

Disclaimer

This report has been generated as part of the Living Murray initiative. Its contents do not represent the position of the Murray-Darling Basin Commission. It is presented as a document which informed discussion for improved management of the Basin's natural resources in November 2003.

Preparation of the social impact assessment scoping and profiling studies preceded the Living Murray First Step decision and the signing on 25 June 2004 at the Council of Australian Governments meeting of the *Intergovernmental Agreement on Addressing Water Overallocation and Achieving Environmental Objectives in the Murray-Darling Basin*. The communiqué from this COAG meeting is provided at www.coag.gov.au. These decisions provide the framework under which \$500m will be invested by governments over 5 years to begin addressing water overallocation in the Murray-Darling Basin and achieve specific environmental outcomes in the Murray-Darling Basin.

The first priority for this investment will be water recovery for six significant ecological assets first identified by the Murray-Darling Basin Ministerial Council in November 2003: the Barmah-Millewa Forest, Gunbower and Koondrook-Perricoota Forests, Hattah Lakes, Chowilla floodplain, the Lindsay-Wallpolla system, the Murray Mouth, Coorong and Lower Lakes, and the River Murray Channel.

The water will come from a matrix of options with a priority for on-farm initiatives, efficiency gains, infrastructure improvements and rationalisation, and market based approaches, and purchase of water from willing sellers, rather than by way of compulsory acquisition.

Consequently, the assumptions that were made to enable the social impact assessment scoping and profiling studies to be undertaken in mid 2003, while reasonable at the time, have been overtaken by these decisions and the consequential benefits that will flow from them. As such, whilst being an important contribution, this report cannot fully and accurately represent the social issues arising from the Living Murray initiative.

**DEVELOPMENT OF A FRAMEWORK FOR
SOCIAL IMPACT ASSESSMENT
IN THE LIVING MURRAY:
WATER RECOVERY IN THE
MURRAY IRRIGATION AREA OF NSW**

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EXECUTIVE SUMMARY

The primary objective of this study was the development of a conceptual framework for undertaking social impact assessment (SIA) of water recovery in the context of the Living Murray (TLM). The study was undertaken before Ministerial Council announced the first step decision on the 14th of November 2003.

On the basis of the conceptual framework, the procedural steps integral to a SIA were then undertaken in an example region – the area covered by Murray Irrigation Limited (MIL) - in order to illustrate the framework and to identify and examine appropriate methodological approaches that could be used.

The methodology was based on individual interviews undertaken with key informants from the Murray Irrigation area and the use of appropriate secondary data. The interview process was undertaken in two phases. Phase 1 focussed on the identification of issues, social impacts and framework development, while Phase 2 focussed on the prediction and evaluation of impacts.

The executive summary describes several key study findings and outcomes including

- the development of a conceptual model for SIA and water recovery,
- a discussion of the methodology and outcomes of implementing the SIA framework, including scoping, profiling, prediction, evaluation and mitigation, and
- a summary of findings associated with specific hypotheses that were tested against the literature and field research.

Conceptual Framework for Social Impact Assessment

The framework that has been developed for undertaking SIA in relation to TLM and water recovery may be broadly applicable to other areas and regions. However there are several contextual issues that are specific to the geographic location and objectives of this study. These contextual issues may constrain the scope and generalisability of the framework and include the following:

- no reference was made to a possible first step water recovery decision or the scale of any possible first step proposal during the key informant interviews, and many of those interviews assumed that water recovery would be larger than actually proposed in the first step;
- social and economic trends exist in rural communities which are often independent of TLM;
- irrigated agriculture operates within a dynamic commercial environment;
- the work was conducted during a drought;
- the analysis focussed on issues related to water sourcing rather other issues in TLM including environmental benefits; and
- the section of the River Murray adjacent to Murray Irrigation Limited is relatively healthy, and the belief of the need for enhanced environmental flows within this community is less than exists in downstream communities.

Figure A shows the conceptual framework that has been developed and which integrates both substantive issues in relation to the type of social impacts that may occur (risk shadow) and procedural issues (process shadow) between the community and other stakeholders and interest groups. Recognising the contextual issues that have been described, the conceptual framework and the concepts that have been used may be generalised to other locations and contexts. However the specific attributes underpinning each of the concepts as shown in Figure A may well vary when the framework is applied in different regions and contexts.

The central horizontal axis of the framework as depicted in Figure A, shows TLM and the development of water recovery options. While there is uncertainty as to the type of water recovery that may be introduced, it is anticipated that there may be potential social impacts associated with their introduction, which will be predicted and evaluated as part of the social impact assessment process.

Even with uncertainty in relation to the type of water recovery mechanisms that may be implemented, the community within the MIL area was found to be concerned about potential social impacts. The uncertainty itself is an important issue in the identification and prediction of impacts as it was clear that several of the key informants, given the uncertainty that existed, expected the worst in relation to both the type and magnitude of impacts.

As shown in Figure A, precursor impacts (which are identified through community experience with past events such as the withdrawal of government services and the recent drought), create a “risk shadow” and are used by the community as a basis for identifying potential social impacts that may occur as a consequence of the introduction of different water recovery mechanisms.

It was also apparent from the key informant interviews that procedural issues play a significant role in community assessment of potential social impacts. In contrast to the ‘risk shadow’ associated with identification of potential impacts, procedural issues created a similar ‘process shadow’. As shown in Figure A, many of the potential social impacts that were identified were attributed by key informants to the activities of external groups. Procedural issues underpinning relationships with these groups, include:

- **Trust:** A belief that there was little trust in the relationship with external groups;
- **Transparency:** A belief that the decision making processes lacked transparency;
- **Procedural fairness:** A belief that there had been unfair influence on the decision making process by external groups;
- **Distributional fairness:** A belief that while there were broad social benefits associated with the water reform process, the impacts of this process were unfairly distributed across the Australian community, with farming communities absorbing the greatest impacts;
- **Neutrality:** A belief that agencies such as the MDBC had been influenced by external groups and that they should maintain their neutrality in the process;
- **Knowledge:** A belief that external groups had limited knowledge of water and rural issues; and
- **Knowledge Systems:** This issue focussed on the conflict between local and ‘science based’ knowledge systems and that findings of “The Science” was often in conflict with local knowledge.

Figure A also shows that while elements within the risk and process shadows contribute to community identification of potential social impacts and their likelihood, magnitude and evaluation, they also undoubtedly help explain community response and behaviour in relation to TLM.

Figure A also highlights that while potential social impacts associated with different water recovery options may be identified and predicted, the acceptability of the impacts will be very much dependent upon (a) the procedural issues as identified above and (b) the resilience of communities to adjust or adapt to change.

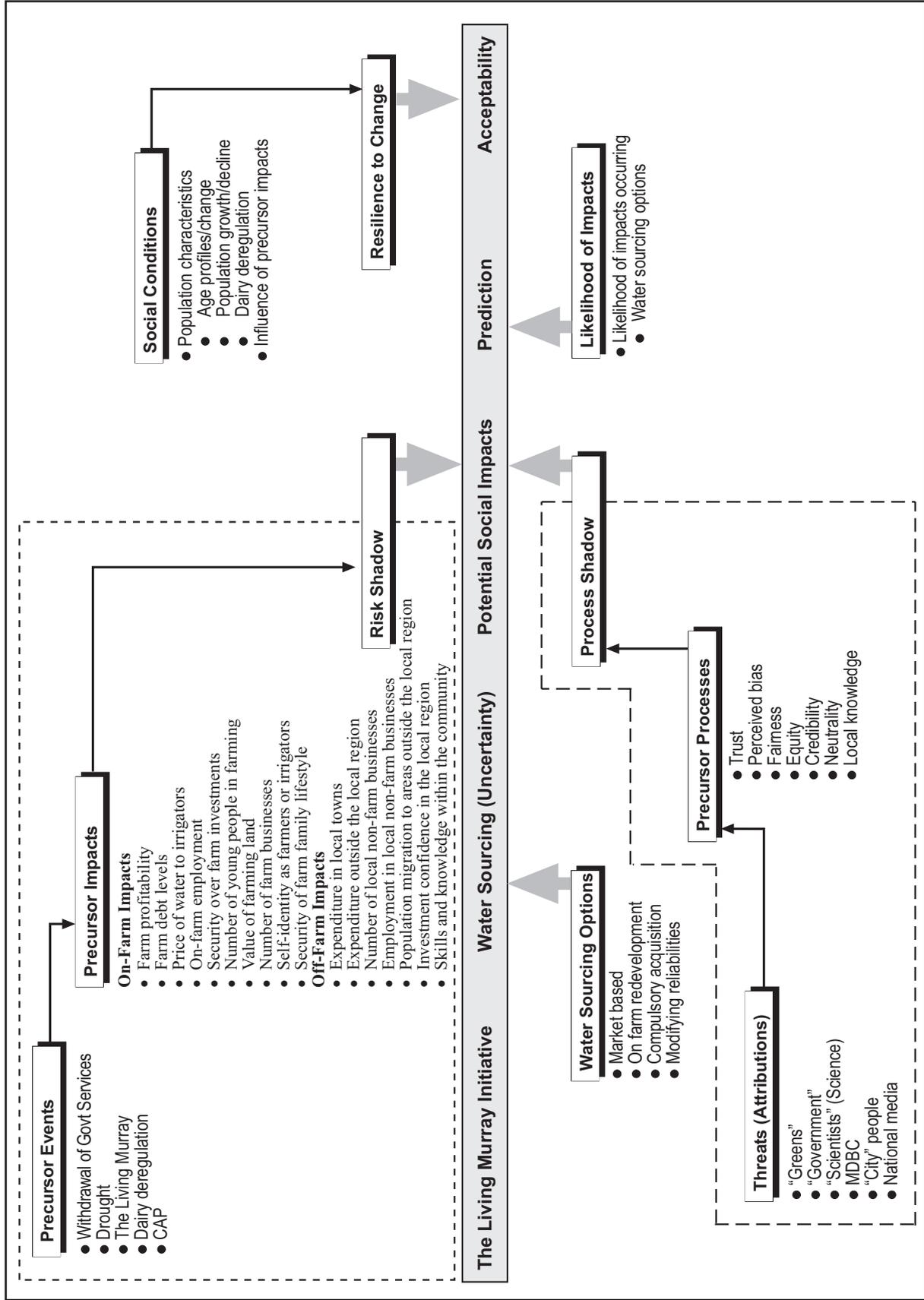


Figure A. Preliminary Conceptual Framework for the Social Impact Assessment of Water Recovery

As previously indicated, the primary objective of the research was the development of a conceptual framework for SIA in relation to water recovery. In the process of developing the framework within the MIL area, a preliminary assessment of social impacts was made. These are described in relation to each of the phases of the SIA.

Scoping

During unstructured interviews, key informants' issues (Table A) and impacts (Table B) associated with four water recovery mechanisms were discussed.

Issues raised in relation to compulsory acquisition with compensation included questions about how the value of compensation was to be determined. In the market based approach a common issue raised by participants was the need for transparency in any water trading process and the requirement to identify regulatory controls in the process in order to address any potential negative impacts.

The change to higher water reliabilities was often associated with the change to higher value crops where the critical issue was the capacity of existing physical and human infrastructure and the knowledge and skill capacity of farmers to shift to these higher value crops. The issues associated with on-farm and regional supply system redevelopment focused more so on the ability to identify further opportunities for water savings.

Table A. Water Recovery Mechanisms: Summary of Implementation Issues

Water Recovery Mechanism
Compulsory Acquisition (with compensation) <ul style="list-style-type: none"> • Determining the value of compensation
Market Based Approaches <ul style="list-style-type: none"> • Need for transparent water trading processes • Need for controls or regulation on market based approach to address process of water trading and potential impacts
Increases in Reliabilities (Change to Higher Value Crops) <ul style="list-style-type: none"> • Need to be undertaken over extended time period • Limited industry infrastructure for new high value crops • May often require significant increase in employment • Limited knowledge, skills and experience to undertake change • As volume of production increases, value of crops may reduce
On Farm Redevelopment <ul style="list-style-type: none"> • Limited opportunities for further improvements in on farm water efficiencies
Regional Supply System Redevelopment <ul style="list-style-type: none"> • Limited opportunities for further improvements in regional system efficiencies

Source: EBC (2003)

Table B provides a summary of the potential social impacts associated with three water recovery mechanisms as no impacts were raised in relation to on-farm and supply system redevelopment. Issues associated with the spatial reallocation and distribution of compensation and water sales income to areas outside the local region were raised in relation to both compulsory acquisition and the market based approach.

Table B. Water Recovery Mechanisms: Summary of Potential Impacts

Water Recovery Mechanism
Compulsory Acquisition (with compensation)
<ul style="list-style-type: none">• Potential distribution of compensation income and associated expenditure outside the region• Loss of population (migration of farm families outside the region)• Impact on self identity of farmers and potential loss of self identity• Potential for stranded farm irrigation assets
Market Based Approaches
<ul style="list-style-type: none">• Potential distribution of income from water sales and associated expenditure outside the region• Potential for stranded farm irrigation assets• Potential impacts on the value of previously irrigated land (including impacts on rates base and Local Government service provision)• Potential increase in the price of water
Increases in Reliabilities (Change to Higher Value Crops)
<ul style="list-style-type: none">• No production income during establishment phase

Source: EBC (2003)

Other social impacts were identified and discussed independently of the water recovery mechanisms and Table C provides a summary of the main potential social impacts identified by key informants. In all cases the key informant interviews clearly distinguished but recognised the interaction between on-farm and off-farm impacts.

Table C. Social Impacts Identified through Key-Informant Interviews

On-Farm Impacts
<ul style="list-style-type: none">• Decrease in farm profitability• Increase in farm debt levels• Increase in the price of water to irrigators• Decrease in on-farm employment• Decrease in security over farm business investments• Decrease in the number of young people in farming• Decrease in the value of farming land• Decrease in the number of farm businesses in the region• Loss of self-identity as farmers or irrigators• Security of farm family lifestyle
Off-Farm Impacts
<ul style="list-style-type: none">• Decrease in expenditure on goods and services in local towns• Increase in expenditure outside the local region• Decrease in the number of local non-farm businesses• Decrease in employment in local non-farm businesses• Increase in population migration to areas outside the local region• Decrease in investment confidence in the local region• Decrease in available skills and knowledge within the community (human capital)• The value of water traded

Source: EBC (2003).

Profiling

The profiling phase generally supported many of the beliefs raised by key informants in relation to recent changes in the population, workforce, and business activity within the MIL area. The most significant trends are associated with a declining population and a population trend with fewer young people and an increasing number of older and elderly people. Somewhat related to this change is the reduction in school enrolments and number of businesses within many of the regional towns and communities.

Although impacted by the recent drought, income levels (individual, family and household) have increased and are now similar to the average for NSW. In addition labour force participation has remained relatively constant over recent years. Unemployment levels in recent years have decreased as they have done throughout Australia and unemployment levels within the region are now below the NSW State average, although movement of the unemployed outside of the area in search of employment may partly explain the lower unemployment levels.

Prediction of Impacts

The use of key informants to provide judgements on the likelihood of impacts associated with water recovery scenarios, while informative, nevertheless indicated the complexity of the issue and the need for additional methods to be used in the prediction phase of the assessment.

In relation to compulsory acquisition and on-farm impacts the three impacts key informants consider most likely to occur were decreases in farm profitability, the number of farm businesses and on-farm employment. Impacts in relation to the market-based approach were similar, however a decrease in farm profitability was no longer predicted, although an increase in the price of water to irrigators became a significant issue.

In relation to off-farm impacts, under compulsory acquisition the most likely impacts that were predicted were a decrease in the number of local non-farm businesses and employment in non-farm businesses. In contrast under the market based approach, off-farm impacts likely to occur were distributional and relate to increased expenditure outside the region and an increase in population migration outside the region.

There is also some indication, although again it is based on initial and limited data and information, that fewer on-farm impacts were predicted with a market-based approach when compared to an approach based on compulsory acquisition.

Evaluation (Acceptability of Impacts)

Through the development of the SIA framework it was evident that community acceptability of social impacts associated with water recovery mechanisms will be dependent upon two key issues. These are (i) the extent to which procedural issues, such as fairness, equity and meaningful community involvement in the decision making process can be addressed, and (ii) the resilience of the community and its ability to adapt to or adjust to the impacts that might occur.

Although based on a limited number of key informants, judgements of the acceptability of social impacts made by key informants indicated that for both compulsory acquisition and market-based approaches a decrease in farm profitability was the least acceptable on-farm impact. In relation to off-farm impacts key informants appeared to be most concerned with population migration outside the local area which is already evident and while somewhat independent of TLM, nevertheless represents an additional cumulative impact to potential TLM impacts.

Mitigation and Policy Implications

As this report focuses on the development of a framework for SIA it is not possible to fully describe all mitigation and policy implications, as a full and complete SIA has not been undertaken.

A summary of water recovery implementation issues has been described in Table A and potential impacts of specific water recovery mechanisms described in Tables B and C. Similarly several procedural issues have also been identified in the development of the conceptual framework. This information has significant implications in relation to policy

associated with the development, implementation and operational aspects of specific water recovery options.

For example, in the development of market-based approaches policy may be directed at implementing transparent water trading processes, the development of incentives to retain income from the sale of water in local regions and the use of exit fees to address the potential for stranded irrigation system assets. Similarly any movement to higher value crops through increases in reliabilities may require policy directed at the development of farm and industry infrastructure and capacity and skill development amongst farmers and primary industries.

In relation to procedural issues there are also significant policy issues including for example the need for policy with a greater focus on the communication of scientific knowledge to local communities; the use of local knowledge in the development, implementation and operational aspects of specific water recovery options and most importantly policy directed at developing effective and meaningful community involvement processes. Given the heightened concern about procedural issues amongst many stakeholders it is clearly apparent that there is a requirement for policy to be directed at the development of a detailed community involvement process that addresses the procedural issues that have been raised in this assessment.

Hypotheses for testing

Five core hypotheses for testing were identified in the SIA project brief. Previous research literature was used to address each hypothesis and summary statements in relation to each hypothesis are provided below.

1. *That involvement of stakeholders in informing interventions and implementing interventions receives more positive feedback overall toward resource allocation changes than the alternative.*
 - Involvement of stakeholders alone does not necessarily yield positive feedback towards resource allocation changes. What is important is that positive perceptions of the decision-making procedures in which participants are involved will often result in positive judgements of the final policies and decisions that are developed from the process.
2. *That voluntary participation in a resource allocation change receives more positive feedback overall than compulsory changes.*
 - A consistent research finding is that people will be more concerned about risks and impacts that are imposed and over which they have little control and less concerned about risks and impacts when they voluntarily participate.
3. *That an intervention to change resource allocation that is phased in over a timeframe negotiated with stakeholders receives more positive feedback than those imposed suddenly.*
 - Previous research and information drawn from key informant interviews suggests a negotiated and phased approach will receive more positive feedback than a change in resource allocation which is introduced suddenly.
4. *That those with greatest dependency on the resource and lowest resilience to change tend to be the most strongly against any intervention to change natural resource management.*

- There is little if any research evidence that integrates resource dependency, resilience, and attitudes towards resource allocation decisions. One might reasonably expect opposition to interventions that reduce resource access as has previously occurred in the logging, timber and fishing industries, however the extent to which resilience moderates this relationship is unclear.
- 5 *That perceptions of fairness of a decision by stakeholders is related to the amount of information provided to the stakeholders, whether they could participate voluntarily, whether they had an opportunity to plan and adjust as the intervention was made, and whether all stakeholders were subjected to the same set of rules.*
- Firstly, rather than the “amount of information being provided to stakeholders” being critical in the judgment of fairness, what appears to be important is the accuracy of the information that is provided.
 - Secondly, while previous research does not identify voluntary participation as a criteria underpinning fairness judgements, it would be counter intuitive to expect that fairness judgments about a decision would be improved through forced or compulsory participation.
 - Thirdly previous research suggests the need for consistency in the application of procedures across time and across individuals is related to perceptions of fairness by stakeholders.
 - Fourthly, findings that fairness is improved when participants are given an opportunity to correct and modify a decision after it is made supports the statement that the fairness of a decision is related to whether “participants are given an opportunity to plan and adjust to the intervention”.

Through research involved in the development of the conceptual model and the review of hypotheses in the context of the previous literature it is evident that knowledge of social impacts and procedural issues have important implications in the development and application of policy outcomes. As shown in Figure B, this includes improved decision making in relation to water recovery, the development of improved adjustment strategies which may be used to mitigate against any potential impacts and greater community acceptance of decisions through improved community involvement and engagement processes.

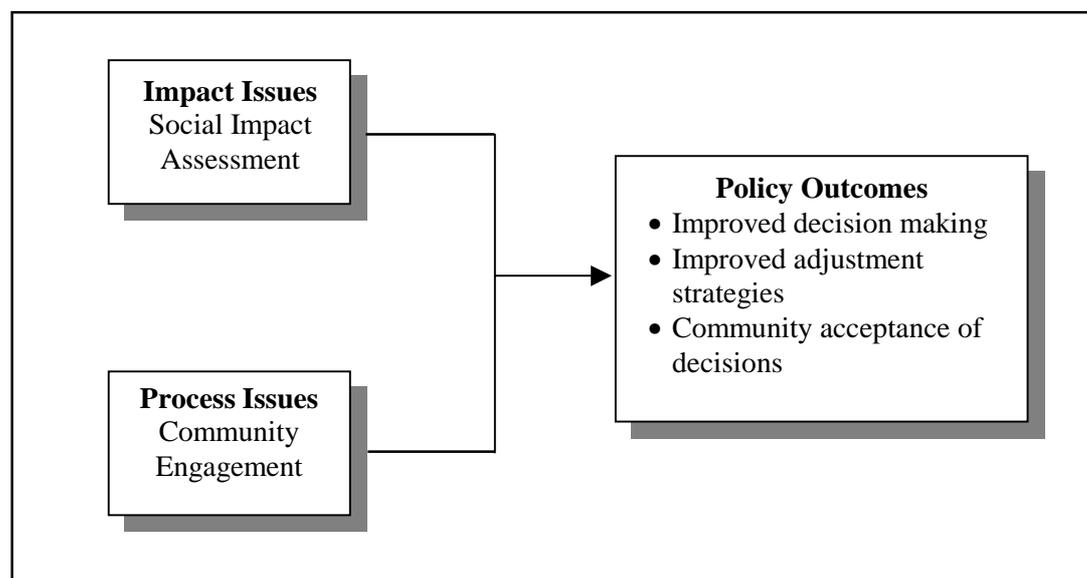


Figure B. The Influence of Social Impact Assessment and Community Engagement on Policy Outcomes

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1 INTRODUCTION

The primary objective of this report was the development of a conceptual framework for undertaking social impact assessment (SIA) research in the context of the Living Murray (TLM) and options in relation to water recovery¹. Once the conceptual framework was developed the procedural steps integral to a SIA were then undertaken in order to illustrate the framework and to identify and examine appropriate methodological approaches that could be used.

The development of the framework also extends previous social impact assessment studies undertaken by the Murray Darling Basin Commission (MDBC) as part of TLM. These studies include a regional SIA scoping and profiling study² and desktop SIAs provided in the Murray Mouth (Appendix A), Coorong and Lower Lakes demonstration report, and the Gunbower and Koondrook-Perricoota forests demonstration report.

Given the pervasive nature of social issues in the context of TLM, issues raised in the report have obvious implications in relation to communication with communities and stakeholders, the development and implementation of community engagement and involvement programs, and the economic and ecological assessments that are being undertaken. The findings and issues raised in this report have important implications in the development of these programs and assessments that are being undertaken as part of TLM.

1.1 Objectives

The social impact assessment framework and issues addressed within the context of this framework reflects a requirement by Ministerial Council that advice and information be provided on ‘known and manageable’ social impacts of a first step water recovery decision for increasing environmental flows.

In developing an appropriate social impact assessment methodology and framework, this project had four primary objectives, which were:

1. To draw on experiences from past natural resource management decisions both within Australia and overseas to establish lessons learnt on social impacts and to identify any relevant principles.
2. To demonstrate how social impact assessment may be useful in the development of water recovery policy options, so that social impacts are as known and manageable as possible.
3. To demonstrate the application of all of the stages of a SIA for an example of confined scope, to provide further information to tighten the design of subsequent stages of the social impact assessment.
4. To highlight the nature of potential inter regional social trade-off issues that will be considered by Council.

In addition to the four primary objectives, five core “hypotheses for testing” have been identified. These are:

¹ Throughout this document the terms ‘water sourcing’ and ‘water recovery’ are used synonymously. Both terms refer to there being less water available to irrigators and more water available for the environment.

² Hassall and Associates (2003). Stage 1: Volume 1. *Scoping Study: Social Impact Assessment of Possible Increased Environmental Flow Allocations to the River Murray System*. Report prepared for the Murray-Darling Basin Commission.

Hassall and Associates (2003). Stage 1: Volume 2. *Profiling – Social and Economic Context. Social Impact Assessment of Possible Increased Environmental Flow Allocations to the River Murray System*. Report prepared for the Murray-Darling Basin Commission.

1. That involvement of stakeholders in informing interventions and implementing interventions receives more positive feedback overall toward resource allocation changes than the alternative.
2. That voluntary participation in a resource allocation change receives more positive feedback overall than compulsory changes.
3. That an intervention to change resource allocation that is phased in over a timeframe negotiated with stakeholders receives more positive feedback than those imposed suddenly.
4. That those with greatest dependency on the resource and lowest resilience to change tend to be most strongly against any intervention to change natural resource management.
5. That perceptions of fairness of a decision by stakeholders is related to the amount of information provided to the stakeholders; whether they could participate voluntarily, whether they had an opportunity to plan and adjust as the intervention was made, and whether all stakeholders were subjected to the same set of rules.

1.2 Research Context

The research and framework development for the SIA was undertaken in the Murray Irrigation area of NSW in partnership with Murray Irrigation Limited (MIL) who had expressed an interest in the development of SIA in the area. The assistance and support of MIL to the development and implementation of this research is acknowledged.

The research was based on a number of key informant interviews that were selected for interview by the irrigation authority. A larger and more representative number of key informants would normally be used in a full SIA, which may be further supplemented through the use of survey research. However, given that the focus of the study was on framework development it was considered unnecessary at this stage to include large numbers of informants and stakeholders in the assessment.

It should also be emphasised that, when undertaking the key informant interviews, no reference was made to a possible first step water recovery decision or the scale of any possible first step proposal. As such the findings of the key informant interviews do not necessarily reflect the scale and magnitude of change that might occur from a possible first step proposal, which may well be considerably less than the expectations of many key informants.

In addition, the social and environmental context in which the research has been undertaken needs to be recognised. Communities in the area have recently emerged from a period of drought that has certainly influenced their attitudes towards the water reform process and which has also perhaps made these same communities less resilient to change. In addition there has been and continues to be significant change occurring in rural Australia in the composition of rural populations and changes in rural industries and agricultural businesses which undoubtedly influence many of the beliefs expressed in the key informant interviews.

Finally, many of the findings and issues that are raised in this research reflect the subjective judgements of key informants and the local knowledge values and beliefs of people in the community. It is important to recognise and understand these belief systems, particularly in relation to how they determine attitudes towards the water reform process and how they influence decisions and behaviours, whether at an individual farm or business level or collectively in relation to geographic communities or other communities of interest.

It is not the objective of social research or SIA to critically evaluate the statements of key informants in terms of their 'correctness', or whether they accord with existing scientific evidence or some objective assessment of environmental condition. What is important is to

understand the beliefs that are reported in their own right independently of any objective yardstick that might be used as a measure of ‘correctness’.

While the framework that has been developed for undertaking SIA in relation to TLM and water recovery, it may be broadly applicable to other areas and regions there are nevertheless several contextual issues that are specific to the geographic location and objectives of this study. These issues are summarised below:

- the primary goal was the development of a framework for future social impact assessment in the Living Murray, and hence relatively small numbers of key informants were interviewed;
- social and economic trends exist in rural communities (including the towns of Deniliquin and Finley) which are often independent of TLM;
- no reference was made to a possible first step water recovery decision or the scale of any possible first step proposal during the key informant interviews, and many of those interviews assumed that water recovery would be larger than actually proposed in the first step;
- irrigated agriculture operates within a dynamic commercial environment;
- the work was conducted during a drought;
- the analysis focussed on issues related to water sourcing rather other issues in TLM including environmental benefits; and
- the section of the River Murray adjacent to Murray Irrigation Limited is relatively healthy, and the belief of the need for enhanced environmental flows within this community is less than exists in downstream communities.

2 SOCIAL IMPACT ASSESSMENT

2.1 Introduction

This Chapter provides a description of SIA and the core generic procedural steps that are associated with undertaking SIA in an applied context. The Chapter also identifies and summarises key issues associated with previous SIAs in an Australian context.

2.2 Social Impact Assessment

Social impact assessment (SIA) is an applied interdisciplinary field that has emerged from within the social sciences. The term 'social impact assessment' was first used in the context of environmental impact analysis, stemming from the US National Environmental Policy Act (NEPA) in 1969, and was used to recognise and quantify the impacts on human populations resulting from significant environmental alteration. It is an approach to understanding and assessing the impacts of change on individuals, families, communities and society. It draws on existing knowledge and methods used in a number of different social science disciplines including sociology, psychology, human geography, environmental studies, economics and political science. SIA differs from other types of social science analysis in that it is anticipatory where the goal is to assess the consequences of an action before the event has actually taken place (Burdge, 1995)³

The process of undertaking a SIA is often described in relation to a number of core generic procedural steps, which typically include (i) scoping, (ii) profiling, (iii) prediction, (iv) evaluation, (v) mitigation and (vi) monitoring. Depending on the context of the SIA, several of the steps may overlap or be undertaken concurrently and each step may be accorded a different level of detail or significance.

Scoping is usually the first step in the assessment process and focuses on the identification of important issues to be addressed in the SIA. The scoping process may include a detailed description of the policy or development change which is likely to give rise to social impacts; a description and identification of appropriate techniques, methods or approach to be used in the SIA and most importantly the identification of potential social impacts. Scoping is often undertaken through direct community involvement and engagement process and through a review of existing and relevant documents, reports and other materials.

In the current project, the scoping process involved individual interviews with key informants which sought to not only identify potential impacts but was used to develop a conceptual framework and approach to the SIA.

Profiling involves describing the existing social environment in which change or impacts are likely to occur. It is sometimes described as a 'baseline social assessment' which is used to describe the past, current and future social environment that exists and is likely to exist if none of the proposed policy or development changes were to occur. As profiling provides a comparison against which social change can be understood, the description of the social environment should be meaningful in relation to the potential impacts identified in the profiling stage of the SIA. For instance, profiling may identify important variables and indicators that describe the vulnerability or resilience of people or communities to change.

An additional issue addressed in the profiling phase of the SIA is the identification of other changes that have occurred or are occurring in communities and the extent to which these changes may influence the current impacts of interest. For example, while changes in water

³ Burdge, R.J. (1995). *A community guide to social impact assessment*. Middleton, Wisconsin: Social Ecology Press.

allocation may potentially impact on communities, these same communities may also be experiencing significant social change from other events occurring within the community. For instance, these changes may include the impacts of drought, low farm commodity prices, specific development projects or land use changes.

Profiling in this project is based primarily on the use of Australian Bureau of Statistics (ABS) information which has been used to describe the community and social trends that have occurred within the community. Issues developed from the scoping phase of the assessment have been used to focus the descriptive assessment of the profiling phase. In addition to the use of existing secondary data and information, key informant interviews undertaken as part of the scoping phase have also been used to provide a description of the community, particularly in relation to the identification of recent significant events and changes that have occurred within the community.

Prediction is undertaken after the completion of the scoping and profiling phases of the SIA and uses information on identified potential impacts and the description of the existing social environment to describe the predicted social impacts. Prediction often addresses any cumulative impacts and flow-on impacts and describes the likelihood, magnitude and distribution of social impacts.

Evaluation is the process of determining the community and stakeholder acceptability of the impacts identified in the prediction phase of the assessment. The process generally includes extensive community involvement and participation, as there are often significant differences across communities in how potential impacts are evaluated and the level of acceptability of impacts.

Mitigation focuses on addressing how any negative impacts that have been identified and are above acceptable thresholds may be ameliorated in order to minimise the level of social disruption and impact to those likely to be affected by the change. It is an important part of the SIA process and should be based on extensive community involvement and participation in the identification of mitigation strategies and approaches.

Monitoring in the SIA process usually requires the establishment of a monitoring program in order to ensure that no unforeseen impacts are occurring and that any mitigation strategies that have been developed and implemented are functioning and operating as intended.

2.3 Social Impact Assessment in Australia

SIA in Australia has been undertaken within the broader context of environmental impact assessment and also independently as a stand-alone assessment. In an NRM context several social impact assessments have been undertaken in relation to specific resource use activities including forestry, fisheries, water resources and mining. With the exception of those social impact assessments undertaken in relation to mining developments, many of the other resource based SIAs have been undertaken at a regional level and as part of a broader environmental planning and management process. In this context, one of the largest social impact assessment programs in Australia was undertaken in relation to the development of Regional Forest Agreements between the Commonwealth and State Governments, with Comprehensive Regional Assessments being undertaken as part of this process. Included in these assessments was a SIA, which concurrently with other assessments, was undertaken for large regional areas including the State of Tasmania, Southern NSW and South East Queensland.

SIA in a NRM context has continued to be applied, most recently in relation to TLM (Hassall and Associates)⁴ and in relation to the Great Barrier Reef Representative Areas Program (Fenton, 2003)⁵ however in both a national and international context it continues to be limited and constrained by a number of substantive and methodological problems (Becker and Vanclay, 2003)⁶. Several of the key issues and problems are discussed below.

Use of Procedural Steps in the SIA

Although there are accepted procedural steps for undertaking SIA as described in Section 2.1 it is rare to find a social impact assessment that conforms in both structure and methodology to these steps. The majority of social impact assessments focus on scoping and profiling as it is these steps for which information is often available and which can be readily accomplished using existing methods and techniques. The prediction and evaluation phases of the SIA are more difficult to address and there is a need to develop more rigorous methodological techniques to address issues within these phases.

Quantification and SIA

Quantification or the application of numeric and statistical techniques, along with the use of existing secondary data and an emphasis on 'desktop analysis' with little in any field research has been a common approach to undertaking SIA. This approach to SIA has produced a number of SIAs which have tended to focus only on those issues amenable to quantification or for which secondary data is readily available. As a consequence SIA using this approach has often omitted issues of critical concern to communities as these issues have not been identified or there has not been secondary data available to address them. For example issues related to the fairness and equity of decision making process are difficult to quantify using exiting published data such as that found in ABS census statistics.

While resource issues are often cited as the reason for undertaking desktop quantitative analyses, an additional reason for undertaking this form of analysis is that the context in which the SIA is being undertaken is highly politicised and conflictual and there is often concern by government agencies and development proponents that field research by SIA practitioners may further exacerbate the issues. However, when there are experienced SIA practitioners undertaking the field research the opportunity for community and stakeholders to voice and address issues of concern will often assist in reducing the level of conflict in these circumstances.

While quantification is not necessarily inappropriate, there needs to be recognition that such an approach is only one of a number methods and interpretative approaches that may be used in social impact assessment. The use of non-numeric, or qualitative approaches for instance are widely used in human geography, anthropology and sociology and focus on discourse and meaning through such methods as group discussions, unstructured interviews, analysis of spoken and written materials and the use of case studies. Reflection on the methodology of previous SIAs suggests that in many contexts there is a need to use multiple methods drawn

⁴ Hassall and Associates (2003). Stage 1: Volume 1. Scoping Study: *Social Impact Assessment of Possible Increased Environmental Flow Allocations to the River Murray System*. Report prepared for the Murray-Darling Basin Commission.

Hassall and Associates (2003). Stage 1: Volume 2. *Profiling – Social and Economic Context. Social Impact Assessment of Possible Increased Environmental Flow Allocations to the River Murray System*. Report prepared for the Murray-Darling Basin Commission.

⁵ Fenton, D.M. (2003). An assessment of the social impacts of implementing the revised zoning plan under the representative areas program for the Great Barrier Reef Marine Park (GBRMP): A profiling assessment based on TRC-Analysis.

⁶ Becker, H.A. and Vanclay F. (Eds.) *The International Handbook of Social Impact Assessment: Conceptual and Methodological Advances*. Cheltenham, Edward Elgar Pub.

from both quantitative and qualitative approaches (Philip, 1998)⁷ if the core subject matter of SIA is to be adequately addressed.

‘Triggers’ for Social Impact Assessment

There are no legislative ‘triggers’ in Australia that require SIAs to be undertaken in contrast to environmental impact assessments (EIA) where there are several State and Commonwealth legislative triggers. The requirement for an SIA is often dependent upon the definition of environment as used in the legislation. SIAs may be required if the definition of environment is interpreted broadly to include not only the biophysical but also social and economic attributes.

Many social impacts, particularly in the context of natural resource management and planning, are also undertaken in fulfilment of Ecologically Sustainable Development (ESD) principles and a requirement to examine sustainability of development or environmental change in the context of triple bottom line principles associated with biophysical, social and economic issues. This is most likely one of the key reasons for undertaking SIA assessment in many NRM contexts, where an attempt is made to ensure that all three ESD components are addressed in the management and planning context.

However in NRM, social impact assessments are often ‘triggered’ through community and industry demand. SIAs undertaken as part of the Regional Forest Agreement processes were one of the largest programs of social impact assessment undertaken in Australia and were initiated through the demands of forest industry groups (Coakes and Fenton, 2001)⁸. Similarly social impact assessments of dairy industry deregulation (Fenton, 1999)⁹ and fisheries (Fenton, 2002)¹⁰ have been initiated by industry and community groups. It is probable that community pressure for many social impact assessments are due in part to a need for the community and key stakeholders to have voice in the planning and management process and as such social impact may have as much to do with issues of fairness and involvement in process as the identification and reporting of social impacts.

Integration with other Environmental Assessments

In the context of NRM, SIA is often undertaken as one of a number of components of the assessment process that may include concurrent biophysical and economic assessments. One of the difficulties when assessing social impacts is that while the scientific community may recognise the disciplinary boundaries, community and stakeholders do not necessarily discuss social impacts within the same independent disciplinary compartments and boundaries. As a consequence, social impact assessment may become relatively pervasive across the different assessments and disciplines, as is the case when local knowledge of biophysical processes or micro-economic flow on impacts are identified and discussed as part of the SIA. Where there are multiple assessments occurring within a resource management and planning context the integration of social impact assessment with other assessments often needs to be better identified and articulated.

⁸ Coakes, S.J and Fenton, D.M. (2001). Social assessment in the Australian forest sector. In Dale, A., Taylor N., and Lane, M. (Eds.) *Social Assessment in Natural Resource Management Institutions*. CSIRO Publishing, Collingwood, Victoria.

⁹ Fenton, D. M. (1999). The social impacts of dairy industry deregulation and water reform on dairy farmers and communities in the Bega Valley. Report Prepared for the Bega Valley Water Management Committee, Bega, NSW.

¹⁰ Fenton, D. M. (2002). *Report on the Social and Economic Impacts of Proposed Fisheries Spawning Closures on the Great Barrier Reef Charter Fishing Industry*. Report prepared for the Great Barrier Reef Charter Association, Queensland.

Integration with Community Involvement

In many NRM contexts, the community involvement process, or what has recently been referred to as the community engagement process in TLM, often occurs independently although concurrently with the SIA and other assessments. Difficulties have occurred in the past where the two processes have not been clearly integrated.

Firstly, the social impact assessment process, if it is not to be a 'desktop' assessment, will undertake field research where there is interaction with key stakeholders and community groups, which may well also be what is occurring in the community involvement process. Clearly if the two processes are not integrated community may find both processes somewhat fragmented and lacking clear objectives.

Secondly, closer integration is often required between SIA and community involvement processes as the content and substance of the issues identified in the SIA and community involvement process are often closely related. Many of the issues that are identified and discussed in the substance of the community involvement processes are also core issues for the SIA. Similarly, many issues identified in the SIA process often have significant implications in relation to the content and development of community involvement programs.

Thirdly, and of critical importance, is that meaningful community involvement with the assistance of the social impact assessment may be used to better negotiate the introduction of change with the possibility of achieving greater acceptance of any changes that may occur. If integrated with the social impact assessment community involvement may essentially be used as an important procedural tool through which to assist in the mitigation of impacts that have been identified in the SIA. Furthermore, community involvement processes may be used to monitor social impacts that take place after the intervention of change has occurred.

As discussed above, there are significant opportunities for improving the value of social impact assessment particularly if the nature of the impact is clear and the impact assessment is integrated at an early stage with community involvement processes. However, as indicated the high level of integration that has been described has not occurred in past SIAs with the impact assessment and community involvement process often being undertaken independently with little if any integration.

Policy Implications of Previous SIAs

The extent to which the findings of previous social impact assessments have been directly used in the policy development and decision-making framework is difficult to assess as like many environmental impact assessments, there has generally been no auditing process undertaken after the completion of these assessments.

This Chapter has outlined and described the procedural steps that are recognised as being integral to SIA. However, while procedural steps exist it is rare to find a SIA in an applied setting that makes systematic use of all the procedural steps. Many of the SIAs undertaken in Australia are often embedded in broader environmental impact assessments, place an emphasis on scoping and profiling and are often based on desktop analyses which place an emphasis on quantification and the use of secondary data sources.

While procedural and substantive frameworks are important in guiding SIA, the assessment itself needs to be grounded in the context in which the impacts are likely to occur and be sufficiently flexible that it is able to adapt to the requirements of the specific research setting. More specifically SIA should not be undertaken independently of community involvement processes and in many contexts greater emphasis needs to be placed on a 'participatory' approach to SIA where community and stakeholder groups have greater involvement and ownership in the research process.

3 METHODOLOGY

Several issues related to qualitative and quantitative research in social impact assessment are discussed in Section 3.1 followed by a description of the methodology used in the current research (sections 3.2 and 3.3)

3.1 Introduction to Qualitative and Quantitative Approaches

The methodology for the development of the SIA framework is based on multiple methods that utilise both quantitative and qualitative techniques. Quantitative methods focussing on the use of secondary data have been used extensively in developing social and community profiles and partly in the prediction of impacts. Qualitative methods, including the use of key informant interviews, have been more extensively used in scoping and describing the social impact assessment issues and impacts.

The qualitative research method that has been used in this assessment to develop the framework for social impact assessment utilises a ‘grounded theory’ approach (Glaser and Strauss, 1967)¹¹ where the theory, or in this case the framework for SIA, is developed after data and information have been collected. This is essentially an inductive approach to theory and conceptual development as opposed to a more deductive approach where theory and conceptual frameworks are selected, imposed and subsequently tested rather than developed during the research process.

Qualitative research methods are often criticised for their subjectivity and inability to generalise from selected interview and case study approaches to broader populations. While there has been considerable discussion on the validity of both qualitative and quantitative methods in social research, both approaches are widely used in social research although as indicated in Section 2, SIA has generally been overly preoccupied with the more quantitative approaches.

Cronbach (1975)¹², one of the most influential researchers on social measurement, is cited by Patton (1980)¹³ in a discussion of the issues of generalisability in qualitative and quantitative research who states that “social phenomena are too variable and too context-bound to lend themselves to generalisation [and that] the emphasis should be on the importance of interpreting data in context rather than reducing the context to arrive at generalisations” (Patton, 1980, p. 280).

Winter (2000) also addresses the issue of generalisability and accuracy in both qualitative and quantitative research and states:

“In a very general sense, qualitative research concerns itself with the meanings and experiences of the ‘whole’ person, or localised culture. On the other hand, quantitative research attempts to fragment and delimit phenomena into measurable or ‘common’ categories that can be applied to all of the subjects or wider and similar situations. Hence, quantitative research, whilst able to claim validity for wider populations and not just merely samples, is restricted to measuring those elements that, by definition and distortion, are common to all. This raises the question of ‘at what cost’ are we exchanging accuracy for generalisability. Within the quantitative definition, an account may be judged ‘valid’, ‘replicable’ and ‘stable’ on the merits of its generalisability. Yet, one could argue that

¹¹ Glaser, B and Strauss, A. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Chicago: Aldine

¹² Cronbach, L.J. (1975). Beyond the two disciplines of scientific psychology. *American Psychologist*, 1975, 30, 116-127.

¹³ Patton, M.Q. (1980). *Qualitative Evaluation Methods*. London: Sage Publications

generalisation in itself is neither 'valid' nor accurate. It is likely that a 'generalisable' statement, whilst relating to all those to whom it is applied, may not actually describe the phenomena of any single case with any accuracy, in the same way that a mean average score need not be the same value as any of the numbers of which it is an average” (Winter, 2000)¹⁴

While the above quotations emphasise the problematic nature of reductionism and quantification in the context of generalisability, it is nevertheless the case that qualitative research findings grounded in a specific context do permit some level of generalisability to other similar contexts and circumstances. For instance the SIA framework that is developed and discussed in Chapter 4, which includes the concepts of risk and process shadows, may be generalisable to other contexts. However, the specific social impacts and procedural issues identified within this framework may well vary across different contexts.

3.2 Qualitative Interviews with Key Informants in this project

Individual interviews were undertaken with key informants from the Murray Irrigation area. The interview process was undertaken in two phases. Phase 1 focussed on the identification of issues, social impacts and framework development, while Phase 2 focussed more so on the prediction and evaluation of impacts.

Interviews were undertaken over a period of approximately one hour and usually included a single participant, although on several occasions family and business partners also participated in the interview. The interviews were undertaken at the participant’s home address or at their place of work. At the commencement of the interview, participants were asked if the interview could be tape-recorded. All participants agreed to the interview being recorded.

Phase 1 Interviews: Impact Identification and Framework Development

Apart from interview participants being advised that the objective of the interview was to address the social impacts of possible water recovery options, the interviews undertaken in Phase 1 were not undertaken as a structured interview using predefined questions. A broadly unstructured approach was particularly useful in Phase 1 of the research, and in the development of a ‘grounded approach’ to the development of the conceptual framework, as it allowed issues to be identified and discussed without the constraints of a structured interview protocol.

Murray Irrigation Limited (MIL) organised and made the initial contact in relation to the selection of interview participants. Eleven interviews were undertaken in Phase 1 with the following participants:

- 4 broad acre irrigators (rice, cereals);
- 3 council staff from two Local Government Authorities;
- 1 town based business operator;
- 1 staff member from Murray Irrigation;
- 1 community group member; and
- 1 dairy farmer.

In relation to the interviews undertaken in Phase 1 several core methodological issues were identified which need to be considered in the development of a framework for social impact assessment.

¹⁴ Winter, G. (2000, March). A comparative discussion of the notion of 'validity' in qualitative and quantitative research. The Qualitative Report. Available: <http://www.nova.edu/ssss/QR/QR4-3/winter.html>

1. While it was recognised as being important to identify and address social impacts, participants often found it difficult to *directly* identify the type of social impacts that may occur from any reduction in water allocations. If participants were asked to directly identify potential social impacts, there was often considerable uncertainty as to the meaning and scope of social impacts. Social impacts were more readily identified indirectly and with reference to other changes and events that had occurred in the past.
2. When social impacts were identified and discussed either directly or indirectly there was often little reference or association made to the type of water recovery mechanism that might be used. The majority of participants appeared to assume that water recovery implied a significant reduction in water allocations over and above that likely in any first step decision and there was often little awareness or reference to different water recovery mechanisms. In many instances it appeared participants were assuming water recovery would occur through compulsory acquisition.
3. Two core components individuals discussed in the unstructured interviews were (a) the social impacts that were likely to occur as a consequence of any reduction in allocations to irrigators, and (b) the procedural and process issues involved in decision making. In many instances procedural and process issues were often addressed at length in comparison to the identification and description of social impacts.
4. It is possible that given the weighting attached to procedural and process issues during the interviews as described above, that community demand for “social impact” assessment may be partly based on a need for them to redress issues of fairness and other procedural issues. Amongst some participants social impact assessment was clearly a mechanism through which community impacts could be fairly addressed alongside environmental impacts and also as a process through which they could have greater voice in the decision making process.

Phase 2 Interviews: Impact Prediction and Evaluation

Phase 2 interviews, which involved a different set of participants to the first, were more structured and directed, with the objective being to clarify issues raised in the Phase 1 interviews and to attempt to address issues associated with the prediction and evaluation of impacts that had been identified in Phase 1. It involved a checklist approach to the prediction and evaluation of social impacts.

In Phase 2, Murray Irrigation Limited again organised and made the initial contact in relation to the selection of interview participants. Due to time constraints only seven interviews were undertaken in Phase 2 with the following participants:

- 3 broad acre irrigators (rice, cereals);
- 2 town based business operators;
- 1 staff member from Murray Irrigation; and
- 1 dairy farmer.

In these interviews specific questions were asked which were directed at obtaining more information in relation to the outcomes of the Phase 1 interviews. In addition and in the context of the prediction and evaluation of social impacts, each participant was presented with a list of impacts derived from the Phase 1 interviews and asked to (i) add additional impacts they believed had not been reported, (ii) assess the likelihood of the impact occurring under a compulsory acquisition and market based approach (prediction) and (iii) identify which impacts under both water recovery mechanisms would be of most concern to them (evaluation).

As indicated in relation to the Phase 1 assessment, many participants saw the interviews and the social impact assessment process as an opportunity to have voice in the process and to raise procedural issues associated with community and the decision making process for TLM. For several participants the more structured interview process in Phase 2 was difficult to implement as their primary focus for the interview was on issues of voice and process.

3.3 Quantitative Assessment of Secondary Data

The quantitative assessment in this project focussed on the analysis of ABS (1996, 2001) census data in order to provide descriptive profiles of the MIL region. Where possible the selection of specific census variables included in the social profiles has been based on issues raised in the scoping phase. For instance, changes in population age profiles and its impact on the community was a common theme raised in the qualitative Phase 1 interviews and the quantitative analysis of census data confirms this assessment.

While census information is readily available it is clear that other custom data sources, often from other State and Commonwealth agencies, may need to be accessed if the issues raised in the scoping phase are to be addressed in the social profiles. One example is the belief that there has been a decline in the number of Government service providers and employees within the towns of Deniliquin and Finley. This time series information is not readily available from standard census information for these localities and custom data may be required if it is to be included in the quantitative assessment.

4 CONCEPTUAL FRAMEWORK FOR SIA

In developing the SIA framework in the Murray Irrigation Area as discussed in Chapter 3 key informant interviews and secondary data sources were used as the basis for the identification, prediction and evaluation of social impacts and most importantly for the development of a conceptual framework for understanding the assessment of potential social impacts associated with different water recovery options. It should be emphasised that it was a primary objective of this research to develop a conceptual framework and the identification of social impacts was a secondary outcome of the development of the framework.

Figure 1 illustrates the preliminary conceptual approach to social impact that has been developed from research undertaken within the Murray Irrigation Area. The central axis within Figure 1 shows TLM and the development of water recovery options as part of that initiative. While there is uncertainty as to the type of water recovery mechanisms that may be introduced, including their legal, administrative and institutional characteristics, it is anticipated that there may well be potential social impacts associated with the introduction of these mechanisms, which will be predicted and evaluated as part of the social impact assessment process.

It is clear that even with uncertainty in relation to the type of water recovery mechanism that may be implemented, the community within the region is nevertheless concerned about a range of potential social impacts that may occur. As shown in Figure 1, precursor impacts which are identified through community experience with past events, such as the withdrawal of government services and the recent drought, create a “risk shadow” and are used as a basis for identifying potential social impacts that may occur as a consequence of the introduction of different water recovery mechanisms.

While past experience of significant changes occurring within the community is often used to identify potential social impacts, it is also clear from many of the key informant interviews that procedural issues play a significant role in community assessment of the likelihood, magnitude and evaluation of potential social impacts. In contrast to the risk shadow associated with potential impacts, procedural issues also create a process shadow in relation to future potential impacts. As shown in Figure 1, many potential social impacts that are identified are attributed by the community to the activities of external groups. Procedural issues underpinning relationships with these groups, including for example relationships of trust, fairness and equity appear to play a significant role in community assessment of social impacts.

Figure 1 also shows elements within the risk and processes shadows contribute to community identification of potential social impacts and their likelihood, magnitude and evaluation. They also undoubtedly help explain community response and behaviour in relation to TLM. While these beliefs about potential social impacts are important to identify and represent the scoping phase of a social impact assessment, additional ‘data and information’ can also be used to predict the likelihood and magnitude of the impact occurring.

Figure 1 also highlights that while potential social impacts associated with different water recovery options may be identified and predicted, the acceptability of the impacts will be very much dependent upon (a) procedural issues, such as fairness and equity in the decision making process and (b) the resilience of communities and regions to adjust or adapt to change.

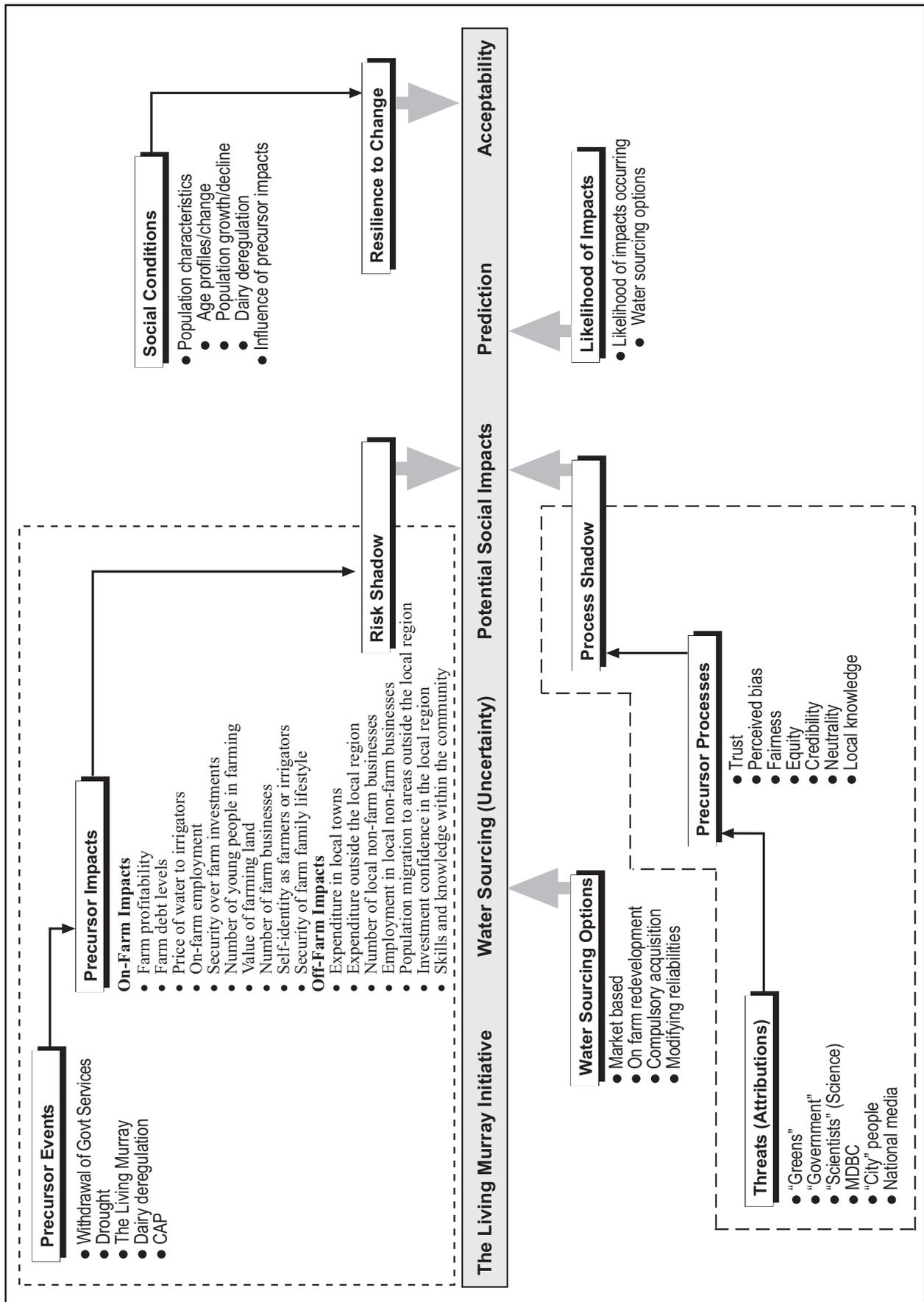


Figure 1. Preliminary Conceptual Framework for the Social Impact Assessment of Water Recovery

5 SCOPING: OPTIONS FOR WATER RECOVERY

Drawing on available knowledge and consultations with the different Government jurisdictions, the MDBC has identified six core water-sourcing mechanisms (Table 1).

Table 1. Description of assumed water recovery mechanisms

Water Recovery Mechanism	Description
System Based	
Modifying Reliabilities (Exchange of low security entitlements to high security)	Voluntary conversion of existing low security entitlements to high security entitlements at an exchange rate that would maintain the integrity of all entitlements.
Regional Water Supply System Development	Regional irrigation supply systems would be redeveloped in accordance with the relevant catchment strategies and priorities, reflecting the contribution, risk and opportunity irrigation provides the region.
Market Based	
Market Based Water Recovery	Entitlements purchased by government or by a designated organisation through current market mechanisms.
On-farm Redevelopment	Investment in improved irrigation management and infrastructure on-farm to increase water-use efficiency. Cost sharing between governments and irrigators would determine the proportion of the on-farm water use savings made available for environmental purposes.
Regulation Based	
Changing Reliabilities (Modify water supply reliability based on environmental needs)	Change reservoir operating rules or allocations strategies to increase the amount of environmental water in wetter years while protecting and/or enhancing water availability for consumption in dry years.
Compulsory Acquisition	Reduce the volume of water entitlements on all water licences and make payments to offset impacts.

A program of regional studies, which has also included the Murray Catchment of NSW, has sought to identify the feasibility and acceptability of the six water recovery mechanisms and to identify and assess alternative water recovery mechanisms as identified within each of the regions. Amongst regional stakeholders within the Murray Catchment, the report indicated that “of the six mechanisms suggested by the MDBC, exchange of low security entitlements to high security, regional water supply system development, market based water recovery and

on-farm redevelopment were viewed more favourably than modifying water supply reliability based on environmental needs and compulsory acquisition, as they would involve a voluntary rather than compulsory process.” (SKM, 2003, p.27)¹⁵

In unstructured interviews with key informants awareness of different water recovery mechanisms, including the six as described in Table 1, was variable with many key informants having limited or no knowledge of the different water recovery options. Contextually, it is important to note that many of those interviewed may expect the scale of intervention to be significantly greater than that in the first step proposal.

Water recovery with compensation and a market based approach were the two most common water recovery mechanisms identified in the interviews, followed by approaches based on modifying water supply reliabilities, on-farm redevelopment and supply system redevelopment. The interviews confirm the findings of stakeholder discussions held by SKM (2003) in the Murray Irrigation Area that market based water recovery and on-farm redevelopment were viewed more favourably as mechanisms for water recovery than a non voluntary approach such as compulsory acquisition.

5.1 Compulsory Acquisition (with Compensation)

While several key informants raised the issue of water recovery with compensation and discussed the impacts of such a mechanism, there was little reference to water recovery without compensation. It is possible that such a mechanism for water recovery was considered as simply unviable by many of the key informants.

“The worst case scenario would be if it was taken away and we just got nothing”

One of the key issues associated with compensation was determining what was a fair value for compensation and the process that might be used to determine the value of compensation.

“How do you determine the lifetime removal of water from a farm?”

“Bureaucrats are talking compensation, but until the real value of water is established, compensation means very little. The value of water over a lifetime on a farm must be considered if adequate compensation is to be given” (Deniliquin Pastoral Times, 28.3.2003)

As was also the case in relation to the market based approach to water recovery (Section 6.2), distributional impacts associated with income derived from compensation were also raised. Like the distributional impacts raised in relation to the market based approach, the focus was on whether income derived from compensation and any associated expenditure would remain within the local community.

“Compensation itself is an issue...for there to be a benefit to the community that compensation has to stay in the community...so who does that compensation actually go to? Does it go to the farmer who thinks...beauty I’m off to Southport and I’ll set myself up there. So there is no residual benefit in the community...how is that going to work? I see that as a great threat to the future of the community in that you are going to strip even more wealth out of it”

Not only was it a question of the distributional impacts associated with income derived from compensation, but questions were also raised as to whether income derived from

¹⁵ SKM (2003). *The Living Murray Initiative Water Recovery Regional Studies (Draft)*. Report prepared for the Murray Darling Basin Commission.

compensation would result in the movement of farm families out of the local region leading to the associated losses in regional expenditure.

“We have a lot of farmers retiring into the town, especially Finley...it has a growing population of retired farmers moving there and settling there. Now if they are all given there nice little package (compensation) do they retire somewhere else...or do they retire in the town and spend the money in the town...”

The following quotation also highlights the issue of farmer identity and that many irrigators and farmers may not want compensation for their water, but may see their identity as farmers and irrigators as being more important than any benefits that may be gained from compensation. Furthermore identity with farming may also represent a lifestyle choice rather than economic necessity where monetary compensation may not be as critical an issue.

“How do you convince farmers that their position is not going to be further eroded without some form of compensation...and that is the last thing most of them want, believe me...they don't want compensation...they want water. They're farmers...they want to farm...they want their farm to be viable...that is how they want to make their money. They don't want someone to come along and give them a handful of dollars and take the water from them.”

As with other water recovery mechanisms, the issue of stranded assets associated with on-farm irrigation infrastructure was also raised.

“...and then you end up with all of the irrigation farms with all of the irrigation infrastructure with no water...you can't just farm them as dry farms when they are laid out for irrigation...so then you have all the money to spend to correct it.”

5.2 Market Based Approach

The most common issue raised in relation to a market-based approach was the concern and beliefs amongst key informants about the impacts associated with any potential redistribution of income associated with the sale of water. Most importantly this concern was raised in relation to the redistribution of income derived from the sale of water to locations outside of the local region or community. This issue was raised and attributed to not only the actions of water traders external to the local region, but also in relation to those local farmers and irrigators that sold water and who resided in the local area.

A common belief about the market based approach and specifically to government entering the water market for the purpose of acquiring water for environmental benefit, was that the income derived from the sale of water may no longer be available within the local community. While a significant portion of the income from the productive use of water had previously been used to purchase local goods and services, particularly from within the agricultural sector, there was the possibility that with the sale of water this income would no longer be put to “productive use” as it had previously been. The following quotation provides a clear description of how this belief is articulated:

“...What will happen is that the multiplier effect of that is going to be gone. For example...I've got 1,000ML of water...somebody comes along to me...say it's the MDBC. They say...look we need X amount of megalitres of water to increase the flows of the Murray River. We will buy 100 of yours and we will give you \$200 per megalitre for it...that's fine...I can't make \$200 a megalitre with my water so I am happy, if I take that view, to sell that water and get a cheque for \$20,000. I sit on my bum...I do

something else...instead of irrigating things I might run dryland...whatever. The thing is that once I've got that \$20,000 I don't consume with it...I might go to Melbourne...I might buy a new TV...I might go on a holiday...or I might do something that isn't productive. Whereas if I was watering pasture or spraying or doing something...what I am doing is I am consuming...I am buying seed...I am buying fuel...and then we are getting the multiplier effect of the money."

While the above quotation provides an illustration of this issue by one key informant, another key informant independently confirmed the issue by indicating that any income they may derive from the sale of water would be invested outside the local community.

"I have to tell you...if we got a payout...we wouldn't be putting the money in this area...we would go and buy a house in Melbourne right now...absolutely...somewhere where we know we are going to get a return on our investment."

Distributional impacts of water markets were also identified but placed in the context of the actions of external water purchasers rather than the actions of local sellers of water. Whether attributable to an external purchaser or an internal water seller the distributional impacts on local communities are similar, although the emotive weight attached to external 'water barons' or speculators is undoubtedly higher.

"That frightens the hell out of us...the thought of speculators."

The following quotations illustrate the uncertainty of a market based approach and concern about issues associated with equitable distribution of impacts and the impacts of water trading outside of the area on irrigation infrastructure and regional communities generally.

"Not fully trusting a totally free market...I am a bit reluctant...anytime they have gone total free market you see many people losing out. So I would rather see some social consideration in there in terms what the impact would have if somebody came in...cashed up and took it all out...and they just decided where they were going to take it to afterwards...it could leave a lot of stranded assets...a lot of communities"

"I would like to see it attached to land and not just bought on speculation...someone out of Sydney just buying it up and not using it."

Beliefs about the potential impacts of water trading focussed on its impact on the value of land once water becomes unattached from the land itself. As in the first quotation, one key informant was concerned that the value of the land would become significantly less once water was detached from it and sold. In the second quotation another key informant described what impact the lower land values may have on Council rates and the ability to provide infrastructure services by Local Government Authorities.

"I had a place...I sold 3500ML...sold it to a wine company in the Barossa Valley...it became absolutely desolate country...do we want that to happen...the land becomes next to worthless."

"What does it do? Say all the water in the Wakool Shire was sold to a water trader. They might make money...they may not. The long term problems...Council rates...all of a sudden you won't have a council...because the rating system will go down...diminish on the land...you won't have a Council...you won't have roads...you won't have hospitals."

As shown in the following two quotations other potential impacts of a market based approach raised by key informants included potential impacts associated with possible increases in the price of water and the potential for stranded irrigation assets. Both of these additional issues have also been independently identified by SKM (2003) in regional studies undertaken in the MIL area.

“What we’re worried about...you’ve got water traders buying water...they’re only in it for one thing and that is to make money. Over 20 years at a compound interest rate...what is the price of water in the year 2020? That’s what we are looking at.”

“What’s going to happen with the infrastructure...whose going to pay for that? When I’m the last rice farmer in Berrigan Shire do I have to pay for all of the infrastructure...at what point does that become unviable.”

Issues related to the process of water trading, questions about the potential for corruption and the need for transparent water trading systems was raised independently by three of the key informants. In the third quotation the existing Murray irrigation water exchange is used to illustrate the need for a transparent water trading system.

“I can’t mention any names...but why has one of our ex-politicians got a water bank already registered...to trade and get into business? You know...what is going on?”

“The corruption....if the government were trading as well...you know...”

“We wanted to get a more transparent system...and now anyone can log onto our system and see what the water is trading for...you can dial up the Murray Irrigation water exchange and see what the water is trading for”

It is apparent that the market-based approach is not necessarily rejected as an appropriate mechanism for sourcing water. What is suggested is that there is a requirement through the legislative, administrative or institutional frameworks that are established within the context of a market based approach that mechanisms or strategies be developed which attempt to ensure that the broader community is not significantly impacted by any potential loss in the ‘productive capacity’ of the water that has been sold. The following quotations highlight beliefs about the need for a mechanism to address this issue, which essentially is one in which government develops strategies to restrict the potential redistribution of wealth created through the sale of water.

“...We see the entering of the Government through any instrumentality into buying water outright without some form of mechanism for ensuring the efficiency and productivity are retained is going to be a total disaster. Especially when we are talking such big amounts of water.”

“..the problem with buying in the open market is that the lazy...non-caring farmers will sell...and the impact of those guys selling will have a severe impact on the social and economic fabric of the community.”

“...from the point of view of the MDBC and government they have a responsibility to look at the impacts and they will be severe...because there will be no controls...unless you introduce controls...”

“There has to be some trading rules. This issue of the water barons is just poo-pooed...I’m just not so sure about that. Why wouldn’t I buy water if I though I could buy it now and sell in next week for more?”

5.3 Increasing Reliabilities (Change to Higher Value Products)

Change to higher water reliabilities for many key informants equated to a shift to high value agricultural products. Key informants discussed this issue not in relation to its potential social and economic impacts but in relation to the capacity of existing physical and human infrastructure and the knowledge and skill of farmers to change to higher value crops.

The period required to establish higher value crops, including establishment costs and the development of the required on-farm and off-farm infrastructure during this time was seen as a significant barrier to the change in cropping types and agricultural production.

“We seen a number of pushes in this area to increasingly focus on horticulture...this push to move to higher value crops. But that will only occur over a very extended period because there is none of the support infrastructure in place...”

“How does your cocky turn his rice paddy into an orchard? It’s not just that simple is it! He’s got a very extended period where he has no production at all...because the trees are growing. He has significant costs in getting it established. In reality how do you get them through that time?”

“Because there is significant industry specialisation in terms of the agricultural product and transport...that is a really big issue...its not very easy to go from transporting rice to transporting peaches or pumpkins...it just doesn’t work.”

Several key informants indicated that any shift to higher value crops may also require high levels of on-farm employment with there not only being additional costs associated with employment but difficulties in sourcing employment from the local area.

“Your fruit growers...500-600ML...are turning over 2-3 million dollars a year and planting trees...now the frightening thing is where do I access the 100 staff because I wouldn’t access 100 staff in Finley! Then I’m looking at having to transport all my fruit to Shepparton...it’s a big cultural change.”

“Like one bloke can handle the farm...but you get into grapes and stone fruit your going down the track of employing gangs of people...employment become the major cost...and finding people.”

While issues related to the development of infrastructure and employment requirements were raised, a central issue raised by many key informants was that they did not have the capacity, in terms of skills and knowledge, to move to higher value crops. As noted in the previous and following quotations many indicated that such a change would require a significant “cultural change” or approach to their farming practices.

“So do I look at converting some of my water to high security...I probably should...I mean I’d really have to have a culture change.”

“The trouble is that to acquire the knowledge to do those things [higher value crops] takes years...you can’t switch from one thing to another.”

“You can’t expect the older generation when they’re 60 to start developing higher value crops. Right...now you’ve got to start growing stone fruit...you’ve got to get into grapes...you just can’t do it.”

If there was a significant change to higher value crops in the region one of the issues raised was the ability to continue to market the produce as a 'higher value' crop as presumably with an increase in supply they may no longer be considered high value.

"They always say, you've got to get into horticulture...we grew some pumpkins and some corn this year and it was really good fun...and it was fun...but you can grow the best fruit...and you can grow as much as you like but you've still got to sell the dam thing...you get a few people doing that and you'll just flood everything."

5.4 On Farm Redevelopment

When this issue was raised there was a general tendency to indicate that many irrigators were approaching their limit in what could be done to improve water efficiency on their farms.

"We've done all that."

"We have just purchased an irrigator...to try and improve water use efficiency...That's the big thing, but after that there's not many changes you can make to become more efficient."

"There is a classic example...over at [name of place]...they had a 5,000ML water allocation...last year they decided they would go to drip irrigation...last year they reduced their water consumption to 1,500ML...they had a bigger yield than ever...and they sold \$700,000 of water into the temporary water market...now there you go...it can be done."

5.5 Regional Supply System Redevelopment

As was the case with improving water use efficiencies on-farm, there was also a belief that opportunities for improvement of irrigation systems within the MIL area were also limited, with many of the more significant improvements already having occurred.

"The forest working group...Barmah...they paid for the lining of a couple of MIL channels in a couple of places where it was going through sandy places...where it was leaking...the estimated savings...say 40,000ML...they bought it because they paid for the lining. Water was coming in and disappearing...we weren't getting any use of it anyway...that was one way of getting water back. Apparently we have been looking at the system and that was the easy gain...apparently anything else beyond that is probably going to cost you \$2,000-\$3,000 for every megalitre saved...the big savings probably aren't out there."

"we have to look at how we manage and run our systems... we've worked very hard and spent a lot of money. Within Murray Irrigation I don't think there is a lot of room to move...I think Murray Irrigation run their system fairly tight..."

5.6 Alternate Approaches to Water recovery

One alternative approach that was suggested is identified here as a 'constrained' market based approach wherein government purchase of water has a constraint applied such that the income derived from the sale of water is directed towards improving the efficiency of farm irrigation infrastructure.

"...we have land and water management plans here...the government give you money to improve the productivity...drainage on your farm...we see

the same type of mechanism for water. Like this...we want 10% of your water...we want to acquire it permanently so that we can improve the environmental flows down the Murray. We're not going to give you money straight out for that...what we're going to do is provide you with financial assistance to improve the technology on your farm so that you save 10% of your water and you maintain the same productivity or even better it...only then do you give back the water. In this type of situation we have an all win situation...because we see a huge improvement in technology...a huge improvement in productivity...and we see the cost being amortised against the future value of the water which will permanently reside with the river."

The voluntary nature of the transaction is described in the following quotation and whilst one of the problems in improving water efficiency on-farm in the past has been that farmers have generally retained the water efficiency gains, in the following example and within the context of a market based approach, water savings are returned to the environment.

"I have just spent \$100,000 on my farm putting in a centre pivot...if the government said we are going to give you \$100,000 for that centre pivot because you are going to save 15%-20% water use on that...we'll give you \$100,000 as a grant...in return for that the water that you save we want it and that's ours...and you will never get it back again...I am fine with that...wouldn't worry me in the slightest. Not only that, it means that we maintain our employment...we maintain our productivity...we probably even gain on it...and we keep the infrastructure moving locally...and nobody is disadvantaged...everybody gets what they want."

The approach not only emphasises the on-farm and environmental benefits but as suggested below there is the belief that such an approach may also have significant flow on benefits to the broader community.

"The benefits are going to be so huge...because it will create a boom in agriculture...the demand for services in the agricultural sector to enable people to comply will create a boom...as it has here in land and water management...and its created a boom in earthmoving...a boom in surveying..."

5.7 Summary of Water Recovery Mechanisms

The key informant interviews identified issues associated with the implementation of specific water recovery options and the potential impacts associated with the implementation of each option. During the interviews five different water recovery options were discussed and identified by participants. These included (i) compulsory acquisition, (ii) a market based approach, (iii) increasing reliabilities or a change to high value crops, (iv) on-farm redevelopment and (v) regional supply system redevelopment. Compulsory acquisition, the market based approach and on-farm redevelopment were the three most common options raised by participants. It should be noted that while the different options are described in relation to these 'technical' category labels, these were not necessarily the labels used by participants during the interview process.

Table 2 provides a summary of issues identified in relation to the four water recovery mechanisms discussed in the key informant interviews. In relation to compensation, questions were raised in relation to how the value of compensation is determined. In the market based approach a common issue discussed by participants was the need for transparency in any water trading process and the requirement to identify regulatory controls in the process in order to address any potential negative impacts.

The change to higher water reliabilities was often associated with the change to higher value crops where the critical issue was the capacity of existing physical and human infrastructure and the knowledge and skill capacity of farmers to shift to these higher value crops. The issues associated with on-farm and regional supply system redevelopment focused more so on the ability to identify further opportunities for water savings.

Table 2. Water Recovery Mechanisms: Summary of Implementation Issues

Water Recovery Mechanism
<p>Compulsory Acquisition (with compensation)</p> <ul style="list-style-type: none"> • Determining the value of compensation <p>Market Based Approaches</p> <ul style="list-style-type: none"> • Need for transparent water trading processes • Need for controls or regulation on market based approach to address process of water trading and potential impacts <p>Increases in Reliabilities (Change to Higher Value Crops)</p> <ul style="list-style-type: none"> • Need to be undertaken over extended time period • Limited industry infrastructure for new high value crops • May often require significant increase in employment • Limited knowledge, skills and experience to undertake change • As volume of production increases, value of crops may reduce <p>On Farm Redevelopment</p> <ul style="list-style-type: none"> • Limited opportunities for further improvements in on farm water efficiencies <p>Regional Supply System Redevelopment</p> <ul style="list-style-type: none"> • Limited opportunities for further improvements in on farm water efficiencies

Source: EBC (2003)

Table 3 provides a summary of the potential social impacts associated with three water recovery mechanisms as no impacts were raised in relation to on farm and supply system redevelopment. Issues associated with the spatial reallocation and distribution of compensation and water sales income to areas outside the local region was raised in relation to both compulsory acquisition and the market based approach. Other potential impacts associated with each approach are also identified in Table 3, including the potential loss of population, impacts on farmer self-identity and the potential for stranded farm irrigation assets.

Table 3. Water Recovery Mechanisms: Summary of Potential Impacts

Water Recovery Mechanism
<p>Compulsory Acquisition (with compensation)</p> <ul style="list-style-type: none"> • Potential distribution of compensation income and associated expenditure outside the region • Loss of population (migration of farm families outside the region) • Impact on self identity of farmers and potential loss of self identity • Potential for stranded farm irrigation assets <p>Market Based Approaches</p> <ul style="list-style-type: none"> • Potential distribution of income from water sales and associated expenditure outside the region • Potential for stranded farm irrigation assets • Potential impacts on the value of previously irrigated land (including impacts on rates base and Local Government service provision) • Potential increase in the price of water <p>Increases in Reliabilities (Change to Higher Value Crops)</p> <ul style="list-style-type: none"> • No production income during establishment phase

Source: EBC (2003)

6 SCOPING: IDENTIFYING THE RISK SHADOW

Through the scoping process (Figure 1), interview participants identified several significant previous events that had occurred within their community. Key informants often used the existence and impact of these events to identify the type of impacts that might occur if significant water recovery were to occur in the future. In this context the previous events created a ‘risk shadow’ and were referred to when key informants attempted to predict future impacts.

These events were (i) used as a basis to assist in the identification of potential social impacts, (ii) used to illustrate possible cumulative impacts that should be considered in the context of other changes that were occurring in the community and (iii) identified as potentially lowering the resilience of the community to change.

6.1 Withdrawal of Government Services

When those interviewed were asked about events that had occurred in the past that had had a significant impact on the community within the region, the event most frequently identified was the withdrawal of Government services. The attribution of impacts and community change to the withdrawal of Government services was an issue that was believed to have been ongoing since the mid 1970’s and was believed to have occurred and had the greatest impact within the towns of Finley and Deniliquin.

“When I first came here [Finley] the Water Commission had a lot of jobs...and the DMR...and they have both gone in that period of time...that’s effected all businesses in town and the services...while there has been a slow erosion of businesses...like the Health Services.”

“This town used to have quite a lot of government employees...a lot of services closed down here when they left.”

“The withdrawal of government services probably started back in the mid 70’s with the closure of the CSIRO Rangelands Research Laboratory...and then its gone on and on to this day. The Government are now threatening to remove the school...the High School...they employ 20-25 people.”

Several impacts, including those on employment, are identified in relation to the withdrawal of Government services and these are often used to show both the vulnerability of the community to further change and to illustrate and define the type of social and economic impacts that could potentially occur within the region as a consequence of the water reform process.

What was also evident in many of the interviews was that “Government” was perceived as the ‘cause’ of the impacts that had occurred and that as a consequence of the process of withdrawing Government services over the past 30 years this has also changed the relationship between community and Government.

“It’s the rationalisation...the total non-caring attitude of Government about the survival of regional Australia. And what happens in relation to the removal of those jobs...it’s not only the multiplier effect of them, but a lot of those jobs are highly paid people.”

There was also a belief that the loss of Government employees from the region, as a consequence of the withdrawal of government services, also impacted on the region through the loss of human capital, including those with specialist skills and knowledge within the

community. As a consequence of the loss of employees within this sector, there was a belief that the social and economic mix of the community changed with the loss of higher income earners with more disposable income and those with professional knowledge and skills.

“There has been a profound change in the socio-economic makeup...there is a big void now...to the point where the school teachers and the police are the most professional people you tend to deal with.”

“The impact on the community is that it translates not only into the multiplier effect of the dollars that those people spend...but it is the intellectual effect that they have on the community...so you find that...better quality food...better quality clothing...maybe jewellery and more luxury style of things starts to disappear.”

As shown in the latter and following quotations, there was also a belief that the loss of high-income earners has also changed the social mix of many local communities and as a consequence this has changed the demand for the range of goods and services provided in many regional towns.

“In the last 10-15 years we have gone from having three jewellery stores to having one...we have gone from having four shoe stores to two...one of them is a Speedy shoes. If you look at Deniliquin now you will find we’ve got a Target, two Go-Low Stores and a Silly Willies...which is a two-dollar store. So from nowhere...we’ve now got four major...they would be biggest retailers next to the Coles Supermarket...I would guess that they would be the highest turnover businesses in the town and they are all 2,3, and 4 dollar shops.”

Given some reduction in the range or specialisation of goods and services provided within many of the towns it was also a belief that those now wishing to purchase these goods and services would do some from outside of the local community.

“If you go round you will find that you can’t buy reasonable quality goods here anymore because the market is not there. What happens is that those people who are still earning enough money are going out of town...they would most likely go to Melbourne...we are three hours from Melbourne.”

In addition to employment losses and the consequent changes in the social mix and the type, pattern and amount of expenditure within local communities other impacts that were attributed to the loss of Government services included a decline in property values and a decline in investment confidence.

“Effect on future development confidence...for example Finley and other towns being belted by loss of Government employment...some long term results of that which would never have been considered...like stripping the wealth out of communities by declining property values...property values dropped by 15%.”

While the concept of ‘stranded assets’ associated with the withdrawal of irrigation water from an area is widely understood, a similar concept more closely aligned with the stranding of social infrastructure assets was also identified.

“Finley has had this huge job withdrawal...which has reduced local expenditure...reduced property values...reduced confidence significantly...decreased population by about a third. Here’s a town that was built for a lot more people...now much of that public infrastructure has now been wasted or is being paid for by a much smaller pool of people.”

While it was clearly evident that many of the impacts associated with the withdrawal of Government services were being used as a rational basis by many in the community to identify potential impacts associated with a reduction in water allocations, it was also evident in several instances that the impacts that had occurred as a consequence of the withdrawal of Government services had made some communities in the region more vulnerable to change. In other words, impacts associated with the withdrawal of Government services which have been ongoing for several decades had lowered the resilience of the community to change.

“Berrigan and Finley are now at risk of going into social decline...they are a low cost option...they are attracting a particular type of person...you can see that in Finley. Finley has a lot of problems with people on low incomes...a lot of very low cost rental properties and there is quite a big problem with unemployed youth. There are young people who are transitory and homeless...they go there because there is no Centrelink office...so they don't have to report in.”

“Six to eight fifteen to sixteen year olds living in group housing at \$50 per week...which is creating a huge new social dilemma for the community...which of course has had a lot of its services withdrawn so it doesn't have the ability to deal with it.”

6.2 Impact of the Recent Drought

The recent drought and the associated impacts families and communities experienced as a consequence of the drought was a significant precursor event, which highlighted to many people in the community what the potential impacts of any reduction in water allocations might be.

“This drought has brought things home. This is the first year this area has not had water. This has really created some higher level of thinking in the community about resource security.”

“The drought was a great educator...and I don't think anyone would want to live through a drought like that again. It made people very attuned to how valuable water is...how valuable it is to people out in the bush and how valuable that income is to people in town.”

The experience of the drought appears to have provided many in the community with an event through which they could better recognise and identify the potential broader community impacts of any reduction in water allocations and the indirect importance of water to many businesses.

“For a while we had people working in shops that said...oh no its only affecting the irrigators...when there is no water...they don't realise that Mrs irrigator comes and buys a dress that keeps you in a job...there would be now nobody unaware of how good irrigation is to their employment.”

As shown in the following quotation, prior to the drought many in the community believed that the primary impact of the drought would be on farmers. The drought showed that in many instances it was the household and business suppliers in the smaller towns that were being directly impacted by the drought through a reduction in business and household expenditure by farmers. As a precursor event, the impact of the drought was used as a basis for identifying impacts that might occur if farmers were faced with reduced water allocations.

“With the drought it brought it to the forefront...everyone was worried about how the drought was going to impact on farmers. It wasn't the farmers in the first round that had problems...it was the main street...it was the shops and small business holders...they were the first group that

got knocked out. They were the ones closing down...packing up and leaving town. The farmers were just holding on to sustain themselves through."

"...beyond direct social impacts which are relatively easy to identify...farmer Jones loses half his income...that's relatively straight forward. But it's where it flows on from there...if farmer Jones loses half his income then he's only got half his money to spend in his local shop...and you can map expenditure and all that."

"The first thing they do [farmers] in drought or with no resource security...like water...is that they just stop spending...but they have passed that impact on to another part of the economy by just shutting the purse strings..."

"The impact of the drought last year in Swan Hill...like it had a hell of an impact in Swan Hill. Shops in the main street can't pay their rates...can't pay their rent. And that's what we are looking at."

In interviews with key informants a number of impacts were identified and directly attributable to the drought including the loss of income and employment.

"No rice last year...aerial sowing and spreading...they had planes...million dollar planes sitting on the ground with no work for them. For them the big concern also was they had labour but they didn't have any work for them. Those people might drift out of the area and they would then lose all their skilled labour. They got through last year with most of their fellows but that was a big worry."

"Our neighbour who is a rice farmer and has a couple of [transport] trucks...well he had to park a couple of his. Put off his two blokes...there was no wheat harvest and no rice harvest."

"This guy he also had a header sitting there for use with wheat and rice...same repayments...he would normally employ one other person. He didn't employ anyone...he didn't have any income."

In addition to the experience of the drought being used as a precursor event to identify the social and economic impacts of any reduction in water allocations, the impact of such events themselves may also increase the vulnerability of many regional communities to further change and impact. For instance, many key informants identified the impact of the drought on farmers having to acquire or further extend their level of debt that in turn may increase their vulnerability to future impacts and changes.

"Anyone who had a huge debt load prior to last year [drought] would have got themselves further in."

"I said...tell me how it [drought] has affected you...well two of them burst into tears...one woman is about 35 and the other woman would have been in her 60's...they'd paid off their farm...they had educated their children...they were just cruising along. The drought hit...they went in debt \$300,000."

Many of those interviewed emphasised the impact of the drought on dairy farmers.

"The dairy guys...they found it really hard...they were spending \$2,500 per day on feeding their herd...the impact of that is just phenomenal."

Of course it should be remembered that while the drought, as a precursor event, highlighted many potential impacts that might be associated with a reduction in water allocations, the experience and impact of drought itself is itself part of the seasonal variability associated with farming.

“We can handle seasonal fluctuations...we know that it hasn't rained...well that's part and parcel...but if you are just going to have an asset taken away...”

6.3 Dairy Industry Deregulation

The impact of dairy industry deregulation was also an important precursor issue raised by several dairy farmers, and particular emphasis was given to the uncertainty of deregulation at the time.

“It was a stressful time...the stress was more about whether the stuff was going to go through the parliament... I must say deregulation affected us personally.”

6.4 Water Reform Process

Given over allocation in the Murray Darling Basin, the MDBC Cap was introduced in 1995, which limited water use across the basin to 1993/94 levels of development. One key informant described the situation prior to the introduction of the Cap and most importantly described how the availability of water and the over allocation of water 'socialised' water into the community. This appeared to suggest that the over allocation of water into the community and region had become 'normalised' and the community had become dependent upon and adapted to this level of resource access.

“The Cap was the main change...what was happening was that they were over allocating water to this area because we were using it...they encouraged us to use the water...they wanted us to use the water...they over allocated because they knew other areas further down the Murray weren't using the water. Your high security water fellows further down the Murray had a history of use of about 57%. So what they used to do was over allocate to this area because they knew farms were actually accessing and using the water. What they were doing was socialising the water into this region by over allocating.”

Of course the introduction of water trading also resulted in water users now having to purchase water that had previously been reallocated.

“Pre-trade...the government would actually reallocate under usage...if you and I could trade...I used my full quota but you didn't...the government would look at that and say we can actually increase the allocation...they reallocated the under use. Once trade came in they couldn't do that...because your under use you would see as yours and you would trade it to me or something. The fact that the trade came in...pushed down the maximum level of allocation because government couldn't then reallocate the water. Some of the bigger water users then became a bit wary of trade because they now had to go and buy the water they had previously been reallocated.”

The introduction of water trading created the potential for significant variation in the price of water and made those businesses dependent upon sourcing water from the market potentially more vulnerable to future increases in water prices.

“After the Cap we started accessing through temporary water...and that was fine for the first 3-4 years...and we were accessing it at \$5, \$10...\$15 a megalitre. Once the Cap was implemented and trading was implemented...it was worth money...last year it was \$300. So people build a business on this temporary water and like last year all of a sudden its not available...\$300...it makes them extremely vulnerable.”

Since 1994 the process of water reform has maintained continuous uncertainty and low levels of security over farm business investments. As evident in the following quotation, the length of time over which the process has occurred and the uncertainty over outcomes of the water reform process has also entrenched attitudes and beliefs about the interrelationships amongst stakeholder groups.

“...that’s being going on since 1994...farmers have been robbed, cheated...told lies and procrastinated to for years and years and years. They have multi million dollar investments with absolutely no security over them whatsoever.”

“Without water the land here is finished. If you talk to valuers they will tell you that the average value of an acre of land around here is \$200...that’s a dryland acre. Now we have farms selling for \$1,000...\$1,200 per acre with infrastructure and with water. So you can see the huge impact of uncertainty on the investment people have to make when they don’t know...and there’s still a huge amount of cynicism even after the COAG meetings.”

Several key informants believed that the water reform process, including TLM, has not only created uncertainty and lowered confidence and investment amongst farming businesses, but it has also created these impacts more broadly throughout the local region, particularly amongst many businesses based in local communities.

“...a lot of those things created a lack of confidence in the area...a lack of investment...a lack of investment in capital infrastructure because they are worried about what is going to happen next.”

“Where is our community going...do we build our new house...do we do this or don’t we? Do we expand our business because we don’t know if the farmers are going to have money? So everybody is in that climate of fear.”

“Much of this is about confidence...confidence to spend money...confidence to invest. The Living Murray proposal only has to be spoken about and the farmers go into turmoil...and that’s the start of it...until all that security is restored all that investment and expenditure stops.”

While the uncertainty of the water reform process lowered confidence and impeded investment amongst local farmers and businesses, there was a belief that outside investment was also being impeded by uncertainty associated with the water reform process.

“It’s not only confidence within the community...we have a lot of people now...international buyers...that are looking at buying land within the area...or people from cities that are looking at investing in business...and its amazing how much they understand about water trading. They say, what’s going to happen here...what’s the Living Murray all about? How is it going to be affecting you? What’s going to happen with our water security long term? Dairy farmers coming from New Zealand...all over the place...and they’re the people who are asking what’s going to happen here. The uncertainty isn’t only local its national and international...its keeping people away from investing in the area and the region.”

“One of our bigger enquiries was a Taiwanese person...a person looking at a dairy farm...very clued up on the whole system and wanted to know if it was actually going to be feasible into the future...these were people looking at investing millions...and they say, ‘Oh no, I don’t think I will because of the risk’.”

6.5 Changes in Population Age Structure

As a consequence of an aging population and the loss of young people from rural areas one of the core issues raised by many key informants was the age of the farmer population. Not only was this seen as a consequence of an aging population generally, but many of the uncertainties and concerns about the future viability of farming businesses were given as reasons as to why young people were no longer willing to stay in farming or even to stay in the local region.

“In a lot of farming areas we have a lot of last generation farmers...their sons and daughters have decided in terms of their future that they’re not going to do it.”

“I went to a MDBC meeting...in Deniliquin...there were 500 odd people there and I stood up to say thankyou very much for coming...and one thing I did notice...which staggered me from the back of the hall was our greying population...and these are the people that have no security on succession of planning for their children. I think it has been very unfair...I think it’s been very difficult.”

“We have sons and they have each been told to go and do something else outside of the rural industries...they were never encouraged to stay farmers.”

“One of the things that really worries me is the age of our farmers now. Because of all the uncertainty that is happening...we are not getting the younger people staying or coming back on the farms...they’re going to university or they’re getting jobs off-farm. It is concerning that there is not a lot of young people.”

6.6 Summary of Precursor Impacts

The precursor impacts derived from key informant experiences of previous events that had occurred within the community were used to identify and illustrate the type of potential impacts that may occur if farmers were to experience reduced water allocations.

It should of course be remembered that many of the impacts that have been identified have already been experienced within the region. The introduction of further change associated with specific water recovery mechanisms may not only produce specific impacts, but the severity and magnitude of these impacts may need to be considered cumulatively and in the context of previous impacts that have been experienced.

Table 4 illustrates that social impacts associated with the loss of irrigation water have both on-farm and off-farm impacts, with in many instances flow-on effects occurring between the loss of irrigation water, on-farm impacts and off-farm impacts in many of the rural centres and towns.

The impacts described in Table 4 were derived from the Phase 1 interviews with key informants. In the Phase 2 interviews the list of impacts as shown in Table 4 was also presented to key informants and they were asked to change, modify or add additional impacts they considered important but which had not been identified. Two additional social impacts

were identified in the Phase 2 interviews included impacts on the value of water traded and potential impacts on the future security of farm family lifestyles.

Table 4. Social Impacts Identified by Key-Informants

On-Farm Impacts

- Decrease in farm profitability
- Increase in farm debt levels
- Increase in the price of water to irrigators
- Decrease in on-farm employment
- Decrease in security over farm business investments
- Decrease in the number of young people in farming
- Decrease in the value of farming land
- Decrease in the number of farm businesses in the region
- Loss of self-identity as farmers or irrigators
- *Security of farm family lifestyle*

Off-Farm Impacts

- Decrease in expenditure on goods and services in local towns
- Increase in expenditure outside the local region
- Decrease in the number of local non-farm businesses
- Decrease in employment in local non-farm businesses
- Increase in population migration to areas outside the local region
- Decrease in investment confidence in the local region
- Decrease in available skills and knowledge within the community (human capital)
- *The value of water traded*

Note: Impacts identified in italics were identified in the Phase 2 interviews, when key informants reviewed the impacts identified from the Phase 1 interviews.

Source: EBC (2003).

7 SCOPING: IDENTIFYING THE PROCESS SHADOW

In all interviews with key informants, issues of process were raised concurrently with issues about the potential impacts of reduced water allocations. Reference was made to past relationships between the community and other key stakeholder groups with process issues underpinning relationships with these groups creating a 'process shadow' that often permeated and influenced current interactions with these groups.

As shown in Figure 1 issues of process are particularly important in relation to understanding community acceptability of potential impacts. Furthermore many potential social impacts need to be mitigated through community involvement processes, which require an understanding of process issues within the community.

Many of the process issues that have been identified also describe the relationship between the irrigation community and other key stakeholder groups. In this context for instance, key informants discussed the community's relationship with government, people from 'the city', 'green groups', the MDBC, scientists and the national media.

It is possible that many in the community believe that the precursor events that have been discussed (with the exception of the drought) and the associated impacts that have been experienced can be attributed to the activities and actions of several of these stakeholder groups. As such the actions of many of these stakeholder groups, which are external to the community, may often be seen as a threat to the future functioning and viability of local communities.

One key informant as shown in the following quotation illustrates the belief that the community is under threat and in conflict with many stakeholder groups.

"These guys [irrigators] are very cowered down...we've lost the battle initially...we'll get it back...we've lost the battle of saying to people...hang on...I don't sit out here and walk through muddy waters for nothing...I actually produce your food. And we have to get up and say it...its for food and exports...nothing else."

7.1 Relationship with Government (Trust)

As discussed in Section 6.1 several of those interviewed believed the withdrawal of Government services has had a significant impact of communities within the region. While the withdrawal of Government services is not the only event that has influenced community attitudes towards Government, many of those interviewed were distrustful of Government as a consequence of these actions.

"Greater Murray Health. They made changes to the hospital here...and part of the trade was that Deniliquin would house their Human Resource Management team. So what happened was that they rented a building...they fitted it out...and no sooner had they got into it than they started to dismantle everything...they paid lip service to placate the community. In the end they withdrew their services...and they shifted all their people...most of whom were educated professional people to Albury."

Current community attitudes towards Government on issues unrelated to TLM are not necessarily independent of the current processes, but do permeate and influence community relationships with government on many issues including that of TLM.

“I am not an agitator in anyway...but why have they lied about the Tampa? Why have they lied about the weapons of mass destruction? They are liars...and now I’m going to tell you honestly!!! You’d want to run a mile when the politicians or Government comes.”

“One of the laughable things is Simon Crean with his 3000GL...even the 1500GL...how do you get it through the Barmah choke? Those things are a bit scary!”

Attitudes towards Government also have a more direct relationship with community attitudes towards many initiatives that are being undertaken in relation to the water reform process, including beliefs about trust and self interest in the decision making process.

“The problem is that the water access right in perpetuity is one thing...but what is a water access right and what percentage of its current access is it going to be? There is so much distrust...the devil is in the detail. So there is so much distrust of Government...”

“One of the things that is particularly abhorrent to us is that politicians are short term people...and that they make decisions and they are gone. These people are trying to make the decisions for the long term...for themselves, for their environment and for their succession planning.”

7.2 Relationship with “City People” (Knowledge of Issues)

One of the most common beliefs identified in the key informant interviews was the frequent reference made to ‘city people’ and that one of the problems in relation to the water reform process and TLM was the lack of understanding or knowledge about water use, agriculture and rural issues amongst ‘city people’. This appeared as a critical issue for many people, particularly given the belief that many of the current and potential changes that might be experienced in the region were attributable to the actions and beliefs of ‘city people’.

“...everybody has been very sceptical about mentioning the word compensation...the city people will say...the greedy farmers...they got water for nothing...it was given to them by god and by previous Governments...why should they get anything for it?”

“Your general people that are uneducated about river health...what the whole process is all about and the whole situation are now making decisions...in Melbourne and Sydney...saying we can’t move to that area because that area is going to fall apart. The first things people ask are...what about water security? What about salinity? Salinity is the lowest its been here in bloody 50 years...if you ask someone in the city...well we’re swimming in the sea here.”

“...they assume that if we shut down the rice industry...suddenly the mouth of the river would be open.”

7.3 Relationship with “Green” Groups

Reasons underlying the changes and impacts that had occurred in the region was not only attributed to Government and ‘city people’ but they were also attributed to the activities of ‘green’ groups. While there were similar attitudes towards Government and ‘city people’, there was also the belief that Government had been influenced by ‘green’ groups, which had in turn unfairly influenced the decision making process.

“...the irrigators out there are more suspicious than ever...the rules and the announcement of off-allocation...of supplementary water has changed

significantly...the Green groups have infiltrated the bureaucracy...they now lay claim to the water for other uses.”

“This is why we’ve been so anti the debate...and the process up to this point...its all based on flows. I mean Peter Garret gets on there...a month or so ago at Mildura...floating down the river saying...this river is dead, we’ve got to save this river. In historical terms, with the drought that we are having that river should have been bone dry!! Absolutely dry...no water...and the river was back up to its normal levels. I mean you could see the shots of the banks...and the river was right at its normal levels! And he’s saying this river is dead...we’ve got to save it...we’ve got to put all this extra water in.”

7.4 National Media and the ‘Image’ of Irrigators

Issues voiced through the national media in relation to environmental degradation, the water reform process and TLM were believed to have often created inaccurate perceptions of the health of the environment, farming practices and water use. Again as with other issues raised in this chapter, the ‘image’ created in the national media was often perceived as unfair and inaccurate and a significant threat to the viability of farming and rural communities in the local area.

“Rice cropping has got an absolute barrelling. Has the world gone mad? The people get paid well to grow rice...you can’t put in rice without having a ground test done...so that’s very controlled. There are now better varieties which don’t take as much water...they own their industry...they’re shareholders in their industry...and it’s a major export industry...talk about a feel good thing...so for God’s sake don’t get down on rice!”

“...a winery...he had some people from Sydney...he was saying look I have got triple irrigation...I don’t grow any rice now...we are watering our vines this way. And they say...oh that’s good...that rice it uses so much water. And then they said...where can we see rice being grown...and he said...well you’ve been driving through it for the last two hours. They have no idea...they have an image thing...they’re the perceptions you’ve got to get over.”

“The big problem is the media...the media have got the green tinge with them. Don’t get me wrong I am not anti green.”

There was also a belief that as a consequence of the image being created about the local region in the national media, this was having a significant negative impact on tourism within the region and on regional development generally.

“I have had people call me and say...but there’s tourism along the river. How can there be tourism along the river...isn’t it all dead with salt? How can you have a tourism industry when you don’t have a river? That’s the media in the city areas...the Murray is dead.”

“The whole of regional development is being skewed...trying to get people to move into regional areas...people say...well we can’t go there it’s a dead area...”

7.5 Relationship with the Murray Darling Basin Commission

Attitudes towards and beliefs about Government, ‘city people’ and ‘green’ groups were also commonly attributed to the MDBC. For instance, the belief that improvements in river health

benefited everyone, but that the impacts associated with achieving this goal were not being distributed equitably between rural and 'city people' was also applied to the MDBC.

"The other thing about the MDBC...in relation to people here...when your in your own business you can be flexible. Our big worry is that in Canberra we have third generation bureaucrats...who've never risked a dollar. Now if you've never risked a dollar you always know your superannuation is right...you're going to have four weeks' annual leave...all that sort of thing. You wonder why people out here arc up...when things are being put on them...the risk is not shared. Everybody has to feel it for the Living Murray...Mr Jones in the City can also feel it as well."

While the previous quotation raises issues about the equitable distribution of impacts associated with the water reform process, equity in relation to future development is also raised. However in this instance the MDBC is seen as being directly responsible for the control of future development and issues of equity.

"Why are you allowing further development on the Murray? We're really dark on that because the water has traditionally being used here prior to 1995...the water was traditionally been used here. That's why we're so dark on them...that's why when we have a Living Murray meeting in Finley...the whole town closes down...and 500 turn up...and it goes down like a lead balloon I can tell you."

Key informants believed that one of the roles of the MDBC was to ensure equity and fairness in any decision making processes and that the MDBC should be impartial or neutral and rely on objective information in its decision making. However amongst several key informants there was a belief that this was not occurring and that there were issues of equity and fairness that were not being addressed in relation to the documentation and reporting of information.

"So there is a lot of misinformation...and we're certainly very cross with the MDBC for not clearing up that information...and allowing the environmentalists to paint a picture that isn't true. We saw it happen over the Snowy...and it is not right...there is 10 kilometres that maybe is trickling...but it was that 10km that we are seeing all the time."

"Where they have found that the Living Murray document is flawed...erroneous statements in it. They haven't got up and said...we've made a mistake. They have a duty of care to do that."

"The MDBC themselves...some of the inaccuracies that are coming out in the press they have never even challenged. That worries me...and it worries a lot of other people. They've got a duty of care to the people that they serve."

"Why did the MDBC hide the fact about fish numbers going up the Torrumbarry Weir? Why did they hide it? These are the things we have been asking right along the river."

While key informants raised beliefs about the process of documenting and reporting information, procedural issues were also raised in relation to the transparency of the decision making process. The belief that decision making has not always been transparent has for some also affected trust the relationship with MDBC.

"We are very mistrustful of the MDBC...I am not pulling any punches there. Just the way they have carried out their community consultation and inviting people to meetings and things like that and not having open

meetings. When you have an open meeting 500 people come...that's the reason...I mean 500 people are worried."

"I think you need to keep people informed and if people want to come and be informed you don't do it behind closed doors and you don't use other people...that creates the mistrust...and that's very strong here."

While several procedural issues have been identified which underpin the relationship between the community and the MDBC, there is some indication that the development of a meaningful community involvement program may well begin to address several of these issues.

"When they did their first round of meetings...a long way into their process...and they got big roll ups...oh shit...we're not just going to be able to slip this one through. And they have come back and since had other meetings...they are starting to listen a bit more and not just push it through."

7.6 Attitude Toward 'The Science'

An issue raised in many of the interviews with key informants focussed on the science used in the decision making process. In this context a key issue raised concerned the veracity of the science and that the findings of the science often contradicted local knowledge. The following quotations illustrate attitudes raised in relation to the science and the science as presented through the Wentworth group.

"Scientists have got to be independent...and the Wentworth Group is not showing any independence in anyway. The science...it's a bit like economics...you can make it which anyway you want it...and as John Anderson said on Monday...they got the science wrong up in the Condamine-Balonne...they got the science wrong."

"What we have found is that the scientific study by the Wentworth group is totally flawed...I know that is a big statement...but from what we gather from different scientists. One of them [scientists] was making a statement about the Murray River...and when he was asked further, it was on the Goulburn River...this type of thing"

"The credibility of the Wentworth group is really non-existent."

"The science...its totally wrong. Got it wrong. Their fish strategy for a start is totally wrong. Salinity levels...etc etc."

"When I first got involved in the Living Murray...when it was dumped on my desk...well I knew nothing. I had an open mind. The first thing I thought of was...are the local people parochial? Is it pecuniary? Are they biased? So I started asking a lot of questions of a lot of people...to make up my own mind about whether I wanted to get involved or not. After talking to a lot of the key people around...I thought there was something wrong. I went to Jerilderie and I heard the scientists speak there...and when his credibility got shot out the door, I thought what was going on here...something is amiss somewhere."

The veracity of the science was questioned particularly in relation to fish populations, which appeared to represent for several key informants a useful indicator of river health. However in this context local knowledge of fish populations was often seen to contradict the scientific evidence that was being presented. Given the perception that the science did not always support local knowledge this created some doubt in relation to other areas of scientific inquiry and ultimately the scientific evidence supporting the need for additional environmental flows.

“The little creek down here...its got hardly any water in it...its got all these weeds in it so they can't move around. There's fish there. There's heaps of them. So...well...we're saying maybe we don't need those extra flows.”

“...fish by the boatload...I was talking to the secretary there...years ago it would be one cod and you'd catch about seven or eight Carp...it's the other way around now. The [guy] in Finley...he's a keen fishermen...you don't catch the carp like you used to catch them. And so it's a bit hard to swallow when you get people coming saying there's no native fish.”

That there was a lack of scientific evidence for increasing environmental flows was also a common theme raised in the key informant interviews. The following two quotations highlight the belief that there is insufficient scientific evidence supporting the need for reduced environmental flows, while the third quotation emphasises the belief that a focus on environmental flow is too narrow and that other issues associated with the ecology of the river should also be addressed.

“...they need to have a much better science based idea of what is happening. Rather than just go...oh...we'll just put however many megs down the river and we'll fix that problem. It needs to have some research done on it which says if we are going to do this then the potential for this to happen is...”

“For a start they just put up these targeted figures...150 through to 1,500...and people in the cities said it was just one of those targets to achieve...No...no...they are starting at the wrong end...we need to find out what is going on, what is wrong...what do we want...what outcomes do we want? Build up to a figure...to get this we really need that much water...people started coming the other way.”

“Another issue with water recovery is focussing on the megalitres...I'm concerned that it is too focussed on megalitres and not the overall ecology of the environment. And yes...perhaps flood irrigation does use a bit more water...but at the end of the day we've got a much better overall environment...you're not manufacturing a heap of plastics for pipes...It's just really focused on megalitres without understand the broad implications.”

While process issues identified and discussed previously in this section undoubtedly influenced attitudes towards the science, a common issue associated with these attitudes was the often cited mismatch between local knowledge on the one hand and scientific knowledge on the other. This issue has also been raised in the previous discussion of fish populations and environmental flows.

“The river from Tocumwal to down past Barham...the river is in danger of dying from too much water. Trying to shovel all this water through it...”

“Have you been down to Barham...they can't even get the river boat under the bridge.”

The potential mismatch between local and scientific knowledge needs to be addressed as a fundamental objective of any community involvement program (Section 11) as beliefs about the veracity of the science will underpin community acceptance of any water recovery mechanisms and any potential impacts. The following quotations also indicate the importance of addressing local knowledge and community ownership and involvement of “the science”.

“Lets be honest...I have been around myself...I come into an area. The first thing I want to do is talk to the locals. They know more about it than some bloke living in Canberra, Sydney or Melbourne...the locals can tell you more about most things...some of them may be biased...but even if you take that into account...”

“You’d probably find somebody on the river that actually says...I notice that when the water is being sucked in or whatever...or that there is a pool of water going out...you have to ask the people that have that on ground information...and you certainly don’t have it in Canberra.”

“If the community has ownership to things like that...and we have done it here with these Land and Water Management Plans...which have been extremely successful. That’s the way to get people on board...then there’s ownership...then they have all worked on it.”

7.7 Summary of Precursor Processes

One of the key findings associated with the development of the social impact assessment framework is that issues of process need to be recognised and included as core components of any social impact assessment process developed in this context. It is evident that if an approach had been used in which the framework had been more prescribed and interviews undertaken using a more formalised and structured approach, the importance of process issues may have been overlooked.

Issues of process focussed on relationships amongst external stakeholder and interest groups and the farming communities, with farming communities including not only the farmers and irrigators but also the broader local community. The key informant interviews identified several external groups that played significant roles in the water reform process and who were often seen as a potential ‘threat’ to the viability of the farming community. The external groups that were identified included ‘Government’, the Murray Darling Basin Commission, ‘city people’, ‘green groups’, scientists and the national media.

In several instance the problems being experienced by the community in relation to water reform were attributed to the actions and beliefs of these external groups.

The relationship between the farming community and the external groups was described in relation to a number of specific process attributes that are summarised below:

- **Trust:** A belief that there was little trust in the relationship with external groups
- **Transparency:** A belief that the decision making processes lacked transparency
- **Procedural fairness:** A belief that there had been unfair influence on the decision making process by external groups
- **Distributional fairness:** A belief that while there were broad social benefits associated with the water reform process, the impacts of this process were unfairly distributed across the Australian community, with farming communities absorbing the greatest impacts
- **Neutrality:** A belief that agencies such as the MDBC had been influenced by external groups and that they should maintain their neutrality in the process
- **Knowledge:** A belief that external groups had limited knowledge of water and rural issues
- **Knowledge systems:** This issue focussed on the conflict between local and ‘science based’ knowledge systems and that the findings of “The Science” were often in conflict with local knowledge.

8 PROFILING: BASELINE ASSESSMENT OF THE SOCIAL ENVIRONMENT

8.1 Murray Irrigation's Operational Area

The social impact assessment framework was developed in the area in which Murray Irrigation Limited (MIL) supplies irrigation water. This includes an area of over 716,000 hectares of farmland in NSW to the north of the Murray River. It includes an area from Mulwala in the east to Moulamein in the west and includes the regional and country towns of Deniliquin, Finley, Berrigan and Wakool (Figure 2).

MIL is a private irrigation company that is located in the regional centre of Deniliquin although it also has an office in Finley. The company was established 1995, when the NSW Government Murray Irrigation Area and Districts was privatised with each irrigator in the district also becoming a shareholder in the company. MIL is the largest privately owned irrigation supply and drainage company in Australia, and has an entitlement of 1.445 million megalitres that is 67% of the NSW share of Murray River irrigation entitlements.

MIL provides irrigation water to over 2,400 farms that are owned by 1800 farm family businesses within this area¹⁶. In addition over 75% of the water in MIL is used by businesses growing rice (about 60% on rice crops), with the balance used by mixed (no rice) businesses and dairy businesses (McGuckian, 2002)¹⁷.

8.2 The Objectives of the Profiling Phase

The profiling phase of the social impact assessment provides a baseline assessment of the social environment within the operational area of Murray Irrigation. The description of the social environment through the development of specific social profiles addresses three core objectives, which are:

1. To provide a descriptive overview of the population and social characteristics of the community within the affected area,
2. Where possible to develop social profiles which address issues raised by key informants in the scoping phase of the assessment (Sections 5, 6 and 7). The aim of this objective to provide convergent validity to the issues that have been identified through the application of multiple methods, and
3. To develop social profiles which provide an indication of the resilience (vulnerability or robustness) of the community to adapt, manage or adjust to any future changes.

The profiling that is presented makes use of ABS census information showing trends in each census variable across the time periods of 1986 to 2001. It is suggested that the use of time series data provides better descriptive information of the community and particularly community resilience to change than reporting current census data relative to State or national averages.

Time series data for the Australian census is more readily available at a Local Government Authority (LGA) scale and in this case the seven LGAs of (i) Wakool, (ii) Windouran, (iii) Murray, (iv) Conargo, (v) Deniliquin, (vi) Jerilderie and (viii) Berrigan as shown in Figure 2 have been aggregated to approximate the operational area of MIL. While LGAs have been used due to the availability of time series data at this scale, it should be noted that profiling at a local scale often requires greater disaggregation.

¹⁶ Murray Irrigation Website. www.murrayirrigation.com.au

¹⁷ McGuckian, R. (2002). *Implications for Farm Viability of a Reduced Allocation for Irrigation in the Murray Irrigation Area*. Report prepared by Rendell McGuckian Agricultural and Management Consultants.



Figure 2. Local Government Areas and the MIL Area

8.3 Population and Dwellings

Table 5 and Figure 3 shows the population and dwelling counts for the MIL area between 1986 and 2001. During this time there has been a decline in the regional population of 4.5%, although there has been some increase in the number of private dwellings during this time.

Table 5 also shows that the percentage of the population who were at a different address one year ago was 16.8%, which is similar to NSW State average of 18.2%. Similarly Table 5 also shows that 38.2% of the population of the area were at a different address five years ago, which again is similar to NSW State average of 41.9%

Table 5. Population and Dwellings (1986 – 2001)

	1986	1991	1996	2001
POPULATION				
Total persons counted	31,242	30,028	30,180	29,824
Persons in private dwellings	30,592	28,882	29,024	28,808
% in private dwellings	97.9	96.2	96.2	96.6
PRIVATE DWELLINGS				
Occupied	10,755	10,592	11,174	11,639
Unoccupied	1,269	1,326	1,564	1,826
Total	12,024	11,918	12,738	13,465
PERSONS PER PRIVATE DWELLING				
	2.9	2.7	2.6	2.5
Different address 1 year ago	na	na	na	4,667
Percent different address 1 year ago ¹	na	na	na	16.8
Different address 5 years ago	na	na	13,231	10,593
Percent different address 5 years ago ¹	na	na	47.7	38.2

Note: ¹ Percentages based on those aged over 5 years
na indicates data not available

Source: ABS (1996, 2001)

Prepared by: EBC (2003).

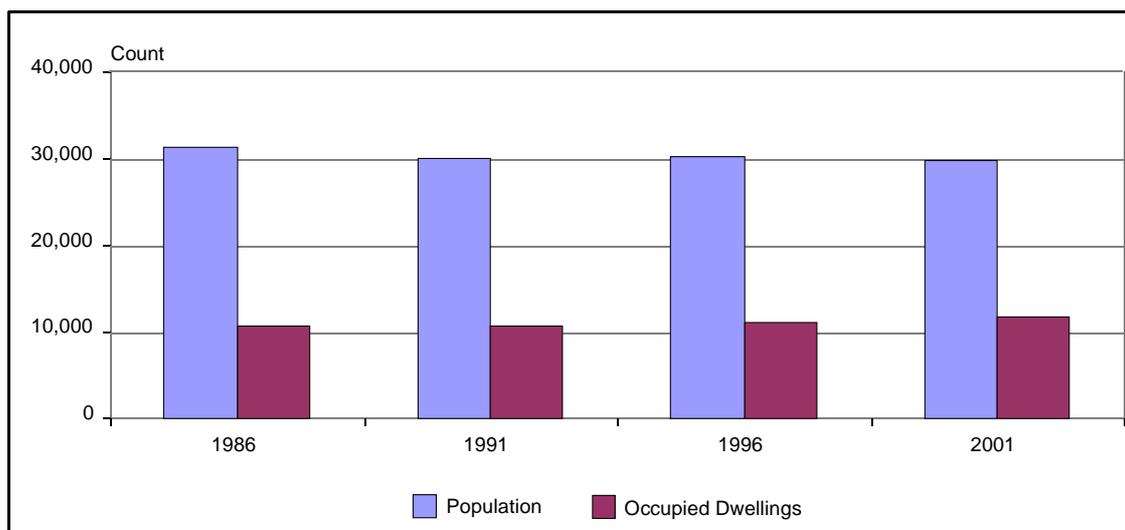


Figure 3. Population and Dwelling Counts (1986-2001)

During the scoping phase of the assessment key informants indicated that, in recent years there had been a significant decrease in the population of the three towns of Deniliquin, Finley and Berrigan.

Table 6 shows that between 1986 and 1991 Deniliquin had a population increase of 4.3%, however since 1991 the town has declined in population by only 1.4%. In contrast the population of Finley during the last 10 years since 1991 has declined by 14%, while the population of Berrigan has only declined by 2.5%.

Table 6. Deniliquin, Finley and Berrigan: Population and Dwellings (1986 – 2001)

	1986	1991	1996	2001
Deniliquin				
Total persons counted	7,566	7,895	7,816	7,786
Occupied private dwellings	2,886	2,935	3,058	3,135
Finley				
Total persons counted	na	2,222	2,137	1,912
Occupied private dwellings	na	872	905	925
Berrigan				
Total persons counted	na	953	1,015	929
Occupied private dwellings	na	397	430	428

Note: The LGA of Deniliquin has been used.
na indicates data not available

Source: ABS (1991, 1996, 2001)

Prepared by: EBC (2003).

8.4 Population Projections

Population projections from 2001 to 2026 for each of the seven Local Government Areas (LGAs) are shown in Table 7 with Figure 4 showing the population projection for the area as a whole. Table 7 indicates that with the exception of the LGA of Murray, which shows an increase in population between 2001 and 2026, all other LGAs show a decline in population. Across all seven LGAs and for the region as a whole, the decline in population between 2001 and 2026 is projected to be 2.4%.

Table 7. Population Projections for Local Government Areas

Local Government	2001	2006	2011	2016	2021	2026
Berrigan	7,709	7,900	7,700	7,500	7,200	6,800
		2.5	-2.5	-2.6	-4.0	-5.6
Conargo	1,417	1,300	1,200	1,100	1,000	900
		-8.3	-7.7	-8.3	-9.1	-10.0
Deniliquin	7,786	8,300	8,200	8,100	8,000	7,700
		6.6	-1.2	-1.2	-1.2	-3.8
Jerilderie	1,790	1,800	1,600	1,600	1,500	1,400
		0.6	-11.1	0.0	-6.3	-6.7
Murray	5,907	6,500	6,900	7,300	7,600	7,800
		10.0	6.2	5.8	4.1	2.6
Wakool	4,806	4,800	4,600	4,500	4,300	4,100
		-0.1	-4.2	-2.2	-4.4	-4.7
Windouran	409	400	400	400	400	400
		-2.2	0.0	0.0	0.0	0.0
Total Region	29,824	31,000	30,600	30,500	30,000	29,100
		3.9	-1.3	-0.3	-1.6	-3.0
NSW State	6,311,168	6,904,600	7,171,700	7,421,900	7,653,200	7,860,800
		9.4	3.9	3.5	3.1	2.7

Source: ABS (2001)

Prepared by: EBC (2003).

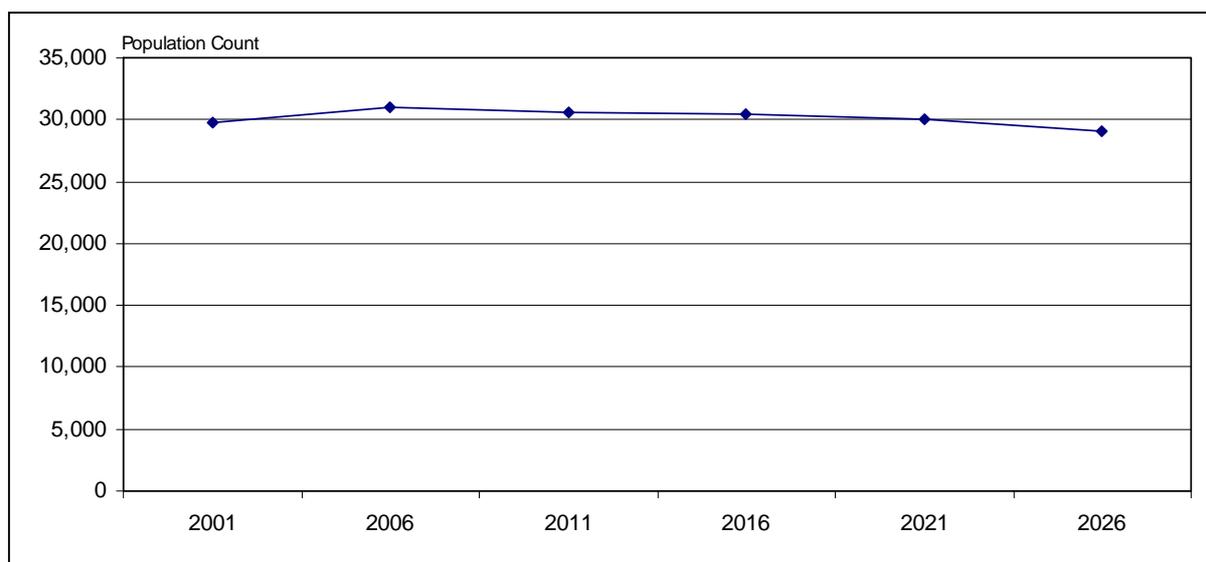


Figure 4. Population Projections for the MIL Area (2001-2026)

8.5 Community Age Profiles

A common issue raised in many of the key informant interviews, as reported in Section 6.5, was the changing age structure of the population, which included the loss of young people from the community and the ageing of the population. This issue was important in the context of water reform as any further change in the community may impact cumulatively on changes already occurring on the age structure of the population. Furthermore the age and the changing age structure of the population is an important component of community resilience and its ability to adapt, manage and adjust to future change.

Table 8 shows that with the exception of the percentage of the population over 50, the age profile of the population in 2001 is similar to that of NSW state. However there is a significantly higher percentage of people over 50 years of age in the population of the area when compared to NSW State.

Table 8 and Figure 5 also show that between 1986 and 2001 there has been a decline in the percentage of younger people in the population (below 39 years of age) and an increase in older people (people over 40 + years of age). These changes have been very significant for the area with the number of people in the population below 39 years of age declining by 22% since 1986. In contrast the number of older people above 40 years of age has between 1986 and 2001 increased by 24%.

The age dependency ratio is the proportion of the dependent component of the population (below 14 years of age and above 65 years of age) that is economically dependent for every 100 persons of working age (between 15 and 64 years of age). This ratio has increased between 1986 and 2001 and is now significantly higher than the age dependency ratio for the State of NSW.

Table 8 also shows that while there has been an increase in the elderly dependency ratio there has also been some decline in the child dependency ratio. However the child dependency ratio is still significantly higher than that of NSW.

Table 8. Age in the Lifecycle (1986 – 2001)

Age in Lifecycle	1986	1991	1996	2001	NSW State 2001
0-4 Pre-School	2,607 8.4	2,407 8.0	2,331 7.7	2,056 6.9	422,341 6.7
5-12 Primary School	4,189 13.4	3,801 12.7	3,810 12.7	3,704 12.4	716,350 11.4
13-17 High School	2,670 8.6	2,184 7.3	2,101 7.0	2,057 6.9	439,592 7.0
18-24 Young Singles/Couples	2,713 8.7	2,424 8.1	2,129 7.1	1,843 6.2	580,412 9.2
25-39 Young/Middle Families	7,181 23.1	6,711 22.4	6,188 20.6	5,432 18.3	1,398,042 22.2
40-49 Mature Families	3,556 11.4	3,808 12.7	4,270 14.2	4,402 14.8	920,595 14.6
50-64 Pre-Retirement	4,736 15.2	4,810 16.1	4,887 16.2	5,360 18.0	1,005,361 15.9
65+ Elderly	3,495 11.2	3,814 12.7	4,389 14.6	4,908 16.5	828,475 13.1
Total	31,147 100.0	29,959 100.0	30,105 100.0	29,762 100.0	6,311,168 100.0
Median Age	36	33	36	37	35
Age Dependency Ratio	57.2	56.1	60.6	62.7	49.3
Elderly Dependency Ratio	17.6	19.8	23.5	26.8	19.5
Child Dependency Ratio	39.6	36.2	37.1	35.9	29.7

Note: The age dependency ratio is the proportion of the population (below 14 years and above 65 years) that is economically dependent for every 100 persons of working age (15-64 years).
The elderly dependency ratio is the proportion of elderly persons (above 65 years) for every 100 persons of working age (15-64 years).
The child dependency ratio is the proportion of children (below 14 years) for every 100 persons of working age (15-64 years).
Median age is approximated and is based on the median of the seven LGA medians.

Source: ABS (1996, 2001)

Prepared by: EBC (2003).

Interviews with key informants also identified a concern in relation to the changing age structure of farmers (Section 6.5). Table 9 shows that between 1991 and 2001 the percentage of younger farmers in the population (below 34 years of age) has declined by 20%, while the percentage of older farmers in the population (above 35 years of age) has increased by 13%.

Table 9. Age and Employment in Agriculture, Fisheries and Forestry (1991 – 2001)

Age	1991	1996	2001
15-19 years	142 3.7	104 2.9	121 3.1
20-24 years	268 7.0	207 5.8	217 5.5
25-34 years	852 22.2	658 18.5	666 17.0
35-54 years	1,719 44.7	1,682 47.4	1,841 47.0
55+ years	864 22.5	901 25.4	1,071 27.3
Total	3,845 100.0	3,552 100.0	3,916 100.0

Source: ABS (1991, 1996, 2001)

Prepared by: EBC (2003).

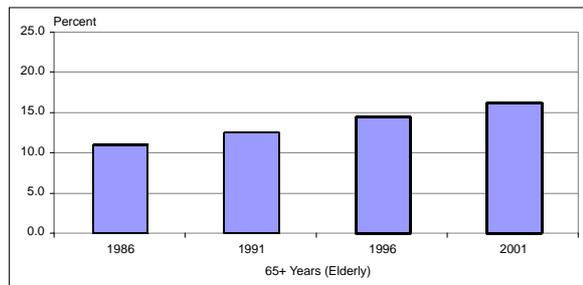
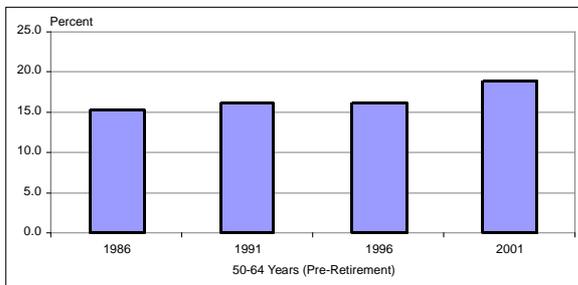
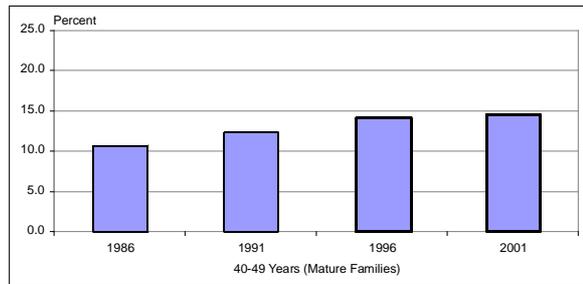
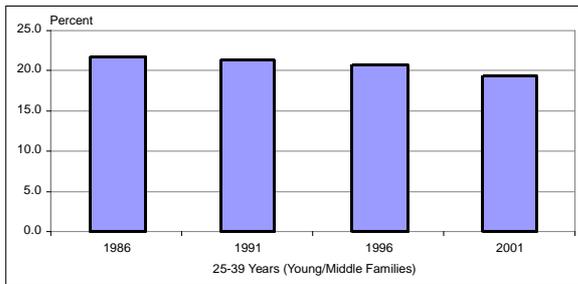
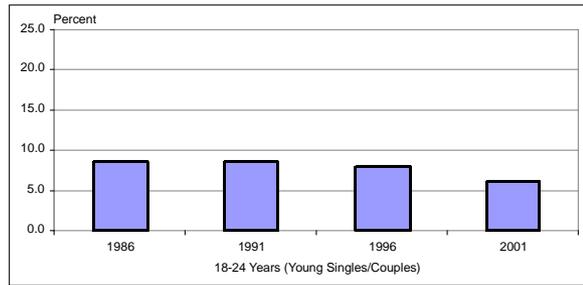
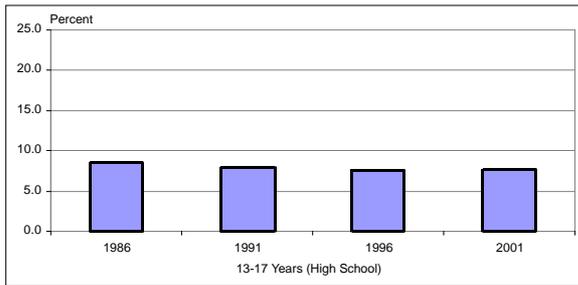
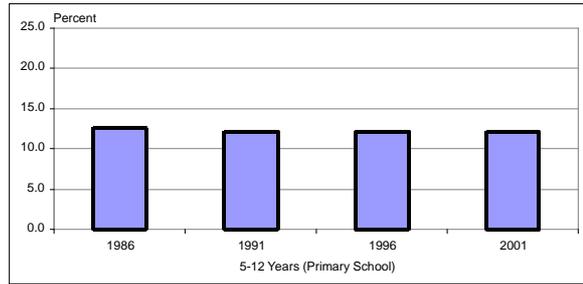
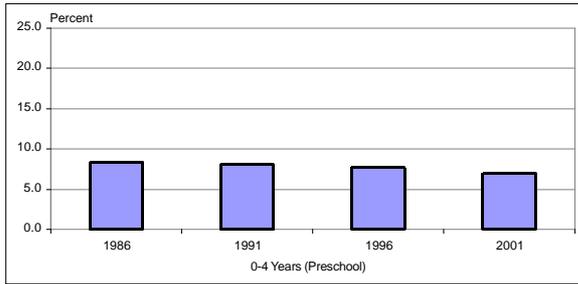


Figure 5. Age in Lifecycle (1986-2001)

8.6 Industry Employment

Table 10 shows changes in industry of employment for the MIL area between 1986 and 2001 and a comparison of 2001 employment levels within the region to NSW State averages.

Thirty percent of employed persons in 2001 were directly employed in agriculture, forestry or fishing with this percentage having remained relatively stable since 1986. Since 1986 there has been employment growth in manufacturing (7.6%), wholesale trade (60.1%), retail trade (23.8%), property and business services (53%) and health and community services (34.6%).

In contrast, since 1986 there has been a decline in employment growth in the industry sectors of electricity, gas and water supply (-36.2%), communication services (-45.5%), finance and insurance (-30.2%) and government administration and defence (-23.7%), suggesting some decline in employment in the service provision sectors.

Table 10. Industry of Employment (1986 – 2001)

Industry	1986	1991	1996	2001	NSW State 2001
Agriculture, Forestry and Fishing	3,883 32.0	3,862 29.9	3,955 30.7	3,914 29.5	92,358 3.4
Mining	9 0.1	7 0.1	3 0.0	12 0.1	14,823 0.5
Manufacturing	935 7.7	797 6.2	910 7.1	1,006 7.6	316,113 11.5
Electricity, Gas and Water Supply	268 2.2	360 2.8	282 2.2	171 1.3	20,389 0.7
Construction	646 5.3	560 4.3	571 4.4	679 5.1	189,740 6.9
Wholesale Trade	380 3.1	501 3.9	558 4.3	611 4.6	152,790 5.6
Retail Trade	1,326 10.9	1,327 10.3	1,397 10.8	1,641 12.4	390,914 14.2
Accommodation, Cafes and Restaurants	648 5.3	1,032 8.0	915 7.1	901 6.8	141,927 5.2
Transport and Storage	412 3.4	458 3.5	469 3.6	491 3.7	125,752 4.6
Communication Services	176 1.4	128 1.0	161 1.2	96 0.7	54,958 2.0
Finance and Insurance	285 2.3	266 2.1	232 1.8	199 1.5	131,955 4.8
Property and Business Services	381 3.1	383 3.0	443 3.4	585 4.4	334,299 12.2
Government Administration and Defence	556 4.6	512 4.0	508 3.9	424 3.2	105,380 3.8
Education	691 5.7	673 5.2	683 5.3	685 5.2	187,168 6.8
Health and Community Services	765 6.3	829 6.4	976 7.6	1,030 7.8	258,522 9.4
Cultural and Recreational Services	150 1.2	148 1.1	128 1.0	165 1.2	67,595 2.5
Personal and Other Services	201 1.7	272 2.1	279 2.2	340 2.6	98,321 3.6
Non-classifiable economic units	70 0.6	27 0.2	127 1.0	68 0.5	14,884 0.5
Not stated	370 3.0	773 6.0	303 2.3	267 2.0	50,508 1.8
Total	12,152 100.0	12,915 100.0	12,900 100.0	13,285 100.0	2,748,396 100.0

Note: Based on employed persons

Source: ABS (1996, 2001)

Prepared by: EBC (2003).

Table 10 shows changes in employment within industry sectors for the MIL area as a whole and may mask employment changes occurring within towns in the area. For instance, several key informants indicated that the employment structure within Deniliquin and Finley had changed significantly in recent years.

While time series data for small towns is difficult to obtain and use given changes in ABS definitions and boundaries, Table 11 nevertheless provides some information on changes in employment within industry sectors for the towns of Deniliquin and Finley.

As shown in Table 11, Deniliquin experienced between 1986 and 2001 growth in employment in agriculture, forestry and fishing (78%), retail trade (28%) and health and community services (29%), while employment in manufacturing remained relatively constant (1%) and employment in government administration and defence declined (-27%). Certainly the decline in government administration and service provision supports the view of many key informants that government service provision had declined in the town.

Time series census data for the town of Finley is difficult to develop. However employment in agriculture, forestry and fishing (19%), manufacturing (52%) and retail trade (3%) increased between 1996 and 2001. In contrast employment in the health and community services sector (-10%) and Government administration and defence (-21%) declined between 1996 and 2001. The declining employment in the government and health sectors again generally confirms the beliefs of many key informants in Phase 1 interviews.

Table 11. Industry of Employment: Deniliquin and Finley (1986 – 2001)

	1986	1991	1996	2001
Deniliquin				
Agriculture, Forestry and Fishing	228 7.7	280 8.7	246 7.8	406 12.3
Manufacturing	259 8.7	347 10.8	291 9.2	263 8.0
Retail Trade	481 16.2	495 15.4	511 16.2	615 18.6
Health and Community Services	273 9.2	339 10.5	385 12.2	351 10.6
Government Administration and Defence	188 6.3	172 5.3	192 6.1	137 4.1
Total	2,971 100.0	3,218 100.0	3,154 100.0	3,303 100.0
Finley				
Agriculture, Forestry and Fishing	na	na	90 10.3	107 13.0
Manufacturing	na	na	33 3.8	50 6.1
Retail Trade	na	na	157 18.0	162 19.6
Health and Community Services	na	na	87 10.0	78 9.5
Government Administration and Defence	na	na	34 3.9	27 3.3
Total	na	na	874 100.0	825 100.0

Note: *na indicates no available and comparable data.*

Based on employed persons

Source: *ABS (1996, 2001)*

Prepared by: *EBC (2003).*

8.7 Labour Force Participation and Unemployment

Information on labour force participation and unemployment in the region is presented in Table 12. In 2001 the percentage of people in full-time and part-time employment was similar to that found in NSW. However while there has been an increase in the number of employed persons in the MIL area since 1986 (59%), the percentage of persons in full-time employment has declined (-14%) while part-time employment has increased (12%).

Unemployment rates across the different age groups are lower than the NSW State average and have declined since 1986. However some caution is required in the interpretation of unemployment rates, as people may have moved to other larger regional and urban centres in order to seek employment.

Table 12 shows that while the labour force participation rate has remained relatively constant between 1986 and 2001 and is similar to that of the NSW State, participation of males in the labour force has declined (-8%), while female participation rates have increased (16%).

Table 12. Labour Force Participation (1986-2001)

	1986	1991	1996	2001	NSW State (2001)
Employed					
Full-time	6,680	9,177	8,897	8,800	1,805,433
	79.9	71.0	69.0	66.2	65.7
Part-time	1,505	3,123	3,543	4,003	858,483
	18.0	24.2	27.5	30.1	31.2
Not stated	173	622	446	483	84,480
	2.1	4.8	3.5	3.6	3.1
Total	8,358	12,922	12,886	13,286	2,748,396
	100.0	100.0	100.0	100.0	100.0
Unemployed					
15-24 years	573	463	332	187	68,999
Rate ^(a)	21.4	20.0	16.1	9.5	13.3
25-34 years	493	341	235	148	50,334
Rate ^(a)	13.5	9.5	8.1	5.6	7.1
35-44 years	321	226	198	115	44,553
Rate ^(a)	9.7	6.3	5.3	3.3	6.0
45-54 years	204	148	175	122	32,202
Rate ^(a)	8.6	5.6	5.7	3.7	5.0
55-64 years	119	141	88	72	15,470
Rate ^(a)	8.1	8.6	5.5	3.9	5.4
65 yrs+	6	24	0	6	1,638
Rate ^(a)	1.6	5.1	0.0	0.9	2.7
Total Unemployment	1,716	1,343	1,028	650	213,196
Total Unemployment Rate ^(a)	12.4	9.4	7.4	4.7	7.2
Total Labour Force					
Males	8,799	8,697	8,282	8,057	1,637,943
Labour Force Participation ^(b)	73.4	74.2	70.0	68.4	66.3
Females	5,065	5,568	5,632	5,879	1,323,649
Labour Force Participation ^(b)	44.8	49.9	49.8	51.5	51.2
Total	13,864	14,265	13,914	13,936	2,961,592
Labour Force Participation ^(b)	59.5	62.3	60.1	60.0	58.6

Note: ^(a) Number of unemployed expressed as a percentage of the labour force

^(b) Number of males, females or persons in the labour force expressed as a percentage of the total males, females or total persons aged 15 years or over

Source: ABS (1991, 1996, 2001)

Prepared by: EBC (2003).

8.8 Weekly Individual, Family and Household Income

Table 13 presents weekly individual, family and household income for each of the seven LGAs within the MIL area between 1991 and 2001. Weekly individual and family incomes were in 2001 similar to the NSW State averages. However, in 1991 individual and family incomes were lower than the NSW State average and have shown significant growth, so as they are now comparable with the NSW State average.

A similar pattern also emerges in relation to weekly household incomes, however weekly household income in 2001 is somewhat lower than the NSW State average.

Table 13. Median Weekly Individual, Family and Household Income (\$)

Income	1991	1996	2001
WEEKLY INDIVIDUAL			
Berrigan	40-79	200-299	300-399
Conargo	40-79	300-399	400-499
Deniliquin	80-119	200-299	300-399
Jerilderie	40-79	200-299	300-399
Murray	40-79	200-299	300-399
Wakool	40-79	200-299	300-399
Windouran	40-79	200-299	300-399
Modal Income	40-79	200-299	300-399
NSW State	80-199	200-299	300-399
WEEKLY FAMILY			
Berrigan	200-299	500-599	700-799
Conargo	160-199	700-799	800-999
Deniliquin	200-299	600-699	800-999
Jerilderie	200-299	600-699	800-999
Murray	160-199	500-599	700-799
Wakool	160-199	500-599	700-799
Windouran	160-199	500-599	800-999
Modal Income	160-199	500-699	800-999
NSW State	400-499	700-799	800-999
WEEKLY HOUSEHOLD			
Berrigan	160-199	400-499	600-699
Conargo	160-199	600-699	700-799
Deniliquin	160-199	500-599	600-699
Jerilderie	160-199	500-599	600-699
Murray	160-199	400-499	600-699
Wakool	160-199	400-499	600-699
Windouran	160-199	400-499	600-699
Modal Income	160-199	400-599	600-699
NSW State	300-399	600-699	800-999

Note: Table includes median values as provided by ABS.

Source: ABS (2001)

Prepared by: EBC (2003).

8.9 Occupational Structure

The occupational structure of employed persons has been reported in Table 14, as several key informants indicated there had been some reduction in the number of professional occupations within the region. However Table 14 shows that the percentage of 'white collar' workers has increased in the area since 1986, while the percentage of 'blue collar' workers has declined.

Table 14. Occupation of Employed Persons (1986-2001)

Occupation	1986	1991	1996	2001
WHITE COLLAR				
Managers and Administrators	3,306 27.2	3,382 26.2	3,261 25.3	3,103 23.4
Professionals	1,102 9.1	1,141 8.8	1,287 10.0	1,440 10.8
Associate Professionals	775 6.4	867 6.7	1,323 10.3	1,364 10.3
Advanced Clerical and Service Workers	540 4.4	575 4.5	398 3.1	428 3.2
Intermediate Clerical, Sales, Service Workers	902 7.4	1,054 8.2	1,370 10.6	1,493 11.2
Sub-Total	6,625 54.6	7,019 54.3	7,639 59.3	7,828 58.9
BLUE COLLAR				
Tradespersons and Related Workers	1,566 12.9	1,505 11.7	1,483 11.5	1,490 11.2
Intermediate Production and Transport Workers	1,111 9.2	1,089 8.4	1,052 8.2	1,131 8.5
Elementary Clerical, Sales, Service Workers	976 8.0	970 7.5	752 5.8	911 6.9
Labourers and Related Workers	1,516 12.5	1,586 12.3	1,547 12.0	1,663 12.5
Sub-Total	5,169 42.6	5,150 39.9	4,834 37.5	5,195 39.1
OTHER				
Inadequately described	164 1.4	100 0.8	100 0.8	82 0.6
Not stated	179 1.5	647 5.0	316 2.5	181 1.4
Sub Total	343 2.8	747 5.8	416 3.2	263 2.0
Total	12,137 100.0	12,916 100.0	12,889 100.0	13,286 100.0

Note: Based on employed persons

Source: ABS (1996, 2001)

Prepared by: EBC (2003).

While Table 14 shows an increase in white collar employment and a decrease in blue collar employment within the MIL region, this trend may have masked trends occurring within specific towns and regional centres as identified in the key informant interviews. In order to identify if this was occurring an analysis of the percentage of blue and white-collar workers in Deniliquin was undertaken.

Table 15 shows that the employment mix within Deniliquin is significantly different and quite the reverse of the regional trend. In Deniliquin the percentage of blue-collar workers between 1986 and 2001 has increased, while the percentage of white-collar workers has declined. This tends to support the belief of several key informants as reported in Section 6.1, that the percentage of people employed in professional occupations has in recent years declined in Deniliquin.

Table 15. Occupation of Employed Persons: Deniliquin (1986-2001)

	1986	1991	1996	2001
White collar workers	1,713 57.7	1,486 46.1	1,726 54.7	1,755 53.2
Blue collar workers	1,176 39.6	1,537 47.7	1,342 42.5	1,484 45.0
Other (not stated)	81 2.7	198 6.1	86 2.7	62 1.9
Total	2,970	3,221	3,154	3,301
		100.0	100.0	100.0

Note: Based on employed persons

Source: ABS (1996, 2001)

Prepared by: EBC (2003).

8.10 Number of Businesses in Towns

Several key informants in Phase 1 interviews reported that the number of business in towns throughout the region had declined in recent years. Table 16 shows the number of businesses as reported in the Yellow Pages in several rural towns throughout the MIL area between 1996 and 2002. Amongst towns in the area the number of businesses in towns peaked in 1999 at 1,566 and in the three years since that time has decline by 8% to 1,438.

Interestingly while the number of businesses in many of the towns peaked at about 1999, the peak in Finley occurred in 1997, and since this time there has been a 13% decline in the number of businesses in Finley.

Table 16. Growth in the Number of Businesses in Towns (1996-2002)

Town Location	1996	1997	1998	1999	2001	2002
Barooga	50	49	47	51	47	46
		-2.0	-4.1	8.5	-7.8	-2.1
Berrigan	90	90	88	91	92	84
		0.0	-2.2	3.4	1.1	-8.7
Deniliquin	562	578	598	600	602	552
		2.8	3.5	0.3	0.3	-8.3
Finley	233	248	239	236	231	215
		6.4	-3.6	-1.3	-2.1	-6.9
Jerilderie	107	118	117	120	115	106
		10.3	-0.8	2.6	-4.2	-7.8
Mathoura	42	45	50	47	47	46
		7.1	11.1	-6.0	0.0	-2.1
Moama	167	177	192	192	199	192
		6.0	8.5	0.0	3.6	-3.5
Moulamein	40	47	45	45	45	42
		17.5	-4.3	0.0	0.0	-6.7
Tocumwal	143	141	151	161	151	134
		-1.4	7.1	6.6	-6.2	-11.3
Wakool	17	21	21	23	23	21
		23.5	0.0	9.5	0.0	-8.7
Total MIL Region	1,451	1,514	1,548	1,566	1,552	1,438
		4.3	2.2	1.2	-0.9	-7.3
Swan Hill	704	729	728	728	726	723
		3.6	-0.1	0.0	-0.3	-0.4
Barham	136	129	128	128	130	121
		-5.1	-0.8	0.0	1.6	-6.9
Conargo	19	18	16	14	14	14
		-5.3	-11.1	-12.5	0.0	0.0
Total Outside Region	859	876	872	870	870	858
		2.0	-0.5	-0.2	0.0	-1.4

Note: Based on Telstra Yellow Pages (1996-2002).
 No information is available for the year 2000.
 The number of businesses should only be used to identify relative changes, as many agricultural and farming businesses will not be included in the yellow pages.

Source: Australia on Disk (1996, 1997, 1998, 1999, 2001, 2002).

Prepared by: EBC (2003).

8.11 Primary and Secondary School Enrolments

Table 17 shows enrolments in NSW Government schools in the Deniliquin Education District between 1997 and 2002. This information has been presented as declining school enrolments was an issue raised in several of the key informant interviews. It should be noted that while the Table provides enrolment statistics for the region, it may also mask more significant changes in enrolment occurring in specific schools.

As shown in Table 17 total Government school enrolments in the Deniliquin Education District has continued to decline since 1997 from 6,040 to 5,476 in 2002, which represents a 9% decrease in enrolments.

The declining enrolment trend between 1997 and 2002 is most significant in relation to Kindergarten enrolments where the enrolment decline has been 22%. In contrast, primary school enrolments have declined by 7% since 1997 and secondary school enrolments by 10%.

Table 17. NSW Government School Enrolments (FTE): Deniliquin District

Town Location	1997	1998	1999	2000	2001	2002
Total Kindergarten	525	463	470	429	462	408
		-11.8%	1.5%	-8.7%	7.7%	-11.7%
Year 1	449	507	460	439	397	456
Year 2	512	446	483	455	444	407
Year 3	429	499	436	481	446	419
Year 4	477	421	487	444	471	460
Year 5	438	468	408	470	441	463
Year 6	441	417	456	424	456	436
Support classes	19	15	14	12	12	12
Total Primary	3,290	3,236	3,214	3,154	3,129	3,061
		-1.6%	-0.7%	-1.9%	-0.8%	-2.2%
Year 7	452	406	406	401	403	401
Year 8	446	450	387	400	397	413
Year 9	397.6	406	405	378	356	359
Year 10	415	373	395	379	359	334
Year 11	305	316.7	293.9	282	301.6	266.2
Year 12	204.5	258.3	242.1	221	225.4	234.4
Support classes	5	1	0	0	1	0
Total Secondary	2,225.1	2,211.0	2,129.0	2,061.0	2,043.0	2,007.6
		-0.6%	-3.7%	-3.2%	-0.9%	-1.7%
Total all enrolments	6,040.1	5,910.0	5,813.0	5,644.0	5,634.0	5,476.0
		-2.2%	-1.6%	-2.9%	-0.2%	-2.8%

Note: FTE Enrolments for the Deniliquin District (Mid year enrolments)

Source: NSW Department of Education

Prepared by: EBC (2003).

8.12 Summary of Profiling and Baseline Assessment

The profiling that has been undertaken generally supports many of the beliefs raised by key informants in relation to recent changes in the population, workforce and businesses within the MIL area. This is particularly the case in relation to changes in population size and age structure. At a township level, changes in employment within different industry and occupational sectors, and changes in the number of town based businesses and school enrolments has also been identified.

Table 18 provides a summary of the trends associated with the social profiles. The most significant trends are associated with a declining population and a population trend with fewer young people and an increasing number of older and elderly people. Somewhat related to this change is the reduction in school enrolments and number of businesses within many of the regional towns and communities.

Income levels (individual, family and household) have increased and are now similar to the average for NSW and labour force participation has remained relatively constant over recent years. Unemployment levels in recent years have decreased as they have done throughout Australia and unemployment levels within the region are now below the NSW State average, although movement of the unemployed outside of the area in search of employment may partly explain the lower unemployment levels.

Table 18. Summary of Regional Social Profiles

Profile	Trend
Population trend	Decline
Population projections (2001–2026)	Decline
Population of young people (below 39 years of age)	Decline
Population of older people (above 40 years of age)	Increase
Age of farming population	Increase
Age dependency	Increase
Elderly dependency	Increase
Child dependency	Decrease
Labour force participation	Constant
Unemployment rate	Decrease
Individual Income	Increase
Family Income	Increase
Household Income	Increase
Trend in white-collar workers	Increase
Trend in blue collar workers	Decrease
Number of businesses	Decrease
School enrolments	Decrease

Source: EBC (2003).

In the context of framework development for the SIA, focussing the description of social profiles on issues raised by key informants is worthwhile, however custom census data may need to be obtained if a broader range of issues raised by key informants is to be addressed.

In addition, this analysis has primarily reported ABS census data for the MIL area through the aggregation of data from seven LGAs, as this is the level at which time series and trend information is most readily available. However in the course of attempting to use census data

to address issues raised by key informants, it is apparent that the regional scale analysis, while useful, may nevertheless mask important changes occurring in towns and communities in the region. In several instances the analysis of census data for towns (i.e., Deniliquin and Finley) has identified trends and relationships that were not evident at the regional scale of analysis. This for instance occurred in relation to analyses based on industry of employment, occupational structure and business numbers.

In any future implementation of the SIA framework it is suggested that ABS spatial units of 'urban centres and localities' are used as an additional unit of analysis and that time series information is obtained for urban centres and localities and the aggregate of areas outside these units. While this approach may require more data preparation the benefits are that the profiles will more closely represent changes that are occurring at the local level.

9 PREDICTION OF IMPACTS

It should be emphasised that any prediction of social impacts has as its focus the prediction of impacts associated with the implementation of a specific water recovery mechanism and that at present the specifics (including the scale) of a water recovery mechanism is not available. Furthermore and unlike the assessment of biophysical impacts, several social impacts have already occurred as a consequence of TLM and will continue to occur through the development of water recovery options and their implementation.

Before proceeding to address issues of prediction it should also be recognised that social impacts are very much about the behaviour and actions of individuals and that these actions and behaviours may not be dependent upon the objective evidence associated with the prediction of impacts, but also on the subjective beliefs individuals have about the likelihood of impacts occurring. For instance, assume that there was objective economic evidence to suggest that there would be no change in the location and distribution of farm expenditure after the implementation of a water recovery mechanism. However, if town based business owners *believe* expenditure will shift more outside their local area they may ignore the objective economic evidence and change their business and business practices to accommodate their beliefs.

The use of qualitative interviews with key informants using their local knowledge to identify potential impacts associated with water recovery is one methodological approach to the prediction of impacts. Given that potential impacts have been identified and summarised in Table 4, two related issues arise in regard to the further prediction of social impacts.

The first issue concerns the validity of the predictions made using key informants and whether additional quantitative analyses are needed to confirm these predictions. Although as indicated in Section 2.2 quantification does not necessarily mean an improvement in validity. The second issue is whether there is a requirement or need to make further quantitative predictions in relation to the likelihood, scale and magnitude of the impact predictions that have been identified in the interviews.

For instance the economic research of McGuckian (2002)¹⁸ and Pinge (2003)¹⁹ in the Murray Irrigation area and the Murray Darling Association subregion provides some support for several of the potential impacts that have been predicted by key informants in relation to reduced water allocations. This is particularly the case in relation to the prediction of on-farm economic impacts and regional employment impacts. However these studies say little in relation to many distributional impacts, impacts associated with different water recovery scenarios, and other social impacts that have been identified through the key informant interviews.

Within the context of the development of a social impact assessment framework and given the type of social impacts that have been identified, what is required is a methodology for the prediction of social impacts at a localised scale, which is able to more directly assess the magnitude, scale and distribution of social impacts that have been identified. Such an approach has been developed in the Australian context and has been extensively used in the prediction of social impacts in forestry and fisheries and was used in the assessment of the social impacts of dairy industry deregulation in NSW.

¹⁸ McGuckian, R. (2002). Implications for farm viability of a reduced allocation for irrigation in the Murray Irrigation Area. Report prepared by Rendell McGuckian Agricultural and Management Consultants.

¹⁹ Pinge, I. (2003). *The socio-economic impact of reduced water allocations in the Murray Darling Association MDA Sub Region*. Centre for Sustainable Regional Communities. La Trobe University, Bendigo

The methodology and conceptual foundations to the approach, known as Town Resource Cluster Analysis (TRC-Analysis), has recently been described and published in an international handbook of social impact assessment (Fenton, Coakes and Marshall, 2003)²⁰ and needs to be considered within the context of future social impact assessments if more detailed predictions beyond those described by key informants are required. The approach is based on the use of structured interviews and seeks to describe the location and distributional impacts associated with changes in resource use. The approach would enable relationships to be established between on-farm impacts and changes and flow-on impacts to local towns and businesses within these towns. As such the approach is well suited to the type of impacts that have been identified and described in the scoping phase of this study.

In the context of Phase 2 interviews an attempt was made to understand beliefs about the likelihood of specific social impacts occurring as a consequence of two water recovery scenarios. The methodology underpinning this approach is described in the following section and while based on a limited number of key informants was informative in terms of the decision making process used by key informants in determining the likelihood of occurrence of impacts.

9.1 Likelihood of Impact Occurrence

Within the context of developing a framework for the SIA and due to time limitations only seven interviews were possible in Phase 2. However what is important, particularly in the context of developing a framework for SIA, is not only the results of the analysis, which are reported in Tables 19 and 20, but the process and procedural steps underpinning the approach.

Two scenarios were presented to each key informant. One scenario was based on the compulsory acquisition of water with compensation and a second scenario used a market-based approach where Government entered the water market to purchase water for the environment. These scenarios did not necessarily reflect the scale of intervention in a first step approach to water recovery or the policy positions of partner governments.

In the scenario based on compulsory acquisition with compensation participants were told to assume (a) 10% acquisition from all irrigators in the area, (b) that water would be purchased at a market price of \$450 per ML and (c) that this would represent the sale of \$45,000 of water from each farm in the area.

In relation to the market based approach with government acting to purchase water for environmental purposes, participants were told to assume (a) that 25% to 40% of farmers in the area would sell their water, (b) that the average sale would be 400ML at \$500 per ML and (c) through the sale of water each farm business would receive \$200,000.

Each participant was presented with the list of impacts identified in Table 4 and asked to make a judgment and score the likelihood of each impact occurring using a three point scale with a score of 3 indicated high likelihood of occurrence and a score of 1 a low likelihood of occurrence.

Tables 19 and 20 show the results of this analysis for both water recovery scenarios. This example is based on very limited data, and any implementation of this task in a full SIA would require sufficient participants (perhaps in a survey) to account for the variability that is evident in responses. Nevertheless the approach is informative in the current context.

²⁰ Fenton, D.M., Coakes, S., and Marshall, N. (2003). *Vulnerability and capacity measurement*. In H.A. Becker and F. Vanclay (Eds.) *The International Handbook of Social Impact Assessment: Conceptual and Methodological Advances*. Cheltenham, Edward Elgar Pub.

In relation to compulsory acquisition and on-farm impacts the three impacts considered most likely to occur were decreases in: farm profitability; the number of farm businesses; and on-farm employment. Impacts in relation to the market-based approach were similar. However a decrease in farm profitability was no longer predicted, although an increase in the price of water to irrigators became a significant issue.

In relation to off-farm impacts, under compulsory acquisition the most likely impacts that were predicted were a decrease in the number of local non-farm businesses and employment in non-farm businesses. In contrast, under the market based approach off-farm impacts likely to occur were distributional and related to increased expenditure outside the region and an increase in population migration outside the region.

There was also some indication, although again it is based on limited data, that fewer on-farm impacts are predicted with a market-based approach (1.8) when compared to compulsory acquisition (2.4)

Understanding the likelihood of impacts occurring is one component of prediction and as indicated previously additional structured approaches such as TRC-Analysis would be able to provide detailed information in relation to the magnitude and spatial scale of the impacts as described in Tables 19 and 20. In addition, the introduction of this type of analysis would also permit current trends to be examined in the context of judgements of the likelihood of impacts. For example, detailed trend information in relation to changes in farm employment, income and profitability would be useful in further interpreting these judgements.

A further observation in relation to this task was the decision making process used by participants in determining the likelihood of impacts. It was evident that for each scenario, when identifying the likelihood of impacts occurring there was a cognitive process developed by participants which linked changes and impacts together in a series of flow on events. This included consideration of a number of assumptions about the behaviours of farmers and off-farm businesses owners resulting from on-farm changes in water use.

Table 19. Likelihood of Social Impacts: Compulsory Acquisition with Compensation

Potential Impacts	Participants (Phase 2)					Average
	1	2	3	4	5	
On-Farm Impacts						
Decrease in farm profitability	3	3	3	3	3	3.0
Decrease in the number of farm businesses	3	3	3	3	3	3.0
Decrease in on-farm employment	3	3	3	3	3	3.0
Increase in the price of water to irrigators	2	2	3	*	3	2.5
Decrease in security over investments	1	3	3	*	2	2.2
Loss of self-identity as farmers or irrigators	1	2	3	*	3	2.2
Increase in farm debt levels	1	1	3	2	3	2.0
Decrease in the value of farming land	1	3	3	1	*	2.0
Decrease in the number of young people in farming	1	1	3	1	3	1.8
Average						2.4
Off-Farm Impacts						
Decrease in the number of local non-farm businesses	3	3	3	3	3	3.0
Decrease in employment in local non-farm businesses	3	3	3	3	3	3.0
Decrease in expenditure in local towns	1	3	3	3	3	2.6
Increase in population migration outside the local region	2	3	3	2	3	2.6
Decrease in available skills and knowledge	1	3	3	*	3	2.5
Decrease in investment confidence in the local region	1	3	3	3	2	2.4
Increase in expenditure outside the local region	3	3	3	1	1	2.2
Average						2.6

Note: The task was not completed in two interviews. A score of three (3) indicates a high likelihood of occurrence. * indicates the participant did not respond

Source: EBC (2003)

Table 20. Likelihood of Social Impacts: Market Based Approach

Potential Impacts	Participants (Phase 2)			Average
	1	2	3	
On-Farm Impacts				
Increase in the price of water to irrigators	2	3	2	2.3
Decrease in the number of farm businesses	3	3	1	2.3
Decrease in on-farm employment	1	3	3	2.3
Decrease in security over investments	1	*	3	2.0
Decrease in farm profitability	1	3	1	1.7
Loss of self-identity as farmers or irrigators	2	2	1	1.7
Decrease in the number of young people in farming	*	3	2	1.7
Increase in farm debt levels	1	2	1	1.3
Decrease in the value of farming land	1	1	1	1.0
Average				1.8
Off-Farm Impacts				
Increase in expenditure outside the local region	3	3	3	3.0
Increase in population migration outside the local region	3	3	2	2.7
Decrease in the number of local non-farm businesses	1	3	3	2.3
Decrease in employment in local non-farm businesses	1	3	3	2.3
Decrease in expenditure in local towns	1	3	3	2.3
Decrease in investment confidence in the local region	1	2	1	2.0
Decrease in available skills and knowledge	1	2	2	1.7
Average				2.5

Note: The task was not completed in four interviews. A score of three (3) indicates a high likelihood of occurrence. * indicates the participant did not respond

Source: EBC (2003)

10 ACCEPTABILITY OF IMPACTS

Given the introduction of a water recovery mechanism and having predicted specific impacts as likely to occur as a consequence of the introduction of that mechanism, a further issue that needs to be considered concerns the likely acceptability of any impacts to the community.

The acceptability of impacts will be dependent upon the type of impacts that are predicted and the type of water recovery mechanism that is introduced, including how it is implemented, over what time period it is implemented and its legal, administrative and institutional context. Furthermore the acceptability of change and any associated impacts is very much a subjective judgement that may well vary across different interest and stakeholder groups, and through time.

Through the development of a social impact assessment framework it is evident that community acceptability of social impacts associated with specific water recovery mechanisms will also be dependent upon two key issues. These are:

1. The extent to which procedural issues, such as fairness, equity and involvement in the decision making process (Section 7) are addressed and
2. The resilience of the community and its ability to adapt to or adjust to the impacts that might occur.

10.1 Procedural Issues and the Acceptability of Impacts

In relation to community acceptance of impacts associated with water recovery, the procedural issues as described and discussed in Section 7 and summarised again below will be *the* most critical issue underpinning community acceptance of impacts. They include:

- **Trust:** A belief that there was little trust in the relationship with external groups
- **Transparency:** A belief that the decision making processes lacked transparency
- **Procedural fairness:** A belief that there had been unfair influence on the decision making process by external groups
- **Distributional fairness:** A belief that while there were broad social benefits associated with the water reform process, the impacts of this process were unfairly distributed across the Australian community, with farming communities absorbing the greatest impacts
- **Neutrality:** A belief that agencies such as the MDBC had been influenced by external groups and that they should maintain their neutrality in the process
- **Knowledge:** A belief that external groups had limited knowledge of water and rural issues
- **Knowledge systems:** This issue focussed on the conflict between local and 'science based' knowledge systems and that findings that "The Science" was often in conflict with local knowledge.

The extent to which the core procedural issues as described above are addressed at a local level and through a meaningful community involvement process will ultimately influence the acceptance of any decisions in relation to water recovery and the impacts that might result from such a decision.

Not only is this clear from the material presented in Section 7 but there is also a significant body of social research which also emphasises that if the procedures for making the decision are judged to be fair they are more likely to judge and accept the decision as being fair (Folger, 1977²¹; Lind et al, 1980²²; Barrett-Howard and Tyler, 1986)²³. Similarly perceptions

²¹ Folger, R (1977). Distributive and procedural justice: Combined impact of voice and improvement on experienced inequity. *Journal of Personality and Social Psychology*, 35(2), 108-119

of the fairness of decision-making process have also been found to be correlated with satisfaction or support for decision makers responsible for the decision (Tyler and Caine, 1981²⁴; Tyler and Degoey, 1995²⁵).

The need for meaningful community involvement programs to be developed in order to address the procedural issues as described in Section 7 is essentially a mitigation strategy and is discussed further in Section 11.

10.2 Community Resilience and the Acceptability of Impacts

The social resilience of a community refers to its ability to cope with or adjust to change and to maintain social equilibrium after the change has occurred (Adger, 2000²⁶; Berkes and Folke, 2000²⁷; Holling, 1973). Holling's (1973)²⁸ The definition of resilience in this context has three defining characteristics which are:

- (i) the amount of change a system can undergo and still retain the same control over function and structure;
- (ii) the degree to which the system is capable of self-organisation; and
- (iii) the degree to which the system expresses capacity for learning and adaptation.

Some communities may be impacted temporarily through the introduction of change, but after some interim period, will adjust or adapt and continue to function as 'normal'. On the other hand, other communities may find it difficult to adapt and adjust to change, and may move into a period of decline. Resilience is then the ability of social systems to re-organise following the occurrence of an impact or change event and to maintain a configuration that retains their original functional and structural characteristics.

Understanding the resilience of community to change has important implications in relation to the acceptability of impacts. For instance, significant change that is introduced to a community that is 'robust' and has the characteristics which enable it to adapt and adjust to the intervention may be acceptable. In contrast, change that is introduced to a 'vulnerable' community, that has limited capacity to respond and is unable to effectively adapt and adjust, may be viewed as unacceptable.

The development of the SIA framework has identified two related issues that may impact on whether the community is 'robust' or 'vulnerable' and able to adapt to or adjust to significant change as a consequence of water reform.

The first issue concerns the occurrence of precursor events as described in Section 6 and includes such events as the withdrawal of Government services, the drought, dairy industry

²² Lind, E.A., Kurtz, L., Musante, L., Walker, A., and Thibaut, J.W. (1980). Procedure and outcome effects on reactions to adductaied resolution of conflicts on interests. *Journal of Personality and Social Psychology*, 39, 643-653.

²³ Barrett-Howard, E., and Tyler, T.R. (1986). Procedural justice as a criterion in allocation decisions. *Journal of Personality and Social Psychology*, 50(2), 296-304.

²⁴ Tyler, T.R. and Caine, A. (1981). The influence of outcomes and procedures on satisfaction with formal leaders. *Journal of Personality and Social Psychology*, 41(4), 642-655.

²⁵ Tyler, T.R. and Degoey, P. (1985). Collective restraint in social dilemmas: Procedural justice and social identification effects on support for authorities. *Journal of Personality and Social Psychology*, 69(3), 482-497.

²⁶ Adger, W.N. (2000). Social and ecological resilience: Are they related? *Progress in Human Geography*, 24(3), 347-364.

²⁷ Berkes, F. and Folke, C. (2000). Linking social and ecological systems for resilience and sustainability (p. 1-25). In Berkes F. and Folkes, C. (Eds.) *Linking social and ecological systems for resilience and sustainability: Management practices and social mechanisms for building resilience*. Cambridge: Cambridge University Press.

²⁸ Holling, C.S. (1973). Resilience and stability of ecological systems. *Annual Review of Ecology and Systematics*, 4, 1-23.

deregulation and the introduction of the Cap. While these events may appear unrelated to the water reform process, the acceptability of potential impacts associated with the water reform process may be very much dependent upon cumulative impacts and changes that have occurred within the community as a consequence of previous events. For instance a community that has recently experienced drought and the significant withdrawal of Government services may be more vulnerable to future change from the water reform process and have limited capacity to adjust or adapt to these changes. In contrast a community that has not experienced the impacts of these previous events may be viewed as more 'robust' and have greater capacity to adjust to any future change.

The second issue that will influence the resilience of communities to change concerns the underlying characteristics and profile of populations and communities within the area that may be affected by change. For instance the profiling and baseline assessment undertaken in Section 8 indicates a number of specific social trends occurring within the community that may influence the level of community resilience. For instance, Table 21 shows several key profiles from this analysis, the trend in the profile and whether the trend may influence the level of resilience within the community.

For example and as an illustration of the approach, Table 21 suggests that through an analysis of the historical trends associated with each of the profiles, that the community is relatively robust in relation to employment and income, but vulnerable in terms of the declining population and changes in population age profiles. It is possible to provide quantitative assessments of vulnerability derived from the profiles using specific techniques for the analysis of social indicators (ie., Fenton, 2000²⁹; Fenton, 2001³⁰), however in terms of the development of a SIA framework several issues need to be addressed prior to this being undertaken.

Table 21. Community Resilience: Social Profiles

Profile	Trend	Resilience
Population trend	Decline	Vulnerable
Population projections (2001–2026)	Decline	Vulnerable
Population of young people (below 39 years of age)	Decline	Vulnerable
Population of older people (above 40 years of age)	Increase	Vulnerable
Age of farming population	Increase	Vulnerable
Age dependency	Increase	Vulnerable
Elderly dependency	Increase	Vulnerable
Child dependency	Decrease	Vulnerable
Labour force participation	Constant	Robust
Unemployment rate	Decrease	Robust
Individual Income	Increase	Robust
Family Income	Increase	Robust
Household Income	Increase	Robust
Number of businesses	Decrease	Vulnerable
School enrolments	Decrease	Vulnerable

Note: The labels decline and increase are used to indicate the direction of the line of best fit over the four census years (section 8).

Source: EBC (2003).

²⁹ Fenton, D.M. (2000). *Social Catchments and Socio-Demographic profiles for the South Brigalow CRA/RFA Region (NSW)*. Report prepared for the Department of Urban Affairs and Planning, NSW.

³⁰ Fenton, D. M. (2001). *Social Assessment of the South East Trawl Fishery: Application of TRC-Analysis*. Report in preparation for the Bureau of Rural Sciences, Canberra.

If social profiles are to be used in the development of resilience indicators there are two issues that need to be addressed which are:

- (i) the identification of specific social profiles and the direction of the relationship between the trend in the social profile and resilience; and
- (ii) the definition of community and the unit of analysis for the purpose of describing the social profiles and assessment of resilience.

Firstly, the social profiles that have been presented in section 8 have primarily been developed on the basis of issues identified on the scoping phase. It is possible that additional profiles may need to be included in this analysis if they are to be used in the development of indicators of community resilience. In addition and once a set of resilience indicators have been defined the direction of the relationship between the indicator and resilience needs to be better identified. For instance the percentage of 'white' and 'blue' collar workers has been omitted from Table 21 as the relationship between this indicator and resilience is unclear. For instance, does an increase in 'white collar' workers and a reduction in 'blue collar' workers in the community make the community more vulnerable to change? It is probable that if resilience is to be used in future SIAs then a literature review of the concept of resilience and its underlying indicators is required concurrently with some 'expert' judgement on the type of indicators that might be used and the directional relationships between the indicator and assessments of vulnerability.

Secondly and as alluded to in section 8 when undertaking the analysis of social profiles, the definition of community for the purpose of analysing social profiles and the development of resilience indicators needs to be addressed. As discussed in section 8, the analysis of regional profiles and indicators for the MIL area as a whole, may well mask important variations occurring at a town level, which is the focus for many of the changes. As such it is suggested that in terms of the spatial definition of the community and when using ABS census data that trend information be obtained for individual 'urban centres and localities within the region' and that in addition trend information be obtained for all areas within the region but outside of 'urban centres and localities'. In this way, important variations in the social profiles are less likely to be masked as was the case when taking a regional approach and it will also better represent that assessment of 'on-farm' and 'off-farm' or town based impacts.

While it is important to address the spatial definition of community for the purpose of defining resilience and ultimately the acceptability of impacts it is also apparent that resilience and impact acceptability will vary across different sectors within the community and that community may need to be better defined in non spatial terms. For instance and during the course of many of the Phase 1 interviews several key informants indicated that due to the nature of farming practices, dairy farmers were the most vulnerable to the impacts of the drought, in comparison to many crop farmers who had greater flexibility to adjust to these circumstances.

10.3 Judgements of Impact Acceptability

As part of the process of developing a framework for SIA, key informants were also asked in Phase 2 interviews to examine the potential impacts that had been identified (Table 22 and 23) and indicate those impacts that were of most concern to them. As was the case when using key informants in impact prediction (section 9.1) the purpose was not to provide definitive results, but to illustrate one approach to identifying the acceptability of impacts as part of the development of an SIA framework.

Each participant was asked to examine the list of impacts and identify 2-3 impacts from the list which they believed would be of most significant concern to people in the region. Table 22 shows the results of this assessment when the impacts occur in the context of compulsory

acquisition and Table 23 shows levels of concern when the impacts occur in the context of a market based approach.

While the variation in the data presented in Tables 22 and 23 suggests the need for more participants to be included, what was clearly apparent when the task was being undertaken was that the judgements of concern that were being made were very much dependent upon whether the participant was operating a farm or town based business. As indicated earlier, the acceptability of change and any associated impacts is very much a subjective judgement that will vary across different interest and stakeholder groups, and techniques such as the one described may be used to identify the acceptability of impacts across different sectors within the community.

Table 22. Acceptability of Social Impacts: Compulsory Acquisition with Compensation

Potential Impacts	Participants (Phase 2)				Count
	1	2	3	4	
On-Farm Impacts					
Decrease in farm profitability	✓		✓		2
Increase in the price of water to irrigators				✓	1
Decrease in the number of farm businesses				✓	1
Decrease in security over investments			✓		1
Decrease in on-farm employment					0
Loss of self-identity as farmers or irrigators					0
Decrease in the number of young people in farming					0
Increase in farm debt levels					0
Decrease in the value of farming land					0
Off-Farm Impacts					
Increase in expenditure outside the local region		✓			1
Increase in population migration outside the local region				✓	1
Decrease in the number of local non-farm businesses		✓			1
Decrease in expenditure in local towns		✓			1
Decrease in available skills and knowledge			✓		1
Decrease in employment in local non-farm businesses					0
Decrease in investment confidence in the local region					0

Note: A score of one (1) indicates the high concern about the impact and assumes this would also be the least acceptable impact

Source: EBC (2003)

Table 23. Acceptability of Social Impacts: Market Based Approach

Potential Impacts	Participants (Phase 2)				Count
	1	2	3	4	
On-Farm Impacts					
Decrease in farm profitability	✓		✓	✓	3
Decrease in the number of farm businesses		✓		✓	2
Increase in the price of water to irrigators		✓			1
Decrease in on-farm employment					0
Decrease in security over investments					0
Loss of self-identity as farmers or irrigators					0
Decrease in the number of young people in farming					0
Increase in farm debt levels					0
Decrease in the value of farming land					0
Off-Farm Impacts					
Increase in population migration outside the local region		✓	✓		2
Decrease in the number of local non-farm businesses			✓	✓	2
Decrease in employment in local non-farm businesses				✓	1
Decrease in expenditure in local towns				✓	1
Increase in expenditure outside the local region					0
Decrease in investment confidence in the local region					0
Decrease in available skills and knowledge					0

Note: A score of one (1) indicates the high concern about the impact and assumes this would also be the least acceptable impact

Source: EBC (2003)

11 MITIGATION AND POLICY IMPLICATIONS

As this report focuses on the development of a framework for SIA it is not possible to fully describe all mitigation and policy implications, as a full and complete SIA has not been undertaken. Further, the nature and scale of the policy intervention as part of a first step decision has not been finalised. However given that the framework has identified procedural issues associated with the decision making process and potential impacts associated with the implementation of water recovery mechanisms it would appear reasonable that mitigation and policy implications should focus specifically on these two areas.

From the scoping process a summary of water recovery implementation issues has been described in Table 2 and potential impacts of specific water recovery mechanisms described in Tables 3 and 4. Similarly Section 7.7 describes several procedural issues as identified in the scoping process. The information presented in each of these Tables has significant implications in relation to policy associated with the development, implementation and operational aspects of specific water recovery options.

For example, in the development of market-based approaches policy may be directed at implementing transparent water trading processes, the development of incentives to retain income from the sale of water in local regions and the use of exit fees to address the potential for stranded irrigation system assets. Similarly any movement to higher value crops through increases in reliabilities may require policy directed at the development of farm and industry infrastructure and capacity and skill development amongst farmers and primary industries.

In relation to procedural issues there are also significant policy issues including the need for policy with a greater focus on the communication of scientific knowledge to local communities; the use of local knowledge in the development, implementation and operational aspects of specific water recovery options and most importantly policy directed at developing effective and meaningful community involvement processes.

Given the heightened concern about procedural issues amongst many stakeholders, it is clearly apparent even within the context of framework development that there is a requirement for a detailed community involvement strategy to be developed that addresses the procedural issues that have been raised in this assessment. Such a strategy should be developed in consultation and through negotiation with key stakeholders and interest groups and be developed on the basis of agreed objectives, procedures, techniques and outcomes while at the same time having regard to the process and timetable for any water recovery. Such an approach may well act as an initial action towards addressing many of the procedural issues identified in section 7, may assist through a negotiated approach in ameliorating many potential impacts and create greater acceptance of any water recovery decisions and their potential impacts.

In addition to addressing procedural issues a full SIA needs to also provide (a) mitigation and policy information in relation to specific water recovery mechanisms and their implementation and (b) options related to how any potential impacts associated with the water recovery may be mitigated. Importantly these issues may need to be also addressed concurrently through any community involvement process that may be implemented as part of the SIA or in addition to the SIA.

12 HYPOTHESES FOR TESTING: PROCESS HYPOTHESES

Five core “hypotheses for testing” were identified in the project brief. Where possible they have been addressed using previous social research literature.

1. *That involvement of stakeholders in informing interventions and implementing interventions receives more positive feedback overall toward resource allocation changes than the alternative.*

Involvement of stakeholders alone does not necessarily yield positive feedback towards resource allocation changes. What is important is that positive perceptions of the decision-making procedures in which participants are involved will often result in positive judgements of the final policies and decisions that are developed from the process (Lauber and Knuth, 1999; Latour, 1978; Lind and Lissak, 1985). In a review of several Australian studies undertaken over a 10-year period Syme, Nancarrow and Creddin (1999) emphasise the content of the involvement process and state that “fair decision making procedures are of paramount importance to community acceptance of water allocation decisions”

2. *That voluntary participation in a resource allocation change receives more positive feedback overall than compulsory changes*

The research literature that most closely addresses this issue is derived from the research in risk perception where one of the consistent findings is that people will be more concerned about risks that are imposed and over which they have little control and less concerned about risks when they voluntarily participate (Covello and Merkhofer, 1994). In addition, and again based on research in risk perception, when there is limited personal control over the event the risks and the event are seen as being less acceptable than when there is control over the event (Starr, Langley and Taylor, 2000). Although indirect, the risk perception research would indicate that voluntary participation in a resource allocation is likely to receive more positive feedback overall than compulsory changes, where the individual has limited control over the change that is taking place.

3. *That an intervention to change resource allocation that is phased in over a timeframe negotiated with stakeholders receives more positive feedback than those imposed suddenly*

This ‘hypothesis’ appears to address two issues. The first focuses on an intervention that is phased in over time as opposed to an intervention that is introduced suddenly. The second focuses on an intervention that is introduced through a phased and negotiated approach

In relation to the first issue, no previous research could be identified which addressed the issue associated with phased or immediate introduction of an intervention. However discussions with key informants in the Phase 2 interviews showed that the majority of key informants favoured a phased approach to the introduction of resource allocations. Three reasons were identified for a phased approach. They included (i) reversibility, (ii) monitoring and (iii) adjustment. Firstly there was a belief that an intervention that was phased in across time would provide greater opportunities for the decision to be reversed if required. Secondly, if the intervention was phased in across time there was a belief that this would provide opportunities for impacts and changes to be monitored and if necessary for the intervention to be changed. Finally, a common belief was that a phased introduction would provide greater opportunities for those affected by the decision to adjust and adapt to any potential impacts and changes resulting from the intervention.

Preference for the sudden introduction of an intervention was generally only supported as a means of reducing the uncertainty associated with the intervention.

The second issue associated with the ‘hypothesis’ concerns preference for a phased and negotiated approach to the introduction of the intervention. In this instance the procedural justice and procedural fairness research would indicate that opportunities for negotiated approaches would certainly be preferred over approaches where there is no negotiation (Leventhal, 1980; Tyler, 1988).

4. *That those with greatest dependency on the resource and lowest resilience to change tend to be the most strongly against any intervention to change natural resource management.*

While there has been considerable research on resource dependency and resource dependent communities (see Randall and Ironside, 1996 for a review of this research) there is however little if any research that integrates resource dependency, resilience and attitudes towards resource allocation decisions. Given the recency of research in social resilience (Adger, 2000; Holling, 2001) this is perhaps not unexpected.

It is a truism that given heightened self-interest and dependency on a natural resource one might reasonably expect opposition to interventions that reduce resource access. The previous actions of the dairy, logging, timber and fishing industries are a testimony to this relationship. However the extent to which resilience moderates this relationship is unclear. On the one hand, with high levels of resilience there may be a perception amongst resource users that they are able to adapt or adjust to changes in resource allocation and that they may therefore not be strongly against any intervention that reduces resource access. In contrast low levels of resilience may engender greater negative attitudes towards any intervention that reduces resource access.

5. *That perceptions of fairness of a decision by stakeholders is related to the amount of information provided to the stakeholders, whether they could participate voluntarily, whether they had an opportunity to plan and adjust as the intervention was made, and whether all stakeholders were subjected to the same set of rules.*

Leventhal, Karuza and Fry (1980) and later Lauber and Knuth (1999) in a paper that investigated fairness in participation summarise the findings of several studies on procedural fairness and identify six key criteria that have been found to improve perceptions of the fairness of decision-making procedures. They include:

- Consistency with which a procedure is applied across time and individuals
- The neutrality of the decision maker
- The accuracy of information used in the process
- The existence of opportunities to correct and modify a decision after it is made
- The representation in the decision making process of important perspectives
- The maintenance of ethical standards during the course of a decision making process

The summary of research findings by Lauber and Knuth (1999) are important in so far as they address several of the issues in ‘hypothesis’ five.

Firstly, rather than the “amount of information being provided to stakeholders” being critical in the judgment of fairness, what appears to be important is the accuracy of the information provided (Leventhal, 1980; Barrett-Howard and Tyler, 1986; Tyler, 1988; Tyler and Griffith, 1991).

Secondly, while voluntary participation is not identified as a criteria underpinning fairness judgements it would be counter intuitive to expect that fairness judgments about a decision would be improved through forced or compulsory participation.

Thirdly the criteria suggest the need for consistency in the application of procedures across time and across individuals (Leventhal, 1980; Barrett-Howard and Tyler, 1986), which would confirm the statement that “perceptions of fairness are dependent upon the same set of rules being applied to all stakeholders”.

Finally findings that fairness is improved when participants are given an opportunity to correct and modify a decision after it is made (Leventhal, 1980; Tyler, 1988) also supports the statement that the fairness of a decision is related to whether “participants are given an opportunity to plan and adjust to the intervention”.

13 CONCLUSION

The primary objective of this report was the development of a conceptual framework for undertaking SIA research in the context of TLM. On the basis of key informant interviews undertaken during the scoping phase of the SIA and as described in sections 5 to 7, a conceptual framework was developed, and is presented in Figure 1. Once the conceptual framework was developed the profiling, prediction and evaluation stages of the SIA were then undertaken in a preliminary way in order to illustrate the framework and to identify and examine appropriate methodological approaches to be used in each stage.

Again it should be emphasised that while there have been substantive findings in relation to potential social impacts, the development of a conceptual framework and identification of appropriate methods for undertaking the SIA has been the primary objective of this research. It is for this reason that only general statements are made in relation to mitigation and the policy implications of the potential social impacts that have been identified (section 11) However, the research that has been undertaken provides an illustration of how SIA may be used in identifying and developing mitigation and policy options in relation to community involvement and the design and implementation of water recovery mechanisms.

Methodological issues associated with the implementation of the framework are summarised below in relation to each stage of the SIA. It is intended that these issues will be used in the development of Terms of Reference for undertaking a comprehensive SIA in the future.

Scoping (Sections 5, 6 and 7)

- Qualitative interviews are an appropriate method through which to undertake the scoping phase of the SIA.
- Procedures need to be developed so as to ensure a broad cross section of stakeholder and interest groups are included in the scoping phase (this may include for instance some snowball sampling from the point of first contact).
- The selection process for key informant interviews should be at a minimum stratified on the basis of farmers and farm based businesses on the one hand and town based stakeholders and businesses on the other.
- The number of key informant that are used in the scoping process will be dependent upon the variation in issues identified in the key informant interviews.
- Tape recording of key informant interviews was acceptable by all key informants and provided useful information to illustrate the issues being addressed. However, significant time is required for transcription and thematic analysis of these interviews.

Profiling (Section 8)

- Profiling at a local government area level may mask important variations occurring at a local level. ABS data for the purpose of profiling needs to be analysed at a town (urban centre and locality) and rural level (areas outside urban centres and localities).
- Custom data (ABS and other agency data) needs to be acquired to better address (a) issues raised in the scoping phase and (b) to provide indicators of community resilience.
- Indicators of community resilience need to be better defined through a review of past research and social science literature.

Prediction (Section 9)

- The use of key informants to provide judgements on the likelihood of impacts associated with water recovery scenarios while informative, nevertheless indicated the complexity of the issue, the need to be precise about the intervention being examined, and the need for additional methods to be used in the prediction phase of the assessment. Two approaches are suggested to better address issues of prediction.
- Firstly, rather than using key informants to make simple judgements of the likelihood of impacts associated with water recovery options, the individual decision making process used by key informants may need to be ‘mapped’ in order to better understand how the predictions are being made. This approach would require the use of structured interviews using cognitive scenario modelling, but would also provide valuable information on the likely actions and behaviours of individuals under different water recovery scenarios.
- Secondly, quantitative approaches such as TRC-Analysis may be applied at a micro level to better understand the distributive impacts of decisions associated with specific water recovery scenarios. This approach appears to be able to address many of the issues raised by key informants, but would require survey and field research

Evaluation (Section 10)

- The use of key informants to provide evaluative judgments in relation to impacts is reasonable given that the evaluation process is essentially a subjective judgement.
- Key informants need to better understand the water recovery scenario that is being evaluated and the assessment needs to be directly linked with the prediction task so that knowledge gained through the prediction task can be better used to make evaluative judgements.
- Evaluative judgments will be very much dependent upon the background of the key informant and therefore it is important to ensure a representative and larger group of key informants is used in making evaluative judgements.

Mitigation (Section 11)

- Given that the focus of this research is on framework development and only secondarily on impact identification and prediction, it would be pre-emptive to include a detailed discussion in relation to mitigation and policy options.
- In developing the framework it is clear that mitigation should address (a) issues associated with the development of appropriate community involvement programs and strategies and (b) the mitigation of specific social impacts that have been predicted.

In addition to the methodological issues that have been described in relation to each of the phases of the SIA, the development of the conceptual framework and the examination of ‘hypotheses’ have both illustrated the important role of procedural issues in SIA. This research, including framework development and hypotheses testing, has shown that SIA needs to not only focus on the identification, prediction and evaluation of social impacts as occurs within an existing SIA procedural framework, but that equal and concurrent consideration also needs to be given to procedural issues associated with any change and intervention. The ‘testing’ of hypotheses demonstrates that mitigation of potential impacts may in part be addressed through addressing procedural issues within the context of meaningful community involvement and engagement.

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Appendix A:

Summary Identification of Potential Social Impacts
Associated with Increasing Environmental
Flows Targeting the Murray Mouth
and the Lower Murray River

SUMMARY IDENTIFICATION OF POTENTIAL SOCIAL IMPACTS
ASSOCIATED WITH INCREASING ENVIRONMENTAL
FLOWS TARGETING THE MURRAY MOUTH
AND THE LOWER MURRAY RIVER

July 2003

PRELIMINARY
REPORT PREPARED FOR:
MURRAY DARLING
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EXECUTIVE SUMMARY

This social assessment is a preliminary assessment of potential social impacts associated with the Murray Mouth and lower Murray River and reflects a requirement by Ministerial Council that advice and information be provided on 'known and manageable' social impacts of a first step in water sourcing for the environment. The social assessment is not a comprehensive social impact assessment, but is based on a desktop study of existing reports and documentation, where the primary focus has been on the identification of potential social impacts associated with the demonstration project.

A comprehensive social impact assessment would include a number of generic stages which may include (i) scoping; (ii) profiling, (iii) impact prediction, (iv) impact evaluation, (v) mitigation and (vi) monitoring. The preliminary social impacts identified and discussed in this demonstration project represents a component of the initial scoping process that would be undertaken if a comprehensive social impact assessment were to be undertaken. A more comprehensive social impact assessment would permit the further identification of additional social impacts including flow on, indirect and cumulative effects; the identification and role of mediating attributes, including the resilience of regions and communities to change; and an assessment of the significance or importance of the social impacts that have been identified. In addition a more comprehensive social impact assessment would also seek to integrate the findings of other environmental and economic assessments into the assessment of social impacts.

Table 1 summarises the preliminary social impacts identified in this report. The conceptual framework for identifying social impacts has been based on an assessment of impacts on place meanings and intrinsic values and social impacts associated with the extractive and non-extractive use of water. While the impacts that have been identified are based on only a preliminary assessment they do show the range and extent of potential social impact that may occur as a consequence of increasing environmental flows targeting the Murray Mouth and lower Murray River.

Table 1 also provides an indicative evaluation of the potential social impacts that have been identified. Such an evaluation should be interpreted in the context of the limited and preliminary nature of the social assessment research that has been undertaken and any interpretation should recognise that a more detailed social assessment may show different evaluations for different water users, communities and geographic regions. Furthermore while many of the impacts identified in Table 1 are evaluated as positive, no weighting of the importance or significance of impacts has been undertaken. To conclude from Table 1 that increasing environmental flows targeting the Murray Mouth and Lower Murray river will have overall positive benefits and impacts may therefore be misleading.

Table 1. Summary of Potential Social Impacts

	Direction of Social Impact	Issues and Implications
ASSOCIATIONS		
Place Meanings		
• Indigenous	Positive	Improved health and well-being of Ngarrindjeri culture and people. Need for involvement of Ngarrindjeri people in planning and management of Murray Mouth .
• Non-Indigenous	Positive	Positive impact on emotive and symbolic meaning ascribed to the Murray Mouth. Impacts at a local and national level. Positive implications for other water recovery initiatives.
Environmental Values		
• Intrinsic Values	Positive	Direct positive benefit to intrinsic values. Some conflict in relation to the veracity of the science used to improve intrinsic values.
WATER DEPENDENCY		
Non Extractive Use		
• Tourism	Positive	Potential increase in tourists having positive impacts on the industry and Lower Murray region. Management strategies required to address increase in tourism and potential environmental impacts.
• Recreation	Positive	Potential increase in recreation activity with positive impacts on communities in the Lower Murray region. Management strategies required to address increase in recreation activity and potential recreational use conflicts at the Murray Mouth and in the region of the Lower Murray
• Commercial Fisheries	Positive	Maintenance and potential improvement in catch in the commercial fishery.
Extractive Use		
• Administrative Cut	Negative	Lack of voluntariness and control over change and (without compensation) impacts at a farm level. Farm financial and viability impacts with potential flow on a regional and community impacts.
• Market Based	Neutral	Constrained negative impacts due to voluntariness and control over change and impacts at a farm level. Potential negative impacts include (i) distributional impacts on rural communities and regions, (ii) wealth redistribution and (iii) impacts on social cohesion.

1. INTRODUCTION

The following social assessment is a preliminary assessment of potential social impacts associated with the Murray Mouth and lower Murray River demonstration project and reflects a requirement by Ministerial Council that advice and information be provided on 'known and manageable' social impacts of a first step water recovery decision. Through the process of impact identification and prediction potential social impacts of changes in water allocation decisions become known and through the discussion of mitigation strategies the social impact assessment is able where necessary to provide some direction as to the management of any potential social impacts that have been identified.

This preliminary social impact assessment also directly supports and provides evidence to underpin several of the principles adopted for 'The Living Murray' by Ministerial Council in May 2002, including specifically the principle that any actions taken 'will be fair and reasonable'. While it is important to ensure that outcomes will be fair and reasonable this is very much dependent upon the fairness of processes used to achieve these outcomes. There is considerable evidence indicating community acceptance of water allocation decisions and natural resource management decisions generally is very much dependent upon community and stakeholder judgements of the fairness of the decision making process (Syme, Nancarrow & McCreddin, 1999; Nancarrow & Syme, 2001; Reynolds, 2003). Fairness in the decision making process can be assisted by undertaking well developed community engagement processes and the identification and inclusion of information on potential social impacts in any the water allocation decision making process.

The social assessment is preliminary and not a comprehensive social impact assessment, but is based on a desktop study of existing reports and documentation, where the primary focus has been on the identification of potential social impacts. As such it represents a demonstration of the type of social impacts that would be identified and examined in greater detail if a more comprehensive social impact assessment were undertaken.

The assessment represents preliminary advice based on the identification of social impacts associated with water recovery of a nominal 500GL/annum in environmental flows targeting the opening of the Murray Mouth. For the purpose of the demonstration project and this assessment an assumption is made that additional water recovery would include 70GL from the Snowy decision and 38GL available under the Cap in South Australia, but not currently being used for consumptive use. The balance of 392GL it is assumed will be recovered by an equal cap reduction across the southern connected basin.

For the purpose of the social assessment two water recovery scenarios are also examined both of which assume on farm water is being recovered in the connected basin in New South Wales, Victoria and South Australia. One scenario is a market-based scenario which permits water trading within a broad institutional and legislative framework and where a specific mechanism exists for the purchase of 'environmental water' within the market framework. The second scenario reflects an administrative framework to water recovery and is based on the compulsory acquisition of water without compensation in order to recover water from the connected basin in NSW, Victoria and South Australia.

2. FRAMEWORK FOR THE IDENTIFICATION OF SOCIAL IMPACTS

It is important to recognize in the Murray Mouth demonstration project that social impacts may occur as a direct consequence of increased river flows and also as a direct consequence of the specific ‘mechanism’ that is used to recover water. For example, impacts on the tourism and recreation sectors at the Murray Mouth and lower river may occur from changes which occur directly through increased environmental flows, while social impacts on irrigators may be directly dependent upon the specific mechanism to used recover water (administrative or market based).

Furthermore it is also important to recognize the importance of ‘anticipatory’ or ‘perceived’ impacts in the identification and assessment of social impacts. Unlike environmental impacts, anticipatory impacts often occur from the time a proposal is made and often lead to significant behavioural change in anticipation of the ‘perceived’ impacts occurring. In particular, past decisions and precedents are also important determinants to future behaviour.

Anticipatory impacts along with other attributes of individuals, families and communities may also play an important role in mediating the relation between the changes to environmental flows and the consequent behaviour and attitude of individuals in relation to environmental change.

A conceptual framework (Fenton & Coakes, 1998) for identifying the type of social impacts that may be associated with changes in environmental flows is shown in Figure 1. On the one hand social systems may have a dependency on water, based on extractive use as occurs in irrigated agriculture or a dependency based on non-extractive use as occurs in relation to tourism and recreation. It is these dependencies that are often the subject of traditional economic and social impact assessments.

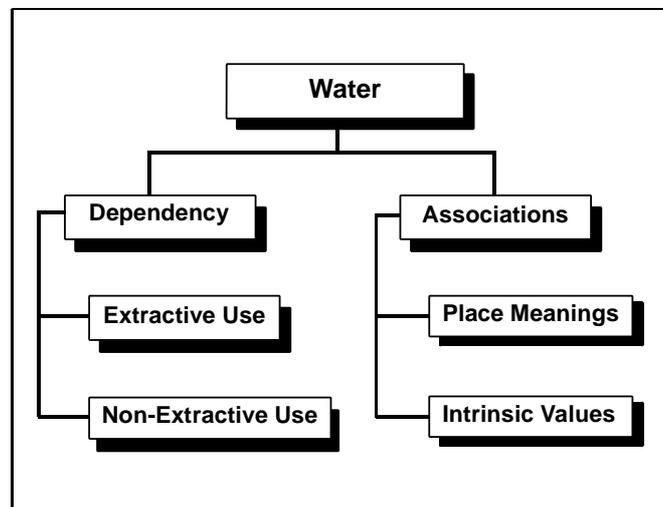


Figure 1. Conceptual Framework for Impact Identification

However, Figure 1 also indicates that water in the environment often has significant associations attached to it. One specific type of association are place meanings where specific reaches of the river or places within the river system have ascribed meanings which are often underpinned by an emotional attachment to place. It is these associations with water and the River Murray that are important to both indigenous and non-indigenous Australians.

It could be argued that this assessment focuses on the Murray Mouth, not because it is necessarily the highest priority area in ecological terms, but because the Murray Mouth is of special significance in relation to the place meanings that are ascribed and attached to this

location. The importance of place meanings in the River Murray has also been emphasised by Sinclair (2001) who states that the land and water of the River Murray are more than the sum total of geological and ecological processes, but are enclosed within ‘webs of meaning’ created by the community (p. 23). Much of the meaning ascribed to the Murray Mouth and lower river is symbolic of cumulative upstream impacts that have occurred to the River Murray including the diversion of water for extractive use.

Figure 1 also highlights that while dependency may be associated with the extrinsic values (or use values) ascribed to water, water and river ecosystems also have intrinsic values ascribed to them. The recovery of water for the environment is an intrinsic value, wherein the environment has value in its own right. That water is being recovered in order to support intrinsic environmental values will be regarded by many as an important positive social impact.

The social assessment that has been undertaken for the preliminary demonstration project is not a comprehensive social impact assessment, but is based on a desktop study of existing reports and documentation, where the primary focus has been on the identification of potential social impacts. A comprehensive social impact assessment would include a number of generic stages which may include (i) scoping; (ii) profiling, (iii) impact prediction, (iv) impact evaluation, (v) mitigation and (vi) monitoring. Each phase is often undertaken using several specific social science research methods, which may include quantitative and qualitative research methods and be based on desktop and consultative processes.

The preliminary social impacts identified and discussed in this demonstration project have been derived from a review of existing reports and represent one component of the initial scoping process that would be undertaken if a comprehensive social impact assessment were to be undertaken. As an example, a more comprehensive social impact assessment would permit the further identification of additional social impacts including flow on, indirect and cumulative effects; the identification and role of mediating attributes, including the resilience of regions and communities to change; and an assessment of the significance or importance of the social impacts that have been identified. In addition a more comprehensive social impact assessment would also seek to integrate the findings of the environmental and economic assessments into the assessment of social impacts.

3. ASSOCIATIONS

3.1 Place Meanings and the Murray Mouth

The mouth of the Murray River is highly significant in both indigenous and non-indigenous cultures and has significant meanings and associations ascribed to it.

Amongst the Ngarrindjeri of the Lower Murray and Coorong lakes areas of South Australia the Murray Mouth is a significant cultural and spiritual place that is intimately linked to the health and well being of the Ngarrindjeri people. Hemming, Trevorrow and Rigney (2002) in a discussion of Ngarrindjeri culture and the closure of the Murray Mouth state:

“There are Dreaming stories such as Thukabi, Ngurunderi and the Seven Sisters associated with the Murray Mouth area that inform Ngarrindjeri people’s understanding of its significance. The relationship of the Dreaming ancestor Ngurunderi to the area has for example been the subject of publications, museum exhibitions and films. The Murray Mouth

area is a part of the ‘meeting of the waters’, a place where the mixing of the waters is spiritually very important to the Ngarrindjeri” (p.5)

Hemming et al (2002) indicate “more water should be made available to reach the Lakes and Coorong...more water will help to support all life and nourish Ngarrindjeri country, Ngarrindjeri culture and Ngarrindjeri people” (p.4). However it is also important to note that actions that may change the character and meaningfulness of place should be undertaken through appropriate and meaningful consultative processes and any management and planning process that are undertaken be inclusive of the Ngarrindjeri people.

Amongst the population at a local and national level the mouth of the Murray River has also attained iconic significance. Its significance for the non-indigenous population is embedded in European settlement history of Australia, including the early European explorers, the onset of river trade, paddle steamers and later tourism activities. A detailed discussion and description of the multiple meanings and significance of the River Murray and River Murray Mouth has been documented by Sinclair (2001).

In relation to the demonstration project additional environmental flows targeting the mouth of the River Murray and the lower river would have very positive impacts on place meanings and the emotive and symbolic qualities ascribed to the river mouth. It is probable that such positive social impacts would occur not only amongst the local population within the Murraylands of South Australia, but amongst the broader population at a national level. While it is recognised that this is only a demonstration project, if it were to be implemented the positive social impacts might well have significant flow on benefits associated with the development of other initiatives associated with water recovery in the Murray Darling Basin.

3.2 Intrinsic Values

The demonstration project has as its core objective the improvement of intrinsic environmental values through increased environmental flows. Any increase in environmental flows that target the mouth of the Murray River and the lower river may well be evaluated by many people at both a national and local scale as an improvement in the intrinsic values of the river ecosystem.

While there is widespread recognition of the importance of intrinsic environmental values in the community (Fenton 1996, 1997), it is also evident that there is some divergence in the belief systems within the community as to whether current environmental flows in the Murray River and at the mouth of the river are outside natural variations and that any attempt to increase environmental flows may not be necessarily beneficial to the intrinsic values of the river and the Murray Mouth. This latter issue is often raised amongst some extractive water users and represents a significant value conflict in relation to extrinsic use values and the current status of intrinsic values associated with the river. The following quotations from the MDBC log of submissions on ‘The Living Murray Initiative’ highlight the importance of this value conflict.

“There is no proof that sending hundred of thousand of megalitres of water down the Murray is actually saving it. No proof at all!!”
(Submission on The Living Murray Initiative)

“We have lived in the Darlington Point area for sixty years and cannot see a difference in the seasonal ups and downs that have always taken place in

the Murrumbidgee River. How can we be dictated to by this group of city dwelling academics who visit the area – take a few tests and then endeavour to destroy the production, way of life of some six generations of families.” (Submission on the Living Murray Initiative)

“Now because some wafty greenies who probably have never been out of the city limits want to live a dream which has never been proven all over the world to be of any economic benefit to man or country, we are expected to give up many, many years of investment and hard work, developing and looking after the land we love.” (Submission on the Living Murray Initiative)

While the belief systems of some water users may question the veracity of increasing environmental flows as a means of improving the intrinsic values of the river and Murray Mouth, a majority of the general population are likely to regard any increase in environmental flows which target the mouth of the Murray River as having significant positive environmental benefits and as improving the intrinsic social values ascribed to the mouth of the Murray River and the river as a whole.

The value conflict and community beliefs about the status of intrinsic river values should be further addressed through a targeted community involvement program that directly addresses these issues.

4. WATER DEPENDENCY

The social impacts of increasing environmental flows that target the Murray Mouth and lower river are discussed in relation to tourism, recreation, commercial fisheries and agricultural irrigation. While impacts on tourism, recreation and commercial fisheries are discussed in relation to the use of the Murray Mouth and lower reaches of the Murray River, the impacts on irrigators are more geographically dispersed and depending on the mechanism for water recovery there may be significant distributional impacts throughout the southern connected basin.

4.1 Tourism and Recreation

Tourism is broadly defined as short-term leisure activities undertaken outside of or away from a persons normal place of residence, while recreation includes a range of leisure activities normally undertaken by residents of a home region (Hall, 1991).

There is significant tourism activity in the lower reaches of the Murray River, which includes the lakes and the mouth of the Murray River (MDBC & DLWC-SA, 2002). To a large extent tourist attraction to the River Murray and the Murray Mouth is a direct consequence of the meaning and significance of place as described earlier.

Cruise boat and houseboat activity on the lower reaches of the Murray River are two of the most significant tourist activities. Cruises generally extend to the Mouth of the Murray River as the primary place attractant for visitors and tourists. However with low water levels cruises to the mouth are not occurring and cruise boats and associated activities are being displaced to other river reaches further upstream. Any increase in environmental flows are likely to again displace tourism cruise boat activity towards the Murray Mouth with concurrent and likely flow on effects of this activity to towns and communities located in the vicinity of the Murray Mouth.

There are also increasing numbers of houseboats in the southern reaches of the Murray River with a marine safety survey identifying 300 houseboats for hire. Hassall and Associates

(2003) also state that “the houseboat industry supported total ‘trip’ expenditure of \$16.5 million in SA in 1995/1996 of which 57% was directly on hire costs, with the remainder on trip support costs. This supports a total of 346 full-time equivalent jobs and incomes of \$16.2 million; 90-100 of these jobs are directly in the houseboat industry” (Hassall and Associates, 2003, p.291)

Any increase in environmental flows that target the mouth of the Murray River and the lower river are likely to increase tourist and visitor numbers to the surrounding region. This may be due to the river mouth becoming more accessible to tourists, greater public awareness of the Murray Mouth and River Murray through the targeted interventions to address environmental flows and the perception that this reach of the river is healthier making it a more attractive place to visit.

An increase in tourist and visitor numbers is likely to have a positive economic impact on tourist and tourist dependent industry sectors in the immediate vicinity of the Murray Mouth and lower Murray. However it is possible that some displacement in tourist activities may occur as the mouth of the River Murray becomes more accessible, with the movement of tourism activities away from the inland reaches of the river to the river mouth. Such distributional impacts may impact on several smaller tourist dependent towns and communities in the region.

In addition the potential increase in visitors and tourists to the region may place increasing pressures on the river ecosystem and effective tourism management strategies would need to be developed to manage potential changes in tourism activities in the area of the Murray Mouth.

Recreation in the region of the Coorong and Murray Mouth is based on a wide range of activities including recreational fishing, boating, fishing, swimming, sailing, water skiing, camping, sightseeing and touring. It is likely that with an increase in environmental flows targeting the Murray Mouth and the lower river, that greater recreational opportunities would occur with the possibility of increased pressure on the river ecosystem. In addition, with increasing human pressure and activity at the mouth, conflict amongst specific users and river uses is also likely occur. The Murray Mouth Biological Resource Assessment notes for instance, that there is already conflict between recreational and commercial fishing activity at the Murray Mouth and with increasing use this is likely to increase or at least continue.

As noted in the Integrated Natural Resource Management Plan for the South Australian Murray Darling Basin (2002), if no further action is taken in relation to increasing environmental flows at or near the Murray Mouth there is likely to be a decline in “tourism and recreation as a consequence of reduced aesthetic appeal, and decline in fresh and marine water quality and fish populations” (p.30). As with tourism any increase in environmental flows targeting the mouth of the River Murray has the potential to increase recreational activity in the area and the number of recreational users. As was the case in relation to tourism, this would indicate a need to address the potential for increased recreational use within the context of existing regional and local natural resource management plans and strategies.

4.2 Commercial Fishing

The Coorong and Murray Mouth is one of the oldest commercial fisheries in South Australia and is directly dependent upon the quality and level of water in the system and the health of the riverine floodplain and wetlands. Hassall and Associates (2003) indicate that there is an intention by Government not to increase the size of the commercial fishing industry and while there are 28 commercial fishers between the NSW/SA border and Wellington, only six derive

their income wholly from the fishery. The fishing industry, which is based in Meningie and Goolwa is valued at \$5 million per annum (Hassall and Associates, 2003, p. 291).

While it is recognised that the commercial fishing industry at the mouth of the Murray River is relatively small, any increase in environmental flows that target the mouth of the Murray River and lower river are likely to have significant environmental and social benefits to the industry. As identified by Jones and Cartwright (2002), “keeping the Murray Mouth open is critical to the health of the Coorong and the local commercial fishery it supports” (p. 25).

4.3 Irrigated Agriculture

The preliminary discussion of social impacts has indicated some positive social impacts associated with increasing environmental flows targeting the mouth of the Murray River amongst non extractive water users (tourism, recreation and commercial fishing) and in relation to place meanings and the intrinsic values ascribed to the river. However there is nevertheless the potential for negative impacts to occur amongst extractive water users where water is recovered from these users for the purpose of increased environmental flows.

The identification of potential social impacts amongst irrigators is a difficult and complex process given the paucity of social information that is available. There are however three critical issues which need to be considered in the identification of potential social impacts amongst this group. They include (i) the mechanism used for water recovery, (ii) the role of mediating attributes and (iii) the distinction between ‘anticipatory’ (or perceived) impacts and ‘actual’ impacts.

4.3.1 Water Recovery Mechanisms

Any potential social impacts that occur will be very much dependent upon the type of water recovery mechanism that is implemented and the time period over which the implementation occurs. For instance, the number and geographic distribution of those affected and the type and magnitude of any social impacts that may occur will likely be very different where water is recovered through a market mechanism as compared to an administrative approach (i.e., compulsory acquisition without compensation). Similarly if the water recovery mechanism is introduced over a very short time period in contrast to a more gradual phased introduction there are again likely to be differences in the type and magnitude of social impacts.

The compulsory acquisition of water from irrigators without compensation and applied proportionally to all users with an allocation regardless of location or security of entitlement, is likely to have the greatest social impact when compared to other water recovery options. The reason for this is that such an approach is likely to impact on those farm families and communities who are most vulnerable to reductions in their water allocations as much as those who are least vulnerable. Furthermore water recovery using this approach is externally imposed rather than voluntary, provides no capital investment in more efficient water use technologies and has limited if any flexibility for recognising individual farm or farm family social and economic circumstances.

An approach based on compulsory acquisition without compensation is likely to not only have farm level and flow on social and economic impacts within regional communities but relative to other water recovery mechanisms (i.e., a market based approach) is also likely to create considerable psychosocial impacts. The psychosocial impacts associated with uncertainty and consequent stress and anxiety will most likely be attributable to the limited control and voluntariness individuals may have in relation to changes to their water allocations. Such an approach may also have broader consequences in creating uncertainty in relation to future investment, given that government has shown a willingness to make sudden and significant changes that were not necessarily predictable or anticipated.

The economic impacts of a Cap reduction without compensation on farm viability in the Murray Irrigation Area has been investigated in a study by McGuckian (2002). The findings of this study showed that with a 10% reduction in the Cap farm profit was reduced by \$4 million per annum, gross farm income declined by \$22 million and the number of farm business dropped from 1,445 to 994. While social impacts were not investigated, McGuckian (2002) reported, "The large economic impact in the Murray Irrigation Area of any reduction in the MDBC Cap would have obvious social implications at a farm and regional level"(p. 3).

The introduction of water trading and market mechanisms to water recovery targeting increased flows at the Murray Mouth and the lower river has the potential to be more flexible and permit greater choice at the individual farm enterprise level with less external administrative control. As noted by Young, MacDonald, Stringer and Bjornlund (2000), it is not only the ability to trade in water that is important, but that the social impacts and consequences of water trading will also be very much dependent upon the institutional, administrative and legal arrangements in which water trading is embedded. If the institutional, administrative and legal framework in which water trading occurs is eventually well developed and considered, it is likely that the magnitude of social impacts from a market based approach to water recovery would be significantly less than would occur from other administrative approaches such as compulsory acquisition.

Clearly a more comprehensive social impact assessment is required in order that the social impacts of implementing a market-based approach can be more fully assessed. Research undertaken at the periphery of social impact assessment has suggested the possibility of positive impacts from a market-based approach.

For instance, Young et al (2000) in a review of interstate water trading concluded that "inter-state water trading during the two year trial period has had very positive social implications for the districts that have acquired water" (p. 23) and that "from a social impact perspective, inter-state trading during the two year trial period has had no measurable adverse social implications for the districts that have sold water inter-state...the water in all but 0.4% of cases was not being used by the seller" (p.3).

McKay (2001) also provides further evidence suggesting positive social impacts associated with water trading in a study of 1,300 buyers, sellers and non-water traders in three permanent and temporary water markets in Australia. She states:

"The combined working, of the temporary and permanent markets, have very positive socio-economic impacts within irrigation regions and help irrigators to react in response to significant adjustment pressure, within all sectors of the irrigation industry. The response can be either to expand or adjust their property and production to meet the challenges of the future, or to navigate their way out of irrigation. This can be either by staying on the property, living from off-farm income and income from water sales, or selling the property and moving into the cities and a new work environment. In these instances, the buildings and some of the land are often taken over by hobby-farmers or life-style farmers, combining off-farm work with a farming life-style.

In all of the above scenarios, the community impact is good. Community cohesion is maintained, by old irrigators staying in the community, and by the influx of non-farmers, attracted by the increased number of jobs, created by the shift to higher value production. This maintains the rural population, and helps to uncouple the rural economy from farming. The flow of water to the more efficient, more professional, and higher value-

producing farmers, increases economic activity, with significant flow on effect in the rural townships.” (McKay, 2001, p.6)

In addition to the research of Young et al (2000) and McKay (2001), Bjornlund (2002) also concluded in a survey of 700 irrigators in the Murray Darling Basin, that “there is overall agreement with water markets being a good idea amongst irrigators” (p. 7). However while research to date tends to indicate broad positive social impacts from a market based approach to water recovery, the research that has been undertaken has not been specifically directed towards an assessment of social impacts and therefore some caution should be used in generalising the findings of these studies.

For instance while the findings of these studies have been generally positive in relation to social impacts there is an indication that there are potential negative social impacts associated with a market based approach to water trading. These potential social impacts require further detailed social impact assessment research but may include:

- Social impacts on rural communities and regions from water being traded into higher value agricultural crops often in a geographically different region from its source (ie., Eigenraam, Crean, Wimalasuriya and Jayasuriya, 2003; McKay, 2001; MDBC, 2003; Young et al. 2000)
- Social impacts associated with the redistribution of wealth in rural communities and amongst farm families. For instance, Young et al (2000) states “a delicate issue is the relative wealth of buyers and sellers...buyers earn significantly above the average income and consider themselves amongst the top third within their area with respect to relative wealth. Sellers tended to have below average income and were in the bottom third in terms of wealth” (p. 24)
- Social impacts associated with changes in social cohesion within rural communities, particularly between ‘life-style water users’ (hobby farmers) and professional irrigators. McKay (2001) states, “The division in the irrigation communities, as a result of this movement between commercial and ‘life-style’ driven properties, however, has the potential to cause community friction, when it comes to the issue of providing water allocations to the environment. The life-style driven component of the community looks favourable on such allocations. Commercial farmers are not so positive. The former group is increasing in numbers, while the latter is decreasing in numbers, but increasing the proportion of water that they control.” McKay (2001, p 6-7).

4.3.2. Mediating Attributes

It is important to recognise that the type and magnitude of social impacts experienced by irrigators through either administrative or market based water recovery mechanisms are likely to be mediated by several key attributes including individual, family and farm enterprise characteristics. In addition mediating attributes may play an important role in both ‘anticipatory’ and ‘actual’ social impacts.

In some instances specific mediating attributes may act to diminish potential social impacts, while in other instances these attributes may act to intensify both ‘anticipatory’ and ‘actual’ social impacts associated with water recovery targeting the Murray Mouth and lower river. Figure 2 shows the conceptual relationship between the introduction of water recovery mechanisms, the mediating attributes and ‘anticipatory’ and ‘actual’ social impacts.

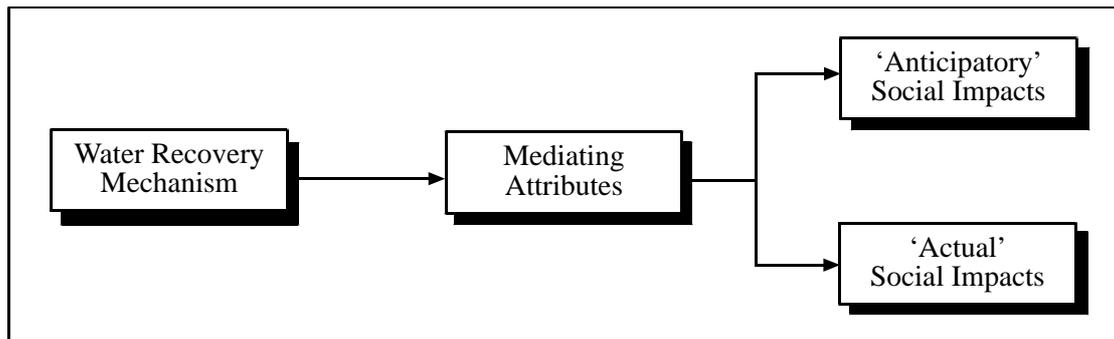


Figure 2. Conceptual Relationship Between Water Recovery and Social Impacts

As an example, in any decision to recovery water from extractive users for the purpose of increasing environmental flows targeting the Murray Mouth and the lower river, the following mediating attributes may play an important role in determining the type and magnitude of social impacts.

- The perceived fairness and equity in water allocation and distribution (Syme, Nancarrow & McCreddin, 1999). The fairness of actions is also a core principle adopted by the Ministerial Council for The Living Murray.
- The involvement of water users and local people in the decision making process about environmental flows (Nancarrow & Syme, 2002).
- Trust in the decision making and community involvement and engagement processes (Johnston, Nancarrow & Kaercher, 2002).
- The resilience of communities to change (Fenton, Coakes & Marshall, 2003; Hassall and Associates, 2003).
- The market value of water under a market based approach.
- Beliefs about veracity of the scientific process in assessing environmental flow requirements (see for example The Living Murray Issues Log).
- The strength of occupational identity ('I am an irrigator') and generational identity ('As a fourth generation farmer...') (see for example The Living Murray Issues Log)
- The need for intergenerational transfer of farm assets (see for example The Living Murray Issues Log).

4.3.3. 'Anticipatory' and 'Actual' Impacts

While there may be 'actual' changes and impacts as a consequence of new water recovery mechanisms, such as impacts to the financial characteristics of farms (McGuckian, 2002), there are undoubtable 'anticipatory' or 'perceived' impacts already being identified by individual irrigators and communities in the region. The possibility of water recovery occurring will have created 'anticipatory' impacts amongst many irrigators to the extent that they are now voicing their concerns in relation to these impacts and may have changed their farming or farm business practices in anticipation of these impacts.

Furthermore beliefs and perceptions about 'anticipatory' impacts and the role of mediating attributes may influence the occurrence, type, magnitude and probability of the more objective or 'actual' impacts of water recovery.

In summary, potential social impacts on irrigators and communities and regions dependent upon irrigation will be very much dependent upon the water recovery mechanisms that is used. Relative to market based approaches a reduction in the Cap without compensation for the purpose of targeting increase flows at the Murray Mouth and the lower river is likely to

have the greatest social impact. Many of these social impacts will be a direct consequence of potential changes in farm financial characteristics and farm viability and will flow on to local and regional communities dependent upon irrigated agriculture.

Although dependent upon the institutional, administrative and legal framework in which a market based approach to water recovery is embedded, what research evidence currently exists suggests the likelihood of positive social impacts occurring. Some caution is required in making this assessment as no specific and detailed social impact assessment research has been undertaken and as noted the type of social impacts (anticipatory or actual) are dependent upon a wide range mediating attributes. Several potential negative social impacts associated with the introduction of a market-based approach have been identified which include:

- (i) distributional impacts on rural communities and regions from water being traded into higher value agricultural crops often in geographically different region from its source,
- (ii) impacts associated with changes in social cohesion within rural communities, particularly between across different water use groups, and
- (iii) impacts associated with the redistribution of wealth in rural communities and amongst farm families.

Recent qualitative research undertaken with irrigators in the Murray-Darling Basin as part of a pilot research project to examine the social impacts associated with different water recovery mechanisms has highlighted several key issues associated with water trading to high value agricultural use:

“We have seen a number of pushes in this area to increasingly focus on horticulture...this push to move to higher value crops. But that will only occur over a very extended period because there is none of the support infrastructure in place. If that does happen then where has the market from that come from? We’ve probably just taken it off some valley in the Dandenong...so have we achieved anything at all or have we just shifted things around?”

“How does he turn his rice paddy into an orchard...its not just that simple is it! He’s got a very extended period where he has no production at all...because the trees are growing. He has significant costs in getting it established. In reality how do you get them through that time?”

Similarly, the social impact assessment pilot research also emphasizes potential distributional impacts associated with water trading where the value of water is traded outside local areas and regions:

“There has to be some trading rules. This issue of the water barons is just poo-pooed...I’m just not so sure about that. Why wouldn’t I buy water if I thought I could by it now and sell in next week for more?”

“For example...I’ve got 1,000ML of water...somebody comes along to me...say it’s the MDBC. They say...look we need X amount of megalitres of water to increase the flows of the Murray River. We will buy 100 of yours and we will give you

\$200 per megalitre for it...that's fine...I can't make \$200 a megalitre with my water, so I am happy if I take that view to sell that water and get a check for \$20,000. I sit on my bum...I do something else...instead of irrigating things I might run dry land...whatever. The thing is that once I've got that \$20,000 I don't consume with it...I might go to Melbourne...I might buy a new TV..I might go on a holiday...or I might do something that isn't productive. Whereas If I was watering pasture or spraying or doing something...what I am doing is I am consuming...I am buying seed...I am buying fuel...and then we are getting the multiplier effect of the money in the local community”

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