# Irrigation Futures

## of the Goulburn Broken Catchment

## Final Report 10 – Business futures

State Government Victoria
Departments of Sustainability and Environment Primary Industries
Sustainable Irrigation
Goulburn Broken Catchment Management Authority
Goulburn-Murray Water
Cooperative Research Centre for Irrigation Futures
Australian Government

**Published by:** Department of Primary Industries
Future Farming Systems Research Division
Tatura, Victoria, Australia
June 2007



**Authorised by:** Victorian Government
1 Treasury Place
Melbourne, Victoria
3000 Australia

**Printed by:** Future Farming Systems Research Division, Ferguson Road, Tatura

**ISBN:** 978-1-74199-568-8 (print)
978-1-74199-537-4 (online)

### Disclaimer

This publication may be of assistance to you but the State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.

### Authors

Ms Claire Pinniceard, Mr Leon Soste, Mr David Robertson and Dr Q.J. Wang

### Documents in this series.

**Final Report – Summary**
Provides a brief introduction to the project and how the project objectives have been met.

**Final Report 1 – Scenarios of the Future: Irrigation in the Goulburn Broken Region**
Provides an overview of the region, drivers for change, scenarios, implications and strategies.

**Final Report 2 – Regional scenario planning in practice: Irrigation futures of the Goulburn Broken Region**
Provides a manual of project methodology for next-users.

**Final Report 3 – Perspectives of future irrigation**
Describes scenario implications for irrigation supply infrastructure.

**Final Report 4 – Handbook of flexible technologies for irrigation infrastructure**
Provides guidelines and tools for irrigation supply infrastructure design.

**Final Report 5 – Scenario implications for catchment management**
Describes scenario implications and strategies for catchment management.

**Final Report 6 – Scenario planning for individuals and businesses**
Tool to assist individuals and businesses to assess the scenario implications for their enterprise.

**Final Report 7 – Hand book of project plans**
Provides project plans including the funding bid, participation, communication and evaluation plans.

**Final Report 8 – Project evaluations**
Independent evaluation of stakeholder satisfaction and overall project processes

**Final Report 9 – Scenario implications for land use planning**
Implications of land-use change for zoning, services, economic development and communities

**Final Report 10 – Business futures**
An entrepreneur's view on the issues and the support environment needed for product differentiation

**Final Report 11 – Water and food: futures thinking**
Translating project outputs into school curriculum

**Final Report 12 – Fact sheet**
One page overview of project aims, processes and outputs

***For more information about DPI visit the website at www.dpi.vic.gov.au or call the Customer Service Centre on 136 186.***

# Irrigation Futures of the Goulburn Broken Catchment

# Final Report 10 – Business futures

**Project Team:**
Dr Q.J. Wang (Project Leader), Leon Soste (Operational Manager), David Robertson (System Analyst), Sherridan Watt (Project Support) – Department of Primary Industries and Cooperative Research Centre for Irrigation Futures

Robert Chaffe (Workshop Facilitator) – Community Engagement Network, Department of Sustainability and Environment

**Governance Committee:**
Ian Atkinson, Murray Chapman, Denis Flett, Phillip McGowan, Ian Moorhouse, John Pettigrew (Chair), Sonja Tymms.

**Stakeholder Reference Committee:**
Mark Allaway, Allen Canobie, Bruce Cumming, Steve Farrell, Peter Gibson (Chair), Colin James, Peter McCamish, Ian Moorhouse, Chris Norman, Russell Pell, Derek Poulton, Ann Roberts, Nick Roberts, Nick Ryan, Ken Sampson, Alan Sutherland, David Taylor, John Thompson, Mark Wood.

**Technical Working Group:**
Bruce Anderson, David Bourke, Allen Canobie, Bruce Cumming, John Dainton, Joe Demase, Peter Fitzgerald, Lyn Gunter, Shane Hall, John Laing, Peter Langley, David Lawler, Oliver Moles, Bev Phelan, Claire Pinniceard, Derek Poulton, Kevin Preece, Durham Prewett, Peter Sargent, Rien Silverstein, Katrina Tehan, Ross Wall, Gordon Weller.

**Project Funded By:**
Department of Primary Industries
Department of Sustainability and Environment
Goulburn Broken Catchment Management Authority
National Action Plan for Salinity and Water Quality
Goulburn-Murray Water
National Program for Sustainable Irrigation
Cooperative Research Centre for Irrigation Futures

# Table of Contents

# Introduction

## *Irrigation Futures of the Goulburn Broken Catchment*

The Goulburn Broken Catchment is known as the food bowl of Australia. It covers 2.4 million hectares and has a population of around 200,000 people (Department of Sustainability and Environment 2005). Irrigated agriculture is a major business engine in the Goulburn Broken region, producing more than $1.2 billion at the farm gate in 2001-2002 from about 280,000 hectares of irrigated agricultural land. Investment in on-farm and processing infrastructure is about A$100 million per annum (Michael Young and Associates 2001). The region is therefore a major contributor to the state and national economies and the quality of life of consumers.

The region faces significant challenges and opportunities. Issues such as free trade agreements, climate change, water reform, and technological developments will have a significant influence on the future. As one of the oldest gravity irrigation systems in Australia, Goulburn-Murray Water's irrigation system needs substantial renewal of its ageing infrastructure in the next 20 years. The consequences of these pressures for the region are highly uncertain and will include impacts on the region's economy, environmental assets and social fabric. Therefore, it is critical that the region develops a sound plan to strategically position itself for irrigation in the future.

Regional planning is highly challenging. In addition to the complexity of issues and high level of uncertainty, a diverse range of stakeholders have interests in the planning process and its outcomes. Enabling all stakeholders access to the planning process is important to managing their expectations and developing plans that are robust and likely to be adopted.

The Goulburn Broken Irrigation Futures project was established to assist the regional community to plan for the future. It was a regional initiative, funded by the Goulburn Broken Catchment Management Authority, Goulburn-Murray Water, Victorian Department of Primary Industries, Victorian Department of Sustainability and Environment, and National Program for Sustainable Irrigation. The project adopted a scenario planning approach in collaboration with the region's stakeholders to:

- develop a shared vision for the future of irrigation in the Goulburn Broken catchment over the next 30 years;
- identify scenarios of major constraints and opportunities and of regional response options;
- understand the social, economic and environmental consequences of various scenarios; and
- facilitate key stakeholders to build consensus on preferred regional strategies for future irrigation.

Scenario planning is a relatively new approach to strategic planning developed and applied famously by the Royal Dutch Shell Company to anticipate and plan profitably for the oil shocks of the 1970s (O'Brien 2000; van der Heijden 1996). Scenario planning explicitly acknowledges ambiguity and uncertainty in the strategic question by creating a set of scenarios that describe plausible, coherent pictures of alternative futures. These scenarios become a powerful tool for testing the robustness of strategies, as well as for generating new strategic options. Scenario planning also provides a useful means for organisational learning. While scenario

planning has become widely used by private corporations and public organisations (O'Brien 2000), there are few examples of its application for regional planning.

The Goulburn Broken Irrigation Futures project used scenario planning in conjunction with the regional community to explore and plan for the future of irrigation in the region. The project was undertaken in four stages. Following an initial stage that developed the project, community perspectives on the future for irrigation were captured by an extensive stakeholder-engagement program. The third stage involved developing detailed scenarios and examining their regional implications. The final stage involved examining the implications of the scenarios for specific issues, in collaboration with the region's agencies and organisations.

## *This document*

The Irrigation Futures project has indicated that our ability to compete in the global market is likely to be driven by our ability to offer differentiated products rather than by our ability to offer a low-cost product. The project team felt that it would be useful to provide an entrepreneur's view on what we (as a region), could do to facilitate the development of differentiated products. The entrepreneur chosen was Ms Claire Pinniceard.

Claire is the owner and sole director of The Pig Pen Pty Ltd, an enterprise that grows-out pigs for domestic and export markets. She has specialist expertise in sustainable agriculture and has been the sole representative of agriculture on the Essential Services Commission. She was the 2006 winner of the Telstra Business Women's Award for Australian Government Business Innovation. In 2007, she was the only farm enterprise to become a national finalist in the sustainability category of the Banksia Environmental awards. She was recently appointed to the Board of Goulburn Murray Water.

These are her views. You may not always agree with them. However, we would encourage you to think about the points that she raises, particularly in the context of co-ordinated land-use planning and service provision. Her message is: If we want to assist agribusinesses to develop differentiated products, and to function in a globally competitive market, we need to provide them with appropriate levels of infrastructure and land-use zoning systems.

The first section of this document provides her check-list of the issues and questions that new and developing businesses need to consider during establishment. The second section provides her views on the challenges faced by new and developing agricultural businesses, and the implications of these challenges for service providers and regional planners.

## Establishing innovative agricultural enterprises

The establishment and development of innovative agricultural enterprises is a complex process. This section provides one entrepreneur's perspective on some of the issues which need to be considered by small – medium enterprises starting with a new product (innovators), and by existing businesses that are modifying an existing product line (adaptors).

The check list is not comprehensive. Many additional resources are available that should be explored including those at Business Victoria (www.business.vic.gov.au).

### *Planning for the new enterprise – feasibility/scoping*

#### Market requirements

What are the unique elements/competitive advantages of my proposed product? What is the likely demand for such an innovation?

What are the market requirements for this product now, what are they likely to be in the future? Can I meet those requirements? eg. Certification and other non-tariff barriers including Corporate Social Responsibility and Triple Bottom Line? Are there any other requirements specific to this category of enterprise?

Can I meet or exceed global market certifications including the emergent ones, such as ISO 14064?

#### Viability assessment

What volume of production is required to provide market stability?

Am I likely to be a price maker or price taker? What value chain or partnering arrangements might I explore to help the situation?

What price and quality differentiators are already factored in?

#### Land and service needs

For innovators – what type of zoning would this new enterprise require? (Farming, Rural Activity, Rural Living).

For adaptors – Does the zoning allow me to start this new enterprise on my current land, or do I need to go elsewhere?

What is the smallest area that I can start with? Can I grow it (or shrink it) as required? Can I partner with others to grow the business? Does it have specific location requirements for services including labour? Do I need to own the land, or can I lease it?

What infrastructure and services will I need – particularly with respect to power, water and transport? Are these generally available now, or will I need to be involved with agencies to seek an upgrade? If I have to compete for upgrades of a scarce resource, can I demonstrate that my process will create sufficient value for the use of any new infrastructure provided, especially water and energy/water nexus? (underlying concept – future allocation of a scarce resource may not be based simply on my ability to pay)

Given all my inputs and outputs, what is the size of the environmental footprint that my enterprise is creating?

**Obtaining funding for the new enterprise**

| Innovators | Adaptors |
|---|---|
| Lending institutions are characteristically timid in the face of innovation | An enterprise with an existing track record is often given credit for experience |
| Security available? | Security may be reduced as a requirement |
| Innovators require a higher level of surety and will pay more for perceived risk | Adaptors may be able to secure funding more readily or with lower premiums |

Age, sex and marital status affect funding decisions, especially in the pricing of risk.

Assets such as a house are not able to be protected in the event of liquidity problems.

Detailed planning will support funding capacity.

### *The pricing of risk*

This deals with - How has the enterprise planned to cover the commercial consequences of a serious risk event?

| Innovators | Adaptors |
|---|---|
| An innovator may have the risk issues of a novice in this new enterprise | An adaptor is moving beyond their current risk experience, but still has the credibility of related experience |

What are the risk associated with:

- Climate change?
- Globalized market movements, including sudden currency fluctuations and security of payment?
- Security of source materials and inputs?
- Market diversions?
- Imports? – quarantine risks etc?
- Contractual security?
- Political and legal risks?
- Insurance cover?
- Reliability of infrastructure supply?

### *Finding a site*

Having done the planning, potential sites have to be identified, and a site chosen.

| Innovators | Adaptors |
|---|---|
| Innovators have to define these issues beforehand, then find a solution that meets all criteria | Adaptors will need to ensure that outcomes are not compromised by attempts to use existing structures when these may not be optimally suitable |

Consider issues such as:

- Location, size, zoning including noise and odour
- Infrastructure availability
- Bio-security protection, animal health risks/ exposure
- Timeframe for funding
- Legal issues eg. ability to secure input credits for sale of electricity back to the grid

### *Obtaining operating permits*

Having identified the target site, the necessary permits have to be obtained. Note - all of the issues listed below favour adaptors over innovators

**Local Government:**

- Timelines
- Informed support
- Ability to negotiate a final consistent permit structure

**Agencies:**

- Variations or conflict over objectives and requirements, including matters relating to the built environment, such as amenity

**Regulatory bodies:**

- Requirements under Codes, statutory obligations, reporting requirements such as the National Pollutant Inventory,
- Compliance requirements for Quality Assurance systems etc

### *Commencing trading*

A new business structure may have new reporting, financial and fiduciary requirements, and may need a new type of labour supply.

| Innovators | Adaptors |
|---|---|
| New businesses will need to shop for professional support – legal, accounting professional financial, etc | An adaptor may have outgrown their original levels of support and will need to secure more suitable expertise |
| An innovator can make labour supply arrangements to suit the enterprise | An adaptor may find it difficult to alter labour supply structures |

Labour supply structures must meet production requirements

# Challenges for farming innovation

## *Introduction*

Irrigation Futures has identified that our ability to compete in the global market will not be based primarily on price, but rather on our ability to offer differentiated products in the market place.

One requirement for the development of such differentiation is the provision of an appropriate operating environment for agriculture. This discussion paper presents an entrepreneur's view of the infrastructure and planning frameworks which need to be in place, if agriculture is to operate in a globally competitive market. The aim is to stimulate service providers and land-use planners to consider their role in providing such an environment.

## *Current trends*

### Cost-price squeeze

The Australian domestic market is, for most cases, too small to provide a profitable, robust, stand-alone market in agricultural produce. Increasingly, businesses need to be able to trade in the global market as well as the Australian market, to obtain the economies of production which buffer them against market movements. Globalised businesses will also need to deal with the problem of production variability created by seasonal variation.

This is producing significant changes in Australian agriculture. Enterprises are becoming larger, mainly by consolidation. Even traditional broadacre grazing enterprises, namely beef and sheep, have been undergoing significant aggregations. Volume of production is steady or rising, the number of enterprises is declining.

Industries are also moving to intensification as a production strategy. For some years, beef enterprises have not been rearing calves on site, but sending them to feedlots. In the lamb industry, larger farms are feedlotting lambs on their own properties, and large feedlots are being established to smooth out production and to provide market consistency. This trend has produced some serious issues for infrastructure provision, animal welfare, and environmental management. For example, an assessment of the environmental impact of livestock has indicated that major changes are required if production strategies in this sector are to be sustainable (*Livestock's Long Shadow, FAO 2006*).

While agricultural industries are aggregating, climate change is driving a reduction in the area of land on which agriculture can be practised. In parallel, population increases are removing land from production to provide for housing. This means that the growing world food needs will be produced on progressively less land.

Locally, climate change will place horticultural production at risk due to temperature and rainfall changes that may induce unseasonal frosts or reduce the available chilling. This may lead horticulture to trial new plant varieties, or move to another region, or construct some form of controlled environment for their plants. Cropping systems will potentially be faced with increased rainfall during traditional harvest seasons. Livestock may require additional shelter. The increased incidence of fires will place all agricultural activity at risk. Note that most of the adaptation strategies outlined have implications for infrastructure and land-use planning.

Many businesses are also taking control over a larger proportion of the value chain by taking responsibility for marketing their product to the consumer. This enables them to have more control over the prices they receive for their produce and therefore moderate the decline in their terms of trade.

**Market demands**

Market requirements have traditionally influenced issues such as consistency of supply, product quality and accountability. These requirements are enforced through matrix payment systems that impose significant penalties on variations from prescribed standards. However, increasingly these requirements have been extended to cover the production systems as well as the products themselves.

Market requirements are generally prescribed in terms of audit and certification requirements. The certification of production systems is costly to establish. It also requires ongoing monitoring and record maintenance, as well as annual licence and audit fees. For example, if a producer wishes to sell any of their product in any part of the UK supermarket system, the business must hold a current, unblemished ISO 14001 certification. This can take more than a year to obtain and the annual audit and licence fees are such as to preclude any but very significant enterprises from being able to support these costs.

The certification of some components of production systems by an individual enterprise is nearly impossible. Singapore, for example, mandates the ability to support by certification, that no genetically modified material of any kind has been used in the production of food products imported into the country. At this stage, mechanisms to prevent cross-contamination of materials in storage and transportation are not well established, and industry wide approaches are required.

A number of new areas of production certification are becoming important in the global market. These go beyond customer concerns about food safety, and focus on production techniques. One relates to animal welfare. In the UK, some market sectors now require labelling of products on a “traffic light” rating system of the quality of animal welfare used by the enterprise producing the food. Green represents approved standards, yellow represents marginal approval, and red asserts that the product was created with unsatisfactory welfare standards. The quandary is that there is no national development or international ratification of animal welfare standards.

The second area pertains to the international market interest in the emissions footprint of the enterprise. This has had more consistent research applied to it than the welfare standards. In Australia, we now have the Australian and International Standard ISO 14064. The methodology to support this Standard comes from the Australian Greenhouse Office and is based on the AS ISO 14040 series of Standards.

There is a significant drive among producers to support their market access with the ability to claim a low or neutral Carbon Footprint. It will not be long before customers begin requiring these as another aspect of market access. In turn, Australian agricultural producers will need to factor this into their certification systems and their production practices.

There is also an increasing interest in the market certification of water use efficiencies. As we move to more stringent management of scarce resources, we will see more emphasis on these environmental certifications.

The trends in market requirements for energy and water efficiency, adaptation to climate and moves toward intensification of agriculture have implications for agencies who deliver infrastructure, zoning and other production needs.

### *Energy supplies*

Traditionally, Victorian agricultural enterprises have been provided with energy, in general electricity, with similar levels of service as residences. In rural areas, this has been through a single wire earth return electricity distribution system. These supplies are inadequate for modern intensive production systems that commonly require three-phase power supplies.

Individual businesses have the opportunity to upgrade their power supplies. However, this can place significant costs on the business as it may necessitate the upgrading of infrastructure for a considerable distance. The current strategy for locating intensive enterprises on the landscape is to scatter them, often in an effort to distance them from other producers, and then to resource each enterprise as it is created. The characteristic result is expensive delays, controversy at the permit stage, then slow and expensive infrastructure provision. Discussions with various intensive enterprises across the State have identified an average cost of $500,000 to $700,000 to the enterprise for these outcomes.

In January 2007, the Australian energy market transferred from a State to a National market. While the Victorian Energy and Water Ombudsman will still have carriage of complaints in Victoria relating to energy matters, the distributors and retailers will be working in the national market. This creates some concern. As an entrepreneur, my experience is that the single user focus has been hard enough to manage at a State level. Will the introduction of a national market make this better or worse?

An alternative approach is to group users of particular types of infrastructure within the landscape, just as we have done with irrigation districts, and then to service those users with appropriate infrastructure. The aggregation of users will make the capital investment by the distributors more commercially appropriate. This will also make it simpler for the electricity retailers to provide service contracts which are appropriate for the intensive agriculture category of users.

The same argument applies to gas supply. The cost and technical constraints of gas reticulation has resulted in slow and difficult servicing of rural townships, let alone production agriculture. But gas can be used effectively by some intensive enterprises, and it produces lower emissions than electricity supply.

### *Water*

Modern intensive agricultural production systems need reliable, good quality, year round water supplies. In rural areas, water supply systems meeting these criteria can be difficult to access.

In many areas, irrigation water supplies are available. However, irrigation water supplies are seasonal and subject to inter-annual variability. Therefore, access to irrigation water alone may be inadequate for an operation that requires year round access to water supplies.

Harvesting of water on-farm is an alternative source of water. However, regulation of farm dams and highly variable rainfall mean that the on-farm water harvesting is unlikely to provide water with sufficient reliability.

Groundwater is another alternative source of water. However, the salinity and chemical composition of groundwater interferes with the efficacy of many agricultural chemicals, and therefore is unsuitable for many purposes. For example, hardness ratings affect chemical performance of both herbicides and pesticides. Alkalinity increases breakdown rates of some chemicals causing irreversible reactions. Bicarbonates drastically reduce herbicide efficacy. Suspended clay particles can deactivate some chemicals. The establishment cost of treatment plants at individual sites often becomes prohibitive.

Piped water supplies are typically of a higher quality than other water sources and are available all year round. This makes piped water attractive for intensive agricultural industries. The challenge is that it is extremely costly to provide this infrastructure to production zones located away from townships.

### *Land use planning and controls*

Existing land use planning processes and controls are designed to serve the needs of traditional low intensity agricultural industries. The shift to the development and operation of aggregated, intensive, agricultural production systems is not likely to be a straightforward issue for land use planners. The provision of appropriate infrastructure and services to these regions (including telecommunications systems) has been discussed. Finally, the potential for farming land to be used for the generation of electricity (through resources such as wind, solar or methane) will also need to be built into the planning process.

Rural lifestyle residents are often making an unplanned incursion into traditional agricultural landscapes. As a result, the number of complaints from residents about agricultural practices has been rising. This has meant that restrictions have been placed on farming enterprises in some areas. While many complaints have been about agricultural operations, issues of visual amenity and aesthetics have also been raised.

Permits are often required for the development of intensive agricultural production systems in rural areas. These permits are commonly objected to on grounds of degradation of amenity. This raises questions of: Who are the owners and beneficiaries of amenity in rural areas?

Due to agriculture using large amounts of rural land, there is an expectation that agricultural enterprises will deliver public benefits from their land management as well as private benefits. Landcare and other programs seek to facilitate natural resource outcomes from private land management. There can be a significant disjunction between productive private land use and the public benefits derived from agricultural land. This disjunction creates substantial uncertainty for the developers and managers of agricultural enterprises.

### *Conclusions*

The Irrigation Futures project has identified that regional agriculture will have to compete in the global market on the basis of a differentiated product rather than a lower price. This paper has identified a number of current market trends and agricultural production system responses. The paper suggests that large-scale businesses will be favoured because they will have the ability to spread infrastructure and marketing costs across a larger production base, and a greater potential to have a business that is diversified.

It has examined the implications of these issues for infrastructure and planning. Our aim is to assist industries and agencies to identify their role in providing an environment within which regional agriculture can operate competitively in the global market place. The paper indicates that to support developing agricultural businesses, particularly intensive enterprises, there are a number measures that could be taken:

- To lower the costs to individual businesses and service providers associated with the provision of infrastructure, zones could be defined where services suiting the requirements of new enterprise are provided.
- Encouraging new enterprises to establish in such zones may also assist with managing the issues of amenity and conflicts between public and private benefits derived from the management of agricultural land.
- There is also a role for industry and regional organisations to support agricultural businesses establishing certified production systems and therefore providing access to higher value markets.

These measures would potentially provide increased investment certainty to new and developing agricultural enterprises and ensure these enterprises continue to support the regional economy.

## References

Department of Sustainability and Environment (2005) 'Know Your Area'. Department of Sustainability and Environment, Melbourne

Michael Young and Associates (2001) 'An economic profile of the Goulburn Broken Catchment (including all of the Shepparton Irrigation Region) 2000: Executive summary'. Goulburn Broken Catchment Management Authority, Shepparton.

O'Brien P (2000) 'Scenario Planning: A Strategic Tool.' Bureau of Rural Sciences Kingston, ACT.

van der Heijden K (1996) 'Scenarios: The art of strategic conversation.' John Wiley & Sons Ltd.: Chichester, England