



# Understanding landholders in an era of regulatory change

Final report for the Goulburn Broken Catchment Management Authority

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## Executive summary

Water policy reform is a priority for state and federal Governments to manage the risk of water scarcity. Statewide water delivery system modernisation is a key initiative to support irrigation viability, maximise water savings and provide water security for urban and rural water users, as well as the environment. The Northern Victorian Irrigation Renewal Project (NVIRP) is one initiative that aims to deliver such water policy reform. The NVIRP aims at saving water through the modernisation of water delivery systems in irrigation districts to better manage the requirements of competing water users. System modernisation offers opportunities to achieve water savings that will provide environmental benefits, as well as benefits for urban and agricultural water users. The Goulburn Broken Catchment Management Authority (GBCMA) is increasingly in demand to support the delivery of such water policy reform in a way that balances environmental needs with the needs of competing water users across and beyond the catchment. The GBCMA has a role supporting landholders adapt to modernisation in a way that does not put the achievement of existing natural resource management objectives at risk, such as those of the Regional Catchment Strategy (RCS).

The NVIRP is a large- scale initiative with financial commitment from both state and federal Government to modernise the water delivery system, which consists of ageing gravity-fed irrigation infrastructure and associated delivery processes. The timelines for modernising the system are very short. In addition, the implications of the NVIRP for individual landholders as well as the achievement of current natural resource management policy objectives are uncertain.

Some of the system changes are fundamentally regulatory in nature, imposing change, with little or no choice for landholders. Some changes are voluntary, where landholders will be able to choose whether or not they adopt the change. These changes could have a variety of impacts on landholders. Changes offer opportunities for some landholders but for others adapting to these changes could be difficult. Understanding how changes generate different responses among landholders is critical, guiding the GBCMA in supporting and assisting landholders adapt to changes in a way that complements and enhances the delivery of RCS objectives.

The aim of this research was to support the GB CMA to understand how these changes generate different responses among landholders. This understanding can then be used by The GBCMA to clarify their role in supporting and assisting landholders adapt to required changes in a way that complements and enhances the delivery of RCS objectives. To do this we used the I<sub>3</sub> Response

Framework (Kaine et al. *forthcoming*) to predict likely behavioural responses of landholders to regulations. Once revealed, the predicted responses can then be used to identify policy implementation strategies that can potentially influence responses to better achieve desired objectives.

The findings of the research confirmed that the importance of four critical irrigation components investigated depends very much on the landholder's situation; their business needs, where they are located on the supply system, and the physical contextual options and limitations of their farm. Therefore if these components are important in decision making it is central to take account of these critical variables in refining the modernisation intervention and designing implementation strategies. It also reinforces the difficulties in designing generalised strategies targeting groups of landholders or the risks in consulting with a small number of individuals in the design phase as they may not be able to represent the diversity of landholders. The findings support the need for a flexible and customised program that considers the benefits and costs for individual landholders and responds accordingly.

There is the potential to design and implement a modernised system for the delivery of irrigation water to northern Victoria which can achieve water savings for the state of Victoria and offers opportunities for regional development. However, the benefits and costs for landholders will not be the same and the implementation strategy needs to reflect this to enable the achievement of project objectives.

## Introduction

Water policy reform is a priority for State and Federal governments to manage the risk of water scarcity. Statewide system modernisation is a key initiative of the State Government to maximise water savings and provide water security for urban and rural water users, as well as the environment. The Northern Victorian Irrigation Renewal Project (NVIRP) is one initiative that aims to deliver such water policy reform. The NVIRP aims at saving water through the modernisation of water delivery systems in irrigation districts to better manage the requirements of competing water users.

System modernisation offers opportunities to achieve water savings that will provide environmental benefits, as well as benefits for urban and agricultural water users. The Goulburn Broken Catchment Management Authority (GBCMA) is increasingly in demand to support the delivery of such water policy reform in a way that balances environmental needs with the needs of competing water users across and beyond the catchment. The GBCMA has a role supporting landholders adapt to modernisation in a way that does not put the achievement of existing natural resource management objectives at risk.

The NVIRP is a large-scale initiative with financial commitment from both State and Federal governments to modernise the Goulburn-Murray Irrigation District (GMID) water delivery system, which consists of ageing gravity-fed irrigation infrastructure and associated delivery processes. The timelines for modernising the system are very short. In addition, the implications of the NVIRP for individual landholders as well as the achievement of current natural resource management policy objectives are uncertain.

Over the next five years it is proposed that only part of the existing public irrigation supply system will be modernised and managed in the future by the Government. The remainder of the system will be rationalised or transferred to private ownership (i.e. landholders). This private part of the system may then be reconnected to the public part of the system, the 'backbone', to be managed individually or collectively by landholders. The privately owned parts of the system may also be modernised. Significant progress has been made with a works program for the modernisation of the newly defined backbone. A program to modernise the remainder of the system is in the initial implementation phase.

Practical solutions have been identified that target different types of connections at the interface between the backbone and the private part of the system. Cost share arrangements between Government and landholders have also been put in place for reconnection to the backbone. At the time of writing this report, limited consideration had been given to issues such as to how private works programs will progress and how private management schemes might be developed, and what new tariffs will be put in place.

How landholders will respond to these changes to the irrigation system is unclear. This is because the changes involve many landholders with diverse needs in regard to the delivery of irrigation water, which suggests that there may be substantial variety in the responses of landholders. Consequently, it is our contention that anticipating and understanding these responses will be essential to ensuring the NVIRP objectives are met.

Some of the proposed changes to the system are fundamentally compulsory in nature; that is, they impose change on landholders. An example is the replacement of meters where the farm connects to the backbone. The success of compulsory changes is influenced by, among other factors, the willingness of individuals to accept the change and, if necessary, change their behaviour accordingly. Other proposed changes are voluntary in nature, landholders will be able to choose to adopt the change, or not. Rationalisation of outlets is an example of voluntary change. The successful implementation of voluntary changes depends on enough landholders choosing to adopt the desired changes within the timeframes set for the policy. Anticipating and understanding the willingness of individuals to change their behaviour is critical then in predicting the likely effectiveness of proposed voluntary and compulsory changes.

The willingness of landholders to accept and comply with compulsory changes, or adopt voluntary changes, will be influenced by the extent to which the changes create opportunities for landholders to better meet their personal and business objectives. If a change is perceived by the landholder as creating an opportunity for them to better meet their personal and business objectives then they are likely to form a favourable attitude toward the change. If a change is not perceived by the landholder as creating an opportunity for them to better meet their personal and business objectives then they are likely to form an unfavourable attitude toward the change.

If landholders' attitudes towards the changes entailed in modernisation are favourable it is more likely that modernisation will occur more easily and rapidly than if landholder attitude is unfavourable. A favourable attitude is likely to result in landholders being more accepting of

compulsory change, willing to adopt voluntary modernisation options and viewing the modernisation program in a positive way. An unfavourable attitude is likely to result in landholders being less accepting of compulsory change, unwilling to adopt voluntary modernisation options and viewing the modernisation program in a negative way. This could mean NVIRP timelines not being met. At worst, unfavourable attitudes may lead to landholders and other community members actively and publicly protesting against the NVIRP and putting the modernisation program at risk. Hence, a critical factor that will influence the ease and speed of the NVIRP implementation is landholder attitude to the changes entailed in modernisation. This conclusion is supported by previous research into landholder behaviour in regard to the implementation of channel automation on the Central Goulburn 2 (CG2) water delivery system (Cowan et al. 2005; Cowan et al. 2006).

The Department of Primary Industry (DPI) Practice Change Research team have been involved in the development of the I<sub>3</sub> Response Framework (Murdoch et al. 2006) to predict the likely responses of landholders to policy interventions of a compulsory nature. In this project we have, in consultation with the GBCMA, applied the I<sub>3</sub> Response Framework to understand and predict the likely responses of landholders to proposed changes associated with the NVIRP modernisation. We also comment on strategies that may encourage landholders to accept the changes entailed in modernisation. This information may be useful in guiding the decision-making of the GBCMA and other organisations and so assist them in the achievement of their objectives.

## **Project objectives**

1. In consultation with GBCMA apply and refine the I<sub>3</sub> Response Framework to identified case studies within the Shepparton Irrigation Region (SIR) to understand irrigator responses to changes.
2. Formulate appropriate policy implementation strategies based on the I<sub>3</sub> Response Framework case study results.
3. Provide policy advice to the GBCMA and other stakeholders to support the development of programs that assist landholders in adapting to and capturing benefits of changes associated with the NVIRP across northern irrigation regions.
4. Work with staff delivering the GBCMA RCS to refine the RCS implementation programs utilising research results.



We have defined and described the various parts of the NVIRP policy process used in this research. Refer to Table 1 for these definitions and descriptions.

**Table 1 Description and definitions of the NVIRP policy process**

<b>Issue</b> The policy issue for which Government has responsibility to address to protect and enhance the public good	↻ Increasing the amount of water available for all users, including landholders, urban and the environment
<b>Intervention</b> The obligation imposed by regulation that requires landholders to act in a prescribed way in order to address the policy issue	↻ The Northern Victorian Irrigation Renewal Project (NVIRP) water delivery system modernisation
Elements of the intervention	↻ <ul style="list-style-type: none"> <li>• Meter replacement</li> <li>• Channel repair</li> <li>• Channel replacement</li> <li>• Rationalisation</li> <li>• Automation</li> <li>• Tariffs</li> <li>• Ordering upgrades</li> <li>• Delivery processes</li> </ul>
<b>Implementation strategy</b>	↻ A package of complementary mechanisms aimed at delivering on targets in set timelines
Implementation strategy examples	↻ <ul style="list-style-type: none"> <li>• Incentives</li> <li>• Extension</li> <li>• Promotion</li> <li>• Compulsory change</li> </ul>

This report presents the findings of our research to address Objectives 1 and 2. We begin by outlining the I<sub>3</sub> Response Framework and the methods we employed to research the problem. We then describe the findings and application of the I<sub>3</sub> Response Framework. We follow with our interpretation of the findings then make comment on possible implementation strategies which may be considered by GBCMA and NVIRP decision-makers for future implementation. Key insights from our research are drawn together in the concluding section.

# Theory and methods

## Theoretical approach

In this section we describe the theory we have developed and applied to this project to understand and predict landholder responses to the NVIRP system modernisation. We then describe the methods we employed to collect and analyse project data.

### *A framework for understanding individual response to regulation<sup>1</sup>*

The I<sub>3</sub> Response Framework (Murdoch et al. 2006) was developed to explain and predict the motivation of individuals to comply with policy interventions of a compulsory nature, such as regulations. Two ideas are central to the framework. The first idea uses the psychological construct of involvement to predict the motivation of individuals to comply. The second idea distinguishes the influence of the personal impact of the policy intervention itself on the motivation of individuals to comply from the influence of the policy issue or objective on the motivation of individuals to comply. These two ideas provide a basis for systematically classifying individuals into groups on the basis of differential behavioural responses to policy interventions of a compulsory nature. Its application can be used to identify strategies to increase the likelihood of favourable attitudes and thereby increase compliance.

The I<sub>3</sub> Response Framework was developed primarily to consider individual responses to compulsory interventions such as regulations; hence the next section describes the theory underpinning the Framework in a regulatory context. As well as being informative to the compulsory elements of the NVIRP, the application of the I<sub>3</sub> Response Framework may also provide insights on the motivation of individuals to adopt voluntary changes, which may indicate the likely scope and rate of adoption of these changes, as well as assisting to identify strategies to encourage their adoption.

### **Attention and effort – involvement in decision-making**

To predict how landholders do or do not respond to regulatory interventions it is necessary to understand when individuals are more likely to invest effort in decision-making with regard to the regulation. Social psychology theory suggests that, given limited cognitive capacity to process information, individuals must form priorities in order to allocate processing capacity. Essentially,

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<sup>1</sup> The theory section of this report is sourced from Kaine et al. (*forthcoming*)

the theory proposes that deliberate, effortful thinking is reserved for more important decisions while automatic processes that require less effort, such as habit, are employed to make routine, unimportant decisions (Derbaix and Vanden Abeele 1985). We use the term decision here in relation to a stimulus or an external cue, and this includes decisions in relation to tasks, activities and issues. Hence, when an individual is presented with a decision-making situation they must, consciously or sub-consciously, evaluate the importance of the decision to determine the level of deliberate, effortful thinking they should invest in it (Derbaix and Vanden Abeele 1985). The importance or personal relevance of a decision is judged, essentially, on the basis of the extent to which it is perceived to influence the individual's capacity to satisfy their needs (Assael 1998, Oliver 1997).

An individual's perception of the importance of a decision in relation to the satisfaction of their needs represents their 'involvement' with the decision. Hence, involvement is defined as a measure of the intensity of an individual's motivation in regard to a decision (Verbeke and Vackier 2004). The intensity or level of involvement evoked by the decision is dependent on a mix of external cues, including context and promotion, and internal cues, such as past experience, perception of risk, personal value systems and social norms (Assael 1998).

Laurent and Kapferer (1985) argue that understanding the source or cause for involvement may provide insight into decision-making, in addition to considering the intensity of involvement. There are three fundamental sources of involvement – interest, sign, and hedonic (Laurent and Kapferer, 1985; Mittal and Lee, 1989; O'Cass, 2000; Zaichkowsky, 1985). Interest relates to the consequence of a decision in utilitarian, economic and functional needs. Sign concerns the consequences of a decision in terms of self-concept and impression management needs. Hedonic is the extent to which the consequences of the decision satisfy pleasure or experiential needs. The intensity of involvement can also be influenced by an individual's perception of the risks entailed in the decision (Dholakia, 2001; Laurent and Kapferer, 1985).

The intensity and source of involvement will determine the attention given to a decision by an individual and the effort they will invest in information processing and reaching a decision (Celsi and Olson, 1988; Poiesz and de Bont, 1995). Where involvement is low attention to external cues is likely to be low, little consideration will be devoted to decision-making, and relevant attitudes are likely to be weak, to the extent they are formed at all (Priluck and Till, 2004). Where involvement is high attention to external cues is likely to be high, substantial effort will be devoted to decision-making, and relevant attitudes are likely to be carefully considered and strongly held.

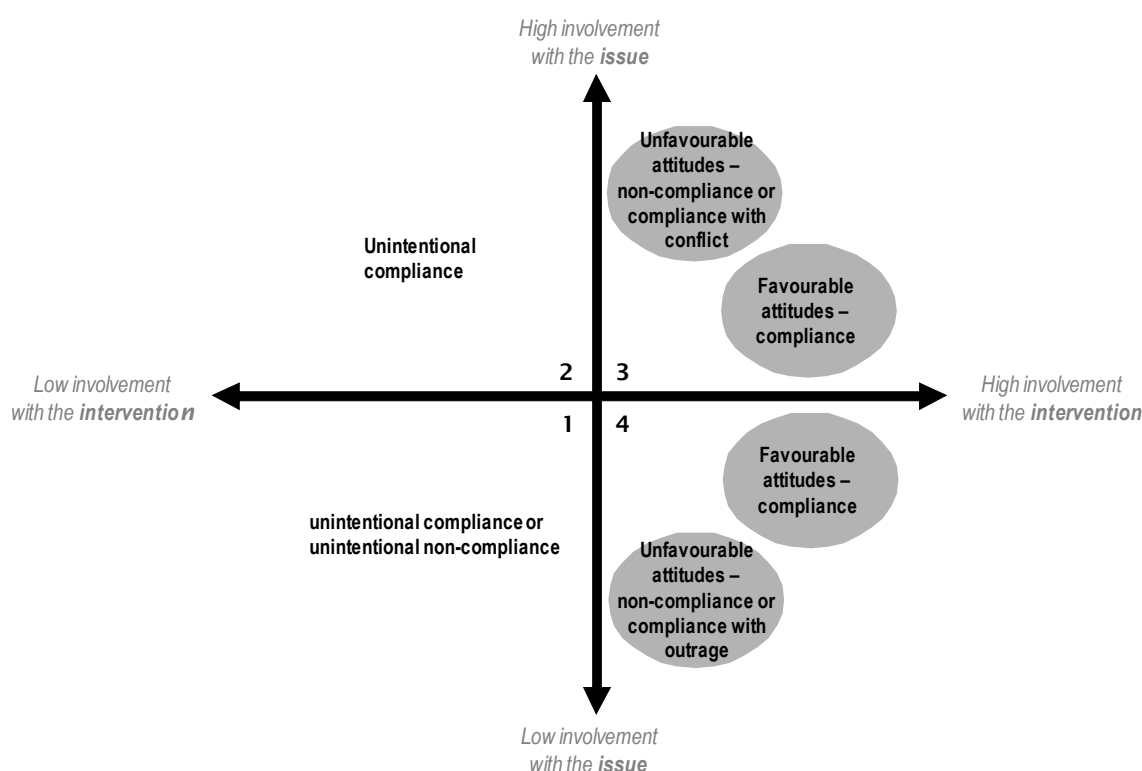
Following an evaluation of several scales for measuring involvement Mittal (1995) concluded that when there is an involving decision to be made and for which there can be two sides (for and against), there will be a distinction between involvement and the individual's attitude. That is, depending on the individual's assessment of the consequences of the decision, high involvement may result in either a favourable or unfavourable attitude. As such, we believe that individual response to a regulation will depend on the intensity and source of involvement of the individual with regard to the regulation, and where that involvement is sufficiently intense to form an attitude, on whether that attitude is favourable or unfavourable.

### **Predicting behaviour**

Given an individual's intensity and source of involvement will critically influence their motivation in regard to awareness of, attitude formation, and decision-making with respect to a regulation, we believe their behaviour may be predicted by distinguishing between two key dimensions of involvement. These two dimensions are involvement with the issue and involvement with the intervention. An issue is defined here as the policy objective the regulation is intended to address, e.g. the control of the grapevine pest *Phylloxera* to protect Victoria's grape and wine industry. An intervention is defined here as the obligation imposed by the regulation that requires individuals to act in a prescribed way in order to address the policy issue, e.g. the legal obligations to manage the movement of grape and vine material within defined zones across the state. We term the framework we have developed to predict behaviour the I<sub>3</sub> Response Framework where the term "I<sub>3</sub>" of the I<sub>3</sub> Response Framework title stands for involvement with the issue and the intervention.

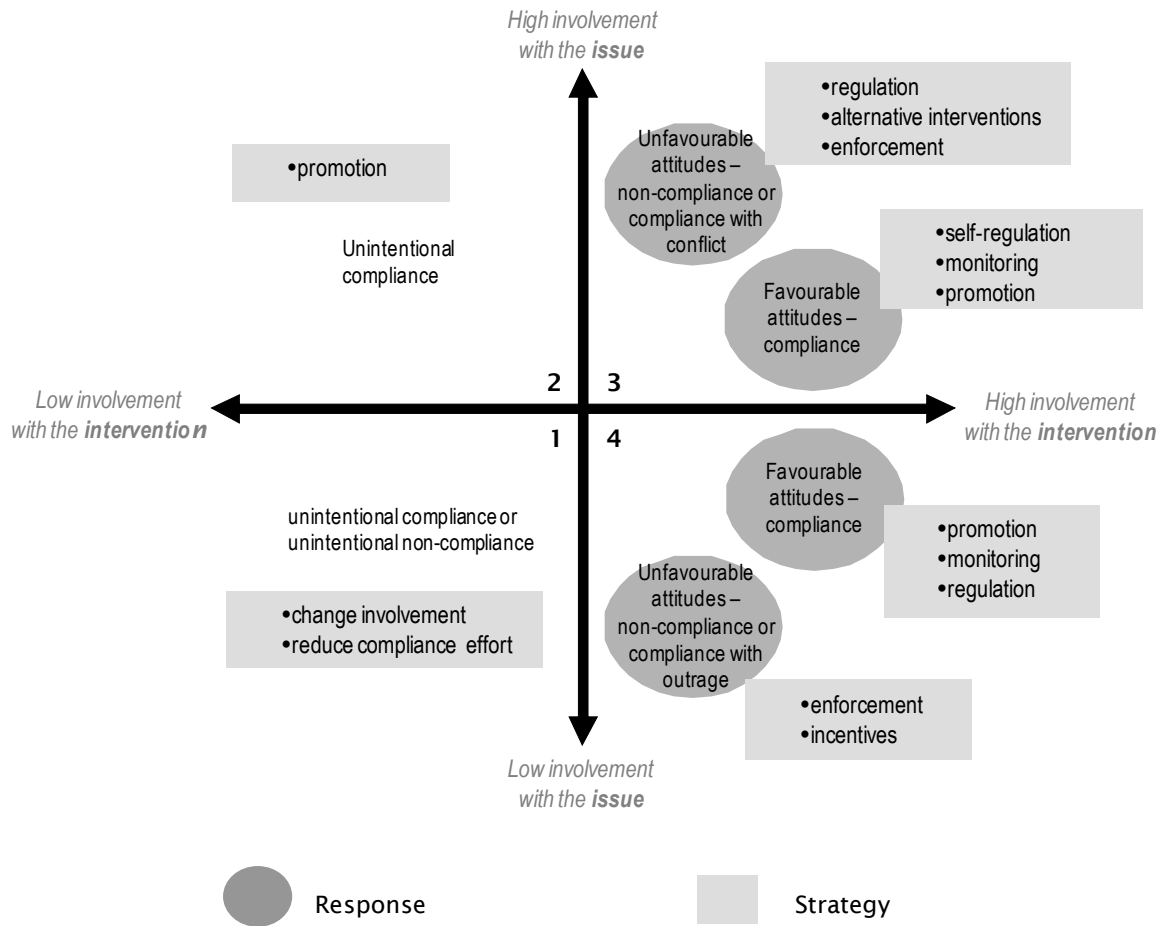
Involvement with the issue represents the level of personal relevance of the policy objective. Issue involvement signals the degree to which the policy objective itself is a source of motivation for the individual, irrespective of the regulation (Laaksonen, 1994). This allows for individuals to be motivated to take action in response to an issue, even though the associated regulation does not impose an obligation on them directly. Involvement with the intervention represents the level of personal relevance created by the regulation. Intervention involvement signals the degree to which the regulation is a source of motivation for the individual, irrespective of the issue (Kim, 2003; Zaichkowsky, 1985). This allows for individuals to be motivated to take action in response to a regulation even though the issue the regulation addresses is not perceived to be directly relevant to them.

These two dimensions of involvement can be combined to predict four main involvement profiles. The relationships between the two dimensions of involvement and the types of likely behavioural responses are summarised in Figure 1. The horizontal axis in the figure represents a continuum from low involvement with the intervention on the left-hand side to high involvement with the intervention on the right-hand side. The vertical axis in the figure represents a continuum from low involvement with the issue at the bottom to high involvement with the issue at the top. Four quadrants are formed by the intersection of these two involvement axes. These quadrants represent types of likely behavioural responses to regulations.



**Figure 1: I<sub>3</sub> Response Framework – likely responses to regulation (adapted from Kaine et al. forthcoming)**

Given this understanding of likely behavioural responses the I<sub>3</sub> Response Framework can then be used to suggest strategies to maintain existing behaviour that is in line with the regulation obligation or to promote compliance with the intervention by individuals. There are two options for increasing compliance, strategies that change behaviour by changing involvement or strategies that work with the existing level of involvement. These choices are summarised in Figure 2 and will be discussed as we describe the behaviour responses in each quadrant of the Framework.



**Figure 2. Implementation strategies for each quadrant (adapted from Kaine et al. *forthcoming*)**

**Quadrant 1. Low issue involvement, low intervention involvement**

Quadrant 1 of the I<sub>3</sub> Response Framework represents individuals who have low involvement with both the issue and the intervention. We expect that individuals in this quadrant would be largely unaware of the details of the issue and any related intervention obligations. In terms of Kassirjian (1981) these people may appear as either detached, i.e. they have other interests and concerns, or as ‘know-nothings’, people who do not particularly care about or have interest in that issue. In addition, we would expect that individuals in this quadrant would be unlikely to devote much, if any, time or effort in information processing and decision-making regarding either the issue or the intervention (Petty and Cacioppo, 1984). As such, individuals in this quadrant would not have considered or evaluated their behaviour with respect to the issue. The behaviour of these individuals would not be influenced by the intervention and, in blissful ignorance; they may or may not comply with its obligations.

In these circumstances one strategy to promote compliance with the intervention is to try to change involvement by reframing the issue to link into a subject that is highly involving for these

individuals (Murdoch et al. 2006). To be successful the subject would need to be perceived as relevant to the intervention and be likely to lead to the formation of favourable attitudes. An alternative strategy is to promote compliance by reducing the level of effort required to meet the obligations imposed by the intervention.

### *Quadrant 2. High issue involvement, low intervention involvement*

Quadrant 2 represents individuals who have high involvement with the issue but low involvement with the intervention. We would expect that individuals who have high involvement with the issue to consider it to be relevant and important to them (Zaichkowsky, 1986). Consequently, they would be aware of the issue and invest time and energy in processing information, decision-making and responding to the issue (Chaffee and Roser, 1986; Petty and Cacioppo, 1984).

The associated intervention however, is not highly involving for these individuals. Given the intervention is not personally relevant to them this suggests the intervention does not impose a substantial obligation on them and so requires little, if any, behavioural change for these individuals. This may be because the intervention imposes obligations that align with their existing behaviour. Consequently, we predict that the individuals in this quadrant will comply with the intervention. These individuals may hold favourable or unfavourable attitudes towards the issue. However because they have low involvement in the intervention they need not be a direct target in terms of a compliance strategy. They may become a target within a compliance strategy if their behaviour is seen to be negatively influencing others such as encouraging behaviour counterproductive to the policy objective.

In these circumstances the appropriate strategy to promote compliance would be to take advantage of the existing intensity of involvement, particularly when this is accompanied by favourable attitudes. For example, promotion might employ the issue involvement to ensure awareness and knowledge of obligations, and the link with appropriate behaviours, remains high. Promotion might also be used to reinforce the desirability of continuing to exhibit appropriate behaviours. An information strategy focusing only on promoting the behaviours required by the intervention without linking them to the issue may be perceived as irrelevant by this audience.

### *Quadrant 3. High issue involvement, high intervention involvement*

Quadrant 3 represents individuals who have high involvement with both the issue and the intervention. Like those in Quadrant 2, high involvement with the issue would lead these individuals to invest time and effort in making decisions about their most appropriate and relevant

actions and practices (Petty and Cacioppo, 1984). There is however, with regard to high involvement in the intervention, a subdivision of the responses of individuals within this quadrant, depending on whether their attitude towards the intervention is favourable or unfavourable.

A favourable attitude is evoked where individuals perceive that benefits of complying would outweigh the costs of meeting intervention obligations, or because the intervention imposes obligations that align with their views, or both. We predict those individuals in Quadrant 3 who have a favourable attitude towards the intervention will comply with the intervention.

Consequently, a strategy for promoting compliance among individuals with a favourable attitude might rely on self-regulation through the use of mechanisms such as voluntary codes of conduct. Promotion and monitoring may also be worthwhile to ensure awareness and knowledge of obligations and desirable behaviours is maintained and to identify at an early stage any change in attitude.

An unfavourable attitude is evoked where individuals perceive that the cost of meeting the intervention obligations would be greater than the benefits of complying or because the intervention imposes obligations and behaviours that do not align with their views, or both. We predict those individuals who have an unfavourable attitude towards the intervention will intentionally choose not to comply with the intervention, or comply with the intervention reluctantly, irrespective of their attitude towards the issue.

One strategy for promoting compliance among individuals with an unfavourable attitude is to change their attitude toward the intervention. This may be possible by reframing the benefits of the intervention in terms of another more involving subject. Alternatively, a promotional program may be implemented with the objective of persuading these individuals that the behaviours imposed by the regulation are superior to any alternatives. Another strategy is to include in the intervention behaviours advocated by these individuals, as long as they meet the policy objective (Gunningham et al. 1998). Finally, compliance among these individuals might be increased by investing resources in enforcement to increase the likelihood of detection and prosecution, and the severity of penalties for non-compliance.

Note that if the causes for non-compliance relate to unpredictable variations in the environment or from unforeseeable technical problems with implementing the regulation then enforcement and general deterrence may be ineffective. A more appropriate strategy in these circumstances may be to focus on the provision of technical assistance (Carlough, 2003).



#### *Quadrant 4. Low issue involvement, high intervention involvement*

Quadrant 4 represents individuals who have low involvement with the issue and high involvement with the intervention. Individuals who are not highly involved with the issue would be unlikely to have invested time or effort in information processing and decision-making (Petty and Cacioppo, 1984). However, because they have high involvement with the intervention they would be likely to have devoted considerable effort to assessing intervention obligations.

Individuals in this quadrant may behave differently depending on whether their attitude towards the intervention is favourable or unfavourable. As for Quadrant 3, we expect on the one hand, that individuals who perceive the intervention to have positive implications will form a favourable attitude towards it and be motivated to comply. In these circumstances the regulatory agency may play a monitoring role to check that the conditions promoting compliance do not change. Also a promotional strategy to support and reinforce compliance behaviour may be worthwhile.

On the other hand, we expect individuals who perceive the intervention to have negative implications for them will form an unfavourable attitude towards it and may intentionally choose not to comply, or comply reluctantly. Since these individuals do not regard the policy issue as personally relevant and the fact that they view the intervention unfavourably means they may be strongly opposed to the intervention and exhibit outrage. Consequently, these individuals may publicly express their opposition to the intervention and seek to influence the public in support of their case.

One strategy for promoting compliance among these individuals is to change their attitude toward the intervention. This may be possible by reframing the intervention in terms of another involving subject. Alternatively, their opposition to the intervention may be reduced by offering incentives to reduce the costs the regulation imposes on these individuals and to delay or stage the introduction of the regulation (Gunningham et al. 1998). Finally, compliance among these individuals might be increased by investing resources in enforcement to increase the likelihood of detection and prosecution, and through the severity of penalties for non-compliance.

Through the application of the I<sub>3</sub> Response Framework to the NVIRP we hope to offer insights into the range of likely landholder responses. This information can then be used to shape an implementation strategy that is better positioned to meet project objectives in a timely manner. Our results may also have broader implications for the design and implementation of similar policies in other parts of Victoria.

## **The research approach**

To understand landholder responses to changes associated with the NVIRP system modernisation we used quantitative data to measure interviewee involvement intensity and qualitative data to explore attitudes. We then placed interviewees in the I<sub>3</sub> Response Framework, based on a combination of measured and inferred involvement intensity data. We were then able to comment on particular strategies that may make the NVIRP implementation more effective.

### ***Understanding issue and intervention involvement***

We considered the two main factors influencing landholders' involvement with, and attitudes to, the changes associated with modernisation would be:

1. Landholders' involvement with the policy objective (issue) modernisation is intended to serve; and
2. What costs modernisation will impose, and what benefits modernisation will bring, for individual landholders.

In relation to the first point, we defined the policy issue as increasing the amount of water available for all users including agriculture, environment and urban (see Table 1). We measured landholder involvement in this issue by adapting the Laurent and Kapferer (1985) Consumer Involvement Profile. This Profile allows for the identification of five dimensions of involvement. Measurement of these five involvement dimensions can be combined to obtain an overall measure of involvement intensity. We used this scale because it allowed us to compare individuals' scores on the different sources of involvement with their responses to unstructured questions about their opinions, attitudes and actions. These comparisons provided a test of the validity of the scale and would also assist in identifying strategies for increasing compliance.

In relation to the second point, the costs and benefits will depend on how the modernisation changes impact upon landholders' management of their farm and achievement of their goals. While a range of elements that would make up the NVIRP intervention was known (see Table 1), precisely which of these would apply in individual instances was not known when we conducted the research. Consequently, we were driven to infer landholders' involvement and attitude towards the intervention rather than measure these directly. In short, we inferred landholders' involvement in the intervention by having landholders rate the importance, to them, of various components of their

farm irrigation system which would, potentially, be affected modernisation. The rationale for this was as follows.

Irrigation is an important part of farming across the Goulburn Murray Irrigation District (GMID) and landholders have invested resources by way of capital, time and labour into irrigation infrastructure on their farm to secure a reliable supply of water from their water supply system. We contend that they have invested time and effort to manage and refine their farm systems as a whole to get the most from this system for their farm business. Their perceived level of competency is generally high with regard to managing their irrigation system to meet their farm needs. Therefore if the modernisation of the water delivery system affects the performance of their farm system, it is possible these effects could significantly alter a landholder's ability to achieve their farming objectives. If this were the case then we predict it would trigger high involvement in the intervention and lead to the formation of strong favourable or unfavourable attitudes to it.

Consequently, to infer involvement in, and attitudes towards, possible interventions we used landholders' ratings of the importance of four critical components of on-farm irrigation that could be affected by modernisation.

### ***Selection of the critical irrigation components***

The critical irrigation components that could be affected by modernisation were identified using information from a range of sources including documentation, meetings involving key agency and/or irrigator representatives, and research by Cowan et al. (2005, 2006) on the impact on landholders of channel automation on the Central Goulburn 2 channel system.

Upon consideration of this data, the four critical irrigation components selected were:

- Service delivery of irrigation water – including the timeliness of delivery when ordering, flexibility in changing orders, variability in supply, flow rates.
- Changes to commandability over the area of land planned for irrigation each season - some sort of change that might occur to the area planned for irrigation in a particular season from event to event which is related to delivery variability or change rather than seasonal allocation.
- Negotiating the delivery of irrigation water with other users on the system - how an individual may have to negotiate arrangements with others, including neighbours and those upstream and downstream in terms of the delivery of the water ordered to an outlet.

- Water delivery charges - how an individual considers the charges associated with the delivery of water rather than variation in the seasonal cost of water.

Additionally, interviewees were given the opportunity to add other components that they considered important to their irrigation management and decision-making that had not been addressed by the components we had identified.

### ***Data collection methods***

#### **Sampling**

Two geographical areas were identified in which to conduct the research. Selection of the areas was limited to the Central-Goulburn Irrigation Area (CGIA) (excluding CG 1-4) because it is an area in focus for the GBCMA implementation of the RCS and future modernisation. The areas were selected in consultation with GBCMA and G-MW staff. The areas chosen were based around two pods within the CGIA. A pod is a geographical unit identified by G-MW as a management unit for implementation of the modernisation.

Interviews were conducted with 21 landholders. The sampling strategy used for the interviews was purposive in nature (Patton 1990), orientated towards the goal of identifying landholders from a variety of farm contexts, on the assumption that landholders from different farm contexts would have different needs in regard to the delivery of irrigation water. Landholders with properties of varying sizes and production types, representing a mix of enterprises (dairy, horticulture, mixed, cropping) and with differing demographic backgrounds were selected to be interviewed.

Interviewees were located within, or adjacent to, each pod, on different parts of the irrigation delivery system. Implementation of modernisation was at different stages depending on each interviewee's location on the system.

#### **The interview process**

Interviews were conducted between June and August 2008 following piloting, which incorporated the administration of the issue involvement scale, to identify difficulties faced by interviewees when completing the scales and responding to other interview questions. Interviews were conducted by two interviewers, with interviewee responses recorded manually.

The principle aim of the interview was to elicit data that could be used to place the interviewees in the I<sub>3</sub> Response Framework. This required determination of the intensity of involvement in the issue

and the critical irrigation component importance ratings and collection of qualitative contextual and attitude data; as a result the landholder interviews comprised three parts as follows.

### *Part 1 – Farm context*

Part 1 of the interview involved a general discussion about an interviewee's specific farm context including; enterprise type, size, location, irrigation set up and needs, infrastructure.

### *Part 2 – Critical irrigation components importance*

Part 2 of the interview involved gathering information about the importance of the four critical components to irrigation management (service delivery, commandability, water delivery charges, negotiating arrangements with neighbours).

First, interviewees were asked to rate the importance to them of each component using a 5-point scale. A tape divided into five parts and labelled "not important" at one end and "very important" at the other end was placed in front of each interviewee. They were shown cards labelled with the four critical irrigation components and were provided with a definition of each component. Interviewees were then given the opportunity to question the interviewers to clarify the definitions of each of the components. Interviewees were then invited to consider how important each component was in terms of irrigation management and decision-making, and the achievement of farm business success and to place each of the components on the tape accordingly. They were free to place cards to any point along the tape.

Interviewees were then questioned about their reasoning for placement and importance ratings assigned for each component (Sandall 1999). This process allowed interviewees to make explicit their comparative judgements about the four critical irrigation components, to revise their positioning on the scale, and to be physically involved in the interview process (Sandall 1998). In addition, interviewees were given the opportunity to add components that they felt important to their irrigation management and decision-making that were not addressed by the four critical irrigation components. The final positioning of the irrigation components on the scale were then recorded by the interviewers.

### *Part 3 – Issue involvement*

This part of the interview involved questioning and measurement of involvement in the policy issue which we defined as increasing the amount of water available for all users. The issue involvement scale we used in the interview was adapted from Laurent and Kapferer (1985). The scale was

piloted before interviewing commenced to eliminate unnecessary statements and refine the wording of statements. The Laurent and Kapferer (1985) scale measures involvement intensity in relation to five sources; interest, importance and risk consequence, risk probability, hedonic value and sign value.

The scale consisted of 20 statements related to the five sources of involvement each of which corresponded to a 5-point Likert-type scale (labelled “strongly agree” at one end and “strongly disagree” at the other end of the scale). Interviewers also recorded any additional comments made by interviewees and questioned further to understand and clarify the rationale for interviewee responses. Laddering (Grunert and Grunert 1995) techniques were employed throughout the interview to understand more about interviewees’ source of involvement with respect to the issue and importance rating for each of the four irrigation components. Laddering provides a systematic way of questioning to explore the reasoning underlying the decisions and actions of the interviewee.

### **Data analysis**

The interviews were analysed using case-analysis (Patton 1990). Case-analysis occurred with the investigation of each participant interview or ‘case’ for accuracy, both in terms of required data and actual transcription.

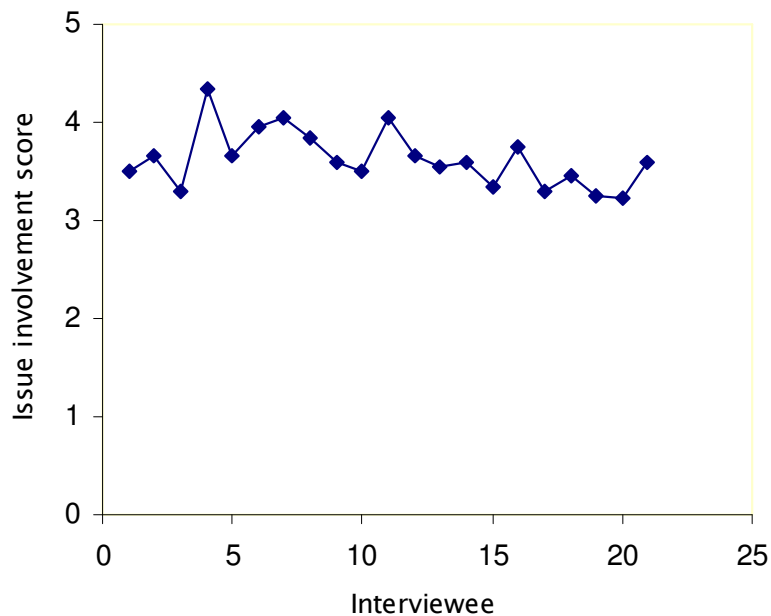
Interviewees were placed on the issue axis of the I<sub>3</sub> Response Framework based on the scale calculation of issue involvement, compared against qualitative response data. Interpretation and predictions were then made about possible placement of interviewees in particular quadrants based on interviewer’s assessment of the interviewees’ rating of importance of the four critical irrigation components and potential attitudes towards changes to these components. These assessments were validated by comparison of assessments among the interviewers. We then identified possible implementation strategy elements that could be applied to increase the likelihood of favourable attitudes and minimise the risk of unfavourable attitudes towards the NVIRP system modernisation for each quadrant.

In the next section of the report we present the research findings discussing interviewee involvement with the issue and the proposed intervention.

# Results

## Issue involvement

All interviewees were placed on the issue involvement axis of the I<sub>3</sub> Response Framework for the based on the average of their ratings for the issue involvement scale. The results showed that all interviewees rated the issue of increasing the amount of water available for all users as highly involving (see Figure 3). Consequently, we would place interviewees in either Quadrant 2 or Quadrant 3 of the Framework, depending on their level of involvement with the intervention.



**Figure 3. Issue involvement of interviewees**

In relation to the issue, interviewees described behaviours that are characteristic of high involvement, such as making a special effort to gather and evaluate information and paying careful attention to detail before reaching a decision (Celsi and Olson 1988). Most interviewees had attended information meetings and followed the issue in the media, and could discuss the various aspects of the issue in detail.

All interviewees held views on the issue and most expressed strongly-held attitudes with regard to the issue. Interviewees suggested that while they were not necessarily entirely in favour with sharing water they were not going to let urban users go without water.

The environment was not really seen as a user by some interviewees, who said they were not necessarily comfortable with a share of the water savings going to the environment as they felt it didn't necessarily need more water.

Several interviewees believed that modernisation could achieve water savings, although a few expressed concern about estimates of water savings. Other interviewees did not believe the modernisation project would produce the water savings. Several interviewees also spoke about the regional development opportunities the system upgrade would create.

### Importance rating of critical irrigation components

#### *Service delivery*

Most interviewees rated the service delivery very high in terms of importance for their irrigation management and decision-making (Figure 4). Some interviewees did not rate this component as they did not believe it was relevant for their context.

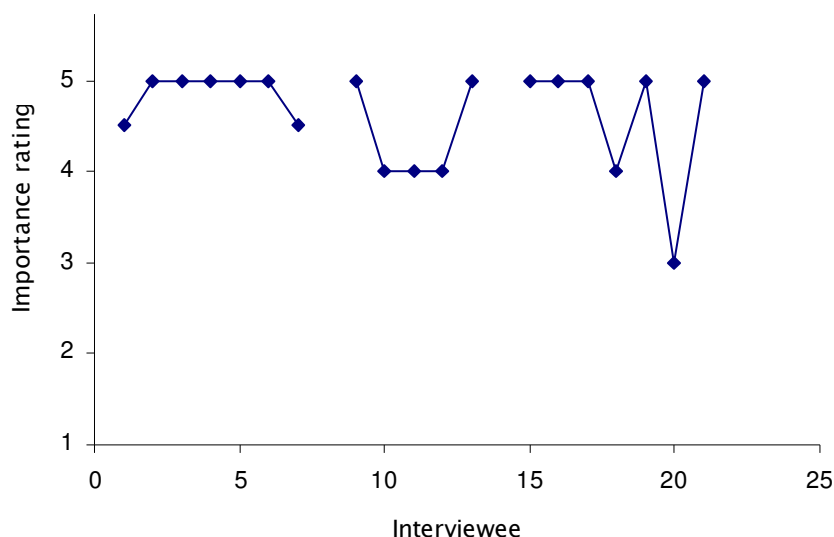


Figure 4. Interviewee rating of importance of the service delivery component



Interviewees identified the following as characteristics they were looking for in service delivery:

- Timeliness of water delivery
- Flexibility in starting and finishing times
- Control over farm gates
- Constant flows of water at the rates ordered
- Personal interface with G-MW planners and bailiffs to adjust orders and report problems

Interviewees described in detail their individual service delivery requirements. They talked about wanting to get a consistent flow rate over their entire irrigation period. Some interviewees also spoke about wanting flexibility in delivery. For example, they wanted to be able to contact G-MW staff to move the starting or finishing times of particular orders.

For some interviewees, who were horticulturalists, having access to irrigation water for frost control was very important. They described how they needed water to be available from the system at short notice to allow them to pump at high risk times. One horticulture interviewee described the importance of being able to make specific contractual arrangements with G-MW to pump irrigation water directly from the system on an ad hoc basis to enable successful management of irrigation needs. For this interviewee, control over the timing of irrigation was a critical issue due to the nature of the enterprise; the crop required lots of short watering within quick time demands and this water needed to be able to be started and shut off at short notice. Another interviewee spoke about difficulties they faced in managing irrigation while working off-farm that had been triggered by changes G-MW had made in relation to the timing of delivery.

Interviewees described different levels of satisfaction with their current service delivery. One interviewee on a large delivery channel described how outlets currently met their needs in providing required high flow rates. Some spoke about getting reliable and consistent flows from all the outlets to their properties, whilst others described variability in the current level of service delivery between different supply channels and outlets, which they attributed to the condition of channels, and/or the height of outlets. One interviewee also talked about continual supply problems, such as variability in flow rates, which was attributed to the numbers of users at particular times.

Several interviewees described how they had made changes to their farm systems to ensure they had a more reliable supply of irrigation water. These changes included the installation of pumps,

building new or utilising existing storages (such as reuse dams), and accessing groundwater, drainage diversions or the river for irrigation water.

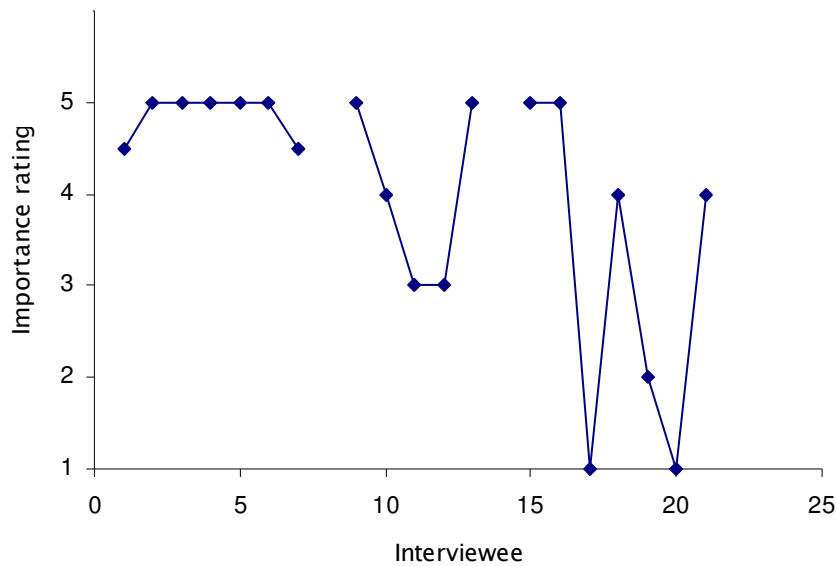
A range of opinions were expressed about the potential impacts of system modernisation on service delivery. One interviewee described experiencing an improvement in flow rates and consistency of flow since the installation of flume gates on one channel, and therefore anticipated that the further modernisation would be beneficial for the delivery of water to other outlets. Several interviewees, who described being located on larger delivery channels, had given some consideration to how they could take advantage of modernisation. They believed they could achieve faster flows across irrigation bays with some on-farm upgrades and as a result use water more efficiently. Other interviewees, who had supply problems, hoped that modernisation would improve service delivery, particularly in terms of constant flow rates.

Several interviewees believed elements of modernisation such as shorter ordering times could assist in controlling irrigation, such as when rainfall events occur. This potential benefit was generally raised where irrigation was the responsibility of others such as employees or business partners.

Some interviewees with supply problems were concerned that modernisation would result in less flexibility in ordering for needs such as frost control, or would result in less control over the delivery of water to outlets, such as not being able to manually shut off supply if there was a problem such as a blow out in a channel bank or irrigation bay. Interviewees located on the end of delivery systems believed that modernisation would lead to reduced outfalls which they felt would affect their supply and limit their irrigation options. Some interviewees indicated how they had already seen a change in recent years in the way the delivery system was managed by G-MW and combined with dry seasonal conditions, had experienced less outfalls to use for irrigation.

### ***Commandability***

The commandability component was rated as important or very important by most interviewees for their irrigation management and decision-making (Figure 5).



**Figure 5. Interviewee rating of importance of the commandability component**

Those who did not rate commandability high were generally those who pumped directly from their delivery channel, or had set up pumped irrigation systems on farm.

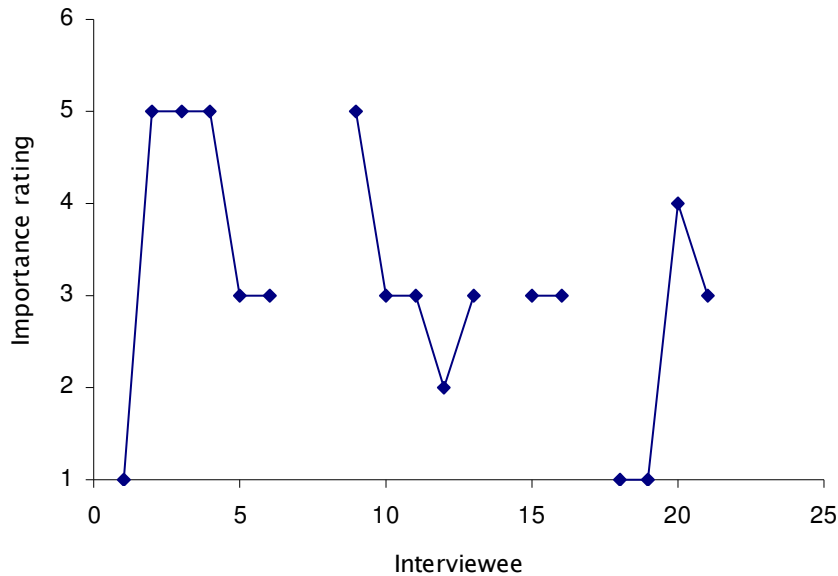
Some interviewees provided detailed descriptions of commandability issues. Most of those who rated this component as important described requirements for a large and consistent head of water to get their irrigation across required areas. One interviewee described command problems associated with the state of the delivery channel (leakages) and how the channel had to be run at a high level to have command over the farm. This, however, had resulted in water leaking out to other sections of the farm, leading to waterlogging.

Those interviewees with command problems had implemented options, where available, to adapt to or manage these problems. Options included installation of pumps, use of storages, laser grading and installation of other irrigation technology such as centre pivots. If interviewees had made other investments on irrigated areas in a season, such as in fertiliser or seed, they felt it was extremely important to be able to get irrigation water to the area they planned to capitalise on their investment.

Some interviewees who rated commandability as very important were particularly concerned about modernisation if channel supply heights were lowered as part of, or in association with, modernisation.

### ***Negotiating water delivery with other users***

The importance attached to negotiating water delivery with other users varied amongst interviewees but was generally rated as less important than service delivery or commandability (Figure 6).



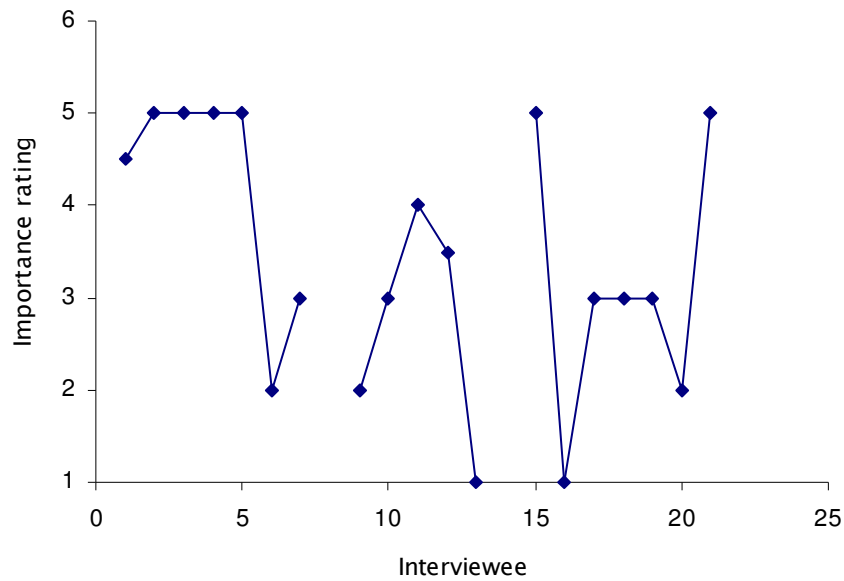
**Figure 6. Interviewee rating of importance of the negotiating water delivery component**

Most interviewees expressed the view that G-MW had responsibility to negotiate water delivery to all users on the delivery system and that they should continue to do so. Consequently, negotiating delivery had not been given consideration by many interviewees. Some interviewees drew on past experiences with community surface drainage schemes to make comment on this component.

Experiences in negotiating with other users in setting up the drainage scheme were both positive and negative, however most had seen some resolution. Some of the potential problems that were identified by interviewees were related to numbers of neighbours they might have to deal with in negotiating water delivery, and the time needed to negotiate requirements with other users.

### ***Water delivery charges***

Water delivery charges tended to be rated as less important by many interviewees in comparison to the service delivery and commandability components (Figure 7).



**Figure 7. Interviewee rating of importance of the water delivery charges component**

When discussing delivery charges, few interviewees actually described or made comment on the detail or breakdown of charges. Some interviewees described how delivery charges for water were not a high cost, particularly in comparison to other input costs such as fertiliser and fuel.

Some interviewees stated that delivery charges for water were acceptable, and that they expected charges to increase in the future. However, they also commented that if the increase was to be substantial then charges would become much more important for their decision-making. Some had given some thought to the increase in the level of technology in the system and expressed concern that they may have to bear the costs to maintain it in the future.

Some interviewees who did rate water delivery charges as highly important, talked about the costs associated with transferring allocations between properties or outlets, particularly with staged increases in allocation across recent seasons. These interviewees were generally those who had more than one type of allocation, or allocations on different properties. One interviewee had sold off most of the farm’s water allocation just after the cut off time for changes in water trading policy and felt unfairly burdened with the cost of maintaining infrastructure. This interviewee’s importance rating reflected this frustration.

### ***Additional critical irrigation components***

All interviewees were given the opportunity to add any component that they felt was important to their irrigation management decision-making but not covered in the four critical irrigation components. One interviewee, who was a horticulturalist, added a component; this was carry-over water. This interviewee preferred to use less allocation in one season in order to have water to carry-over for the next season. They considered carry-over to be very important as it provided them with advantage of having access to water early in the next irrigation season if the seasonal allocation was low.

For all the critical irrigation components the importance rating results indicate that the likely involvement in any potential intervention will vary among landholders based on differences in their farm context. For example, variability in individual enterprise needs, such as horticulture and frosts control, and context specific opportunities, such as those provided where landholders have a number of options for water delivery. In the next section we describe how landholders may be placed in the I<sub>3</sub> Response Framework and make inferences about their likely behavioural responses to modernisation.

## Potential placement in I<sub>3</sub> Response Framework quadrants

Because all interviewees were assessed as being highly involved in the issue we did not place them in Quadrants 1 or 4 of the I<sub>3</sub> Response Framework. Hence we now explore in more detail the potential placement of interviewees in Quadrants 2 and 3, based on our interpretation of the data. Involvement with a possible intervention was extrapolated based on the importance ratings of the four critical irrigation components.

### Quadrant 2 High issue involvement, low intervention involvement

Quadrant 2 of the I<sub>3</sub> Response Framework represents landholders who have high involvement with the issue but low involvement with the intervention. We placed interviewees in this quadrant who gave the critical irrigation components a low importance rating on the assumption that, this would translate into low intervention involvement should modernisation affect these components. The basis for this assumption is that, because these components are not rated as very important, then modernisation is not likely to require these interviewees to change their decision-making or behaviour in any substantive way.

In addition, some of the interviewees that rated the critical components as important could have a low level of intervention involvement. This might occur where modernisation will have little impact on these components such as where interviewees have already developed strategies and processes to deal with service delivery issues (such as accessing alternative irrigation water sources or working with G-MW staff to achieve adequate and consistent flow rates to address problems with commandability).

The importance rating for negotiating with neighbours was variable but was also generally lower than for service delivery and commandability. Most interviewees thought G-MW had the responsibility to negotiate water delivery to all users on their system and that they should continue to do so in the future. If system modernisation drives a change in importance of this component for decision-making and the achievement of farm objectives, this is also likely to strongly influence irrigator attitudes, and in a potentially unfavourable way.

### Quadrant 3 – High issue involvement, high intervention involvement

Quadrant 3 represents landholders who have high involvement with both the issue and the intervention. We placed interviewees in this quadrant who gave the critical irrigation components a

high importance rating on the assumption that, this would translate into high intervention involvement should modernisation affect these components. The basis for this assumption is that, because these components are rated as very important, then modernisation is likely to require these interviewees to change their decision-making or behaviour in a substantive way.

Many interviewees rated service delivery as very important. Modernisation of the delivery system may provide improved service on some parts of the delivery system. Where this is the case then involvement with the intervention is likely to be high and favourable among landholders who expect and receive an increased level of service and want to incorporate that service level into their business. This may be the case, for example, among those who want efficiencies from higher flow rates. We predict landholders in these circumstances will have a favourable attitude towards the intervention and will be willing to comply with the intervention, or to adopt voluntary elements of the intervention, and may be active advocates of the NVIRP.

An unfavourable attitude is evoked where landholders perceive that the intervention will impose costs that would be greater than the benefits they receive, or because the intervention imposes obligations and behaviours that do not align with their views, or both. We predict those landholders who have an unfavourable attitude towards the intervention will intentionally choose not to comply with the intervention, or will comply with the intervention reluctantly. It is likely they will not adopt voluntary elements of the intervention, and may actively protest against the NVIRP.

The importance rating given to level of service delivery including channel height, flow rates, delivery times and flexibility of ordering suggests landholders will be sensitive to both changes in infrastructure upgrades and quality of the service associated with the delivery of water. This indicates that irrigator attitudes to modernisation will not only be bound up with the infrastructure changes themselves but the process of service delivery. For example many interviewees spoke about the importance of control and the ability to communicate with G-MW staff to achieve a level of service delivery that worked for their farm business. Some interviewees were already considering there could be significant changes to the quality of service associated with modernisation, such as reduced control and interaction in planning decisions, suggesting in these instances the potential for an unfavourable attitude. There are a number of factors that influence likelihood of complaints about unsatisfactory service experience such as cost and social involvement and service criticality (Lovelock et al. 2004). These landholders may publicly voice their disapproval of the intervention and devalue its role in managing an issue or in this case, achieving the NVIRP objectives such as generating water savings.



Some interviewees rated the water charges component at the lower end of the importance scale. However, this may not translate into low involvement in regard to this aspect of modernisation if charges rise to a point where landholders consider charges to be a major input cost. It should also be noted that although some interviewees indicated that charges should be shared more evenly amongst landholders they did not indicate that they had considered a differential tariff based on level on service as a possibility. This suggests that while they are not necessarily highly involved in decision-making in relation to water delivery charges at present, the introduction of this kind of tariff may provoke high involvement and unexpected unfavourable responses.

We have used interviewees' importance rating of four critical irrigation components as an indicator of involvement with modernisation as an intervention. If these components are important, and they are affected by modernisation, this will influence irrigator's level of involvement with modernisation, their attitudes towards it and their willingness to comply with, or adopt, the various elements of modernisation. In the next section of the report we comment on options that may be considered to improve the chances of favourable responses from landholders.

## Implications for implementation

Through this research we have sought to understand landholder responses to the changes that may be brought about through the NVIRP modernisation. Understanding landholder attitudes provides some means of predicting their likely responses which, in turn, may assist decision-makers responsible for implementation of the NVIRP for system modernisation. It also assists the GBCMA in considering the implications of the NVIRP for the achievement of RCS objectives (Project objectives 3 and 4).

### Implementation options

It is difficult to generalise about how landholders will respond to the NVIRP system modernisation in regard to the critical components that we have used as a proxy for the intervention. The interview results indicate that the importance of, and so involvement in, the four components was variable and depends very much on the landholder's situation; their business needs, where they are located on the delivery system, and the physical contextual options and limitations of their farm. This indicates that a range of implementation options are required to match the variability.

In broad terms there are two options available to increase the likelihood of achieving the policy objectives set for modernisation; these are strategies that change behaviour by changing involvement or strategies that work with the existing level of involvement (Kaine et al. *forthcoming*). These strategies are summarised in Table 2.

**Table 2. Involvement and implementation strategies**

Issue/Intervention Involvement	Implementation strategy	
	<i>Change involvement</i>	<i>Work with involvement</i>
<b>Quadrant 2</b> HIGH/LOW	No	Promotion
<b>Quadrant 3</b> HIGH/HIGH favourable attitude	No	Self-regulation Promotion Monitoring
unfavourable attitude	Reframe issue	Enforcement Regulation Alternative interventions

***Quadrant 2 – High issue involvement, low intervention involvement***

In circumstances where landholders have high issue involvement but low intervention involvement the appropriate strategy to promote compliance would be to take advantage of the existing intensity of issue involvement. Promotion might take advantage of issue involvement to ensure awareness of, and links with, appropriate behaviours remains high. Promotion might also be used to reinforce the desirability of continuing to exhibit appropriate behaviours. In principle, an information strategy focusing only on promoting the behaviours required by the intervention without linking them to the issue may be ineffective for these landholders.

***Quadrant 3 – High issue involvement, high intervention involvement***

Here, interviewee’s involvement with the issue, and recognition that they may need to share water, suggests that an effective implementation strategy would be working with their existing motivation. Where the intervention provides a benefit to the business and favourable attitudes are held then the appropriate strategy would be working with landholders’ existing involvement and motivations. Preferred strategies are those that can encourage the desired action such as using promotion and voluntary change.

An implementation strategy attempting to work with landholders' existing involvement intensity with an unfavourable attitude could use an approach that incorporates landholders' preferred alternatives. In the case of modernisation this could include, for instance, increasing the variety of connections offered to landholders to dispel concerns associated with level and quality of service. In a similar vein, the strategy could include offering flexible options to interviewees to offset the cost of adapting to the modernised system, or phasing in or staging significant change (Gunningham et al. 1998). Carlough (2003) found that compliance can be an issue when there are unpredictable variations in the environment or unforeseeable technical problems arise. This suggests the provision of customised information to assist landholders with decision-making may improve compliance. Relatedly, providing landholders with adequate time to seek out information for decision-making in relation to modernisation may reduce the likelihood of unfavourable responses.

Strategies to change involvement could also be considered for interviewees in Quadrant 3 with an unfavourable attitude towards the intervention. This would mean using promotion activities to reframe the intervention in a way that evokes a more favourable response from landholders.

The way most interviewees described the possible implications for them of system modernisation suggested to us they assumed it was a matter of time before their delivery system would be upgraded. Few interviewees had considered that their part of the supply system might not be upgraded as part of the modernisation of the public system. This raises the possibility that landholders on any parts of the system that are not modernised may become highly involved in modernisation and form unfavourable attitudes about the implementation of modernisation. This could have implications for the timely achievement of policy objectives. A strategy to counter this possibility would be to change their attitude toward the intervention by offering flexible incentives to reduce the costs of connecting to the backbone.

### **Separating involvement in the issue from involvement in the intervention**

In the I<sub>3</sub> Response Framework involvement with the issue represents the level of personal relevance of the policy objective and motivation for the landholder, irrespective of the intervention (Laaksonen 1994). In other words, issue involvement concerns how landholders may be motivated to take action about an issue, even though the intervention may not affect them directly.

Involvement with the intervention represents the level of personal relevance and therefore source of motivation for the landholder created by the regulation, irrespective of the issue (Kim 2003;

Zaichkowsky 1985). In other words, intervention involvement concerns how landholders may be motivated to take action in response to a regulation even though the issue the intervention addresses is not directly relevant to them. It appears that the interviewees did not readily distinguish the policy issue of increasing water to all users from the policy intervention, namely modernisation, designed and implemented to address this issue. Although interviewees could discuss the policy issue, they did not necessarily distinguish the issue from the interventions being implemented by Government to meet issue objectives.

There was a consistent view among the interviewees that the modernisation of the delivery system was happening too quickly. There was also some concern expressed about who would be required to pay for further upgrades in future if the apparent haste with which modernisation decisions were being made resulted in the installation of “new” technology that might need ongoing costly maintenance.

Whilst many interviewees recognised that they may need to share water and therefore had high involvement in the issue, they may react unfavourably in response to the way the current intervention is being designed and implemented because of its perceived personal relevance to the achievement of their farming goals. At the time the research was undertaken the full implications of the intervention were largely unknown by landholders, however the findings suggest that attitudes will be mainly tied up in the intervention and may change as its impacts are realised. Once the intervention is in place and attitudes towards it are formed, they are likely to be strongly-held if it has a large impact upon farm components that are important to landholders. Therefore, any implementation strategy needs to be carefully considered in its design phase to ensure implementation results in favourable attitudes, as changing unfavourable attitudes may be a difficult task, as demonstrated with the CG2 experience.

## Conclusion

The main objective of our research was to use the I<sub>3</sub> Response Framework to better understand and anticipate the likely responses of landholders to modernisation of the irrigation delivery system, which is being implemented by NVIRP. We employed both quantitative and qualitative methods to assess the involvement of a sample of landholders in the issue of creating water savings for all users, and to infer their involvement and attitudes towards critical elements of modernisation. The sample comprised landholders from a range of enterprise types and sizes in two neighbouring pods.

The results suggest that landholders are highly involved in, and favourably disposed towards, the issue of saving water for all users. However, the results also suggest that the involvement and attitudes of landholders in regard to the implementation of modernisation will depend heavily on the individual circumstances of landholders. Consequently, while most interviewees recognised that they needed to share water, this did not necessarily mean they had favourable attitudes towards modernisation. Their attitude towards modernisation appeared to depend on how modernisation, when implemented, would affect the achievement of their farming goals. The results confirmed that the relative importance of the four critical components we considered depended very much on the landholder's business needs, their location on the supply system, and the biophysical configuration of their farm in regard to irrigation.

The results suggest the benefits and costs to landholders of modernisation changes will vary, and that modernisation cannot be assumed to necessarily create benefits sufficient to ensure all, or even a majority of landholders, will be motivated to comply with the compulsory aspects of modernisation or adopt the voluntary aspects of modernisation within required timeframes. This highlights the need for a flexible and customised implementation program.

These findings highlight the risks in relying on a single implementation strategy to accommodate the diverse circumstances of landholders. They also highlight the risks in consulting with only a small number of landholders in the design phase as they may not be able to adequately represent the diversity in the irrigation community.

In conclusion, the findings suggest that landholders' attitudes towards modernisation will be mainly influenced by its impacts on their farm businesses. The evidence is that these attitudes, once formed, will be strongly held because they will be based on the impact of modernisation on

components of the farm system that are critical to the performance of farm businesses. Therefore, the implementation of modernisation needs to be carefully considered to ensure implementation avoids as much as possible, generating unfavourable attitudes. This is because, as demonstrated with the CG2 experience, changing unfavourable attitudes can be an extremely difficult, time-consuming and expensive task.

## References

- Assael, H 1998, *Consumer behaviour and marketing action*, South Western College Publishing Ohio.
- Bearden, W, Netemeyer, R and Mobley, M 1999, *Handbook of marketing scales: Multi item measures for marketing and consumer behavior research*, 2nd edition, Sage Publication Newbury Park, CA.
- Burby, RJ and Paterson, RG 1993, 'Improving Compliance with State Environmental Regulations', *Journal of Policy Analysis and Management*, vol. 12 no. 4, pp. 753-772.
- Carlough, L 2003, 'General Deterrence of Environmental Violation: a Peek into the Mind of the Regulated Public'. Oregon Department of Environmental Quality
- Celsi, R, L and Olson, J, C 1988, 'The Role of Involvement in Attention and Comprehension Processes', *The Journal of Consumer Research*, vol. 15, no. 2, pp. 210-224.
- Chaffee, SH and Roser, C 1986, 'Involvement and the Consistency of Knowledge, Attitudes, and Behaviours', *Communication Research*, vol. 13, no. 3, pp. 373-399.
- Cowan, L, Murdoch, H, Linehan, C and Kaine, G 2005, 'Linking Farms, Catchments and Channel Automation. Module 6 - Structural implications and change behaviour', Final report to Victorian Water Trust - Water Smart Farms Initiative, Department of Primary Industries, Victoria.
- Cowan, L, Murdoch, H, Linehan, C and Kaine, G 2006, 'Is there a role for extension in regulatory change? A channel automation case study', In Australasia-Pacific Extension Network Conference, Beechworth, Victoria, 2006.
- Derbaix, C and Vanden Abeele, P 1985, 'Consumer inferences and consumer preferences. The status of cognition and consciousness in consumer behavior theory', *International Journal of Research in Marketing*, vol. 2, no. 3, pp. 157-174.
- Dholakia, UM 2001, 'A motivational process model of product involvement and consumer risk perception', *European Journal of Marketing*, vol. 35, no. 11/12, pp. 1340-1360.
- Dick, B 1999, *Rigour without numbers: the potential of dialectic processes as qualitative research tools*. 3rd edition, interchange, Queensland.
- Grunert, K and Grunert, S 1995, 'Measuring subjective meaning structures by the laddering method: Theoretical considerations and methodological problems', *International Journal of Research in Marketing*, vol. 12, pp. 209-225.
- Gunningham, N, Grabosky, P and Sinclair, D 1998, *Smart Regulation: Designing Environmental Policy*, Oxford University Press Inc, New York.
- Illies, J and Reiter-Palmon, R 2004, 'The Effects of Type and Level of Personal Involvement on Information Search and Problem Solving', *Journal of Applied Social Psychology*, vol. 34, no. 8, pp. 1709-1729.
- Janis, IL and Mann, L 1977, *Decision Making: A Psychological Analysis of Conflict, Choice, and Commitment*, The Free Press, New York.
- Johnson, B, T and Eagly, A, H 1989, 'Effects of Involvement on Persuasion: A Meta-Analysis', *Psychological Bulletin* vol. 106, no. 2, pp. 290-314.



- Kaine, G, Murdoch, H, Lourey, R and Bewsell, D 2008, 'A framework for understanding individual response to regulation', *forthcoming*.
- Kassarjian, H, H 1981, 'Low Involvement: A Second Look', in KB Monroe (ed.), *Advances in Consumer Research*, vol. 8, Association for Consumer Research, pp. 31-34.
- Kim, Y 2003, 'Conceptualizing health campaign strategies through the level of involvement', *Corporate Communications: An International Journal*, vol. 8, no. 4, pp. 255-267.
- Laaksonen, P 1994, *Consumer involvement: concepts and research*, Routledge, London and New York.
- Laurent, G and Kapferer, J-N 1985, 'Measuring Consumer Involvement Profiles', *Journal of Marketing Research*, vol. 22, no. February, pp. 41-53.
- Lovelock, C, Patterson, P and Walker, R 2004, *Services Marketing: An Asia-Pacific and Australian perspective 3rd edition.*, Pearson, NSW.
- Maris, E, Stallen P, Steensma, H and Vermunt, R 2006, (Un)Sound management. Three laboratory experiments on the effects of social nonacoustical determinants of noise annoyance. In *Inter-noise 2006 the International congress on Noise Control Engineering*, Honalulu, Hawaii. Acoustical Publications.
- Mittal, B 1995, 'A comparative analysis of four scales of consumer involvement', *Psychology and Marketing*, vol. 12, no. 7, pp. 663-682.
- Mittal, B and Lee, M-S 1989, 'A causal model of consumer involvement', *Journal of Economic Psychology*, vol. 10, pp. 363-389.
- Murdoch, H, Bewsell, D, Lourey, R and Kaine, G 2006, 'Understanding people's response to biosecurity regulation', In *Decision Making in Uncertain Times 3rd National Conference on Risk Management*, Auckland, 2006, The New Zealand Society for Risk Management Inc.
- O'Cass, A 2000, 'An assessment of consumers product, purchase decision, advertising and consumption involvement in fashion clothing', *Journal of Economic Psychology*, vol. 21, no. 5, pp. 545-576.
- Oliver, R, L 1997, 'Need Fulfilment in a Consumer Satisfaction Context', in R Oliver, L (ed.), *Satisfaction: A Behavioural perspective on the Consumer*, Irwin/McGraw-Hill, New York, pp. 135-161.
- Patton, MQ 1990, *Qualitative interviewing: a technique for qualitative data collection*, Sage Publications, USA.
- Petty, R, E and Cacioppo, J, T 1984, 'The Effects of Involvement on Responses to Argument Quantity and Quality: Central and Peripheral Routes to Persuasion', *Journal of Personality and Social Psychology*, vol. 46, no. 1, pp. 69-81.
- Poiesz, TB, C and de Bont, CJ, P, M 1995, 'Do we need involvement to understand consumer behavior?', in FR Kardes and MS Provo (eds), *Advances in Consumer Research*, vol. 22, Association for Consumer Research, pp. 448-452.
- Priluck, R and Till, B 2004, 'The role of contingency awareness, involvement and need for cognition in attitude formation', *Journal of the Academy of Marketing Science*, July 2004, vol. 32, pp. 329-344.

- Sandall, J 1998, 'Farmers' Perceptions of Occupational Health and Safety Hazards: An Application of Perceptual Mapping'. Faculty of Economics, Business and Law. University of New England, Armidale, pp. 155.
- Sandall, J, Cooksey, R, Reeve, I and Kaine, G 1999, 'Managing farm safety: the key in future risk management on farms', *The Journal of Occupational Health and Safety*, vol. 15, no. 5.
- Siegrist, M, Cvetkovich, G and Roth, C 2000, 'Salient value similarity, social trust and risk/benefit perception', *Risk Analysis*, vol 20, no. 3, pp353-362.
- Verbeke, W and Vackier, I 2004, 'Profile and effects of consumer involvement in fresh meat', *Meat Science*, vol. 67, no. 1, pp. 159-168.
- Zaichkowsky, JL 1985, 'Measuring the involvement construct', *Journal of Consumer Research*, vol. 12, no. 3, pp. 341-352.
- Zaichkowsky, JL 1986, 'Conceptualizing involvement', *Journal of Advertising*, vol. 15, no. 2, pp. 4-14.