



***Economic Forces  
Shaping DPI&F's Service Delivery and  
Investment***

## Executive summary

DPI&F's enhanced service delivery strategy is being driven by the bright outlook for Queensland primary industries emerging from current global trends. These trends include:

- rising global demand for food and fibre commodities. While current high prices for agricultural commodities will not be sustained, prices are likely to remain above 1990s levels – supported by a slow unwinding of global protectionist and subsidisation policies;
- greater consumer interest in food quality and in environmental and ethical issues related to production processes, operating through increased supply chain integration. This means an increasing quality premium in the market-place, which benefits Queensland; and
- opportunities in industrial uses of agricultural products, particularly for biofuels, as well as in carbon sequestration.

Over the medium- to long-term, this will mean:

- increasing demand for animal and seafood products - especially for Queensland's number one agricultural commodity, beef;
- shift in grain demand from food to animal feed purposes, which Queensland's grain industries are well placed to meet;
- increasing biosequestration opportunities for tropical and sub-tropical forestry, including agro-forestry and forestry on marginal lands;
- opportunities in industrial applications – e.g., sugar, grains for biofuels;
- increasing demand for fruit and vegetables, particularly tropical and “niche” products; and
- increasing value-adding opportunities.

DPI&F's objective is to accelerate growth of the primary industries sector in Queensland in response to these opportunities. To achieve this, it faces the challenges of:

- climate change. The primary industries sector is adapting to significant changes in water availability, changed pest and disease distribution, and shifting growing conditions for different plants and animals. Water resources are becoming scarcer in the south but remaining abundant in the north, presenting a wide range of opportunities, notably for the beef, tropical fruit and vegetable industries in the north;
- maintaining high rates of productivity growth, requiring close attention to both the levels and also the nature and direction of rural research, development and extension (RD&E). Queensland is one of the few examples of tropical agriculture in a developed country, and so cannot rely on technology imports and needs a substantial local R&D effort;
- enhancing skill and education levels – including the business, production and resource management skills of farmers and the availability of skilled labour for farm production;
- identifying opportunities to intensify land use on a sustainable basis. Even allowing for contested landscapes and competing uses, an estimated 31 million hectares could be investigated in this regard. The Department is developing its agribusiness development precincts approach - a first-round analysis points towards horticulture and aquaculture around the Water for Bowen development, beef in the Fitzroy agricultural corridor, and a range of industry opportunities around the proposed Nathan Dam; and
- changing customers due to an increasing share of production coming from the largest farms, an increase in small lifestyle-oriented farms and a decrease in the conventional, small family farms which traditionally formed DPI&F's customer base. The Department is responding through its Next Generation Extension strategy, which is providing a greater focus on innovators (actual and potential) and technologies to promote food and agriculture as a viable business investment.

## 1. Introduction

To make the best possible contribution to profitable primary industries, the Department of Primary Industries and Fisheries (DPI&F) must shape its operations according to changing conditions.

This paper outlines the economic forces shaping the future of Queensland's food and fibre agribusinesses. These economic forces, operating on both the demand and the supply side of the market for food and fibre commodities, create opportunities as well as challenges for Queensland primary industries. DPI&F's future service delivery and investment blueprint aims to address the challenges as well as take advantage of the opportunities facing the sector.

## 2. Primary Industries in Queensland

Queensland produced almost 24% of Australia's agricultural output in 2005-06 – up from around 19% in 1995-96.

With a gross value of production of approximately \$12.5 billion each year, Queensland's rural sector is critical to our State's prosperity. As well as earning around \$6 billion in export income each year (around 25% of total state exports), the sector makes a vital contribution to state employment, economic growth and supplies a consistent supply of low-cost, quality food and fibre products for Queensland and Australian households.

Despite drought conditions, expected 2007-08 values of Queensland primary industries are:

- Cattle and calves and meat processing - \$4.3 billion
- Fruit, vegetables and lifestyle horticulture - \$3.4 billion
- Sugar - \$1.1 billion
- Cereal grains - \$1 billion
- Forestry - \$550 million
- Poultry (meat and eggs) - \$400 million
- Fisheries (including aquaculture) - \$300 million
- Pigs - \$220 million
- Sheep and lambs (wool and meat) - \$175 million
- Cotton - \$80 million.

Queensland's primary industries are in a unique position in Australia:

- Queensland agriculture is the most geographically dispersed of any State (even Western Australia which, though larger, has most of its agriculture in the southwest corner).
- Queensland has the most diverse agriculture: a mix of temperate, subtropical and tropical environments plus a mix of wet and dry zones, creating a number of unique production niches as well as challenges (for example, Queensland has had a series of high-cost biosecurity incidents, consistent with its climate and geographical position close to Asian/Pacific neighbours).
- Worldwide, there are very few developed countries in the tropics. Australia is one of them, and Queensland has the lion's share of that.

DPI&F is unique as a provider of Research, Development and Extension (RD&E) and biosecurity services to subtropical and tropical industries.

### **3. Opportunities for agricultural development**

#### **3.1. Demand-side influences**

Recent and expected trends in the world and domestic demand for agricultural products present unique opportunities and challenges for Queensland. These trends include:

- rising global demand for food and fibre commodities;
- greater consumer interest in food quality and safety as well as in environmental and ethical issues related to production processes;
- increases in supply chain integration;
- opportunities for food and fibre products as industrial inputs;
- opportunities in carbon sequestration; and
- an unwinding of global protectionist and subsidisation policies.

Forecasts indicate that strong real income growth world-wide is set to continue, particularly in developing Asia. As incomes rise in developing countries, the demand for food and fibre also rises, but less strongly, while the pattern of food consumption changes towards greater quality, variety and convenience. This results in rising demand for higher-quality foods, with more value-added services and more livestock products (such as meat and dairy).

Increasing concern about food quality and safety issues is being driven by a shift toward healthy eating, which is reflected in the increasing demand for fresh produce. Along with environmental and ethical concerns, this means that niche products such as organically certified and 'natural' products are gaining greater market share. As consumers have a greater interest in the origins of food, food processors and retailers are responding through product labelling information.

Australia's relative freedom from many of the debilitating pests and diseases of animals and plants that affect other countries helps maintain our competitive position. This disease and pest status has continued over the years through the country's relative isolation as an island continent and through significant investment in quarantine activities to protect against incursions of exotic pests and diseases. Similarly, the ecological sustainability of Australia's agriculture industries – including in terms of greenhouse gas emissions – is superior to that of many of our competitors. These will be increasingly important marketing tools in both domestic and export markets.

The recent jump in global prices for food-based commodities stems mainly from the rising use of food and fibre products for industrial feedstock, particularly biofuels, and nutraceuticals and functional foods. While much of this demand is policy-driven, and hence subject to ongoing uncertainty, indications are that much of the price increase may be sustained for some years to come.

Implications for Queensland's primary industries are:

- increasing demand for animal products (especially beef);

- shift in production of grains from food to animal feed purposes;
- increasing demand for fruit and vegetable products, particularly tropical and “niche” products;
- increasing demand for value-added foods; and
- Increasing opportunities in supply of food and fibre for industrial purposes
  - Opportunities for grain, sugar, niche products.

Future growth in Australian agriculture is likely to depend more on export markets than on the comparatively small domestic market. Despite the generally favourable demand conditions, there are also challenges: protectionist barriers to trade, other quarantine and technical barriers, maintenance of global competitiveness and market image, and management of biosecurity issues.

Increased competition from other countries, often reflecting improved economic performance in those countries, is generating both additional demand and supply. Examples of increasing competition for Queensland include sugar and beef from South America, cotton from central Asia and Africa, grain from Eastern Europe, and horticulture from China. Australia is also becoming more open to international trade, including increased international scrutiny of our strong quarantine barrier.

Direct government payments in agriculture (including market price support) account for a large proportion of farm incomes in many industrial countries. While protectionist policies continue in some countries, globally there is a slow unwinding of the production impacts of protectionist and subsidisation policies. However, it is increasingly the case that complex, non-transparent technical barriers, particularly sanitary and phytosanitary (SPS) measures (including food standards), are affecting market access for agricultural products.

- Opportunities in beef with Australia’s disease-free status.

Within the general threat of climate change, a likely future opportunity is that of carbon biosequestration to create carbon offsets.

- High potential in tropical and sub-tropical forestry.

## **3.2. *Supply-side influences***

### **Climate Change**

One of the Queensland Government’s top priorities is to develop strategies for pro-actively managing the risks of climate change. These risks, and the need to adapt to such changes, presents a major challenge for primary industries as it is the sector that is most dependent on the climate. Global warming is changing the level and pattern of water availability, the geographic pattern of optimal conditions for plant growth and the distribution of pests and diseases. It also impacts on the distribution of seafood species and on animal welfare.

Driven by changing water availability, climate change is expected to shift the agricultural resource balance to the north of Australia as water resources are becoming scarcer in the south of the continent but remaining abundant in the north.

Existing government programs already target Queensland’s north through creating, for example, an integrated, efficient transport system across roads, rail and ports that are critical for national and international competition. The Government’s Northern Economic

Triangle and regional development and Blueprint for the Bush initiatives are relevant in this context.

### **Productivity and Innovation**

DPI&F's objective is to accelerate growth of the primary industries sector in Queensland. Accelerating growth means either increasing inputs to production, raising productivity, or both.

A region's potential as a profitable supplier of agricultural products is determined by its comparative advantage – the availability of land, labour and capital resources and the productivity of their use. From an economic perspective, additional agricultural production will take place where the use of available resources is more profitable than in alternative locations.

Natural resource inputs are unlikely to increase significantly in future – indeed, competing pressures and sustainability issues mean that natural resource inputs are likely to decline. DPI&F is working to enhance labour and capital inputs through its training and skilling and investment attraction strategies.

The reality is that most growth will be through productivity improvements as a result of innovation in products and processes. Productivity growth in primary industries has consistently been stronger than in the rest of the economy, reflecting the market orientation of the sector and the strong levels of public support for innovation in the sector. A mountainous literature demonstrates the high social returns from investment in rural RD&E. Queensland is one of the few examples of tropical agriculture in a developed country; and so cannot rely on technology imports and needs a substantial local R&D effort.

DPI&F is the largest single direct provider of RD&E services to Queensland primary industries and a major provider of RD&E in Queensland - its efficient use of resources in this endeavour is therefore of state-level significance.

### **Land**

Queensland has a total land area of 173 million hectares. 83% of this is held by agricultural operators (freehold or leasehold). There are significant barriers to further expansion from alternative land uses, including environmental (e.g., National Parks, Wild Rivers, remnant native vegetation), cultural (e.g., Native Title), social (e.g., urban development) and economic (non-farm industry) purposes. The high price of land for non-agricultural purposes is one factor driving spatial adjustment of land-use options, particularly in the contested landscapes of the southeast of the state and the coastal centres.

Analysis using GIS software suggests that 31 million hectares could be investigated for further agricultural development, after allowing for the major known institutional constraints (Appendix A).

Of these 31 million hectares, 9% is classified as dryland agriculture and the rest as production from relatively natural environments, including grazing on native vegetation and native forestry. Additional water and infrastructure could see higher-value use of this land, for example, switching from dryland to irrigated systems. Current intensive agricultural production in Queensland covers an area of around 1.3 million hectares. This analysis

indicates that there is considerable scope for investigating further agricultural development through increased intensity of land use in these areas.

### **Water and related infrastructure**

Water is the one indispensable resource of primary production. While in some locations the risk of floods and cyclones limits production options, drought is a much more widespread problem.

Irrigated agriculture has been the conventional approach to 'drought proofing'. Water-resource development has three discrete phases:

1. water is regarded as a free gift and is easily accessible
2. water exploitation involves an engineered redistribution in time and space and so becomes a costed input
3. maximum attainable level of stream-flow regulation is reached, where competing demands require an effective mechanism to allocate water to its highest value uses.

Throughout much of south-eastern Australia, water resources have reached the third phase. In many regions water resources for agricultural production have been over-allocated, a problem further compounded by climate change.

For much of Australia, new irrigation opportunities are likely to be restricted largely to water derived from savings and recycling projects. However, northern Queensland has a relative abundance of water, with options still available for further development of storage and redistribution.

Some climate models indicate that water availability in north Queensland may actually increase. However, there is a higher forecast probability that water availability will decline in most of south-eastern Australia, including southern Queensland. This means that north Queensland's *relative* abundance is expected to increase.

Queensland, in collaboration with relevant governments and other agencies, has established the Northern Australia Irrigation Futures Project to develop:

- a sustainable framework for future irrigation in northern Australia
- an improved understanding of water systems, particularly the likely risks to groundwater and connected surface water systems if used for irrigation
- an improved understanding of the advantages and disadvantages of smaller, discrete patches of irrigation, dispersed across the landscape, compared with traditional, large scale contiguous irrigation systems.

To date in excess of 1.5 million ML/a of 'unallocated water' has been identified that can be made available without compromising ecological outcomes. Resource Operation Plans specify the process for release of unallocated water.

### **Other resource issues**

Other resource use issues that influence production patterns include land degradation, run-off (especially impact on the Great Barrier Reef), biosecurity issues, vegetation management, and public concern over issues such as animal welfare. Many of these are impacted by climate change.

- Opportunities exist for those able to demonstrate best practice – assisted by DPI&F's Property Management Systems agenda.

## Capital

*Private capital* investment is motivated by profitability. In addition to a region's natural endowments, a main determining factor of profitability is *public physical infrastructure* that includes transport, ports, telecommunications, and energy and irrigation facilities. They need to be of a sufficient quantity, quality, and within an integrated system to attract private investment to a region.

The Queensland Government is paying particular attention to the physical infrastructure of the north in order to realise the region's potential, for example, the Northern Economic Triangle's transport and energy systems. Such improvements have a flow-on effect by improving the profitability in all sectors, including primary industries.

Primary industries stayed in business through decades of declining terms of trade by improving productivity above other sectors in the economy through the efficient use of private and social capital. Trends in the distribution of farms indicate a 'hollowing-out' of the middle, that is:

- increasing investment in, and production from, the large commercial operators (many of which are family-owned);
- increasing numbers of small, primarily lifestyle-oriented establishments; and
- a reduction in the numbers of the conventional, small family farms.

These different groups have different needs for, and propensities to use, *social capital*, particularly production know-how. Historical returns on rural RD&E have been outstanding, with returns on funds consistently well above those from most other investment options. To ensure similar returns in the future, RD&E must be targeted where it is most profitable.

DPI&F's services were traditionally oriented towards servicing relatively small family farms. The accelerated growth objectives means this will need to change, with a greater focus on innovators (actual and potential) and appropriate technologies to promote food and agriculture as a viable business investment.

## Labour

Primary industries require specialist skills. The sector's performance is increasingly dependent on operators of large-scale commercial enterprises with an extensive and integrated knowledge of bio-physical and socio-economic systems and information technology. Farm managers, particularly new entrants, increasingly need higher levels of formal education.

Some enterprises depend on seasonal labour for fruit picking and other labour intensive activities. Given the competition from other sectors in a tight labour market, it is increasingly difficult to find local residents to undertake such work.

There is no single solution to these bottlenecks that are particularly acute in remote rural regions. Rather, a mix of immigration policy, trained skilled workers, the development of labour hire systems that provide continuity of work in industries with strong seasonal peaks, and industrial relations reforms is increasingly important.

## 4. Future development

### Issues in facilitating the development of primary industries in Queensland

Supply and demand analysis shows beef, tropical fruits and vegetables are particularly prospective for the north. These industries:

- have a critical mass to enable a 'least-cost' means of expansion
- lead to flow-on impacts that promote wider regional benefits.

#### ➤ Feed-grain expansion as an input to beef production

Feedlot-finishing of beef is a rapidly growing trend, driven by climate conditions and export demand for a less lean meat than Australia's traditional offering. Both of these factors are expected to continue in the future, leading to continued growth in feedlotting, notwithstanding the constraints derived from high grain prices.

#### ➤ Development of abattoir and processing capacity

Additional feedlots generate a consistent cattle supply and the potential for employment of a second shift in the processing plants would provide a significant increase in local jobs and expenditure. DPI&F aims to build on the region's strengths by further integrated development of the Fitzroy Industry and Infrastructure Corridor.

#### ➤ Horticultural opportunities

Due to a lack of established international supply chains, much of the region's fruit and horticultural produce is shipped through metropolitan centres. With production increasing locally, exports from local (air)ports become more feasible, and local value-adding becomes more profitable, resulting in shorter shipment times and a virtuous circle that enables better quality.

### Precinct opportunities at a regional level (potential agribusiness precincts)

To further stimulate business, DPI&F has been promoting the concept of agribusiness development precincts. The aim is to add significant value to the Queensland economy in key locations in response to market opportunities and emerging infrastructure availability.

By taking a precinct planning approach, the potential for agribusiness development can be assessed and planned for in conjunction with economic and industry development strategies, efficient catchment and resource management, local and regional land use planning, infrastructure planning and sequencing and supply chain development, to attract investment in regions. A first-round analysis indicates the following are most prospective:

#### Water for Bowen

- Some areas of grazing land could be transformed into fruit and vegetable production, while other areas are developed fruit and vegetable land but are constrained by a lack of water.
- Increased water availability will enable expansion of high value fruit and vegetable into existing production areas that have been constrained by reduced water entitlements from the declared groundwater system. This could almost double the current production area with an additional 5,000 to 8,000 hectares.
- This area has a niche production period in winter when production in southern Australia is constrained due to low temperatures.
- There are also significant aquaculture opportunities in the region, subject to the resolution of environmental impact issues in this Reef catchment.

- Industry development may be boosted by the construction of rail link in the Bowen basin and the possible ultimate development of container ship facilities at Abbott Point.
- The Department of Tourism, Regional Development and Industry is considering food processing / value adding opportunities in the region.

### **Fitzroy agricultural corridor**

- Intensive animal production (beef feedlots and some piggeries) are a principal component of the Fitzroy Infrastructure Study (FIS), which has identified significant investment potential for the development of new large-scale beef feedlots to substantially increase the turn-off cattle to supply central Queensland export meat works. This work is in an advanced planning stage.
- Feedlots could increase the number of cattle available to local underutilised meatworks by as much as 200,000 to 300,000 extra cattle per year.

### **Nathan Dam**

- Potential for cotton, grains and forage for silage to support supplementary cattle feeding and feedlotting.
- Potential for typical irrigation area development and further downstream uses.
- Possible horticulture market windows and an area suitable to a range of agronomic options so new production risk could potentially be spread across a range of new production activities.
- Mining demand is for high-reliability water, food and agriculture industries may use lower-reliability allocations.

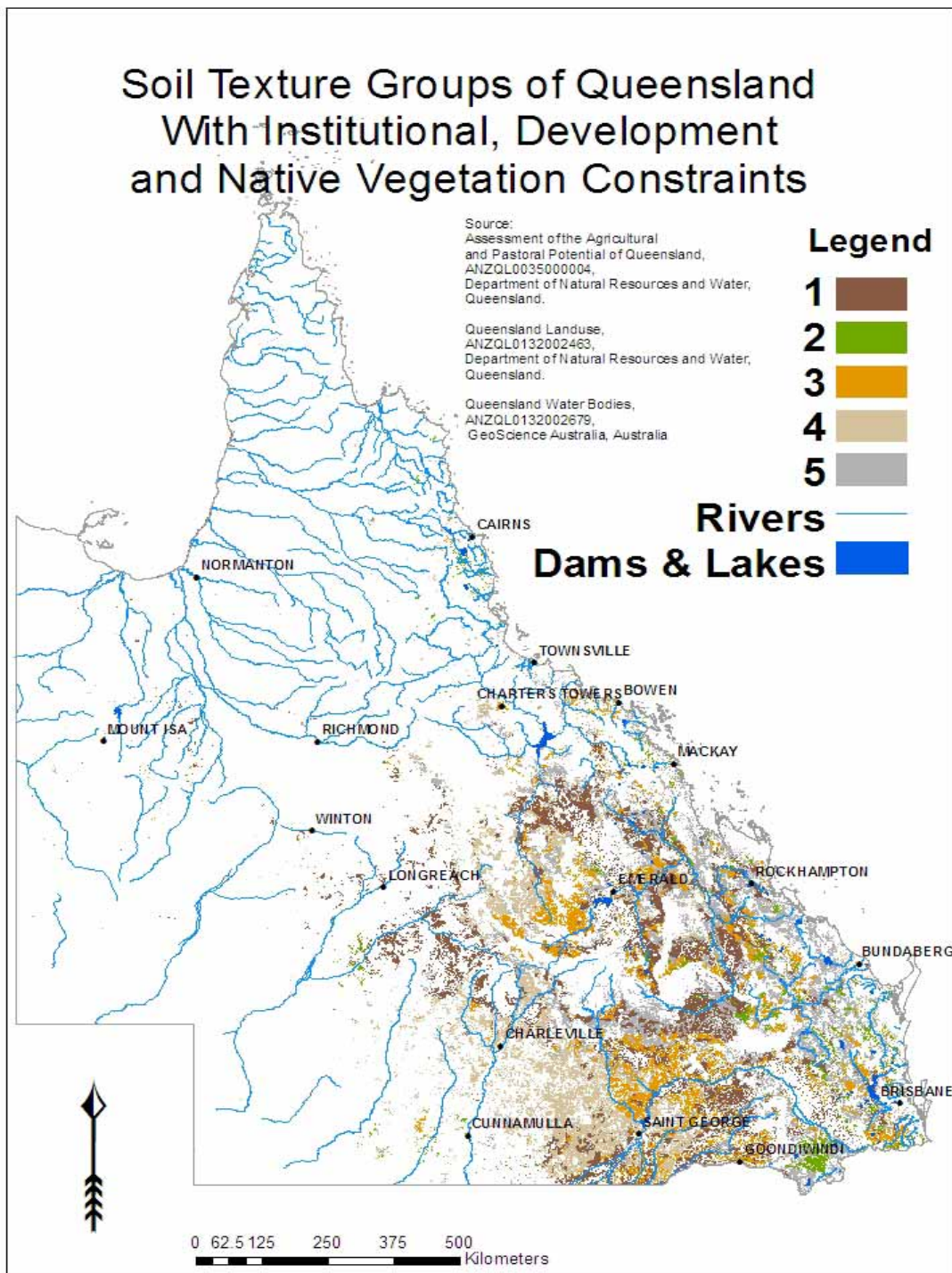
## **5. Conclusion: The Need to Change**

To maintain the government's relevance to the primary-industries sector and value for the taxpayer's dollar, DPI&F must continuously change.

Major challenges, not the least of which is climate change, are already shaping Queensland government policies, and DPI&F must play its part.

In addition, climate change and market developments are expected to have unique implications for the primary sector, creating both challenges and opportunities. DPI&F must use its resources to best help the sector in overcoming the impediments and capitalising on the opportunities.

Since much of the opportunities are in the state's north, DPI&F must change its spatial and functional scope of operations accordingly to maintain maximum impact.



A data set based on soil associations of the Atlas of Australian Soils was used to separate total land area into broad soil texture groups. These soil texture groups have been numbered for convenience, where the ***potential for plant production decreases in order from 1 to 5***. Soil type is the only criteria considered as a site characteristic in this analysis, as this is the only meaningful layer consistently available at a state level that will allow this sort of top down approach to be used. It is acknowledged that more detailed soil attribute data sets are available for specific regions, however the resources required to use these data sets in a state-wide analysis are beyond the scope of this report.