



Cooperative Research Centre for  
**IRRIGATION FUTURES**

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# Informing Reform: Scoping the affects, effects and effectiveness of high level water policy reforms on irrigation investment and practice in four irrigation areas

Mike D. Young, Tian Shi and Wendy McIntyre

June 2006

BETTER IRRIGATION

BETTER ENVIRONMENT

BETTER FUTURE





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CRC for Irrigation Futures

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The project was implemented via four case studies involving a considerable number of community, industry and government representatives that were each given the opportunity to comment upon and add to the material included in the appendices to this report. While responsibility for the content of these case studies remains with the authors, we would like to acknowledge the contributions made by all involved in our case studies. Many of the issues explored were challenging and involved many very frank discussions. Readers are urged to consider these as contributions made in the interests of generating hypotheses and an improved understanding of the affects, effects and effectiveness of high level reform processes.

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## Abbreviations

ABARE	Australian Bureau of Agriculture and Resource Economics
ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
CMA	Catchment Management Authority
CPI	Consumer Price Index
CRC IF	Cooperative Research Centre for Irrigation Futures
COAG	Council of Australian Governments
DEUS	Department of Energy, Utilities and Sustainability
DIPNR	Department of Infrastructure Planning and Natural Resources
DLWC	Department of Land and Water Conservation
DNR	Department of Natural Resources
DNR&M	Department of Natural Resources and Mines
DPI	Department of Primary Industry
DSE	Department of Sustainability and Environment
DWLBC	Department of Water, Land and Biodiversity Conservation
EBC	Environment & Behaviour Consultant
GL	Gigalitre
GMW	Goulburn Murray Water
HLWPR	High Level Water Policy Reform
IPART	Independent Pricing and Regulatory Tribunal
IROL	Interim Resource Operation Licence
g/L	Grams per Litre
MDB	Murray-Darling Basin
MDBC	Murray-Darling Basin Commission
MDBMC	Murray-Darling Basin Ministerial Council
MIA	Murrumbidgee Irrigation Area
MIL	Murrumbidgee Irrigation Limited
ML	Megalitre
ML/ha	Megalitres per hectare
MOU	Memoranda of Understanding
NAP	National Action Plan for Salinity and Water Quality
NCC	National Competition Council
NCP	National Competition Policy
NHT	Natural Heritage Trust

NRM	Natural Resource Management
NSW	New South Wales
NT	Northern Territory
NWI	National Water Initiative
NWC	National Water Commission
OECD	Organization for Economic Cooperation and Development
PAV	Permissible Annual Volume
PWA	Prescribed Wells Area
QFF	Queensland Farmers Federation
Qld	Queensland
ROP	Resource Operations Plan
SA	South Australia
SECWMB	South East Catchment Water Management Board
t/ha	Tonnes per hectare
Tas	Tasmania
Vic	Victoria
WA	Western Australia
WAMP	Water Allocation and Management Plan
WAR	Water Allocation Register
WMP	Water Management Plan
WRP	Water Resource Plan
WSC	Water Service Commission
WSP	Water Sharing Plan

## Executive Summary

It may be impossible to keep all or even most people happy during the development and implementation of High Level Policy Reform Processes. It is easy to criticise but given the constraints on all administrative systems, it may be very difficult to do better. This report seeks to catalyse interest in research that will improve consultation processes and as a result produce better outcomes.

Designed to inform policy debate and catalyse further research, this report searches for insights into the perceived and actual impacts of high level water policy reform on irrigation investment and practice. The approach taken involves a search for draft propositions and hypotheses for open discussion and further research, not final conclusions.

The report explores impacts both perceived and actual and has a strong focus on process. If there is any general conclusion that can be drawn from this project, it may be the observation that many irrigators and many administrators consider, that with the benefit of hindsight, the processes of engagement used to develop high level reforms and implement them could be much better.

All seem to share a belief that better outcomes could have been achieved. Many believe that the processes used to implement high level policy reforms caused much unnecessary angst with the result that the reforms made have arguably been less successful in terms of impact on investment and on practice than they could have been.

In a number of areas, a considerable degree of distrust has emerged (Box 1). On the positive side, the industry as a whole, though not necessarily individuals or individual districts, has experienced considerable increase in wealth especially in the value of water entitlements it holds.

### **Method**

The approach taken in this CRC IF project was to map the nature of high level water policy reforms since the “direction turning” COAG National Competition Reforms in 1993/94 that sought to make the water industry more competitive. The main methodology used was to collect background information on what had happened and then convene a series of focus group meetings to scope perceptions and search for evidence of actual outcomes. Many of the resultant discussions were surprisingly frank yet constructive. Summarised in appendices to this report, they are offered to the reader in good faith.

Four case study regions were chosen to provide context and depth to our work. They are:

- In Qld, the Nogoa Mackenzie Region in Fitzroy Basin;
- In NSW, the Murrumbidgee Irrigation Area;
- In Vic, the Kerang-Pyramid Hill-Boort Region; and
- In SA, the Lower South East.

Readers are encouraged to read the case study summaries in the appendices to this report. All comments made by participants were made in good faith in the hope that they may, in the long term, lead to better outcomes.



## ***High Level Water Policy Reforms examined***

The case studies focus on the affects, effects and effectiveness of:

- water sharing processes including entitlement reform;
- the introduction of trading;
- price reform; and
- changes to land-use controls.

## ***General affect of the entire reform package***

Since 1993/94 the value of water entitlements and regional production has increased significantly in all case study areas examined. National indices of the value of water entitlements reveal that in recent times the value of water has increased at the rate of 9.5% per annum. How much of this is due to the efforts of a highly innovative industry and how much is due to high level water policy reform processes is a contestable issue.

Irrigation industry representatives, for example, point to the increase in water use efficiency that has occurred in areas where little trading has occurred. Some irrigation industry representatives argue that this suggests that a considerable proportion of the increase in the value of water reform may be due more to the efforts of industry than as a result of water policy reform. Economic theory would suggest, however, that the policy reforms have acted as a catalyst for change – even in the areas where little trading has occurred.

Another issue rarely discussed in formal policy circles, is the considerable redistribution of wealth that the reforms have generated within many regions.

## ***Identified affects and effects of specific reforms***

The project relied upon focus group meetings to elicit ideas and propositions for further research. The least contentious of all the reforms explored in this report appears to have been those associated with changes in land-use control regulations. Statements made suggest that the degree of local engagement with these reforms was much more than with other reforms. Pricing reforms are much more contentious but appear to be less so in areas where irrigators have been given the opportunity to own and, under licence, operate the supply system that delivers water to them. Objective analysis of the merits or otherwise of irrigator self-management of water supply systems could result in the significant changes to water supply arrangements across Australia. Strong arguments for both approaches were presented to us.

Entitlement reform has been extensive. In each State, the nature of the water right, water share or water licence held is very different to that held a decade ago. Register integrity has improved and entitlements are more fully specified. Most entitlements have increased in value. At the same time, however, there has been a considerable redistribution of wealth among categories of entitlement holders.

Water sharing arrangements – the difficult processes of deciding how much water should be allocated to irrigation water entitlement holders and how much should be retained or allocated for environmental and other purposes – have proved to be contentious. Once completed, the main benefit from the introduction of formal water sharing arrangements appears to have been increased investment confidence induced by the knowledge that once a plan is made, it is difficult to change it without going through extensive public consultation processes.

As far as we are aware, the impact of entitlement reforms has yet to be measured directly. Generally, entitlement security has been increased but it is hard to find concrete examples of these reforms leading to more investment. The tone of responses from industry representatives suggests that increased entitlement security has helped to reduce fear. Research on the actual impacts and benefits of entitlement reform is needed. It is possible that the main benefit has been the development of more fully specified water sharing and catchment plans.

### **Box 1**

#### **A selection of challenging statements made by irrigators:**

1. *“What do we need to do now - on the farm - that will add value, that will give us some guarantee that system will get off our back – that it makes a difference, that fits in with the targets?”*
2. *“At end of day, when the funding for reform goes away, how is all this stuff going to sustain us.”*
3. *“When we find a problem, we like to fix it. This is how farmers behave. Why does it take 20 years for the government to get the fundamentals right? We started in 1993/94 and you are telling us that the National Water Initiative will run until 2014. This is twenty years! Why does it need to take so long?”*

See Appendix 1 to 4 for further statements

Irrigator perceptions of the effects of increased trading are mixed. Within districts, trading now appears to be seen as beneficial. A surprising observation was that support for entitlement and allocation trading within and between regions appears strongest in the area where the economic pressure for change is greatest. A formal survey of the region could produce a different conclusion but the positive community response to trading as a beneficial process that allows adjustment with dignity stands out. Awareness of the weaknesses of current (interim and ever changing) trading arrangements is considerable.

There is considerable frustration about the time that reform processes seem to take. Research on ways to better sequence reforms may produce significant dividends. The report contains a number of examples of reforms at one level being frustrated and even swamped by those occurring at another level (Box 1).

### ***Ways forward***

Scoping projects aim to identify issues and propositions for further research. Many of the issues explored are challenging and cover sensitive policy issues. The methodology used in this project involved many very frank discussions with both irrigators and, also those involved in both policy formulation and implementation. Readers are urged to consider the summary of discussions presented and the observations made as contributions offered in the interests of generating hypotheses and an improved understanding of the affects, effects and effectiveness of high level reform processes. Much more research and analysis is necessary.

Throughout this report, opportunities for further research are presented in italics.

# Table of Contents

<b>Acknowledgements</b> .....	<b>ii</b>
<b>Abbreviations</b> .....	<b>iv</b>
<b>Executive Summary</b> .....	<b>vi</b>
<b>Table of Contents</b> .....	<b>1</b>
<b>1. Introduction</b> .....	<b>4</b>
<b>2. Methodology</b> .....	<b>5</b>
<b>3. History of HLWPR in Australia</b> .....	<b>6</b>
<b>4. Understanding the affects and effects of HLWPR</b> .....	<b>8</b>
<b>5. The affects and effects of high level water policy reform</b> .....	<b>12</b>
5.1 Overall effects of reform .....	13
5.2 Affects of water sharing processes .....	13
5.3 Affects of entitlement reform .....	16
5.4 Affects of the introduction of trading.....	18
5.5 Affects of price reform – setting charges for the supply and delivery of water .....	20
5.6 Affects of land use controls .....	22
5.7 Role of communication and engagement processes .....	22
<b>6. Synthesis</b> .....	<b>24</b>
<b>7. Future Research Opportunities</b> .....	<b>25</b>
7.1 Water entitlement, allocation and trading.....	25
7.2 Governance .....	25
7.3 Public participation and trust building.....	25
7.4 Knowledge sharing and capacity building .....	26
7.5 Infrastructure management .....	26
7.6 NRM and salinity issues .....	26
7.7 Social and economic impacts assessment .....	26
7.8 Interactions between forestry and irrigation .....	26
<b>8. References</b> .....	<b>27</b>
<b>Appendices</b> .....	<b>28</b>
<b>1. Appendix One – Queensland Nogoa-Mackenzie Catchment case study</b> .....	<b>29</b>
1.1 Purpose .....	29
1.2 Background information .....	29
1.3 History of water reform in the area.....	30
1.3.1 Water administration .....	30
1.3.2 Water reform processes .....	31
1.3.3 Water allocations and trading.....	32
1.3.4 Water pricing .....	33
1.3.5 Land use control.....	34
1.4 Perception .....	34
1.4.1 Overall impact of high level policy reforms.....	34
1.4.2 Impact of pricing policy on rural communities .....	35
1.4.3 Upper bound pricing and investment .....	36
1.4.4 Self-management as an option .....	36
1.4.5 Infrastructure standards .....	37
1.4.6 Water markets and water trading .....	37
1.4.7 The effects of moratoriums on regional development.....	38
1.4.8 The reform and engagement process .....	39
1.4.9 Land use control.....	41
1.5 Research issues .....	41

1.5.1 Consultation process.....	41
1.5.2 Consistency in implementation .....	41
1.5.3 Capacity and knowledge building.....	42
1.5.4 Risk assessment and systems efficiency.....	42
1.5.5 Integrated NRM issues.....	42
1.5.6 Agricultural development.....	42
1.6 Case study references .....	42
<b>2. Appendix Two – NSW Murrumbidgee case study .....</b>	<b>43</b>
2.1 Purpose .....	43
2.2 Background .....	43
2.3 History of COAG water reforms in NSW and the MIA.....	44
2.3.1 Introduction of the Murray-Darling Basin Cap.....	44
2.3.2 Pricing reform and water supply.....	45
2.3.3 Water sharing.....	46
2.3.4 Water trading.....	47
2.4 Perception .....	48
2.4.1 Overview.....	48
2.4.2 Impact on pricing.....	49
2.4.3 Impact on investment .....	50
2.4.4 Impact on water use efficiency.....	52
2.4.5 Impact on land use.....	53
2.4.6 Impact on community well being.....	53
2.4.7 Impact on environmental health.....	54
2.5 Issues for future research.....	54
2.5.1 Water allocation/sharing and water entitlements .....	54
2.5.2 Management and assessment issues.....	54
2.5.3 Government and water resource governance.....	55
2.5.4 Public participation and trust building.....	55
2.6 Case study references .....	55
<b>3. Appendix Three – Victorian Kerang-Pyramid Hill-Boort case study.....</b>	<b>56</b>
3.1 Purpose .....	56
3.2 Background .....	56
3.3 This case study .....	57
3.4 History of water reform in the area.....	58
3.4.1 Salinity.....	58
3.4.2 Water allocation policy .....	60
3.4.3 Water delivery .....	61
3.4.4 Water use and trading.....	61
3.4.5 The regional economy.....	62
3.5 The importance of knowledge and information .....	63
3.6 Perception .....	63
3.6.1 Overall impact .....	63
3.6.2 Instability.....	64
3.6.3 Trust and information sharing.....	64
3.6.4 Fundamental and superficial water reform.....	65
3.6.5 Unfair cost sharing .....	65
3.7 Research issues and opportunities .....	66
3.7.1 Knowledge base and capacity building.....	66
3.7.2 Water trading issues.....	66
3.7.3 Water infrastructure management.....	66
3.7.4 Others.....	66
3.8 Case study references .....	66
<b>4. Appendix Four – South East of South Australia case study .....</b>	<b>68</b>
4.1 Purpose .....	68
4.2 Background information .....	68

4.3 History of water reform in the area .....	69
4.3.1 Water Administration .....	69
4.3.2 Water reform processes .....	72
4.3.3 Water trading policy.....	73
4.3.4 Economic impacts of water trading .....	74
4.4 Perception .....	75
4.4.1 Overall impact of high level reforms.....	75
4.4.2 Managing with minimal information.....	75
4.4.3 Water allocation.....	76
4.4.4 Water trading and the costs of holding water.....	77
4.4.5 Certainty and investment.....	78
4.4.6 Specific problems .....	78
4.4.7 Water use efficiency and development .....	79
4.4.8 Irrigation and forestry interactions .....	79
4.5 Research issues and opportunities .....	80
4.5.1 NRM and salinity issues .....	80
4.5.2 Water allocation and trading.....	81
4.5.3 Social and economic impacts of water policy reform .....	81
4.5.4 Interface between forestry and irrigation.....	81
4.5.5 Technology .....	81
4.6 Case study references .....	81

# Informing Reform: Scoping the affects, effects and effectiveness of high level water policy reforms on irrigation investment and practice in four irrigation areas

*“The main reform challenge remaining is to achieve the environmental objectives associated with water use [...] while meeting the demands of irrigators and urban users. This involves the creation of effective water property rights separate from land title as a basis for water trading”.*

NCC 2001-02 Annual Report

*“The scramble driven mainly by state treasuries to qualify their states for national competition policy payments has placed the emphasis on ticking the boxes in the COAG Agreement rather than on the substance of reform”.*

Farmhand Foundation, 2004

## 1. Introduction

This Cooperative Research Centre for Irrigation Futures (CRC IF) project was implemented at the request of the CRC Board and irrigators involved in its establishment. It was their perception that in the haste of implementing high level water policy reforms many mistakes had been made and these mistakes had cost both industry and the community dearly. They also expressed the view that some of the people involved in high level reform processes were unaware of these costs and of opportunities to avoid them.

Others expressed the view that well intentioned reforms were having too many unintended outcomes. In response to these concerns and comments, it was proposed that in the process of setting up CRC IF, a project on the affects, effects and effectiveness of high level water policy reforms on irrigation investment and practice should be commissioned. This report is the outcome of this process. It is hoped that, as a result of its completion, subsequent research and practice would be more focused and more effective.

In this report, we define high level policy reform as any strategic policy adopted by a government, or a collection of governments, in the expectation that it will be implemented in many different areas and scales. In the case of water reform, one of the most obvious examples of a high level water policy reform (HLWPR) in relation to pricing is COAG's commitment to “the adoption of pricing regimes based on the principles of consumption-based pricing, full-cost recovery and desirably the removal of cross-subsidies which are not consistent with efficient and effective service, use and provision”<sup>1</sup> (COAG, 1994).

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<sup>1</sup> Cost recovery requires the revenue collected to cover at least the cost of operating and maintaining irrigation assets. Consumption based pricing reflects the cost of delivering extra units of water.

## 2. Methodology

The intent of this report, as emphasised in the executive summary, is to scope the extent and nature of impacts of HLWPRs on irrigation investment and practice, not to quantify them. We search for insights and hypotheses for examination and development by others. The assumption underpinning this report is that resolution of these hypotheses could be expected to result in improved investment and the adoption of more efficient irrigation practices.

The approach used for the study involved:

- i) desk top review of relevant literature and policy documents to develop knowledge of the documented impacts of HLWPRs
- ii) a series of focus group meetings with irrigators, and industry, community and government representatives to provide insight about the impacts from those most closely involved.

To simplify the task, we focused on four themes of high level water policy reforms that have occurred across Australia:

- The introduction of water sharing/ planning processes;
- The removal of restrictions on temporary and permanent water trading;
- The introduction of full cost water pricing reform; and
- Changes in the regulations associated with the application of water to land.

To provide depth and context, we selected four case study areas. Summarised in more detail (see Table 1), the four case study areas give us an opportunity to examine the affects, effects and effectiveness of HLWPR on well established and newly developed irrigation areas, in both ground and surface water systems. Case study areas were also chosen to allow examination of different governance and infrastructure management arrangements. The four case studies chosen were:

- In Qld – the Nogoa Mackenzie Region centred around Emerald;
- In NSW – the Murrumbidgee Irrigation Area centred around Griffith;
- In Victoria – the Kerang-Pyramid Hill-Boort Region; and
- In SA – the Lower South East.

A complete write up of each case study is presented in Appendices 1 to 4 of this report.

**Table 1: Characteristics of four case study areas**

State	Case study area	Main features	Dominant issue at time of consultation
Qld	Nogoa Mackenzie Region in Fitzroy Basin	Relatively new irrigation system, water trading just beginning, water supply managed from Brisbane	Water pricing
NSW	Murrumbidgee Irrigation Area	Mature irrigation system, considerable experience of water markets, water supplied by a private company owned by local irrigators	Water trading and most cost effective way to source and manage environmental allocations
Vic	Kerang-Pyramid Hill-Boort Region	Mature irrigation system, in the process of dealing with serious salinity problems, water supplied by a government corporation managed at the regional level	System reconfiguration and community concerns when water is traded
SA	Lower South East	Groundwater irrigation system experiencing rapid change as a result of expansion in dairying, forestry and viticulture. Access rules determined by catchment management board financed via a levy on all entitlement holders	Groundwater trading and dynamic interactions between forestry and irrigation practice

### 3. History of HLWPR in Australia

The history of HLWPRs that affect irrigation investment and practice in Australia is complex and its nature is difficult to understand. A variety of intergovernmental, Murray-Darling Basin wide and state level processes have been undertaken. In the last decade, the main national building blocks were:

- a) COAG 1994 – as part of a National Competition Policy (NCP) agenda all Australian governments agreed to introduce policies that would improve water use and management across the nation by introducing reforms that would encourage water to be used in areas where it would create the greatest value.<sup>2</sup> State jurisdictions have responsibility for implementing the COAG Water Reform Framework for the Australian water industry. Payments are made to the States on the delivery of key reform milestones;
- b) NCC 1995 – Governments agreed to establish a National Competition Council (NCC) that would audit progress in implementing the COAG 94 agreement and, using a tranche payment system, make a proportion of transfer payments from the Commonwealth to States conditional upon meeting performance targets set out in the COAG 94 agreement;
- c) NAP 2000 – National Action Plan for Salinity and Water Quality; and

<sup>2</sup> COAG adopted the recommendations of the COAG report in April 1995 and, in 1997, the Prime Minister confirmed that the COAG was to define a reform process for water management in Australian states and territories. The resultant framework embraces pricing reform based on consumption-based pricing and full-cost recovery, the reduction or elimination of cross-subsidies and making subsidies transparent. It also involves the clarification of property rights, the allocation of water to the environment, the adoption of improved entitlement and allocation trading arrangements, institutional reform and expanded public consultation and participation.



- d) NWI 2004 – A blueprint for the next decade of reform of Australia’s water management which was signed by the Commonwealth and most State and Territory governments.

In addition to these high level policy reforms, the Commonwealth government introduced four programs designed to assist states, communities, businesses and individuals to invest in the restoration and protection of Australia’s natural resources. The four programs were:

- The Natural Heritage Trust (NHT) was set up by the Commonwealth Government in 1997 to help restore and conserve Australia's environment and natural resources. A \$3 billion fund was established to provide grants to community groups and organisations for environmental and natural resource management projects;
- The National Action Plan from Salinity and Water Quality, endorsed by COAG in 2000, provided a significant funding package of \$1.4 billion to tackle two major natural resource management issues facing Australia's rural industries, regional communities and unique environment through working with people in communities to find local solutions for local problems;
- A \$2 billion Australian Government Water Fund; and
- The Commonwealth government joined with NSW, Victoria, SA and ACT in a \$500 million investment to address the declining health of the Murray-Darling River system through the Living Murray initiative.

In parallel with these national reform processes a number of independent reforms were being implemented by the Murray-Darling Basin Commission. These included:

- 1995 – Introduction of a “Cap” that limits the volume of surface water that may be extracted from the Murray-Darling Basin system in any year<sup>3</sup>;
- 1998 – Introduction of a Pilot Interstate Water Trading Trial along the River Murray (between Nyah and the Barrages at the river mouth);
- 2001 – Adoption of a Salinity and Drainage Strategy; and
- 2002 – Development of the Living Murray process.

Another feature, common to all states, has been the preparation of new water legislation. In most cases, a number of further amendments to these new Acts have been necessary. The approaches used to implement these processes differ considerably. For example, following an extensive consultation process involving a green and then a white paper, Victoria has recently introduced a totally new act that will change the way water entitlements are defined and water is managed across the State. Most recently, NSW has used a Ministerial statement to accompany a set of amendments that enable water entitlements to be defined using a unit share system.

Perhaps the most dominant of all high level water policy reforms that have ever been made by COAG is to make receipt of competition payments under the National Competition Policy (NCP) conditional upon States’ meeting a number of water reform targets. Table 2 summarises the nature of these payments for the period from 1997/98 to 2005/06. Payments to each state reflect the relative size of their economy. The amounts of money are large and in many cases the water reform targets required significant changes to existing administrative and legislative arrangements. In 2004/05, \$26 million (10%) of NSW’s competition payments were suspended because the NCC

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<sup>3</sup> Diversions refer to water that is diverted or taken from the river. Diversions include water supplied to irrigators for agriculture, and supplied to satisfy stock, domestic and urban needs.

was of the opinion that NSW had failed to adequately demonstrate to “satisfy the COAG obligation to provide appropriate allocations of water to the environment” (NCC, 2004).

**Table 2: Annual NCP payments<sup>4</sup> received by four case study states (\$ million)**

State	Year								
	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06
NSW	126.5	138.7	148.6	155.9	242.5	251.8	203.5	233.6	292.5
Vic	92.8	102.0	109.2	114.7	179.6	182.4	178.7	201.6	197.9
Qld	74.2	81.6	81.5	73.0	147.9	138.9	87.9	143.3	178.7
SA	34.3	38.4	34.5	35.9	55.7	57.1	40.7	50.4	54.3

Source: <http://www.ncc.gov.au/articleZone.asp?articleZoneID=40#Article-93>

## 4. Understanding the affects and effects of HLWPR

It became evident early in the project that attempting to quantify impacts on irrigation investment and practice in terms of final outcomes was both beyond the scope and capacity of the project and, perhaps more importantly, was an inadequate way to fully understand the impacts of reform. Key informants from industry, government and community pointed to the importance and the impacts of the process for development and implementation of the reforms as being equally or potentially more important than the actual social, economic or environmental impact.

Accordingly, the approach the focus of the study provides for a mix of the effects of the reforms both from a process, a predicted outcome and actual outcome perspective through providing a descriptive understanding of the processes involved in developing and implementing HLWPR and the impacts that they can have on irrigation investment and practice, together with the impacts on other identified areas. It is stressed that this is a scoping report designed to inform people of perceptions of reform and to stimulate further research.

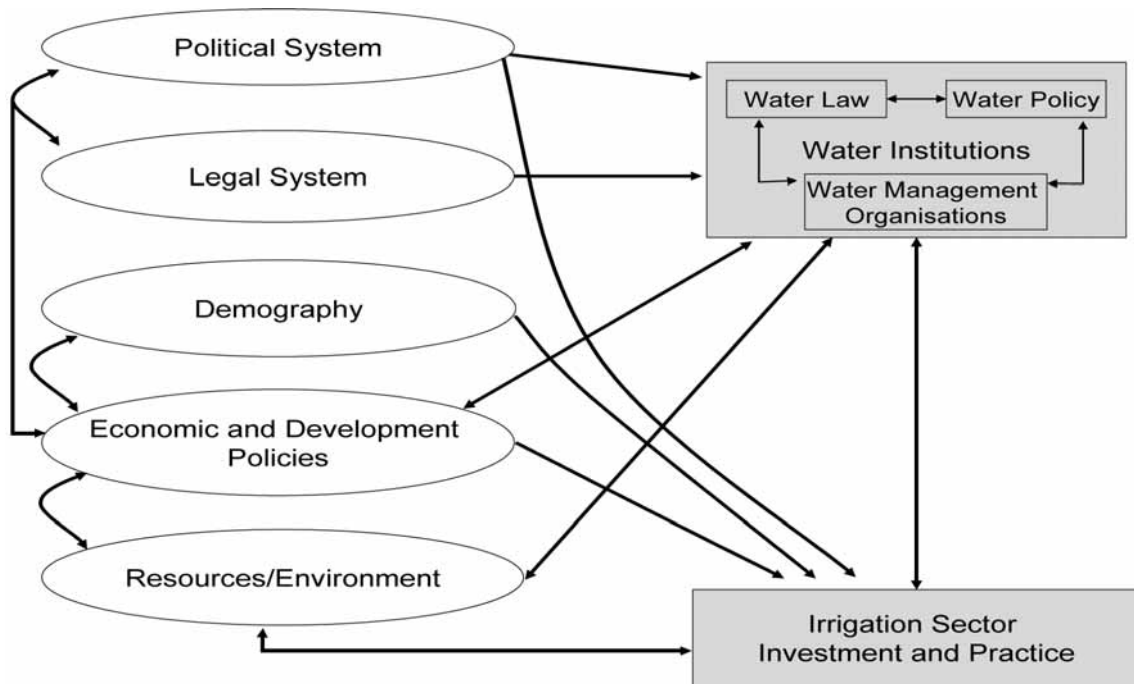
Any attempt to scope the effects of HLWPR involving a process of meeting with community, government and industry representatives in focus group settings requires a considerable degree of judgement. In this report, the approach taken seeks to develop a descriptive understanding of the processes involved in implementing HLWPR and the impacts that this can have on irrigation investment and practice, together with the impacts on other identified areas. It is stressed that this is a scoping report designed to inform people of perceptions and stimulate further research. As a general rule, insights are presented as hypotheses in italics. Most require further research.

Institutional arrangements that relate to irrigation investment and practice can be decomposed into their legal, policy and organizational components. Many of the processes that influence investment are determined by processes that have little to do with a specific industry. In the case of water reform, the irrigation sector and water

<sup>4</sup> These estimates are subject to periodic revision as new consumer price index and population data become available. Consequently, the dollar estimates reported here may differ slightly from the actual payments and penalties determined by the Australian Government in response to the NCC's recommendations.

institutions have been strongly affected by more general institutional arrangements but have had little influence on the nature of these general political, legal, demographic and economic considerations (see Figure 1). A change in income taxation arrangements, for example, can totally change investment opportunities.

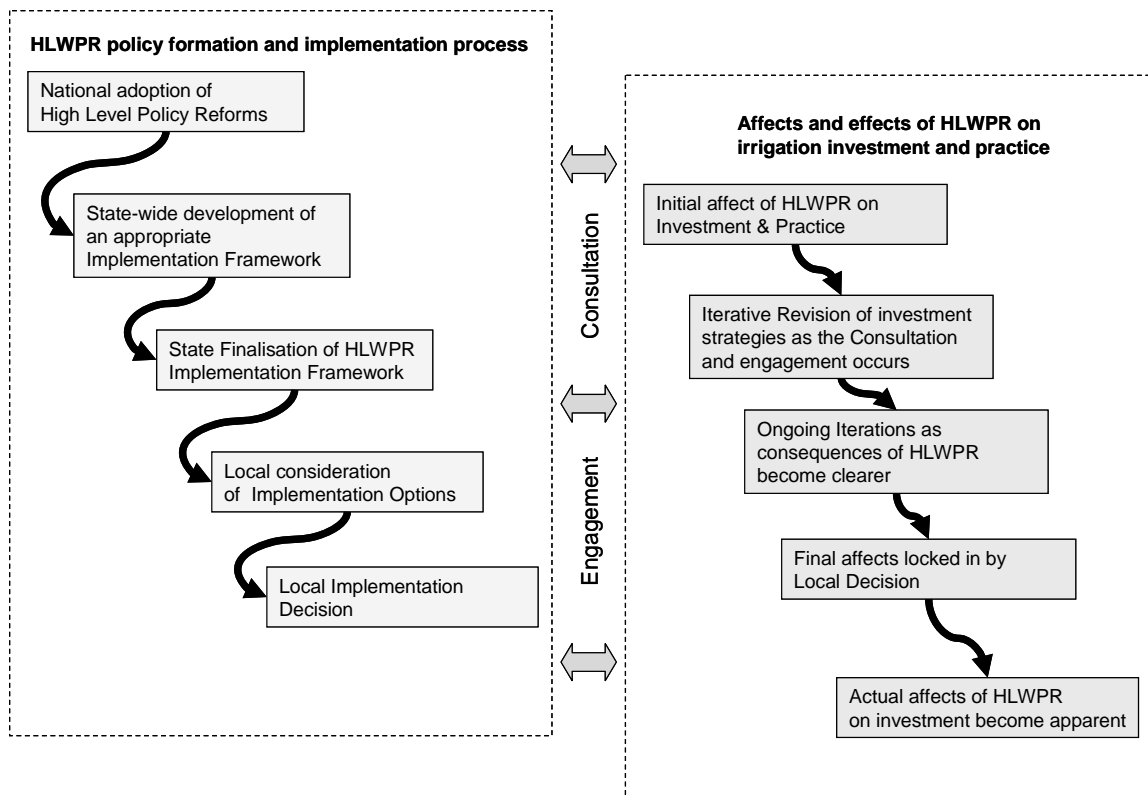
It is our impression that COAG's initial decision to implement a National Competition Policy was imposed on water institutions and the irrigation sector as a non-negotiable requirement. Water institutions became involved in sorting out implementation detail but had little say in the original decision.



**Figure 1. Irrigation, policy and institutional arrangements**

Source: After Saleth & Dinar (2004).

Figure 2 gives one perspective on the nature of the reform process. In essence, this reform process is depicted as involving a sequence of interactive processes and decisions which should, at each step, clarify the nature of the ultimate effects that the reform will have at any specific location. However, the experience of many in the reform process is that clarification of the nature and extent of impacts is, all too often, not provided, not sufficient or not timely.



**Figure 2. A highly simplified overview of (a) the process of HLWPR and (b) the effects that these processes have on irrigation investment and practice**

The processes summarised in Figure 2 are consistent with Saleth and Dinar's subjective theory of institutional change (Saleth and Dinar, 2004). According to them, it is necessary to differentiate between affects during implementation and those that occur once a final decision has been made.

Most conventional economic analysis ignores affects and effects that occur during a reform process and only compares differences between the pre-reform state before a HLWPR is implemented and the post-reform state after final local implementation decisions have been made and there has been sufficient time for the actual effects of the process to reveal themselves.<sup>5</sup>

Saleth and Dinar (2004) argue that changes in perception play an important role in shaping policy and influencing decision making processes. More importantly, the process of change is influenced by path dependency. Reforms bring about mind changes that are affected by the information, consultation and engagement processes used. In particular, early steps in the process can have a lasting affect on willingness to tolerate and even support change. Community groups can be particularly influential in altering or distorting perceptions about change.

This process leaves considerable scope for slippage between the intent of a HLWPR and what finally happens on the ground. In many cases, most of the initial changes

<sup>5</sup> This is often described as comparative static analysis. Expected net income before a reform begins is compared with expected net income after all effects have flowed through to the paddock. Sometimes other indicators of change in welfare are used. For example, change in the market value of a water entitlement is used as an indicator.

following a decision to implement a high level policy reform are ceremonial and procedural in nature (eg. policy declaration, legislation enactment, and the creation of a new administrative structure).

In some cases, the procedural changes facilitate realignment of administrative arrangements in an attempt to create a pro-reform atmosphere. Once a strong pro-reform atmosphere has been achieved, institutional change gradually moves from the stage of procedural changes to the stage of substantive changes ( e.g. legal reform, policy changes, and organizational restructuring) (Saleth and Dinar, 2004).

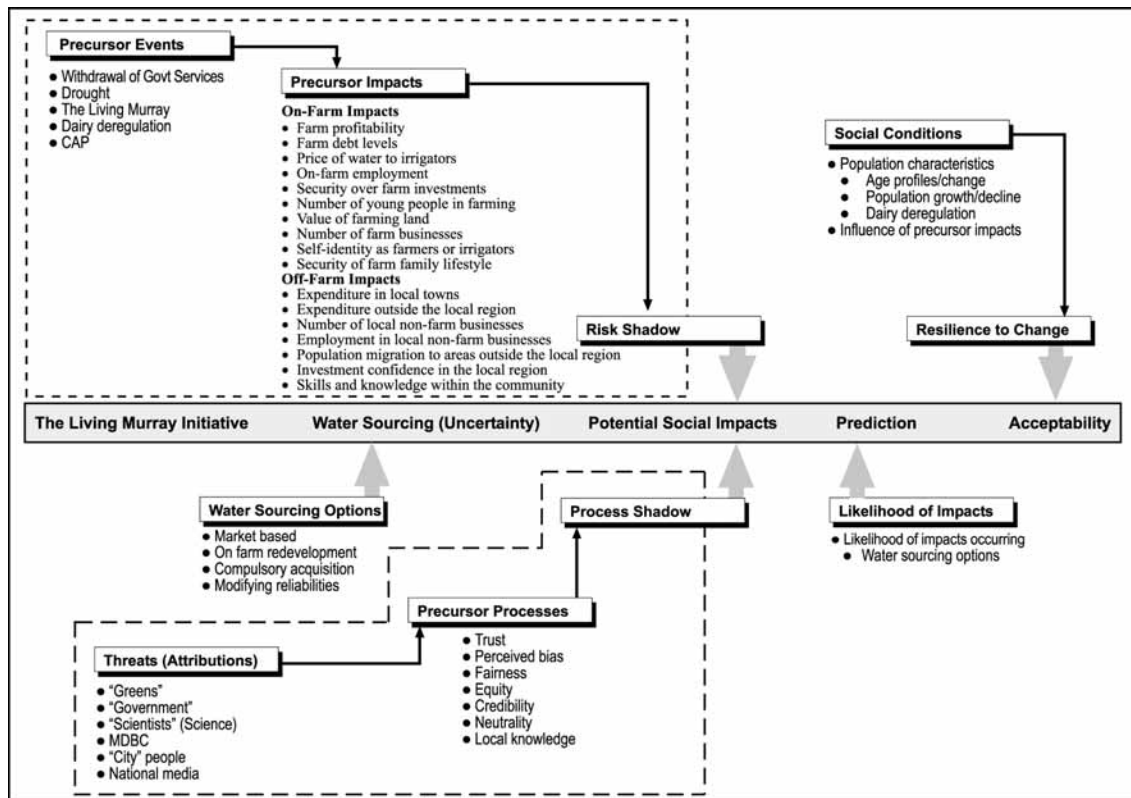
This focus on the process of policy development and implementation process reflects the conceptual framework (see Figure 3) developed by Environment & Behaviour Consultants (EBC) (2003)<sup>6</sup> based on work in the Murray Irrigation Area in 2003. Whilst this framework was focussed on social impact assessment and, more particularly, social impact assessment of actions associated with the Living Murray process, it is also applicable at a broader level. The framework posits that precursor impacts (which are identified by community experience with past events such as withdrawal of government services or drought), create what is termed a 'risk shadow'. These precursor impacts are used by communities in identifying potential impacts that may arise from the introduction of different water policy reforms.

The observations gathered in development of the framework also show that procedural issues play a significant role in the assessment, prediction and perception of impacts which in turn acts to produce a 'process shadow'. The process shadow contains elements of identifying potential threats (e.g. the government, scientists, the national media and the procedural issues) that need to be addressed to develop the relationships needed to build acceptance of changes and their potential impacts. The procedural issues include trust, transparency, procedural fairness, distributional fairness, neutrality, knowledge and knowledge systems.

In the broader context of this project with its focus on HLWPR, the announcement of a decision to undertake reform or a particular reform element can create considerable uncertainty. This is especially the case when it is clear that there are many administrative alternatives and implementation details still need to be worked out. It is at this stage that the risk shadow comes into play – with precursor impacts identified (based on knowledge of other reform impacts) – along with the process shadow with its associated views that the process for implementation of the reform will be characterised by a lack of transparency, undue influence of external groups, unfair distribution of impacts and conflict between local and 'expert' knowledge. It was this process shadow that was a significant issue for many of the participants in the case studies. As one reviewer put to us, the effects of bad past experiences can linger on and frustrate progress with new reforms.

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<sup>6</sup> For more information see The Living Murray website at [http://www.thelivingmurray.mdbc.gov.au/\\_data/page/196/Development\\_Framework\\_SIA1.pdf](http://www.thelivingmurray.mdbc.gov.au/_data/page/196/Development_Framework_SIA1.pdf)



**Figure 3. Social impact framework used to understand the affects and effects of water reforms in the Living Murray Project**

## 5. The affects and effects of high level water policy reform

The remainder of this report draws upon the results from consultations with industry, community and government representatives summarised in Appendices 1 to 4 and associated literature review. . As the main source of information is gained from discussions with a small sample of people involved, the approach taken is to turn observations made into hypotheses which, in many cases, need further analysis. As mentioned earlier, these hypotheses are presented in italics.

Two further qualifications are needed. First during the last decade, the number of water reforms that have been occurring in parallel with each other make it very difficult, if not impossible, to separate the affects of one reform from another. In virtually all cases, the only effect that can be identified is the aggregate result of many interacting processes occurring at different scales and in different arenas. These effects include not only the effects of water reform processes but also the many other things that changed at the same time. In the case of the Nogoia-Mackenzie, for example, expansion of water trading opportunities occurred at the same time as the emergence of citrus canker – a disease that is having devastating effects on the region’s citrus industry.

The second qualification to be made is that recent prolonged drought together with the more general structural adjustment that has been occurring in agriculture means that it is difficult to separate from the impacts of reform.

## 5.1 Overall effects of reform

Since 1993/94 the value of water entitlements and regional production has increased significantly in all case study areas examined. How much of this is due to the efforts of a highly innovative industry and how much is due to high level water policy reform processes is a contestable issue. Representatives, for example, point to the increase in water use efficiency that has occurred in areas where little trading has occurred. Economic theory, on the contrary, would suggest that the reforms have acted as catalyst for change.

Another issue rarely discussed in formal policy circles, is the considerable redistribution of wealth that the reforms have generated within and across many regions.

## 5.2 Affects of water sharing processes

The need for more precise water sharing processes was signalled to irrigators via a combination of processes including:

- The COAG Communiqué on Water Resources Policy in February 1994;
- The introduction of a Cap on surface water extraction in the Murray Darling Basin in 1995<sup>7</sup>;
- The introduction of new water legislation and new catchment planning process in each State;
- The commencement of the Living Murray process in 2000; and
- The emergence of a National Water Initiative in 2003.

Initial investment and behavioural responses to these reforms varied and appear to be heavily dependent on whether or not the system in question was defined by administrators as either fully or even more seriously over-allocated. In cases where the system was under allocated negotiations with irrigators appear to have been easier but can still involve considerable anxieties for communities. The issue was to put measures in place that would guide and constrain further development but not the erosion of existing entitlements.

In all cases, the intent of these reforms appears to be one of trying to prevent unsustainable forms of practice and investment and further decline in river and/or aquifer health.

Generally, the irrigators we consulted consider that the introduction of water sharing plans in the South East of South Australia and in the Nogoia Mackenzie of Queensland have encouraged investment as they made it clear how water reform policies would evolve in the future. Of all the case studies, community concern appears to have been the least and the response most positive in the South East of South Australia. It is

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<sup>7</sup> An interim Cap was imposed in June 1995. Following an independent review of equity issues (Setting the Cap - Report of the Independent Audit Group - November 1996) permanent Cap or NSW, Victoria and South Australia was implemented from 1 July 1997. For NSW and Victoria, the Cap is defined as "*The volume of water that would have been diverted under 1993/94 levels of development.*" For Queensland (a moratorium on further development in place since September 2000) and ACT which together divert less than 7% of total water being diverted in the Basin, the Cap arrangements are still being worked out.

Source: [http://www.mdbc.gov.au/naturalresources/the\\_cap/the\\_cap.htm](http://www.mdbc.gov.au/naturalresources/the_cap/the_cap.htm).

possible to hypothesise that this may be due to the fact that SA is the only State where formal Catchment Water Management Boards were established with access to funds collected from a levy on irrigators. Using these funds, these local boards were expected to develop water allocation and catchment management plans. As a result, it is possible to hypothesise that *the formation of Catchment Boards with access to an independent source of income and a clear responsibility for the preparation of management plans may decrease the likelihood of adverse effects that planning processes may have on investment.* With an independent source of income, these boards are less dependent upon state budget processes and, hence, may be able to plan with greater certainty. The issue is worthy of further research to determine whether or not and in what circumstances this approach leads to improved outcomes.

Those consulted make it clear, however, that the way such boards are established is critically important. Victoria introduced Boards with catchment management and planning responsibilities to be funded partly via a levy and then, following a change in government, removed these levies. The role of State government in the preparation of catchment plans in Victoria appears to be greater than that in SA. More research is needed to determine which approach is most likely to produce a better outcome.

In Queensland, the irrigators consulted indicated that they are frustrated because centralised planning processes and other water reform agendas are preventing progress in the further development of water resource plans in the Nogoa-Mackenzie Region. *The possibility that other reform processes may crowd out and prevent completion of intended reforms is an issue that may deserve more research.* The challenge is to find arrangements that ensure the completion of reforms. Indeed, it was suggested to us that the introduction of new reforms have such an adverse affect on former reforms that little progress is made.

In the NSW Murrumbidgee, community-owned catchment planning processes became tangled in wider water reform processes at both the State and Basin-wide level. Bowmer (2002), the Chair of the Murrumbidgee River Management Committee responsible for preparing the plan for the Murrumbidgee, reports considerable frustration with government failure to sign-off the plan upon its completion and the adverse affects on investment that the two-year delay in approving and implementing this plan have had. She also reports considerable community concerns and anxieties arising from the commencement of the Living Murray process and the River Murray System wide announcement that as much as 1,500 GL of water may have to be taken from irrigators in order to enhance environmental flows. It can be argued that high levels of irrigator uncertainty normally have significant adverse affects both on investment and on community well-being. Conversely, it can be argued that it is better for all involved to be aware of the policy uncertainty and, hence, take a conservative approach to any decision making.

Statements by irrigators in both the Murrumbidgee and the Kerang-Pyramid Hill-Boort areas, however, suggest that ongoing policy uncertainty over the quantity of water likely to be available to irrigators has had the most adverse effect on marginal water users. The effects on investment by high value water uses, however, appear to be minimal as these users expect to remain in business irrespective of the quantity of water available to all irrigators. Moratoriums such as those used in the Nogoa Mackenzie may have delayed investment in some regions.

One of the main costs of policy uncertainty may be a general reluctance for marginal irrigators to invest in the equipment and infrastructure necessary to better manage any adverse effects on the environment and river health. As discussed in more detail later, this may mean that more water entitlements are traded permanently than would be the



case if final decisions were made more quickly. *There may be considerable returns to the development of mechanisms that structure, sequence and possibly synchronise interactions among reform processes. Research on the affects on the speed of change on reform processes may also produce dividends. A number of people involved in our focus groups expressed concern that reform processes took so long.*

Adverse community responses appear to be common when implementation of a previous decision comes into conflict with the development of the next array of high level reforms. This is particularly evident in the Murrumbidgee case study where the community had begun to address environmental flow issues well before the Living Murray process began.

*Development of ways to signal the time frame for new reform processes may provide a means to overcome these problems.<sup>8</sup> High level failure to recognise progress may make it much more difficult to explore future policy options in a constructive manner.*

A related observation made by irrigators in South East of South Australia is that the policy certainty provided by statutory planning processes has given them the confidence to invest. In particular, they are aware that as a result of the legislative status of their plans neither the Minister nor departmental officials can change a plan in an *ad hoc* manner. The 5 year review process means that they do not need to continuously monitor policy development processes. "One of the clear benefits of the planning process is that the Minister cannot change the plan on whim." The converse argument made in Queensland was that it should be possible to respond quickly to new opportunities even if this requires a change to a plan. Attempts to do this in Queensland, however, have back fired when it became clear that the proponents of a rapid reform had not adequately considered impacts on all others.

*Research on the optimal period for the review and revision of management plans could focus on the optimal time period for reviews, the speed at which to implement them and the time before any resultant changes should come into effect.* The converse argument is that regional and individual contexts are such that it may not be possible to identify any optimal review period. Nevertheless, it is common for State legislation to mandate the frequency of a review. If undertaken, this research should include consideration of the effects of moratoriums on development that are often implemented during review processes. Among other things, the Queensland case study documents the extent of effects that moratoriums have both on irrigators who would like to change the way they deploy water resources and on contractors and other third parties who depend upon them.

*There is also considerable room for research on the consultation and engagement processes used.* In all but the South Australian case study, irrigators complained about a loss of access to appropriate amounts of information and a tendency for officials to withhold information. Anecdotal evidence presented in several of the case studies suggested that COAG processes, and in particular the tight time frames associated with them, have meant that there has been too much crash through and not enough searching for more cost-effective solutions in consultation with industry and community. Many perceive, with the benefit of hindsight, that a much better job could have been done. The challenge for researchers is to support communities, industry and governments to develop practical guidelines for the involvement of stakeholders in policy development that move beyond rhetoric.

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<sup>8</sup> In an apparent intent to address this problem, the National Water Initiative presents a firm timeframe for a large number of high level reforms.

### 5.3 Affects of entitlement reform

In all of the case studies, the last decade has witnessed considerable reform in the way that water entitlements are defined. Each State has introduced a new water management act and made considerable changes to the degree of security associated with a water licence. In all cases, government statements suggest that the nature of the reforms introduced has sought to increase entitlement security in a manner that was designed to encourage investment. This has been achieved by seeking to clarify and assign risks associated with changes in the quantity of water likely to be made available to water users. Most recently, through the National Water Initiative (COAG, 2004), from 2014 entitlement holders have been promised protection from uncompensated policy changes that alter the volume of water likely to be made available to them

- in excess of 3% reduction in water allocation as a result of changes in knowledge (see s. 49); and
- complete protection as a result of changes in environmental and other government policies (see s. 50).

When examined from the outside, the first and most noticeable change has been the change in a number of States from term licences to licences that are either indefinite or issued in perpetuity. Arguably, this means that governments are no longer able to decide to reallocate the water entitlement to another user as the term of the entitlement never expires.

While all irrigators seem to have welcomed this change it is not clear from the comments made that it has increased the actual level of investment. One of the possible reasons for this comment may be that while governments are of the view that the entitlement specification systems they have put in place have increased investment security, from the perspective of irrigators further entitlement reform still appears likely.

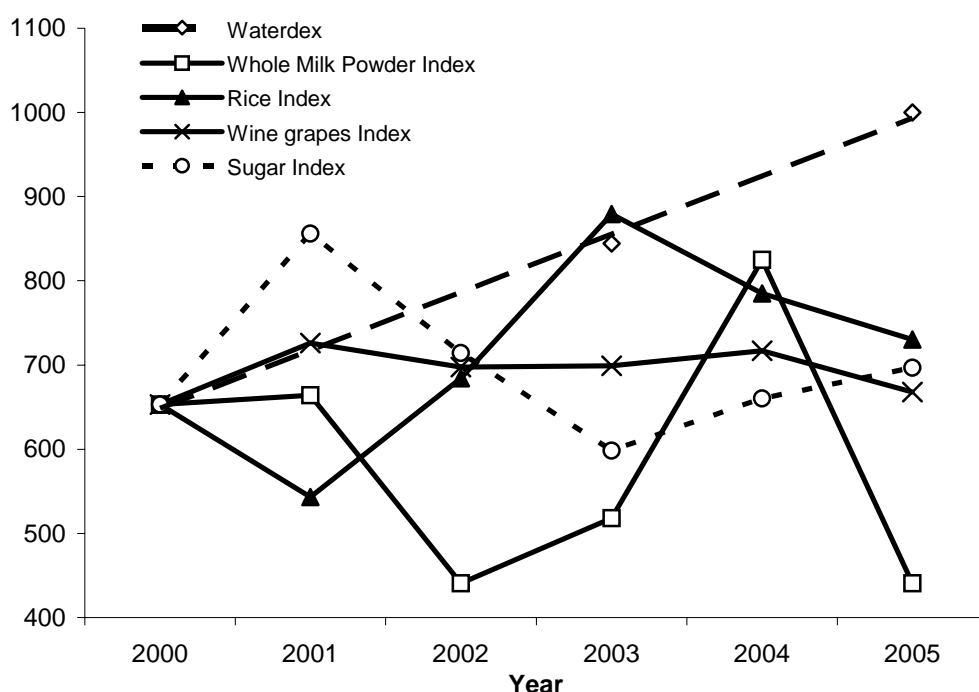
In each case study we specifically asked for examples of investments that had been made and which would not have been made if this change had not happened. But examples could not be identified. The changes, however, are consistent with economic theory that increases in certainty will increase investment.

One of the reasons that irrigators cannot point to obvious increases in either the amount of investment made or the practices adopted may be due to the number of other policy changes that masked the benefits of entitlement reform. *As yet, and as far as we are aware, empirical evidence of the effects of increased entitlement security on investment and practice has not been assembled. Given the difference in opportunities to earn profits from dryland versus irrigated land, it may be that the effect of increased entitlement security has been more on income and wealth in the form of asset value than on the degree of investment that has occurred.*

Most recently, Psi-Delta (2005) has found a compound increase of 9.5% per annum in the value of traded water entitlements since 2000 and, also, that this increase has significantly improved performance indices for associated industries (see Figure 4).

The fact that the value of water entitlements over recent years has been increasing suggests that the aggregate impact of all reforms coupled with industry initiatives and market developments has been positive for investment. There remains, however, a need to identify which components of the many reforms made have stimulated or

detracted from investment. Comparison with other industries may offer a way to improve understanding in this area.<sup>9</sup>



**Figure 4. Indices of changes in the value of selected commodities. “Waterdex” is a national indicator of the value of water entitlements in Australia.**

Source: Psi-Delta (2005).

Three other entitlement reforms seem to have been accepted by the industry without any suggestion of major concern or appreciation from irrigators. First, in NSW and Qld there has been a dramatic improvement in the integrity of water entitlement registers with the result that the integrity of a Queensland entitlement essentially has the same degree of security as a land title. NSW has announced that it is on track to deliver the same level of register integrity by 2007.<sup>10</sup>

The second entitlement reform of significance has been the conversion in NSW of volumetric water entitlements into unit shares. This reform appears to be consistent with the National Water Initiative requirement that all risks associated with the impact of climate change on water supply are to be borne by water users.

The third entitlement reform of significance has been the separation or unbundling of the individual components of each water licence. This has been achieved in NSW by issuing irrigators with both a water access entitlement and a formal use approval. In Queensland, it has been achieved by issuing allocations and requiring irrigators to prepare land and water management plans under the Integrated Planning Act 1997. As a result of reform processes that are now in the advanced stages of development, Victoria is also in the process of unbundling the water licences. The result is the emergence of new opportunities for irrigators to hold, use and trade water. Among other things, this enables them to place water access entitlements in self-managed

<sup>9</sup> We are indebted to Jeff Camkin for making this suggestion to us.

<sup>10</sup> See <http://www.naturalresources.nsw.gov.au/water/pdf/wms02.pdf>

superannuation trusts and supply water to their agricultural businesses in a more tax-effective manner. The extent of water trading between legal structures is essentially controlled by one group of interests. An analysis may prove powerful in helping to understand how much entitlement reforms may have made it possible to hold water in more tax effective ways. If or when this becomes significant, economic theory would suggest that the value of water entitlements would rise.

## **5.4 Affects of the introduction of trading**

The intent of introducing water trading was to facilitate autonomous adjustment within sustainable limits and thereby increase the contribution that water makes to the economy. Water sharing plans would determine the sustainable limit and trading would enable an autonomous adjustment process to maintain regional profitability and drive innovation.

Arguably, the introduction of water trading, more than any other water reform, has had the largest impact on Australia's irrigation industry. Three types of water trading have been occurring:

1. the temporary trading of allocations within a season;
2. the permanent trade of entitlements from one holder to another; and
3. the much less documented development of agreements to temporarily trade water from one entity to another for a period of time.

National assessments suggest that the introduction of water trading will bring considerable economic gains to the economy. For example, an ABARE study has estimated that the more widespread use of water trading in the MDB would increase output by around \$48 million annually.<sup>11</sup>

Temporary markets for water have developed rapidly in all the surface water case study areas involved in this project. One indicator of the positive influence of water trading on investment has been the emergence of private internet-based water trading companies. In surface water cases studies, arrangements have progressed to the extent that water allocations now trade regularly over the Internet.

Trading is particularly common during drought when difficult decisions need to be made about whether or not to sell at a high price or apply water to a crop. Many irrigators in the Kerang-Pyramid Hill-Boort case study area of Victoria are quick to point out that without the opportunity to trade water, the district and many farmers would not have survived through the droughts. This is particularly the case for dairy farmers. Water trading gave them access to water supplies and/or income sources that, otherwise, would not have been attainable.

At the national level and as confirmed in this project's case studies, the introduction of water trading has facilitated considerable adjustment and considerable expansion in the area irrigated. Participants in most case study areas reported that trading has resulted in a considerable increase in the amount of investment that has been occurring and considerable economic gain. Bjornlund (2003) reports that even in the River Murray System where interstate trading is possible most trades are local. Within the River Murray System, most irrigators have experience in water trading. During drought trading is particularly common and is thought to have produced much more regional income than otherwise would have been the case.

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<sup>11</sup> See <http://www.mdbc.gov.au/naturalresources/watertrade/watertrade.htm>

As a general rule, the economics of irrigation production means that it usually more profitable to use existing infrastructure rather than move to a new location. If this is the case, then one can hypothesise that much of the increase in investment in water management technology that has occurred between 1995/6 and 2001/02 has benefited from the expansion of opportunities to trade water. Bryan and Marvanek (2004) observe a 20% increase in water use without an increase in surface water extractions.

*A researchable issue is the question of whether or not the sequencing of reforms has been in the net interests of Australia. It is possible that the introduction of water trading without first attending to deficiencies in the definition of entitlement and accounting systems may have resulted in a nett social loss rather than a social benefit.*

Economic theoreticians often point out that trade involves exchanges among willing buyers and willing sellers. The introduction of water trading has, however, come with the emergence of considerable debate and concern about third party impacts. The people we consulted consider that third party impacts can be significant when permanent trade results in less production within a district. As hypothesised above, as yet, *there is a big difference between trade that involves the sale of water that, as the result of increases in water use efficiency, can be sold without reducing production and that involving reductions in local production. Research on the extent to which trade is eroding the interests of others may do much to address community concerns about the local and regional impacts of water trading.* One of the questions that communities would like answered is the question of whether or not trade is increasing at the rate of capital flight – the reinvestment of money received as part of the trading process – in other parts of Australia and overseas.

The only example of significant water trading from one area to another that our case study discussions were able to identify was in the Kerang-Pyramid Hill-Boort region. There is, however, considerable support for this process occurring as a result of increasing salinity problems a considerable proportion of irrigation farms in the area were not viable and trading has allowed irrigators to “leave with dignity.”

Facing a future threatened by increasing salinity, this region invested heavily in the construction of drains to reduce salinity impacts. The result was a reduction of 6 EC of impact. Realising that this would not produce enough salinity savings, the local community then led the development of water trading in Victoria and produced another 20 EC reduction without the need for any investment in drainage infrastructure. That is, water trading delivered three times more benefit than that attainable from the engineering solutions the community, in partnership with government, was able to implement. Interestingly, this same community is now concerned that the proposed introduction of exit fees may decrease the rate of autonomous improvement in a way that is to the community’s nett loss rather than nett benefit. *Assessment of the extent of local environmental improvement resulting from water trading and the development of opportunities to increase these benefits may be a fruitful area for further research. Research on the potentially adverse effects of exit fees on community well-being may also prove a fruitful area for careful analysis.*

**Extract from Kerang-Pyramid Hill- Boort case study**

“In the pre-trading world, rural counselling was the norm and necessary.

With trade, people were able to adjust and do so with pride. Water trading enabled the district to find a way to use its resources more sustainably.

It took a long time but eventually people realised that the government would never get it right. Trading allowed people to exit with dignity.

More recently, however, it has become clear that exit fees or some other contractual arrangement may be a necessary part of water supply.”

A crucial requirement for wealth generating exchanges to occur is the existence of well-defined and legally-defendable water entitlements. Generally, leaders in the irrigation industry are supportive of water trading providing it occurs in ways that don't exacerbate other problems or create opportunities for exploitation of less informed people. The first water trades conducted in the Murrumbidgee System were conducted by current leaders in that system. Similarly, irrigators in the Kerang-Pyramid Hill-Boort region developed the case for the expansion of trading in that region and, in particular, were influential in both convincing Goulburn-Murray Water to establish *Watermove* and making information about trading prices transparent and available to all.<sup>12</sup>

Another dimension of the introduction of water trading has been its effect on the re-distribution of wealth among individual irrigators. This is most evident in the South East of South Australia where after intense community negotiations and political debate it was decided to allocate the remaining unallocated water in each management area to all land holders, including dryland farmers, on a per hectare basis so that the wealth associated with water development would be shared among all land holders.

Similar tensions can also be seen in NSW Murrumbidgee System where, arguably, the introduction of water trading has resulted in a significant transfer of wealth from general to high security entitlement holders. *Conventional economic theory predicts that, providing transaction costs are low, in the long-run wealth distribution and redistribution should have little impact on the degree of investment that occurs in an area. The fact that the introduction of trading in NSW has resulted in the significant redistribution of wealth may have created a data set that would enable objective assessment of this hypothesis.*

Consultation with industry suggests that a significant number of irrigators are concerned about the affect of debt on capacity and willingness to trade water.

Another issue of considerable concern to irrigators is the affect of partial restrictions on the nature of trades that are permitted. In the current environment, astute water users are finding ways to circumvent the intent of restrictions on trade. Private contracts to trade water on an annual basis, for example, are being used to get around restrictions on permanent trades.

One of the potentially adverse effects of trade restrictions mentioned to us is that it may be causing more adjustment in some areas than others. Irrigators in Kerang-Pyramid Hill-Boort region perceive that restrictions on the transfer of water out of NSW is causing more water to be traded out of Victoria than would be the case if the market no restrictions on trade existed.

## **5.5 Affects of price reform – setting charges for the supply and delivery of water**

In a trading environment, one needs to be careful in the use of terms associated with water pricing and charges set for the supply and delivery of water. On its own, the introduction of trading is sufficient to reveal the marginal value of water. Nevertheless, driven by a COAG commitment to increase the competitiveness of the Australian economy, the intent of “price” reform has been to promote efficient investment and

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<sup>12</sup> One of the major complaints about the early development of water trading in the Nogo Mackenzie is the lack of transparent information on the prices paid for both temporary and permanent water trades.

management of infrastructure used to supply and deliver water (COAG 1994). Care needs to be taken to differentiate between reforms that aim to improve the efficiency of supply infrastructure installation and management *and* those associated with attempts to reveal the value of water via the introduction of trading. Pricing reform deals with the former.

The NWI includes a commitment by Federal and State governments to move towards upper bound pricing (recovering a rate of return on rural irrigation assets, where practical). Opposition to pricing reforms appears to be greatest in Queensland's Nogoa-Mackenzie Region where the State government has chosen to implement pricing reforms directly and, also, move to upper bound pricing. In two of our other case studies, lower bound pricing has been achieved by transferring management – and in the case of the Murrumbidgee – ownership of infrastructure to local corporations. This has meant that these companies have had to decide what to spend on managing the delivery of water, maintenance and infrastructure upgrades. As a result some irrigators and water authorities perceive they are very much into the realm of upper bound pricing. Full upper bound pricing however is seen to require all water users, amongst other things, to pay a return on the value of the capital invested in dams and other headworks as well as local supply channels etc. *As far as we are aware, there have been no independent regional studies of the effects of factor price increases on irrigation investment and practice. Economic theory would, however, suggest that price increases will first result in a reduction in individual income and then adoption of actions that seek to reduce water use. In the long run, and as subsidies are reduced, increased efficiency should be the result.*

All the people we consulted, reported very positively about the benefits of local management – including those in the South East's groundwater system. None proposed that they would prefer a return to management by an entity over which a government had control. Interestingly, the Queensland irrigators we consulted perceived that, at least in the short term, they would be better off working with the government-controlled SunWater. *Research on the relative effectiveness of the different corporatisation models for water use across Australia could be of significant benefit to those states and those regions that have yet to fully consider the merits of local management.* This research could involve an assessment of international as well as Australian experience with the benefits and costs of local management. Both Murrumbidgee Irrigation Limited and Goulburn Murray Water report that they have been able to keep prices well below those attainable by government. A key feature of these corporatised structures is that these companies have a strong incentive to keep costs to a minimum. In Queensland, irrigators are searching for ways to increase the incentive for SunWater to seek innovative ways to reduce the costs associated with water delivery and the negotiation of changes to management plans etc.

A related issue is the question of who should pay for the costs of delivering water to the environment and maintaining environmental assets. Some irrigators argue that it is inequitable that they should have to pay for the costs of maintaining these assets for the public at large. They perceive that *if governments decide to make irrigators share part or all of these costs then research on ways to reduce the cost of managing environmental water.*

*The Kerang-Pyramid Hill-Boort case study also revealed an interest in understanding the real costs of water supply to each irrigator. This information can become very useful in the search for opportunities to reconfigure supply infrastructure.*

*A related issue drawn to our attention by a reviewer is the need for an assessment of the effects of price reform on the costs of supplying environmental water.*

## 5.6 Affects of land use controls

With the exception of salinity management and forestry, our case studies suggest that the impacts of changes in land-use controls on irrigation investment and practice appear to have been either minimal or accepted by irrigators as necessary. As one irrigator put it, “you can’t have land use improvement without land use change.” As a general rule, irrigation industry and industries that process its products seem more concerned about the local impacts of irrigation than government water managers. Irrigators in Qld and NSW drew attention to the fact that monitoring arrangements seemed to be inadequate. They also expressed the view that opportunity to work with industry to develop accreditation systems etc was not being taken up as fast as one would expect. *Research on the development of systems to enable the objective assessment of the environmental impacts of irrigation on the local environment can be expected to develop the means to fill this gap.*

In South Australia, irrigators also expressed concern that irrigation restrictions were being used to control irrigation salinity without adequate consideration of the introduction of more direct control mechanisms. In particular, they seek opportunities to commence irrigation development without having to secure water. Separation or unbundling of existing water entitlements would enable them to achieve this objective.

The most contestable issue identified in the case studies we undertook was the question of the impacts of increased commercial forestry on the volume of water likely to be available to irrigators. The National Water Initiative proposes that States should have plans to resolve this issue by no later than 2011 (s. 57). *Assessment of the effects and effectiveness of arrangements being implemented in the South East of South Australia and elsewhere may assist implementation of the National Water Initiative.* In the South East of South Australia, under current policy and once forestry exceeds a threshold area, new forestry investments are allowed only when the effects on the interests of existing water users is offset. Assessments of the likely impacts of increases in large-scale commercial forestry suggest that the impacts on the volume of water in dams may exceed the volume of water that the “first step” 500 GL that governments are proposing to return to the River Murray system<sup>13</sup>

## 5.7 Role of communication and engagement processes

Of all the affects and effects examined in this report, the greatest concern and greatest opportunities for improvement appear to be associated with the affects of communication and engagement processes used in the development and implementation of high level water policy reforms.

One noticeable observation common to all case studies was the view that the 1994 COAG reform agenda has reduced either departmental willingness or departmental capacity to engage with industry. It was claimed that prior to this period information was shared routinely with industry, particularly at a regional level, and examined in a robust manner. In particular, the NSW, Victorian and Queensland case studies revealed a considerable level of frustration on behalf of irrigators and government officials. South Australian representatives, while less frustrated, revealed that the costs of political interference had been high.

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<sup>13</sup> See Young and McColl (2003a,b) for one such assessment.



Industry and community participants spoke of their frustration with slide shows masquerading for engagement and emphasised the need for involving communities from the start of the process – not two years on after much of the research and thinking has been done and communities are presented with options based on information over which they have no ownership and little trust. Shared responsibility for and involvement in identifying, monitoring and responding to the impacts of reform processes was also identified as an essential part of communication and engagement – this was seen as an issue that is becoming increasingly apparent as the reform process continues.

Many participants mentioned the need to find ways to restore “trust.” The general tone of comments made is that participants generally are convinced that better outcomes will be achieved if a more open approach is adopted. These sentiments and views are in line with the *hypothesis that effective engagement and communication provides for better public policy, greater trust in government and stronger democracy* (OECD, 2001).

It was evident from the discussions that engagement was seen to be necessary not just at a representative level, but extensively throughout the community with the capacity provided for a range of voices and interactions in the policy development and implementation process. The issue of knowledge and whose knowledge counted was also a recurring theme in discussions. Nogoia-McKenzie irrigator participants for example spoke of both the learning curve that they needed to conquer in order to effectively participate in various forums, but also of the value of their own local knowledge and how this could be better captured, valued and incorporated into policy and on-ground decisions. *An awareness of and respect for different knowledge systems or cultures – e.g., local knowledge, specialist knowledge, strategic knowledge and integrative knowledge – is an issue identified as essential in achieving improved community engagement* (Aslin and Brown, 2002.)

Industry, government and community participants whilst likely to differ as to the specifics of what may be needed for future engagement processes were however consistently of the opinion that improved processes in both the development and implementation of future policy reforms were essential. The past actions and experiences of government, industry and community people will influence the way in

#### Extract from Murrumbidgee case study

“There was agreement between all informants that the process for implementation of the reforms had contributed to significant angst and distrust in communities. There is seen to be a real need to re-engage rural communities to facilitate agreed and owned policies.

Departmental representatives also see a need to engage with officers in the field earlier in the reform process. It is important to reach a point where it can ensure true public participation in government decision-making on reform. This means involving communities at the front-end and not insulting them with so-called ‘consultation’ beyond a point where they can have meaningful influence.”

#### Extract from Kerang-Pyramid Hill-Boort case study

“...during the 1980s and early 1990s there was a major investment in sharing knowledge with the community and developing community understanding of the nature of problems and ways to solve them. This approach created a high degree of trust.

There was a strong commitment to ensuring that the community understood the reasons why policy had to change and what was being proposed.

At some stage, in the early 1990s and probably as a result of the COAG reforms, information sharing and the co-development of knowledge stopped.

This previous practice was replaced with an approach that began with the announcement of decisions that had largely been made from the top. This ‘new’ approach also seemed to be characterised by the withholding of information. The old practice of sharing the data and information has been replaced with statements that there was a problem but little release of the underpinning information.”

which this future evolves as well as the individual values, social networks and institutional frameworks. These different contexts mitigate against a one size fits all approach to communication and engagement. But agreement and adherence to a set of principles and clarity on what is (and is not) negotiable provides a common starting point for the development of context specific approaches.

## 6. Synthesis

The most striking insight that emerges from this study is the observation made by virtually all people consulted that the processes used to introduce, negotiate and manage high level water reforms can be improved. The hypothesis presented by many is that improvements in these processes will produce many gains in the form of less adverse impact, speedier introduction and more insightful policy. There is an opportunity for someone to carefully examine all the different consultation processes and styles used and from this distil a set of recommendations for future high level policy reforms.

A second insight is the impacts that continuous changes in administrative arrangements have on those involved in irrigation. There is a sense of ongoing frustration with the seemingly continuous rate of change and the lack of time to work out what needs to be done. Research into ways to reduce the time taken to implement reforms and to coordinate reform processes so that they do not get in the road of one another could produce significant benefits in terms of improved investment and improved irrigation practice.

### Extract from Nogo Mackenzie case study

Across the Board, whether in government or in industry, there is a large degree of frustration with the effects of high level policy reforms on the irrigation industry. As one irrigator said to us – “When we find a problem, we like to fix it.” This is how farmers behave. Why does it take 20 years for the government to get the fundamentals right. We started in 1993/94 and you are telling us that the National Water Initiative will run until 2014. This is twenty years. Why does it need to take so long?”

There is also a large degree of dissatisfaction with the processes used to consider options and then decide what action to take. The consultation process is not consistent and efficient. “There has been too much conflict.” “There has to be a better way to do business.” “Too much is happening behind closed doors.”

A third insight is the observation that there is considerable support for the National Water Initiative. One of the key reasons for this is the expectation that this initiative will attend to the fundamental issues that were ignored as earlier high level reforms were introduced.

A fourth insight is that reforms can facilitate structural adjustment. Markets have provided a means for structural adjustment to occur. While this can result in the shrinking of some industries it has also enabled communities to respond autonomously to serious local problems with dignity and to a degree that other initiatives have not been able to achieve. Increased work on research and documentation of the actual effects of trading on local investment and community well being could do much to increase community and industry support for this reform. It could also do much to reveal the extent to which existing trading arrangements undermine the interests of other water users. It is possible that the nett result is a nett social loss *not* a nett social benefit.

In the last decade much of the focus of water reform has been on the definition of entitlements, pricing and the development of water markets. Much less has been on the development and improvement on land-use controls and the expression of these in catchment plans and use approvals. At present, the issues associated with the most

cost effective and equitable ways to control irrigation practice and guide investment has received little attention.

The last and arguably most significant is that all are of the opinion that there are improvements in the definition of entitlements and these are perceived to have stimulated investment and confidence in the irrigation industry. The effects, however, may be more on income than on the total amount of investment that has occurred. A considerable amount of wealth creation and wealth redistribution has occurred in ways that are poorly understood.

## **7. Future Research Opportunities**

One of the aims of this project was to identify research issues and opportunities for future development by the CRC IF and others. To this end, at the end of every meeting we asked participants to summarise the issues that they thought the CRC IF should focus on and these are summarised in the case study descriptions in Appendices one to four.

The list presented below groups these suggestions into eight broad themes.

### **7.1 Water entitlement, allocation and trading**

- Optimising allocation system complexity for regional development & environmental benefit
- Equitable and efficient reduction of over-allocation of groundwater
- Effects of trading policies on investment and water use
- Effects of trading on community well-being
- Designing, assigning and trading delivery shares
- Protocols for the joint management of surface and ground water entitlements
- Effects of water trading and allocation policies on land values
- Trading environmental allocations through time

### **7.2 Governance**

- Who and how many should manage consumptive, in-stream use and environmental consumption
- Role of government, trusts and communities in savings investment and environment management
- Accounting and paying for the cost of supplying environmental water
- Optimising ground and surface flow and drainage to the sea

### **7.3 Public participation and trust building**

- Accessing and representing interests of those not on boards and committees
- Improving trust and establishing true partnerships between community and government
- Processes to provide for early and 'real' involvement across community interests in the initiation, development and implementation of policy reform
- Incentives and rewards for public participation and stakeholder participation
- Understanding why some policy processes get corrupted

## **7.4 Knowledge sharing and capacity building**

- Benchmarking information availability and sharing against world best practice
- Respecting and bringing together different knowledge systems or culture values
- Documentation of difference between community and administrator knowledge of the industry
- Combining local water use data with regional and national data sets - accuracy
- Efficient communication and discussion of new issues (e.g., capacity shares, peak flow access)

## **7.5 Infrastructure management**

- Impacts of taxation arrangements on irrigation investment
- Channel reconfiguration and management
- Performance benchmarks for infrastructure
- Optimising design and risk of dam failure

## **7.6 NRM and salinity issues**

- Benefits of unbundling land use control from salinity management
- Tradeable salinity credit systems
- Impacts of water trading and other reforms on ground water and river salinity
- Consolidation and management of land retired from irrigation
- Integrated management of overland flow, groundwater and regulated water systems
- Opportunities for farmers to be paid for the provision of environmental services

## **7.7 Social and economic impacts assessment**

- Definition and inclusion of desired social outcomes in policy formulation rather than as issues for impact assessment following formulation of draft policy
- Development of agreed (community, industry, government) social and economic impacts assessment approaches and methods
- Impacts of adjustment on small and large towns
- Community engagement built into impact assessment

## **7.8 Interactions between forestry and irrigation**

- Cost-effective offset of the uncertain effects of plantations on groundwater
- Predicting effects of interception and root extraction by crops and trees
- Effects of irrigation on soil productivity – tree productivity is thought to be lower on land retired from irrigation than on land retired from dryland agriculture

## 8. References

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## **Appendices**

Appendix One – Queensland Nogoa-Mackenzie Catchment case study

Appendix Two – NSW Murrumbidgee case study

Appendix Three –Victorian Kerang-Pyramid Hill-Boort case study

Appendix Four – South East of South Australia case study

# 1. Appendix One – Queensland Nogoa-Mackenzie Catchment case study

*“Water is not like gold – gold doesn’t impact the fundamentals of life.”*

*“Pricing is Queensland’s Murray Darling. Looming as a significant show stopper.”*

*“What do we need to do now on farm that will add value, that will give us some guarantee that the system will get off our back – that it makes a difference, that fits in with targets? At end of day when the funding for reform goes away, how is all this stuff going to sustain us?”*

Queensland Industry Representatives

## 1.1 Purpose

The purpose of this report is to provide information about the impact of high level policy reforms on irrigation investment and practice in the Nogoa-Mackenzie catchments that are centred around Emerald in Queensland’s Fitzroy River Basin. The information summarised forms part of a series of scoping studies designed to identify experience and provide contextual understanding of differences between perceived and actual impacts of water reform on the irrigation industry.

The Nogoa-Mackenzie case study summarised here is intended to provide a basis for subjective comparison with information collected through three other case studies. These three other case studies are located in the Kerang-Pyramid Hill-Boort region in Victoria, the Murrumbidgee Irrigation Area in NSW, and the South East of South Australia.

Issues that this scoping study focuses on include:

- Water sharing/planning processes;
- Water pricing reform;
- Water trading; and
- Impacts of water regulation changes on land use.

The Nogoa-Mackenzie catchment was selected as a case study primarily because of its experience in the development of water markets and with the introduction of price reform without the institution changes and without the need to consider whether or not water in the region is over allocated.

## 1.2 Background information

Nogoa-Mackenzie region is located in the western edge of the Fitzroy catchment and Queensland’s Central Highlands district (see Figure 5). It is characterised by a sub-tropical, semi-arid climate with high rainfall variability. Irrigation in the Nogoa-Mackenzie region is characterised by a diversity of crop types. Cotton is the main irrigated crop grown in the region. Other crops grown include citrus, grape, nuts, cereals, oil seeds and forage. Irrigation water is drawn from Nogoa River and relies heavily upon access to storage in the Fairbairn Dam, which is larger than Sydney Harbour in surface area. Recently, citrus growers have had to deal with the prospect of the need to quarantine production from the area until citrus canker is eradicated.

Water is also used for urban and industrial purposes and, increasingly, for mining purposes.



Figure 5. The Fitzroy Basin in Queensland – most irrigation in the Nogoa catchment occurs below the Fairbairn Dam near Emerald

## 1.3 History of water reform in the area

### 1.3.1 Water administration

Responsibility for the management of water use in the region is divided between the Queensland Department of Natural Resources and Mines (DNR&M) and SunWater. Under the direction of the Minister for NR&M, the Department is responsible for policy and management of “un-supplemented” water that is taken directly from a river or by



trapping overland flows while SunWater is responsible for the management and delivery of “supplemented” water within the operating licence and management rules set by DNR&M. The systems maintained by Sunwater typically involve a dam and/or the maintenance of a channel or piped supply system.

In 2000, a new Water Act was introduced to change the way water resources in Queensland are managed. As a result of these reforms, the degree of investment security associated with a water licence was increased significantly. In particular, processes were put in place to enable the water entitlement register to have the same degree of security as that associated with land titles. Water entitlements are now separated from land, water trading has been introduced and formal water resource planning processes have been put in place. Water allocation ownership is registered on a Torrens-Title like register and these entitlements can be mortgaged.

The *Water Act 2000* requires the DNR&M to develop Resource Operations Plans (ROPs) on a case-by-case basis to implement the Water Resource Plans (WRPs). The Water Act allows existing water entitlements (tied to land) to be converted to tradeable water allocations (separated from land) on the commencement of a ROP.

However, the commencement of a ROP in a catchment does not automatically result in the conversion of all existing water entitlements within a plan area to tradeable water allocations. Landholders in a ROP area are required to check the details of their water entitlements. Once a ROP has been approved, water entitlements are converted into water allocations. Details of granted water allocations are recorded on the Water Allocation Register (WAR) and they become tradeable.

In Queensland, water entitlements are known as “water allocations” and are tradeable according to rules set out in the ROP. Normally, trading rules vary by zone or reach of the river system. Trading rules established under ROP and river system are broken into a series of trading zones. Trading within zones is virtually unrestricted but can incur volumetric reduction to account for increased transmission losses. In effect, a water entitlement entitles its holder to a share of the volume of water that is available and assigned for consumptive use within a season. Limited borrowing and carry forward rules are in place.

Under the new regime, water entitlements are defined independently of land and, hence, have a value in their own right. Amongst other things, this means that theoretically the value of land to which a title was attached has declined by the value of the water entitlement. This change in the way land is valued both officially and in the market is forcing local government authorities to review the way they rate land. Under the new regime irrigated land and non-irrigated land after adjusting for the value of built improvements is of similar value as neither has water attached to them. If a local government authority wishes to collect rates in the same manner as they did before introduction of the Water Act 2000 and once ROPs are in place, then they will need to rate irrigated land and dry land at a different rate.

### **1.3.2 Water reform processes**

Water reform in Queensland and the Fitzroy basin in particular has been characterised by a series of events. Major events include:

- 1995 Commencement of COAG induced discussion of water reform issues that resulted eventually in amendment of the Water Resources Act 1989 to enable introduction of Water Allocation and Management Plans (WAMPs)

- 1996 Establishment of Community Reference Panels and Technical Advisory Panels to assist with policy development
- 1997 Introduction of an Integrated Planning Act 1997 formalising the use of Water Management Plans (WMPs) and WAMPs
- 1997 Establishment of a Water Reform Unit in the then Queensland Department of Natural Resources (now DNR&M). They began releasing discussion papers in 1998 on a wide array of water reform issues
- 1997 Two groups established in the Basin – Central Highlands Regional Resources Use Planning Cooperation and Fitzroy Basin Association
- 1998 Draft Fitzroy Basin Water Allocation and Management Plan released
- 1999 Final Fitzroy Basin Water Allocation and Management Plan approved
- 2000 SunWater established as a government-owned corporation
- 2000 New Water Act, under the direction of a Water Reform Implementation Committee, brought about many changes including:
  - replacement of WAMPs with WRPs
  - establishment of WRP as statutory instrument
  - lower bound pricing
  - capacity to convert water licenses and interim water allocations into water allocations through ROP process
  - specification of draft arrangements for water trading
  - institutional separation of water service provider (SunWater) and regulator (DNR&M)
- 2000 Set price paths for SunWater rural water supply schemes until June 2005
- 2001 National Action Plan for Salinity and Water Quality galvanised preparation of catchment plans
- 2000 IROLs allow SunWater to hold water losses as entitlements
- 2002 Draft Fitzroy Resource Operations Plan released
- 2004 Final Fitzroy Resource Operations Plan approved
- 2004 Draft Fitzroy Water Resource Plan amendment released
- 2005 Final Fitzroy Water Resource Plan amendment approved
- 2005 DNR&M investigated amendment to Water Act and released Land and Water Management Plan Guidelines
- 2005 Water Plan 2005-2010 released announcing, among other things, a fixed annual charge of \$4 per megalitre extracted to cover planning, resource management and administrative costs

### **1.3.3 Water allocations and trading**

As permanent water trading is permitted only after a ROP has been approved and the Fitzroy ROP was only approved in 2004, permanent trading in the region between users commenced for the first time in the 2003/04 irrigation season. Prior to that, sales of new allocations were only from SunWater and its predecessors. Both water allocations and seasonal water assignments are transferable either permanently or temporarily, according to rules set in the Fitzroy ROP. According to the DNR&M (2004), in the first year of trading of supplemented water, 2003/4, there were:

- 22 permanent allocation trades for 3,466 ML; and
- 171 temporary trades of seasonal assignments for 30,891ML.

**Table 3: Indicative water trading prices in the Fitzroy Basin (nominal \$/ML)<sup>14</sup>.**

Year	High priority allocations (for mining and towns)		Medium priority allocations (for agriculture)		Notes
	1998	2005	1998	2005	
Permanent trades	\$2,500	\$7,500	\$600	\$2,000-2,100	In 1997, the region's first water auction of 10,000 ML for use in Bedford occurred. From 2003 to 2005, the value of medium priority allocations has increased from \$1,700 to \$2,100
Temporary trade	na	na	\$50	\$60-200 normal range, average is around \$150, but can be up to \$400	Prices appear to be a function of dam storage levels, crop prices and seasonal conditions, etc.

Source: Col Bendall and Jim Cook (SunWater) on 4 October 2005.

As at 22 September 2005, seasonally assigned allocations were trading at \$80 per megalitre. Prices for a water allocation in the district are currently around \$2,100 per megalitre (Table 3). As started at September 2005, it is possible for water users to trade seasonal assignments temporarily via SunWater's online trading system. Provided both the buyer and seller are registered SunWater Online account holders, temporary transfers can be conducted electronically without completing any forms and at no cost to either the seller or buyer.

### 1.3.4 Water pricing

Arguably, water pricing issues are the most sensitive of all water management issues in Queensland. Charges are set by both the Queensland government and SunWater in consultation with irrigators. In order to begin the process of moving to a situation where pricing arrangements comply with COAG pricing requirements, the government has released three discussion papers and in 2000 announced a 5-year price reform pathway that will deliver lower bound COAG compliance for infrastructure maintenance and water delivery<sup>15</sup>. In September 2005, the Government announced that from 1<sup>st</sup> January 2006 irrigators will be charged \$4 per megalitre of water extracted to cover the costs of resource management and administration.

At the same time, the Government announced that there would be no new rate of return requirement prior to a national review of water pricing policies in 2008, and a two "tier" review of SunWater pricing arrangements that will require a State-wide Irrigation Pricing Working Group to consider and advise on State-wide principles and concepts to be used to "set prices in a fair and efficient way." The first tier working group includes people selected from SunWater, irrigation industry, agricultural organisations,

<sup>14</sup> Nominal prices, not adjusted for inflation.

<sup>15</sup> [http://www.sunwater.com.au/pdf/water/factsheet\\_01\\_Process.pdf](http://www.sunwater.com.au/pdf/water/factsheet_01_Process.pdf) as at 19/09/2005

commercial water users and urban water users. The second tier process is used to resolve scheme-specific issues.

At present, the Queensland government requires SunWater to set a two part tariff for the supply of irrigation water, i.e. charges of extraction of water from a channel and from a river differ. For water taken from a channel system,

- Part A tariffs are payable in proportion to a water entitlement's maximum annual allocation at a rate of \$19.28 per megalitre; and
- Part B tariffs are payable at a rate of \$10.35 for each megalitre of water extracted.

Charges for the supply of water from the river, as distinct from the channel system, are \$7.16 and \$4.32 per megalitre, respectively.

In addition, SunWater charges irrigators for the provision of services such as extra meter readings, meter testing etc. As part of this process and to assist government in its negotiations with industry it maintains a Customer Council for each supply system.

### **1.3.5 Land use control**

Since the introduction of the Integrated Planning Act in 1997, control of the environmental and resource impacts of irrigation has been managed under the Integrated Planning Act. Any person wishing to trade water and irrigate a land area for the first time has had to prepare a land and water management plan for the area in question and have it approved.

## **1.4 Perception<sup>16</sup>**

### **1.4.1 Overall impact of high level policy reforms**

The most striking difference between an assessment of the impacts of high level policy reform on irrigation in the Nogoa-Mackenzie and other case study areas is the attention being given to pricing issues. In other case studies, we have undertaken, pricing issues seem to have been avoided by either:

- privatising the supply system and placing it in local control; or
- establishing a catchment management board that retains control of any resource management charge.

At the time of writing, however, Queensland is the only state that has proposed that consideration be given to the idea that irrigators should have to pay a charge sufficient to provide a rate of return on the assets used to supply water to them.

The overall impression gained, however, is that irrigation in Queensland is alive and well and that irrigators are resigned to the fact that they will be forced to pay higher charges with the result that improvement in practice will follow. There is, however, a general perception that in retrospect, the entire water reform process could have been "done much better. Better outcomes could have been achieved at less cost and in a more timely manner...There has been too much angst and agony." Given the high

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<sup>16</sup> In some cases, quotes in this section are paraphrased to provide greater clarity of expression. The meaning has not been changed.

level policy constraints placed on all involved in the process, however, departmental representatives consider it would only have been possible to do better if they were not constrained by the need to meet COAG milestones.

As water trading can only occur within the district, there is a perception that trading is to the net benefit of all involved. Some are concerned that trading may result in the over-aggregation of water entitlements by large landholders. To date, however, this has not occurred.

### **1.4.2 Impact of pricing policy on rural communities**

One of the most difficult issues in assessment of the impacts of price is the choice between investment in irrigation and dryland farming in the Nogoa-Mackenzie region. As one representative put it “is a no brainer”. No matter what charges are put in place irrigation is always likely to be more profitable than dryland agriculture and, hence, all the available water in the region will be used. The fight about price is more over the effects on income and wealth as expressed in the value of land and water than over the effects of price reform on investment and irrigation practice.

Irrigators are also aware of the inter-relationship between asset value and the charges set by government. “As charges go up, asset prices come down. In prime irrigation areas, the effect is more on wealth and economic opportunity than on investment. Sudden change, however, can force businesses, towns and regions to stagnate.”

Consultation with industry representatives make it very clear that industry is very aware of the fact that SunWater is a monopoly water supplier that is not controlled by them and “sometimes acts more like a government organisation than a corporation.” Those we consulted with in the Nogoa-Mackenzie region also seem to be aware that they may be better off using SunWater rather than a self-managed company to supply them water. Their experience in negotiating with SunWater has been mixed. At times they have felt that the process has been a one-way flow of information and that their views have not received adequate consideration. In the recent past, the main vehicle used to exchange views has been a Customer Council that, due to a walkout, stopped meeting in 2004. More recently, however, an irrigator from the region was appointed to the first tier of the State-wide Irrigation Pricing Working Group.

Pricing is a very sensitive issue as any increase in price has an immediate impact on net income and, through this, competitiveness with producers elsewhere. Irrigators are very aware of the fact that they are largely price takers and, hence, any increase in water charges will reduce the value of the water entitlements they hold. While it is clear that increased prices mean less income and a decline in wealth, the irrigators we consulted could not identify any investments that people have not made because of the schedule of prices that are being phased in. This, however, may be due to the fact that this high level policy reform has been accompanied by both an improvement in the security of water entitlements and the introduction of trading.

When five-year price paths were first set in 2000, irrigators indicated that they considered the logic behind them was not adequately considered. In particular, they stated that “there was no formal process for irrigators or for that matter other stakeholders to make submissions and have these reviewed.” They were also of the view that “the five-year price paths did not accurately reflect the efficient costs of supplying water to each scheme. The price paths were developed based upon limited scheme cost data and central office costs of a government agency. Allocation of central office costs across the schemes and benchmarking to assess ‘efficient’ costs was primarily based on ‘desk top’ estimation.” They go on to express the view that

“they are, at best, an estimate of the level of charges required to provide a revenue stream that would sustain a corporatised agency of Government given defined reductions of Government subsidy.”

In essence what irrigator representatives seem to want – apart from continued access to low prices – is a mechanism that provides SunWater with a continuing incentive to ensure and deliver services to them at the lowest cost possible. Some are also of the view that “it is not appropriate for irrigators to bear the responsibility for recovering the cost of implementing reforms.” In particular, they do not consider that industry should have to bear the cost of resource planning. They argue that “the costs of preparing ROPs should be met by government in the same way as the costs of urban planning etc are met by government.” Government officials, however, point out that many of the costs of urban and regional planning is funded by local government using funds collected by rate payers. Queensland irrigators are not yet required to pay a levy to cover these costs.

One of the most sensitive issues – to be resolved by the State-wide Irrigation Pricing Working Group – is the question of whether or not the government should seek a rate of return on existing assets as required under the National Water Initiative. If upper bound pricing is adopted then charges will need to be set at a level sufficient to provide Queensland with a return on the value of existing infrastructure. If, however, a lower bound price were set then irrigators would only have to pay charges sufficient to cover operating and maintenance costs of all existing infrastructure. Irrigators are particularly fearful that “the imposition of rates of return (even in stages) will impose costs and associated risks beyond the capacity of most industry sectors and areas to sustain.”

### **1.4.3 Upper bound pricing and investment**

With regard to the financial impact of price reform, industry representatives are concerned about the effects of price reforms on other reforms that they are expected to make. “Implementation of a rate of return will make it increasingly difficult for rural water users in many schemes to cope with water prices. Placing an additional impost of a rate of return will also be difficult when we are trying to address a range of other priority reforms including improving the efficiency and sustainability of schemes, on farm property planning for implementation of sustainable practices, water metering and addressing the implications of a range of other natural resource management reforms.” The question is one of the rate at which changes can be made whilst still receiving an adequate income.

Several of the irrigation industry representatives we discussed pricing issues with were particularly concerned about the fact that Queensland appeared to be the first state contemplating introduction of an upper bound price for delivery of irrigation water. “Upper bound pricing is not something that Queensland should lead on as it would make Queensland farmers uncompetitive with other farmers.”

There is a general perception that water pricing has not affected investment on large horticultural properties but has reduced the income and hence profitability of these enterprises.

### **1.4.4 Self-management as an option**

On the issue of the most appropriate way to charge for operation and maintenance costs, irrigators are very aware of the self-management option that has been adopted in other States. They are not yet of the opinion that “this would make them better off and, at this stage, would prefer to continue to work with SunWater.”

While self-management is not yet seen as a desirable option by most, it is clear that all are using this option as the benchmark against which all alternatives are evaluated. Comments made by irrigators suggest that as soon as the Government or SunWater attempts to charge above a lower bound price serious assessment of self-management options will begin.

At this stage, irrigators would prefer a highly effective two-way participatory process that would give them a say in SunWater policies. Self-management is something they intend to consider only if the effective participatory processes cannot be established and they are forced to pay prices that include a return on the value of the assets used to supply irrigation water. By effective participation some appear to be articulating a model whereby the administrative structure is better described as one that facilitates joint governance in partnership with SunWater. There is a hope that the two tier pricing reform process may end up creating such a structure.

#### **1.4.5 Infrastructure standards**

An issue related to the above pricing issues is the question of who should pay for infrastructure renewal and upgrades. As one irrigator put it to us, “in the past it has been these types of investments that have been made by government on behalf of society in the expectation that productivity will increase and they (the government) will receive more taxation revenue.”

An issue emerging in Queensland is the question of spillway standards. New standards are emerging and as a result a number of spillways will need to be upgraded. Irrigators are concerned that they may have to pay for these investments.

#### **1.4.6 Water markets and water trading**

As noted in Section 1.3.3, water markets are in an early stage of development in the region. Nevertheless, there seems to be a high degree of satisfaction with the way that markets are starting to facilitate increased development in the region. Water is trading within the district but not to distant locations with the consequence that it is perceived to be of net benefit to buyers and sellers and to the district at large.

An interesting insight into the effectiveness of the ROPs in setting up stable rules came via a complaint from one group that it should be possible to change trading rules “as soon as it became clear that a better arrangement existed.” Comments made by others, however, offer a warning, in a number of cases well connected and influential industry representatives have proposed changes that while being in their financial interests are strongly opposed by another group who perceive that they would be made worse off by the change. In this regard, opportunities to allow trading of overland flow allocations were drawn to our attention.

Information on prices, however, is difficult to obtain and not yet transparent to individuals. In the early stages of the introduction of trading temporary water prices have seemed to be erratic. Prices have been as high as \$300 per ML and as low as \$30 per ML. Recently, the emergence of citrus canker has devastated orange production with the consequences that demand for water is lower than it would have been. Commentators are of the view that if this had not happened prices would have been higher and some water would have traded from cotton to orange production.

There is some concern and an interesting policy debate about how much price information should be available to all that seek it. Prices are known roughly but information on the prices being paid at any specific point in time is difficult to obtain.

One opinion is that if there is too much price detail there will be less opportunity to pick up good deals. The other opinion is that transparent and full price information is a necessary condition for efficient investment and water allocation.

Another issue of concern is the fact that in the past Queensland governments have used their capacity to control water allocations as a way to secure regional development. To this end, irrigators are fearful of the impacts on them of the potential implications of a decision to support development of the mining industry over agriculture.

Exploring this issue, one participant drew attention to the fact that the Government was holding water for such developments and was prepared only to release it under terms suitable to the mining industry. In this person's view, reinforced by others, all water in Queensland should be made available to all under the same terms and conditions. "The sweetheart deal approach characteristic of Queensland politics needs to disappear if we are to have free market."

The converse view is that it is the role of the State to foster appropriate forms of economic development. Some farmers are fearful that they "are really only temporary holders of water until bigger and better uses come along." While the reasons for this fear are not clear, it appears to be associated with a desire to ensure that the size of the existing industry continues to grow.

#### **1.4.7 The effects of moratoriums on regional development**

Under the *Water Act 2000*, the Minister can announce moratoriums on development in order to protect a resource or existing entitlements until a WRP can be amended to have the same effect.

In the Fitzroy, irrigators consider that a moratorium introduced to control access to overland flow and investments that enabled the recycling of irrigation water had a significant adverse impact on investment. Under the moratorium in the draft WRP amendment released in 2004, irrigators were prevented from making investments and building infrastructures that would enable them to increase the quantity of overland flows they could capture. They were also prevented from building works that would enable them to recycle more water.

While some irrigators consider that this moratorium had a significant adverse effect on investment, others are quick to point out the rush on investment in works to harvest more overland flows and increase recycling was occurring at the expense of other irrigators who, if these investments went ahead, would lose access to water that was previously available to them.

While in the long run, the moratorium process enabled amendment of the WRP to bring overland flows and recycling within the purview of the water entitlement and allocation arrangements, many irrigators and departmental representatives pointed out that this occurred at considerable cost to the contracting industry that could undertake no further work until the moratorium was replaced with a suite of control measures under the WRP for the region. As a result, contractors who had been working in the district and spending money in the district had to move elsewhere.



### 1.4.8 The reform and engagement process

Across the Board, whether in government or in industry, there is a large degree of frustration with the effects of high level policy reforms on the irrigation industry. As one irrigator said to us – “When we find a problem, we like to fix it. This is how farmers behave. Why does it take 20 years for the government to get the fundamentals right? We started in 1993/94 and you are telling us that the National Water Initiative will run until 2014. This is twenty years. Why does it need to take so long?”

There is also a large degree of dissatisfaction with the processes used to consider options and then decide what action to take. The consultation process is not consistent and efficient. “There has been too much conflict.” “There has to be a better way to do business.” “Too much is happening behind closed doors.”

Some irrigators are expressing frustration with the tendency of government agencies to take a silo approach to water reform issues.

There is a real concern among irrigators that the main impact of high level reform processes has been a failure to develop a set of arrangements that can be expected to work in the long term. The system has had to work upwards and put most effort into achieving milestones dictated by COAG rather than getting the sequence right and attending to detail.

SunWater executives express the view that the processes “have been too fast.” Expressing a similar view, industry representatives point to things that have been missed. They point to the fact, by way of example, that investment in environmental and resource monitoring arrangements has been postponed even though this is essential for the objective review and revision of the region’s ROP. Some consider that it is imperative that investments like this be made. Industry would like to work with government to lead on issues like this but is unable to get traction on this issue. They perceive that this is primarily because the reform processes used are ones that “encourage resolution of one issue before the next one is addressed.” “There is a need for implementation strategies that move across the silos – water reform, veg reform, protection of the reef, etc. It is time to start on these issues before structures become entrenched and impede capacity to change.”

Regulation always comes at a cost – and usually with minimum response. Voluntary driven and supported programs within regulation framework are useful to produce better results but need more upfront investment in their development. “Changes cannot be expected to happen overnight. ... There has been a phenomenal change in growers’ attitude and participation over last few years. This is really worth investing in. Reasonable time periods are needed for these arrangements to evolve. ... State and Federal governments need to go through a consolidation process for a number of years and pay attention to regional arrangements. The desire for outcomes needs to be balanced with ability of people to move forward.”

Engagement with industry is something that the industry, SunWater and the State government seek to achieve. There is a real belief that by working with government much better outcomes can be obtained (see Box 2). The experience in getting a ROP that they are proud of demonstrated this.

## Box 2

### **A frank summary of the way irrigators believe that they ended up with a ROP they are proud of (précis of a statement by an irrigator).**

“Originally, WRPs – called WAMPs in those days – were to be developed by community liaison groups etc. A consultation process was set up. The government came out and consulted us. But it was very hard for us to consult on the stuff, to have active dialogue, on issues we didn’t really understand .. or what the ultimate impacts would be, etc. Anyway, our community groups put down whole range of scenarios and agreed on what impacts that had to be fixed through the process .... not a single one of these impacts was addressed.

Then we got involved with SunWater to put in place ... an IROL – an Interim Resource Operation Licence. ... We were supposed to be involved in that process to make sure that they were doing every thing on “our” behalf. We would go to ... slide shows. SunWater told the department that they were consulting us fully. .... We went to two slide shows each with a dozen or so slides that contained absolutely nothing. At the second slide show, we were told that the Department was going to release the IROL the next day, so we asked for a copy but they refused – even though we could have got it under freedom on information the next day – so we walked out of the meeting.

Then (a little later) we went into the ROP process. When the draft ROP came out, we identified huge problems. This was different, we could identify individual impacts on us. You were able to identify impacts on yourself – you couldn’t do this under the WRP... When we were able to do this we were able to show flaws in the WRP (Water Resource Plan). But the Government said we can’t change WRP. It had to stay the way it is! ... So we irrigators put our hands in our pockets and employed a whole heap of consultants in hydrology and ecological stuff (through the Food and Fibre Association).

We soon realised that this was not going to work ... it would end in a huge fight. So we went down to see Stephen Robertson – the Minister we had a bit of a biff in the press – as you do to get their attention. When we got to see him we said ‘there is no use having our consultants and your department running off and putting data together. We will all just end up arguing.’ So what we said was ‘We want a compromise – we want our consultants to work with your department guys and your department guys to work with our consultants – both ways.’ And that’s what we did! We had a working group, we put all the stuff on the table and worked it through. We ended up with a WRP that delivered outcomes and met all the objectives.

To this day we are still trying to come up with ecological stuff because our WRP only meets hydrology objectives it does not go far towards meeting ecological objectives. We are really keen to come out with that – even though a lot of people think we are wasting our time. We want to be confident that we will not have impact. So when we come up for our review, we can just walk through it.”

Nevertheless, it is clear that industry representatives are frustrated with the consultation processes that high level policy reforms are imposing on them. Indicative of this, irrigators in the Fitzroy recently stopped participating in their Customer Council as it was becoming “too confrontational.” Those involved felt that the information flow was a one-way rather than a two-way process. One of the issues they point to is the nature of the consultation processes used. In particular, there seems to be a way of too much paper and the use of processes that drown the system in detail rather than efficiently discussing high level concepts and propositions. “Farmers do not need 260 pages of information to read the night before a high level meeting in Brisbane.”

There is a strongly held irrigator view that outcomes would be much better, at least for the Fitzroy, if irrigators were brought in at day one. The approach of “dropping lots of data on people and showing that the process has been analysed in great detail” in the eyes of irrigators does not work. Conversely, those involved on the other side say that

they put a large amount of effort into simplifying the choices and trying to keep processes on track.

“The focus of reforms has been and continues to be at state-wide and catchment level. There has yet to be a realistic appraisal of efficient and effective means to implement reforms and the likely resource requirements and time needed for implementation.”

While many are critical of the engagement processes used and perceive that processes could be better, all seem to prefer them to those used in other states. In particular, they appear fearful of using an independent pricing authority to set prices. Irrigators, in particular, seem to perceive that they would be worse off under such an arrangement. One of the reasons they offer this is the observation that in the process of seeking the answer to one question, another one emerges as being more important. Rather than just setting the price, for example, it may be more important to change the practices that create the need for a price to be set. Negotiation processes facilitate this. Independent arbitration processes do not. Using a consultative engagement model often “one can develop better outcomes, make adjustments along the way and potentially find better solutions.”

#### **1.4.9 Land use control**

Audits on individual Land and Water Management Plans now are a statutory requirement under the Water Act. Industry argues that this audit process is too costly and that it would be more effective to have their own programs accredited by Government. In particular, they draw attention to the potential of using an MOU between government and peak industry bodies to establish a process that would result in the accreditation of the farm management systems they use. Government representatives have indicated that this process is under consideration. They have yet to be convinced, however, that it is sufficient to meet statutory requirements. Nevertheless, they seem to be supportive and appear to consider that it could reduce the cost to all of ensuring compliance.

The open sharing of information on resource trends and impacts is seen to be an important part of the success of voluntary processes.

### **1.5 Research issues**

As part of the consultation process run with the irrigation community and industry representatives in Queensland, we asked people for suggestions as to the nature of research that should be undertaken by CRC IF in the future. Research issues and opportunities identified include:

#### **1.5.1 Consultation process**

- Development of open door approaches to design sustainable futures in irrigation
- Emphasis of the role of stakeholders in the processes of policy consultation as well as implementation
- Development of ways to combine the representations of people from the top and from on-ground

#### **1.5.2 Consistency in implementation**

- Consideration of ways to set clear policy objectives they want to achieve from the start and keep this as the focus in the implementation process

- Development of ways to let participants participate and monitor the implementation process ( e.g. Community Reference Panel)
- Assessment of the impact of market distortions and pricing arrangements on investor confidence

### **1.5.3 Capacity and knowledge building**

- Development of better ways to engage/involve/negotiate people in decision-making process
- Development of ways to understand the costs and benefits associated with implementation and anticipate/respond to these more quickly and nimbly
- Development of new knowledge and understanding on issues (e.g. capacity shares, peak flow access, etc) to increase options for management of water

### **1.5.4 Risk assessment and systems efficiency**

- Improvement of understanding on the risk of infrastructure ( e.g. what is the right standard to set for dams etc., some work already under way)
- Reassessment of the risk and cost of infrastructure if the standard is revised

### **1.5.5 Integrated NRM issues**

- Consideration of broad NRM issues rather than just water, and the need to bring overlapping and conflicting issues (e.g., regulation of water taken and regulation of off farm water)
- Consideration of the issues of timing and priority (e.g., Burdekin emphasis on management of water allocation, yet the major problem with rising underground water tables which institutionally have not yet started to address)

### **1.5.6 Agricultural development**

- Development of better marketing arrangements and opportunities for industry which in turn will increase the value of water

## **1.6 Case study references**

DNR&M (Department of Natural Resources and Mines) (2004). Minister's Annual Report for the Water Resource (Fitzroy Basin) Plan 1999: July 2003 to June 2004. Prepared by the DNR&M, December.

## **2. Appendix Two – NSW Murrumbidgee case study**

### **2.1 Purpose**

This report provides information on the impact of high level water policy reforms in the NSW Murrumbidgee Irrigation Area (MIA). It is based on a series of discussions with people involved in the use and management of water in the MIA and supplemented by information obtained from official reports and other research.

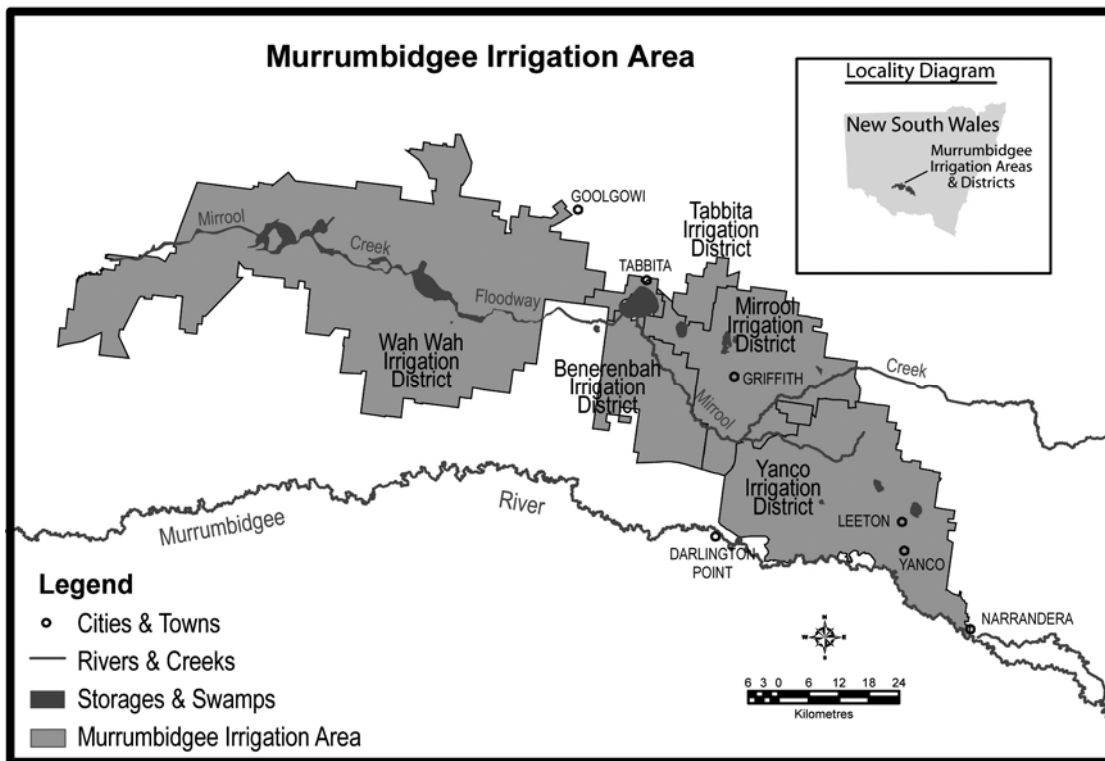
The NSW Murrumbidgee Irrigation Area case study was one of four focus areas – with the others located in the Kerang-Pyramid Hill-Boort area in Victoria, the Nogoa-Mackenzie area in Queensland and the South East of South Australia. These four case studies form part of a broader project intended to increase understanding of the impacts of selected components of the COAG water reforms.

The policy reform components on which the project focuses are:

- Water sharing/planning processes;
- Water pricing reform;
- Water trading; and
- Impacts of water regulation changes on land use

### **2.2 Background**

The Murrumbidgee catchment (see Figure 6) is located in southern NSW, west of the Great Dividing Range and covers approximately 84,000 km<sup>2</sup>. The Murrumbidgee River system is the most regulated river in Australia. Between 40-50% of the water flowing down the Murrumbidgee is extracted for consumptive use with about 95% of this used for irrigation. The Murrumbidgee Irrigation Area is one of several irrigation areas located along the Murrumbidgee River.



**Figure 6. Murrumbidgee Irrigation Area, NSW**

The entire Murrumbidgee Area, including the MIA, is renowned for its export industry in agriculture and value added wine and food manufacturing. In 2000-01, the total agricultural land use in the area covered 262,623 ha, with 157,516 ha land under irrigation (NSW Agriculture, 2003; Meyer, 2005). The area covered by the Land and Water Management Plan is 660,000 ha. The gross revenue from irrigated land use is estimated at approximately \$700 million per year. Through exports (including irrigated and dry area production and value adding) the area contributes approximately \$1.3 billion to the national economy.

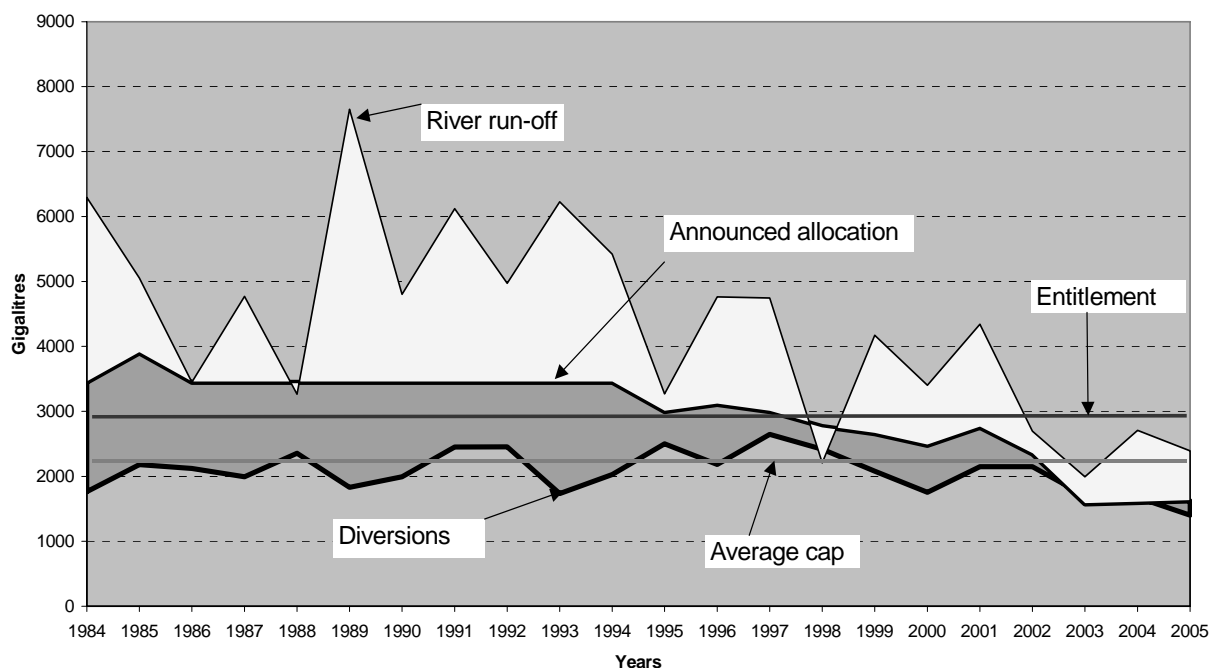
## 2.3 History of COAG water reforms in NSW and the MIA

The formulation of the COAG framework for water reform in the mid-1990s was by no means the beginning of reform in NSW or the MIA. NSW and the Murrumbidgee area were progressing in areas such as price reform, ownership structure of irrigation areas and water trade throughout the 1980s and early 1990s (Overview Report, 2002). A key feature of irrigation in the MIA is that a number of irrigators in the district have been strong advocates for many of the high level policy reforms that have occurred. They were, for example, involved in the first inter-valley water trades and the first interstate water trades. Interest in these concepts began almost a decade before they became part of the national high level policy agenda.

### 2.3.1 Introduction of the Murray-Darling Basin Cap

Introduction of the Murray-Darling Basin Cap in 1995 provided for a 'line in the sand' on extractions. As the Cap is a constraint on diversions – and not on access entitlements – the sum of all allocations (though not extractions) in the Murrumbidgee Irrigation area remain above the Cap (see Figure 7). Department of Natural Resources (DNR) – most recently the Department of Infrastructure Planning and Natural Resources (DIPNR) and

formerly the Department of Land and Water Conservation (DLWC) representatives explain that the reason for doing this is that “the Cap is expressed in term of the long-term average diversion, and the Murrumbidgee is not 100% secure, the sum of the entitlements must be greater than the Cap”. Annual allocations can then be managed so that the Cap is achieved. The Murrumbidgee Irrigation representative’s view on this is that the Cap is based on climatic conditions that cannot be predicted well enough in advance to enable sound (and Cap consistent) annual cropping decisions. Allocation announcements are therefore not the appropriate instrument to deliver Cap. Rather, allocations should be based on availability, and rules governing use and trade should reflect incentives for individual Cap compliance.



**Figure 7. Impact of the drought on run-off, allocations, diversions and Cap in Murrumbidgee Valley, 1984-2005**

Source: Murrumbidgee Irrigation.

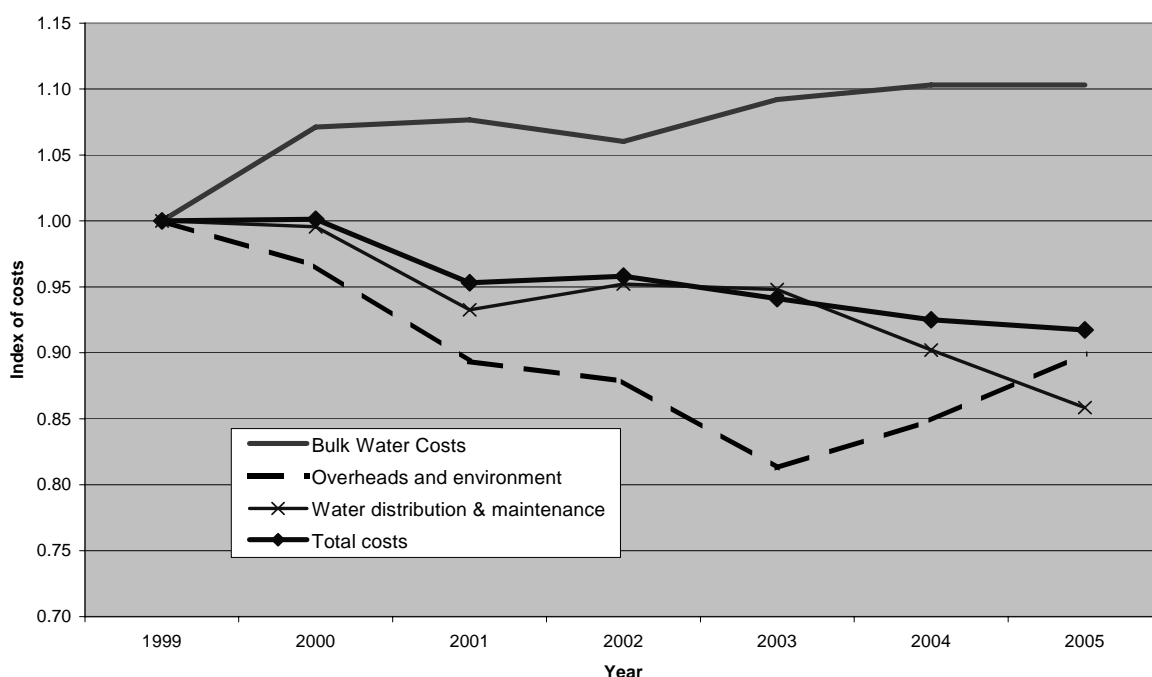
### 2.3.2 Pricing reform and water supply

The 1995 NSW Government water reform package included endorsement of full cost recovery pricing as agreed by COAG in 1994. The package resulted in the introduction of interim rural water charges for NSW irrigators in the 1995/96 season and referral of the issue of rural water pricing to the Independent Pricing and Regulatory Tribunal (IPART) (Jayasuriya et al., 2002). IPART subsequently undertook a major inquiry into bulk water pricing in NSW in 1996 and since then has continued to make bulk water price determinations, usually every 3 years.

In 1998 the NSW government ‘ring fenced’ State Water as a separate commercial entity in the then DLWC to provide rural bulk water services for customers such as Murrumbidgee Irrigation. State Water was later placed with the Department of Energy, Utilities and Sustainability (DEUS) before eventually becoming established as a State-owned corporation on 1 July 2004.

In 1996 NSW began the corporatisation and/or commercialisation of government owned irrigation areas and districts. In 1997 responsibility for managing water

distribution in the MIA transferred from a NSW state government entity, DLWC, to Murrumbidgee Irrigation Corporation (a statutory state owned corporation). The corporation was subsequently privatised through the establishment of Murrumbidgee Irrigation Ltd, a private company, in 1999. The Company holds a bulk licence with irrigation entitlement of 1,213 GL, and supplies water to over 1,800 individual irrigation businesses (and over 2,700 customers in total). Departmental representatives report that once management was transferred to Murrumbidgee Irrigation, irrigators' concern about the charges for water use diminished considerably. Since privatisation in 1999, the Company has been able to significantly reduce water supply and delivery costs while the government has found it necessary to increase bulk water charges (see Figure 8). Bulk water costs are now about 25% of water delivery costs in Murrumbidgee Irrigation.



**Figure 8. Index of water supply and delivery costs in real terms since privatisation of Murrumbidgee Irrigation**

Source: Murrumbidgee Irrigation.

### 2.3.3 Water sharing

The Murrumbidgee River Management Committee was established in 1997 to advise the Minister on environmental flow rules, which were announced in February 1998 and implemented the following July. The Committee included representatives of the irrigation industry, environmental interests, Indigenous communities, the local Catchment Management Board, local councils and government agencies (the then DLWC, National Parks and Wildlife Service, Environment Protection Authority, NSW Agriculture and NSW Fisheries). These rules were reviewed each year, providing the first phase of environmental flows, beyond those ensured by the Cap, for the river.

The Water Management Act was introduced in 2000. This new Act required that water sharing plans be developed before water entitlements could be converted from the old Water Act 1912. The process for development of a water sharing plan for the Murrumbidgee is generally agreed to have been problematic – with a lack of clarity of



goals, poor definition of roles, lack of resources, poor knowledge base and undue haste (Bowmer, 2002). In 2001, the Minister for Land and Water Conservation asked the Committee to recommend water sharing rules for the Murrumbidgee to incorporate into a statutory water management plan. A draft water sharing plan was prepared by the Committee and placed on public exhibition by the Minister in mid-2002.

The statutory plan was approved by the Minister for Land and Water Conservation in December 2002. It was based on the recommendations of the Committee, submissions received from the community as a result of the public display of the draft plan, and agreed Government policy. Some amendments were made to the Plan in consultation with the Committee and it commenced on 1 July 2004.<sup>17</sup> The water sharing plan involved high security entitlement holders giving up 5% of allocation across the valley without compensation. For general security entitlement holders the average contribution to environment flows is expected to be about 5%, but the year on year impact will be variable (up to 25% in very dry conditions).

### **2.3.4 Water trading**

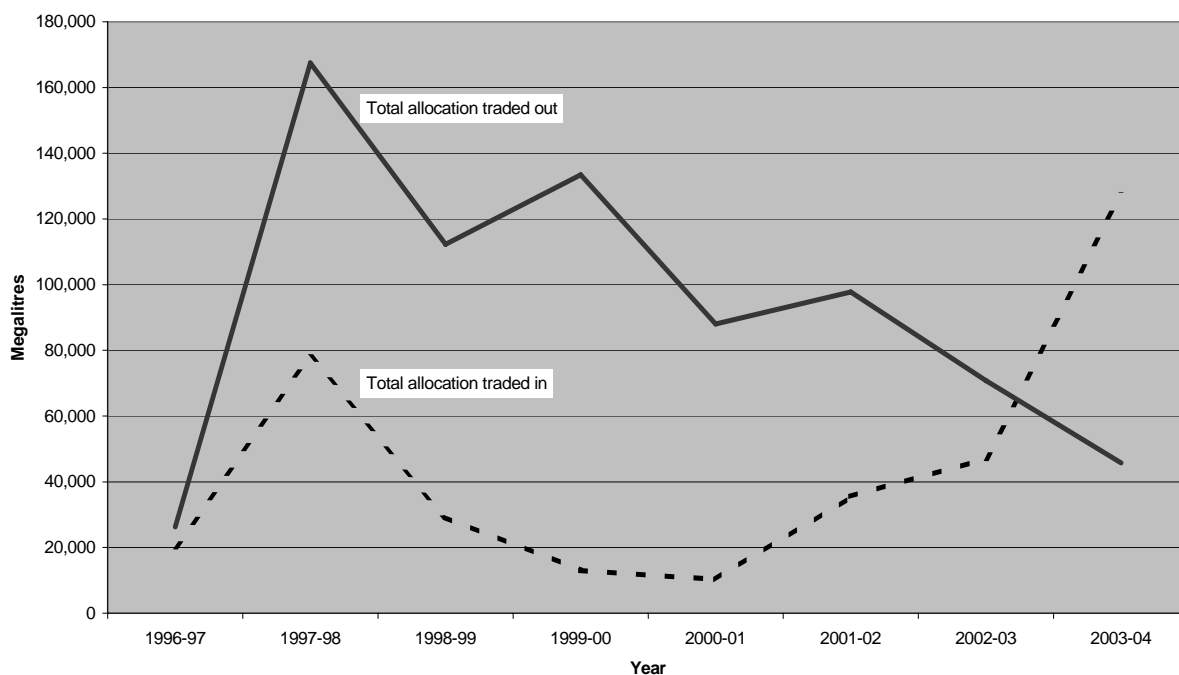
The Murrumbidgee has been a forerunner in many aspects of water trade. The first (and in some senses the only real) inter-valley trade was from the Darling to the Murrumbidgee in 1993/94. In 1995, the first interstate trade of 300 ML high security entitlement took place from Murrumbidgee to South Australia.

Murrumbidgee Irrigation has a series of trade rules to maintain the Cap. Temporary trade rules require lodgement of an intention to temporarily trade out, early close-off for intentions after allocation announcements, and the capacity to trade up to the quantity specified in the intention at any time (within any time limits imposed by State agencies) (see Figure 9). Permanent trade rules allow for unlimited trade of water savings, restrict trade to Cap share on a case by case basis, limit the trade in supplementary water to specified access areas, and attempt to avoid trades with high risk for the environment or other users.<sup>18</sup>

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<sup>17</sup> Source: <http://www.dipnr.nsw.gov.au/water/sharing/guides/murrumbidgee-reg-guide.pdf>

<sup>18</sup> Thompson, Dick; Water 05 Presentation – ‘Good governance of water trade’



**Figure 9. Temporary trade by MIA, 1997-2004**

*Note:* Since 2002-03, MIA seems to have traded out less and in more due to the drought (figures also include the Snowy deals as trades in). *Source:* Murrumbidgee Irrigation.

## 2.4 Perception

### 2.4.1 Overview

It is difficult to separate the influence of the high level policy reforms from the effects of other factors such as drought, terms of trade or improvements in technology. One industry representative raised the question as to what would have happened without reform. “For whom would it have been better and for whom would it have been worse?” In this section, we summarise the nature of the comments received.

Throughout discussions with industry and government representatives undertaken as part of the case study it was evident that significant investment has been made on all sides to move forward in the water policy area. There was a shared view that whilst there have been positives resulting from implementation of the reforms – particularly those resulting from the finalisation of water sharing plans and agreement on National Water Initiative commitments relating to security of entitlements – these gains have come at a significant social and financial cost.

The National Water Initiative, whilst seen largely in positive terms, was also seen as being likely to continue to create concerns for communities, particularly given the excessive detail of the initiative with the view that this decreases flexibility and capacity to negotiate at regional/industry levels. Differing and at times conflicting interpretations and expectations of the NWI were evident throughout the discussions.

The costs of the reforms are seen in terms of both the impacts of actual implementation and the process used during implementation.

There was general agreement that the process for initiation and implementation of reform has been, and is likely to continue to be, the source of significant uncertainty

and frustration along with distrust of government and the reform processes by both irrigators and many in the broader regional community.

The direct costs attributable to implementation of the reforms are more difficult to identify with a view that the current drought is masking the impacts. The data and industry advice indicates, however, that there has been a significant shift in wealth – with the reforms described as providing a climate of ‘wealth transfer’ rather than ‘wealth creation’. Whilst this may be a positive for some, it illustrates the ‘winners and losers’ dilemma associated with the reforms. The need to protect all interests, especially through the mitigation of third party costs, was identified as an issue for government, industry and communities.

The case study has highlighted the difficulties of fully assessing the impacts of the reforms, particularly in terms of distributional impacts both within and between communities and industries. The capacity of the NWI to address such concerns is yet to be tested.

### **2.4.2 Impact on pricing**

This component of the reforms was generally agreed, by both government and industry representatives, as being the least problematic in terms of the intent of the reform. Industry representatives, however, expressed the view that whilst pricing reform “has been right in design, it has been shocking in implementation”. The establishment of State Water as a State owned corporation at arms length from the Department was seen as a positive step by industry and community representatives with State Water seen as having significant potential to establish transparent and responsive processes and relationships. Department of Natural Resources however was seen by some irrigators as “a big bureaucracy with no transparency with regard to costs and continuing to hold on to functions such as monitoring when this was not efficient”.

Delivery price charges set by Murrumbidgee Irrigation have remained below inflation with no major price movements since privatisation. Water delivery costs by the Company have risen by an average of 1% per year since 1999 which has largely been driven by increases in environmental and engineering services, and bulk water costs which have increased by an average of over 5% per year. This containment of prices of water delivery to producers can perhaps be marked up as a benefit of reform. During this same period (1999 to 2003), the Consumer Price Index (CPI) increased from 15.5%.<sup>19</sup>

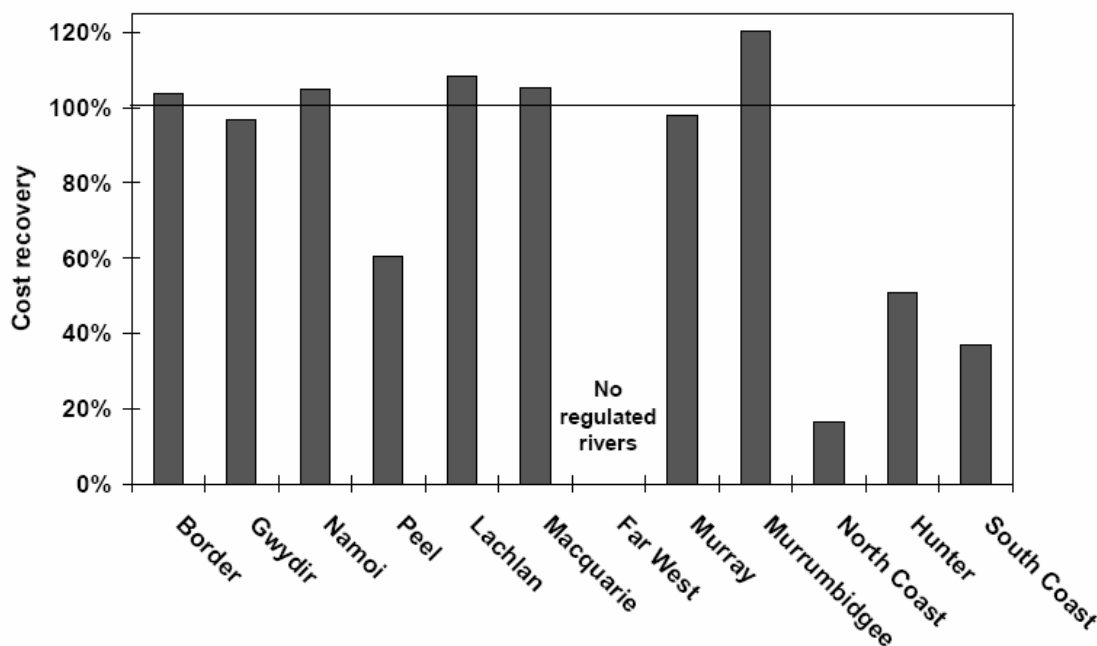
Clarity on the definition of upper and lower bound pricing of bulk water delivery was raised as an outstanding issue by both industry and agency contributors to this case study. Agency representatives indicated that whilst the situation in the Murrumbidgee is close to full cost recovery (lower bound), the capacity to assess in terms of upper bound pricing was restricted by the ability to fully account for environmental costs. Some industry representatives are of the view that regulated river bulk water prices have been at full upper bound cost recovery for some time (see Figure 10). There is acknowledgment about the uncertainty surrounding pricing for environment costs, but there is a wide belief that pricing for externalities by Government agencies is not the appropriate instrument to deal with those issues.

Other Industry representatives in the MIA also pointed to discrepancies in moving to upper bound pricing for the irrigation sector when equivalent charges were not levied

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<sup>19</sup> From 2191 to 2530. The CPI for the reference base year in 1945 = 100.0

on dry-land farmers who for example, impose significant salinity costs on the system. They also draw attention to the fact that “there are no levies on the boating and tourism industries to account for their environmental impacts”.



**Figure 10. State Water regulated rivers estimated cost recovery levels 2004/05**

Source: Murrumbidgee Irrigation.

### 2.4.3 Impact on investment

As evidence of the positive impact that water reforms have had on investment, Government representatives pointed to the change in the cost of obtaining a water entitlement. In particular, they referred to the fact that in 1983 a 972ML entitlement could be obtained from the Government for \$369. Today a 972ML entitlement trades in the market for around \$0.5 million. Industry representatives in the MIA, however, are quick to point out that this is comparing apples with oranges (i.e., licence charges with water values). Water values had previously been reflected in land and water packages until the recent unbundling of land and water. On this basis water values would no doubt have increased in recent years but at much more moderate levels than suggested by the Government representatives. Also, “much of this increase in real value is due to changes in water scarcity and the contribution that industry has made to productivity.”

Economic theory adds weight to this industry view, with much of the increase due to changes in scarcity and productivity not water reform processes. Moreover, the marginal value of any input is correlated with the marginal value of all other inputs including managerial skill, infrastructure and technology. From an industry perspective, it was clearly stated that “any analysis needed to look at the net affect across a range of factors, include both land and water and, also, adjust for inflation”. They also stress that large increases in the price of water and cost of delivery will tend to reduce investment in water dependent industries – at least in the short to medium term.

Industry and government informants, however, both point to the water sharing plan process and the NWI as providing a positive for communities from the perspective of providing a level of certainty for the future with a framework that gives confidence to invest and an ability to secure finance. The description of this by one industry representative was “there’s now a Cap on the pain!” Government representatives advised that most irrigators now see the Cap as necessary and as the only way to guide investment.

From a broader regional economy perspective, it is difficult to find evidence that suggests that the aggregate financial impact of the reforms has been negative. The 2001 census data for Griffith, Narrandera and Leeton give a mixed (and incomplete) picture of the regional situation, with unemployment rate of approximately 5%, median taxable incomes of around \$630 per week (below the Riverina average) with mixed growth across the areas mainly in manufacturing, retail and wholesale, though with strong growth in agriculture in Leeton. The value of residential building approvals for Griffith and Narrandera was below Riverina and NSW levels, but above Riverina rates for Leeton. Results such as this suggest that something is going on because irrigation areas have generally been the growth areas in rural NSW.

Local views however are that the data does not fully reflect the reality of the situation. “Closure of local businesses, continuing job losses, and the necessity for farmers to work harder and longer to stay in business and keep households afloat is the reality with which people and the region are faced.” Many parts of the region are in a marginal position and, whilst this may be due largely to drought and independent structural adjustment processes, the impact is seen by some to be compounded by the reform process, the impacts of which are yet to be fully realised. Policy analysts state, however, that “most regional population decline is due to farming efficiencies as well as the roll out of conglomerate stores in place of corner stores. It is completely naïve to blame regional decline on water supply.” This observation does not sit well with water users. “It sounds as though policy analysts are arguing that because the patient is sick he/she would be completely naïve if they complained about discomfort due to the hospital reducing the supply of drinking water. Also, nobody is saying that regional decline is due only to reduced water supply. We are arguing that reducing water supply – at the same time as the worst drought since Federation and other structural adjustments – is reducing investment, wealth, and income at a time when people can least afford it.”

“During the reform process, some short term losses would be expected – and pain for the relevant parties – before longer term gains arising from greater efficiency and better outcomes for beneficiaries (such as the environment and efficient producers). How to manage the adjustment path, especially the short term harm, is the key to ensure the maximisation of net benefits.”

Concerns were also raised by industry informants as to the sequencing and governance arrangements around the reforms, particularly with regard to trade, and the resultant impact on investment confidence. They also pointed to the fact that policies have changed continuously and this alone creates uncertainty. Water entitlement definition, the Living Murray process, catchment management planning process and governance processes appear to be in a continual state of flux.

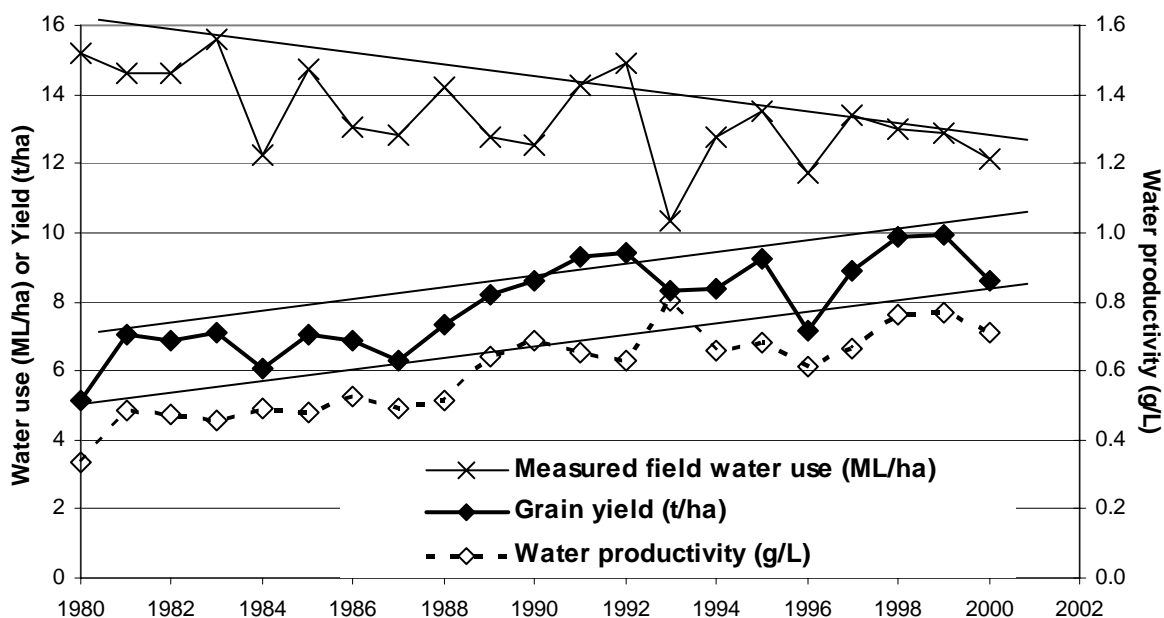
Finally, many comments by industry representatives suggest that the main impact of the introduction of reforms like water trading has been the redistribution of wealth within the community. Trade, among other things, has enabled high security entitlement holders to sell allocations to general security entitlement holders. Before the introduction of trading, unused high security allocations remained in the system and

became available to general security irrigators via the allocation process or to river flows.

## 2.4.4 Impact on water use efficiency

Reforms were mainly intended to bring about significant increases in water use efficiency. How much of such a change can be attributed to water reform as opposed to more innovative water use practices by farmers is difficult if not impossible to assess.

Whatever the cause, it is clear that water use efficiency has increased in the MIA. One of the strongest indicators of this improvement in productivity is the increase in the efficiency of rice production per ML of water. Some researchers (e.g. Meyer, 2005) report that Rainfall + Irrigation Efficiency has increased in the MIA from around 0.83 in 1985 to 0.92. Similarly, Crop Water Efficiency + Productivity has increased from about 0.51 g/L in the early to mid 1980's to an average of about 0.65 g/L in subsequent years. In the same period, Water Productivity increased from 0.42 g/L to 0.72 g/L (see Figure 11).



**Figure 11. Trends in rice water productivity, grain yield, and field water use in the MIA**

Source: Modified from Humphreys and Robinson (2003).

Industry views are that whilst reforms, particularly the Cap have contributed to a much keener appreciation of the value of water, they have not been the only, nor necessarily the key driver for changes to irrigation practice. Demand drivers such as the requirements of buyers for particular environmental standards, lifestyle drivers relating to time savings and the resultant capacity to spend more time with family have also been influencing factors. On the supply side, significant breakthroughs in developing more efficient varieties (from investments by growers, R&D and Government agencies) have contributed to steady improvement in water use efficiency. There is agreement,

however, that increased water use efficiency has been necessary to offset increases in costs and to take advantage of opportunities to trade water.

Overall, the impression received from discussions with industry representatives is that to some degree high level policy reforms have contributed to an improvement in irrigation practice. There have also been benefits to the community who sold the equipment and supplies necessary to invest in better water use and to the environment that has benefited from the adoption of practices that allow better control of water.

#### **2.4.5 Impact on land use**

The State has gone through the process of unbundling water entitlements from use approvals. The imperative to protect the value of privately owned land has always been a strong incentive for long term agricultural investors to deliver an appropriate balance between water use and land capacity. The main problems here usually arise due to third party impacts. Some industry representatives are concerned that “the unbundling of the land and water assets will put greater pressure on regulators to ensure sound land use (eg, if there is an increase in ‘opportunity investment’ without regard to longer term land impacts)”. As there is little confidence that the regulators are fully aware of potential problems, greater self-regulation may be seen as a result. The rice industry has strict controls as to where rice can be grown, how much can be grown in any one year, with the view that no industry has made the gains that rice has. The introduction and adoption of self-regulation and/or incentives in horticulture has been slower, but the value of water is seen to be pushing this forward. Irrigation corporations have also often sought to govern water use and trading within hydrological capacities.

#### **2.4.6 Impact on community well being**

There was agreement between all informants that the process for implementation of the reforms had contributed to significant angst and distrust in communities. There is seen to be a real need to re-engage rural communities to facilitate agreed and owned policies. Departmental representatives also see a need to engage with officers in the field earlier in the reform process. It is important to reach a point where it can ensure true public participation in government decision-making on reform. This means involving communities at the front-end and not insulting them with so-called ‘consultation’ beyond a point where they can have meaningful influence.

When attempting to ascribe the impact of water reforms on community well being, all informants pointed to the impacts of the current drought and broader factors impacting on rural and regional Australia. In particular, they expressed the view that the current drought was masking the impacts of reforms and as a result, it was only in the future that these impacts would be fully appreciated.

Discussions with local industry representatives pointed to negative or potentially negative impacts on community well being arising from a mix of the following factors:

- Decreased capacity of growers to participate in community life – e.g. the need to spend additional hours on farm resulting, for example, in not having the time to participate in local recreation activities
- The price of water becoming so prohibitive that younger people are not able to enter the industry with the view that this will impact on the ownership of farms (either because of larger corporate entities buying properties or the current property owners being unable to sell) and consequent changes in the structure of local communities

- The closure of local businesses and the cumulative impact of this on the viability of local towns, particularly smaller centres
- The ongoing nature and the pace of reform and the process for implementation have resulted in resentment and harking back to the past. This makes ongoing reform difficult, with growers and the broader community being inclined to feel that they are the victims of imposed and unnecessary change with little capacity to influence the direction, timing and implementation process of change
- Local views that activation of trading arrangements under the NWI will result in water 'walking out the door' in some districts with the potential for large areas to be left as stranded assets
- Land is valued on the current water entitlement and production capacity. A decrease in land productivity due to a decrease in water entitlements will decrease the land value and thus decrease council's rating base and the asset of the landholder. Farmers and financiers have traditionally aggregated the value of land and water. There is concern that water reforms could result in farmers being regarded as having less security and collateral in their property
- Impact on local government rating. Very little consideration has been given to the impact that the separation of land ownership from water entitlements and the trading of water will have on the rating base of councils in which irrigation farming is a predominant industry.

#### **2.4.7 Impact on environmental health**

The impact and contribution of the reform process on environmental health has yet to be fully assessed. Transparent monitoring and reporting arrangements to measure the outcomes of industry concessions under water sharing arrangements are seen as essential in providing a level of confidence in the necessity for and results of changed allocations. There was a view expressed that the concept of a healthy working river (particularly as this is being used in the Living Murray initiative) is seen to emphasise the environmental perspective with secondary consideration given to other water needs and uses.

Again, the contribution of the reform process to environmental health is seen as difficult to separate from other factors, including initiatives such as MIA Envirowise, the Land and Water Management Planning process and demand drivers requiring compliance with environmental standards. There is, however, a strongly held belief that many of the local actions taken have had very positive outcomes.

### **2.5 Issues for future research**

#### **2.5.1 Water allocation/sharing and water entitlements**

- Development of improved ways to define water access entitlements ( e.g. delivery capacity shares, and clarification of public benefit uses in WSPs)
- Development of improved ways to manage entitlements to interconnected surface and groundwater systems
- Development of better ways to balance consumptive and in-stream water uses and to manage the impacts of commercial forestry on water yield.

#### **2.5.2 Management and assessment issues**

- Clarification of the role of the Natural Resources Commission and the processes used to review Land and Water Management Plans in a timely manner



- Agreed and standardised approaches to social and economic assessment
- Development of methods to better account the performance of water trusts, bulk water providers and water resource managers
- Development of ways to ensure that those responsible for managing environmental allocations pay for their fair share of the costs of maintenance, infrastructure, delivery etc, coupled with more transparent way to reveal true costs
- Long term case studies or other processes to properly monitor the process for and the impacts of the development and implementation of water reforms.

### **2.5.3 Government and water resource governance**

- Separation of the Departmental representatives in their role as a regulator, investor in water savings, and as environmental manager – including the maximisation of opportunities for privatisation and contestability of service provision
- Development of ways to establish partnerships between communities and government agencies to develop policies and deliveries from the beginning
- Incorporation of the influences of key irrigation community leaders in the water reform process initiation and the subsequent course taken.

### **2.5.4 Public participation and trust building**

- Development of ways to include the broad interests of government, industry and community, rather than just those represented on boards and committees
- Processes to provide for early and 'real' involvement across community interests in the initiation, development and implementation of reform and policy

## **2.6 Case study references**

Bowmer, K. H. (2002). Fenner Conference – Lessons from Developing a Water Sharing Plan: A Reflection on Achievements and Disappointments.

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### 3. Appendix Three – Victorian Kerang-Pyramid Hill-Boort case study

*“The community now knows it has to be able to kick into the wind as well as with the wind.”*

Kerang Irrigator and Community Representative

#### 3.1 Purpose

The purpose of this case-study report is to provide information about the impact of high level policy reforms on irrigation investment and practice. The report should be seen as a scoping study designed to reveal experience and provide contextual understanding of the effects both perceived and actual on irrigation. The resultant observations are to be compared with those derived from meetings with irrigators and community representatives in the Lower South East of South Australia, the Murrumbidgee Irrigation Area in NSW and the Nogoa—McKenzie Catchment in Qld. Issues that this case study focuses on include:

- Water sharing and water infrastructure planning processes;
- Impacts of water trading;
- Impacts of water supply charges; and
- Impacts of salinity management and other controls on land use.

#### 3.2 Background

The Kerang Cohuna and Pyramid Boort irrigation area is located in the North Central Catchment of Victoria. It is located at the north of the Great Dividing Range and forms part of the Murray-Darling Basin. Administratively, the area belongs to the Torrumbarry and Pyramid Hill-Boort irrigation districts of the Goulburn-Murray Rural Water Authority (see Figure 12). Agriculture in the area is diverse with a mixture of dairy, fat lamb, wool, beef cattle, tomato, cereal, fodder, lucerne and oil seed production. Grape and olive production is relatively new.

Water rights, diversion licenses and sales water are the major water products of the area. As at 30 June 2003, they comprised around 19% of Victorian entitlements within the River Murray System. A total 276,400 ha of land is irrigated. While most irrigation water is supplied by Goulburn Murray Water (GMW), some is diverted privately either from waterways or by pumping groundwater.



Figure 12. The Kerang-Pyramid Hill-Boort case study area

### 3.3 This case study

This Kerang-Pyramid Hill-Boort case study was chosen because of the nature of changes that have occurred in the region over the last two decades. In particular, the area has had to respond to some of the worst salinity management problems in the Murray Darling Basin. As a result, there has been considerable reconfiguration of the district via investment in drainage programs, water trading and the introduction of new irrigation and dryland management practices.

As would be expected, the experience of each part of the case study region is different from each other and hence generalisations are difficult. Box 2 provides a summary of the changes that have occurred in one part of this region. Organisations like the Murray Darling Basin Commission are quick to point out that the region was among the first to face up the challenges of salinity and water reform. They go on to stress that this community response has received little publicity – even though their experience has provided the foundations for the development of similar programs in other parts of the Murray-Darling Basin.<sup>20</sup>

One of the most prominent indicators of the extent of community willingness to deal with water reform challenges in a pro-active way is seen in the focus on the development of future land use options and strategies. For example:

- In 2001, the Kerang-Swan Hill community commenced a Future Land Use Study; and
- In 2004, the Pyramid Hill-Boort community began developing a Future Management Strategy that includes careful consideration of the most

<sup>20</sup> [http://www.mdbc.gov.au/naturalresources/env\\_issues/water\\_and\\_land\\_salinity.htm](http://www.mdbc.gov.au/naturalresources/env_issues/water_and_land_salinity.htm)

appropriate way to reconfigure the irrigation area and deal with the challenges that arise from the relocation of water use.

**Box 3.**

**Extract from Kerang Swan Hill Future Land Use Working Document for the Torrumbarry irrigation sub-system**

“Agriculture in Kerang-Swan Hill has mirrored these national trends and they have been accelerated by the introduction of water trading. The price of water on the water market has been higher than the price justified from the major use of water in the Kerang Swan Hill area. As a result, there has been a large loss of water rights and full time farms from the study area.

...

“The local community has already dramatically changed. Traditionally, the local community was made up of full time mixed irrigation farmers and their families. Now, the community has developed into one that is predominantly residential and part time agriculture.

...

“By 2011 it is predicted that on existing trends the full time mixed irrigation farming area will occupy just 8% of the land use. Increasing external pressures, such as the growing demand for water in the Murray, may accelerate these trends further.

...

“Fortunately, the overall economy of the study area is not expected to decline and it’s population is expected to continue to grow, especially in the residential areas around the lakes.

“Providing supporting water supply infrastructure, and regional development services will be crucial to ensure that new irrigators and investors are attracted to the region so that the local community grows further.

...

“The water supply system needs to change to meet the change in land use. Already Goulburn-Murray Water is attempting to identify cost savings by assessing the viability of different parts of the supply system. This project needs to ensure that this cost saving occurs in a fair, coordinated and environmentally sound way.

....

**“In summary, we need new approaches to our rapidly changing land use. These new approaches need to consider all of the above needs so that it will create a better future for the local community than if we continue with the current ‘ad-hoc’ and possibly future ‘imposed’ approaches that will occur if we do nothing.”**

*Source:* Interim Steering Committee, 2003.

## **3.4 History of water reform in the area**

### **3.4.1 Salinity**

Fifteen to twenty years ago, many soils in the region were saturated and salinity was a major problem. People thought that salinity would eventually render much of the land in the region unusable. An overview of the extent of the problem and the communities’ approach to it can be found in a University of Tasmania (2000) study of the region that observed that:

*“Some 60% of the irrigated pasture lands are affected by soil salinity and 24 % is severely salinised. Within 30 years, with no remedial action, salinity will reduce annual farm production by 25% reducing the value of farm production by AUD\$3 million. The problem is widely acknowledged by farmers and industry leaders in Kerang. A 2000 ABC Landline report showed that action is being taken to address the salinity issue. Despite being branded Victoria’s ‘salt capital’, Kerang has not surrendered to the salinity problem. ... In Kerang, private reclamation projects were well under way before there was any talk of government funding.”*

While some of the salinity in this area is natural, it has been exacerbated by rising groundwater table levels due to irrigation. In response, in the 1980s a major salinity and drainage program was implemented in consultation with the industry in the Barr Creek Area. This was the first salinity management program in Victoria. It began with a knowledge strategy developed as a partnership between industry, community and government and was followed with an implementation of a joint investment strategy with variable contributions from industry, Victorian government, and the Commonwealth government.

As the strategy was implemented additional funding was secured from the MDBC, the Natural Heritage Trust, the National Salinity and Water Quality Program and the Victorian Government. This work was also expanded in an attempt to reduce the impact of salinity in other areas.

Collectively, these investments, among other projects, produced an estimated 6.2 EC reduction in MDB salinity impacts at Morgan from the region (Interim Steering Committee, 2003). More critically, however, the initial assumptions underlying salinity plans and investments include:

- There would be no need to reconfigure water supply infrastructure; and
- The mix of enterprises and land uses in each area would remain the same.

The introduction of the opportunity to trade water, however, meant that these assumptions no longer held. It soon became clear that new market conditions and opportunities would result in significant changes to the enterprise mix, water use and environmental flows.

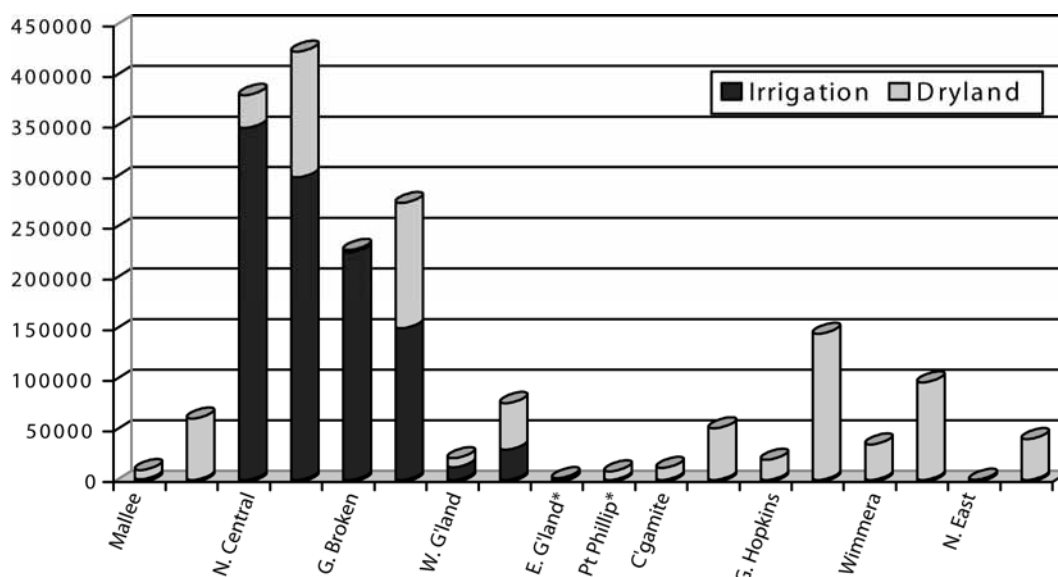
Figure 13 summarises the nature of changes that have occurred in the North Central Catchment within which the Kerang Cohuna Pyramid Hill-Boort region is situated. Over the last decade, the data for this period suggests that irrigation salinity has declined but that dryland salinity has increased.

Recently, in 2001, a review of the salinity benefits arising from all the changes that have occurred found an observed reduction in irrigation salinity could be partitioned as follows:

- 6.2 EC at Morgan as a result of salinity planning, investment in drainage schemes, laser levelling and improvement in irrigation practice; and
- 20 EC at Morgan as a result of water trading and the associated removal of irrigation.

The reported gains from salinity trading, however, have yet to be confirmed and may not be recognisable under current MDBC policy.

Another interesting regional response has been the private development of salt harvesting as a business in the region.



**Figure 13. Area of land with high water tables (<2m), 1990 and 2000 (ha)**  
**Source: Auditor General (2001).**

### 3.4.2 Water allocation policy

According to many of the irrigators we consulted with, water policy reforms have been conducted in a manner that has created considerable uncertainty and discouraged both innovation and investment. How much of this could have been avoided is a moot point but if formal analysis finds this assertion to be true and ways can be found to reduce this affect then this form of analysis could provide a major opportunity for governments to improve reform consultation and implementation processes. The major events identified by stakeholders include:

- 1989 – The introduction of a new Water Act
- 1990 – Issuance of bulk water entitlements to Goulburn Murray Water in a manner that was designed to give greater allocation certainty to the region
- 1994 – Introduction of water trading to allow irrigators to optimise water and land use, and retire land areas where irrigation was not possible and exit the irrigation industry with dignity
- 2002 – Start of the Living Murray Process negotiations in a manner that threatened to significantly reduce the amount of water available to irrigators in the area
- 2002/03 – 2003/04 Drought which dramatically reduced the quantity of water available to all irrigators
- 2003 – COAG commitment to a National Water Initiative and to reduce River Murray allocations by around 500 GL
  - Victorian Government release of a Green Paper setting out a set of options for water reform
  - COAG finalisation of National Water Initiative announcing an intent to increase environmental flows by 500 GL of water
  - Victorian Government release of a White Paper setting out a new water administration framework and, in particular, the removal of 20%

of water from the sales pool and the conversion of the remaining water into a medium security entitlement

### **3.4.3 Water delivery**

A related issue has been the effectiveness of the institutional arrangements used to manage water supply infrastructure and delivery. In the late 1980s, there was considerable community dissatisfaction with these arrangements that resulted in farmers protesting about the way the irrigation system was being managed. This resulted, in 1992, in the conversion of the Rural Water Corporation into the Rural Water Commission and the progressive transfer of local management powers to Regional Management Authorities of which Goulburn Murray Water was one.

Following the 1994 COAG reform which, among other things, required the separation of resource management and regulatory roles of government from water service provision, Goulburn Murray Water (GMW) was formed on 1 July 1995. GMW assumed full responsibility for management of the State headworks within its region and was appointed as Victoria's Constructing Authority for MDBC works.

The high level intent of this last administrative reform in forming GMW was designed to give irrigators more control over their destiny, but they had to pay full cost of water delivery. Irrigators were now defined as "customers".

### **3.4.4 Water use and trading**

Opportunities to trade water were introduced into the region in 1994 beginning first with the introduction of temporary trading and then the introduction of permanent trading.

As noted above, the introduction of water trading has enabled the district to significantly reduce salinity impacts and to do this in a manner that has been market driven. To this end it is interesting to note that early problems with water trading led the community to set up their own water trading notice board and then lobby Goulburn Murray Water to set up an Internet based water trading site now known as "*Watermove*."

The *Watermove* water trading exchange was introduced in August 2002, replacing the Northern Victorian Water Exchange. Goulburn-Murray Water now operates *Watermove* on behalf of all Victorian water authorities.<sup>21</sup>

A related problem that is gaining increasing prominence is the question of exit fees. Many people in the community have become concerned that as people trade water permanently out of the area they leave an increased liability per irrigator for both ongoing maintenance of the system and responsibility for the resolution of problems as they emerge. As a result of a recent Victorian White Paper, it is now expected that exit fees will be introduced in the near future. In the meantime, there is a short term incentive for people to trade water out of the region.

Table summarises the extent of permanent and temporary water trades in the region. Overall, around 7% of water entitlement has left the area but in recent times a significant volume of water has been leased back into the region on a temporary basis.

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<sup>21</sup> *Watermove* has an interactive website, through which traders obtain offer forms and view previous exchange results and graphs. It thus provides an open and transparent marketplace for dealers, with full disclosure of prices and volumes traded.

The data in Table 4, however, needs to be interpreted with caution and probably understates the extent of adjustment that has occurred. In some supply channels, over 50% of water entitlement has left and the community is now considering which, if any parts of the supply system should be closed. Irrigators have suggested to us that it is possible that one of the reasons why so much water is trading into the Kerang Cohuna region on a temporary basis is because irrigators are parking water outside the Goulburn Murray Irrigation Scheme until the exit fee issue is resolved. If this is true then it provides some indication that delays in high level reforms can have a significant influence on on-ground practice and investment.

**Table 4. Permanent and temporary water trade in the case study area (+ trade in, - trade out)**

Zone	Water entitlements held (ML)			Temporary trading in and out of the region 2003/04 (ML)		
	1990/01	2004/05	Net change <sup>#</sup>	Buyers	Sellers	Net trade <sup>#</sup>
Kerang Cohuna	na	na	na	74,873.4	22,260.9	52,612.5
<i>Sub-Total</i>	<i>na</i>	<i>na</i>	<i>na</i>	<i>+74,873.4</i>	<i>-22,260.9</i>	<i>+52,612.5</i>
Pyramid North	77,739	50,887	-26,852 (-35%)	see sub-total	see sub-total	see sub-total
Pyramid Mid	44,262	32,231	-12,031 (-27%)	see sub-total	see sub-total	see sub-total
Pyramid South	49,565	53,500	+3,935 (+8%)	see sub-total	see sub-total	see sub-total
Boort North	21,821	17,745	-4,075 (-19%)	see sub-total	see sub-total	see sub-total
Boort South	41,140	57,189	+16,049 (+39%)	see sub-total	see sub-total	see sub-total
<i>Sub-Total</i>	<i>244,527</i>	<i>211,552</i>	<i>-32,975 (-13.5%)</i>	<i>+36,149.6</i>	<i>-52,120.7</i>	<i>-15,971.1</i>

<sup>#</sup> Includes trades between zones but within district.

Source: Pyramid-Boort Future Management Strategy Project Newsletter No. 1, March 2005.

Water is now being traded back into the region via leasing and other temporary market arrangements. As a result of water trading, horticulture has expanded in Boort and Pyramid South areas. The depressed attitude in the community has been replaced to some extent by a positive attitude towards the future. Many irrigators in the area are quick to point out that without the opportunity to trade water, the district and many farmers would not have survived. This is particularly the case for dairy farmers.

### 3.4.5 The regional economy

While the total population decreased in Kerang (-4%) and Pyramid-Boort (-3%) between 1996 and 2001, economic information suggests that the region has been able to adjust. Illustrative of this is the fact that in 2001, the unemployment rates in Kerang (4.3%) and Pyramid-Boort (3.8%) were below Victoria's average unemployment rate of 6.8% (Hassall and Associates, 2003).

One of the most difficult high level reform issues for the community to deal with has been the impact that water reforms have had on the local government's rating base. Trade of water entitlements out of the area means a loss in value. Separation of water



entitlement from land title means that the community has to decide either to rate water entitlement holdings, irrigate areas in a manner that approximates previous patterns or, alternatively, determine a new rating system.

### **3.5 The importance of knowledge and information**

From the outside looking in, water reform in the Kerang Cohuna Pyramid Hill Boort region has been highly successful. Irrigators are quick to point out to us that along the way there has been a lot of angst and a lot of agony. The need for fundamental land-use reform rather than minor changes to the system has been a difficult issue to communicate. Hard decisions, as they say, are not easy to take. Those centrally involved in this process draw repeated attention to the importance of sharing data and information in the communication process. When one is talking about fundamental reforms that may significantly affect a person's livelihood they stress the importance of having access to data and information that:

- enables the right questions to be answered;
- is accurate at the paddock level so that those involved in discussions trust the analysis; and
- can be displayed and communicated quickly and simply.

They go on to stress that in the early stages and to some extent, most information about water use and irrigation was collected in a manner that was designed to help a water authority and was of varying quality. Various silos existed and it often proved impossible to use existing information and/or combine it with information from others sources.

In the past, considerable data was collected to provide administrative context and background on the assumption that it would never come under close public scrutiny. In retrospect, some irrigators are of the view that it would be better if all data was collected on the assumption that it may come under public scrutiny.

### **3.6 Perception<sup>22</sup>**

#### **3.6.1 Overall impact**

Focus group discussions with irrigators and other members of the community suggest that, over all, the water reform experience has been positive. The main reason for this is that the community was aware that unless they found a way to change they would have been doomed. As a result, many of the benefits of reform were easier to appreciate. As one person said to us "salinity and lack of opportunity to trade water was killing the district. People were locked into allocation arrangements that were to the detriment of all. If water trading had not been introduced many more people would have gone bankrupt, it would not have been possible to attract new industries and make new investments." Another said, "without trade, the district would not have survived."

"In the pre-trading world, rural counselling was the norm and necessary." With trade, people were able to adjust and do so with pride. Water trading enabled the district to find a way to use its resources more sustainably. It took a long time but eventually

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<sup>22</sup> In some cases, quotes in this section are paraphrased to provide greater clarity of expression. The meaning has not been changed.

people realised that the government would never get it right. Trading allowed people to exit with dignity. More recently, however, it has become clear that exit fees or some other contractual arrangement may be a necessary part of water supply.

In the early stages of the reform process, however, there was considerable community anger, frustration and blame of others.

### **3.6.2 Instability**

Asked what has characterised the last decade, a number of people in different forums stated that above all else the last decade has been characterised by instability. It was about time, some would state, that they got it right and guarantee that the rules of the game would not keep changing. There is a large amount of distrust and frustration that has resulted from a bureaucratic unwillingness to get it right for once and for all.

Virtually, all people we spoke to stressed that this meant that people were reluctant to invest and even though they eventually did invest they spent too long in evaluating all the options. There is a strong perception that this has cost the community much in terms of lost opportunities.

There is also a concern and a fear that processes are getting confused with new reforms being put in place in a way that forces abandonment of the old ones.

A number of people in the community are concerned that there are too many superficial consultation processes taking place. As a consequence, processes are confused. "It is about time high level policy people got their act together."

### **3.6.3 Trust and information sharing**

Another feature of the comments made by many people was a concern that somewhere in the 1990s there was a total shift in the approach governments took to the development of land and water policy. Prior to the 1994 COAG decision to include water management as part of National Competition Policy, officials tended to consult widely and develop knowledge with the community. That is during the 1980s and early 1990s there was a major investment in sharing knowledge with the community and developing community understanding of the nature of problems and ways to solve them. This approach created a high degree of trust. There was a strong commitment to ensuring that the community understood the reasons why policy had to change and what was being proposed.

At some stage, in the early 1990s and probably as a result of the COAG reforms, information sharing and the co-development of knowledge stopped. This previous practice was replaced with an approach that began with the announcement of decisions that had largely been made from the top. This "new" approach also seemed to be characterised by the withholding of information. The old practice of sharing the data and information was replaced with statements that there was a problem but little release of the underpinning information. The debate around the health of the River Murray really highlights this problem. Many people from the Kerang Cohuna Pyramid Hill Boort area are not convinced that there is any real problem at all. "The River Murray is not sick – 'it used to be dry', people used to picnic in it! It has too much not too little water in it. It is time people started telling the truth."

There is a perception that if information is being withheld it is because the position being taken is one that is hard to justify.

There is a strong belief that the community should have been involved from the start and be able to share knowledge. Uncertainty can be managed and should be discussed openly – not hidden. Failure to share this means that fundamental errors are made. In particular, irrigators perceive that this practice leads to poorer policies and discourages investment. They find it hard, however, to point out investments that have not been made or would have been made differently if a different approach would have been taken.

Another dimension of this is the capacity of local irrigators to solve problems. They point, for example, to the fact that when things were going wrong, in the early days of water trading, it was the local community who saw the need for transparency. They, not the government, set up trading bulletins and convinced GMW to set up *Watermove!*

### **3.6.4 Fundamental and superficial water reform**

An interesting discussion and point made by a number of people we met was a desire for fundamental lasting reforms. The district, perhaps because of the restructuring processes it has been through, has a considerable number of very experienced water traders. As a result, many people are aware of the fact that it is possible to get around many artificial constraints on water trade and water ownership. We spoke, for example, to people in the Boort district who were taking advantage of the option to carry water forward in NSW but not Victoria. Others told us how people were involved in deals that got around the 2% restriction on trade of water rights out of the district and how to be paid in advance for water that is in the water queue. They also pointed to a number of arrangements used by people wishing to bring water into the district. While politically, such rules seem important, in practice, a number of people explained to us how they reduce development opportunities and create community concerns about equity issues in a manner that is counter-productive.

“People are good at finding ways to wriggle through the rules. Restrictions on the market just cause us to make the wrong adjustments.”

One issue that was pointed out to us was a fear that NSW Irrigation company restrictions on trade out of the districts they control could result in too much reconfiguration of irrigation. Kerang irrigators would prefer access to an open market.

### **3.6.5 Unfair cost sharing**

Another issue identified by irrigators is the impact of government and society’s changing environmental preferences. Irrigation involves significant modification of river and groundwater systems which, in turn, results in the emergence of modified environments that take on attributes that people come to value.

One example of this is reflected in a government decision to protect the endangered fish – the Murray Hardy Head – that now lives in habitats that did not exist before the commencement of irrigation. Local analysis of the system revealed that it would be possible to reconfigure the supply system and save 2.6 GL water. The presence of the Murray Hardy Head, however, meant that 700 ML of water had to be left in the system so as to maintain the habitat being used by this endangered fish. Some water users are of the opinion that society rather than irrigators should have to pay for the resultant 700 ML of potential water savings for the Murray Hardy Head. These same people consider it illogical that 700 ML of water needs to be kept in a saline environment. “If it is saline, shut it down.”

Another issue of considerable concern to some members of the community has been the construction of lifestyle housing near lakes that form part of the irrigation supply system. While some people are of the view that people who build such “lifestyle” houses should be made to contribute to the costs of supply water to the lakes and other parts of the system they benefit from, others are more concerned that their presence is restricting opportunities to reconfigure supply and distribution arrangements.

### **3.7 Research issues and opportunities**

As part of the consultation process run with the irrigation community in the Pyramid – Hill-Boort Region we asked people for suggestions as to the nature of research that should be undertaken by CRC IF. Research issues and opportunities identified include:

#### **3.7.1 Knowledge base and capacity building**

- Documentation of differences between the irrigation community and administrator knowledge and perspectives about the irrigation industry and its effects on regional economies and the environment
- Development of ways to combine water use data with regional and national data sets
- Better ways to facilitate access to ABS and other data sources.

#### **3.7.2 Water trading issues**

- Assessment of the effects of differences in interstate trading policies on investment and water use in the irrigation industry
- Analysis of the social and economic impacts of water trade on small and large towns

#### **3.7.3 Water infrastructure management**

- Development of benchmarks for the irrigation industry and water supply
- Development of knowledge and technology to assist with the reconfiguration and management of supply systems
- Development of ways to facilitate the consolidation and management of land no longer used for irrigation. Is there a case for land reform or rationalisation?

#### **3.7.4 Others**

- Assessment of the impacts of taxation arrangements on investment in irrigation
- Opportunities for companies to couple water rights with licences to use plants developed by these companies
- Development of opportunities for farmers to be paid for the provision of environmental services

### **3.8 Case study references**

Auditor General (2001). Managing Victoria’s growing salinity problem. Melbourne, Victoria.

Hassall and Associates, Helen Ross and Mary Maher and Associates (2003). Scoping Study: Social Impact Assessment of Possible Increased Environmental Flow Allocations to the River Murray System. Report prepared for MDBC, Hassall and Associates, Sydney, August.

Interim Steering Committee (2003). Future Land Use in the Kerang Swan Hill Area: Inception Working Document. Prepared by Kerang-Swan Hill Future Land Use Pilot Project Interim Steering Committee, with assistance from Rendell McGuckian, Sinclair Knight Merz, Brett Land and Associates, Agriculture Victoria Services, February.

Victorian Government White Paper (2004). Securing Our Water Future Together. Victorian Government Department of Sustainability and Environment, Melbourne, June.

University of Tasmania (2000). Learning Communities in Education and Training, Volume 2, Centre for Research and Learning in Regional Australia.

## **4. Appendix Four – South East of South Australia case study**

### **4.1 Purpose**

The purpose of this report is to provide information about the impact of high level policy reforms on irrigation investment and practice in the South East of South Australia. The information summarised forms part of a series of scoping studies designed to identify, experience and provide contextual understanding of differences between perceived and actual impacts of water reform on the irrigation industry.

The South East case study summarised here is intended to provide a basis for subjective comparison with information collected via three other case studies. These three other case studies are located in the Kerang Pyramid Hill Boort area in Victoria, the Murrumbidgee Irrigation Area in NSW, and the Nogoa-McKenzie-Fitzroy area in Qld.

Issues that this scoping study focuses on include:

- Water sharing/planning processes;
- Water pricing reform;
- Water trading; and
- Impacts of water regulation changes on land use.

This case study was selected primarily because of the South East's experience in the allocation of water to all land-holders as a means to distribute opportunities to derive wealth among them, its experience in developing a way to manage the effects of forestry and other perennial crops on groundwater recharge, the way it has implemented salinity management procedures and its experience with the introduction of groundwater trading.

### **4.2 Background information**

The South East of South Australia is characterised by two contrasting landscapes, the sandy soils of the Upper South East originally supporting low mallee and heath, and the dunal ranges of the Lower South East supporting forests, woodland, grassland and wetland systems. The region has very diverse agricultural activity including forestry, vineyards, seed production, dairying, potatoes, olives, apples, sheep and cattle grazing, aquaculture and dryland cropping including wheat, barley, oats, lupins and canola.

In recent years, the regional economy has experienced simultaneous expansion of viticulture, forestry and dairy farming.

At the risk of over-simplifying a description, most land in the South East sits on top of an unconfined aquifer and several confined aquifers. In many areas, groundwater is relatively close to the surface and accessible at low cost. Quality and depth to groundwater, however, varies considerably.

In some areas groundwater salinity is low, but in most areas salinity needs to be managed with great care. Salinity is one of the most threatening processes in the Upper South East. In some aquifers natural salt levels exceed the concentration of salt in the sea.

There are few surface river water systems and opportunities to irrigate from these systems are rare.

An extensive drainage system comprising of over 1,780 kilometres of drains and 1,200 associated structures is used to drain water from potentially productive land. This system has recently been extended to help address dryland salinity.

## **4.3 History of water reform in the area**

### **4.3.1 Water Administration**

Since 1998, water use in the area has been under the direction of the South East Catchment Water Management Board (SECWMB). In close consultation with the community, the Board develops and reviews Water Allocation Plans, which contain local water allocation and trading rules for four Prescribed Wells Areas (PWA) in the South East. The first surface water allocation plan is nearing completion. Water Allocation Planning Committees, reference groups and other consultative mechanisms have been established to provide the Board with options and recommendations for the allocation of water in each PWA (see Figure 14), and to appreciate the consequences of draft policy on industry, society and the environment.

Amongst other things, the total volume of water that may be used in each PWA is defined by a Permissible Annual Volume (PAV). Water licences to irrigate land are issued in hectare equivalents and defined in terms of a standard crop. The actual area that may be irrigated is a function of the type of crop grown and the way it is irrigated. More recently, allocations have been issued volumetrically. A process of converting all area-based licences into volumetric allocations is underway and expected to be completed by the end of 2006. Licences are transferable within water management areas (hundreds) but not among them.

People may hold either a “holding” licence or a “taking” licence. In order to irrigate an area, an irrigator must acquire a water “taking” licence. Before a water (taking) licence may be issued, a hydro-geological assessment of likely salinity and drawdown effects is conducted. For the unconfined aquifer, this assessment involves examination of the effects of water extraction on a 4 km square around the proposed water point of extraction and use. If assessed impacts are acceptable, a taking licence is issued. To understand how these arrangements work in practice, see Box A4.1.

#### **Box A4.1 Water Trading for Vineyard Expansion**

A grape grower in the Lacepede Kongorong Prescribed Wells Area bought a 26.4 ML water (holding) allocation in 2002 to allow for vineyard expansion. The grower then applied to convert the water (holding) allocation to a water (taking) allocation in order to extract the water and use it on the vineyard. The application passed the hydro-geological assessment and the grower obtained permission for the conversion. The purchase of the water (holding) allocation was dependant on passing the hydro-geological assessment.

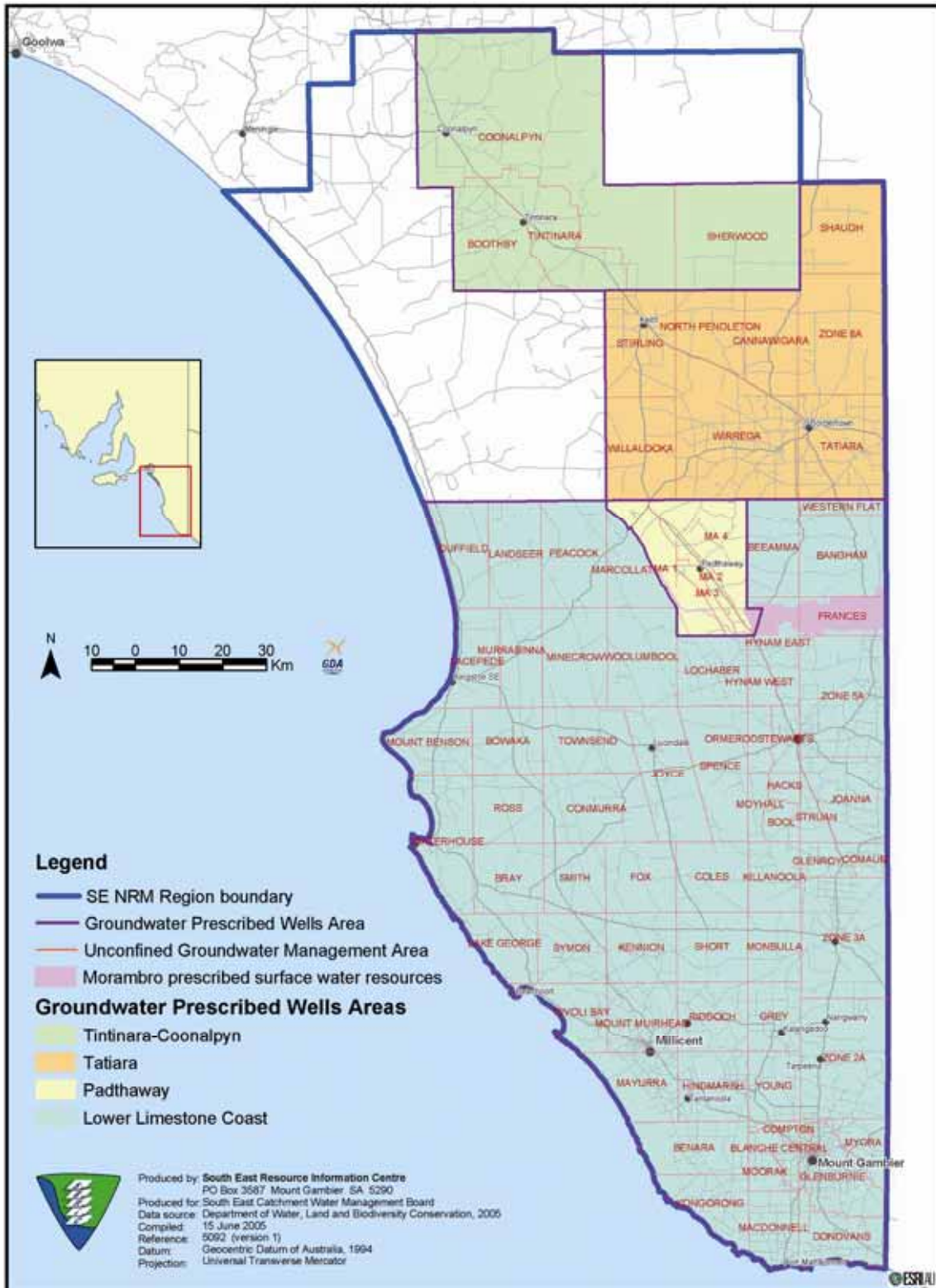
"I bought land in the mid-1990s to establish a vineyard in the area along with a water licence associated with the property" said the grower, "However, by 2002 I no longer had enough water left to expand. A call to the Department of Water, Land and Biodiversity Conservation established that there was no more water available for allocation from the Crown. In order to expand, I had to source a water licence through the water market".

The Department provided the grape grower with names of existing licensees in the management area and the grower contacted each licensee to determine if they were interested in trading their water licence. "Of all those contacted, approximately six licensees expressed some interest in trading", said the grower, "An additional challenge was the lack of information on the value of water licences in my area. Licensees indicated that they would be willing to sell within the range \$4,000 ->\$20,000 per HaE. I began to negotiate, using values from trades in the Coonawarra vineyard area as a guide, and was successful in obtaining the water needed to expand"

*Source: Water Trading in the South East: Benefits and Common Misconceptions (Information sheet no. 1). DWLBC, July 2003.*

Groundwater resources in the Lower South East straddle the Victorian/South Australian border and a bi-lateral agreement has been established to enable both states to manage the area on either side of the border as a single integrated entity. More recently, work has begun to develop a complimentary agreement to incorporate surface water management issues.





**Figure 14. The boundary of South East Catchment Water Management Board**

In June 2004, the South Australian Government placed a threshold on the extent to which commercial forestry plantations would be able to continue to expand without offsetting the groundwater recharge interception effects of increased forestry development on the water balance and hence other water users, particularly licensees. This was achieved by regulation, prescribing plantation forestry as a “*water affecting*

*activity*” and requiring developers to approach local government to obtain a land use permit. The application must be referred to the Minister responsible for water management. Under this permitting policy, once another 59,000 ha of forestry has been established, permits will only be issued when a water holding sufficient to offset the expected impact of the development is quarantined for the life of the development.

In addition to the question of the effects of interception by commercial plantations, a policy to enable the maintenance of water balance in situations where commercial plantations tap into and extract groundwater is being prepared for consideration.

A dominant feature of all catchment management in South Australia was the introduction of catchment levies in 1998. These levies are used to raise much of the money necessary to fund catchment board activities, as described in the comprehensive plan required by the Water Resources Act and approved by the Minister. In the South East, this levy is in two parts. One part relates to the amount of water allocated on each licence; the second part relates to a set charge per rateable local government assessment. This second part is paid by all landholders, including those who own land in towns and those who do not hold a water licence.

### **4.3.2 Water reform processes**

A significant feature of many water reform processes in the South East is that many of the early reforms were community led. One of the first examples of this was the establishment of an agreement to manage water resources across the Victorian/South Australian border in the collective interests of all involved. The major events that have influenced water use in the South East include:

- 1985 - Victoria-South Australia Groundwater Border Agreement
- 1994 – Introduction of water holding licences enabling people to trade and hold water without owning land
- 1997 – The introduction of a new Water Resources Act
- 1997-99–Complex community discussions and several changes to water allocation policy
- 1998 – SEWCMB was established and catchment levies introduced
- 1999 – A Select Committee of SA Parliament recommended that nearly all unallocated water be allocated separately from land in proportion to the area of land held in each PWA
- 2000 – State Water Plan introduced requiring meters to be in place by 2005
- 2000 – Allocation of most unallocated water as holding licences in proportion to the area of land held by eligible applicants
- 2001 – Water Allocation Plans finalised for five Prescribed Wells Areas (all but Tintinara Coonalpyn)
- 2001 – Water market development project commenced, CSIRO report recommends urgent attention to a large number of issues to ensure that ground water use in the South East remains sustainable and the region does not “trade into trouble”<sup>23</sup>
- 2001 – Development of the Morambro Creek Water Allocation Plan began.
- 2003 – Five year Catchment Water Management Plan adopted for 2003 to 2008
- 2003 –Water Allocation Plans finalised for Tintinara Coonalpyn Prescribed Wells Area

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<sup>23</sup> The ideas presented in this report (Young and Hatton McDonald, 2000), following further development were subsequently incorporated into the National Water Initiative.

- 2004 – National Water Initiative endorsed by the SA Government, together with other States and the Commonwealth
- 2004 – Commencement of the review of the five “2001” Water Allocation Plans
- 2004 – Three Prescribed Wells Areas amalgamated
- 2005 – Water Resources Act incorporated into a new Natural Resource Management Act and policy changed to facilitate control of the impacts of forestry and other land uses on water availability

### 4.3.3 Water trading policy

Water trading in the South East has been permitted as a matter of State policy since 1983 and trading separately from land since 1994.

In 2000 the Water Resources Act was amended to allow people to hold a water entitlement without owning land. The licence issued is known as a water (holding) licence. Prior to this time, water (taking) licences and allocations could only be transferred in association with land. It was not possible for a person to hold a water licence without holding an interest in land and holding permission to irrigate that land. The Minister in the interests of all held any water not attached to land.

During the late 1990s, the South East landholders became engaged in a major debate about the best way to allocate water. As reported in the Parliamentary Select Committee report that debate eventually resolved the issue, the

*“... methodology for allocating all water resources in the South East has become the focus of the most intense community debate. This debate is divisive and may have discouraged investment in the South East due to uncertainty about the long term allocation and use of the water resource.*

*9. There are two clearly polarised schools of thought on water allocation within the South East. One school advocates the allocation of water ‘on demand’, with the capability to transfer water allocations on a permanent (sale) or temporary (lease) basis. The other school has called for an allocation policy that relates allocation to landholding. This system is commonly referred to as ‘pro rata’. Many of the second school advocate that no permanent transfer (sale) of water should be permitted, although temporary transfer (lease) may be permitted if the landholder is unable to use, or does not intend to use, the allocated resource. ...*

*12. While there have been numerous issues raised over the methodology used previously to allocate water in the South East, it is generally accepted that the rights of all bona fide existing licensed water users must be protected.*

*16. The Committee notes that under current legislative arrangements it would be very difficult to take action to remove unused water allocations from bona fide licensees, simply on the basis of their level of use” (Select Committee on Water Allocations in the South East, 1999).*

As a result of this Select Committee’s recommendations, a previous decision to commit the South East to groundwater trading and allocate most unallocated water to landholders in proportion to the area of land held was made. In some PWAs, as much as 20% of unallocated water was retained in the form of a Ministerial Reserve. Where possible, a further 10% was retained for the environment. Full accounting for all demands on the water resource was described for the first time in the 2001 WAPs. From 2000, people wishing to irrigate land that did not have a water (taking) licence attached to it either had to buy a water (holding) licence or a water (taking) licence and then obtain permission to transfer it to the area where they wanted to use it.

Another major issue has been a debate about the affects of forestry plus other deep rooted and perennial crops on the quantity of water available for use. More recently this debate has extended to include consideration of the degree to which plantation forestry accesses groundwater tables.

The final major issue that the South East has had to deal with has been the need to convert its area-based licence system into a volumetric system. Once this conversion process has been completed each licence holder will effectively hold a share of the permissible annual volume in each management area.

#### **4.3.4 Economic impacts of water trading**

Before 1997, access to groundwater in the South East was available, generally, on application and issued licences providing the resultant irrigation would not result in an unacceptable salinity impact. By this time, however, the PWAs of Tatiara, Naracoorte Ranges and Padthaway were nearly fully allocated.

Following the allocation of all unallocated water to landholders or a Ministerial Reserve in 2000, the only way to expand irrigation was to acquire or obtain access to an allocation held by someone else. As a result, the SECWMB has sought to promote the development of a transparent water market and invested considerable resources in the explanation of the processes that need to be followed.

How much these policy reforms influenced land value and development is, however, difficult to identify. Essentially, this separation of water and land ownership means that potential rents for water development, after the transaction costs associated with the transfer of water from one location to another, accrue to all landholders. Economic theory would suggest that the introduction of a policy like this would mean that the total amount of development is probably less than it otherwise would have been. But this would only be the case in situations where the cost of acquiring water via such a process would be less than that of acquiring it by application. It is possible that, in practice, the cost of acquiring water from another person is less than the costs of applying for and successfully presenting a case for allocation to the government.

The most extensive review of the impact of water trading in the South East has been undertaken by Peterson (2002). While the volume transferred has been small, it has facilitated the expansion of vineyards and the dairy industry. As discussed below, there are also signs that water trading is starting to influence development of the plantation industry.

Peterson (2002) reports that from 1994 to 2001, there have “been 16 conversions of water (holding) allocations<sup>24</sup> to water (taking) allocations and around 34 transfers of water (holding) allocations across the South East.” The majority of these trades occurred in the Lacepede Kongorong PWA. In short, despite much community angst and debate the volume of actual trading has been quite small. No explanation is given of the reason for this lack of trade but it may be because many existing allocations have yet to be fully used and also because most of the profitable irrigation opportunities are constrained more by soil type and salinity considerations than by water scarcity.<sup>25</sup>

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<sup>24</sup> There are approximately 1100 water holding licences in the South East.

<sup>25</sup> The Coonawarra wine district, for example, is defined by the presence or absence of terra rosa soils and a 4km by 4 km test of likely salinity impacts. Almost all irrigation development opportunities in the area were taken up many years ago.

There is some evidence, however, that the uncertainty around water policy may have some influence on the location of forestry investments and the degree to which investment has occurred.

## **4.4 Perception**

### **4.4.1 Overall impact of high level reforms**

The first impression that one gets from talking to people about water in the South East is that many people regard access to water for irrigation and related purposes as a way to make significant amounts of money. This has been both a cause for optimism and for angst within the community. High level water policy reform processes have been tangled up in this highly political process.

A major community debate during the late 1990s occurred over the most appropriate way to distribute opportunities to profit from irrigation. Consultation with many people in the community suggests that this debate may have delayed investment in the South East. But there is little evidence to suggest that this debate has had a lasting impact on investment. In retrospect, however, it is possible to argue that the ultimate result of the very public debates about the allocation of water has increased awareness of the extent of the economic opportunities associated with irrigation. If this is true then more – not less – investment may have occurred.

While there is little evidence of a lasting impact on investment of changes in allocation policy, it is clear that the processes followed have caused deep rifts in the community that will take years to heal. There is a strong sense of inequity, unfairness and division. Another major impact has been a dramatic increase in community awareness of the effects of one water user on another and recognition of the importance of keeping the total volume of all entitlements issued within biophysical limits.

The planning processes imposed on the community by the legislation and also the introduction of a Catchment Management Board seems to have been well received. The main perception here is that outcomes would have been better if high level reformers had trusted the catchment planning processes they put in place and not become involved in implementation detail.

The main pricing (a catchment levy) and the introduction of water trading have been well received. They are not perceived to have had adverse impacts and the available evidence seems to support this view.

### **4.4.2 Managing with minimal information**

In the South East a network of 1,100 monitoring wells has been in place for over 30 years, measured quarterly, and used to develop a good understanding of the way aquifers in the region function. Nevertheless, one feature that differentiates the South East from irrigation in many other parts of Australia is their willingness to rely upon expert judgements to develop a highly effective set of allocation policies and irrigation management policies. All people involved are quick to point to the benefits of putting relatively simple management systems in place. They are convinced that this pragmatic approach has kept most investment within sustainable limits.

In particular:

- All water taking licences were defined in irrigation equivalents in a manner that enabled relatively easy conversion to volumetric allocations as and when appropriate
- A 4km by 4 km square test was put in place to facilitate pragmatic control of salinity impacts and aquifer draw down
- Management plans are used to define a sustainable yield in volumetric terms and then from this identify limits on the area that may be irrigated and number of hectare equivalents that may be irrigated.

Irrigators are unanimous that this pragmatic approach and attention to design detail has encouraged the rational development of the available resource.

The main challenge the community now faces is to decide how sophisticated the South East's water allocation system should be. Conceptually, as sophistication increases so do opportunities for development, but at the same time, the costs of maintaining the system also increase.

Many irrigators are of the view that the "current area based allocation system is fine." Some are of the view that conversion to a volumetric allocation system is being undertaken mainly because the State Water Plan requires it rather than because it will produce net benefits. "Why do we have to convert to a volumetric system? Where is the gain?" Others are concerned that conversion will reduce the opportunities available to them. There is, however, a clear perception that "in the future much more information will be needed." "Information plays a critical role in reducing the gap between perception and reality."

#### **4.4.3 Water allocation**

As noted above, the recent history of water allocation in the South East has involved intense community debate. As one person put it to us, "there is a sense of community divide. There are the haves and the have-nots." The initial processes used to allocate water were to respond to applications for access to water. Applicants needed to present a development proposal and, in doing so, often obtained letters from banks etc to support their case. If the proposal was judged by a panel to have merit, a taking licence was issued. Typically, these licences were subject to a condition that the proposed development be implemented within a reasonable period of time. While the initial expectation was that people who did not undertake the proposed development within the stated time period their taking licenses would be cancelled, in practice, no licences were cancelled<sup>26</sup>. As a result, a sense of unfairness prevailed. Today, a sense that this process brought out the worst in people still remains. "Some people got allocations they shouldn't of. ... If you could prove a financial commitment and support from a bank you got an allocation. This was particularly unfair for those who did not need to borrow money."

Another impact was a decision by some people to make an investment simply to get access to water. As a result, there are a number of centre pivots "rusting in paddocks." "Others believe that the roll out of holding licences is denying people the opportunity to have a go."

Angst, mistrust and a sense that *all* landholders in the community should be allowed to benefit from emerging opportunities to irrigate resulted in a political debate that was

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<sup>26</sup> There is a proposal that the Minister can cancel some water taking licenses that have not been taken up so that others can develop land in the same area.

ended by a Parliamentary Select Committee that reported in 1999. But before resolving the debate, some irrigators consider that the processes they used may have worsened attitudes. “Traditional irrigators still feel that the community is against them...Dryland farmers are seen as the enemy. ...The process became very political.” ... “It may take 50 years to overcome the rifts that the processes used created.”

Arguably, Government adoption of the Select Committee’s recommendation to distribute most unused water among all landholders increased the cost of undertaking a development. In practice, however, there is little evidence that this policy change was sufficient to slow investment. The people we consulted were unable to identify investments that were substantially affected by this decision. As noted elsewhere, in much of the South East, soil quality and salinity rather than water scarcity, seem to be the main constraint on irrigation development.

When consulted, however, irrigators are quick to point out that it is important to manage community perceptions of the impacts of policy on community well-being. Many are waiting to see the benefits of the decision to allocate all unallocated water on a *pro rata* basis. Others are aware that, once fully implemented the options available to them will be less and they may have to start purchasing water they were previously able to access for free. In virtually all cases, however, all expect to continue to irrigate although they may adopt more efficient technology.

#### **4.4.4 Water trading and the costs of holding water**

Board staff reported that the development of water trading arrangements in the South East has been aided significantly by the presence of a high level policy requirement to allow water trading. This is particularly useful when confronted by people that are strongly opposed to the concept.

Water trading, while still in its infancy in the South East, has allowed significant development in the region. There is, however, a perception that the arrangements in place are still too restrictive. Irrigators we consulted complained that it is not yet possible to get development approval without first securing a holding: “Water is not separate from land. You can’t get approval until it is attached to land.” ...“This is a stifling development.”

Some people are also of the opinion that government charges for water trading are too high and discourage investment and sensible land use practice.<sup>27</sup> One example of this is the potato industry which has been allowed to hold a mobile licence permitting them to irrigate at any location within a management area. They are now complaining that the need to trade water to new locations as they move is acting as a significant deterrent. As one person said to us, the cost of moving water from one location to another is making him seriously reconsider whether or not to remain in the industry.

Another issue is the fact taking licences state the way that water must be used. For example, a taking licence may require that the water be used for flood irrigation. This means that if one wants to convert to spray or drip irrigation he has to apply for permission to do this. In an ideal world, some of irrigators argue that “people should not have to apply for permission to do this.” Others are aware that changes on one farm can have very adverse effects on another and are keen to have their interests protected by such processes.

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<sup>27</sup> The Board is involved in the development of policy but normally does not get involved with individual trades.

A related issue is the cost of holding but not using water. At present, people are required to pay a catchment levy in proportion to the volume of water they are entitled to use. Some people comment that this is too expensive nevertheless these same people are not prepared to sell their water to others in order to avoid paying the levy. One of the reasons stated for this is that the groundwater market is too thin. That is, “if you sell it you may not be able to get it back.”

#### **4.4.5 Certainty and investment**

According to the Board, community and irrigation industry representatives, the water management planning processes used in the South East have clarified and hence improved investment. “One of the clear benefits of the planning process is that the Minister cannot change the plan on whim.”<sup>28</sup>

Catchment Management Board and irrigation community representatives argue that one of the major benefits of the water allocation planning processes now used in the South East is that plans prevent *ad hoc* changes in policy. Before plans were implemented it was possible for policy to be changed in response to a high level policy direction. Once plans are in place, however, and unless a critical situation emerges, policy change is possible only by modifying the plan and only after a process of consultation and review.

Plans are made for five years and, towards the end of this period, are subject to review. While some are fearful that this review process may result in adverse decisions being made, Board staff report that it is difficult to attract people to meetings – even though it is Board policy to reimburse people for the cost of attending meetings. These same staff suggest that this may be one of the best indicators of the extent of satisfaction with the current system. If people are not prepared to attend meetings then they either think that the process is so flawed that engagement will make no difference or that things are so good that “there is nothing to add value to.” Discussions with irrigators and community representatives suggest that there appears to be a high degree of satisfaction and considerable trust that those involved will get it right.

“The community has learnt the hard way that it is important to plan carefully and follow due process. Highly political processes such as those run by the previously mentioned Parliamentary Select Committee tend to be highly political and destructive for the communities involved.” In retrospect those we consulted were of the opinion that the Board, not Parliament, should have been left to work out how to allocate water in the South East. “The eventual decision worked out well but the process could have been better.”

#### **4.4.6 Specific problems**

Investment appears to be most compromised in areas where there are severe salinity problems such as in the Upper South East and in areas where the available water is fully utilised such as near Mount Gambier.

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<sup>28</sup> This is not strictly correct but if a Minister wants to change a plan outside the normal review process it would take around two years to make a change. The Act requires a review to be held every five years but does not require an amendment to be made.



With regard to uncertainty, one irrigator did draw attention to the way bridging licences in Tintinara Coonalpyn are worded. He claimed, perhaps correctly, that the department had not given enough consideration to the way licences are worded. The amount in question is actually an estimate of water that is extracted but is expected to return to the aquifer. The words on the licence suggested that the permissions given were very much of a transitional nature and not likely to continue into the future. One irrigator from the Upper South East, indicated that licence wording was making it difficult for him to borrow money and would cause serious problems if he wanted to sell his property.

#### **4.4.7 Water use efficiency and development**

When probed about the issues most talked about by irrigators, one issue that is raised is the nature and effects of increasing public demand for irrigators to increase the efficiency of water use. A number of irrigators consulted through this project expressed the view that in a groundwater system where so called “inefficiently used water” returns to the aquifer there is no environmental or resource allocation problem. “Efficiency in water use produces no environmental benefit.” ... “Flood irrigation is no more harmful than spray or drip irrigation.” They go on to stress that water is only one input to a complex production system. In practice, virtually all irrigators in the South East are aware of this fact. Nevertheless, they remain fearful that public failure to understand this economic reality could cause high level policy makers to impose unnecessary or inappropriate restrictions on irrigation. They are also fearful that “the result may be a cut in allocations.” Increased cost and loss of economic activity could be the outcome. They are particularly fearful that high level decision makers may unintentionally assume that aquifer management is the same as river management and force adoption of policies that are not in the interests of groundwater users.

#### **4.4.8 Irrigation and forestry interactions**

A related issue of critical importance to the South East has been the development of plantation forestry in the Lower South East. Following changes to the Income Tax Assessment Act in 1999, opportunities to develop blue gum plantations emerged. Access to relatively low cost land in a high rainfall area, and to a nearby port such as Portland, were the necessary conditions for investment. Land in the Lower South East of South Australia and across the border in Victoria met these criteria and investment resulted. A spike in annual planting of 35,000 ha per annum caused immediate concern amongst water resource managers and scientists. Intense debate began about the potential effects of this development in the region. Scientists and water resources managers began to reason that, as a result of both the interception of rainfall and tree roots tapping into shallow aquifers, increased plantation forestry would reduce groundwater stocks. The dairying industry was particularly concerned as a result of a separate dairy industry reform process. The industry was expanding in the Lower South East. If forestry were allowed to expand without securing water then ultimately the dairy industry would be forced against its wishes to contract.

As described above, after nearly four years of debate and considerable scientific investigation, arrangements were put in place to manage the effect of all significant water affecting industries on one another. A level playing field was established which is different from the previous situation where, in effect, all dryland land users had a prior right to the water they intercepted.

Industry representatives stress first that the plantation industry expansion associated with managed investment schemes is influenced most by income tax policy and, particularly, the time frames within which trees have to be planted. Nevertheless, some industry representatives appear to be of the view that the emergence of concerns

about potential impacts of plantation forestry on groundwater stocks probably resulted initially in slightly more investment in Victoria than in South Australia. Another interpretation offered, was that the increase in investment in Victoria was due to greater land availability.

The debate about the interception impacts of commercial plantations was resolved by setting a threshold or limit on the areas of new plantations that could be established in each management area. Nevertheless, some forestry industry representatives regularly state and are clearly of the view that such a policy approach is inappropriate. In their view, the allocation of previously unallocated water to landholders was entirely unnecessary and totally inappropriate. In their view, they have a prior right to plant trees. “The *pro rata* roll out of unallocated water caused an unnecessary problem. The government made a rod for its own back.” Indeed, one company board member has stated to his local employees that if he had known about the “forest-impacts-on-groundwater” debate his company would have taken their money elsewhere. This highlights the nature of the effects that policy uncertainty can have on investment.

One surprising forest industry response to the entire debate about the impacts of forestry on groundwater stocks is a well articulated response that they do not want to hold water rights. If absolutely necessary and where reliable science has demonstrated an impact, the industry seems to be suggesting that they would prefer an arrangement that permits them to off-set assessed impacts on a case by case basis. Many in the industry, however, consider that the science is still too unreliable to enable impacts to be assessed. The best available science – that summarised in Dillon *et al.* (2000) and developed further by Benyon and Doody (2004) – in their view is too limited to permit the development of offset policies. Board representatives, however, point out that they are required to take a precautionary approach to the management of such issues. “Decisions can and should be made – even if there is a low degree of confidence associated with the available science.” As one person said, “it is better to get it roughly right than totally wrong.”

As with the rest of the South East, however, it is difficult to find examples of adverse impacts of irrigation or forestry practice on the regional economy and relatively easy to point to cases where in comparison with the rest of Australia sensible decisions have been made at a rate and in a manner that has facilitated continued development.

## **4.5 Research issues and opportunities**

As part of the consultation process run with the irrigation community in the South East of South Australia, we asked people for suggestions as to the nature of research that should be undertaken by CRC IF. Research issues and opportunities identified include:

### **4.5.1 NRM and salinity issues**

- The development of more efficient and cost effective ways to manage salinity including consideration of the development of a tradeable salinity credit system
- Management of nitrate and contaminants other than salt on opportunities to use water
- Impacts of water trading on ground water salinity
- Risk management approaches of salinity impacts in fully allocated but underutilised 4 km squares

#### **4.5.2 Water allocation and trading**

- Development of improved models that improve understanding about the nature of flows to the sea via groundwater and surface drainage systems
- Consideration of the benefits of unbundling land use control and salinity management from the volumetric allocation of water
- The design and development of fair, equitable and efficient ways to account for the un-meterable effects of land use (interception and extraction) on groundwater stocks
- Assessment of tradeoffs between complexity in allocation policy and net benefits to regional development
- Equitable and efficient ways to reduce over-allocation of groundwater resources

#### **4.5.3 Social and economic impacts of water policy reform**

- Consideration of the costs and benefits of including environmental allocations in the irrigation water trading system – can we have smart management of drainage systems?
- Assessment of the impacts of the water allocation, trading, and use on the regional economy and community well being
- Effects of the costs of water trading and allocation policies on land value
- Economic impacts of allowing people to hold water without using it – would the South East be better off without unused holding allocations?

#### **4.5.4 Interface between forestry and irrigation**

- Impacts of plantation forestry and other plants on groundwater stocks as a result of rainfall interception and extraction by deep roots accessing aquifers
- Development of cost-effective ways to off-set the effects of plantations on groundwater stocks
- Effects of the likelihood of retrospective decisions on investment – should previous investments be protected from changes in policy?
- Effects of irrigation on soil productivity – why is tree growth low on previously irrigated land?

#### **4.5.5 Technology**

- Remote sensing of groundwater use / impact by certain land uses in certain seasons
- Remote reading of water use meters
- Influence of charges, levies and fees on behaviour and opportunities to use them to encourage more desirable responses

### **4.6 Case study references**

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