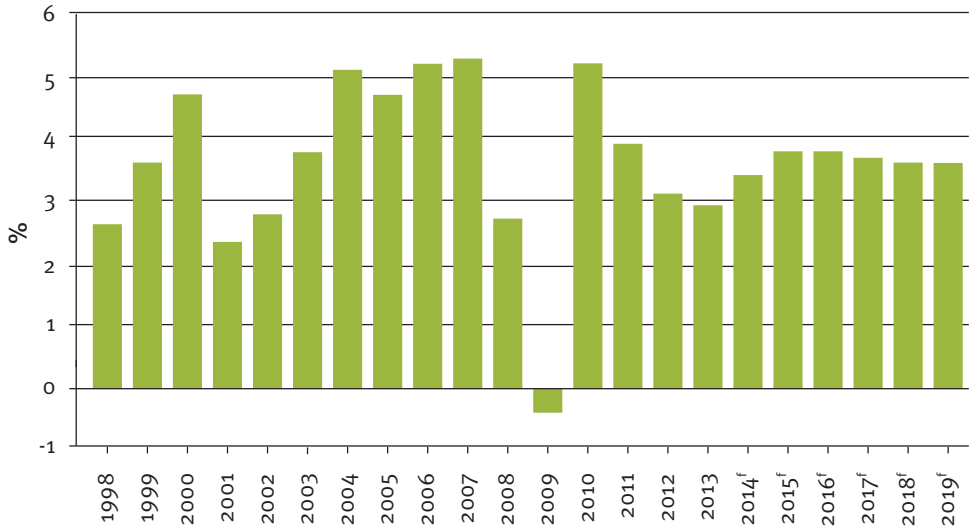
Economic overview

Global growth has recovered from the effects of the GFC, but remains modest. While global growth is being suppressed by the ongoing poor performance of the Eurozone it is supported by continuing growth in emerging economies, particularly China. Growth in China is likely to ease in the medium term, while remaining at a high rate of 7 per cent, with global growth supported by improvement in India and limited recovery in Europe and the USA. As a result, global growth is expected to improve slightly from 2.9 per cent in 2013 to approximately 4 per cent over the five years to 2018.[1]

Figure 1.1 Global economic growth



f forecast

Source: Agricultural commodities 2014, ABARES

Economic growth in most major Organisation for Economic Co-operation and Development (OECD) economies is expected to recover gradually in the short term. It is estimated to be at 2 per cent in 2014, increasing to 2.5 per cent in the medium term. Private demand in the USA shows signs of strength, while in the Eurozone there are signs that many core economies have pulled out of recession.

Growth in Japan—Queensland's largest market for agricultural exports—is forecast to slow with an expected tightening of fiscal policy, resulting in forecasts of 1.2 per cent growth in 2014 down to 1.1 per cent in subsequent years.

Growth in Queensland's other major advanced economy export destinations in Asia—Korea, Taiwan, Singapore and Hong Kong—is likely to continue its solid pace of recent years at 4 per cent per annum.

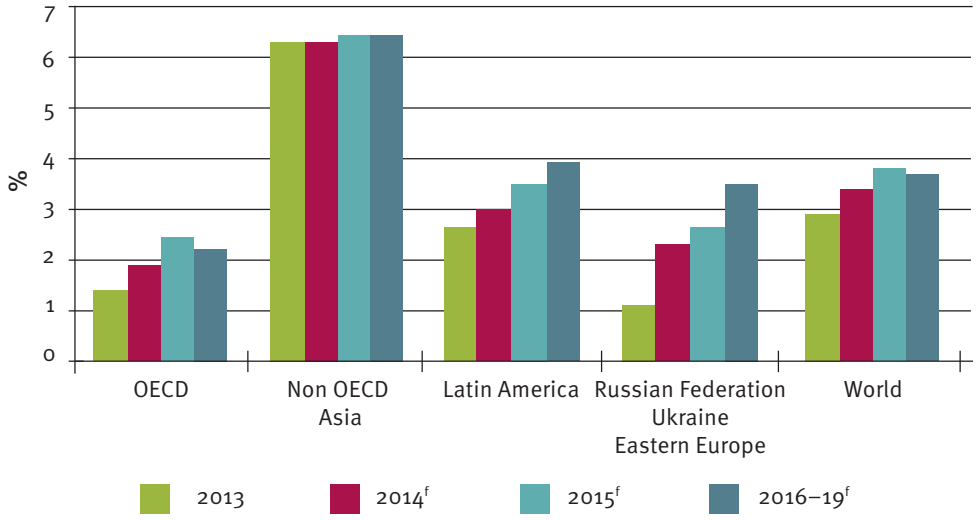
A smaller but growing share of Queensland's agricultural exports go to emerging markets in Asia. China has been undertaking economic reforms and transitioning to a more stable and sustainable growth path. Growth in China was 7.6 per cent in 2013, with an expected decline to 7.0 per cent by 2018.

1 *World Economic Outlook,* October 2013, International Monetary Fund

India's earlier impressive growth faltered in recent years, largely due to the stalling of domestic reforms. However, the impetus for reform seems to be re-emerging and is likely to restore healthy growth rates in excess of 6 per cent per annum in the medium term. Other emerging markets such as Indonesia and Malaysia are also expected to continue to show solid growth in the region of 5 to 6 per cent in the medium term.

Some of Queensland's competitor regions for agricultural exports are also expected to show healthy growth rates in the medium term. Latin American growth is estimated to be less strong than emerging economies in Asia, in the vicinity of 4 per cent per annum in the medium term. Central and Eastern European growth rates are projected to gradually increase due to improving domestic financial conditions.

Figure 1.2 Regional economic growth



f forecast

Source: *Agricultural Commodities 2014*, ABARES

Table 1.1 Economic growth (% per annum)

	Share of Qld agricultural exports (%)	Ten years to 2012	2013	2014	Four years to 2018
Australia		3.1	2.5	2.8	3.0
Japan	24	0.8	2.0	1.2	1.1
Korea	15	4.0	2.8	3.7	4.0
USA	10	1.8	1.6	2.6	3.3
New Zealand	4	2.4	2.5	2.9	2.5
Taiwan	4	4.2	2.2	3.8	4.3
Singapore	3	5.9	3.5	3.4	3.8
Hong Kong	3	4.3	3.0	4.4	4.5
EU	2	1.1	0	1.3	1.9
Advanced economies		**1.4**	**1.2**	**2.0**	**2.5**
China	6	10.3	7.6	7.3	7.0
Indonesia	6	5.6	5.3	5.5	6
India	4	7.3	3.8	5.1	6.5
Malaysia	4	5.1	4.7	4.9	5.2
Developing world		**6.5**	**4.5**	**5.1**	**5.5**
World		**3.7**	**2.9**	**3.6**	**4.1**

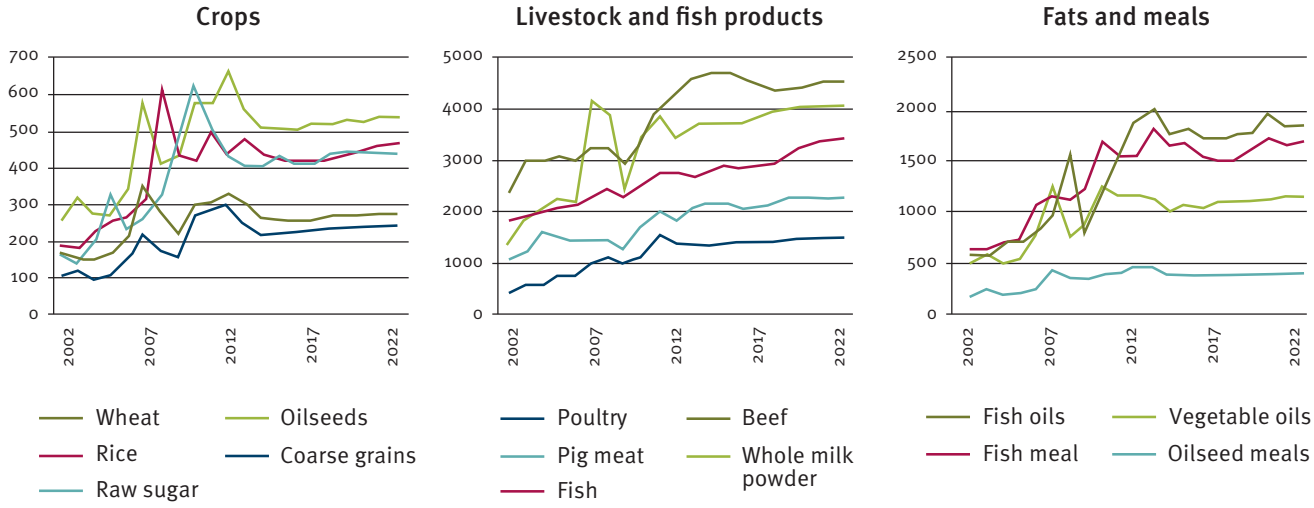
Source: *World Economic Outlook*, October 2013, OESR trade data, International Monetary Fund

The economic growth outlined in Table 1.1 is likely to continue to underpin global commodity prices. Major emerging economies such as China and India are at the intensive energy and materials use stage of development. Rapid income growth in these countries is also reinforcing the demand for higher-quality foods, particularly from the emerging middle class. However, demand for food as a whole usually rises less rapidly than incomes. The economies of India and China are both quite distinct in terms of food demand patterns. India is largely vegetarian with an increasing reliance on dairy and fruit and vegetable imports, but remains relatively self-sufficient for grains and minor meat products. China, on the other hand, will be significantly increasing its beef consumption and subsequently importing fruit and vegetables and other higher-value products.

This demand will be matched by increasing commodity supply. High commodity prices in the mid-2000s and again during recovery from the GFC reflected the unexpected strength and duration of demand growth, particularly from China, which exceeded planned capacity increases. Investment and productive capacity is now responding, following a lag that was exacerbated by the GFC.

As a result, commodity price projections from the Food and Agriculture Organisation of the United States and the OECD are for a near-term downward adjustment, particularly in crop prices, as production increases. However, rising prices for both crop and livestock products are projected over the coming decade as demand remains strong and production growth slows. Meat, fish and biofuel prices are projected to rise more strongly than primary agricultural products.

Figure 1.3 FAO/OECD Outlook for world agriculture prices to 2022 (USD/t)



Source: *Agricultural outlook 2013–22*, OECD–FAO

Australia's economic growth in 2013 was 2.7 per cent and is forecast to be 2.5 per cent in 2014 and 2015 before recovering to around 3 per cent in the medium term.[2] The below-trend growth reflects a decline in business investment, largely attributed to the mining sector shifting from an investment phase to a production phase. In addition, a backdrop of fiscal consolidation as Australia attempts to lower debt, as well as lagging non-mining sectors and a high exchange rate are also contributing factors to the slower growth. Despite the below-trend performance in 2013, Australia has outperformed most other advanced economies.

Australia's inflation is within target at 2.7 per cent per annum in 2013. Underlying inflation is expected to decline towards 2.5 per cent[3]. The cash rate is sitting at a historical low of 2.5 per cent since August 2013 and is expected to remain unchanged in the short term.

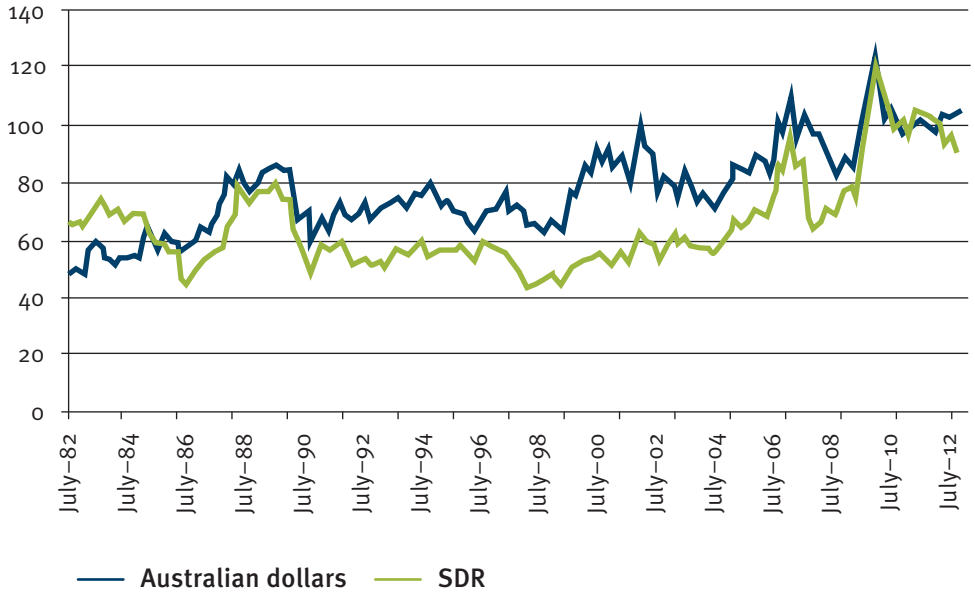
The first quarter of 2014 saw the Australian dollar floating around USD0.90, down from a high of USD1.11 in 2011, alleviating some of the competitive pressure on tradeables industries. This decline reflected a fall in commodity prices, and a narrowing in the gap between Australia's low interest rates and the zero to near-zero rates in major advanced economies. These factors are expected to continue to push the dollar down slightly in the short to medium term, with forecasts of USD0.80 to USD0.85 cents.

Regardless, the Australian dollar would still remain well above the historical average since floating. This indicates that commodity prices are likely to remain strong relative to historical norms, and that interest rates in Australia are likely to rise in line with those in other countries in the medium term.

2 *Agricultural commodities 2014*, ABARES

3 Board meeting minutes, February 2014, Reserve Bank of Australia

Figure 1.4 Reserve Bank of Australia's index of rural commodity prices, 2011–12 = 100



Source: Reserve Bank of Australia

Domestic food and fibre demand growth is likely to remain subdued. Currently, Australia's population growth is approximately 1.8 per cent per annum.[4] In most scenarios this is projected to slowly decelerate, perhaps to around 1 per cent per annum by 2045, depending on trends in fertility, longevity and net overseas migration. Domestic food and fibre demand is likely to grow slightly more rapidly than population growth, reflecting some income growth and new sources of demand such as biofuels.

4 Australian Demographic Statistics, Australian Bureau of Statistics 3101.0

Queensland snapshot

Regional context and importance

Agriculture industries are integral to Queensland's economy. The agriculture, fisheries and forestry sector as a whole is the backbone and social fabric of many rural and regional communities throughout the State.

Queensland is Australia's second-largest state, covering more than 173 million hectares of land. It has the highest proportion of land area dedicated to agriculture and is broken into 77 local government areas of varying sizes. Agriculture is a dominant economic contributor to many of Queensland's local communities.

In the beginning

Primary products for food, clothing and shelter have been harvested and traded with our neighbours for as long as aborigines have inhabited the continent. It is believed that trading of primary products, particularly seafood products, occurred for centuries before European settlement, between what is now known as North Queensland, Papua New Guinea and Indonesia.

Since European settlement, grazing has been a dominant part of agriculture in Queensland. Between 1840 and 1860 there was significant settlement of pastoral land, primarily for grazing sheep for wool.

By 1860, there were 3.5 million sheep and 500 000 cattle. Pastoral interests generated 70 per cent of Queensland's revenue, representing over 90 per cent of exports. Cropping was largely limited to the Eastern Darling Downs where large pastoral properties were subdivided into smaller properties in the 1870s.

In the 1860s land regulations were introduced permitting one-year licences on properties of 100 square miles. This resulted in rapid expansion of the grazing industry. From 1880, the industry was further strengthened by the tapping of artesian water, providing a reliable water source for livestock.

Railway extensions enabled efficient transport of wool for export and livestock to processing works on the coast. The establishment of stock route networks enabled movement of cattle to railways for loading. The development of refrigeration technology after 1883 meant that shipments of beef and mutton could be sent to overseas markets.

By 1892 sheep numbers reached 21 million and cattle numbers reached 7 million shortly after, but drought, dust storms, strike action, economic depression and tick fever led to a decline in stock numbers.

In 1862 the first successful sugar cane crops in Australia were grown by Captain Hope. He grew eight hectares of sugar cane near Brisbane and opened Australia's first raw sugar mill at Ormiston in 1865. By the end of 1867, there were 800 hectares of sugar cane in the Brisbane district. As sugar cane growing spread further north, mills were built at Maryborough and Mackay in 1866, at Bundaberg in 1872 and at Cairns in 1882.

Farm selections in the Atherton Tableland began in 1882. A railway opened between Cairns and Mareeba in 1893 and it was extended to Atherton by 1903. Atherton and Mareeba provided markets, transport and social infrastructure to support the growing agricultural industries. With the construction of the Tinaroo Dam for irrigation in post-war reconstruction, farming diversified into cereals, feed crops, pigs and beef cattle.

From the early 1900s vegetation was cleared across eastern Queensland to access the fertile clay soils underneath. However, thick regrowth and prickly pear were problems. The practice of feeding prickly pear to stock during the drought of 1901–02 spread the species, and by 1926 prickly pear was so thick in some areas that settlers abandoned their properties. In the late 1920s the cactus moth was used to successfully control prickly pear and by 1934 prickly pear was no longer a problem.

In 1962 the Brigalow Development Scheme began. It was the first 'closer settlement' policy to provide a combination of transport infrastructure, generous financial assistance in the form of interest-free loans and large, economically-viable holdings.

Within five years, 30 per cent of vegetation had been cleared in the areas around Taroom, Bauhinia, Duaringa and parts of the Northern Brigalow Belt. The intention was to maintain a minimum of 10 per cent vegetation on each property in the form of shade lines. However, much of the vegetation was destroyed by very hot fires resulting from burning piles of 'pulled' Brigalow, and clearing evolved into a practice that typically left little or no remnant vegetation.

The Nogoa–Mackenzie Water Supply Scheme near Emerald and the Burdekin Falls Dam and associated water supply scheme south-west of Townsville were established in 1968 and 1987 respectively. They were established to meet agricultural, urban and industrial water requirements. The main crops irrigated near Emerald are cotton, citrus and grapes. The Burdekin–Haughton Water Supply Scheme was used to irrigate sugar cane and various horticultural crops. These irrigation schemes have enabled production and incomes to stabilise and the benefits have flowed on to local and regional communities.

From the 1930s to the 1980s the Queensland Government established softwood plantations for saw log production in coastal areas, primarily in the south of the State. From the late 1990s, hardwood plantations in Queensland were established by private investors and the Queensland Government. In 2010 the plantation forestry estate on state-owned land was licensed and on freehold land it was sold to private interests.

Best practice management

In the 1980s there was growing awareness of land management practices to protect soil and water resources and sustain agricultural production. In recent decades there has been a significant investment in improving land management, in recognition of the role land condition plays in productivity. On-farm biosecurity management practices are critical for reducing the risk of establishment and spread of pests and diseases, and to facilitate early detection.

Improved soil conservation practices introduced in the 1980s and 1990s resulted in greatly reduced levels of soil loss from cropping lands in the Darling Downs and Central Highlands regions. The practices also improved soil structure and fertility. Practices included stubble retention and reduced tillage and contour construction.

Green-cane harvesting in the last 20 years has led to improvements in soil health and production, and has reduced off-site impacts. Green-cane harvesting substantially reduces soil erosion, helps control weeds, improves soil structure, conserves soil moisture and reduces fertiliser requirements.

Breeding for climatic conditions and markets, and improving land condition and herd management have been the focus of best practice in the beef and sheep industry, and present the most significant opportunities for growth.

Cattle are bred to comply with meat quality market specifications and cope with climatic conditions and parasites. In North Queensland, Brahman cattle were crossed with British beef herds in the early 1900s. In the 1980s and 1990s there was rapid improvement in beef herds to meet market standards and environmental conditions.

Recent developments

Since the 1980s, agriculture has become more diverse and increasingly export-oriented. It includes non-traditional commodities and processed products where opportunities to add value have been identified. There are several niche processing facilities for products such as gourmet dairy cacao, vanilla bean, condiments, dried fruit and vegetables, and frozen vegetables.

There is significant growth in specific market segments, such as grass-fed, chemical-free or free-range ‘branded’ beef, poultry and lamb. There are also opportunities for organic produce. In Queensland’s western regions, particularly in Channel Country, organic beef is cost-effective and reliable due to the availability of extensive native pastures, and drier conditions which lower the risk of pests and diseases and subsequently reduce the need for chemicals or antibiotics. Again, biosecurity is critical in maintaining Queensland’s reputation and product quality.

Queensland’s agriculture industry has grown and evolved as markets, infrastructure and services have evolved. It is expected that the industry will continue this tradition for some time.

Map 1.1 Location of Queensland's primary industries

Industry overview

The gross value of production for agriculture, fisheries and forestry in Queensland is estimated to be $14.7 billion in 2013–14. This includes approximately $11.6 billion at the farm gate and $3 billion in added value from first stage processing at abattoirs, dairies, mills and the like.

Queensland's overseas agriculture exports are worth $8.9 billion per annum and account for approximately 16 per cent of the State's overseas commodity exports.

Geographically, Queensland is Australia's second largest state, covering more than 173 million hectares of land. Almost 144 million hectares or 85 per cent of land in Queensland is used for agriculture and grazing. Queensland not only has the largest area of agricultural land of any Australian state, it also has the highest proportion of land area dedicated to agriculture.

Queensland also has the largest amount of 'certified organic' agricultural production land in Australia, with almost 2.3 million hectares in total. This includes large tracts of organic grazing land in Queensland's Channel Country, resulting in almost 70 per cent of Australia's growing organic beef industry coming from Queensland.

There were approximately 28 000 businesses conducting agricultural activity in Queensland in 2011–12. This represented 20.7 per cent of the national total. The number of farm businesses was down slightly over the previous year, continuing a long-term trend of declining farm numbers.[5]

Table 1.2 shows the number of farm businesses in Queensland by industry class and turnover in 2011–12.[6]

Most agricultural industries recorded a decline in the number of businesses over the year to June 2012. However, the generally small net reduction reflected a more substantial flow of exits—typically around 10 per cent—which was largely offset by a flow of new entrants to the industry.

5 *Agricultural Commodities Australia, 2011–12*, Australian Bureau of Statistics 7121.0. For the purposes of this publication, an agricultural business is defined as a business whose main activity is in agriculture and which had an estimated value of agricultural operations exceeding $5000 in 2011–12.

6 The components of the table do not sum to the total, partly because of the large number of multi-commodity producers.

Table 1.2 Number of farm businesses in Queensland, June 2012[a]

	Number of farm businesses	Turnover				% change	Entry rate	Exit rate
		<$50k[b]	$50–200k	$200k–2m	>$2m			
Nursery production (undercover)	139	57	43	32	7	-5	4	6
Nursery production (outdoor)	176	65	56	52	3	-7	3	10
Turf growing	189	49	50	79	11	-5	6	12
Floriculture production (outdoor)	162	73	47	34	8	-1	11	9
Vegetable growing (undercover)	211	99	56	51	5	-7	4	10
Vegetable growing (outdoor)	1 255	422	340	401	92	0	9	8
Grape growing	320	210	63	38	9	-14	4	19
Berry fruit growing	156	54	31	54	17	-3	7	10
Stone fruit growing	163	67	50	43	3	0	4	2
Citrus fruit growing	229	93	40	69	27	-3	9	11
Olive growing	156	147	5	4	0	-10	7	20
Other fruit and tree nut growing	1 764	840	406	436	82	-4	7	11
Sheep farming (specialised)	560	179	158	211	12	-4	4	7
Beef cattle farming plus beef cattle feedlots	17 195	8 163	4 894	3 772	366	0	7	8
Sheep—beef cattle farming	1 059	311	252	465	31	-1	6	7
Grain-sheep or grain-beef cattle farming	2 607	1 012	755	768	72	-3	5	8
Other grain growing	1 434	384	408	576	66	-2	5	7
Sugar cane growing	4 764	1 130	1 826	1 730	78	-2	5	6
Cotton growing	492	75	64	260	93	-1	6	6
Other crop growing (n.e.c)	834	345	257	214	18	-4	5	9
Dairy cattle farming	1 332	433	380	499	20	-3	3	7
Poultry farming (meat)	171	32	31	99	9	-4	8	7
Horse farming	831	478	232	113	8	-3	8	12
Other livestock farming (n.e.c)	363	216	87	55	5	-7	4	13
Pig farming	289	72	90	98	29	-6	2	10
Beekeeping	171	88	53	30	0	1	8	5
Onshore aquaculture	161	70	30	49	12	-11	7	17
Forestry	1 740	1 546	131	52	11	-20	8	28
Logging	346	126	114	96	10	-3	12	15

	Number of farm businesses	Turnover				% change	Entry rate	Exit rate
		<$50k[b]	$50–200k	$200k–2m	>$2m			
Rock lobster and crab potting	214	93	85	33	3	0	19	22
Prawn fishing	325	91	94	130	10	-4	6	11
Line fishing	264	100	119	45	0	-2	9	9
Fish trawling, seining and netting	328	107	127	87	7	-7	8	14
Other fishing	236	96	85	52	3	-11	6	16
Hunting and trapping	278	122	121	35	0	-1	10	11
Forestry support services	246	155	52	33	6	-10	13	21
Other agriculture and fishing support services	2 525	782	786	896	61	-1	12	12
Meat processing	126	39	14	40	33	-2	8	13

a Industries with less than 100 Queensland producers are not shown

b Includes businesses with an estimated value of under $5000 in 2011–12 in agricultural operations. These businesses are not included in other agricultural statistics.

Source: *Counts of Australian businesses including entries and exits, June 2008 to June 2012*, Australian Bureau of Statistics 8165.0

Of the Queensland agricultural businesses operating in June 2008, 90.7 per cent were operating one year later, and 73.6 per cent were operating four years later. This rate of decline was lower for larger businesses, at 94.8 per cent and 81.6 per cent respectively, with turnover exceeding $2 million. Four-year survival rates were lower for businesses in other sectors; 61.7 per cent in aquaculture, 38.4 per cent in forestry and logging, 60.1 per cent in fishing, hunting and trapping, 61.4 per cent in support services to the sector, and 61.7 per cent in food product manufacturing.

Nationally, agriculture had one of the highest four-year survival rates of all industries in the four years to 2013, but it had the lowest entry rate. The survival rate was 71.3 per cent compared with the survival rate of 62.9 per cent for all industries. The entry rate was 4.9 per cent in 2012–13 compared with 11.2 per cent for all industries.

Of the 2849 businesses that entered Queensland's agriculture industry in 2008–09, 81.9 per cent survived until June 2010 and 62.8 per cent survived until June 2012.

Most agricultural businesses are small. An estimated 10 300 agricultural businesses (approximately 36 per cent of the total) employ one or more people in addition to farm operators. Only around 1100 employ 20 or more people. Around 11 300 farm businesses have turnover exceeding $200 000 per annum. Few businesses with turnover below this level would be earning the equivalent of a full-time income from farming activities.[7]

7 *Counts of Australian businesses including entries and exits, June 2008 to June 2012*, Australian Bureau of Statistics 8165.0

While corporate farms are only a small proportion of the number of farms, they tend to be relatively large and therefore account for a larger share of total output. Nevertheless, the family farm remains the dominant form of agricultural enterprise and there is little evidence of that changing.

Livestock industries

Queensland is the largest beef-producing state or territory in Australia, representing almost 50 per cent of Australia's total gross value of production each year. Beef is the most significant agricultural commodity for Queensland with cattle and calf sales worth an estimated $3.259 billion in 2013–14.

The significant area of high-quality grazing country in Queensland enables beef to largely be grass-fed in extensive grazing systems, with the option of feedlot finishing. The market for grass-fed beef is growing.

Queensland is also the largest producer of pigs in Australia. The estimated gross value of production in 2013–14 is $210 million, which represents approximately 25 per cent of Australia's total pig production.

Poultry meat is also significant in Queensland and is worth an estimated $456 million in 2013–14. Queensland currently ranks third in Australia in terms of poultry production, producing around 19 per cent.

Other important animal products produced in Queensland are milk (worth $215 million), eggs (worth $140 million), wool (worth $83 million), sheep and lambs (worth $78 million), and kangaroos (worth $12 million).

Horticulture

Queensland is the largest producer of vegetables in Australia and the second largest producer of fruit. In 2013–14, Queensland's total vegetable production is estimated to be worth $1.211 billion and its total fruit production is estimated to be worth $1.547 billion.

It produces many varieties of fruit and vegetables in seasonal windows that are different from other Australian states and territories, which enables year-round availability of those commodities.

Queensland produces 90 per cent of Australia's bananas, worth $570 million. It is also the biggest producer of tropical fruits like mangoes, pineapples, avocados, limes and lychees.

It is also the second largest producer of strawberries, producing around one third of Australia's total strawberries, worth an estimated $170 million in 2013–14.

Queensland produces more than 50 per cent of Australia's tomatoes (worth $291 million), approximately 75 per cent of Australia's capsicums (worth $155 million) and 40 per cent of Australia's sweet corn (worth $38 million). Queensland is also a major producer of beans, lettuce, pumpkins, mushrooms and herbs.

Lifestyle horticulture

Lifestyle horticulture is another important sector for Queensland and is estimated to be worth $1.158 billion in 2013–14. Nurseries contribute $867 million to this total and provide the root stock for much of the horticulture sector.

Queensland's turf industry is worth $140 million and cut flowers are worth $151 million, making Queensland the biggest producer of cultivated turf in Australia, producing over one third of total production.

Broadacre cropping and sugar cane

Queensland has the third highest value of production for broadacre cropping as a whole in Australia. The total estimated value of broadacre cropping in 2013–14 is $2.645 billion.

Queensland's broadacre cropping is largely rain-fed, so the area planted and subsequent yields are closely linked to seasonal rainfall conditions and available soil moisture.

Queensland is the largest producer of sugar cane. It produces 94 per cent of Australia's total sugar cane and 61 per cent of Australia's total sorghum. In 2013–14, sugar cane is estimated to be worth $1.068 billion and sorghum is estimated to be worth $230 million.

Sugar cane grown in coastal Queensland has naturally high levels of sugar. Queensland's sugar cane production practices are now seen as some of the most efficient and sustainable in the world, due to the significant investment in green-cane harvesting and reduced chemical use.

Queensland is also a major producer of cotton, growing approximately 41 per cent of Australia's cotton crop, with an estimated value of $632 million. Queensland-grown cotton produces some of the highest-quality lint in the world and usually sells for a premium price on the global market.

Queensland produces Australian Prime Hard Wheat which is high-protein milling wheat of exceptional quality. Flour milled from this wheat is used to produce high-protein noodles and is also suitable for high-protein, high-volume bread. Queensland wheat production is estimated to be worth $375 million in 2013–14.

Other important crops produced in Queensland include maize, pulses and barley.

Forestry

The value of Queensland's forestry sector is estimated to be $175 million in 2013–14, representing approximately 10 per cent of Australia's production. Queensland's annual timber harvest for logs is approximately 2.5 million cubic metres each year.

Most of the annual harvest is processed in Queensland by the primary timber processing sector. In Queensland, timber and wood-based product processing and manufacturing segments account for approximately one third of overall industry sales. These sales include the production of plywood, veneer, panel boards, laminated timber products, doors, structural frames, roof trusses, flooring and decking, wooden containers, pallets and packing cases.

Fisheries and aquaculture

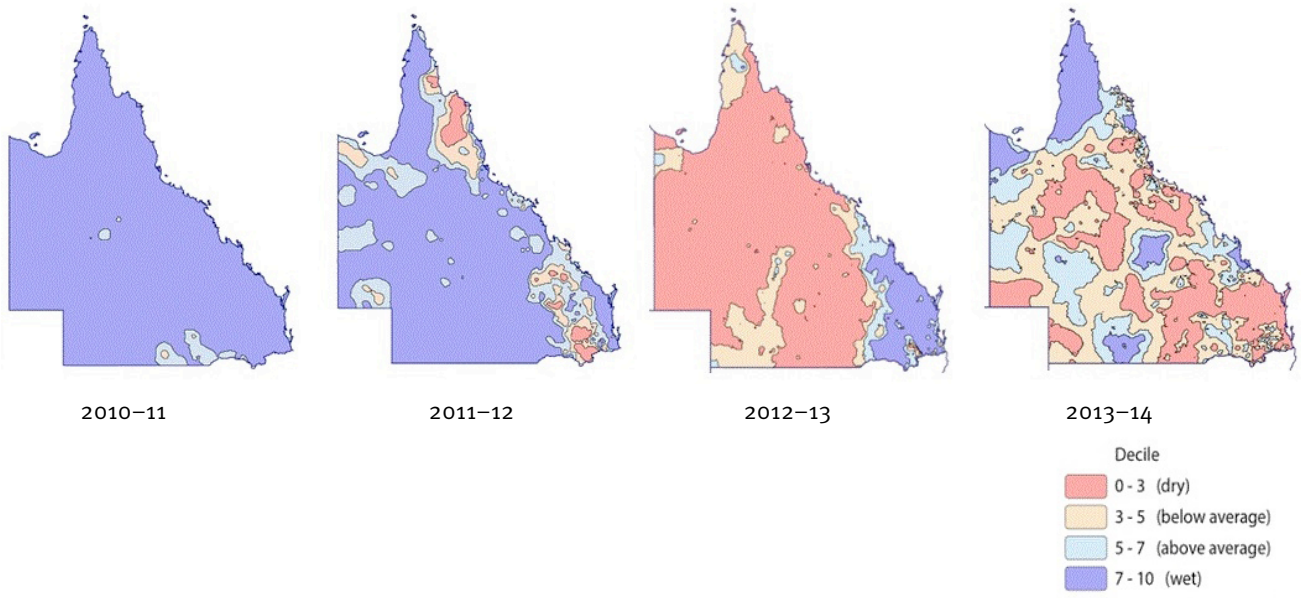
Queensland has an extremely diverse range of fisheries that are targeted by both recreational and commercial fishers. The commercial and aquaculture sectors are estimated to be worth $250 million and $101 million respectively in 2013–14. Queensland produces approximately 50 per cent of Australia's prawns, crabs and scallops and 25 per cent of Australia's finfish (excluding tuna and salmonoids).

Seasonal conditions

Historical rainfall variability

By world standards, Queensland's rainfall is extremely variable as recent years have highlighted. Widespread wet conditions experienced throughout most of Queensland during 2010 and 2011 have have been followed by widespread drought over the last two years (see Figure 1.5).

Figure 1.5 Rainfall patterns over Queensland for the last four summers (November to March)

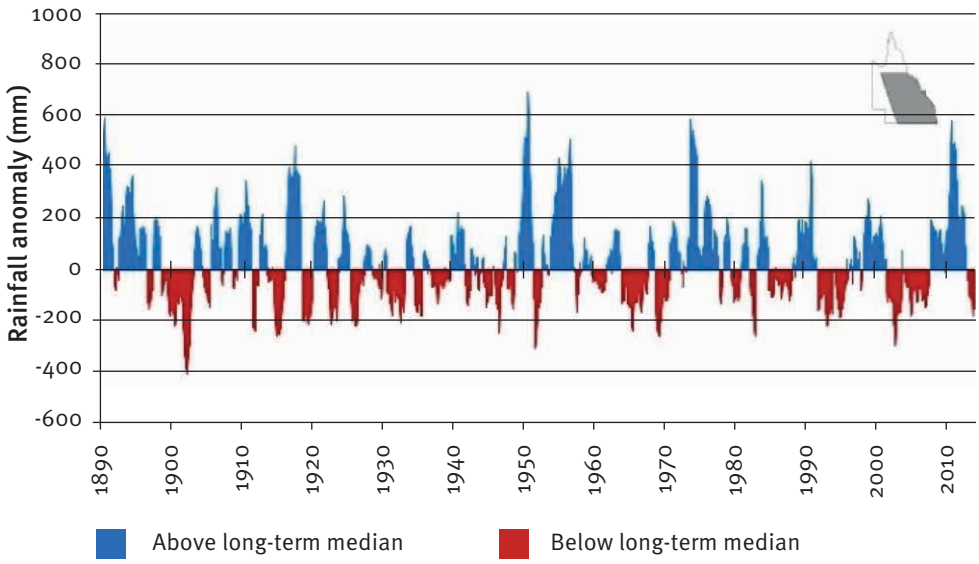


Source: Department of Science, Information Technology, Innovation and the Arts (DSITIA)

For the major grazing region in Queensland, the long-term rainfall record clearly shows a pattern of rainfall extremes (see Figure 1.5). Over the historical record, multi-year periods of average to well-below average rainfall have alternated with multi-year periods of well-above average to extremely high rainfall. This time-series is indicative of the historical rainfall pattern for any region of Queensland and the State as a whole. Rarely, if ever, has there been an extended period of near-average rainfall in Queensland. However, the historical rainfall pattern shown in Figure 1.5 is based on 12-month rainfall averaged over nearly half of the State. This time-series can mask significant rainfall extremes occurring over shorter or longer time-scales, particularly for more localised areas.

The shaded region of Queensland shown in Figure 1.6 represents approximately 50 per cent of Queensland's land area, which carries over 80 per cent of the State's livestock. Rainfall averaged over this area provides a useful, broad-scale index of grazing land rainfall being biased toward the most heavily stocked regions of Queensland.

Figure 1.6 Broadscale index of Queensland's grazing land rainfall



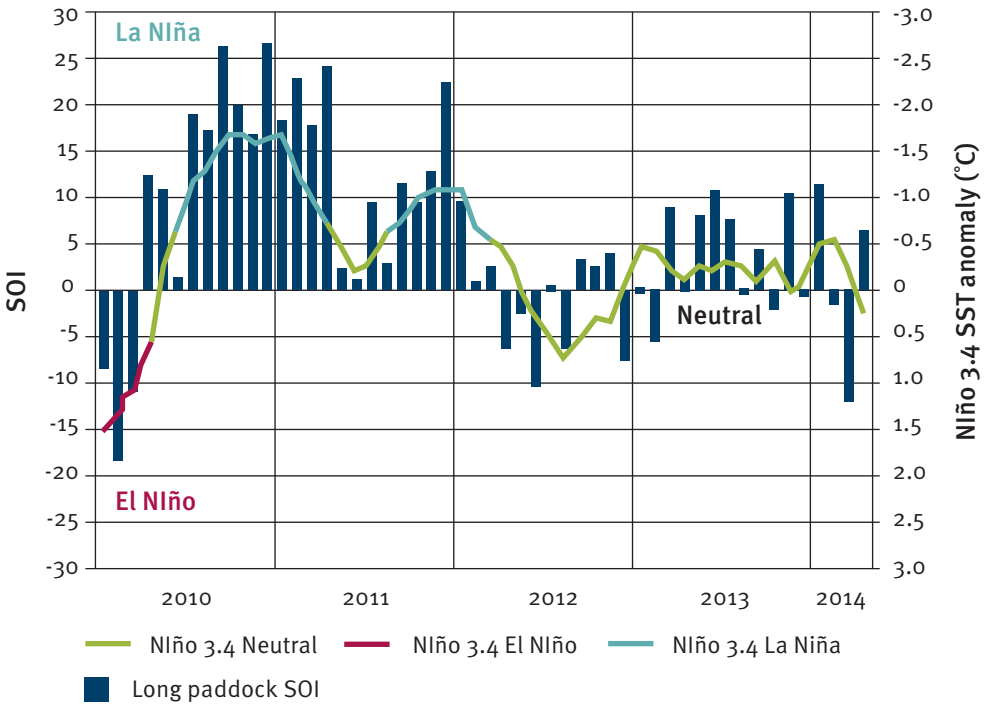
Source: DSITIA

The clustering of wet and dry periods throughout history is partly due to the strong influence of the El Niño-Southern Oscillation (ENSO) on Queensland's rainfall and partly due to the influence of the Interdecadal Pacific Oscillation (IPO) that affects the frequency and strength of El Niño and La Niña events. El Niño and La Niña represent opposite extremes of the global ENSO phenomenon. This phenomenon leads to a global redistribution of rainfall each year and has a strong influence on rainfall and temperature in Queensland. ENSO indices, such as the well-known Southern Oscillation Index (SOI) and central Pacific Ocean sea surface temperatures, account for approximately 25 per cent of the historical year-to-year variations in Queensland's rainfall. However, the strength of this relationship has varied over time, apparently breaking down during the 1920s, 1930s and 1940s but being stronger in the decades prior to and after those decades.

The last four years

The widespread wet conditions during 2010–11 and 2011–12 were associated with back-to-back La Niña events. The 2010–11 La Niña event was particularly strong (see Figure 1.7). The widespread drought conditions that followed developed during an 'ENSO-neutral' period when the SOI and sea surface temperature (SST) indices remained close to their average values (see Figure 1.7).

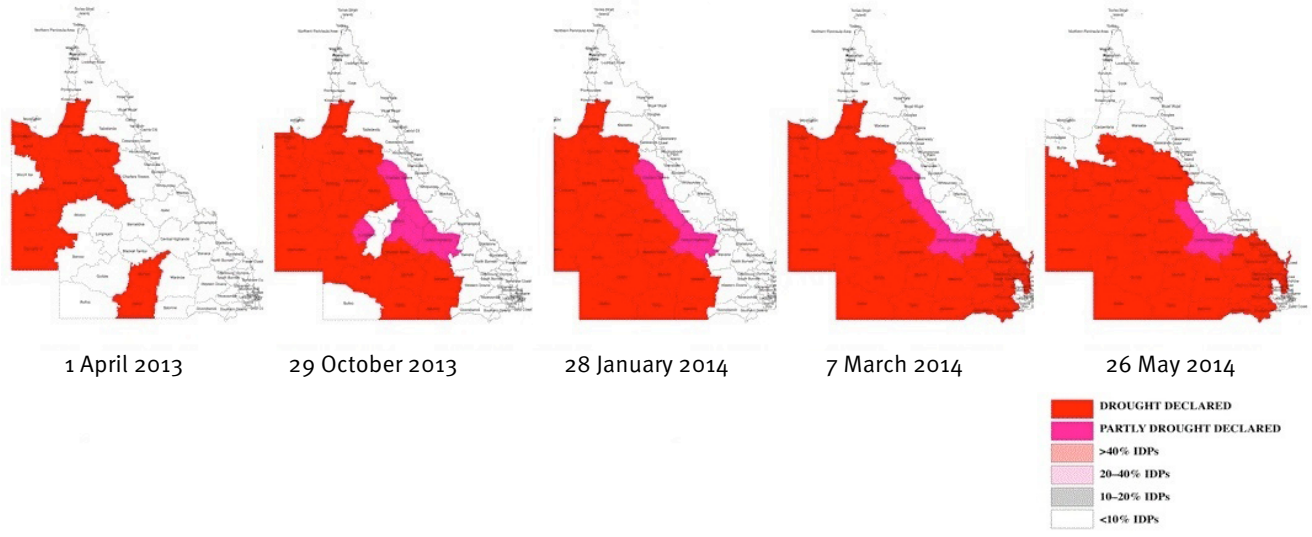
Figure 1.7 Fluctuations in the Southern Oscillation Index (SOI) and central equatorial Pacific Ocean sea surface temperatures (Niño 3.4 region) since 2010



Source: Southern Oscillation Index, DSITIA; SSTs, National Oceanic and Atmospheric Administration

The 24-months leading up to and including the 2011–12 Summer was one of the wettest 24-month periods on record in Queensland. In 2010–11, rainfall in the major grazing land region of the state (see Figure 1.6) was more than double the long-term (1890–2013) average. Rainfall was also well above average in 2011–12. The 2010–11 Summer will long be remembered as one of the wettest summers on record with widespread flooding across much of Queensland in December 2010 and January 2011. Most locations in Queensland received summer rainfall within the highest 10 per cent of rainfall totals on record with many of those locations receiving their highest summer rainfall in history. In contrast, the ensuing two-year period culminated in 80 per cent of the Queensland being drought declared in March 2014 (see Figure 1.8).

Figure 1.8 Queensland drought declared areas at selected times during 2013 and 2014



Source: DAFF

Drought declarations

From February 2011, Queensland enjoyed a rare period that was free of drought declarations, but that ended in April 2013 with 13 western Queensland local government areas being drought declared by the Queensland Government, following a particularly dry summer. For much of inland Queensland, hot and dry conditions persisted through winter and spring but by November 2013, water and forage shortages led to drought declarations being extended across much of inland Queensland (20 local government areas and six part shires). A dry start to the 2013–14 Summer saw drought declarations further extended in western Queensland with a total of 23 local government areas and four part local government areas drought declared by the end of January 2014.

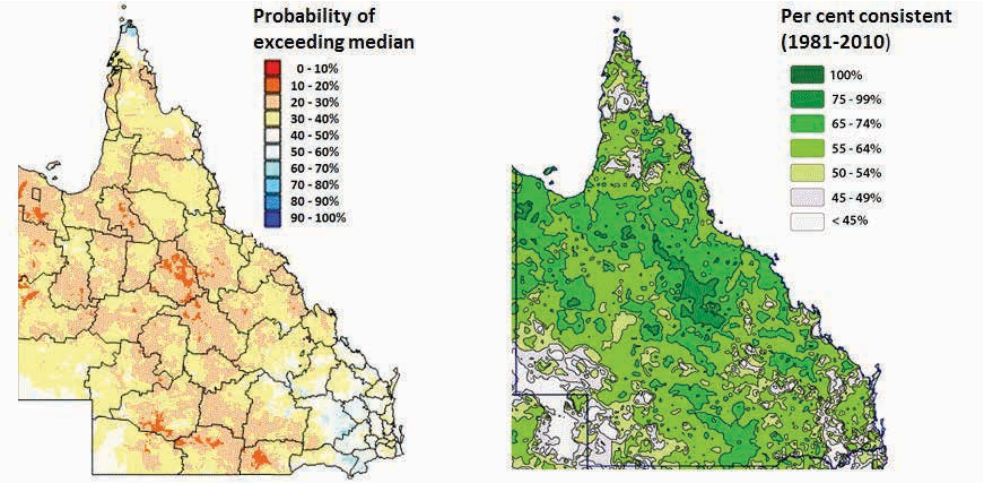
Although south-eastern Queensland had received high rainfall totals towards the end of the 2012–13 Summer, the following twelve-month period was extremely dry, leading to several local government areas being drought declared in March 2014 due to high rainfall deficits. Subsequently, high but patchy rainfall associated with an active late monsoon brought relief to some drought affected regions. However, as it was late in the pasture growing season it only brought some relief to short-term surface water issues, rather than providing lasting feed growth. In cropping regions, this rainfall also benefited late plantings of summer crops and helped replenish rural water supplies for irrigators.

Outlook for 2014–15 Summer

Queensland graziers have borne the brunt of drought conditions over the last two years. Many Queensland graziers, some having faced two years of drought conditions, currently face the prospect of managing through the seasonally dry winter period with little pasture that can sustain cattle. To add to this challenge, there is currently the threat of El Niño conditions developing in coming months and with this, a threat of dry conditions over winter and summer. This is not only a concern for graziers but also for the cropping sector, including both irrigated and dry land cropping.

International agencies currently rate the chances of an El Niño event developing this year as high as 75 per cent. The Bureau of Meteorology has indicated that El Niño conditions may be evident as early as July this year. Despite the strong El Niño forecast it is currently too early to base seasonal rainfall forecasts on this information. However, at this time of year, it is possible to issue long-lead rainfall outlooks for the coming summer based on the extra-tropical, sea surface temperature pattern associated with the Interdecadal Pacific Oscillation (IPO). Climate scientists from DSITIA have developed an approach to track this pattern on an annual basis in March each year and also provide rainfall probabilities for the following summer. This experimental approach currently indicates a high probability of below-average rainfall over the coming summer and, with this, a low probability of widespread drought-breaking rainfall (see Figure 1.8).

Figure 1.9 The probability of exceeding median summer rainfall in 2014–15 (November to March)



Note: Probabilities outlined in Figure 1.9 are generated from DSITIA's analysis of Pacific Ocean sea surfaces temperatures in March 2014. This outlook is based on historical statistics for the 100-year period from 1900–01 to 1999–2000.

Source: DSITIA

From June 2014 the outlook for summer rainfall will be updated on a monthly basis, incorporating SSTs associated with the evolving ENSO pattern. These forecasts will progressively become more confident as the ENSO situation unfolds. If an El Niño event develops, as seems likely in coming months, it would increase the likelihood of a dry summer in 2014–15 and DSITIA's confidence in this outlook.

The future

Part of the challenge for agriculture in Queensland is to continue to find ways to adapt to Queensland's highly variable rainfall. In this respect, fluctuations in Pacific Ocean sea surface temperatures not only help to explain historical variability in Queensland's rainfall but also enable seasonal rainfall forecasts to be provided up to several months in advance.

Part of ongoing adaptation to rainfall variability in Queensland must involve improving understanding of the processes which lead to rainfall variability at both inter-annual and multi-year timescales. The development of more accurate and timely rainfall outlooks linked to agricultural production cycles will benefit government decision-making and planning, industry and individual primary producers. Integration of accurate forecasts into decision-making will help producers be more resilient to Queensland's variable climate and improve productivity and profitability.