bananas, mangoes, avocados, pineapples and lychees to the more familiar crops such as capsicums, pumpkins, potatoes and tomatoes.

Dry Tropics

The Burdekin basin, located around the town of Ayr, is a fertile, alluvial plain situated in the dry tropics. The most important horticultural crops grown in the Burdekin basin are mangoes, lychees, melons (honeydew and rockmelon), capsicums, eggplant, sweetcorn, peanuts, pumpkin and zucchini. Pineapples and carambolas are grown at Rollingstone, north of Townsville, while potatoes are grown west of Townsville. At Charters Towers, west of Townsville, table grapes and mangoes are grown.

Wet Tropics

The Wet Tropics coastal plain extends from Cardwell to Mossman, north of Cairns.

The main horticultural crops grown in the Cardwell, South Johnstone and Innisfail areas are bananas, papaya, lychees, tea, coffee, cocoa, taro, chokos, pumpkins, zucchinis, passionfruit, mangosteens, rambutans, pummelos, chillies, langsat and yam beans. In the Cairns area sweet potatoes and vanilla are grown, while turf is grown in the Mulgrave River Valley. At Mossman, north of Cairns, a wide variety of tropical crops are grown. The main tropical crops grown are rambutans, mangosteens, durians, dragon fruit, carambolas, soursops and breadfruit along with tea, cocoa and citrus (limes).

Atherton Tablelands

The Atherton Tablelands are situated west of Cairns and are in the dry tropics. The horticultural production area extends from Dimbulah in the west, to Mareeba in the north and Ravenshoe in the south, encompassing the former shires of Atherton⁷, Eacham⁸, Herberton⁹ and Mareeba. The main horticultural crop production area is between Dimbulah, Mareeba and Atherton. The Atherton Tablelands produces both tropical and sub-tropical crops as well as temperate crops.

The varied list of horticultural crops grown on the Atherton Tablelands includes avocados, bananas, mangoes, longans, lychees, pineapples, papaya, table grapes, strawberries, citrus (limes, mandarins, lemons, grapefruit, pummelos and oranges), custard apples, pumpkins, navy beans, tomatoes, watermelons, flowers, persimmons, asparagus, zucchini, capsicums, onions, eggplant, sweet potatoes, organic herbs, jackfruit, star apples, dragon fruit, dates, coffee, cashews, tea tree and macadamias. At Julatten, on the northern edge of the Atherton Tablelands, lychees and avocados are grown.

Cape York

The main horticultural crop grown near Lakeland is bananas. While at Cooktown, the main horticultural crops grown are passionfruit, longans, rambutans and lychees.

⁷ The former Atherton Shire is now part of the Tableland Regional Council.

⁸ The former Eacham Shire is now part of the Tableland Regional Council.

⁹ The former Herberton Shire is now part of the Tableland Regional Council.

A profile of major horticultural crops

Avocados

The North Queensland avocado industry is based principally on the Atherton Tablelands.

The first commercial plantings of avocados occurred on the Atherton Tablelands in 1974, in the Tolga-Walkamin area.

Increased plantings are taking place across the Atherton Tablelands, particularly in the Dimbulah and Mutchilba areas.

Shepard and Hass are the main varieties of avocado grown, along with small numbers of Fuerte and Sharwil varieties. Shepard is the first Australian variety on the market in late February, with the Atherton Tablelands being the earliest production area. The avocado season in North Queensland extends mainly from February to July.

The peak industry organisation is Avocados Australia Ltd, which manages a research and development program and a marketing campaign paid for by a compulsory national levy which is collected on all fresh avocados at first point of sale.

Queensland produces 70% of Australia's crop with 20% of the total production coming from the Atherton Tablelands.

QPIF, in conjunction with funding bodies, are conducting research into best practice for profitability, pest and diseases control and fruit quality.

The main markets for North Queensland avocados are Brisbane, Sydney, Newcastle, Melbourne, Hobart and Adelaide. Exports are currently limited but the industry plans to explore opportunities to expand the export market, mainly to Asia.

In recent years Managed Investment Schemes (MIS) have started to invest in avocados, particularly in southern production areas. Approximately 30% of Australian avocados are now under control of MIS companies like Timbercorp.

The avocado industry is a strong, well organised industry with Queensland as the dominant national producer. The only competition in the Australian market is from New Zealand.

Table 41. Summary of Atherton Tablelands avocado industry – 2007/08

Total area under production	749.33ha
Total production	112400 trees
Number of farming business units	80
Average production	9t/ha
Average farm gate price	\$3.40/kg
Average land value	\$15000/ha
Total tonnes	6744t
Farm gate Industry gross income	\$22929600

Source: Matthew Weinert & Greg Mason, QPIF

Bananas

The banana industry in North Queensland is located in the wet tropics, mainly from Cardwell to Cairns, with increased production in the dry tropics from Mareeba to Walkamin. There are also minor plantings around Lakeland, Daintree and Bowen. North Queensland's climate allows a year round harvest, with a small summer peak.

The main type of banana planted in North Queensland is the Cavendish (cultivars Williams and Grande Naine). There are also minor plantings of Ladyfinger, Ducasse, Senorita/Sucrier and Pacific Plantain.

The North Queensland banana industry produces approximately 85% of Australia's banana crop.

Approximately 10% of banana production in North Queensland is grown on the Atherton Tablelands.

North Queensland bananas are for the domestic market only. The main buyers are large wholesale merchants, large national and regional distributors and retail chains. Price considerations mean that bananas are unlikely to develop as a major export.

An outbreak of black Sigatoka in 2001 on banana plantations at Tully, south of Innisfail, was eradicated following an extensive eradication program.

In 2006 Cyclone Larry destroyed a large number of plantations around Innisfail and on the Atherton Tablelands. Payment on loans that were given after Cyclone Larry commenced in 2008. Production is expected to rise steadily and prices fall after producers return to full production after recovering from Cyclone Larry.

Wet Tropics

Table 42. Summary of Wet Tropics Cavendish banana industry – 2007/08

Total area under production	9000ha
Total production	289800t
Number of farming business units	210
Average production	32.2t/ha
Average farm gate price	\$1.38/kg
Average land value	\$25000/ha
Total production	289800t
Total cartons	21076363.64
Farm gate Industry gross income	\$379374545

Table 43. Summary of Wet Tropics Ladyfinger banana industry – 2007/08

Total area under production	80ha
Total production	887.04t
Number of farming business units	5
Average production	11.09t/ha
Average farm gate price	\$2.85/kg
Average land value (\$/ha)	\$25000/ha
Total production	887.04t
Farm gate Industry gross income	\$2386944

Atherton Tablelands

Table 44. Summary of Atherton Tablelands Cavendish banana industry – 2007/08

Total area under production	435ha
Total production	15312t
Number of farming business units	15
Average production	35.2t/ha
Average farm gate price	\$1.38/kg
Average land value	\$20000/ha
Total production	21771.75t
Farm gate Industry gross income	\$21201231

Table 45. Summary of Atherton Tablelands Ladyfinger banana industry – 2007/08

Total area under production	300ha
Total production	4455t
Number of farming business units	5
Average production	14.85t/ha
Average farm gate price	\$2.69/kg
Total production	4455t
Farm gate Industry gross income	\$11994231

Source: Jeff Daniells & Greg Mason, QPIF

Beans

The fresh-market bean industry in North Queensland is located in dry tropics of the Bowen and Burdekin regions.

In the Bowen region in 2005, 2000 hectares produced 16000 tonnes, valued at \$22 million. Fresh-market beans service the domestic market only.

The prospects for the industry are good with a strong and stable market combined with good operators. However, no large expansion of the industry is anticipated in the near future.

Table 46. Summary of Burdekin bean industry – 2007/08

Total area under production	800ha
Total production	9611t
Number of farming business units	2
Average production	12.01t/ha
Average farm gate price	\$1.80/kg
Total production	9611t
Farm gate Industry gross income	\$12456000

Source: Ian Walker & Greg Mason, QPIF

Capsicums

The capsicum industry in North Queensland is located in the dry tropics of the Bowen and Burdekin regions. There are also small volumes grown on the Atherton Tablelands.

Approximately 75% of the Queensland capsicum crop is grown in North Queensland.

Queensland production of capsicums is 89% of the national production.

The main varieties of capsicum grown in North Queensland include Merlin, Aries, Warlock and Tycoon.

In the former Bowen Shire¹⁰ in 2005, approximately 1120 hectares were under production producing 29000 tonnes, valued at \$45 million.

The capsicum season in North Queensland extends from May to December, with peak production during August to October.

The capsicum industry is a strong one that has a few large, well organised growers.

Exports account for less than 10% of the North Queensland production.

The major export markets are New Zealand and, to a lesser extent, Hong Kong and Singapore.

Table 47. Summary of Burdekin capsicum industry – 2007/08

Total area under production	130ha
Total production	3744t
Number of farming business units	6
Average production	28.8t/ha
Average farm gate price	\$1.88/kg
Total production	3744t
Farm gate Industry gross income	\$7020000

Source: Ian Walker & Greg Mason, QPIF

Citrus

The citrus industry in North Queensland is mainly located on the Atherton Tablelands and on the tropical wet coast.

The citrus season on the Atherton Tablelands is variety specific. Imperial mandarins are available from March to early May, while Muscott mandarins are available from July to early September.

Lemons are available from January to May

Limes have three fruiting periods, November to January, May and then August.

Grapefruits are available from April to July.

The main domestic markets for North Queensland citrus are Brisbane, Sydney and Melbourne.

Currently there is no citrus value-adding in North Queensland.

¹⁰ The former Bowen Shire is now part of the Whitsunday Regional Council.

Table 48. Summary of Atherton Tablelands citrus industry (oranges, mandarins, lemons, limes and grapefruit) – 2007/08

Total area under production	310ha
Total production	79943 trees
Number of farming business units	120
Average production	18.224t/ha
Average land value	\$15000/ha
Total production	5649.44t
Farm gate Industry gross income	\$7388335

Source: James Drinnan & Greg Mason, QPIF; Chris Horsburgh, ex DPI&F

Coffee

The coffee industry in North Queensland is located on the Atherton Tablelands, mainly in the Mareeba-Dimbulah area.

The Australian coffee industry began in the 1880s, but did not survive beyond the 1920s due to high labour costs. The introduction of machine harvesting led to the re-establishment of the coffee industry in the 1980s.

Australia does not have the major pests and diseases of the other coffee producing countries. Australia grows only the higher quality Arabica coffee used in the roast and ground market. The main varieties of Arabica coffee grown are Catuai Rojo, Mundo Novo and Borburn.

The coffee season in North Queensland extends from May to August.

Approximately 50% of the crop is sold in the domestic market and 50% is exported, mainly to Japan, Germany, France, Spain, Greece, the UK and the United States.

A number of coffee producers are value-adding by establishing a tourist component to their properties.

Table 49. Summary of Atherton Tablelands coffee industry – 2007/08

Total area under production	220ha
Total production	330000kg
Number of farming business units	10
Average farm gate price	\$5.50/kg
Farm gate Industry gross income	\$1815000

Source: James Drinnan & Greg Mason, QPIF

Eggplant

The eggplant, or eggfruit, is a native of India. Eggplant belongs to the Solanaceae family which contains such crops as tomato and capsicums. Eggplant is also known as aubergine.

In the North Region eggplant is grown mainly in the Burdekin region. The industry has a high level of growing expertise and business knowledge.

Eggplant production is very labour intensive during planting, harvesting and packing. Eggplant is a warm weather plant that can be grown as a winter crop.

The crop supplies the Sydney, Brisbane and Melbourne markets, where there is a growing demand from the Asian and Middle Eastern communities in those centres.

Seedlings are raised to 10-12cm before transplanting into the field. Harvesting usually takes place 14-18 weeks after transplanting. The main planting time is May to September. Eggplant is sensitive to frost.

Varieties and cultivars include Black Gnome, Black Bell, Mission Bell and Market Supreme.

Eggplant is susceptible to the eggfruit caterpillar, cutworms, spider mite, the potato tuber moth and the heliothis moth. Fungal and bacterial diseases include bacterial wilt, bacterial soft rot and verticillium wilt.

There are no eggplant exports from North Queensland.

Table 50. Summary of Burdekin eggplant industry – 2007/08

Total area under production	100ha
Total production	5000t
Number of farming business units	7
Average production	50t/ha
Average farm gate price	\$2.00/kg
Total production	5000t
Farm gate Industry gross income	\$10000000

Source: Greg Mason, QPIF

Grapes

Grapes originated from western Asia and are one of the oldest cultivated plants. In North Queensland grapes are grown in the Burdekin area and on the Atherton Tablelands.

The table grape season in North Queensland extends from September to November.

The main market for North Queensland table grapes is Brisbane. Table grapes from North Queensland are supplied to the domestic market in the very early part of the season when prices are at their highest.

There is optimism that the grape industry will expand in the Burdekin due to the seasonality of the crop and the market window opportunity. The crop can be harvested before any other table grape crop area in Australia.

Table 51. Summary of Burdekin grape industry – 2007/08

Total area under production	50ha
Total production	868t
Number of farming business units	2
Average production	17.36t/ha
Average farm gate price	\$4.00/kg
Total production	868t
Farm gate Industry gross income	\$2500000

Source: Greg Mason, QPIF

Longans

The longan (*Dimocarpus longan*) belongs to the Sapindaceae family. The longan is closely related to the lychee and has a similar growth and fruiting habits. The fruit is smoother and yellow-tan to brown in colour, milder in flavour and less acidic.

Approximately 30000 trees are grown in Australia, with the major growing centres from Cairns and the Atherton Tablelands to Coffs Harbour in northern New South Wales.

The major commercial varieties are Kohala, Dang, Daw, Homestead No.1, Champoo, Haew and Biew Kiew. Yield ranges from 23-57kg per tree. Major production occurs between January to March.

The longan industry in North Queensland is centred around Mareeba on the Atherton Tablelands with smaller coastal plantings south of Ingham.

The main varieties of longan grown are Kohala and Biew Kiew, then Champoo with minor plantings of Haew and Homestead.

The ripening season usually runs from January to April.

The main consumer market is ethnic Asian people through retail chains and traditional stores in Sydney and Melbourne.

Table 52. Summary of Atherton Tablelands longan industry – 2007/08

Total area under production	135ha
Total production	26950 trees
Number of farming business units	20
Average production	7.7t/ha
Average farm gate price (7kg carton)	\$5.00/kg
Average land value	\$15000/ha
Total tonnes	1042t
Farm gate Industry gross income	\$5211456

Source: James Drinnan & Greg Mason, *QPIF; Horticulture Australia 1995*

Lychees

The lychee industry in North Queensland is located on the Atherton Tablelands, the tropical wet coast from Tully to Mossman and from Rollingstone to Cardwell.

Queensland produces 90% of the national lychee crop.

The main varieties grown are Kwai May Pink (B3), Tai So and Fay Zee Siu with minor volumes of Sui Tong, Salathiel, Wai Chee, Kiamana and Bengal.

The harvest season is in November and December.

Domestic consumption accounts for approximately 80-85% of the crop, which goes to capital city markets in Sydney, Brisbane and Melbourne.

The industry exports around 15-20% of the crop, mainly to Hong Kong, Canada, the Middle East and Europe.

Table 53. Summary of Wet Tropics lychee industry – 2007/08

Total area under production	120ha
Total production	27000 trees
Number of farming business units	25
Average production	5.4t/ha
Average farm gate price(5kg carton)	\$5.00/kg
Average land value	\$15000/ha
Total tonnes	648t
Farm gate Industry gross income	\$3240000

Table 54. Summary of Atherton Tablelands lychee industry – 2007/08

Total area under production	322.65ha
Total production	49688 trees
Number of farming business units	45
Average production	5.85t/ha
Average farm gate price(5kg carton)	\$5.00/kg
Average land value	\$15000/ha
Total tonnes	1887t
Farm gate Industry gross income	\$9437494

Source: Yan Diczbalis, Greg Mason & Claudio De Faveri, QPIF; Peter Tonello, ex DPI&F

Mangoes

The mango industry in North Queensland is located in the Dry Tropics and the Atherton Tablelands sub-regions, with the main production regions around Mareeba, Mutchilba and Dimbulah.

Mangoes were first introduced into Australia from India at Bowen in the mid 1880s.

The mango tree was mainly a backyard feature until a small but steady increase in commercial plantings occurred in the 1970s, firstly in the Burdekin area then later on the Atherton Tablelands.

The main variety of mango grown in North Queensland is the Kensington Pride followed by other important varieties such as R2E2, Calypso, Honey Gold, Keitt, Kent, Brooks and Nam Doc Mai.

In the Burdekin the Kensington Pride variety accounts for 65% of mango production. R2E2 represents 30% of total production while other varieties represent 5% of mango production.

On the Atherton Tablelands there are a number of rare mango cultivars such as Sunset Blush, Manzanillo and Honeygem. There are also a small number of organic mango growers producing organic Kensington Pride, Kent, Palmer and Brooks mangoes.

Mango production in North Queensland occurs in the Dry Tropics between October and December. On the Atherton Tablelands production occurs from December to February.

In 1999 the industry established the Australian Mango Industry Association (AMIA) which employs an Industry Development Manager. The AMIA have a compulsory national levy which is collected at the first point of sale on all fresh mangoes, both domestic and export, but not on processed fruit.

In recent years Managed Investment Schemes (MIS) have started to develop in mangoes. Timbercorp, a Melbourne based public company, has planted over 60000 trees (200 hectares) of the B74 Calypso variety on a plantation near Dimbulah. The Rewards group have purchased a number of existing mango plantations on the Atherton Tablelands and other mango growing areas.

QPIF is leading a national mango breeding program for better mango quality and tree productivity of the Kensington Pride variety. This program is based at Southedge Research Station, north-west of Mareeba. Due to the proposed sale of Southedge this program will be moving to nearby Walkamin Research Station.

Extensive research into mango pests and diseases is currently being carried out by QPIF. They are conducting research into the mango seed weevil and the red banded mango caterpillar while keeping a close watch on the mango leafhopper. For the latter a quarantine zone has been set up north of Coen on Cape York Peninsula. The mango seed weevil is a barrier to mango exports.

QPIF is also promoting Integrated Pest Management (IPM) programs through on-farm workshops. The workshops provide information to help producers to more closely monitor their orchards and record the insects they detect before making decisions on control options.

Mango scale is the number one insect pest in Queensland, causing pink blemishes on the fruit.

QPIF's "Asian Markets for Horticulture" initiative is funding research and extension activities to improve market access for Australian mangoes into key export destinations in Asia including China, Malaysia and South Korea.

Australian mangoes have been exported from Rewards' plantations in Western Australia (R2E2) and the Northern Territory (Calypso) direct to China. The R2E2 mangoes were transported to the Diamond Star facility near Mareeba for vapour heat treatment for the eradication of the Queensland fruit fly. Rewards are now harvesting mangoes from their Mareeba plantations for export to China.

Exports represent less than 5% of total production.

The Golden Drop Winery north of Mareeba was established in 1999 and was the first commercial mango winery in North Queensland to produce mango wines, port, sparkling wines and fortified liqueur style cellos. These wines are mainly produced from the Kensington Pride Red variety.

Table 55. Summary of Burdekin mango industry – 2007/08

Total area under production	1500ha
Total production	360000 trees
Number of farming business units	150
Average production	210t/ha
Average farm gate price	\$2.50/kg
Total production	22050t
Farm gate Industry gross income	\$50715000

Table 56. Summary of Atherton Tablelands mango industry – 2007/08

Total area under production	2492ha
Total production	461100 trees
Number of farming business units	450
Average production	300t/ha
Average farm gate price	\$2.43/kg
Average land value	\$15000/ha
Total tonnes	26170.54t
Farm gate Industry gross income	\$53200970

Source: Ian Bally & Greg Mason, QPIF

Melons

The melon industry in North Queensland is located in the Dry Tropics, with smaller volumes grown on the Atherton Tablelands.

The area estimated under production for watermelons in the former Bowen Shire is 500 hectares, producing 12000 tonnes, valued at \$5.8 million.

The main production season for melons in North Queensland is May to June and from September to early December.

The main export markets for melons from North Queensland are Hong Kong, New Zealand, Singapore and the Middle East.

North Queensland has an ideal period during the winter months for melon production.

The melon industry is well organised with specialist growers. Melons are a big industry valued at over \$30 million.

The main varieties grown in the region are:

- **Rockmelon:** Hybrid varieties, Dubloon, Eastern Star, Eldorado, Flinders, Hammersley, Hiline, Hotshot, Ivanhoe, Malibu, Mission, Morocco, Otway, Pablo, Picnic, Sahara and Stirling.
- **Honeydew:** Hybrid varieties, Casper, Dewcrisp, Dewsweet, Dewette, Full Moon, Glacier, Honeybale, Honeymoon, Limelight, Sweet Success and White Mist.
- **Watermelon:** Warpaint, Madera and Mirage.

Rockmelon and honeydew

Table 57. Summary of Burdekin rockmelon and honeydew melon industry – 2007/08

Total area under production	400ha
Total production	17857t
Number of farming business units	11
Average production	44.64t/ha
Average farm gate price	\$0.93/kg
Total production	17857t
Farm gate Industry gross income	\$15810000

Watermelon

The watermelon industry is now dominated by seedless varieties, and therefore the tables below reflect the current market trend.

Table 58. Summary of Burdekin seedless watermelon industry – 2007/08

Total area under production	340ha
Total production	12750t
Number of farming business units	5
Average production	37.5t/ha
Average farm gate price	\$0.80/kg
Total production	12750t
Farm gate Industry gross income	\$10200000

Table 59. Summary of Wet Tropics seedless watermelon industry – 2007/08

Total area under production	60ha
Total production	2250t
Number of farming business units	15
Average production	2250t/ha
Average farm gate price	\$0.80/kg
Average land value	\$15000/ha
Farm gate Industry gross income	\$1800000

Table 60. Summary of Atherton Tablelands seedless watermelon industry – 2007/08

Total area under production	80ha
Total production	3000t
Number of farming business units	15
Average production	3000t/ha
Average farm gate price	\$0.80/kg
Average land value	\$15000/ha
Farm gate Industry gross income	\$2400000

Source: Ian Walker & Greg Mason, QPIF

Papayas/Papaws

The current consumer trend in marketing these fruits is to describe the yellow fleshed varieties as papaws and the red fleshed varieties as papayas. In this document both fruit types are referred to under the generic term papaya.

The papaya industry in North Queensland is located on the tropical wet coast from Tully to Daintree and on the Atherton Tablelands.

The main variety of papaya in North Queensland is the yellow papaya, particularly the hybrid variety 1-B. Production of red papaya, particularly the Solo types, is increasing.

A hybrid papaya, called Bruno's Choice, has been developed by hybridising the Solo and Thai Red variety.

The papaya season in North Queensland extends all year, with peak production between March and June and later in the year between October and December.

Queensland produces 89% of the national papaya crop.

In Australia, the main markets for North Queensland papaya are Brisbane, Sydney and Melbourne.

The volume of papaya exported from North Queensland annually is quite low. Papaya is generally sent as part of mixed orders to Hong Kong and Singapore.

There seems to be a decrease in fruit from Innisfail growers but an expansion in the number of growers in the Tully and Mareeba areas.

Table 61. Summary of Wet Tropic papaya industry – 2007/08

Total area under production	70ha
Total production	7371t
Number of farming business units	9
Average production	105.3t/ha
Average farm gate price	\$0.94/kg
Average land value	\$15000/ha
Farm gate Industry gross income	\$9639000

Table 62. Summary of Atherton Tablelands papaya industry – 2007/08

Total area under production	162ha
Total production	17059t
Number of farming business units	9
Average production	105.3t/ha
Average farm gate price	\$0.94/kg
Average land value	\$15000/ha
Farm gate Industry gross income	\$22307400

Source: Greg Mason, QPIF; Gerard Kath, Chairman, Papaya Australia

Passionfruit

Passionfruit produce fruit all year around with a major peak period in December-January and two small peaks in March-April and July-August.

Mature fruit fall to the ground from where they are harvested. This practice is changing where picking off the plant improves product qualities.

Passionfruit is generally grown as a dual purpose crop with fruit being marketed to the fresh and processing markets.

The bulk of the fresh fruit is generally consigned to the major metropolitan wholesale markets of Brisbane, Sydney and Melbourne. A small quantity of fruit is exported to Southeast Asia, the Pacific and to the Middle East. Most processing fruit is handled by processor in south-east Queensland and northern New South Wales.

Queensland and New South Wales are the main producers, accounting for approximately 40% of supply, with the remainder coming from Western Australia and Victoria.

The common varieties grown in the Queensland are Supersweet, Tom’s Special and 96A. In the tropics the dominant variety Panama – a purple skinned selection of the golden passionfruit *P. edulis f. flavicarpa*, is popular for its large attractive fruit.

Vines are grown on trellises and can be expected to start bearing at about 6 months and peak about 12 months. Commercial hybrids generally yield from 10 to 25 tonnes per hectare, depending on management. Plant densities range from 555 to 838 plants per hectare.

Passionfruit is popular with new growers as it offers relatively quick returns compared to other orchard crops, with smaller investment required. However, over the pass 20 years the industry has been somewhat unstable and unpredictable with regular cycles of “boom and bust”.

Passionfruit are susceptible to a wide range of pests and diseases. Failure to act quickly can result in complete loss of crop, indicating poor management and crop hygiene.

Table 63. Summary of Wet Tropic passionfruit industry – 2007/08

Total area under production	120ha
Number of farming business units	30
Average farm gate price (7kg cartons)	\$2.57/kg
Total tonnes	1798.28t
Farm gate Industry gross income	\$3275439

Source: *Passionfruit Agrilink; Greg Mason, QPIF*

Pineapples

Apart from a small holding at Ballina in New South Wales, Queensland produces the entire Australian crop.

The pineapple industry in North Queensland is confined to the Atherton Tablelands with small plantations at Rollingstone.

The main variety of pineapple grown is the Smooth Cayenne.

Two crops are planted during the year. The first is usually planted between April and June and the second between November and December. For example, a crop planted in April to June 2007 will be harvested in November to December 2008 and a new crop planted.

There is no mechanisation in the growing of pineapples. All planting and harvesting is done by hand.

Queensland grows an estimated 2614 hectares of pineapples which produces an estimated 104738 tonnes.

The area under production on the Atherton Tablelands is 121 hectares, producing approximately 30000 tonnes, valued at \$7.35 million.

The Scurr property (350 acres) just outside Mareeba uses the brand name “Piñata Marketing” and markets pineapples under the name “Mareeba Gold”.

The crop at Mareeba only takes eighteen months to grow, unlike plantations near the Glasshouse Mountains that can take up to two years to produce a crop.

Ninety percent of all fruit from “Piñata Marketing” is sold through Coles and Woolworths. Some 200 tonnes of blemished fruit is sent to the Golden Circle cannery in Brisbane for juicing.

“Piñata Marketing” doesn’t produce enough volume for export and can’t compete with multinational companies like Dole and Del Monte. Attempts to export to New Zealand were undercut by Dole and Del Monte, who dropped costs to force out “Piñata Marketing.”

No foreign fresh pineapple is currently allowed into Australia.

Source: Claudio De Faveri, QPIF; Peter Tonello, ex DPI&F; Gavin Scurr

Potatoes

The potato originated from the northern Andes region of South America.

Queensland produces less than 9.3% of the national potato crop.

The potato industry in North Queensland is located on the Atherton Tablelands, with some production west of Townsville.

The main varieties of potato grown in North Queensland are Sebago, Atlantic and Pontiac.

The potato season in North Queensland extends from July to December.

The majority of the Atherton Tablelands potato crop is sold for the fresh market, with the majority going to Sydney. A smaller proportion goes to processors for potato crisp production.

Table 64. Summary of Atherton Tablelands potato industry – 2007/08

Total area under production	2348ha
Total production	82180t
Number of farming business units	70
Average production	35t/ha
Average farm gate price	\$617.50/t
Average land value	\$20000/ha
Farm gate Industry gross income	\$50746150

Source: John Fitzpatrick, Michael Hughes & Greg Mason, QPIF

Pumpkins

Pumpkins in North Queensland are grown on the Atherton Tablelands and in the Dry Tropics of the Bowen and Burdekin regions.

In the former Bowen Shire in 2005, 200 hectares produced 4500 tonnes valued at \$1.8 million.

On the Atherton Tablelands the majority of pumpkins are the Butternut variety with smaller plantings of Jap, Kent and Jarradale.

The pumpkin industry fluctuates depending on supply and demand of the market and crop losses in other regions. Cane growers treat this crop as opportunistic and therefore distort yields and gross margins.

Pumpkin oil production from pumpkin seed is a recent and small but potentially valuable industry. The pumpkin oil seed industry is based near Dimbulah.

Table 65. Summary of Atherton Tablelands pumpkin industry – 2007/08

Total area under production	180ha
Total production	5400t
Number of farming business units	50
Average production	30t/ha
Average farm gate price	\$0.75/kg
Average land value	\$15000/ha
Farm gate Industry gross income	\$4050000

Table 66. Summary of Burdekin pumpkin industry – 2007/08

Total area under production	700ha
Total production	8400t
Number of farming business units	5
Average production	12t/ha
Average farm gate price	\$0.67/kg
Total production	8400t
Farm gate Industry gross income	\$5628000

Table 67. Summary of Wet Tropics pumpkin industry – 2007/08

Total area under production	100ha
Total production	3000t
Number of farming business units	20
Average production	30t/ha
Average farm gate price	\$0.75/kg
Average land value	\$15000/ha
Farm gate Industry gross income	\$2250000

Source: Greg Mason, QPIF

Rambutans

Rambutan (*Nephelium lappaceum* L) is a member of the Sapindaceae family and a close relative of the lychee and longan. Rambutan is native to the Malay Peninsula, Sumatra and Borneo. It is an evergreen tree that produces yellow or red, hairy, round to oval fruit about 5cm long and weighing about 25-60g. It is sometimes referred to as the “hairy lychee”. Trees can grow up to 25m in height. Most rambutan trees are clonally propagated, budded, grafted or marcotted. Yield range from 30-60kg per tree, with a tree density of 100 trees per hectare.

Australia produces approximately 500 to 1000 tonnes per annum, with heavy production occurring between March to May and small production from October to February.

The rambutan industry in North Queensland is located in the Wet Tropics coastal areas from Tully to Cooktown and is concentrated around Innisfail. There is a small production area surrounding Darwin in the Northern Territory.

The leading varieties of rambutans in North Queensland are Jitlae, R134, Bingi, R156 Red, R162 and R167.

In Queensland in 2002 there were approximately 24000 trees located on approximately 160 hectares, producing 700 to 1000 tonnes, with a projected value of \$4-\$6 million.

The main season for rambutans is between March and April, with early season supplies from December and late season supply through to June.

The main domestic markets are in Sydney and Melbourne with small volumes sold through Brisbane, Perth, Adelaide and Hobart. The main consumers are ethnic Asians.

Half of the North Queensland crop is exported to wholesalers in Japan who supply retail chains.

Source: Chris Horsburgh, ex DPI&F

Sweetcorn

The bulk of the sweetcorn industry in North Queensland is located in the Bowen and Burdekin regions with a small production area on the Atherton Tablelands.

In the former Bowen Shire, 900 hectares produces 9000 tonnes valued at approximately \$11 million (2005).

At Dimbulah on the Atherton Tablelands there is an organic sweetcorn grower with a gross yearly value of \$500000 and at Julatten there is a smaller organic grower with a yearly gross value of \$50000.

The Dimbulah organic grower uses a QPIF hybrid called Hybrix 5.

Another sweetcorn activity on the Atherton Tablelands is seed production. Pacific Seeds Ltd grows seed of the QPIF Hybrix 5 variety at Innot Hot Springs.

Recently, 27 available and upcoming sweetcorn varieties, all grown under the same conditions at Bowen Horticultural Research Station, were showcased at a Field Day.

The sweetcorn industry in the Bowen and Burdekin regions has four large, highly experienced growers.

Queensland produces 38% of the national sweetcorn production.

Table 68. Summary of Burdekin sweetcorn industry – 2007/08

Total area under production	800ha
Total production	11111t
Number of farming business units	2
Average production	13.89t/ha
Average farm gate price	\$1.38/kg
Total production	11111t
Farm gate Industry gross income	\$11064000

Source: Ian Martin, Ian Walker & Greg Mason, QPIF

Tea

The first tea grown in North Queensland was from seed collected from Ceylon (now Sri Lanka) and planted at Bingil Bay near Tully during the 1880s by the Cutten brothers. In the late 1950s tea was planted on Nerada Estate near Innisfail by a Dr Allan Maruff.

The tea season in North Queensland extends all year, with peak production between October and May. It takes roughly three to five years for trees to become mature for harvesting.

All tea is sent down by road freight to Brisbane for packaging. Currently, no tea is exported from North Queensland.

Nerada make two major grades of tea; tea bags and pot tea.

Table 69. Summary of Atherton Tablelands tea industry – 2007/08

Total area under production	750ha
Total production	2625t
Number of farming business units	4
Average production	3.5t/ha
Average farm gate price	\$2/kg
Average land value	\$20000ha
Farm gate Industry gross income	\$2625000

Source: *Nerada Tea; Greg Mason, QPIF*

Zucchini

Zucchini are mainly grown in the Burdekin region. Zucchini can be grown all year round. Planting times in the Burdekin region are usually between March and August. They require intensive harvesting. This industry has a high level of growing expertise and business knowledge.

Zucchini varieties include Regal Black, Black Belt, Blackjack, Night Rider, Jet Black and Pot Black.

Pests of the zucchini are the cutworm, cucumber fly, leaf eating beetle, nematodes and the heliothis moth. Diseases of the zucchini are anthracnose, downey mildew, powdery mildew and fusarium wilt.

The bulk of the North Queensland crop supplies southern markets. There are no zucchini exports from North Queensland.

Table 70. Summary of Burdekin zucchini industry – 2007/08

Total area under production	100ha
Total production	1600t
Number of farming business units	3
Average production	16t/ha
Average farm gate price	\$1.92/kg
Total production	1600t
Farm gate Industry gross income	\$3842000

Source: *John Brown & Greg Mason, QPIF*

Pig Industry

Queensland represents 22% of the national pig herd. The total of Queensland's gross value of pigs sold for slaughter in 2006/07 was forecast to be \$220 million.

North Queensland plays only a small part in the overall Queensland pig industry, servicing the domestic market through smaller retail chains and local butchers.

The North Queensland pig industry is based in the Dry Tropics at Bowen, Townsville, Charter Towers and the Atherton Tablelands with a combined estimated value of around \$7.4 million (Atherton Tablelands \$3 million, Bowen \$4 million, Townsville \$0.4 million).

There are seven commercial pig farmers on the Atherton Tablelands; two near Townsville, one near Charters Towers and one near Bowen.

The major pig breeds are Large White, Landrace, Duroc and Hampshire, or crosses between them.

Pork Queensland replaced Queensland Pork Producers' in 2006 as Queensland's major pork body.

In 2005/06 Queensland exported 1022 tonnes of pig meat. Major export markets are Singapore and Japan.

In 2007 Australia imported 60%, or 100000 tonnes, of its domestic pig meat. In comparison Australia only imported 25% of pig meat in 2002/03.

Imports come mainly from Canada, Denmark and the United States of America. From Canada, Australia imports mainly boneless legs for ham manufacturing, and from Denmark boneless middles for bacon manufacturing.

Imports seem not to affect the North Queensland pig industry as the imported produce is sold through the major retail chains outside of North Queensland.

Table 71. Summary of Atherton Tablelands pork industry – 2007/08

Total area under production	20ha
Average total sow herd per year	200 sows
Number of farming business units	5
Average production	9 litters/sow
Average farm gate sale price	\$3.10/kg
Average land value	\$25000.00/ha
Farm gate Industry gross income	\$3685762

Source: Robin Boundy, pork producer; Greg Mason, QPIF

Poultry Industry

The majority of chicken meat production is in the south-east of Queensland and is controlled by three companies – Ingham, Barrter-Steggles and Golden Cockerel. Barrter-Steggles is the only company that operates in the north.

The main area of chicken meat production in North Queensland is on the Atherton Tablelands.

The Barrter-Steggles meat processing factory is situated at Mareeba. Processed chickens from the Mareeba factory service domestic chain store outlets and local butchers.

The value of the chicken meat production for Queensland in 2007/08 was forecast to be approximately \$280 million.

Queensland slaughtered approximately 95 million chickens in 2007/08.

For the years 2006/07 the gross value of Queensland's poultry production was forecast to be \$235 million, 2% higher than in 2005/06 and 5% higher than in 2004/05.

Chicken meat processing accounts for approximately 97% of Queensland's chicken production.

Poultry meat is expected to increase in price by about 15% due to the increase in grain prices.

Egg production for Queensland is valued at approximately \$100 million.

Australian egg consumption is about 170 eggs per year per person.

In 2007 an oversupply of eggs in Queensland meant that gross value of production was forecast to drop by 5% to \$95 million. Australian retail egg sales amounted to about \$66.5 million eggs.

The two biggest egg producers in Queensland are on the Darling Downs.

North Queensland supports a relatively small portion of the total egg industry around Cairns and Townsville.

Currently Australia does not import eggs or raw poultry meat, but imports of small quantities of cooked meat have been allowed since 1998.

Table 72. Summary of Atherton Tablelands poultry industry – 2007/08

Total area under production	40ha
Total production	8000000 birds
Number of farming business units	10
Average production	3 sheds
Average farm gate price	\$0.534/bird
Farm gate Industry gross income	\$4456000

Source: Greg Mason, QPIF; Wayne McKeich, Operations Manager, Bartter-Steggles

Grass Seed, Legume Seed and Hay Industries

The tropical pasture seed industry in North Queensland is the most diverse of its kind in the tropical world and is a significant contributor to the local economy. Most of Australia's tropical grass and legume seed is grown in North Queensland, favoured by unique growing conditions and infrastructure.

Within North Queensland, the seed industry returns to farmers approximately \$9 million per annum for seed (farm gate) plus \$3.2 million per annum for hay produced as a by-product of seed production. Local seed processing returns approximately \$1.5 million per annum based on normal tonnage.

These values do not include profits or other spin-off benefits (e.g. trade of inputs) from the trade of seed through contracting seed companies, contractors, wholesalers and retailers.

Overall, the North Queensland seed industry might be estimated at about \$20 million per annum, but it should be recognised that these values are difficult to obtain.

The tropical pasture seed industry has steadily diversified and expanded over the last 30 years. Originally established to support the development of dairy and beef pastures, the industry has expanded to include specialist fodders for stock production, green manures for cane and cropping industries, and short term grazing leys in the tropics and sub-tropics. More recent developments include pasture and hay production in saline environments and summer production in southern grazing systems.

Today, seed of tropical grasses and legumes contributes significantly to the Queensland and Australian economies through enhancing the productivity of core primary industries including:

- beef and dairy, through improved growth and reproductive performance on sown pastures and fodder;
- sugar cane through reduced fertiliser costs and soil conditioning of green manures; and
- field cropping through the use of short term grazing leys.

The value is difficult to quantify but, for example, value for beef production has been estimated between \$40-\$80 million per annum with additional benefits of \$2 million per annum due to new pasture sowings.

Dairy is based completely on sown pastures and legume green manures can increase first harvest yields of sugar cane by over 20%.

The export market for North Queensland grown pasture seed has steadily expanded over the last ten years, built on a reputation for high quality and hygiene.

The export of tropical grasses into the Middle East and Asia has been particularly important in recent years.

The pasture seed industry now includes a wide range of (mostly exotic) grasses and legumes, the majority of which are grown in North Queensland. These are grown in rotation with local field crops to enhance soil structure and break pest and disease cycles. Grass seed is produced mostly on the basalt-derived soils between Walkamin and Kairi, whereas the legumes tend to be grown north of Walkamin within the Mareeba-Dimbulah Irrigation Area (MDIA) on basalt and granite derived soils.

A wide range of grasses are grown in North Queensland, but market demand dictates emphasis on a few species.

During 2007 over 20 cultivars of 14 grass species were grown for seed on the Atherton Tablelands. The Rhodes grasses and signal grass have dominated in recent years with a combined yield of over 500 tonnes per annum.

Approximately 160000 bales of hay was produced as a by-product of grass seed production.

Legume seed production is dominated by the large-seeded green manures and the stylos. In 2007, the combined yield of the green manures was estimated to be approximately 1000 tonnes and frost-affected stylos approximately 70 tonnes (normally over 200 tonnes are produced annually). Overall, more than 25 cultivars of 17 legume species are grown today in North Queensland.

There is a range of specialist support infrastructure for seed producers on the Atherton Tablelands including seed marketing companies, seed drying and cleaning plants, contract seed harvesting and hay production and marketing.

QPIF has provided research, development and extension support for the seed industry as it steadily developed. Current research and development is undertaken by a team of five staff based at Walkamin Research Station. Recent activities include:

- regeneration and characterisation of the tropical forages collection to provide opportunities to develop future varieties of superior grasses and legumes
- two-tiered seed multiplication program to provide:
 - ~ seed for plant evaluation programs throughout Australia,
 - ~ foundation seed and agronomic knowledge for commercial adoption of new varieties, and
 - ~ maintenance of superior varieties of pasture grasses and fodders to meet market expectations
- fast-tracking of superior overseas varieties to enable use in Australia
- agronomic and market assessment of native grasses to meet emerging commercial demand
- the assessment of tropical forages for novel purposes.

Grass seed and legume seed industry

Table 73. Summary of Atherton Tablelands grass and legume seed industry – 2007/08

Total area under production	3917ha
Total production	2356.3t
Number of farming business units	50
Average production	1.7t/ha
Average land value	\$15000/ha
Farm gate Industry gross income	\$12959650

Table 74. Summary of Wet Tropics grass and legume seed industry – 2007/08

Total area under production	175ha
Total production	290.88t
Number of farming business units	5
Average production	1.7t/ha
Average land value	\$15000/ha
Farm gate Industry gross income	\$584575

Hay industry

Table 75. Summary of Atherton Tablelands hay industry – 2007/08

Total area under production	3000ha
Total production (120kg bales)	150000 bales
Number of farming business units	150
Average farm gate price	\$20/bale
Average land value	\$15000/ha
Farm gate Industry gross income	\$3000000

Source: Kendrick Cox & Greg Mason, QPIF

Infrastructure

Transportation

Air freight

Cairns Ports owns and operates the Cairns International Airport. The airport:

- has Airfield Operations available 24 hours per day
- handles aircraft movements of around 130000 per annum
- is Australia's fifth busiest in terms of international passengers
- had revenue totalling \$71.3 million in 2006/07.

Figure 4 illustrates the air transportation network that links Queensland to the rest of the world.

Sea

Figure 4 illustrates the sea transportation network that links Queensland to the rest of the world.

Cairns

Cairns Ports owns and operates the Cairns Seaport. Cairns Seaport is the most northern port on the eastern seaboard and is the closest port to the Great Barrier Reef. It is a small multi-purpose regional port.

The port's bulk cargo includes petroleum products, sugar, fertiliser and liquid petroleum gas.

The port has long been the natural consolidation and redistribution centre for supplies that are shipped to the coastal communities north of Cairns, the Torres Strait Islands and the Gulf of Carpentaria.

The port is as a supply and service centre for mine operations in Papua New Guinea and Indonesia.

The port contains a molasses and bulk sugar terminal.

The port also is home to Australia's largest fishing fleet.

Berths, wharves and moorings

Wharves no. 1-6

Wharves 1 to 6 form a continuous quay length of 595m with a height of 4.9m above port datum and a design depth of 8.3m LAT, unless otherwise noted. These wharves are used predominately for cruise vessels and visiting naval vessels. The wharves are also used as overflow for tourist and fishing vessels and other coastal shipping. Heritage listed cargo sheds are on wharves 2 and 3; one of which is used as an international cruise terminal. The aprons in front of the shed are 8m and wharves 4-6 have a 27m apron width.

Wharves no. 7-8

With general cargo, dry bulk, containers and fertiliser berths, wharves 7 and 8 form a continuous quay length of 250m with a height of 5m above datum and a width of 27.8m. Design depth alongside is 9.5m LAT. The wharf has a trelex fendering system which can accommodate vessels with up to 40000 tonnes of dead weight capacity and the distance from the outer edge of the fender to the waling piece is 1.35m. The cargoes using this facility include containers, bulk fertiliser and break bulk cargo. This wharf complex is complemented by easy access to the container terminal area (3800m²).

Townsville

The Port of Townsville provides all of North Queensland with a gateway for commerce and trade. It continues to be one of the state's fastest growing ports. In 2004/05 almost ten million tonnes of cargo passed over its wharves.

Agricultural exports from the Port of Townsville are mainly live cattle and sugar.

Live cattle are exported to the Philippines, Brunei, Vietnam, Thailand, Indonesia, Malaysia, Papua New Guinea, the Pacific Islands and Egypt.

A cattle holding facility is located within 15km of the port and can accommodate a total of 8000 head of export cattle. A second cattle holding facility is located 40km from the port and can hold 7000 head of cattle.

The port's berthing facilities allow for the loading of three cattle ships simultaneously.

The port's deep channels allow unrestricted access to any sized live cattle ship.

Timber is also exported to Japan, China and South Korea by Pentarch Forest Products.

Berths

- Berth 1 - Fuel, oil, sulphuric acid and LP gas
- Berth 2 - Nickel ore
- Berth 3 - Lead ingots, copper, containers, live cattle
- Berth 4 - Cement, molasses
- Berth 7 - Minerals, fertiliser
- Berth 8 - Frozen beef, scrap metal, timber, fertiliser, general cargo
- Berth 9 - Sugar, cruise ships
- Berth 10 - Live cattle, mining materials
- Berth 11 - Lead and zinc concentrates

Other ports

Lucinda

Lucinda is situated approximately 100km north of Townsville. The Port of Lucinda is dedicated to the export of raw sugar from the Ingham sugar growing district. The port has on-shore sugar handling and storage facilities and a single trestle jetty, which is one of the longest of its type in the world. The terminal is operated by Lucinda Bulk Sugar Terminal, a subsidiary of Queensland Sugar Limited.

Karumba

Karumba is located at the mouth of the Norman River in the south-east corner of the Gulf of Carpentaria. The Port of Karumba has serviced the remote Gulf communities since the late 1800s. General cargo, zinc, lead, fisheries products and live cattle are the main exports from Karumba.

Mourilyan

The Port of Mourilyan is situated about 20km south of Innisfail. Its main trade is the export of raw sugar and molasses from the Innisfail, Babinda, Tully and Atherton Tablelands sugar growing areas. The terminal is operated by the Mourilyan Bulk Sugar Terminal, a subsidiary of Queensland Sugar Limited. The terminal is supplied by the South Johnstone, Mourilyan, Tully, Mareeba and Babinda sugar mills. Live cattle are also exported through the port.

Rail

In 2006 Queensland Rail merged its Queensland bulk freight operations with the Australian Railroad Group (ARG), which is headquartered in Perth, Western Australia.

ARG hauls a range of commodities for primary industries including livestock, sugar, grain and timber.

Grain haulage represents 12% of ARG's bulk freight business, with the majority of these operations centred in Western Australia and Queensland.

A limited freight rail service exists between Mareeba and Cairns. However, major freight container depots exist at Cairns, Innisfail, Tully and Townsville.

Figure 4 illustrates the rail transportation network that links Queensland to the rest of Australia.

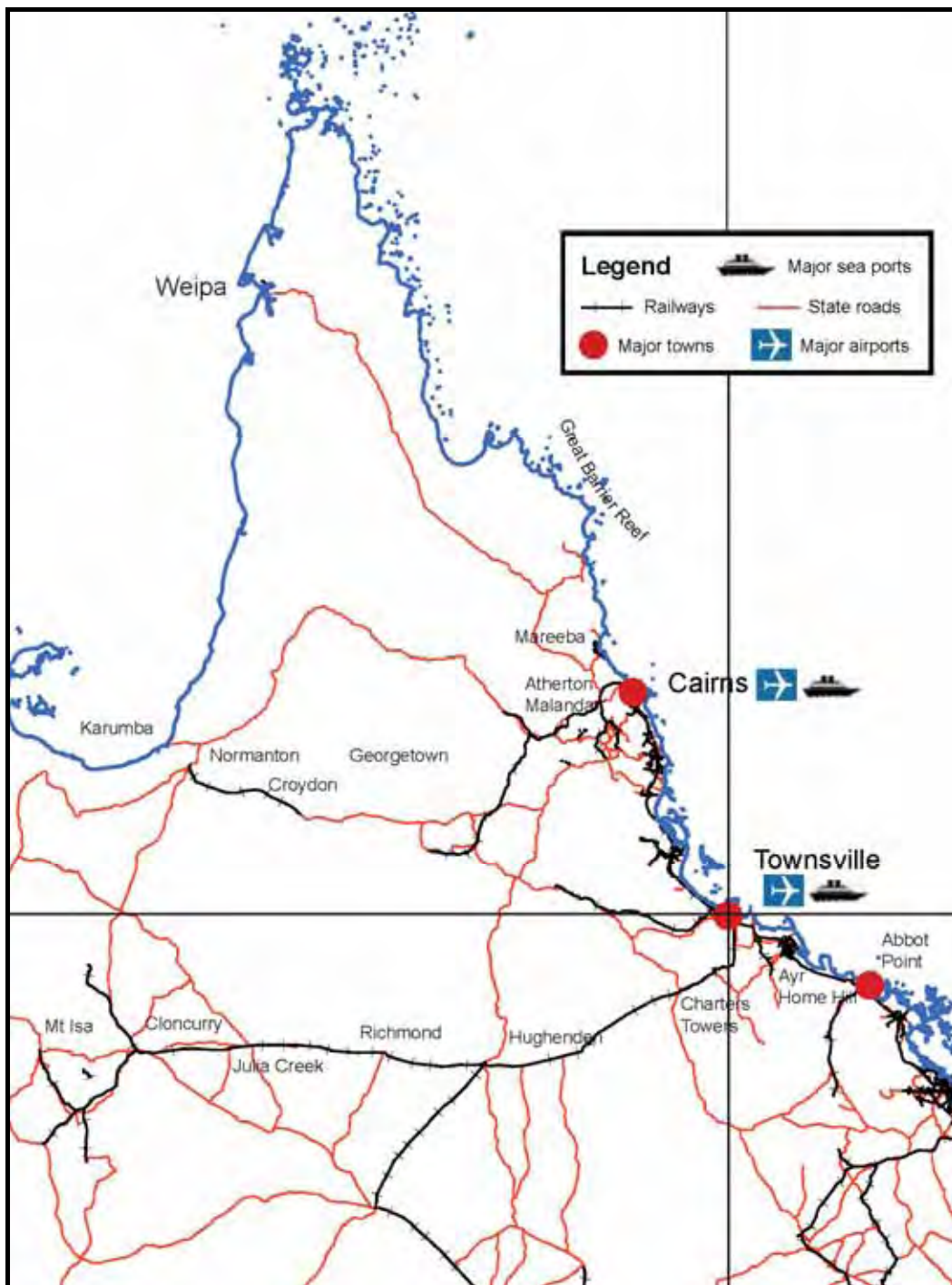


Figure 4. Major state road, rail, air and sea port infrastructure networks in North Queensland

Road network

The major highway in the North Region is the Bruce Highway which links all the main coastal centres.

Highway upgrades, especially around Tully, have made the Highway more accessible in the wet season. However, heavy rains, as witnessed in February 2009, temporarily closed the Highway from Cardwell to Ingham.

The major road freight routes from the Atherton Tablelands are the Kuranda Range Road and the Palmerston Highway. B-double size vehicles are restricted to the Palmerston Highway only.

There are a large number of local and national transport carriers located on the Atherton Tablelands and in Cairns, Innisfail, Tully and Townsville.

Figures 4 and 5 illustrate the road transportation network that links Queensland to the rest of Australia.

Table 76. Distances by road from Townsville

Location	Destination	Approximate Distance (km)
Townsville	Ayr	90
Townsville	Bowen	206
Townsville	Brisbane	1337
Townsville	Cardwell	164
Townsville	Charters Towers	136
Townsville	Ingham	111
Townsville	Lucinda	139
Townsville	Mackay	391
Townsville	Melbourne	2490
Townsville	Sydney	2073
Townsville	Tully	209

Table 77. Distances by road from Cairns

Location	Destination	Approximate Distance (km)
Cairns	Atherton	81
Cairns	Ayr	434
Cairns	Brisbane	1681
Cairns	Charters Towers	480
Cairns	Cooktown	235
Cairns	Ingham	237
Cairns	Innisfail	89
Cairns	Karumba	755
Cairns	Mareeba	65
Cairns	Melbourne	2816
Cairns	Mossman	77
Cairns	Sydney	2417
Cairns	Townsville	348
Cairns	Tully	141

Table 78. Distances by road from Atherton

Location	Destination	Approximate Distance (km)
Atherton	Brisbane	1685
Atherton	Cairns	81
Atherton	Mareeba	34
Atherton	Melbourne	2746
Atherton	Sydney	2454
Atherton	Townsville	352



Figure 5. Road network of Queensland

Telecommunications

The North Region has extensive landline, next G mobile communications and broadband coverage.

Telstra look after some 191591 services across an area that covers approximately 733455m², stretching from Cardwell in the south to the Torres Strait Islands in the north and as far as Mt Isa to the west.

Telstra has 204 mobile base stations across Far North Queensland that are progressively being converted to the one technological standard. This means that when the new national Next G™ network is fully deployed, the North will have access to fast data and internet services. This includes some of the region's more remote communities, such as Thursday Island, Moa Island, Coen, Camooweal, The Monument and Doomadgee and sections of Queensland's major highways, such as the Bruce and Flinders Highways and the Cape York Development Road.

Broadband access is available across a total of 68 exchanges in Far North Queensland via ADSL technology.

Telstra is working in partnership with Queensland Health to further expand access to health and government services.

Power Distribution

Power is supplied throughout the region via Ergon Energy.

Far North region

The Far North Queensland area is a tropical environment with high annual rainfall and exposure to summer electrical storms and cyclones. A substantial part of the wet tropics of Far North Queensland is also World Heritage listed, requiring special consideration with regard to the operation and maintenance of any electrical infrastructure.

This region consists of three main geographic areas with regard to Ergon Energy's electrical infrastructure:

Far North coastal strip

The Far North coastal strip covers the city of Cairns and environs, as well as the townships and surrounding rural areas of Cardwell, Tully, Innisfail, Gordonvale and Babinda.

The area is served by six 132/22kV Connection Points which are supplied from the Powerlink 132kV network. In addition, the Cairns City 132/22kV Zone Substation is supplied via 2.9km of Ergon Energy owned 132kV dual circuit line connected to Powerlink's Woree 275/132kV Connection Point.

Far North Tablelands area

This area is centred around the major rural towns of Atherton and Mareeba and includes the smaller rural communities of Malanda, Millaa Millaa, Ravenshoe, Mt Molloy, Dimbulah and Chillagoe. In addition, the coastal communities of Mossman, Port Douglas and Cooktown are supplied from the Tablelands network.

The area is served from the one 132/66kV Connection Point, T55 Turkinje substation (located near Mareeba). The Tableland system consists of a 66kV subtransmission network, a dual circuit 132kV transmission line from Turkinje to the Craiglie 132/22kV zone substation near Port Douglas, and a single circuit 132kV line to the Lakeland 132/66/22kV substation which supplies the Cooktown area.

Far North western area

The Far North western system takes in the Georgetown, Normanton, Croydon and Karumba communities in the Gulf of Carpentaria.

The area is served from the Ross Connection Point in Townsville where a 132kV single circuit line owned by Ergon Energy to supply this area originates.

North Queensland region

The North Queensland region is a tropical environment with exposure to summer electrical storms and cyclones. It extends from Bowen in the south to Ingham in the north and west to the Northern Territory border, and consists of four main geographic areas with regard to Ergon Energy's electrical infrastructure.

Townsville area

The Townsville area covers the city of Townsville and environs as well as the townships and surrounding rural areas north to and including Ingham.

The area is served by four 132/66kV Connection Points (one in Ingham and three in Townsville), and one 132/11kV Connection Point, which are supplied from the Powerlink 132kV network. Ergon Energy takes supply at the 66kV side of Powerlink's 132/66kV transformers for four of these Connection Points, and at the 132kV terminals of the 132/11kV transformers at the Alan Sherriff 132/11kV Connection Point.

Burdekin/Bowen area

This area covers the coastal strip of the North Queensland region south of Townsville and is centred around the major rural towns of Ayr and Home Hill in the Burdekin and the coastal community of Bowen. It also includes the town of Collinsville and its surrounding rural loads.

The Burdekin area is served from the one Connection Point, T42 Clare 132/66kV substation, located near the Clare township. The Bowen system is supplied by two 66kV feeders emanating from the Proserpine 132/66kV connection point which is located in the Ergon Energy MK region. Collinsville is supplied at 33kV from an Ergon Energy 33kV switching station connected to the Collinsville Connection Point.

North Queensland mid-western area

The North Queensland mid-western system extends from Charters Towers west to Julia Creek and takes in the towns of Hughenden, Winton and Richmond. All these towns are connected at 66kV.

Ergon Energy's Milchester 132/66kV substation is located on the outskirts of Charters Towers and is supplied by an Ergon owned single circuit 132kV transmission line from Powerlink's Ross substation in Townsville. Limited capacity also is available via 66kV lines from Stuart substation (Townsville) and Clare substation to Charters Towers substation. The area west of Charters Towers is supplied by two 66kV feeders, one from Charters Towers substation and one from Milchester substation, to Hughenden substation. Each of these 250km long feeders goes through a 66kV voltage regulator at Cape River substation, which is about 100km from Charters Towers.

North Queensland western area

The North Queensland western system comprises the Mt Isa and Cloncurry regions and also the non-regulated network supplying the Carpentaria Minerals Province mining loads. This network is isolated from the Coastal Network which interconnects the Eastern Australian States and operates outside of the National Electricity Market.

Ergon Energy takes supply at 132kV from the Mica Creek Power Station in Mt Isa to supply the Mt Isa load via the Duchess Road substation. Ergon Energy also takes supply at 132kV from the Mica Creek Power Station in Mt Isa and steps it up to 220kV to transmit supply to the Carpentaria Minerals Province mining loads and the Chumvale 220/66kV substation. The latter provides 66kV supply to Cloncurry's two 66/11kV substations.

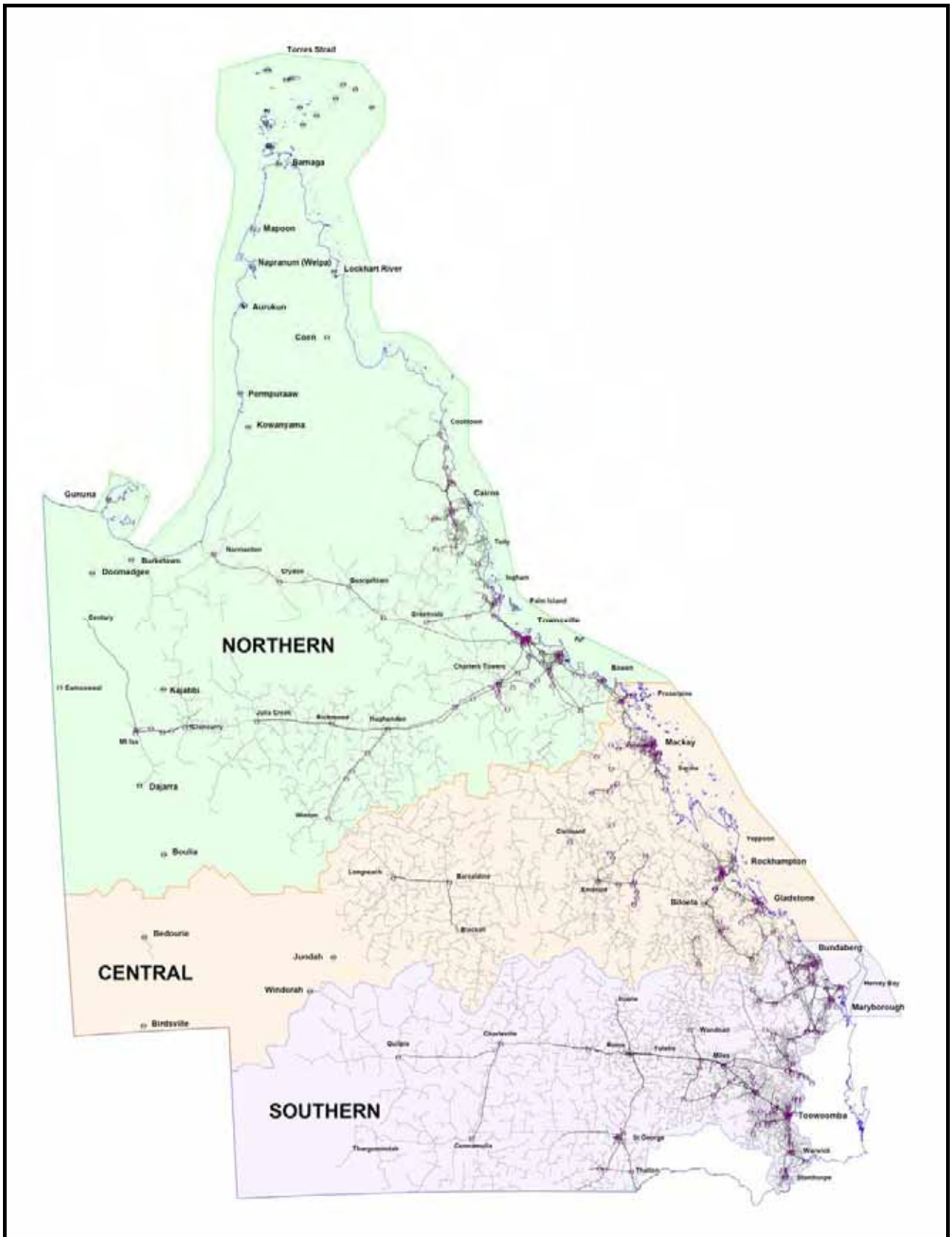


Figure 6. Ergon Energy's subtransmission and rural distribution network in Queensland

Water Facilities

Dry Tropics

Burdekin Dam

The Burdekin Dam is located on the Burdekin River south-west of Ayr and Home Hill. It was completed in 1987 and is the largest dam in Queensland. The dam can hold approximately 1860000 megalitres of water. The body of water held by the dam is known as Lake Dalrymple. The dam is fed by the Burdekin, Cape, Campaspe, Suttor and Belyando Rivers.

Below the Burdekin Dam is Clare Weir. This is the point below the dam where water is distributed to farms via the Haughton and Elliot Main Channels. The full storage capacity for Clare Weir is 15500 megalitres.

Burdekin Delta

In the Burdekin Delta farmers access water for irrigation from aquifers. The aquifers, in turn, are re-charged by water being pumped from the downstream Burdekin River into a series of re-charge pits. Responsibility for re-charging the aquifers is the job of the North and South Burdekin Water Boards, which were set up in 1965 and 1966 respectively and are funded by farmers and sugar mills.

The South Burdekin Water Board oversees an area encompassing 27450 hectares south of the Burdekin River. Within this area there are approximately 13.9km of pipelines and 116km of channels under the Board's control. Sugar cane is grown on 13343 hectares with other crops being grown on another 94 hectares.

The North Burdekin Water Board supplies water to 48530 hectares, 25212 hectares of which are under sugar cane and 800 hectares under other crops.

Atherton Tablelands

Mareeba-Dimbulah Irrigation Area

The main dam on the Atherton Tablelands is the Tinaroo Dam, which was completed in 1958 by damming the upper Barron River. The dam can hold approximately 438900 megalitres of water. When the dam was filled in 1959 the old township of Kulara went underwater, with all the residents relocated to nearby towns. The body of water held by the dam is known as Lake Tinaroo.

Approximately 415km² of farmland is irrigated by the dam. Farmers access this water from the extensive network of 176km of channels. The channel/pipeline system, fed by Tinaroo Dam, is known as the Mareeba-Dimbulah Irrigation Area (MDIA).

Channel system

Water from the dam is distributed by gravity through 176km of main channel to the various sections of the scheme, namely Walkamin to the south of Mareeba, East Barron and the Mareeba area itself, Paddy's Green and Arriga to the west of the town, and along the south bank of the Walsh River through Mutchilba and beyond to Dimbulah. Within these sections a further 189km of subsidiary channels distribute water to farms, dwellings and townships.

Five balancing storages, at Nardello's Lagoon, East Barron, Arriga, Biboohra and Jabiru Lagoon, ensure that effective supply is maintained throughout the system.

In general, the main channels are either open earth or concrete lined. Short lengths of concrete lined steel pipe, reinforced concrete bench flume and cast in-situ concrete pipeline have been used where the terrain and soil type require them.

Relift areas

Two additional areas – Paddy's Green and Price Creek – are served by four pump stations which lift water to concrete balancing storages for further reticulation.

Supplemented streams

Water is also supplied from streams supplemented with water from the channel system. In this way the extent of the channel system has been managed and better use made of natural supplies available from such streams. Releases are made to tributaries of the Barron, Walsh and Mitchell Rivers. In total, water is available for diversion from 276km of supplemented streams.

Table 79. Mareeba-Dimbulah water supply scheme – 2008/09

Area	Charges	\$/ML
Access Charge		512.78
<i>River</i> Supplement stream & Walsh River	Part A	15.76
	Part B	11.29
<i>River</i> Tinaroo/Barron	Part A	3.00
	Part B	16.16
<i>Channel</i> Outside a re-lift to 100ML	Part A	27.8
	Part B	21.84
<i>Channel</i> Outside a re-lift 100-800ML	Part A	26.44
	Part B	16.76
<i>Channel</i> Outside A Re-Lift more than 800ML	Part A	21.08
	Part B	13.39
<i>Channel</i> Re-lift	Part A	38.28
	Part B	24.31

MAREEBA-DIMBULAH WATER SUPPLY SCHEME

Access Charge: For both Mareeba channel and river, access charge is additional to the allocation (part A) and Usage (part B) charges.

Part A: Based on your water allocation and applied quarterly in advance.

Part B: Usage charge for the actual water you have used based on meter reading for the previous quarter.

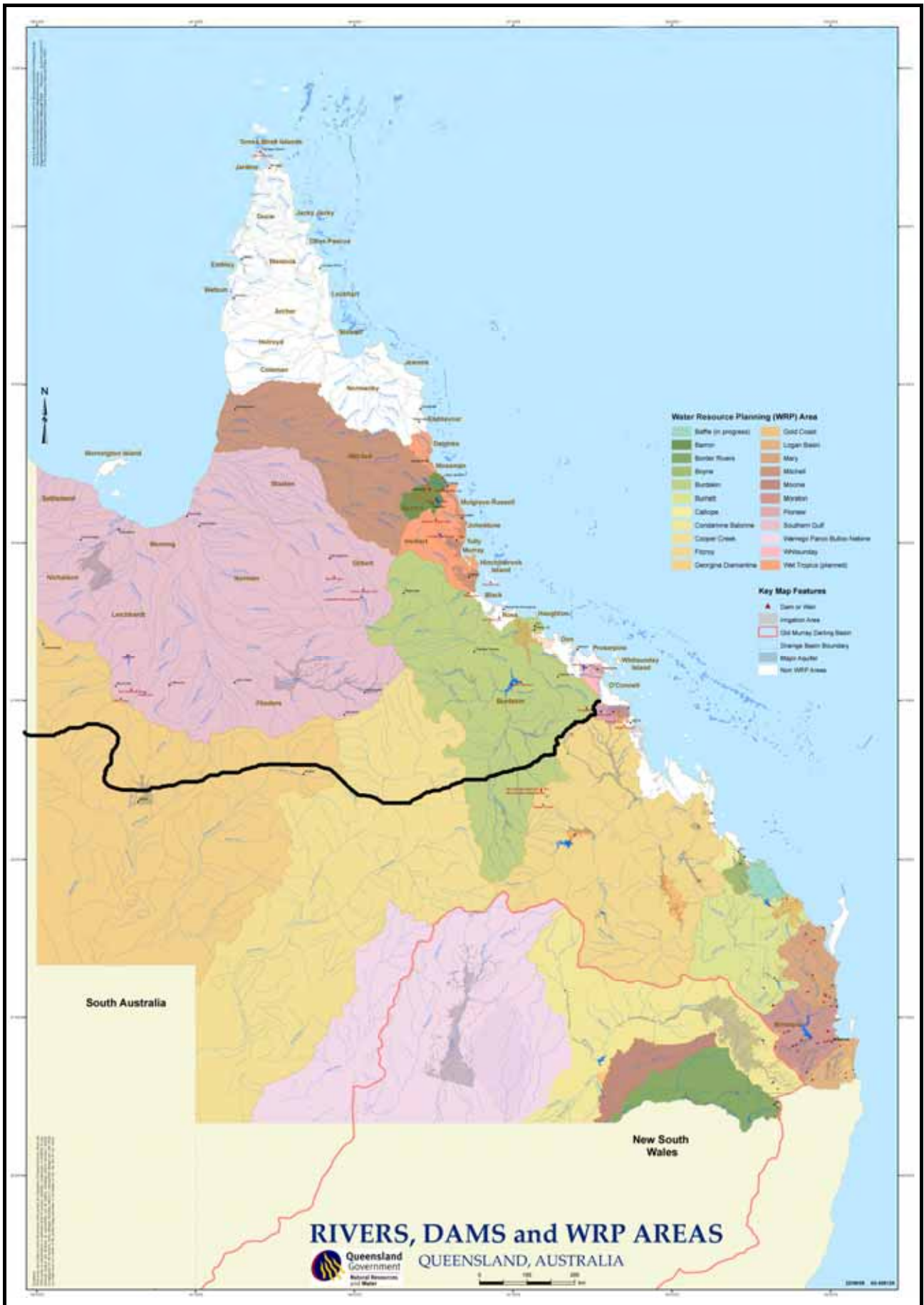


Figure 7. Rivers, dams and Water Resource Planning (WRP) areas in Queensland

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