

# Water markets and the environment – what the irrigation community tells us

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## Abstract

The perceptions and behaviors of irrigators in Australian water markets are explored. Irrigators are concerned with the community impact of permanent water markets, but they hold conflicting views. Irrigators want to protect their communities from the impact of relaxing the market, while at the same time they need this flexibility to better manage their farms and benefit from their combined resources throughout their life. Irrigators are very confident with the use and impacts of temporary markets. They are using markets in a multitude of ways to achieve different objectives: (i) aggressively developing their properties; (ii) fine-tuning their properties to maximize their profit; (iii) grasping an opportunity; (iv) struggling to remain in business; or (v) selling their water to remain in the community and retain their lifestyle. Some are risk adverse and buy water to have peace of mind and be able to plan their production for the season with certainty, while others are risk takers, willing to take a chance on early rain or changes to allocation levels. All of these motives and objectives are important ways in which markets can assist irrigators in dealing with the rapid pace of change within the irrigation industry and should therefore be encouraged.

## Keywords

water markets, water trading, environmental flow, community impact, Australia

## INTRODUCTION

Within most developed countries the water economy emerged from the expansionary phase and entered the mature phase during the 1970s and 1980s. This transition is said to take place when the marginal cost of new supply is high and the long run supply of water is inelastic, the total demand for water is high and growing, the competition for water among users is intense, and externality problems are pressing (Randal, 1981). The onset of the mature phase is therefore associated with a shift in paradigm away from meeting new demand with new supply, towards meeting new demand by reallocating existing scarce resources between competing users. Most developing countries have over the last three to four decades seen a population explosion and an urbanization of their societies. In some developing countries these processes are slowing down, in others they continue apace and in some they are increasing. At the same time the new urban dwellers are increasingly demanding safe water for drinking and sanitation purposes, and also the national demand for food is increasing - in total demand for water is increasing sharply.

There are two issues that will impact on the future availability of water for consumptive use: (i) the global warming process will result in reduced precipitation and increased evaporation and therefore less water in the rivers (Ayers, 2003); and (ii) there is an increased awareness of the environmental implication of existing levels of water use and of the construction of new water supply infrastructure. There is therefore a drive to reduce the existing level of water extraction for consumptive use and a reluctance to invest in new supply infrastructure. Since irrigated agriculture account for 80% of global water consumption (Rosegrant et al., 2002) increased urban demand can only be met by a transfer of water from rural areas. Such transfers can potentially have a detrimental impact on the affected communities since water is the key natural resource underpinning production and thereby economic activity. If water is moved out then economic activity goes down, with the loss of businesses, jobs and services. Within many irrigation regions water is used inefficiently on low value commodities, so there is an opportunity to soften the impact of reduced water availability

if use efficiency is improved and water is used on more intensive and high value crops, which would increase economic activity per unit of water. To allow these processes to take place it is imperative that instruments are available which enable water to move to urban centers and to more efficient and higher valued users within rural regions, while at the same time provide payment to the farmers who are giving up their water to assist them establishing an alternative existence.

Water markets have increasingly been relied on as the instrument of choice to allow these processes to take place. However for a number of reasons water markets have not been very widely adopted (see Bjornlund and McKay, 2002). It is therefore important to learn from water market experiences from countries where markets have been introduced and in operation for some time. Australia is one of the countries where water markets have been most aggressively promoted as part of an ongoing water reform agenda (CoAG, 1994, 2003; MDBMC, 2002; SOGW, 2004).

This paper explores how Australian irrigators perceive the operation of water markets and their impacts within their communities as well as the issue of increased environmental allocations. The discussions are based on 32 focus groups with irrigators in three Australian States in 2003. The first section briefly discusses the Australian policy context, while the second section outlines the data sources and methodologies used. The third section discusses the findings of the research.

## **THE AUSTRALIAN POLICY CONTEXT**

The Australian water industry has undergone a significant reform process since the mid 1990s. The Council of Australian Governments (CoAG) has driven this process on the national level, while the Murray–Darling Basin Commission (MDBC) has been the driving force within the Murray–Darling Basin (MDB), which accounts for some 71% of all irrigation in Australia. State governments have then been amending their legislation in compliance with these national and basin wide agreements.

In its 1994 Water Reform Agenda CoAG puts water markets on the national agenda as the main instrument to facilitate a reallocation of scarce water resources away from inefficient low value users to more efficient and higher value users and away from degraded land and land in locations where irrigation has a negative impact on river water quality. The objectives of this were to increase economic output from a limited resource and reduce negative environmental impacts of water use. The reform agenda also clearly stated that the environment is a legitimate water user and that specific entitlements should be given to the environment. In 1996 the MDBC introduced a Cap on water use within the Basin set at the 1993/94 level of development (MDBMC, 1996). This was done in response to an Audit indicating that water use within the basin was at unsustainable levels and was continuing to increase; if nothing were done the environmental and economic consequences would be unacceptable. At that time irrigators held large volumes of unused and underutilized entitlements, and it was the policy decision by all State governments not to cancel or reduce such entitlements. As water markets have activated these entitlements, while total use has been capped, seasonal allocations have continued to decline for all irrigators. As part of the Cap and the CoAG reform processes all catchments within the Basin are in the process of developing water management plans, defining environmental needs and sharing what is left for consumptive use between competing users. This process will further reduce the access of irrigators to water in most catchments and groundwater aquifers.

In 2002 it was acknowledged that the present Cap is insufficient to secure sustainable rivers; the MDBC has therefore initiated the ‘Living Murray’ process to explore the options of reducing extraction by 350, 750 or 1500 GL (MDBMC, 2002). Water markets are seen as the main instrument to allow this process to take place by facilitating a transfer of water out of some properties and into others on a voluntary basis. In 2003 CoAG issued a Communiqué announcing a

new National Water Initiative (NWI) to further accelerate the water reform process (CoAG, 2003). It acknowledges that good progress has been made but points out that three issues need to be addressed. Two of these issues are hampering investments in high value and efficient production systems: (i) uncertainty over the long-term access to water; and (ii) current water market arrangements are preventing markets from reaching their full potential. The third issue is associated with a significant concern over the pace of securing adequate environmental flows and introducing adaptive management systems to ensure the health of riverine systems. A first discussion paper towards a NWI was released in 2004 (SOGW, 2004) setting out six main issues to be further investigated. Among these were how to implement nationally compatible water access entitlements and nationally functioning water markets. From this discussion it is clear that water markets play a key role in achieving policy objectives. It is also clear that these policy developments have placed irrigators under significant adjustment pressure to cope with reduced access to water and increased uncertainty related to the level of future supply.

## **DATA AND METHODOLOGY**

During the period from March to early June 2003 thirty-two focus groups were held within three states in Southeastern Australia as follows:

- 11 along the River Murray in New South Wales;
- 12 within the Goulburn–Murray Irrigation District in Victoria; and,
- 9 along the River Murray in South Australia.

Irrigators were selected based on an analysis of licence and trading registers of the relevant authorities to ensure that they represented different levels of experience with water markets and a reasonable distribution of large and small farmers and were recruited by the relevant water authorities. The focus groups lasted two to three hours and were conducted by a facilitator with extensive experience with natural resource issues. The discussions followed a set format and tested in a pilot focus group. Before starting the focus group discussions all participants filled in a brief questionnaire giving some personal and property characteristics. Each questionnaire was given a number, which the respective participant also carried as a nametag. During the discussions notes were taken either on butcher's paper on the wall or via a data projector and were visible to the participants. Each statement was assigned the number of the person giving the statement. The notes as well as the questionnaires were entered into the software program NUDIST. This allowed statements to be correlated with farmer and property characteristics and enabled analysis of how perceptions and market behavior varied depending on such characteristics.

The focus groups were not just conducted during a period with significant policy uncertainty with respect to the future level of supply, they also happened to occur during the sixth year of continued drought. During the irrigation season of 2002/03 the seasonal allocation in NSW was 8% (long-term average 70%), in Victoria 56% (long-term average 160%) and in South Australia irrigators were for the first time in history faced with water restrictions. These climatic conditions have exacerbated scarcity, adding to the stress caused by the uncertainty generated by the policy processes discussed above. This is likely to have had an impact on the discussions in the focus groups.

In the following section two different markets will be discussed, which are defined as follows:

1. the market in which the commodity traded is the long-term entitlement to access water in the form of seasonal allocations. In this paper this market is called the permanent market; and,
2. the market in which the commodity traded is the right to use a certain volume of seasonal water allocation within a specified period. In Australia this period is normally one irrigation season. Only in South Australia is it possible to lease water for more than one season. In this paper this market is called the temporary market.

## **FINDINGS**

The discussions about the permanent market showed that most irrigators can see the benefits from it but are very concerned about its potential negative impacts. The discussions about the perceived problems associated with permanent trading were therefore considerably longer than those about the potential advantages; this was particularly the case in NSW and Victoria and among irrigators dependent on a communal supply system. The discussions about temporary markets showed a much lower level of concern and a much clearer understanding of the benefits from trading in this market, both for those buying and selling water. Analyses of the discussions suggest that the concerns of irrigators fall within five major themes as follows:

### **1 Community impact**

Irrigators were very concerned about the community impact of exporting large volumes of water out of any particular area. The concern was that the loss of water would result in a decrease in economic activity within the area and a loss of potential new developments. Such decrease in economic activity would result in a loss of population, jobs, businesses and services, and loss of opportunities for the young generation. Furthermore, selling water of the land reduces land values and therefore erodes the rating base for local councils, resulting in higher rates or lower services. The second level of concern is with the impact on the irrigators not selling their water. If less water is left in the channels the delivery charges per ML will go up; eventually it might be unviable to service channels at all and remaining properties will then be left dry.

The issue of activation of sleeper water was also discussed at length in most focus groups and was seen as an equity issue. Those most concerned about this are the farmers, who are buying water in order to maintain their production and replace what they use to get in the form of seasonal allocations with purchases in the market. They believe that trade has caused, or partly caused, this drop in seasonal allocations and that, having invested in their farms and their communities, they now have to pay for water to those who have chosen not to invest in their farms and communities. A second equity issue raised by some was that the poorer farmers were going to lose out to the bigger farmers because they cannot afford to compete for water and therefore will have to do without; this will result in an even greater social divide in the community.

Environmental concerns were also raised in several focus groups. Such concerns were expressed when too much water was traded into a small area resulting in rising water tables, and when too much water was traded out leaving properties dry, which then causes problems with weeds and pests for neighboring farmers.

### **2 The separation of land and water right**

There was a strong and profound fear of the consequences of separating land and water rights. This fear was prevalent in all three states and basically in all focus groups. The fear was associated with water being bought by a few corporate entities or 'water barons' (this term was only used in NSW), who then can sit in New York or Hong Kong and manipulate the market by not using the water and not selling it and thereby controlling who will get the water, when they will get it, and at what price. It was therefore argued that land and water should stay together to prevent this development from taking place; as one irrigator put it, 'permanent or temporary trade should not be allowed if you do not own land on which to use the water. By allowing trade without land ownership the price of water will increase dramatically' and 'price will become based on its speculative value rather than its value in production'. There were also, however, irrigators who believed that the market was large enough to limit the potential influence of 'big players'. A related but separate issue is the concern about speculating in water both within and between seasons (in NSW this was called 'punting' in water). This was discussed as an issue in all states but was especially of concern in

NSW. It was proposed that policies and rules should be put in place to prevent this behavior, such as not allowing the same irrigator to both buy and sell water during the same season.

### **3 Uncertainties**

The discussions also clearly showed that some of the major problems associated with permanent trading were linked to the high level of uncertainty regarding seasonal allocations – as one irrigator said, ‘with water entitlements still being eroded by government why would you buy it?’. Also, the short ‘tenure’ of water entitlements is a problem; it was argued in NSW that ‘ten years is really not enough to warrant the investment’<sup>1</sup>. This issue was discussed as a major concern in nine out of eleven focus groups in NSW. Several said that they would buy more permanent water once they knew the long-term security of supply, but at the moment temporary buying was more certain, ‘you know what you are paying and you know that you are going to get it all’. Uncertainty was also expressed about the long-term viability of the channel systems delivering their water. If many irrigators sell their water right, the cost of delivery will increase and can they afford that? And in the end, will the water authority continue to deliver at all? If not, it will leave them with stranded and worthless assets; the question was therefore raised – ‘should we invest more or get out?’.

Conversely, uncertainty was also raised in many focus groups about the ability of existing supply systems to cope with the increased inflow of water due to trade. Irrigators dependent on temporary purchases expressed this concern; they are worried that irrigators buying permanent water into their channel system will cause channel capacity to be exhausted and consequently make it impossible for them to rely on temporary purchases in the future.

In Victoria the ‘sales’ pool was subject to extensive discussions<sup>2</sup>. Most irrigators are in favor of restricting or totally stopping trade in ‘sales’ water, while irrigators depending on selling water on the temporary market were in favor of scrapping the existing rule of only allowing sale of 30% of sales water. Strong views were expressed about the need for more secure ‘sales’ entitlements.

### **4 Distrust of government**

Distrust of government came through in almost every focus group in all three states. Many irrigators felt powerless with all things to do with water; they found that there was no real community consultation since none of the comments made by irrigators were taken into account; instead they found that the government kept moving the goalposts. The irrigators believe that ‘farmers have a very weak voice in policy making’, that ‘environmental issues are driven by the green movement, which grows stronger every year’, and that ‘the objective of most environmental policy making is to win city votes at the expense of country votes’. The distrust of and antagonisms towards the government was of a totally different scale in South Australia than in the other two states. The mistrust of everything to do with the government in SA is strong, widespread and pervasive, and this distrust is emphasized by, but not caused by, the fact that the focus groups were conducted just after the State government had announced water restrictions for the first time in history.

Irrigators in NSW and Victoria generally express a high level of acceptance of environmental or stewardship responsibilities and recognize that they are under an obligation to use water efficiently

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<sup>1</sup> As a part of the new NSW Water Resources Act 2000 irrigators are given certainty of their entitlements for the length of the relevant water sharing plans, these plans are revised every ten years. If entitlements are reduced during the ten years period irrigators will receive compensation. At the renewal of each plan entitlements can be reduced without compensation if more water is needed for environmental purposes.

<sup>2</sup> In Victoria irrigators have a water right with a security of supply of 96%; in addition they get access to ‘sales’ water on a seasonal basis depending on water availability in excess of what is required to supply water right for this and the following seasons. This is how mean seasonal allocations are estimated at 160% of water right.

and responsibly to minimize environmental impacts and maximize economic benefits. This understanding is limited to what they do on their own property with their own water and they argue that a lot of improvements have been made and paid for by irrigators in this respect. When it comes to giving part of their water to support the environment, the acknowledgement of responsibility is subject to the wider community accepting their share of the burden of environmental improvements. Irrigators feel that they are being vilified and singled out as the ones causing the problems and they resent being forced to pay the cost. It is not perceived to be fair and equitable.

In South Australia there was a much lower level of understanding of irrigators' environmental responsibilities for at least four reasons; irrigators believe that

- (i) they are already paying the cost of remedying environmental problems through levies;
- (ii) they have done a lot of work to improve the on-farm efficiency of water use and thereby have improved the environment;
- (iii) the government has the water saved from refurbishing the Loxton irrigation area, they could give that water to the environment, instead of selling it to Barossa and Clare Valleys (two winegrowing regions outside the Basin being supplied by pipeline); why should irrigators give water away for the environment, when the government is making a profit out of selling water already available for the environment?; and,
- (iv) many irrigators are not using their water and have traditionally left it in the river for the environment; irrigators are now uncertain about whether this actually takes place or whether the government is selling this water to the vineyards in Clare and Barossa.

Many irrigators are still afraid of selling water because they believe the government will take this as a sign that they do not need it and therefore will remove their entitlements. Others argue against keeping more water in the dams to increase security for future years because it again would indicate to the government that they do not need the water, with the result that entitlements would be reduced. Some even argued that governments have set up the whole water market so that they can take irrigators' entitlements away and sell it back to them on the temporary market. Finally, concern was expressed that the high prices that dairy farmers and horticulturalists have paid during the last couple of seasons in order to remain in business would send the signal to the government that farmers can afford to pay those kinds of prices every year.

### **5 More open, flexible and sophisticated market mechanisms consistent across jurisdictions**

Many irrigators wanted more open markets, consistent across states and operating during the same periods and under the same rules. It was also argued that the differences in entitlements in different jurisdictions and catchments made it difficult to determine what prices to pay and to be able to compare prices.

The different attitude to risk came through in most focus groups; some bought water on the permanent market to get peace of mind, while others sold water on the permanent market to raise cash to finance farm improvements or pay of debt and then rely more on seasonal purchases. Some had previously used the temporary market but now felt that they often had problems securing adequate supply and therefore had bought permanent water. Others argue that they buy temporary water early in the season so that they can have peace of mind during the season; while others again are willing to gamble on increased allocations, summer rains or an early break in the weather. Some also said that permanent water gave them increased security for their regular cropping program, which then allowed them to take bigger risks with water that they purchased on the temporary market. In short, many irrigators who have become accustomed to using the market, and seeing its possibilities, want even more flexibility and more ways in which they can use the market to manage their risk.

### **Variation in opinions and concerns as a result of personal and property characteristics**

What is coming through quite clearly is that opinions and concerns vary significantly. For most arguments for and against trading, separation of land and water rights and environmental flows, counter arguments are readily forthcoming. This variation is caused by the fact that each farm has its unique position in the structural adjustment process and uses markets to manage that particular position; so their opinions, views and behavior are dictated by that position; such as,

- (i) irrigators with expanding farm businesses. They are using markets to build up their businesses and see the cost of buying water as just another operating cost in maximizing their profit as well as their capital gain to be realized when the business is sold. This group therefore favor markets and wants them free and open; many of these farmers do not see their farm as a family business but simply as a business enterprise and as an investment and are less concerned about community issues;
- (ii) irrigators mainly buying water because seasonal access to water has been reduced as a result of the drought, water trading activating unused water, as well as increased environmental flows. These irrigators buy water to maintain production and to stay in business; they therefore see the cost of buying water as an additional expense that does not result in increased profit or asset building. These farm businesses are often family farms with aspirations of family continuity and a long-standing involvement with the community, they are therefore more concerned about community impacts and the issue of stranded assets and continued delivery of water. Hence, they are more reserved in their opinion about water markets and favor a more controlled market, but they also want a more effectively functioning and more sophisticated market to improve their risk management options; and,
- (iii) irrigators who have given up developing their farm. These irrigators are buying water to retain their farming lifestyle for themselves and not their children, or they are selling water as part of generating a household income so as to allow them to retain their lifestyle and stay within the community where they have been brought up. They are therefore concerned about water trading and its potential negative community impact, but they are against restricting trade because it will reduce the value of their water and land assets, the sale of which they are dependent on for income and eventually retirement.

A second important trend emerging is that the opinions, concerns and perceptions of irrigators vary quite significantly between the three states, reflecting the level of reliability of seasonal supply. In NSW, which has the lowest level of reliability of supply, the market is being used predominantly to stay in business and maintain production with very little expansion and new development taking place as a result of trade. In Victoria, which has a much more certain, less fluctuating and a higher level of seasonal supply, trading is also to a very large extent used to maintain existing production, but there is a more positive outlook and some water bought on the market is used to expand production or for new developments. In South Australia, where certainty of supply is the highest, trading was almost entirely used for expansion or new development. This confirms the finding of a recent report which concludes that 'investors in irrigation focus heavily on risk. In all regions uncertainty pervades the thinking of investors and shapes the amount and distribution of their investment' and it suggests that, as a consequence, irrigators tend to be 'minimizing capital invested where water reliability is less certain' (BTRE, 2003, p. xxviii).

### **CONCLUSIONS**

This paper has illustrated the multitude of ways in which irrigators are using water markets to achieve very different objectives. Some are aggressively developing their properties, some are fine-tuning their properties to maximize the profit from their investment in land and infrastructure or to grasp an opportunity, others are struggling to remain in business, while others again are selling their water to remain in the community and retain their lifestyle. Some are risk adverse and buying

permanent water to have peace of mind and to be able to plan their production for the season with certainty, while others are risk takers, willing to take a chance on early rain or changes to allocation levels. All of these motives and objectives represent important ways in which water markets can assist irrigators in dealing with the rapid pace of change within the irrigation industry, and it should therefore be encouraged.

There are conflicting views on the separation of land and water rights, the freeing up of water markets and the impact of ‘speculators’ in the market. Irrigators want to protect their communities and businesses from the impact of relaxing the market, while at the same time they understand that they need the flexibility that more open water markets provides in order to better manage their farms and benefit the most from their combined resources throughout their life. The challenge for policy makers is therefore to design instruments and institutions, which, while allowing the market to operate freely, balance both the need for the free market and the need to protect communities and individuals from the vagaries and negative impacts of the same free market. It has taken 150 years to generate the mess the irrigation industry is in, so we should be able to allow the adjustment processes to take place at a pace where individuals and communities affected feel that it can happen with dignity, without uprooting and displacing households at great social and human costs.

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