Irrigation Futures

of the Goulburn Broken Catchment

Final Report 2 – Regional scenario planning in practice: Irrigation futures of the Goulburn Broken Region

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Sustainable Irrigation

Goulburn Broken Catchment Management Authority

Goulburn-Murray Water

Cooperative Research Centre for Irrigation Futures

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Cooperative Research Centre for Irrigation Futures

Preface

We have been in drought for almost 10 years. Water trade is moving large amounts of water in and out of regions. Overseas markets wax and wane. These issues and more will continue to bring major challenges to irrigated agriculture here, and elsewhere in Australia, and indeed the world.

To help us to plan for these challenges, we (as a region) commissioned the Goulburn Broken Irrigation Futures project. The aim of the project was to work with stakeholders to develop a vision and strategies for irrigated agriculture in this region over the next 30 years. That long-term planning horizon involved considerable uncertainty, so we chose to use a scenario-based approach to our planning.

This document entitled *Regional scenario planning in practice* outlines the processes used in the Irrigation Futures project. It provides details of how we engaged the community to formulate scenarios, explore impacts, consider implications, and develop appropriate response strategies for our region. It has been developed as a guidebook for those who may wish to use a similar approach to planning with their communities. Users will obviously have to modify the processes to suit their particular needs and budget. My only suggestion is - don't compromise on genuine stakeholder engagement. It takes time, but it will repay your efforts.

The companion document *Scenarios of the future* provides details of the scenarios, the likely impacts, the types of broad-based strategies which might be formulated in preparation for an uncertain future, and how those strategies can be implemented. It essentially provides a model of the types of outputs which can be generated by such an approach to planning.

I commend both documents to you. I hope that they will be as useful to your region as they have been to mine.

John Pettigrew
Chair,
Irrigation Futures of the Goulburn Broken Catchment
May 2007

Acknowledgments

The work reported in this publication was undertaken as a part of the project Irrigation Futures of the Goulburn Broken Catchment. The project was the initiative of a small group of community leaders, particularly John Dainton, Steven Mills and John Pettigrew, who had the foresight to recognise the need for the region to plan for the long-term.

The authors would like to recognise the numerous people who have contributed to this project.

The Community Engagement Network of the Department of Sustainability and Environment provided expertise in community engagement and workshop facilitation. The contributions of Selina Handley, Nicole Hunter, Fiona Smolenaars deserve particular recognition.

During 2004, over 120 members of the regional community participated in Irrigation Futures Forums, a program of four workshops exploring the future for irrigation in the region. These workshops laid the foundations for the output from the project.

The Technical Working Group contributed many days of their time in undertaking analysis of the scenarios and developing their implications for the region. Members of the Technical Working Group included: 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, and Gordon Weller.

The Stakeholder Reference Committee played an important role in ensuring the stakeholder engagement processes were inclusive. They also helped synthesise the output from the Irrigation Futures Forums. Members of the Stakeholder Reference Committee included: Mark Allaway, Allen Canobie, Alan Crouch, Bruce Cumming, Steve Farrell, Peter Gibson, John Gray, Terry Hunter, Colin James, Brigette Keeble, Tony Long, Peter McCamish, Ian Moorhouse, Chris Norman, Russell Pell, Kylie Pfeiffer, Derek Poulton, Helen Reynolds, Ann Roberts, Nick Roberts, Melva Ryan, Nick Ryan, Ken Sampson, Justin Sheed, Alan Sutherland, David Taylor, John Thompson, Mark Wood and Roger Wrigley.

The Governance Committee provided oversight of the strategic direction of the project. Members of the Governance Committee included: Ian Atkinson, Murray Chapman, Deborah Courtney, Denis Flett, Frank Greenhalgh, Richard Habgood, Brigette Keeble, Philip McGowan, Ian Moorhouse, John Pettigrew, Kylie Pfeiffer, Greg Roberts, Sonja Tymms and Mark Wood.

The project received funding and support from the Victorian Government's Department of Primary Industries and Department of Sustainability and Environment, the National Program for Sustainable Irrigation, Goulburn Broken Catchment Management Authority, Goulburn-Murray Water, the Cooperative Research Centre for Irrigation Futures and the Australian Government's National Action Plan for Salinity and Water Quality.

The authors would also like to thank the reviewers of the project and its documents. These reviewers included Dr. Nick Abel, Dr. Allan Dale, Professor Ron Johnston, Dr. John Wolfenden, and Bruce Wright.

Contents

1. Introduction

What is scenario planning?

Scenario planning is an approach to strategic planning. It acknowledges the uncertainties and ambiguities of the future and seeks to identify ways to strengthen the strategic position of an organisation in that uncertain environment. Van der Heijden (1996) identifies that good strategic planning should be based on four common-sense elements:

- understanding of the aims and purpose of the entity;
- an assessment of the organisation's characteristics, including its capability to change;
- an assessment of the organisation's current and future operating environments; and
- an assessment of the fit between the organisation's characteristics and its environment.

This analysis of an organisation and its environment can then provide the basis for developing strategies, which should be designed to improve the fit between the organisation's characteristics and its current and future operating environments.

Scenario planning develops and uses scenarios that describe alternative plausible operating environments that may confront an organisation in the future. Typically, when using scenario planning several scenarios are created to acknowledge that the future is uncertain and a range of conditions are possible. Scenario planning then uses these scenarios to develop strategies that are robust for a range of plausible future environments.

How has scenario planning been used?

Scenario planning is a technique developed and applied famously by the Royal Dutch Shell Company during the late 1960s and early 1970s. Shell was able to anticipate and prepare for the oil shocks of the early 1970s. It rapidly re-focused its business and grew from one of the smaller oil companies to one of the largest in the world (van der Heijden 1996). In recent times, many large corporations such as British Airways and Electrolux have successfully adopted scenario planning for marketing and business development (Ringland 1998). Governments have also used scenario planning to plan infrastructure and the development of communities and economies. For example, in Singapore and the Netherlands scenario planning is a coordinated, whole-of-government activity which offers significant coherence and direction to future thinking (O'Brien 2000).

Box - Selected references on scenario planning

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

Schwartz, P (1996) *The Art of the Long View, Planning for the Future in an Uncertain World, Doubleday*, New York.

Suter, K and England, S (2001) *Alternative Futures for Aged Care in Australia*, UnitingCare NSW.ACT Ageing & Disability Service, Sydney.

van der Heijden, K (1996) *Scenarios – The Art of Strategic Conversation*, John Wiley and Sons Ltd, England.

For what have we used scenario planning?

Irrigated agricultural industries underpin the prosperity of the Goulburn Broken Region, a region facing a large number of challenges in the short to medium term. Drought and water trade have seen much lower volumes of irrigation water used than previously, and much of the region's irrigation infrastructure is nearing the end of its design life. Declining terms of trade for many of the agricultural industries in the region are placing pressure on the viability of agricultural businesses.

Following community concern for the future of irrigation in the region, the Goulburn Broken Irrigation Futures project was established to facilitate strategic conversations and to better prepare the region for the challenges it faces in the future. The project adopted a scenario planning approach to achieve the following objectives:

- facilitate key stakeholders developing a shared vision for the future of irrigation in the Goulburn Broken catchment over the next 30 years, and identifying scenarios of major constraints and opportunities and of regional response options;
- understand the social, economic and environmental consequences of various scenarios through impact assessment that integrates the best available knowledge;
- facilitate key stakeholders building consensus on preferred regional options for future irrigation, and recommend regional follow-up actions; and
- develop a methodology that can be applied elsewhere in Australia for sustainable irrigation planning at a catchment scale.

BOX – The food bowl of Australia – A snapshot of the Goulburn Broken Region

The Goulburn Broken Catchment of northern Victoria is known as the food bowl of Australia. It covers 2.4 million hectares and is home to 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. The principal agricultural industries in the region include dairy, horticulture, livestock slaughter and cropping and hay production. 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.

Irrigation was first practiced in the catchment during the 1880s, with small quantities of water being pumped out of the Goulburn River into earthen channels. The diversion of water from the Goulburn progressively grew until a cap was placed on diversion in 1995. The region now uses around 1,100 GL of water each year to irrigate nearly 280,000 hectares of land. The majority of the current supply infrastructure was established during the first few decades of the twentieth century as the use of irrigation water was being actively promoted. This infrastructure in now nearing the end of its design life and therefore will need substantial renewal in the next 20 years.

Historically, the region has been able to adapt to the challenges it has faced. For example, the emergence of salinity, initially during the 1950s, has been managed by the development of a land and water management plan that the

region's community has been implementing since the 1980s. This land and water management plan now aims to protect and enhance both agricultural land and environmental assets in the region.

As the region looks to the future a number of issues will have a significant influence on the region's success, including the emergence of free trade agreements, climate change, continuing water reform, and technological developments. These issues have the potential to have substantial consequences for the region's economy, environmental assets and social fabric.

How have we used scenario planning?

The main features of the scenario planning approach used in this project are stakeholder participation, systems analysis, and integration with strategic planning of key stakeholder groups.

Stakeholder participation

We considered stakeholder participation critical to the success of the project. It broadens the "scientific" view of systems, utilises local knowledge, considers stakeholder values, and increases the ownership of planning outputs (Chapman 2002). An additional benefit is that participation develops the capacity of the stakeholder community to respond to change and partake in community activities.

Stakeholder participation was built into all stages of the project during planning and was facilitated by the organisational structure. The project's organisational structure comprised six main groups: the Governance Committee; Stakeholder Reference Committee; Technical Working Group; Irrigation Futures Forums; Technical Advisory Committee and the Project Team. All but the Technical Advisory Committee and the Project Team included stakeholder and community representatives who were critical to the function of the project.

Systems analysis

Irrigation in the Goulburn Broken Region is fundamentally complex. The issues confronting the region are many, and complicated interconnections exist within the region and with systems outside the region. There are significant uncertainties in knowledge of these systems.

We used systems analysis to explore the scenarios. We systematically explored elements and interactions of the region and its operating environment. We considered the operating environment in the region in two categories, the contextual environment, which is beyond the region's power to influence, and the transactional environment, which can be influenced by the region but also by other players (Figure 1).

The detail of the systems analysis undertaken was commensurate with the uncertainty in knowledge about the system. Therefore, systems analysis undertaken was primarily qualitative and exploratory, with supplementary quantitative analysis undertaken when required. The different scenarios represented uncertainties about the future drivers and responses.

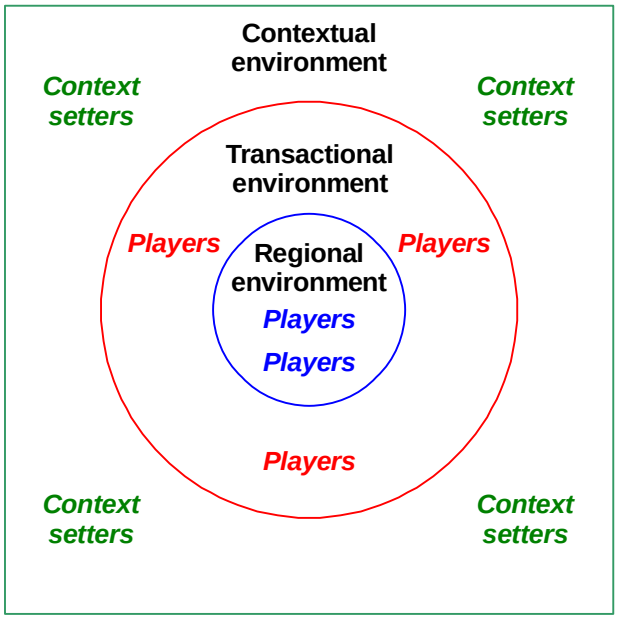


Figure 1: The region in its operating environment (adapted after van der Heijden 1996)

Integration with strategic planning of key stakeholder groups

The adoption of project findings by the stakeholder groups was an important measure of success of the project. The project findings were primarily broad strategic ideas. Therefore, to achieve adoption of these findings, ways of practically implementing these ideas needed to be demonstrated.

We undertook a series of focussed investigations to demonstrate the implications of the scenarios for specific issues. These investigations involved working closely with stakeholder groups to examine how they could best prepare their organisation to manage the challenges and opportunities described by the scenarios. We timed these focussed investigations to coincide with strategic planning activities. For example the investigation into the scenario implications for catchment management was undertaken in parallel with the five-year review of the Shepparton Irrigation Region Catchment Strategy.

Project implementation

The project was undertaken in four broad stages:

Stage 1 was focussed on developing the detailed project plan and securing stakeholder commitment to the project.

Stage 2 used an extensive stakeholder-engagement program to capture community perspectives. A series of four full-day workshops was held at each of six locations throughout the region, with 120 stakeholders participating in the workshop process. Interviews with business leaders were also undertaken.

Stage 3 involved conducting detailed analysis of the output from Stage 2 to develop a set of four full scenarios and a suite of regional strategies to build the region's capability to adapt to the future.

Stage 4 involved working with organisations and groups in the region to build the learning from the project into their business and strategic plans

through a series of focussed investigations and targeted communication activities.

Within these four project stages, work was undertaken in six main themes: Project planning and initiation; Hindsight and insight; Foresight; Broad implications; Specific implications; and Project communication and evaluation. A summary of steps taken in different stages under different themes is given in Table 1.

Table 1: Relationship between project stages and themes

PROJECT THEMES	PROJECT STAGES			
	Stage 1: Project development	Stage 2: Capturing community perspectives	Stage 3: Conducting analysis	Stage 4: Enabling change
Project planning and initiation	• Scoping project concept • Securing funding • Planning project • Establishing Governance Committee (GC) • Establishing Stakeholder Reference Committee (SRC)	• Developing stakeholder participation plan • Arranging independent review of the stakeholder participation plan • Establishing Irrigation Futures Forums (IFF)	• Developing scenario assessment plan • Arranging independent review of the scenario assessment plan • Establishing Technical Working Group (TWG)	• Developing adoption plan • Establishing stakeholder working groups
Hindsight and insight		• Learning from the past – "History wall" – Key drivers of past changes • Exploring community aspiration – Letter from the future – Extracting values and aspirations	• Exploring indicators of the community aspirations	
Foresight: Future scenarios		• Understanding external drivers and plausible futures – Extending past drivers – "Future wall" • Synthesis of external scenarios • Finalising the scenarios with IFF and SRC	• Understanding external scenarios • Exploring regional responses and consequences • Constructing full scenarios • Quantitative scenario modelling • Finalising full scenarios with TWG and SRC	
Broad implications		• Suggesting ideas on regional response options • Synthesising ideas into a preliminary set of regional strategies • Finalising preliminary strategies with SRC and IFF	• Identifying regional competency areas • Understanding scenario challenges and opportunities • Developing strategies for competency areas • Synthesising TWG and IFF strategies • Finalising broad implications with SRC	• Developing a scenario work kit for use by extension teams • Exploring scenario implications with stakeholder groups • Briefing stakeholders on project outputs
Specific implications			• Identifying priority areas for focused investigations • Identifying sub-surface drainage requirements under each scenario • Identifying regional business support needs for developing differentiated products	• Exploring scenario implications for catchment management • Developing a framework for R&D to support adaptive management • Exploring scenario implications for irrigation supply infrastructure • Developing a handbook of flexible technologies for irrigation supply infrastructure • Linking with Rural Strategy development
Project communication and evaluation	• Developing project communication and evaluation plans • Raising awareness of stakeholders on the planned project	• Communicating project progress and results to stakeholder groups • Organising Speakers Day • Evaluating Irrigation Futures Forums	• Communicating project progress and results to stakeholder groups • Arranging independent review of Technical Working Group process	• Undertaking a range of communication activities (all above) • Arranging independent review of the project

This book describes the detail of the methods used in the implementation of the project. The methods are organised in the project themes, and under each theme the project activities are described in order of the project stages. A companion book *Scenarios of the future: Irrigation in the Goulburn Broken Region* and other project reports provide a description of the output and findings of the project.

2. Project planning and initiation

Planning

Project planning was an important undertaking throughout the life of the project, enabling the smooth delivery of each stage. During Stage 1, we developed an overall project plan that described the broad stages of the project at a relatively high level. In addition, communication and evaluation plans were also developed for the project. As the project unfolded, we developed more detailed project stage plans, including a stakeholder participation plan for Stage 2, a scenario assessment plan for Stage 3, and an adoption plan for Stage 4.

This section provides an overview of the overall project plan and the three project stage plans and their development processes. The communication and evaluation plans are described in Chapter 7.

Project plan and project stage plans

Stage 1 - Project plan

The purpose of the project plan was to provide a high-level overview of how the project was expected to unfold. The project plan included:

- definition of the project objectives;
- definition of the project scope, including the geographic boundaries of the project, the nature of the problems to be considered and the broad approach to the project;
- description of the project stages and the broad approach for each stage;
- definition of the funding arrangements, including agreements with each of the funding partners about their commitments and expectations of the project; and
- definition of the project governance arrangements, particularly the roles and terms of reference for the Governance Committee and Stakeholder Reference Committee.

We developed the project plan in close consultation with a wide range of practitioners and stakeholders. The project scope and funding arrangements were discussed with project investors, while discussions with existing practitioners were focused on the appropriate approach.

We established linkages with other projects that were of immediate relevance to the project scope. These included ecological risk assessment work being undertaken by the Water Studies Centre at Monash University, and water trading modelling being undertaken at the University of Melbourne. Linkages were also established with similar investigations being undertaken in other regions, including the Kerang-Swan Hill Future Land Use Pilot Project.

Stage 2 - Stakeholder participation plan

Stakeholder participation was an important component of the project to capture a diversity of knowledge and perspectives and encourage ownership and adoption of project findings. The purpose of the stakeholder participation plan was to describe the principles and methods for stakeholder engagement in the project. The stakeholder participation plan included:

- objectives for stakeholder participation in the project;

- principles for stakeholder participation within the project, including how stakeholders should be engaged and the role of the project team in engaging stakeholders;
- a detailed plan for stakeholder participation in Stage 2; and
- preliminary plans for stakeholder participation in Stages 3 and 4

To inform the development of the stakeholder participation plan, we undertook a review of stakeholder engagement literature and consulted a wide range of stakeholders and practitioners. We used the findings of the review to establish the principles for stakeholder engagement. We used feedback from stakeholders and practitioners to identify the participation needs of stakeholders and potential pitfalls that needed to be managed in the project.

We also performed a stakeholder analysis to understand who the stakeholders in the project were and how best to involve each of the stakeholders in the project activities.

We presented the proposed stakeholder participation plan to both the Stakeholder Reference Committee and the Governance Committee for their approval and sign-off before its implementation.

Box - Principles for stakeholder participation
The underlying principles that have guided the design of this plan are that the project team will:

- Work with stakeholders to develop a common view (as much as that is possible), as the project moves from one stage to the next. It is recognised that, within a diverse community, complete agreement will not be achieved.
- Seek to capture innovative ideas. As such, it will seek input from local and external strategic thinkers, and employ a range of deliberative thinking tools.
- Be inclusive and equitable. Existing stakeholder networks will be utilised to identify stakeholder participants. However, under-represented groups will also be targeted in the planning stage.
- Provide a facilitation role, not an advocacy role. In order to maintain stakeholder confidence, it is essential to emphasise that the responsibility of the project team is to understand, and faithfully represent stakeholder views, not champion a particular cause.
- Utilise an approach which is efficient and within resources.

Stage 3 - Scenario assessment plan

The assessment of the scenarios was undertaken using integrated systems analysis. The purpose of the scenario assessment plan was to describe and justify the approach to the detailed integrated systems analysis. The analysis sought to build upon the material developed during Stage 2 of the project and particularly examine the consequences for the region of the scenarios and identified regional options. The scenario assessment plan included:

- objectives of the scenario assessment;
- a description of the approach to integrated systems analysis and its rationale; and
- a description of the role of the Technical Working Group and the process for the selection of its members.

To inform the development of the scenario assessment plan we reviewed the international literature on integrated analysis to understand the current best-practice approaches. We used the findings of the review and the understanding of the output from Stage 2 to develop a process to undertake the integrated systems analysis.

We presented the proposed scenario assessment plan to both the Stakeholder Reference Committee and the Governance Committee for their approval and sign-off before its implementation.

Box – Integrated analysis of complex open systems

In the context of scenario planning, integrated analysis is the process of describing how the region responds to the external scenarios and how the combination of responses and external forces influence the achievement of regional aspirations.

Understanding the consequences of management decisions and changing external conditions is the concern of the emerging 'meta-discipline' of *Integrated Assessment*. Integrated assessment is concerned with integrating knowledge about a problem domain for the purpose of learning and to assist decision making processes. The discipline has continually evolved since its emergence during the early 1970s, influenced particularly by the development of computational resources and changing attitudes toward computer based modelling.

Integrated assessment exists in two main forms: a normal, or mainstream, scientific paradigm and a post-normal, or Mode II, scientific paradigm (Harris 2002; Ravetz 2004).

The normal science approach builds understanding of a system by collecting facts established from reductionist science and generally uses detailed biophysical and economic models and bottom-up modelling techniques. Models are typically developed by experts and interaction with the affected public is minimal. This can lead to the affected community having little confidence in model results (van der Sluijs 2002), and limited applicability for policy making (Engelen *et al.* 2000).

The post-normal scientific paradigm is used where the facts are uncertain, values are in dispute and problems are typically complex (Funtowicz and Ravetz 2004). In general, these assessments are undertaken to inform policy decisions, when the stakes are high and decisions are urgent (Ravetz 2004). Typically, this approach aims to pool all available information, both scientific and perceived, relevant to the policy issue and use this information to investigate the consequences of alternative management options. It is common that experts and the affected public are involved because both groups can contribute knowledge of different forms to the assessment process.

All integrated assessments are confronted by two substantial challenges: the complexity of the systems under consideration and the uncertainties inherent in knowledge about the current and future conditions and processes operating within those systems.

System complexity exists when many variables are required to explain system behaviour and system components are highly interconnected. The complexity of systems is handled using many different approaches within integrated assessments. One school of thought believes that complexity can

be handled adequately by computer models (Rotmans 1999), while others believe that the current state of computer modelling is inadequate, particularly in the description of social systems (Kemp-Benedict *et al.* 2004).

System uncertainties exist due to lack of knowledge and due to variability. Uncertainty due to lack of knowledge can arise from factors ranging from lack of observations and inexactness of observations through to ignorance and indeterminacy of processes. Uncertainty due to variability can result from natural randomness and behavioural diversity. Variability poses limits on what can be known and therefore contributes to uncertainty due to lack of knowledge (Rotmans 1999).

A spectrum of techniques is available to handle the complexity and uncertainties associated with integrated assessments. These techniques range from intensive numerical modelling through to the intuitive development of scenario narratives. Each technique has its strengths and weakness with respect to the way it handles the system complexity and uncertainties, however no one single technique can handle all the complexity and uncertainties. Therefore, the most appropriate integrated analysis techniques will depend on the nature of the system and issues being considered and several complementary analysis techniques may be necessary to ensure a comprehensive integrated assessment of the system.

Stage 4 - Adoption plan

Stakeholder action in response to the project findings was critical to the ultimate success of the project. The adoption plan was designed to describe the processes used to encourage stakeholders to use the project findings in their business and strategic planning. The adoption plan included:

- the objectives of the adoption;
- a description of the major outputs of the project; and
- a summary of planned adoption activities and their audiences.

During Stage 3, the Technical Working Group identified priority areas for adoption. We consulted stakeholders responsible for management of these priority areas and developed participatory programs that fitted in with their strategic and business planning. A range of communication activities was also planned to inform the wider stakeholder groups of the project findings.

We presented the proposed adoption plan to both the Stakeholder Reference Committee and the Governance Committee for their approval and sign-off before its implementation.

Sequencing of plan development

Project plans were progressively developed throughout the life of the project. Typically, we developed the plan for each stage just prior to its commencement. This allowed plans for each stage to consider both the nature of the output generated by the previous stage and the feedback from participants. This meant that the overall project plan needed to be at a relatively high level and that project investors needed to be comfortable with the project methodology evolving as the project progressed.

Peer review of plans

We arranged independent review of major project plans to ensure that they were robust and consistent with current best practice. The independent reviewers used were recognised as leading practitioners or academics in their

field. Following the review of each of the project plans, we revised the plan to reflect the comments of the reviewers.

Box - Excerpts of review comments

Review of Stakeholder Participation Plan

Dr Allan Dale, Joint Program Leader, Policy and Planning for Change Program, CRC for Irrigation Futures:

"I would like to congratulate your team on developing a cohesive and clear overall approach to public participation components of the project. The Stakeholder Participation Plan is easy to read and clearly articulates your research intent. There has been a focus on identifying the right stakeholders at both sectoral and geographic levels. The participation principles to be applied are clearly articulated, as is the purpose of participation at various levels and stages within the project. The flow of information from participation processes and both in and out of the Stakeholder Reference Committee is clear."

"I would suggest that you seek to formally record and continuously improve your understanding of such sectors, communities and groups throughout the life of the project. Doing so would allow you to continuously review and improve the participation and knowledge building techniques that you are applying throughout the life of the project."

Review of Scenario Assessment Plan

Professor Ron Johnston, Executive Director, Australian Centre for Innovation

"On the basis of a detailed reading of the Milestone Report 2 of the 'Irrigation Futures of the Goulburn Broken Catchment' Project I can conclude:

- by international standards, this is an extraordinarily ambitious and well-conceived futures project, and the evidence available suggests it is being executed in a very professional manner, with particular emphasis on evolutionary learning, and effective stakeholder engagement;
- the adoption of an appropriate 'integrated assessment' approach offers sound prospects for further progress;
- the proposed key methodology of distinct Narrative and Analysis teams is relatively novel, but, effectively managed, could be very effective."

"In my view this is a very interesting approach, well-worth pursuing. However, its effectiveness, and success, will depend crucially on a combination of detailed planning and, even more importantly, active monitoring, learning and development and introduction of adaptive strategies, tools and information throughout the life of this Stage.

It will be a major, experimental learning exercise. It will take the form of action research, engaging the members of the Technical Working Group. And in the language of futures, this project/Stage will itself be a classical exercise in 'inventing the future rather than predicting it'."

Establishing project organisational groups

The organisational groups within the project (Figure 2) were critical to the smooth running of the project. Each of these project groups was established in a different way and at different times according to the needs of the project. This section summarises the processes used to establish each of the project organisational groups.

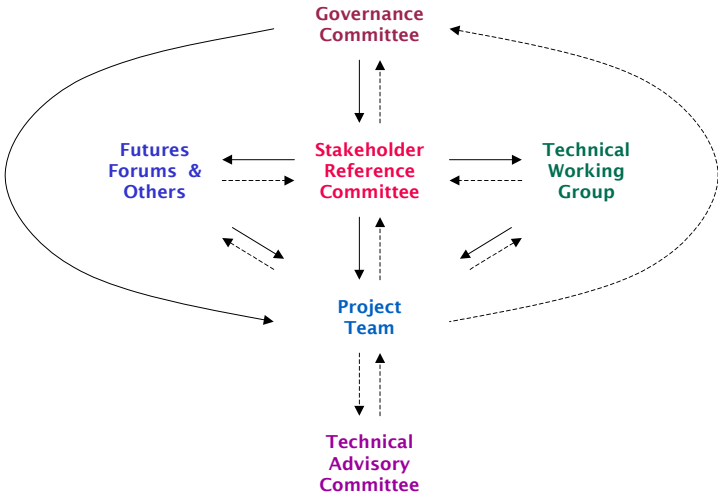


Figure 2: Project organisation structure

Project Team

Early in the project, the range of skills needed to deliver the project was identified. Some specialist skills, including facilitation and economics expertise, were not available within the host organisation (Department of Primary Industries). We established partnerships with other organisations to ensure the project had access to the skills it required. The nature of these partnership arrangements ranged from agreements with individuals to provide technical advice through to contractual arrangements with other organisations to provide specialist services.

Governance Committee

At the commencement of the project, we invited each of the project investors to nominate representatives for the Governance Committee. At its first meeting, the Governance Committee agreed on "Terms of Reference" that defined the committee's membership, role and charter.

The role of the Governance Committee was to set and steer broad project direction, review project progress and performance, exercise quality assurance processes, make decisions on funding for the project, and assist in securing funding. Meetings of the Governance Committee were scheduled at six-monthly intervals based around significant project milestones.

Stakeholder Reference Committee

The Governance Committee was responsible for appointing the Stakeholder Reference Committee. To maximise the opportunity for adoption of project findings and minimise the demands on the stakeholder community, the Governance Committee recommended that the Stakeholder Reference Committee be structured around the existing Shepparton Irrigation Region Implementation Committee (SIRIC), a sub-committee of the Goulburn Broken

Catchment Management Authority (GBCMA). The Governance Committee requested that the skills of SIRIC be reviewed and supplemented where necessary.

We conducted a gap analysis of the skills on SIRIC and recommended additional stakeholders for the Governance Committee to invite to participate in the Stakeholder Reference Committee. The Governance Committee and Stakeholder Reference Committees both agreed to a set of "Terms of Reference" that defined the committee's membership, role and charter.

The role of the Stakeholder Reference Committee was to endorse the wider stakeholder participation processes, consolidate results from wider stakeholders, endorse scenario assessment results and create awareness of the project in the wider stakeholder community. The Stakeholder Reference Committee met on an as-needs basis throughout the life of the project.

Box - Terms of Reference for Stakeholder Reference Committee

1. Title
The committee will be known as the Stakeholder Reference Committee

2. Life of the committee
The committee will operate until the 30 June 2007.

3. Authority of the committee
The Stakeholder Reference Committee is commissioned by the Governance Committee of the "Irrigation Futures in the Goulburn Broken Catchment" project. It can make recommendations to the Governance Committee.

4. Role of committee
The role of the Stakeholder Reference Committee is to:

- provide endorsement of the processes for wider stakeholder participation;
- with input from the wider stakeholder community, develop a shared vision for the Goulburn Broken Catchment for the future of irrigation;
- consolidate scenario ideas from wider stakeholders and identify which are to be analysed;
- discuss the results of the scenario testing in consultation with the Scenario Assessment Panels;
- create awareness of the project within their regions/organisations.

5. Membership
The Stakeholder Reference Committee will be made up of voting members of the Shepparton Irrigation Region Implementation Committee, with additions (to be decided).

6. Chairperson
The Chairperson is to be a member of the committee, nominated by the committee and is in the position for a period of 12 months. Elections will be held annually, with the current chair able to renominate.

7. Meeting frequency
The committee will meet on an "as-needs" basis. Frequency will be discussed at the inaugural Stakeholder Reference Committee meeting,

8. Convening and co-ordination
The Project Operational Manager and Chairperson in consultation with the Project Team and committee will prepare meeting papers and agenda.

Meetings will be convened and coordinated by the Project Operational Manager.

9. Remuneration (to be finalised)
Cost of participation by farmers and self-employed members will be met in line with the GBCMA policy on Remuneration for Implementation Committee members. Budget to be finalised.

Irrigation Futures Forums

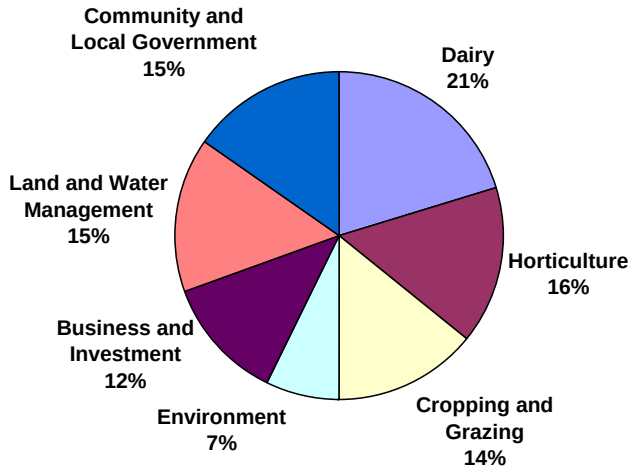
The Irrigation Futures Forums were designed to enable the participation of as wide a cross-section of the community as possible. We attempted to make participation as easy as possible for community members by taking a number of initiatives including holding workshops at six locations throughout the region, to minimise travel times, and providing sitting fees to non-salaried participants. We sought ideas on potential participants at project information presentations to the Stakeholder Reference Committee and regional stakeholder organisations, including Goulburn-Murray Water (G-MW) and local government. As we contacted these people, we asked them to recommend others they thought might be able to contribute to the forums. We specifically sought the participation of traditionally under represented groups including women and young people. We also sought expressions of interest from potential community participants through articles and advertisements in the local print media. Representatives from government departments' policy units were also invited to participate.

We invited each potential participant to register his or her interest in the Irrigation Futures Forums. We initially made contact with potential participants with a phone call and followed up those who expressed some interest with a letter asking them to submit a brief summary of their background and experience. Approximately 120 people, or 40 per cent of those initially contacted, registered their interest and were invited to participate in the Irrigation Futures Forums.

Box – Summary of Irrigation Futures Forum participant profiles

At the Irrigation Futures Forums we aimed to have as great a diversity of participants as possible and particularly sought to involve traditionally under represented groups, including women and young people. For example, of the participants in Workshop 4 of the Irrigation Futures Forum series, held during October 2004, 27 percent were women and 19 percent were aged under 35 years. The industry involvement of participants was also diverse.

Industry sectors of participants in Workshop 4



Box – Invitation to Irrigation Futures Forum participants

Department of Primary Industries

Ferguson Road
Tatura
Telephone: 5833 5222
Facsimile: 5833 5299

31 March 2004

Our Ref:

Dear Nominee,

I would like to invite you to contribute to the Irrigation Futures project.

The objective of the Irrigation Futures project is to bring together key stakeholders in irrigated agriculture in this region to develop a shared vision for, and make informed choices about, the future of irrigation in the Goulburn Broken catchment.

People from local key stakeholder groups will be invited to attend a series of workshops known as Irrigation Futures Forums. Selection of invitees is based on the experience and skills they bring, not the organisation that they represent. Each Forum will have 20–30 participants from a broad cross-section of views.

Forum groups will be established at the following regional centres: Cobram, Echuca, Kyabram, Shepparton, Seymour and possibly Benalla. There will be four one-day workshops at each regional centre. A schedule is attached. If you wish to be involved, we require a commitment to attending all four workshops. A sitting fee will be available.

The output from the workshops, and the subsequent stages of the project, will be used to guide organisations such as GBCMA and G-MW in their planning processes for the future. The project is guided by a steering committee made up of experienced local irrigators and business people.

You have been nominated by your peers for involvement in the Forums, because they think that you have experience in the industry and can contribute to this strategic planning process. We are therefore keen to have your input.

To ensure the workshops are kept to a manageable size we have put a selection process in place. To assist us with this please either send us your CV (and state which Forum location best suits you), or use the attached form.

I look forward to hearing from you via fax, email or mail by Wednesday 7th April. We will be in touch with you the following week.

Yours sincerely,

Leon Soste

Prepared By: Leon Soste
Project Manager
Phone: 5833 5956 Fax: 5833 5299
Email: leon.soste@dpi.vic.gov.au

Victoria
The Place To Be

Technical Working Group

The purpose of the Technical Working Group during Stage 3 of the project was to further develop the material generated by the Irrigation Futures Forums during Stage 2, and to use their knowledge and experience to undertake detailed assessment of the implications of the material for the region. Specifically, their task was to construct full scenarios, describing the interaction between external driving forces, the regional responses and regional consequences, and examine the broad implications of the scenarios to the region.

During the final workshop of the Irrigation Futures Forums, we described the role and function of the Technical Working Group and the anticipated skills required by members of the group. We invited forum participants to register their interest in the Technical Working Group by providing a description of the skills they could contribute. More than 35 members of the Irrigation Futures Forums registered their interest in the Technical Working Group.

In conjunction with the Stakeholder Reference Committee, we prioritised the expressions of interest by attempting to get the greatest possible breadth of skills with the fewest people. We then analysed gaps in the skill base of the proposed group and identified possible candidates to fill these skill gaps. With the approval of the Stakeholder Reference Committee, we invited these candidates to become a part of the Technical Working Group.

The final Technical Working Group, comprising 25 members with a diverse range of skills, was commissioned by the Stakeholder Reference Committee to undertake the detailed analysis. The Stakeholder Reference Committee approved terms of reference for the Technical Working Group.

Box – Technical Working Group membership and expertise

Name	Expertise
Bruce	Urban water supply – Shepparton
David	Dairy farmer – Tatura
Alan	Beef farmer – Numurkah
Bruce	Natural resource management extension – Tatura
John	Water and natural resource management governance – Shepparton
Joe	Viticulturalist – Shepparton
Peter	Dairy farmer, Rural water governance – Tongala
Lyn	Municipal councillor – Alexandra
Shane	Orchardist – Mooroopna
John	Environmental advocacy – Toolamba
Peter	Horse breeding – Benalla
David	Natural resource management extension – Echuca
Oliver	Land use planning – Benalla
Bev	Financial counsellor – Kyabram
Claire	Intensive livestock production – Euroa
Derek	Rural water supply – Tatura
Kevin	Rural water supply – Cobram
Durham	Milk supply management - Tongala
Peter	Horticulture – Strathmerton
Rien	Horticulture – Shepparton
Kate	Economic development – Echuca
Ross	Horticultural industry development – Mooroopna
Gordon	Dairy farmer – Rochester

Technical Advisory Committee

The role of the Technical Advisory Committee was to provide technical knowledge and advice to the project team. The Technical Advisory Committee was an informal network of people from whom the project team drew advice as required.

Key learnings

Through the project planning and initiation, we learnt a number of lessons that we believe were important for the success of the project.

Achieving the endorsement of key managers within stakeholder organisations early in the project was important to the recognition and ownership of the project. These managers were then committed to the success of the project and contributed human and financial resources to assist delivery of the project. For example, Goulburn-Murray Water encouraged senior managers to participate in the Irrigation Futures Forums, and GBCMA offered the use of SIRIC as a base for the Stakeholder Reference Committee. This recognition and ownership of the project was also important in assisting the adoption of project findings.

The involvement of departmental policy officers in the Irrigation Futures Forums and Stakeholder Reference Committee provided the project with a direct connection with government policy development. It also allowed participants in the Irrigation Futures Forums and the Stakeholder Reference Committee the opportunity of understanding government policies and their rationale in greater detail.

Clearly defining the project organisation structure at the start of the project allowed all participants to understand the project governance arrangements and relationship between the different groups. This provided participants with confidence that their contributions would be used and that their commitment to the project was manageable.

During the lifetime of the project, several key personnel in stakeholder organisations changed. This risk to the success of the project was not anticipated during project development, because many of the stakeholder organisations had historically experienced relative stability in senior staff and board composition. Transitions in key stakeholder personnel needed to be carefully managed to ensure the organisation continued to have ownership of and commitment to the project. Without careful management, the adoption of project findings by stakeholder organisations had the potential to be compromised.

The sequencing of the development of plans for each stage of the project was valuable as it enabled each stage to be planned with some knowledge of the nature of the output from the previous stage. This was particularly important in the transition between Stage 2 and Stage 3, where output from Stage 2 was considerably different to what was initially anticipated, changing the direction of both Stages 3 and 4 of the project.

Box – Newspaper article: Planning for the future

COUNTRY NEWS
Reaching Australia's richest agricultural region
APRIL 5 - 11, 2004. 36 PAGES

Can you ever own too many bikes?
Auto Guide

Opening a new era on feed grain
Page 4

Taking the grunt out of irrigating
Page 10

Field days feature
Inside today

Water forum plans

By **Geoff Adams**

A $2 million project to work out long-term options for irrigation has been launched for the Goulburn Broken Catchment area.

The project is seeking more than 100 people to be involved in think-tanks to help map out some options for a commercially viable and ecologically sustainable water industry.

Goulburn Broken Irrigation Futures project chair and a director of Goulburn Broken Catchment Management Authority (GBCMA) John Pettigrew said input from irrigators and the community was the key to the development of any long-term options on irrigation.

"The project is seeking nominations of 120 to 150 participants to the Irrigation Futures Forums," Mr Pettigrew said.

"There is potential for significant change in the future such as water policies, climate change, water availability and pricing, and world market prices for agricultural commodities."

Mr Pettigrew, who is an orchardist and a Goulburn-Murray Water director, said such changes could have a profound effect on the viability of our irrigation enterprises, and it was vitally important that irrigators and the community put their minds together to think about the future.

The four-year project is a regional initiative, formulated and proposed by community leaders such as John Dainton (G-MW chair) and Stephen Mills (GBCMA chair) and staff at DPI, Tatura.

The project is funded by GBCMA, G-MW, DPI, DSE and National Program for Sustainable Irrigation.

The project is being led by DPI's principal scientist Dr QJ Wang.

Dr Wang said the project would use the best available science and knowledge to examine social, economic and environmental consequences of these scenarios and options, and develop a shared vision for future irrigation.

Mr Pettigrew said there had already been some comment about the four-year span, but he said the the large scale of what was being attempted required a longer term study.

"I don't think you can take short cuts on an issue like this and still get strong community support," Mr Pettigrew said.

"It's a bit like the salinity plan that took almost 10 years.

"It seemed like a slow process but it became the foundation for building the successful salinity strategy."

Participants will be invited to contribute to a series of regional workshops known as Irrigation Futures Forums.

The forum groups will be established in a number of major rural centres in the Goulburn Broken catchment.

A series of four, one-day workshops for each of those forum groups is planned during April, May, June, July and October.

Irrigators, community and business groups who would like to participate in the forums or would like more information can phone Irrigation Futures Project operational manager Leon Soste, DPI Tatura, on 5833 5956 or email leon.soste@dpi.vic.gov.au

3. Hindsight and insight

Purpose

The hindsight and insight theme of the project sought to introduce participants to the project and each other, by sharing knowledge about the region and themselves. The theme also sought to encourage participants to begin thinking about the long term and to provide them with a sense of perspective about the issues the project was considering. Hindsight was used to share knowledge of the history of the region and to draw lessons that could inform the project's exploration of the future. Insight was used to raise awareness of participants' own personal values and aspirations, and find a common set of regional values and aspirations.

By knowing where the region had come from, what is important to the region's community and what the community would like to achieve, the participants were placed in a strong position to explore the future of the region.

What we did

Overview

The hindsight and insight theme was primarily investigated during Stage 2 with limited additional work being undertaken during Stage 3 of the project. We focussed on the hindsight and insight theme during the first of the four Irrigation Futures Forum workshops during Stage 2 and also the first workshop of the Technical Working Group during Stage 3. We undertook three main activities with the Irrigation Futures Forums: the history wall; the values checklist; and a letter to self.

Stage 2

History wall

At the first Irrigation Futures Forum workshop we used a history wall or "wall of wonder" (Spencer 1989) to explore the history of the region and understand how the region had managed change in the past.

1. A long (5-10 metre) chart was placed on the wall with a timeline for the past 30 years.
2. Participants were asked to write on the chart paper the changes and significant events that had influenced them, the region, Australia and the world. This initial phase required up to 45 minutes as participants required time to reflect on the contribution of others, which stimulated additional ideas.
3. We then guided the participants through a partial ORID (Objective, Reflective, Interpretive and Decisional) discussion of the history wall. The ORID was partial because the objective information had already been shared in the previous activity. This discussion sought to draw out the key lessons from the exercise and the important concepts that needed to be considered as we explored the future. The ORID discussion took approximately 30 minutes to allow all participants to contribute their ideas. Questions for this discussion included:

   Reflective

- What is really concerning?
- What bits are really encouraging?

Interpretive

- So where are the major turning points? What changed at these times? What stopped and what started? Major shifts?
- What is still unknown? Are there significant gaps in our experience or knowledge as a result of what you see up here?

Decisional

- What are the important messages from the past 30 years that we need to take forward?

Photo – Constructing the history wall

Values checklist

To explore the values of the regional community, we firstly asked the forum participants to clarify their own personal values. We provided participants with a values checklist and asked them to identify their top 10 personal values. We then asked participants to prioritise their list of personal values progressively until they had only one or two remaining. Participants were then asked to share their highest priority personal values with the workshop group. We listed these high priority personal values on a whiteboard. The facilitator then went through the list and asked participants to indicate how many people had each of the highest priority values in their top ten. This gave an indication of the commonality of personal values amongst the workshop participants and therefore the values that the community could be expected to hold as important.

We allowed about one hour for this activity.

Letter to self

To explore the aspirations of the community, we asked workshop participants to place themselves in 2035 and write a letter to their current self. We provided participants with a template for the letter, which began "Dear ..., Here I am in February 2035 and the Goulburn Broken catchment is absolutely thriving ..." We then asked participants to complete the letter, describing what they would be seeing, hearing, smelling and feeling. We allowed participants 20 to 30 minutes to compose their letter.

We asked participants to identify the things in their letter that described the most important parts of what the future looks like for them. We viewed these important parts of the participants' letters as their aspirations for the future of the region. We then asked participants to share their aspirations for the region with the workshop group, with the facilitator writing a list of aspirations on the whiteboard.

After all participants had contributed their aspirations for the region, we facilitated a discussion of the list of aspirations to identify the commonalities and differences in the group's list of community aspirations. We then asked whether the aspirations were relevant to the whole group, and therefore the wider community.

Box – Community aspirations

In 2035 we want the community of the Goulburn Broken Catchment to be:

- seen as a world leader in food production (clean and green, export markets, growth);
- efficient users of water, and having appropriate water distribution systems;
- recognised and valued as stewards of the land (proud to be farmers/irrigators, recognised for contribution to economy and community, keeping natural resource condition in good shape for future generations);
- achieving a balance between environmental, social and economic demands (industry exists in harmony with environment and community);
- a vibrant, prosperous (businesses, region, employment, eco/ag tourism, service industries) and diverse community;
- a great place to live (community well-being, social networks, well-serviced, appropriate/maintained infrastructure, amenities);
- happy people who have time for leisure;
- creating all kinds of opportunities for all (in particular young people and new farmers);
- embracing new and existing technology;
- investing in the environment (biodiversity, healthy rivers, native vegetation, etc.);
- continuing to have access to water resources for irrigation;
- planning strategically and making collaborative decisions (displaying community leadership, co-operation, working together as a wider community);
- actively participating in decision-making processes and implementation programs; and

- managing change (preparedness, adaptability, innovation, learning culture).

Stage 3

Indicators of community aspiration

To provide a deeper understanding of the community aspirations, we asked the Technical Working Group to consider how the achievement of community aspirations could be assessed. Working in small groups, we provided each group with a selection of the community aspirations for the region. We then asked the Technical Working Group to consider what the indications would be if we have (or have not) achieved each of these community aspirations. Each group had a scribe who recorded the thoughts and ideas expressed, which were subsequently compiled by the project team.

We allowed about one hour for this activity.

Key learnings

In the process of exploring the past and the values and aspirations of the project participants, we learnt a number of lessons about undertaking such an exercise.

The depth and quality of the output from this theme was enhanced considerably by not confronting problems directly, but by allowing participants to explore the underlying issues and values surrounding the problem. For example, we explored the lessons that could be drawn from the past by firstly constructing a history wall that summarised the participants' recollections of the significant changes and events that had happened in the region. We then considered the lessons that could be gained from by looking at the complete history wall. This gave the participants a broader perspective about the lessons from history than if we directly posed the question, "What can we learn from history?" Likewise, when considering the aspirations for the region, we indirectly asked participants to consider their own personal aspirations first, before considering the community aspirations. By approaching problems indirectly, any potential conflicts were diffused and higher quality output produced.

Workshop participants found going through the process of developing a history wall rewarding. Many were surprised at how much change they had experienced and how well they had been able to adapt. This provided them with confidence that they would be able to deal with the opportunities and challenges that the future would present, and reassurance that they would not necessarily be able to predict future changes and events.

When workshop participants began the Irrigation Futures Forum process, they were primarily focussed on immediate issues, such as the recently announced Government green paper on water reform. The history wall served as a useful tool in broadening the temporal perspective of workshop participants. It allowed participants to reflect on how similar issues had appeared controversial when announced but took a number of years to have an impact on the region, allowing adaptation to occur.

In establishing the Irrigation Futures Forums, we sought to capture a diversity of opinions and perspectives. We therefore expected that the aspirations articulated by participants would be divergent and antagonistic.

However, we were surprised by the strength of convergence in the community aspirations. This convergence is likely to have been assisted by the process used to elicit the aspirations, by not confronting the problem directly, and also by maintaining the discussion of aspirations at a relatively high level.

Participants suggested a wide range of ways in which they could assess the achievement of the community's aspirations. Many of these measures were traditional indicators of economic, environmental and social well-being, however there were also many indicators that were either not traditional indicators, or were traditional indicators used in a non-traditional sense. For example, participants identified that the region's population and demographic composition could be used as measures of community prosperity, vibrancy and connectedness as well as prosperity and attractiveness of agricultural industries. Non-traditional indicators include measures such as the willingness of people to lend their lawn mower to their neighbour.

The project team carefully planned each workshop and found this to be an important step in the successful delivery of the project. For each workshop, we developed a running sheet that contained the experiential and objective aims, an outline of the day, the equipment required for the workshop and a detailed description of the scheduled tasks (see Appendix). The development of the running sheet would often take several iterations for the project team to agree on the workshop objectives and develop a program able to achieve the desired objectives. This process ensured that all members of the project team had a common understanding of the purpose and delivery of the workshop. Having this common understanding allowed the project team to be flexible in workshop delivery when we found some activities took longer or produced different output than originally anticipated.

4. Foresight

Purpose

The foresight theme sought to encourage participants to think about the future and what it may hold. In thinking about the future, we aimed to specifically understand the:

- range of external forces that may influence the region in the future;
- responses of individual, businesses and organisations within the region to those external forces; and
- combined impact of the external forces and individual, business and organisational responses on the environmental, social and economic well-being of the region.

We sought to synthesise this understanding about the future into a suite of detailed scenarios that describe plausible alternative evolutions of the future that may confront the region.

What we did

Overview

The foresight theme was investigated during Stage 2 and Stage 3 of the project. During Stage 2, the Irrigation Futures Forums drew on the history wall to develop future walls. These were synthesised by the Stakeholder Reference Committee, in conjunction with the project team, to construct four external scenarios. During Stage 3, the Technical Working Group, in conjunction with the project team, explored the external scenarios in depth to describe the region's responses to the external forces and the consequences for the region's environmental, social and economic well-being.

Stage 2

Irrigation Futures Forums

The exploration of the future with the Irrigation Futures Forums began with a review of the history wall. We asked participants to identify the main drivers of change over the past 30 years from the material they had contributed to the history wall. As each driver was identified, the facilitator wrote it on a separate sheet of paper and stuck it on to the wall. We asked the participants to classify the list of drivers into internal, or those that were within the control of the region, and external, or those that were beyond the control of the region. We took the external drivers and asked participants to identify any drivers that were no longer relevant and also to add any additional drivers that they believed were missing. We then asked participants to reflect on the list of drivers and identify those drivers that they believed would have a big impact on the future and therefore needed to be expressed in any description of the future.

BOX – Historical quotes about the future

"I think there is a world market for about five computers". Thomas J. Watson Jr., chairman of IBM (1943)

"There is no reason for any individual to have a computer in their home." Kenneth Olson, founder of Digital Equipment Corporation (1977)

"The world potential market for copying machines is 5000 at most." IBM to the founders of Xerox as it turned down their proposal (1959)

"Almost all of the many predictions now being made about 1996 hinge on the Internet's continuing exponential growth. But I predict the Internet will soon go spectacularly supernova and in 1996 catastrophically collapse." Robert Metcalfe, founder of 3Com and inventor of Ethernet (1995)

"The Americans think we have need of the telephone, but we do not. We have plenty of messenger boys." Sir William Preece, chief engineer of Britain's Post Office (1876)

"The phonograph has no commercial value at all." Thomas Edison (1880s)

"Guitar music is on the way out." Decca Records, declining to record a new group called The Beatles (1962)

"Radio has no future." Lord Kelvin (1897)

"There is not the slightest indication that nuclear energy will ever be obtainable. It would mean that the atom would have to be shattered at will." Albert Einstein (1932)

"The horse is here to stay, but the automobile is only a novelty - a fad." President of the Michigan Savings Bank, speaking to Henry Ford's lawyer, Horace Rackham. Rackham ignored the advice, invested $5000 in Ford stock, and sold it later for $12.5 million.

"That the automobile has practically reached the limit of its development is suggested by the fact that during the past year no improvements of a radical nature have been introduced." Scientific American (Jan. 2, 1909)

"Man will not fly for 50 years." Wilbur Wright, to brother Orville after a disappointing flying experiment in 1901. (Their first successful flight was in 1903.)

"Stocks have reached what looks like a permanently high plateau." *Irving Fisher, Professor of Economics, Yale University (1929)*

(Source:http://www.permanent.com/quotes.htm)

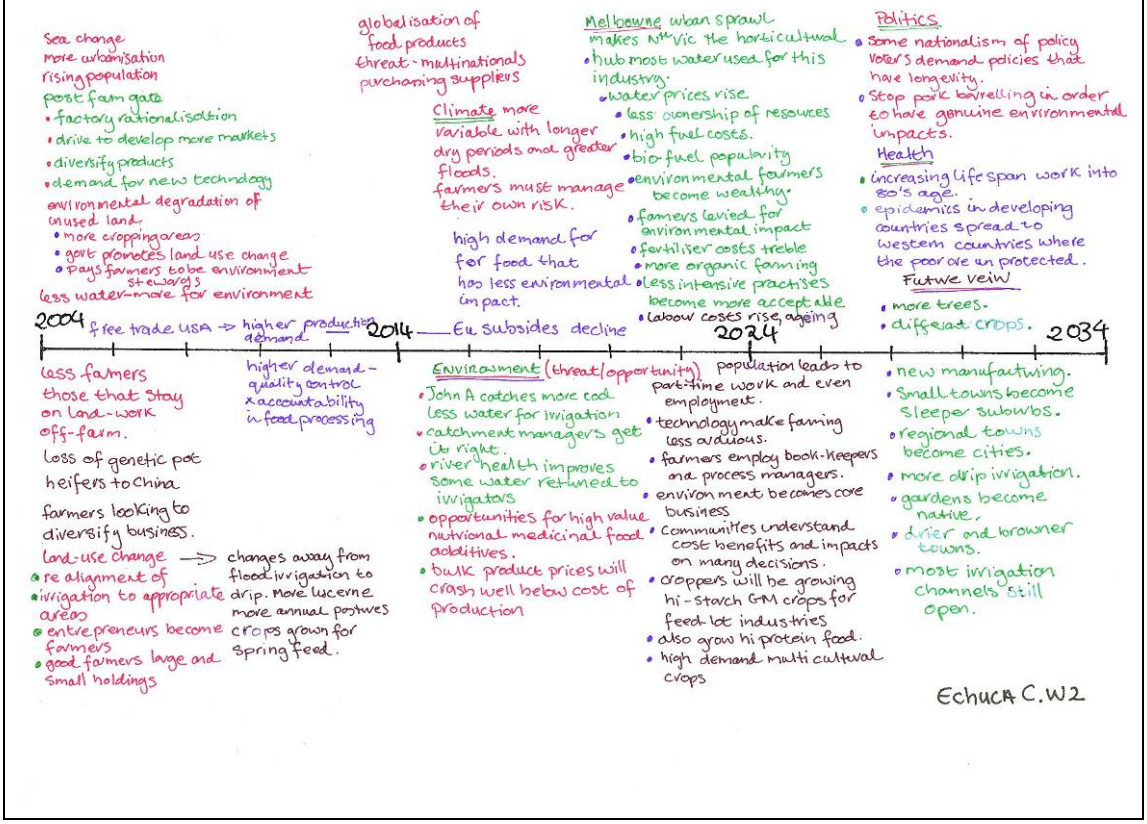
To describe plausible futures, we built on the history-wall idea and asked participants to develop a future wall. Small groups of participants were provided with chart paper with a time-line from 2005 through to 2035. Participants were encouraged to describe stories of the future that included the important drivers they had identified in the previous exercise. We gave the participants a set of rules to guide the development of their future wall. These were:

- be innovative and bold, and think outside the square;
- must be plausible, could possibly unfold with the passage of time;
- stick to external drivers (avoid spending time on regional responses at this point, but if you want to record your thoughts before they get lost/forgotten please do so on a bit of paper and store it in your folder);
- make sure you include a number/variety of key external drivers;
- respect others' ideas;
- consider optimistic, pessimistic and status-quo elements in your scenarios (that is, we want some extremes or competing ideas);
- be controversial or thought-provoking; and
- be specific.

We allowed participants about one hour to develop their future wall. Following completion of their future wall, we asked participants to write a brief story that summarised their future wall.

We asked each group to share their future wall with the remainder of the workshop participants, who were encouraged to ask questions of the presenter to clarify any future wall content. After each group had shared their future wall, we facilitated a discussion of the collection of scenarios. The discussion reflected on the similarities and differences between the future walls, the breadth and depth of the drivers described, and ways to improve the future walls. We then asked participants to develop another future wall, drawing on what they had learned.

Box – Picture of a future wall



Stakeholder Reference Committee

The Irrigation Futures Forums generated 28 different future walls of varying breadth and quality. For subsequent stages of the project, we required a smaller number of scenarios, up to 5, that were comprehensive and covered a broad range of drivers. We used the Stakeholder Reference Committee (SRC) to guide the synthesis of the Irrigation Futures Forums' output.

We began the synthesis process by identifying a set of broad external drivers, or 'megadrivers'. The project team took the drivers identified by the Irrigation Futures Forums and progressively grouped common ideas until we had a manageable set.

We held a workshop with the SRC to complete the synthesis process. Before the workshop commenced, we provided the SRC with the Irrigation Futures Forum output relating to the scenarios to allow them time to become familiar

with the material. We asked the SRC to confirm that the megadrivers encapsulated the drivers generated by the Irrigation Futures Forums.

We divided the SRC into small groups of two or three and provided each group with a selection of the future walls, ensuring that all future walls had been distributed. We then asked each group to examine the future walls and identify and extract the storylines described by each future wall for each of the megadrivers. We then collated the storylines for each megadriver.

Each small group was given the collated storylines for one or two of the megadrivers, and asked to create two or three distinct storylines that encapsulated the ideas expressed by the Irrigation Futures Forums.

We aimed to create five synthesised scenarios and established a separate space to develop each scenario. To create the synthesised scenarios, we requested each group provide a "seed" storyline to one of the development spaces. We then had each group rotate through the five scenarios and contribute a storyline from each of the megadrivers. As they contributed a storyline, we asked that the group consider how their storyline would build on the storylines that had already been provided to the scenario. This allowed groups to use one storyline multiple times if they thought it was appropriate.

The SRC then reviewed the five scenarios to examine their similarities and differences. The SRC decided that Scenarios 4 and 5 overlapped too much with Scenarios 1, 2 and 3, and therefore should be replaced with a scenario depicting a national and/or international catastrophe. They asked the project team to devise a fourth scenario, using Irrigation Futures Forum material containing a national or international catastrophe. They asked also that the project team fill in the detail for all the scenarios.

BOX – List of megadrivers

1. **Resource shifts and allocations** (eg between environment, urban, lifestyle, commercial agriculture, water trading, tourism, plantation forestry etc.)
2. **Consumer demand** (eg price, quantity, quality, variety, environmental impact, globalisation, currency, free trade etc.)
3. **Input costs of production** (eg energy, labour, technology, water, capital, infrastructure, processing, transport, etc.)
4. **Community values and government policy** (eg environment, biodiversity, equity, community well-being, diversity, migration, structural change, religion, subsidy etc.)
5. **Climate** including change and variability (eg water availability, farming conditions, droughts, bushfires, floods, chill hours etc.)
6. **Dramatic change** (eg international conflict, terrorism, disease, earthquake, dam failure, salinity, acidity etc.)
7. **New and emerging technology** (eg genetic modification, desalination, weather manipulation, communication, energy, new varieties, irrigation, etc.)

Project Team

Several senior managers from influential organisations within the region could not participate in the Irrigation Futures Forums due to time commitments. We held interviews with these senior managers to gain their perspectives on the future opportunities and threats to the region and their industry. We also ran a workshop with agriculture students at Dookie

College to understand the perspectives of the next generation of farmers on the future opportunities and threats to the region and its agricultural industries. The output from these interviews and workshops was made available to the Stakeholder Reference Committee as they extracted storylines from the Irrigation Futures Forum scenarios.

Following the workshop with the Stakeholder Reference Committee, the project team took the scenario outlines and filled in the detail. As we developed the detail for each of the scenarios, we reviewed the available literature and data to ensure that the ideas contained in the scenarios were plausible. We developed the detail of each scenario by constructing a detailed future wall and identifying how each of the driving forces evolves and the reasons underlying the evolution of the driving forces. We then took the future walls and composed stories describing the evolution of the external scenarios in three periods (2005-2010, 2010-2020, and 2020-2035). We used three periods of different length to describe the scenarios to allow for the increasing uncertainty of knowledge about the plausibility of events in the more-distant future. As we wrote the scenario stories, we attempted to make the scenarios provocative by using language and concepts that would trigger a reaction in the reader.

Once we had completed the detailed external scenarios, we held a workshop with the SRC to seek its endorsement. The workshop involved providing the SRC with a summary of each of the scenarios and allowing SRC members to comment on the content and presentation. The SRC formally endorsed that the content of the external scenarios encapsulated the ideas expressed by the Irrigation Futures Forums.

We provided the Irrigation Futures Forums with an opportunity to review and comment on the final output from Stage 2 at a reporting day, at which we gave an overview of the scenarios and facilitated table discussions of each of the scenarios. We incorporated comments made by participants at the reporting day in the finalisation of the external scenarios.

BOX – Processes of scenario development

Scenarios are plausible stories of the future and are made up of a collection of storylines that describe how influential drivers may evolve as the future unfolds. Van der Heijden (van der Heijden 1996) describes three broad processes that can be used to create a scenario story from and a range of possible storylines, namely inductive, deductive and incremental methods.

The inductive method builds a scenario step by step progressively from possible storylines, allowing the overall scenario story to emerge. The deductive method first defines an overall framework for the scenario story and fits the possible storylines together to fill in the framework. The incremental method uses an existing 'official' future that an organisation may have as a starting point and creates scenarios that explore territory surrounding the 'official' future. This incremental method is designed to be used with an organisation that still needs to be convinced of what scenario planning has to offer.

In the construction of the four irrigation futures scenarios, we used both the inductive and deductive methods. We used the inductive method to develop the first three scenarios, by extracting storylines from the material generated by the Irrigation Futures Forums and piecing them together to make coherent stories. To develop the forth scenario we used the deductive method, where

the Stakeholder Reference Committee gave the project team a broad overview of the story and the project team filled in the detail with material generated by the Irrigation Futures Forums.

Stage 3

Technical Working Group

The Technical Working Group explored the external scenarios in depth to describe the region's responses to the external forces and the consequences for the region's environmental, social and economic well-being. This exploration was undertaken in a series of workshops held over a 15-month period from March 2005.

At the start of each workshop, we went through a process to allow members to internalise the scenario that was to be explored. This internalisation process aimed to assist members to abstract themselves from their day-to-day worries and allow them to enter a mindset where they could comfortably consider the future. We asked the members to carefully read through the scenario and identify the elements of the scenario that they thought were most important. We provided the group with a variety of materials, including coloured pencils, pens and paper, and asked them to represent these important scenario elements. We encouraged members to be as creative as possible. We then asked each member to share his or her perspective on the important drivers and issues that the external scenario described. This allowed all members to gain a greater appreciation of the content of the scenario and to understand the perspectives of the other group members.

Following internalisation of the scenario, we then facilitated the Technical Working Group to explore the regional responses, or consequences, of the scenario.

We firstly explored how the region might respond to the driving forces described in each of the external scenarios. We asked workshop members to identify the actors present in the period of the scenario under consideration. These actors were people or organisations with a significant role in the region during the scenario period being considered. We asked members to identify the actors using a number of different lenses. During the first few workshops we asked members to identify the actors in the region from their own perspective. As the workshop group became comfortable with the process, we challenged them by asking them to identify the actors through the eyes of the next generation and through the eyes of a hypothetical Regional Development Authority. This provided a different perspective of whom the actors would be and also how they would be doing business. To enable members to identify with the actors in the scenarios, we encouraged members to be as specific as possible in describing the actors; for example, relating the actors in the next generation to young children they know today and describing their job, or describing business in terms of their products, clients and competitive advantage.

After the actors were identified, we facilitated the workshop groups through a process to describe the actions these actors would be taking in response to the external scenarios. We asked members to select one of the actors the group had identified and describe how they were responding to the important scenario elements that had been identified earlier; for example, how individuals were living and working or how businesses were developing in response to the scenario.

We then led the Technical Working Group through a process to identify the region's response and the regional consequences of the scenario. We considered the consequences of the scenario in four broad areas: irrigation and associated business; the way people live and interact; the natural world; and regional infrastructure. To undertake this task we gave the Technical Working Group the role of consultants who were commissioned to assess and report on the scenario consequences in these four areas. We encouraged the Technical Working Group to take a regional perspective when assessing these consequences.

BOX – Operation of the Technical Working Group

For the majority of the Technical Working Group's tenure we operated it as two separate teams, a narrative (or intuitive) team and an analysis (or analytical) team.

The role of the narrative team was to scope out the scenario stories by discussing and describing the evolution and interplay of the external scenarios, regional responses and regional consequences. The narrative team focused on questions of who, what, where and when. This led to the narrative team primarily describing the region's responses to the external scenarios.

The role of the analysis team was to examine and provide a critique of the scenario stories, clarifying concepts and examining the logic and rationale of each scenario story. The analysis team was to illustrate the scenario stories, providing details and examples of the regional responses and consequences. The analysis team focused on questions of how and why.

We allowed the Technical Working Group members to select which team they joined after providing them with information on the role of each group and their preferred learning style. To allow group members to identify their preferred learning style, we provided them with a short questionnaire (obtained from http://www.web-us.com/brain/braindominance.htm).

We encouraged Technical Working Group members with a preference for a right-brain style of thinking to join the narrative team. Right-brain thinking tends to be holistic, intuitive and synthetic, and therefore suited to bringing information together to compose a scenario story. Technical Working Group members with a preference for left-brain thinking were encouraged to join the analysis team. Left-brain thinking tends to be logical, rational and reductionist, and therefore suited to reviewing the concepts within a scenario story and filling in the detail. However, not all Technical Working Group members joined the team aligned to their preferred learning style.

The narrative and analysis teams developed the scenario stories using an iterative process. The narrative team started the development of the scenario stories and the analysis team subsequently reviewed the logic and robustness of the story and added detail. The dynamic created between the two teams encouraged them to provoke and assist each other. The flow of information between the narrative and analysis teams is illustrated in Figure 3.

The Technical Working Group provided ideas and stories, which the project team collated and synthesised into full scenario stories.

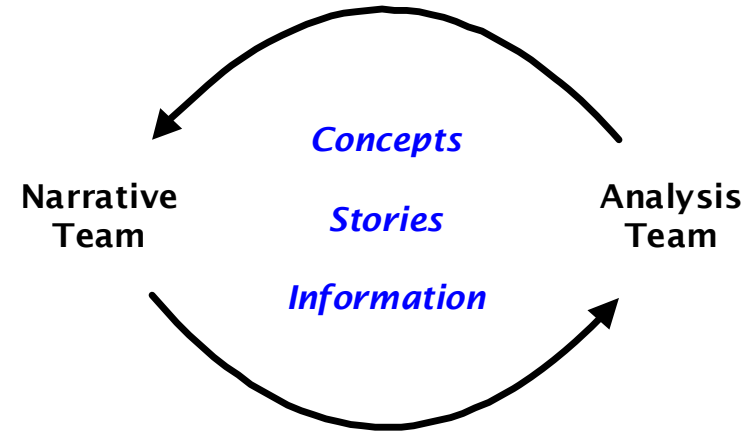


Figure 3: Flow of information between narrative and analysis teams

Project team

The project team supported the development of the scenario stories by undertaking scenario modelling which provided the scenarios with a quantitative dimension. This quantitative dimension provides the scenario stories with increased credibility and interpretability by demonstrating the evolution from current conditions and the relative importance of the region's industries and impacts at different times. However, adding a quantitative dimension to the scenarios also introduces the risk of readers interpreting the scenario as a forecast and also the risk of readers dismissing the scenarios if they believe that the numbers are wrong.

We used scenario modelling to quantify the land and water use, and economic value of production of the major agricultural industries within the region and the region's population. The process used to quantify the region's population was different to that used to quantify the indicators for the region's agricultural industries.

The process we used to model the agricultural industry production, land and water use involved:

1. establishing baseline and historical data describing production, land and water use, and prices received for each agricultural industry, as well as Identifying the magnitude of historical changes to each industry and the plausible causes for the changes;

For each scenario:

2. identifying the non-water factors influencing agricultural industries described by the scenario (eg. consumer preferences, international market directions, government policies, technological developments);
3. assessing the impact of the non-water factors on the demand for, and price of, the products of each agricultural industry and the ability of each agricultural industry to compete in international and domestic markets;
4. using the product demand and industry competitiveness to estimate changes to the value of production, area and water use of each industry;
5. identifying the productive limits imposed on the region's agricultural industries by the availability of water;

6. revising the changes to the value of production, area and water-use of each industry according to the regional water limitations.

BOX - Historical and baseline data used in scenario modelling

Historical water use by industry (ML)

Industry	1996-1997	2004-2005
Dairy	959,821 (64%)	692,038 (63%)
Horticulture	70,765 (5%)	62,141 (6%)
Livestock production	299,362 (20%)	92,720 (9%)
Fodder and grains	175,860 (12%)	195,538 (10%)
Lifestyle*	-	47,703 (4%)
Total	1,505,808	1,090,140
Entitlement	1,103,657	1,066,568
Allocation	200%	100%

* Category introduced in 2004-05

Land use by industry (ha)

Industry	1996-1997	2004-2005^
Dairy	210,997	185,883
Horticulture	21,144	16,707
Livestock production	99,102	74,384
Fodder and grains	115,158	166,498
Lifestyle*		21,805
Total	446,401	465,277

*Category introduced in 2004-2005
^Different data collection methods used

Farm gate gross value of production ($)

Activity	1996-1997	2002-2003
Dairying	408.3	411.6
Horticulture	238.9	372.0
Livestock Production	211.5	321.6

Population

Age Cohort	1996 Population	2006 Population
0-9	28171 (16%)	27516 (13%)
10-19	27198 (15%)	30114 (15%)
20-29	21478 (12%)	21496 (10%)
30-39	27067 (15%)	26967 (13%)
40-49	25849 (15%)	29739 (14%)
50-59	18074 (10%)	27587 (13%)
60-69	14384 (8%)	20061 (10%)
70-79	10482 (6%)	13747 (7%)
80-99	5274 (3%)	8558 (4%)
Total	**177977 (100%)**	**205790 (100%)**

Several agencies, including the Australian Bureau of Statistics (ABS) and State Government departments responsible for land-use planning, such as the

Victorian Department of Sustainability and Environment (DSE), produce long-term population predictions of the demographics of Australia at scales down to local-government areas. These population predictions use age-cohort models and consider the likely birth, death and migration rates under typical conditions over multiple generations, up to 100 years. Compared to the ABS predictions, the scenarios are relatively short-term, 30 years, and also have substantial changes in the conditions that may influence migration rates. Therefore, over the period of the scenarios, the population of the region may diverge significantly from the agency predictions. Several steps were involved in quantifying the regional population changes for the scenarios:

1. The DSE population projections were obtained for the North Goulburn Statistical Sub-division and the Goulburn Statistical division. These population projections were used as a baseline and considered to be equivalent to the natural population growth of each area.

For each scenario:

2. The factors influencing the region's population described by the scenario were identified (eg. labour availability and requirements, agricultural profitability, wider social trends).
3. The impact of the driving forces on the region's population growth rate for each age cohort and each scenario period was assessed.
4. The baseline population growth rates were adjusted to reflect impacts of the driving forces influencing population growth rates.

We checked the modelling results with the Technical Working Group. In a workshop of the whole Technical Working Group, we provided small table-groups with a copy of a scenario story and the corresponding modelling results. We asked each table-group to review the scenario story and assess whether the modelling results were consistent with the scenario story and were plausible. We recorded the comments of the Technical Working group, and subsequently revised the modelling results to reflect these comments. We also provided opportunity for the Stakeholder Reference Committee to provide feedback on the modelling results.

Once we had completed the detailed full scenarios, we sought the endorsement of the Stakeholder Reference Committee. We provided the Stakeholder Reference Committee with a copy of the full scenarios and asked that they endorse that the process used to develop the scenarios was sound and therefore that the scenarios were plausible, and worthy of consideration by the regional community.

Key learnings

In the process of exploring the future with the project participants, we learnt a number of lessons about undertaking such an exercise.

Considering the future, and particularly the distant future, can be challenging for people. Therefore creative techniques are required to get people beyond their day-to-day concerns and into a space where they can effectively consider the future. We found techniques, such as giving participants a futures vest as they entered the workshop room and getting participants to imagine a young person they know now in 30 years time, useful in getting them to consider long-term issues rather than just their current concerns.

The future walls were an effective way to engage the Irrigation Futures Forums in a discussion of the future. They had been introduced to and were comfortable with developing a history wall. Therefore forum participants were able to have the freedom to explore the future in a similar fashion to how they had explored the past. This meant they did not have to think about the process, but could focus on thinking about the future.

Developing comprehensive and detailed scenarios can become a tedious process, particularly when undertaking the process with a group of people. However, it is important to elicit a wide spectrum of opinions as to how the actors in the region may respond to the scenarios and what the consequences would be for the region's well-being. It is therefore important to be constantly innovative in the processes used to develop the scenarios to maintain the interest and good will of participants.

The scenario modelling proved to be an important step in gaining stakeholder acceptance and understanding of the scenarios. The graphical presentation of the scenario modelling results was powerful in adding credibility to the scenarios and capturing the imagination of people with a range of learning styles.

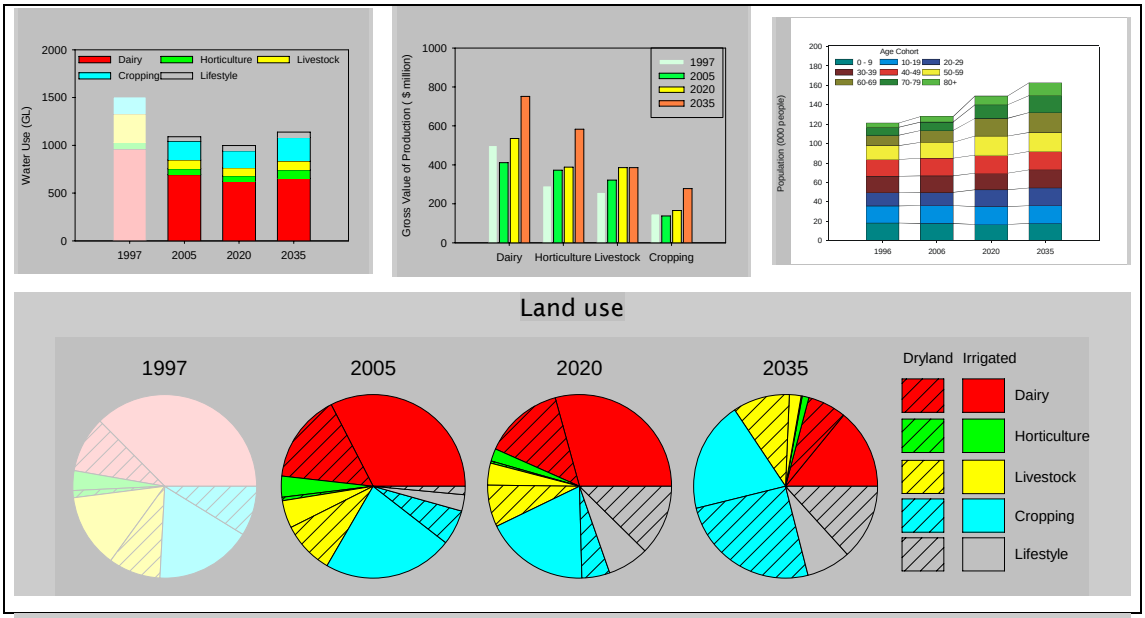
Scenario planning is not a concept that all people can readily understand and adopt. Some participants were familiar with other methods of business or organisational planning, such as the forecast and control method, or vision, mission, objectives, strategies, and action plans approach. These people initially found it difficult to cope with scenario planning, particularly the treatment of many of the future drivers and responses as uncertain. We worked closely with these participants to build their confidence in the approach and attempted to accommodate the needs of these participants through the provision of data, information and analyses.

BOX – Short versions of the scenarios

The following are summaries of the four full scenarios and indicative projections of the land and water use, population and the farm gate value of the primary agricultural industries. The full scenarios are provided in the companion book *Scenarios of the future: Irrigation in the Goulburn Broken Region*.

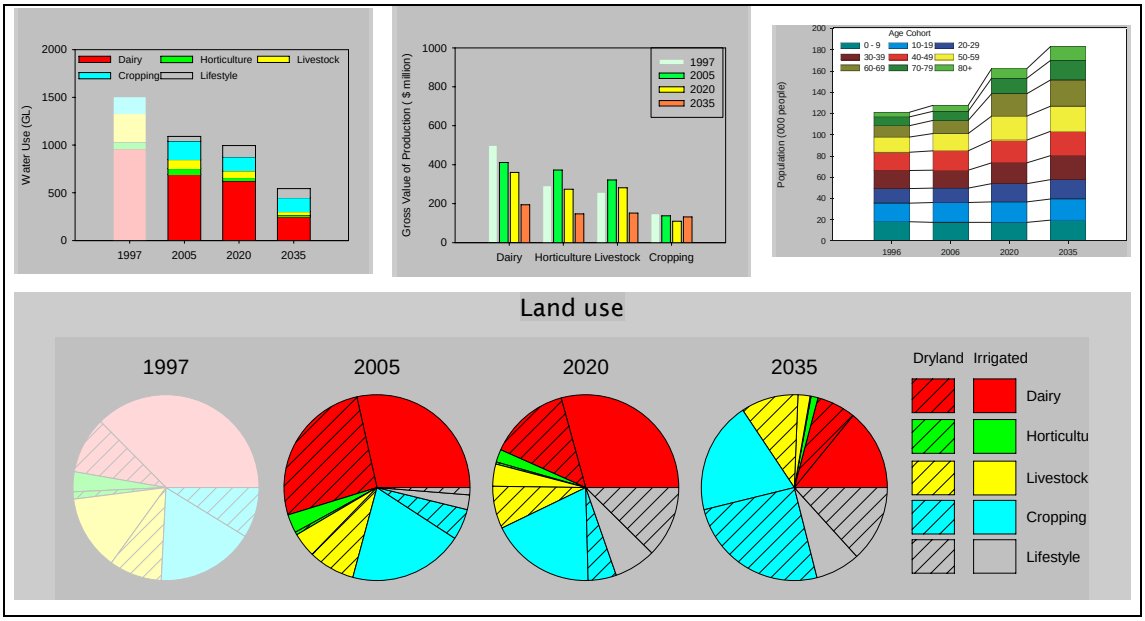
Scenario 1: Moving on

The cost-price squeeze continues to drive the development of agriculture. The phasing-in of bilateral free trade agreements with the US and ASEAN creates both export opportunities and strong competition. Climate change results in less rainfall and a reduction in chill hours. Fire blight decimates pome fruit production in the region. Agricultural businesses adapt to declining terms of trade by increasing farm sizes and developing highly controlled production systems. Multinational corporations takeover the region's processing facilities. The number of lifestyle properties continues to grow slowly. Conflict arises over appropriate land management practices. Irrigation water delivery infrastructure is privatised and rationalised. The population of the region continues to grow steadily. The community is less willing to volunteer forcing the consolidation of community services and groups. The region remains economically prosperous throughout this scenario.



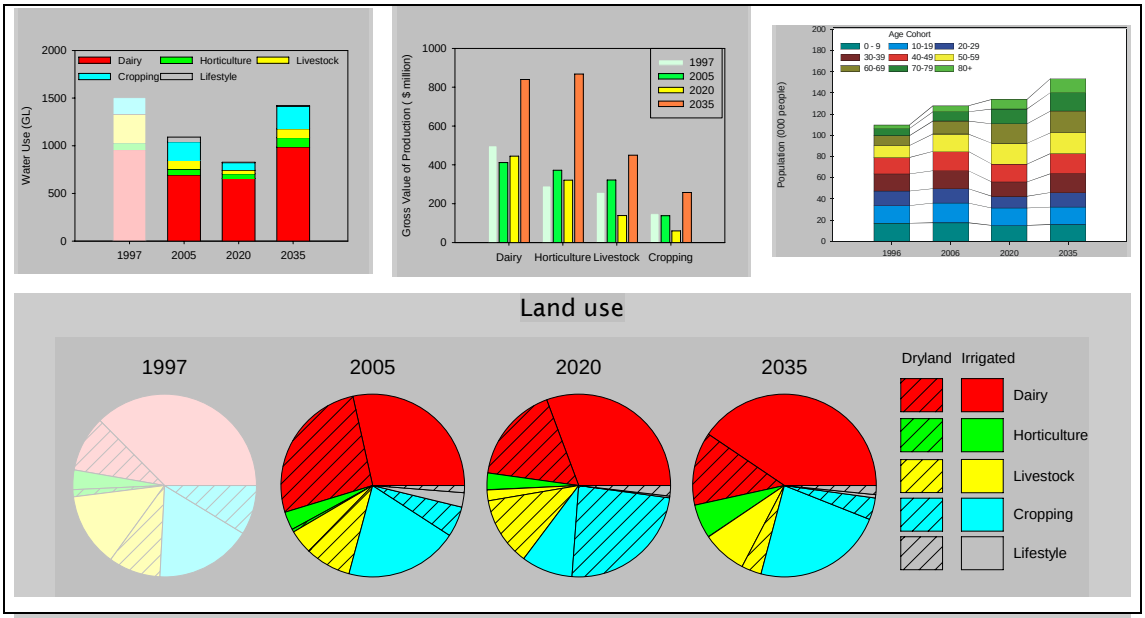
Scenario 2: New frontiers

Demand for lifestyle properties in the region increases substantially as communication technology improvements enable residents to telecommute. Small blocks of land near towns and adjacent to forests and water become the focus of lifestyle developments. Trade with Middle Eastern countries collapses, increasing the price of oil and reducing markets for agricultural products. Governments increase regulation of agricultural practices and introduce a new wave of water reform. Environmental flows are increased through improving the reliability of water entitlements for irrigators. Agricultural industries struggle to adapt to pressures imposed by new regulations and loss of markets. The introduction of synthetic food production changes the face of agriculture, creating demand for grain as a feedstock. Significant volumes of water are traded out of the region due to the limited availability of large land parcels suitable for cropping. A small niche of authentic food production remains. Throughout this scenario the regional community and economy continue to strengthen, however the contribution of agriculture decreases significantly.



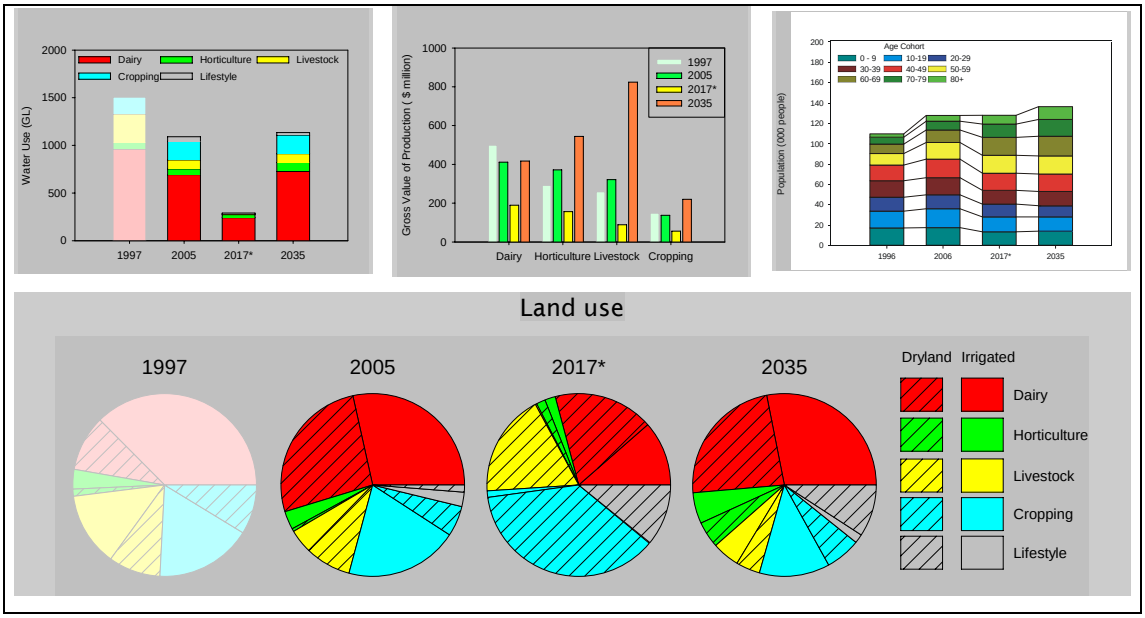
Scenario 3: Pendulum

A green influenced government commits to improve environmental flows in the Murray River. Government purchases all medium reliability water entitlements and some high reliability entitlements. Land and infrastructure is restructured to manage the social impacts of water purchase. The confidence of agricultural industries plummets and investment declines. Fish and aquatic bird populations flourish and attract fishermen and ornithologists from all over Australia. Conservative parties win a federal election and immediately assume control over the management of water resources, reallocating substantial volumes to agriculture. Government auctions water entitlements and rebuilds irrigation infrastructure in partnership with irrigator cooperatives with the auction proceeds. A wet climatic sequence causes floods to occur in successive years. Agricultural export opportunities improve as the dollar weakens, due to the floating of the Chinese yuan, and consumers seek GM free produce. As agriculture in the region expands and diversifies, labour shortages become apparent. The region slowly regains its former economic prosperity.



Scenario 4: Drying up

A recession in the United States and the emergence of China as a horticultural exporter causes Australia to lose export markets. The region is hit by a severe drought with water allocations of less than 100 percent for 5 consecutive years and as low as 30 percent in the worst year. Agricultural producers struggle to make ends meet, many selling assets and relying on government assistance. Irrigation infrastructure deteriorates due to the inability to afford maintenance costs. Aquatic biodiversity declines, as minimum environmental flows are not delivered. An exodus of young people slows population growth to a minimum. As the drought moderates, the global economy grows strongly. Export opportunities improve in the increasingly affluent Asian and South American countries due to Australia's GM free status. Agricultural industries expand and intensify, with support from governments and private investors, but the availability of labour and skills restricts the rate of growth. The economic and environmental wellbeing of the region slowly recovers.


Water Use (GL)
2000
1500
1000
500
0
Dairy
Horticulture
Livestock
Cropping
Lifestyle
1997
2005
2017*
2035
Gross Value of Production ($ million)
1000
800
600
400
200
0
1997
2005
2017*
2035
Dairy
Horticulture
Livestock
Cropping
Population ('000 people)
200
180
160
140
120
100
80
60
40
20
0
Age Cohort
0 - 9
10-19
20-29
30-39
40-49
50-59
60-69
70-79
80+
1996
2006
2017*
2035
Land use
1997
2005
2017*
2035
Dryland
Irrigated
Dairy
Horticulture
Livestock
Cropping
Lifestyle

5. Broad implications

Purpose

The foresight theme developed a series of scenarios describing plausible alternative environments that might confront the region. The purpose of developing scenarios was to examine how the region could prepare for the occurrence of any of the scenarios. The broad implications theme sought to encourage participants to think about the implications of the scenarios for the region as a whole. In thinking about the implications for the future we aimed to:

- capture ideas on possible actions the region might take to manage the scenarios; and
- develop robust strategies to build the region's attractiveness for living and investment.

What we did

Overview

The Broad implications theme was investigated during Stages 2, 3 and 4 of the project. During Stage 2, the Irrigation Futures Forums identified options for the region to respond to the external scenarios and achieve the region's aspirations. The project team synthesised these options into a preliminary set of regional strategies. During Stage 3, the Technical Working Group identified the main regional competencies, or features that make the region attractive for business and living. The Technical Working Group then examined the challenges and opportunities that the scenarios presented to those regional competencies and identified strategies to protect and enhance each competency area. The project team then combined the Stage 2 and Stage 3 outputs and finalised the strategies. During Stage 4, the project team developed a scenario kit for use by extension teams to aid adoption of project findings and ran briefings and workshops for a range of stakeholder groups.

Stage 2

Irrigation Futures Forums

We began exploring the broad implications by reviewing the history wall and identifying the internal drivers, or factors that are directly controllable by players within the region. We asked participants to identify the main actions, behaviours, assets and deficits that had helped or hindered the region over the past 30 years. This gave participants an opportunity to understand better the types of options available to the region as it positioned itself to contend with the scenarios.

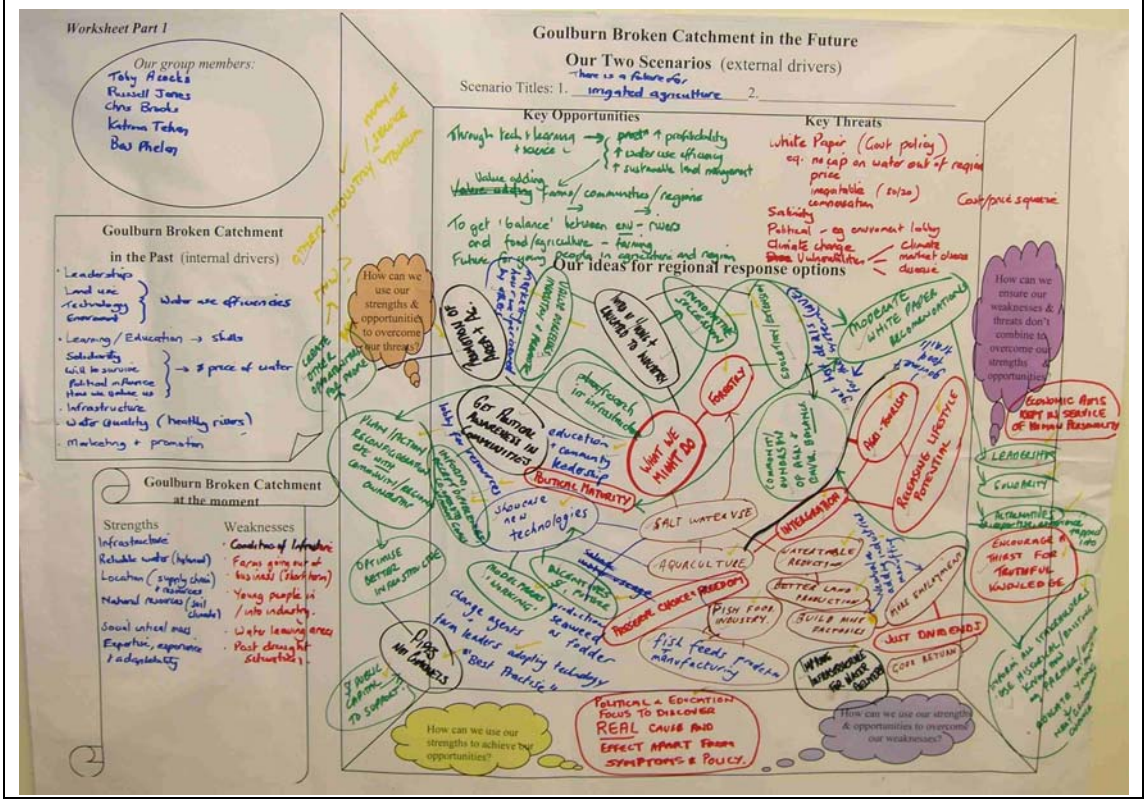
To identify regional options, we asked participants to form small groups around one or two future walls on which they were interested in working. Each group was given a work-sheet that contained a sequence of tasks to guide the development of the regional options. To develop their regional options, we asked participants to use a mind map as a tool to:

- identify the opportunities and threats presented by the two future walls;
- identify the key assets and deficits of the region, from the earlier exploration of internal drivers;

- brainstorm ideas of regional options that would respond to the external scenarios and achieve the region's aspirations; and
- group the ideas to identify up to three distinct regional options.

To allow the small groups to share their ideas with other workshop participants, we used the art gallery technique: we placed the work sheets on the walls and asked one member of each group to remain with their work sheet while other workshop participants were encouraged to walk around and have a look at the work of all the small groups and, if necessary, seek clarification of ideas and response options.

Box – Example mind map



To encourage people in the region to think creatively about the future and provide the wider community with an opportunity to contribute to ideas to the project, we offered the Irrigation Futures prize. We asked the regional community to consider the key issues that need to be addressed in the future and identify what needs to be done and who needs to do it. Through articles and advertisements in the local newspapers and through the Irrigation Futures Forums we invited people to make written submissions outlining their ideas. We had a group of stakeholders review the suggested ideas and award a prize to the best idea. The prize offered was a trip to a conference of the winner's choice including travel, accommodation and registration expenses.

BOX – Irrigation Futures prize winning submission

TITLE: IRRIGATION WATER USE EFFICIENCY

WHY:

There will be less irrigation water available in the future due to a combination of factors - eg competing interests for environmental flows, growing urban populations, climate change, bushfires and possibly future tourism demands.

MY IDEA:

Is to maximise water use efficiencies at both distribution and farm level.

HOW:

1. Develop a plan for all water requirements for Northern Victoria to allow sensible reconfiguration of the irrigation infrastructure for the next 100 years.
2. Implement total channel control system on all regulators on the supply system, that is channels and natural carriers.
3. Replace the Dethridge Wheel with total channel control and actively encourage on-farm automatic irrigation systems linked in with the total channel control programs at a basin level.
4. Where practical, introduce piping from main channels to service many of the smaller channels.
5. Maximise kilos of dry matter from flood irrigation and move away from permanent pasture to more annual species.
6. In the upper part of the catchment irrigation from dams should be replaced where practical with a piped system from a regulated river.
7. Water use licences need to consider penalties for water used for non-productive use on lifestyle properties.

OUTCOME

Would have modern infrastructure, which reduces water losses, improves productivity, is a major labour saver to both G-MW and landholders, and improves the environment, particularly in the upper catchment.

RESPONSIBILITY

Department of Sustainability and Environment (DSE) and region should develop water plan.

Goulburn Murray Water (G-MW) and DSE should implement total channel control (TCC) on channels and natural carriers.

G-MW, DSE and the Department of Primary Industries (DPI) should implement TCC on all channel outlets to irrigators.

DPI irrigators and region encourage the uptake of automatic irrigation.

DPI, irrigators and industry maximise production from flood irrigation.

DSE, DPI, G-MW, Goulburn Broken Catchment Management Authority (GBCMA), and irrigators should develop a plan to replace dams where practical with pipes, then implement.

TIME FRAME

Time is not on our side but need to have most options implemented or implementable within 10 years.

COST

100s of millions of dollars, but with the value of water continuing to escalate this cost is justifiable.

CONCLUSION

Nothing new in what I am advocating. However, the reinvention of the irrigation industry is desperately needed to restore confidence, particularly in flood irrigation within the current irrigation regions.

What is desperately needed is the leadership and regional determination to make it happen.

Project team

The project team took the ideas and response options suggested by the workshop groups and transcribed them into a list. We then examined the ideas and classified them into broad topic areas. For each topic area, we reviewed the existing regional activities and explored how the suggested options could build on or replace these activities. We then extracted the underlying strategies by looking across all of the options within a given topic area and grouping those that sought to achieve a similar outcome. We summarised the options by describing high-level strategies to achieve each outcome.

We held a workshop with the Stakeholder Reference Committee to review and endorse the preliminary strategies. We presented the preliminary strategies in four sections, allowing the Stakeholder Reference Committee to comment on the content and wording of each of the strategies. At the conclusion of the discussion of the preliminary strategies, the Stakeholder Reference Committee endorsed the preliminary strategies subject to incorporation of its comments.

We provided the Irrigation Futures Forums with an opportunity to review and comment on the final output from Stage 2 at a reporting day at which we gave an overview of the preliminary strategies and facilitated table discussions of each group of strategies. We incorporated comments made by participants at the reporting day in the finalisation of the preliminary strategies.

BOX – Underlying principles of regional strategies: Resilience and adaptive capacity

Analysis of the response options and ideas proposed by the Irrigation Futures Forums revealed that they were underpinned by the concept of building the resilience of the region.

Resilience is a concept that has emerged from the ecological literature and is related to the state of a system and its ability to handle disturbances and shocks. Ecological resilience is defined as the ability of a system to absorb disturbance and still retain its basic functions and structure (Walker and Salt 2006). The concept of resilience is related to sustainability but recognises that change is inevitable, and that to ignore or resist change will increase the vulnerability of the system and limit future options.

The emerging discipline of resilience science views the world as a series of interconnected socio-ecological systems that are both complex and adaptive. Conceptually, the fundamental behaviour of these systems is driven by a small number of slowly changing variables. The system can exist in multiple stable states that display different characteristic behaviours. The transition

between different stable states occurs when the driving variables cross threshold values and can be triggered by disturbances. Once the driving variable has crossed a threshold it can be difficult, if not impossible, to return to the previous condition.

The resilience of a system can be changed by moving the position of thresholds, moving the state of the system toward or away from a threshold, or making a threshold more difficult or easy to reach (Walker and Salt 2006). In practical terms, the ability to manage resilience may be enhanced by changing the physical infrastructure, by changing social and institutional arrangements or by empowering the community to recognise and manage disturbances to the system as they occur.

For a region such as the Goulburn Broken catchment to maintain its prosperity, it will need to be resilient to the disturbances it encounters as the future unfolds. The scenarios highlighted the range of possible disturbances that may confront the Goulburn Broken Region over the next 30 years. These scenarios can provide directions on the nature of actions the region needs to take to ensure it maintains its resilience.

The CRC for Irrigation Futures has recently completed related research on resilience in irrigation regions, communities and enterprises which provides a review of this topic for irrigation futures (see Wolfenden *et al.* 2007).

Stage 3

Technical Working Group

We went through a systematic process to look at the broad implications of the scenarios for the region with the Technical Working Group. We structured the discussion of the broad scenario implications around regional competencies, or features that make the region attractive for business and living. To identify these competency areas we asked the Technical Working Group to consider itself as the Goulburn Valley Regional Development Authority. We then requested that it describe how it would market the region to prospective new residents or entrepreneurs considering establishing a business in the region. Attractive features of the region were written on sheets of paper and stuck to the wall. Once those in the group had exhausted their ideas, we grouped the ideas into the principal competency areas for the region.

We worked with the Technical Working Group to identify the challenges and opportunities that the scenarios presented to the region. We asked participants to select a competency area that they would be interested in working on, and form a small table-group around that competency area. We presented the highlights of each full scenario to the Technical Working Group and requested small table-groups to discuss and list the challenges and opportunities that the scenario presented to their competency area of interest. We asked the table-groups to share the most important challenge and opportunity from each scenario with the rest of the Technical Working Group, listing these on a whiteboard. We then facilitated a brief discussion of the challenges and opportunities presented by all the scenarios collectively and added additional items to the whiteboard list.

We subsequently guided the Technical Working Group through a process to identify how organisations and individuals within the region could build on the current competencies to realise the opportunities and manage the

challenges. Using the small table groups, we asked each group to select a competency area on which to work. We asked table-groups to identify strategies to protect and enhance their selected competency area. Once the group's ideas were exhausted for that competency area, we suggested it select another competency area to work on. After about one hour of work, we held a brief plenary session allowing participants to share their work and lessons they had learnt through the process.

Project team

The project team synthesised the strategy ideas developed by the Technical Working Group, the preliminary strategies from Irrigation Futures Forums and results from some of the investigations of the specific implications of the scenarios, described in the next chapter. The synthesis included an analysis of the challenges and opportunities that the scenarios presented to different aspects of the competency areas and the broad strategies to manage these challenges and opportunities. Where appropriate, we also identified some examples of how the strategies could be practically applied.

To record the output from the examination of the scenarios permanently, we prepared a scenario book, *Scenarios of the future: Irrigation in the Goulburn Broken Region*, that provides an analysis of the drivers influencing the region, describes the scenarios, and documents the synthesised strategies and their rationale.

BOX – Broad regional strategies

The broad implications of the scenarios for the region identified by the Irrigation Futures Forums and Technical Working Group were developed into a set of regional strategies. These strategies focussed on the protection and enhancement of key competency areas of the region. The detailed strategies are described in the companion book *Scenarios of the future: Irrigation in the Goulburn Broken Region.* A summary of the strategy areas is provided below.

Land and water for agricultural production

- Irrigation water supply infrastructure
- Irrigation supply service level requirements
- Irrigation drainage infrastructure and management
- Water management on farms
- Integrated land-use planning

Agribusiness

- Developing the agricultural workforce
- Developing agricultural products and markets
- Developing flexible and robust agribusiness structures
- Actively maintaining access to resources

Communities

- Maintaining active community organisations
- Encouraging development of regional community infrastructure
- Actively lobbying governments

Environmental assets

- Vision for the environment
- Encouraging environmental management on farms
- Environmental water reserve
- Regional adaptive environmental management

Institutional support

- Supporting communities during tough times and times of change
- Regional framework for adaptive management
- Knowledge management
- Regional communication, co-operation and decision making

Stage 4

Project team

To aid the widespread adoption of the concepts and strategies developed within the project, we developed a scenario kit to guide individuals through the process of exploring the implications of the scenarios for their personal and professional life. We worked with extension teams and the farming community to define the scope of the kit and identify its requirements.

We ran a number of communication activities to inform stakeholders of the project findings. We ran workshops at the locations of the Irrigation Futures Forums for forum participants and also other regional stakeholders. At the workshops we presented the scenario book and scenario kit and asked for participant feedback. We also provided briefings on the project findings and outputs to stakeholders who were unable to attend the workshops.

BOX – Scenario kit to extend the adoption of project findings

Within the life of the project it was not possible to explore the implications of the scenarios with all agriculture-related businesses and organisations in the region. To enable interested people to consider how the scenarios might influence their plans, we developed a scenario kit as a guide to explore the scenario implications.

The process for individuals and businesses to explore the scenarios involves the following steps:

1. Write down the personal or business objectives that you are seeking to achieve.

2. Read each scenario and note down the answers to the following questions: If this scenario happened:

- What impact would the scenario have on your business or career, lifestyle and community?
- What changes would you need to make to your business or career, lifestyle and community activities?

3. Given that any of the scenarios might happen:

- What changes do you need to make to your business or career plan?
- What changes do you need to make to your lifestyle?
- What changes need to be made in your community? How can you make a difference?

4. Prepare an action plan considering:

- What needs to be done?
- Who will do it?
- When will they do it?

- When will it be completed?

Key learnings

In the process of exploring the broad implications of the scenarios, we learnt a number of lessons.

Two high-level strategies emerged from the exploration of the broad implications of the scenarios to build the resilience of the region. These strategies are building flexibility and adaptability into the region's businesses, organisations and infrastructure. Flexibility may be built into systems through innovative use of technology, infrastructure, organisational structures, financial arrangements, and management systems. Adaptability is about building on system flexibility and operationally recognising and understanding the changes that are occurring within the region and, once a change has been identified, consciously making informed choices about the future. The changes that need to be considered include changes to the social, economic, political, technological and ecological conditions and the fundamental assumptions that underpin activities.

Regional competency areas provided a useful framework to explore the broad implications of the scenarios. The Technical Working Group readily understood the concept of competency areas and was able to identify strategies to build and protect these competency areas.

The Irrigation Futures Forums generated a large number of options for the region to take to manage the scenarios. These ideas required synthesis into a workable set of strategies that the agencies and organisations could implement. To maintain community ownership of the project output, it was important to maintain the intent and language of the ideas expressed by the community. This meant that the synthesis of the strategies had to undertaken carefully to ensure the intent of the ideas was maintained and they were expressed in the language used by the participants.

Initially we anticipated that the options and strategies suggested by the Irrigation Futures Forums would be alternatives, that is some options would be mutually exclusive and choices would be required to identify the best strategy. However, when examining the options and strategies put forward we found that the majority were complementary. This meant that the initial plan for Stage 3 needed to be revised, to examine the robustness of the suggested options under the scenarios, rather than identifying the best strategy.

Detailed examination of many of the ideas suggested by the Irrigation Futures Forums demonstrated that participants may not necessarily have been aware of all the activities and programs occurring within the region. Therefore, many suggested strategies and options were reinforcing the value of existing programs and activities. The fact that these ideas were proposed by participants may suggest that these programs may not have been adequately promoted, or that participants have not investigated their existence.

6. Specific implications

Purpose

The broad implications theme developed a range of strategies to build the region's competency areas. However, many stakeholders found these strategies to be too broad to be readily implemented. The specific implications theme sought to bridge this gap and promote the adoption of project findings within the region's stakeholder organisations. We worked with stakeholder organisations to:

- explore the scenario implications in some detail for high-priority areas;
- support the region's agencies explore of the implications of the region for their activities and their business and strategic plans; and
- demonstrate how the broad strategic ideas could be applied to specific issues.

What we did

Overview

We investigated the scenario implications for specific issues during Stage 3 and Stage 4 of the project. During Stage 3 the Technical Working Group identified priority areas for focussed investigations of specific implications. During Stage 4 the project team worked with three main stakeholders (G-MW, GBCMA and the region's local governments) to investigate the scenario implications for catchment management, irrigation infrastructure and land-use planning.

Identifying focussed investigations

In a workshop with the Technical Working Group, we introduced to the members the concept of focussed investigations to consider the scenario implications for specific issues. We outlined a list of initial issues for focussed investigations and asked small groups to consider the list and add additional critical issues that required further consideration. We asked the groups to share their ideas and listed these on a whiteboard. We then asked the table-groups to consider two of the issues for focussed investigations and identify the key questions that the investigation needed to consider. Groups compiled their own lists of investigation questions and briefly shared their thoughts in a plenary session.

Conducting focussed investigations

Scenario implications for catchment management

Catchment management in the region is the responsibility of the Goulburn Broken Catchment Management Authority (GBCMA). Within the GBCMA, the Shepparton Irrigation Region Catchment Strategy (SIRCS) is primarily responsible for implementation of catchment management activities relating to irrigation in the region. The SIRCS has five main programs of activity: the farm; environment; waterways; surface water management; and sub-surface drainage programs.

To investigate the scenario implications for catchment management, we worked collaboratively with the Regional Catchment Strategy implementation program teams in their five-year review of the strategy. We ran a process involving two formal workshops and numerous support activities.

In the first workshop we provided the program teams with an introduction to scenario planning and how we planned to use scenario planning to contribute to the review of the Catchment Strategy. We commenced by asking program teams to articulate the catchment outcomes they were seeking to achieve through the implementation of their programs. This served to encourage participants to take a longer-term view and to remind the programs of the purpose and focus of their activities. We asked each team to share its most important outcome with the rest of the workshop, to build up a picture of the desired outcomes for the whole of the catchment strategy.

We then introduced a process to examine the implications of a scenario for their program. We provided a short verbal description of a single scenario highlighting the major drivers, the region's responses and some of the important consequences for catchment management in the region. We also provided the participants with a written version of the scenario. We asked the program teams to identify and list the challenges and opportunities that the scenario presented to the achievement of their catchment outcomes.

We asked the program teams to consider what the challenges and opportunities meant to the way the catchment was managed and specifically what they meant for their programs. After allowing groups some time to consider these implications, we asked the program teams to share their two most important implications for catchment management and their program. We concluded the first workshop by setting a date for the second workshop and outlining the tasks we expected each program team to undertake before the next workshop, with the support of the project team.

Between the two workshops, we asked program teams to examine the challenges and opportunities of the three remaining scenarios and the implications of these for their program. We then asked them to look across all scenarios and consider the strategies their program could take to manage any of the scenarios. Once the program teams had completed their tasks, we compiled and synthesised the output.

Each program team took a different approach to the between workshop tasks, with some program teams going to considerable effort to examine the scenario implications. For example, the Sub-Surface Drainage Program of the GBCMA commissioned a consultant to estimate the sub-surface drainage requirement under each of the four scenarios. The consultant assessed the area of agricultural land requiring sub-surface drainage and the number of groundwater pumps required to provide drainage at the midpoint and end of each scenario.

At the second workshop, we asked one person from each program to describe the process they used to examine the implications of the remaining scenarios. We then shared the output of each program with the workshop.

For each program, we presented a synthesis of the major challenges and opportunities followed by program implications of the scenarios. We then invited workshop participants to pose questions to challenge and clarify the program's thinking. We asked table-groups, centred on the programs, to consider these questions and identify strategies to deal with the identified challenges. We then requested each table-group to share a brief summary of its discussion with all workshop participants.

We asked workshop participants to consider the material discussed earlier in the workshop and brainstorm the cross-program issues or opportunities that they could identify. We clustered these cross-program ideas into topic areas and asked groups to discuss a topic area. We requested that the groups discuss the scope of the cross-program issue and identify possible strategies to assist the Catchment Management Authority address these issues. At the conclusion of the group discussion, we facilitated a brief plenary session where the groups summarised their discussion for other workshop participants.

BOX – Changes in thinking for the Shepparton Irrigation Region Catchment Strategy programs

In the exploration of the scenario implications for the Shepparton Irrigation Region Catchment Strategy, the thinking of the implementation program teams showed substantial evolution. This box summarises some of the thinking for the regional catchment strategy programs that has changed as a result of exploring the scenarios.

Irrigation drainage infrastructure and management

The provision of drainage is essential to the sustainability of irrigated agriculture. Drainage infrastructure and management is related to irrigated area, land use and water management practice. The scenarios describe substantial changes in irrigation practices and areas and therefore there is merit in delaying the construction of major high value assets such as evaporation basins as long as possible. Irrigation reconfiguration planning, and infrastructure planning in general, must integrate surface and subsurface drainage with supply infrastructure. As land and water management changes, there should be ongoing review of surface and subsurface drainage needs and design and service standards. There is a strong need to investigate technologies and management practices for increasing flexibility in surface and subsurface drainage systems, so that the systems are adaptable to future conditions. For example, some of the existing subsurface drainage works may be decommissioned and mothballed. They may be recommissioned some time in the future when demand for subsurface drainage increases.

Water management on farms

The scenarios depict how farming enterprises and systems today may change significantly in the future. Whole farm planning, one of the key strategies in the catchment to assist irrigators to improve water management, may need to evolve significantly in the future. It may shift from its current focus on farm and irrigation layout to dealing with more strategic issues such as enterprise and system changes and flexibility, use of new water products and services, and environmental management systems. Whole farm planning may also evolve to the planning of a whole group of farms, to interface with irrigation infrastructure planning. There may also be a greater role for providing knowledge and information support for improving the efficiency of water use.

Integrated land use planning

The scenarios describe significant changes in land uses over the next 30 years, within and between agricultural, lifestyle and environmental uses. There is a need for a collaborative approach to land use planning by agencies, industry groups and the community, to manage potential conflicts

and bring about complementarity. It is critical to develop sound land use zoning to manage the interfaces between production, urban, rural living, environmental and industrial uses of land and ensure land is available for all uses at acceptable prices. For example, the region needs appropriate accommodation for new residents, including lifestyle residents, to encourage them to settle and bring new ideas and income streams to the region. On the other hand, the settlement of new residents needs to ensure that affordability of agricultural land is not adversely affected. To ensure agricultural land is adaptable to future changes in enterprises and farming systems, options should be investigated to enable flexible amalgamation and subdivision of land parcels and to manage redundant assets.

Research supporting adaptive catchment management

Irrigated agriculture in the Goulburn Broken Region depends on sound land and water management at a catchment scale. Because of the complexity and uncertainty of the land and water systems and their drivers, critical assumptions have to be made when management strategies are developed. There is a need to have a systematic research program for monitoring, evaluation and review, integrated with the implementation of the strategies. The research program becomes part of a deliberate adaptive management process.

The core of the research program is to identify critical assumptions on how management strategies lead to management outcomes, carefully design a monitoring scheme, use a sound scientific method to analyse the monitored data to test the assumptions, and understand the implications of the analysis results on management strategies. The research program is also to synthesise other research results outside the catchment and understand whether they shed any light on the critical assumptions being tested at the catchment. In addition, the research program should also be active in searching for new management options and in detecting, monitoring and understanding emerging issues.

Following this workshop series, the program teams completed their reviews, further developed the strategies they had identified and built them into their work plans for the next five years.

To support the implementation of the cross-program issues, the project team worked with the executive officer of the Shepparton Irrigation Region Catchment Strategy Implementation committee to develop a framework for research and development to support adaptive management.

BOX – Research and development framework

Adaptive management incorporates R&D into management actions. At its core, adaptive management involves the integration of design, management, and monitoring to systematically test assumptions in order to adapt and learn.

The following seven steps are adapted from Salafsky et al. (Salafsky *et al.* 2001):

Step 1. Establish a clear and common purpose

- Set clear benchmark for measuring success (social, economic and environmental)
- Promote informed collaboration

Step 2. Construct an explicit model to conceptualise the systems (biophysical and socioeconomic)

- Collect relevant information including scientific and experiential
- Synthesise information to develop cause and effect models – qualitative and where necessary quantitative

Step 3. Use the model to examine management plans

- How do management actions cause the system to effect success?
- What are the most critical assumptions? – System structure (variables and links), values of functional responses, external forcing variables
- How to treat actions as experiments to test the critical assumptions? – Passive experiments, exploratory experiments, move-testing experiments, and hypothesis testing experiments.

Step 4. Review and develop monitoring plans

- What data are needed to test the critical assumptions?
- What data are already available?
- What data are being collected, and what data do not need to be collected in the future?
- What new data need to be collected, and how to collect them?
- Prioritise data collection (and assumption testing) given available resources
- Link with other reporting requirement
- Also develop a plan for learning from sources external of the catchment

Step 5. Implement the management and monitoring plans

- Do it!
- Set up a data management system

Step 6. Analyse data and communicate results

- Analyse data using the cause and effect models
- Also synthesise learning from external sources
- Document and communicate key lessons

Step 7. Use results to adapt and learn

- Incorporate adaptation into decision-making structures
- Use results to reinforce or change management strategies

Scenario implications for irrigation supply and infrastructure

Goulburn-Murray Water (G-MW) is responsible for the delivery of bulk water to irrigators and other users within the Goulburn Broken Region. The infrastructure used by G-MW to distribute irrigation water within the region is under pressure from a number of sources. Much of the irrigation infrastructure within the region is nearing the end of its design life, meaning that it will need replacing in the near future and that some areas are prone to failure, causing losses of water. Water trade has also meant the

infrastructure costs associated with delivering water in some areas is increasing to unsustainable levels. As a result, G-MW is undertaking infrastructure reconfiguration planning to identify how irrigation infrastructure may be redeveloped to ensure it is sustainable in the longer term.

We worked with Goulburn-Murray Water officers involved in the reconfiguration planning process to investigate the implications of the scenarios for irrigation supply infrastructure. As a preliminary step in the reconfiguration planning process, G-MW was preparing a document of *Strategic View of Assets and Service Needs.* We prepared a chapter providing "Perspectives of future irrigation" that outlined the scenarios and discussed their implications for the provision of irrigation infrastructure in the region. We checked the final product with the Technical Working Group.

One of the major conclusions arising from the discussion of the scenario implications for irrigation supply infrastructure was that infrastructure needs to be flexible. To assist with defining and applying the concept of flexibility in infrastructure, we developed a handbook of flexible technologies for irrigation-supply infrastructure. A collaborative working group comprising members of the project team, URS Consulting and Goulburn-Murray Water senior managers and design engineers guided the development of the handbook. Design staff from Goulburn-Murray Water, as end users of the handbook, were involved in establishing the scope and content of the handbook, and also in the testing of the final product. The detail of the flexible irrigation infrastructure technologies is described in the final product, *Handbook of flexible irrigation technologies* (URS Consulting *et al.* 2007).

BOX – Range of flexible technologies for irrigation supply infrastructure and their likely uses *(Source: URS Consulting et al. 2007)*

Technology	Likely use
In-channel and off-channel storages	Are likely to be most useful in association with either main or trunk distribution systems.
Lay flat pipe	Replacement of small spur channels in areas where changes in irrigation practices are likely to occur.
Channel lining	Carrier and trunk infrastructure where the channels operate continuously at their design flow for long periods of time. Channels serving pods do not operate continuously at the design flow for long periods of time and there is less likelihood of a need to increase the channel capacity.
Staged development of supply systems	When the development is large and undertaken over an extended time and is more likely to be appropriate for carrier and trunk infrastructure.
Supplementary supply works	Carrier and trunk supplies, although it could be used for supply to a pod.
Waterway enlargement	Waterway enlargement is an alternative method of increasing the capacity of a supply system to improve hydraulic efficiency and supplementary supply. It is therefore likely to be used for carrier and trunk channels.
Higher operating	Carriers and trunks where the main channels operate at the

levels/improved channel control	design flow for longer periods of time and, due to their larger capacity, they have a larger freeboard.
Over sizing pipeline systems	Should be designed to supply the total area served by the pipeline that is suitable for irrigation, based on crop types appropriate to the area, using modern irrigation practices and taking into account the area occupied by development and access.
Channel system reconfiguration	This technology will be applied mainly to pods where there is the potential for large changes in the water entitlement.
Short life infrastructure	Pods where there is there is likely to be more uncertainty in the continuation of supply.
Groundwater injection/aquifer recharge	When determined to be more cost effective than other storage techniques and the associated operation, environmental and management risks could be mitigated.
Mothballing channels	Mothballing of channels would be used only where they have significant remaining life and the soil types are suitable for continued irrigation.

Scenario implications for landuse planning and regional economic development

To investigate the implications of the scenarios for landuse planning and regional economic development, we worked collaboratively with the region's local governments, Campaspe and Moira shires, and the City of Greater Shepparton, and relevant supporting agencies. At the time, the region's local governments were developing a Rural Strategy, which sought to define rural land-use zoning for the irrigation areas in the Goulburn Broken Region. We ran a program involving two formal workshops and several supporting activities.

The first workshop introduced the concept of scenario planning and how we planned to use the technique to assist the development of the Rural Strategy and regional economic development. We introduced a process to examine the implications of one scenario for land-use planning and regional economic development.

The second workshop commenced by examining the implications for land-use planning and regional economic development of each of the remaining three scenarios. We then asked participants to take a holistic view and identify the challenges and opportunities that all four scenarios, collectively, presented to land-use planning and regional economic development and the strategies that needed to be put in place to manage these challenges and opportunities. For these activities we kept participants in discipline-based groups (land-use planning, economic development and community development) to ensure discussions were focused.

We asked workshop participants to identify and prioritise strategies that needed the involvement of other disciplines. We then formed cross-disciplinary groups to discuss these strategies and identify the actions that were required to implement each strategy and who was responsible for undertaking each action. We allowed groups to share their ideas in a plenary session.

Support for the development of differentiated products

The need for the region to produce high value differential products was identified as one of the broad implications of the scenarios. To assist the region understand how it could support the development of industries that produce differentiated products, we commissioned a consultancy to describe the types of support currently available in the region to new innovative businesses. We also asked the consultant to identify any additional support that could be provided to assist innovative businesses establish in the region.

Key learnings

In the process of exploring the specific implications of the scenarios, we learnt several lessons.

The participation of stakeholders in the exploration of the implications of the scenarios is a critical step in the process of adoption. Guiding stakeholders through a process to explore the scenarios allows them to develop their own understanding of what the future may hold and recognise and develop strategies that are appropriate for their organisation. Enabling stakeholders to recognise and develop their own strategies ensures that they have ownership of these strategies and understand their purpose. This increases the ability of stakeholders to translate high level strategy ideas into activities that they can readily implement.

We found that many of the region's organisations did not necessarily discuss strategic issues and particularly what the future may hold for the activities they undertake. By providing the opportunity and space for organisations to consider the future we observed some organisations initiating discussions of other strategic issues they were facing.

The process of exploring the implications of the scenarios for specific issues proved useful in translating the broad strategic ideas into more concrete actions. Stakeholder organisations were much more receptive to these concrete actions, rather than the broad strategies, because they were able to identify how the actions could be implemented.

The timing of investigations into the implications of the scenarios was critical to their success. We were fortunate to be able to link the focussed investigations to significant strategic planning exercises in the region, for example the review of the Regional Catchment Strategy and the development of the *Strategic Overview of Irrigation Service Needs* (Spatial Sciences Group Primary Industries Research Victoria 2007). To establish these links required the project team to be flexible and opportunistic, recognising that the project could make a contribution to these strategic planning exercises and allocating project resources to contribute to these activities. Attempting to engage stakeholder groups when such strategic planning activities were not being undertaken would have been challenging.

7. Communication and evaluation

Purpose

The communication and evaluation theme sought to communicate the project and its findings amongst the project stakeholders and the wider community. The theme also sought to understand the impact of the project on participants and stakeholders, and how to improve project processes.

What we did

Overview

The communication and evaluation theme was undertaken during all stages of the project. During Stage 1 we developed communication and evaluation plans and also held a wide range of communication activities to raise awareness of the project and get feedback. During Stage 2 we communicated the project progress and preliminary results to a wide range of stakeholders, and evaluated the Irrigation Futures Forum process. During Stage 3 we communicated the project progress results to a wide range of stakeholders, and evaluated the Technical Working Group process. During Stage 4, we undertook a range of communication activities and had the project independently evaluated.

Stage 1

Communication

Communication was the second main method of encouraging adoption of project findings by stakeholders, behind stakeholder participation. During Stage 1 we developed a communication plan for the project, to ensure communication activities were comprehensive. The purpose of the communication plan was to describe the rationale and methods for communication with the range of project stakeholders. The communication plan described:

- aims for communication;
- a list of the primary communication audiences; and
- methods and frequency of communication with each primary audience.

Before developing the communication plan we undertook an analysis of the project stakeholders. We compiled a list of potential project stakeholders and contacts for each stakeholder group. We then categorised each of the potential project stakeholders according to their interest and influence in irrigation and used this information to prioritise their communication needs. We developed the communication plan in close consultation with the high-priority stakeholders. As we communicated with project stakeholders we asked how they would like to be involved in the project and how they would prefer to be informed of project progress. Feedback given by the project stakeholders formed the basis of the communication plan.

To raise awareness of the project, we also undertook a comprehensive program of communication with the major stakeholders within the region and also with government departments. The communication program included providing briefings to:

- the Boards of Goulburn-Murray Water, the Goulburn Broken Catchment Management Authority and the North Central Catchment Management Authority;
- the Moira, Campaspe and Greater Shepparton Councils;
- Department of Sustainability and Environment's Catchment and Water Division;
- the Secretary of the Department of Primary Industries;
- G-MW Water Services Committees;
- Victorian Parliamentary Secretary for the Environment;
- the Northern Water Forum;
- the Victorian Minister for Agriculture;
- district branches of the United Dairyfarmers of Victoria; and
- the Northern Victorian Fruitgrowers Association.

Evaluation

Evaluation and continuous improvement within the project was important in maintaining the commitment of project participants and demonstrating the value of the project to project investors. During Stage 1 we developed an evaluation plan that described the rationale and methods for evaluating the success of the project. The evaluation plan described:

- a vision of success for the project;
- program logic using Bennett's hierarchy (Bennett and Rockwell 1995);
- measures of project performance; and
- methods of collecting data to illustrate the performance of the project.

We developed the evaluation plan considering the needs and requirements of project investors and stakeholders to demonstrate the impact of the project.

Stage 2

Communication

At the beginning of Stage 2 we held a number of information sessions with local stakeholder groups to promote awareness of the project and seek their involvement in the Irrigation Futures Forums. At these information sessions we provided stakeholders with an overview of the project, in particular Stage 2 of the project. We then invited people to register their interest in participating in the Irrigation Futures Forums, or recommend people they felt could make a contribution to the process.

At the conclusion of Stage 2 of the project we held an extensive program of communication with key project stakeholders to brief them on the project progress and preliminary findings. At these briefings we provided stakeholders with an overview of the purpose and structure of the project. We then outlined a brief summary of the key outputs from Stage 2, including the community aspirations, the four scenarios and the set of preliminary strategies. We then invited stakeholders to comment on how relevant the strategies were to their organisation and how they might implement them.

Following each workshop local media outlets published articles in the local newspaper to keep the wider community informed about the project and its progress.

BOX – Newspaper article

Demand for worthy workshops

The enthusiasm of participants has seen extra Irrigation Futures Project meetings planned as part of looking at the future of irrigation in the Goulburn Broken Catchment.

More than 80 people attended a third round of workshops at five locations around the region recently. The workshops considered how the region will respond to changing scenarios in the irrigation sector.

Irrigation Futures Project chair John Pettigrew said that these were part of an intensive series of workshops, which were defining in areas such as people's aspirations and scenarios for the future involving irrigation.

Mr Pettigrew said the high commitment level of participants had led them to request another round of workshops which would allow them to further consider the issues of planning and responding to future scenarios in the irrigation industry.

"They realise that the issues are complex, and they need more time to formulate the regional response," Mr Pettigrew said.

"Their commitment to this process is highly valued and augurs well for the future."

The next round of workshops in October will also look at what indicators should be used to measure the positive and negative impacts of change in the community, the environment and regional business.

In the coming months, the project will run special programs focusing on input from women and ethnic communities in agriculture; young people and next generation farmers; and the indigenous community.

"We are very keen to hear from these people, but recognise different approaches are needed to capture their input," Mr Pettigrew said.

Interviews with business leaders are also planned to ensure future proposals recognise the investment plans of major employers in the processing and service industries.

For information on the project phone Leon Soste at DPI on 5833 5956.

Forum puzzle . . . From left, Denis Moon, Q.J. Wang, Peter Gibson and Della Palmer think through a dilemma at the water futures forum.

Water talk . . . From left, Durham Prewett, David Mulcahy, Carl Russell, Peter Fitzgerald and Ian Moorhouse.

Meeting of minds . . . Gary Arnold, Greg Roberts, Kevin Preece and Alison Guthrie at the water futures forum.

Source: Country News 9/8/2004

At the conclusion of Stage 3 we also organised an Invited Speaker's Day for Irrigation Futures Forum participants and key stakeholders. We invited two speakers with international profiles to stimulate the thinking of participants. Professor Jonathon West, from the University of Tasmania, provided an overview of global agribusiness markets and their implications for Australian produces, and Dr Peter Ellyard, from the Preferred Futures Institute, discussed innovation and change and how communities can create their desired future. Each speaker gave a formal presentation of approximately one hour duration. We followed each presentation with a small group discussion of the issues raised and their implications for the future of the region. Participant comments were then passed on to the Technical Working Group for its consideration during Stage 3 of the project.

Evaluation

At the conclusion of the Irrigation Futures Forums we evaluated the process by assessing the growth of participants with respect both to their individual understanding of issues and complexity involved in sustainable development and to their ability and willingness to share their understanding and exchange ideas in the community.

In the final Irrigation Futures Forum workshop we gave all participants a short questionnaire to complete, allowing them to give quantitative and qualitative feed-back. The completed questionnaires were compiled and the results analysed by an independent contractor.

BOX –Summary of Stage 2 evaluation results
The Irrigation Futures workshops have resulted in a positive and quantifiable change in the participants' understanding of:

- the complexity involved in sustainable development and
- their willingness to share this understanding.

The factors that contributed most strongly to this change were: understanding gained through listening to other participants, and confidence gained from involvement in the workshops.

There was an even greater positive change in the social networks between participants expressed through a better understanding of, and respect for the viewpoints of other participants.

The change in understanding of other participants' viewpoints was statistically larger than changes in other specific factors. Participants attributed this change to the opportunity to hear and see other participants presenting their viewpoints, and the positive environment for discussion that the workshops created. One participant's explanation of this was:

"I enjoy listening to the views of others and trying to understand their perspectives. People are most often reasonable if they do not feel threatened. The workshops avoided threatening situations"

The non-threatening environment provided in the workshops has resulted in substantial personal growth amongst workshop participants. The rich mix of backgrounds and experience amongst participants has also contributed to the personal growth.

Stage 3

Communication

During Stage 3 we provided briefings and information sessions, on request, to a variety of stakeholder and interest groups. These briefings included project updates, introductions to scenario planning and preparatory sessions for focussed investigations.

During Stage 3 we also presented papers at several conferences including:

- Department of Primary Industries - Linking Research and Extension Conference;
- Australian National Committee on Irrigation and Drainage Conference;
- ABARE Outlook Conference;
- Australasia-Pacific Extension Network Conference; and
- Beijing International Symposium on Water Resources Management

Evaluation

The process we used during Stage 3 of the project was experimental. Therefore, at the conclusion of each workshop throughout Stage 3 we ran a brief evaluation session to assess if the process met the participants' expectations and learn how the processes used in the session could be improved.

At the conclusion of the Technical Working Group process we evaluated the process used during Stage 3 and the growth of participants as a result of

their involvement in the Technical Working Group. We employed an independent consultant to undertake the evaluation. All Technical Working Group participants were given a written questionnaire that contained a series of open-ended questions, and provided with the opportunity to give verbal feedback to the consultant. The consultant also interviewed a selection of the Technical Working Group members to gain deeper insights into the personal changes that they had experienced. The consultant compiled the completed questionnaire and interview output and analysed the result.

BOX – Stage 3 Participant stories of personal change

Story 1. You can grow food on concrete

I found that the workshop stage (ie. stage 2) of the project had not extended my thinking very far, however through the Technical Working Group (TWG) I have started to think a bit broader, the sky is the limit, and change will occur quicker than I had previously expected.

My involvement in the TWG has encouraged me to think outside the square more often. An example of how this has occurred is I had always felt that we should preserve our most productive prime soil types. When I made that point at a TWG workshop, I was challenged by another TWG member. They made the point that water is the limit to production – not soil, and used hydroponics as an example of their point. How important is it that we preserve our productive prime soil types - when we can grow produce on the concrete car park?

Why is this story significant? Through the non-adversarial atmosphere created in the TWG, long held beliefs could be challenged without attacking and defensive behaviour. This is an example of how participants were able to reflect on long held views in a safe environment. I think this participant still feels prime soils are important, but is now much more open to possibilities.

Story 2. Now I'm pessimistic

Through the TWG I have developed an increased knowledge of the global situation and Australian agricultural competitiveness. The talk by Jonathan West was brilliant – engaging and full of new information. Q.J. Wang fed in interesting information about the current situation in China. This new information has led me to question the optimistic view I had about our region's global competitiveness – especially in horticulture.

My views and assumptions changed during the TWG process, it was an evolutionary process.

I am now much more informed, questioning and pessimistic. This is a positive thing, as my previous optimism wasn't based on full information. This has changed the way I respond to issues. I no longer assume that the past is a good indicator of the future for agriculture and irrigation.

Why is this story significant? This participant can now contribute to regional strategies with a much broader knowledge of the current situation and future possibilities.

Stage 4

Communication

During Stage 4 of the project, we undertook a range of communication activities to inform project stakeholders of the project findings and facilitate the adoption of project outputs by agencies and irrigation enterprises. We arranged a program of workshops and briefing sessions.

The workshops were targeted to extension and field officers, service providers and leading farmers to develop and test a scenario kit. The scenario kit aims to provide individual landowners with a structured process to explore the implications for their operation. In the workshops we introduced the project and the principal project outputs. We then outlined the scenario kit and asked workshop participants to discuss the usefulness of the kit in assisting landholders plan for the future, and any improvements that could be made to the kit.

To increase the awareness of key decision-makers, including departmental policy-makers and politicians, we ran briefing sessions that described the project, the principal project outputs and how they might be of use to the region.

Evaluation

To evaluate the overall project, we commissioned an independent reviewer to assess the contribution of the project to the region and to the practice of scenario planning. The reviewer examined the project in terms of the project components that were essential to the achievement of community ownership and subsequent implementation, the areas where alternative or additional steps may have been taken, and the areas that have made a unique contribution to the field of scenario planning.

Key learnings

Through the communication and evaluation processes used within the project we learnt a number of lessons.

At the conclusion of each workshop we undertook an evaluation of the processes used that day. This proved valuable as it allowed the project team to continually improve and refine the workshop processes used. Progressive improvements to workshop processes built a good rapport with workshop participants.

Feedback from workshop participants was elicited by the project team at the conclusion of each workshop, and by independent parties at the conclusion of each of the project stages. In all instances, the comments expressed by workshop participants were similar in nature. This suggests that independent evaluation may not be necessary.

Continual communication with key stakeholders was vital in maintaining their ownership of the project and its output. Over the period of a project, we experienced significant turnover in the personnel of several key stakeholders. Such turnover increased the importance of maintaining good communication with stakeholders, so that new personnel could understand the project and develop ownership of it.

Stakeholder participation was a key strategy to develop ownership and encourage the adoption of project outputs. However, it was not possible to

have all stakeholder personnel involved in the project activities, and therefore we needed to communicate project findings with people who had not been part of the process. Such communication was often challenging because people who were not involved commonly found it difficult to understand the significance of the project findings, particularly the strategies and what they needed to do as a result.

8. Conclusions

The Goulburn Broken Irrigation Futures project used scenario planning to explore how the Goulburn Broken Region can prepare for the opportunities and challenges the future may present. The scenario planning methodology that was used, and is described in this book, has three main features: stakeholder participation; systems analysis; and integration with the strategic planning of key stakeholder groups. The scenario planning methodology was implemented over a period of four years in four stages. These stages covered six principal themes of activity: project planning and initiation; hindsight and insight; foresight; broad implications; specific implications; and project communication and evaluation.

The implementation of the scenario planning methodology was successful from a number of perspectives. A diverse range of stakeholders was involved throughout the project. Active participation by stakeholders required a substantial time commitment, with the minimum involvement being two full-day workshops. Participation and retention rates were high for all stakeholder workshops, and post workshop evaluation suggested that participants found their involvement rewarding and beneficial. The participation of stakeholders also added considerable value to the project and its outputs. Stakeholder participation broadened the "scientific" view of systems, allowed the use of local knowledge, explicitly considered stakeholder values and provided the community with ownership of project outputs.

Scenario planning served as a practical tool to systematically explore the complex systems that operate within and outside the region. The scenarios were able to deal with the ambiguity and uncertainty that is intrinsic to an exploration of the future by developing a set of coherent stories describing alternative perspectives of how the future may unfold. While the scenarios are not predictions in the traditional sense, they represent a range of plausible futures that might confront the region. By developing a range of scenario stories we were able to bring together diverse ideas into a common analytical framework. The set of scenarios then became a powerful tool to assess the robustness of proposed strategies and also generate new strategic options.

The scenarios were used to develop a range of broad strategies for the region as a whole. Implications of the scenarios were identified by the Irrigation Futures Forums and the Technical Working Group. The project team synthesised these ideas into a set of broad strategies. The synthesis of the broad strategies was based on concepts from the latest research and management thinking relating to resilience science. As the broad strategies were developed, the project team was careful to retain the intent, and where possible language, of the participant contributions while expressing the ideas within a coherent framework.

In close collaboration with the key responsible organisations as they undertook strategic planning exercises, the scenarios were used to develop strategies for specific issues. For example, strategies relating to irrigation infrastructure were developed in collaboration with Goulburn-Murray Water officers. The collaborative development of the strategies for specific issues enabled the participating organisations to evolve their strategic thinking and at the same time develop their scenario planning capability. Collaborative strategy development also ensured that staff of participating organisations

understood the rationale underlying the strategies and had ownership of them. This embedding of the strategy development process into organisational strategic development helped facilitate the adoption of the project findings and outputs.

In reflecting on the work undertaken within the project we identified a number of additional learnings that were important to the success of the project overall.

All project organisational groups, particularly those involving the community, had high rates of participation, with 80 per cent of Irrigation Future Forums participants retained for the series of 4 workshop held over the eight months and 50 per cent returning to feedback sessions two years later.

We attribute this high rate of participation to a number of factors. The principles for stakeholder participation, developed at the start of the project, established that the role of the project team was one of facilitation, and that the process was to be as inclusive and equitable as possible. While initially some participants found this confronting and difficult to appreciate, the fact that their opinions were respected and faithfully represented encouraged their continued contribution to the project. High participation rates were also due to the high level of communication maintained with each member of the project groups. The project team made verbal contact with all participants between each workshop to discuss any concerns they had with the previous workshop and ideas they had on the next workshop. These conversations maintained contact between the project and participants and also served to remind participants when subsequent group meetings were to occur. We also attribute the high participation rates to the opportunity that the project provided for participants to influence the future direction of the region.

The participation of community and representatives of the region's organisations and agencies in the project organisational groups was very important to the success of the project. Project participants developed an understanding of the complexity of issues facing the region and the nature of the types of strategies that needed to be considered. These strategies about building the adaptive capacity of the region are not immediately apparent to people who have not participated in the scenario planning process. Therefore for the project to have a substantial and perpetual impact, people who have a high level of influence on the direction of the region need to be directly involved in the scenario planning process.

Many of the issues and concepts dealt within the project were complex. During each stage we allowed considerable time for participants to come to terms with theses issues and concepts. At each workshop we allowed participants time to discuss the issues with each other. We also consciously allowed time between workshops to allow people to reflect on the issues raised in the workshops and discuss them with friends and family. Providing participants with sufficient time to consider the issues and concepts allowed their thinking to develop and change. For example, at the start of the Technical Working Group process many participants thought lifestyle residents were a threat to the agricultural productivity of the region. At the conclusion of the process the attitude of many had changed, with lifestyle residents being viewed as valuable contributors to the regional economy and community. These changes in thinking around potentially controversial issues had a significant influence on the nature of the regional strategies and improved the quality of the project findings considerably.

As a government research agency we recognised that one of the risks was the community seeing the project as promoting a government agenda. Articles in the local newspapers at the commencement of the project highlighted this, with local lobby groups calling for an open debate about the future. To manage this perception, we worked hard on developing a process that allowed the community to set the direction of discussions and define the issues of importance. As a part of managing this perception we deliberately did not invite experts or influential people to speak at the start of the Irrigation Futures Forums or Technical Working Group processes. We also did not provide information about current government policy developments until the groups specifically requested it. For example, it was not until the third workshop of the Irrigation Futures Forums that we provided information on and discussed the content of the water reform White Paper and its implications for the region. This transparency process contributed to participants developing trust in the project and understanding that the project team was seeking to facilitate a discussion of the future, and not direct it.

The approach to workshop facilitation also contributed to the development of community trust in the project. The context for all workshop discussions was always that we were seeking a diversity of opinions and that all contributions were valid. This inclusiveness and openness was welcomed by participants and encouraged them to stretch their thinking and understanding of the region. We also attempted to record all discussions as faithfully as possible and return a summary of these discussions to participants. This provided participants with the confidence that the ideas they contributed to the discussions were valued.

The project team carefully planned each workshop and prepared a comprehensive running sheet describing the objectives of the workshop and a detailed description of the scheduled activities. We found this detailed planning to be critical to the success of each workshop, and also to the building of participant confidence in the project team. Often, several iterations of workshop planning were needed before the project team agreed on the workshop objectives and on the best approaches to achieve them. At the conclusion of the workshop planning process, all members of the project team had a common understanding of how the workshop was to unfold. This allowed the project team members to interchange roles within the workshop and also to be flexible in the delivery of the workshop when some activities took longer or produced different output than originally anticipated.

Communication of the scenarios to the range of audiences within the region proved to be challenging, requiring production of several different versions of the scenarios of differing length and complexity. Graphics proved to be more effective than text in communicating the scenarios. The graphs depicting the results of the scenario modelling were among the most useful tools in communicating the scenarios. Even though the modelling results were indicative, the graphs provided people with a feel for the quantitative impacts of the scenarios for the region in a manner that written text could not. The simple graphical depictions of the scenario names also assisted in communicating the underlying themes of the scenarios. Verbal descriptions also helped people understand the scenarios better. Verbal descriptions could be varied between audiences, allowing the level of detail described in the scenarios to be commensurate with the interests of the audience.

BOX – Comments from project reviewer Professor Ron Johnston

The Irrigation Futures project is an exemplar of a very thoroughly planned and conducted foresight project. It sought to achieve its objectives primarily through the indirect mechanism of stakeholder engagement, in which it was very successful. But it has also produced detailed quantitative implications of the scenarios which were developed, which are being used by both organisations with broad responsibilities and individual producers, in their planning for the future. A further feature is the extent to which implementation is proceeding through the existing mechanisms of the authorities responsible for water supply infrastructure and land use planning.

The processes used in the Irrigation Futures project have many notable characteristics. Some are essentially unique, reflecting the particular circumstances of this project. These, together with other more general aspects, are on a par with best international practice.

The special features include:

- a 'slow' foresight process
- deep embedding in existing decision-making structures
- relying largely on local/regional expertise
- a regional economic development focus
- local and regional planning authorities as the major clients
- a developmental approach based on adaptive management
- a clear distinction between internal and external drivers
- a process which prepared for consideration of possible futures by an examination of the past, and engaged the participants in identifying community aspirations prior to considering possible futures
- avoidance of pre-determined scenario logics to define the key characteristics of the scenarios to be developed
- generation of a manageable number of scenarios by a separate process based on the interaction of a Narrative team and an Analytical team
- modelling of the quantitative consequences of each scenario
- a wide range of outputs tailored for different sectors of the stakeholder community
- explicit consideration of the implications of the scenarios for regional stakeholder organisations in their planning

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Appendix: Example workshop running sheet

Workshop 1: Values and Aspirations

Rational Aims:

- Understand the purpose and boundaries of the Irrigation Futures Project, the structure & process of the project & Forum Series
- Identify what is important to people (issues, values and aspirations) in this catchment
- Begin to develop a meaningful vision statement for this group that they 'own', developed with recognition of the many existing visions (G-MW, CMA, LAP, etc.), that may alter as the workshop series progresses ie. dynamic process
- Introduce foresighting skills

Experiential Aims:

- Growing sense of trust amongst participants
- Warmed up and enthusiastic about the project, that leads to participants wanting to come back to Workshop 2
- Opportunity to get things off their chest, and we listen

Outline for the session

9.30am	Arrival and Tea/Coffee
10.00am	Welcome, The project, & Where we are heading
11.00am	Who's here
11.30am	Session 1: Learning from the past
12.30pm	Lunch
1.30pm	Energiser
1.45pm	Session 2: What's important for the future
3.00pm	Preparation for next workshop and Evaluation
3.30pm	Close

Equipment required:

Whiteboard & Markers	Blue and pink highlighters	Digital Camera
Aims & outline on BP	Parking Bay on BP	Folders
Laminated roadmap	Values activity sheet	cd player
Blu tac	Letter to self paper	CD
Roll of BP	Envelopes	
½ A4 paper	Copy of *The Australian* article	
textas	Laminated glossary poster	

To do before people start arriving:

Masking tape line on floor
BP with aims, outline, PB, role/commitment, DRB, expectations heading on pages
Stick up posters
Prepare History wall BP
Folders on tables
Nametags out
Textas and highlighters on tables
Put values exercise in folders
Test camera

TIME	WHO	SESSION	Equipment
10.00am	**Leon**	**Welcome**	

DETAIL:
Thankyou for attending. Looking forward to some innovative ideas and active participation. I am Leon Soste……. There are a few key people here that I would like to introduce: QJ, John/Stephen, Selina & Nicole/Fiona.
Folders are yours – put name on them. We'll pull things out as we go. And add literature as the Forums go on.
Toilets are ……. If you need to go outside/stand up and stretch etc at any time please do so.
Hand over to Selina…..

10.05am	**Selina**	**Context**	• **Aims & Outline on BP** • **Parking bay on BP**

DETAIL:
- Introduce myself and Nic/Fiona, and how we will interact and be flexible
- Run through aims for the day
- Run through outline for the day

We will be **mixing things up** & use different approaches you may not have seen before. This is for two reasons – to keep us awake, and to get us thinking differently, outside square
Parking Bay – if you think of something really important to you but not totally relevant at the time please put it in the parking bay for addressing later or elsewhere
Data Requirements Board – if throughout the workshop you identify the need for some specific data so as to move forward, put it up on DRB and we will work out at the end of the day who, how and when we can source that data, and in what format you would like to receive it
Now, I'd like to hand over to Russell/John/Stephen to introduce the project and give us a bit of background ……

10.15am	**John/Stephen**	**Overview of IF Project**	

DETAIL:
Prompts for their intro:
- This is a regional project, conceived here with no other agenda
- Emphasis on R&D – not implementation, that is role for combination of agencies
- Not reinventing the wheel – this is about recognising and building on what's been done in the past by NRE, G-MW and CMA
- Project aims
- Building capacity of individuals and inspiring innovative thinking and planning
- Context of White Paper
- Clear about the fact that the info produced by the workshops may impact on how policy is interpreted and implemented, but can't change broad policy (ie. may feed into implementation policies of groups such as CMA, G-MW, etc. but won't alter State Gov policy)

10.30am	**Selina**	**Who's here**	• **Space** • **Masking tape line on floor** • **BP for expectations**

DETAIL:

Team building activity – sociometry questions –

Just so we get to know each other, or even better for those of you who do know each other, we are going to begin with a session on who's here. This is for your benefit in terms of working together as a group, as well as ours so we get a feel for who and what we have to work with.

I'm going to ask a series of questions, and some may be slightly challenging or probing so are you up for it?

1. Line up in order of how long you've been an irrigator in this catchment. Now tell us your name, where you are from, how long you've been an irrigator in this catchment, and what you would like to be called
2. Find someone else in the room who has the same hobby as you. Share.
3. Rate yourself on a scale of 1-10 of how innovative you are (work or life). Give us an example of why you put yourself there.
4. Put a green dot on the chart to show how you are feeling re possibilities and opportunities for the future
5. Rate yourself on a scale of 1-10 of how smooth you are on the dancefloor. What's your best style? Move to where your dance partner would rate you!
6. Move to this side of the room/line if you have a strategic plan for your life. Stay here if it is written down, move to the other side if not. How do you measure how life is going?
7. On a scale of 1-10 how tough is life for irrigators in the GB catchment at the moment? Why? Move one step lower, what would have to happen?
8. Return to their seats. What are your expectations from this Forum. Discuss in groups of three for about 5 minutes and then let us know your top one. Co-facilitator to jot on BP as each group tells you their top one. Then ask for any others. Stick on wall and say we will revisit at end of day and/or end of fourth workshop.

10.45am	**Selina**	**Overview of Forum Series**	• **Laminated road map** • **Blu tac** • **Project obj on wall** • **DRB on BP on wall**

DETAIL:

- Purpose of Forum – not debate validity, been there. Now moving forward, explore future for our region
- Not Big Brother or Talkfest – regional initiative which genuinely want you guys to identify the scenarios and develop the regional options that the project will analyse over the next year or so
- However, we need to spend a fair bit of time doing the groundwork to set the scene for the nitty gritty exciting bit of the workshops, so bear with us today?!

- Appreciate that things are pretty tough at the moment, and have been for some time. So there is no right time to plan for the future, it needs to be constant
- We are up to Stage 2 of the Irrigation Futures project, and about 10 months into the four year project. As you know there are four workshops in this series, and they are happening in six forums across the catchment. The overall aims of the Forums are to facilitate the development of a vision, scenarios and regional response options for our catchment for the year 2035 (30 years). This will be achieved through providing the opportunity for wide-ranging discussion/debate and capturing innovative and bold thinking, whilst also building capacity.
- Explain structure of SIRIC, Stakeholder Reference Committee, Project Team, and overall aims of project if not already done so by speaker. Use Update in folder.

ROADMAP

- Project Objectives in folders and on wall.
- We've got a roadmap on the wall (and in your folders) to illustrate how we might get to this point. It may look a bit tricky to follow, but that is indicative of the task we are pursuing – it isn't clear cut and straightforward. There will be turns and obstacles. This isn't easy territory. But we have to try. Having said that, the roadmap is flexible to a degree in that it must respond to workshop outcomes, participant needs and perhaps the White Paper along the way.
- So, we begin at workshop 1 Aspirations and Values. This is a crucial starting point because what is important to us will form the foundation for the rest of the workshops and ultimately the project. Each workshop then builds upon the previous one.
- Workshop 2 will identify the scenarios we may find ourselves in in 30 years time. These are possible operating environments, decided by external drivers or factors, things that are out of our control and will impact on irrigation outcomes in this region.
- Workshop 3 will see you develop some regional response options to the possible scenarios. This is about deciding what we as a region do have control over.
- Workshop 4 then looks at our responses to the options that have been put forward, and allows us to check them against what we identified as important to us in workshop 1. How do we feel about the possible economic, environmental and social consequences of employing a particular option.
- In between the workshops the Project Team will work to refine the data, summarise the workshop outputs and provide notes across all forums, and be on-the-end of the phone if you want to talk/reflect. They will report to the Stakeholder Reference Committee on progress. See folders.
- After workshop 4 the SRC plays a much greater role in terms of working through and deciding on the number of and which options go onto Stage 3. The Project team will do further analysis and provide the technical work and make detailed assessment of the consequences of the chosen options.

- Stage 4 is about the providing the technical assessment and consequences of the various scenarios and options back to the community. Building consensus.

Roles & Commitment

- Our role is to provide a process for this group to decide what they want to put forward
- Expected that all four dates are in their diaries
- Active participation:

-Either sit back and react to change <u>or</u> create your own future

-Create a 'can do' culture rather than a reliant culture who expect government to do everything

- Respect for divergent views, eg. "professional friends – you don't have to like them but must understand them"

11.30am	**Nicole/Fiona**	**History Wall of Irrigation**	• **roll of BP** • **textas** • **blu tac** • **wall or floor space** • **1 red and 1 green texta for facilitator** • **digital camera**

DETAIL:

<u>Purpose:</u> In order to put the next 30 years into context and consider what environment we might be operating in, we must recount the past 30 years. Look at what happened, what was achieved or not, and what we've learnt from the experience. So we are going to spend about an hour looking at the last 30 years and the lessons through a history wall, that we as group construct.

The lessons are only as good as the info that goes in so please think thoroughly. Also, we will be taking a photo of this for posterity and use as a prompt for you to use in between workshops, so let's make it good!

Identify the irrigation changes in this region over the past 30 years (consider key milestones to get started eg. drought, White Paper, war, flood, etc.). Think about what was happening;

- in the world
- in Australia
- this catchment and
- with you.

Anything significant or an event you remember about irrigation jot onto the (chronological) wall with a month or year if you know it. Sprinkle personal experiences throughout the wall to make it relevant to you.

As you fill in this wall chart, consider how we as a region responded (critical things we've done or haven't done).

Now let's recap. I'll quickly run through some of the chunks. As we go if you think there is anything missing or you have just thought of that should be up there please add it.

Now as a group let's stand back and see what this tells us about irrigation in the past, that can then inform us of irrigation in the future (for the afternoon

session). Grab a chair if needs be.
Have we considered the people? Barometer along the bottom?
So, as you glance across:
R: What is really concerning? Facilitator puts a red sad face on that bit
What bits are really encouraging? Put a green smile on that bit
I: So where are the major turning points? Put a line down and asked what changed? What stopped and what started? Major shifts?
What is still unknown? Are there significant gaps in our experience or knowledge as a result of what you see up here?
D: What are the important messages from the last 30 years we need to take forward?
Hopefully this will bring out the external and internal drivers, trends, discontinuities and uncertainties and so provide the opportunity to identify the three areas we want to focus on later at next workshop…use these terms to debrief if possible.

12.45pm		**Lunch**	
1.15pm	**Selina**	**Energiser**	

DETAIL:
We need to get our right brain working this afternoon, and exercise after lunch, so let's do a couple of exercises.
Let's get in a circle.
Lift and tap your knees.
Rub your tummy in circles and pat your head. Swap hands.
Who's been a waiter/res in their past life? Well now's your chance……

1.25pm	**Selina**	**What is important to us as an irrigation region?**	

DETAIL:
Context the afternoon sessions:
Refer to the roadmap again. We are getting into the detail of identifying your values and aspirations. Why do you think we might do this?
We believe the reason we are spending time clarifying our values and aspirations is two-fold;

- these things form the foundation of any other decisions we make or they way we behave. Any actions we take in relation to the future operating environment are based on our values and the future we desire
- this project is about identifying some regional response options to the future scenarios. In order for us to choose and assess the options we need some sort of criteria. This will help us keep checking if the options and outcomes we come up with are what we really want as a region

Therefore we need to consolidate our values and aspirations to a degree, so that we can identify the core values that the community would want or expect us to measure our options against for the well-being of the entire catchment (people, eco and environ).
And their glossary of terms may come in handy.

1.35pm	**Fiona**	**What is important to us as an irrigation region? Pt 1 Values**	• **Values Activity sheet**
DETAIL: We will begin at a personal level and build up to a group list. Let's begin with the Values Clarifier activity.			
2.30pm	**Selina**	**What is important to us as an irrigation region? Pt 2 Aspirations**	• **paper with first line on it** • **envelopes** • **BP** • **blue highlighters** • **project team example** • **CD player and CD**
DETAIL: What we are about to do may seem a little odd. However it is a simple yet very powerful exercise. It has been used by the Dept of Defence and…….to clarify one's aspirations. Ask everyone to spend 10 minutes writing a letter to their future self in the year 2035, from wherever you might be (eg. elsewhere, retired, even looking down on the region from up above!). Begin with Dear self, here I am in February 2035 and the Goulburn Broken catchment is absolutely thriving…….(describe what you see, hear, smell and feel, etc.) Draw from the key messages from the history wall whilst writing your letter. Play creative music. Does anyone want to share their letter? Now from that letter we want to pull out the things that are most important to you. Or your future **aspirations** for the region. Re-read your letter, and use a blue or pink highlighter to clearly identify the most important parts of what the future looks like for you (aspirations). Ask people to share their no. 1 aspiration (in 2-3 words) on butcher paper. Any more? Any saying the same thing? Are there any conflicts? Are they relevant to the whole group and therefore the community you represent? Here's an envelope please put your name on the front, place your letter inside and seal it. I will come around and collect them and return them to you in Workshop 4 when we revisit our foundation stones of values and aspirations. **Collect envelopes!!** Are we happy with our group's lists of aspirations and values accurately reflect our group, and happy for them to go forward to the next workshop and into the mix of forum outputs? This will go on all further correspondence from the project to you.			
3.15pm	**Fiona**	**Preparation for next workshop**	
• Refer back to Roadmap. Let people know that the next workshop we intend to stretch their minds regarding the opportunities and threats for this catchment. Please start thinking scenario building, and read article from *The*			

Australian

- Prompt re drivers and positions – glossary.
- Take photo of irrigation history wall out to friends, colleagues, family, etc and use it as a prompt to gather their thoughts on what the future operating environment might be
- Refer to Data Requirements Board……what do we need, by when, how/who will collect it, how do you want to receive it (eg. quick verbal report at next workshop, written material posted out to you between workshops, information session, guest speaker, etc.??)
- Reiterate date and venue of next workshop

Kyabram Wed 9th June at Fauna Park?
Echuca Tues 8th June, same place
Cobram Fri 11th June, same place
Shep Tues 15th June, same place
Seymour 20th July same place
NB: may need to alter dates of October workshops now

- Put your name tags in your folder and bring back next time
- You will receive the summary package of info by the 19th May. If you wish to discuss anything, or have had a reflection or questions please don't hesitate to contact us

3.20pm	**Selina**	**Evaluation & Wrap up**	

DETAIL:
Sociometry questions:
1. On a scale on 1-5 how well did today meet your expectations? (Refer to list) What would need to happen to move you up one? (co-facilitator to take notes)
2. Put your hand on the shoulder of a person who you knew before today. Then a person you've just met.
3. On a scale of 1-5 how confident are you that your views are being heard? And will play an important role in this project?
4. Dots on the wall.
5. Stand in this corner if you've experienced full on foresighting or scenario building activity before. This corner if you've done some type of visioning. This corner if you've done very little in the way of formally imagining what the future might be like.
6. On a scale of 1-5 how much are you looking forward to the next workshop?
Thanks and see you next time.

3.30pm		**Close**	