

AGRICULTURE FOR THE AUSTRALIAN ENVIRONMENT— LEARNING FROM EXISTING PRACTICE. REFLECTIONS ON DEVELOPING A WATER SHARING PLAN

Ngangaaana-gu Kairai billa's dya Kairai billa's durai ngangna ngindu!

Kathleen H Bowmer*

Independent Chair, Murrumbidgee River Management Committee, 25 Henschke Avenue, San Isidore, Wagga Wagga 2650

Summary

This paper gives a personal reflection on the development of a catchment-based water sharing plan and documents the constraints and achievements of a community-based whole-of-government Committee charged with the task. The aim, in sharing this experiment in community participation, is to improve the processes of public participation in the future, having learned from past mistakes and successes.

In April 2002 the New South Wales Minister for Land and Water Conservation, John Aquilina, placed the draft Water Sharing Plan for the Murrumbidgee River on public display. Once finalised and gazetted under the Water Management Act the Plan will be binding for ten years

The draft Plan contains a series of Ministerial comments to highlight recommendations from the Murrumbidgee River Management Committee that are inconsistent with government policy, as well as dissenting reports from eight members of the committee. Yet previously, in August 1999, the Committee had achieved a hard-won consensus on the contentious issue of allocation of water for the environment. What went wrong and why?

Some of the critical issues and events that contributed to dysfunction of committee processes include: lack of clarity of goals (including changing goalposts); poor definition of roles (including tension between community advice and ministerial decree, and confusion about the roles of other Committees and Boards); lack of resources; a poor knowledge base (especially on the state of river health, environmental benefit of water allocation, and socio-economic impact); and undue haste imposed by a political process.

On the positive side a range of non-flow options for improving river health has been developed and the committee, agencies and community have learned a great deal about their region, their river and about each other's agendas. Attitudes have changed and the link between on-farm behaviour and catchment scale impact is firmly on the agenda. It would be a shame to stop now and lose the investment that many dedicated people have made over the last five years.

The challenge is to demonstrate that local and regional solutions can work inside an overarching set of state and national policies and principles. Catchment-based decision-making will become more

* Please note that the views expressed here are personal and not necessarily endorsed by the Murrumbidgee River Management Committee

important with new challenges in landscape restoration and water redistribution, so needs to be strengthened by learning from previous experience.

Introduction

The Murrumbidgee catchment (Figure 1) is an interesting and important case study because the river is highly regulated with two major storages in its headwaters, and major irrigation enterprises downstream.

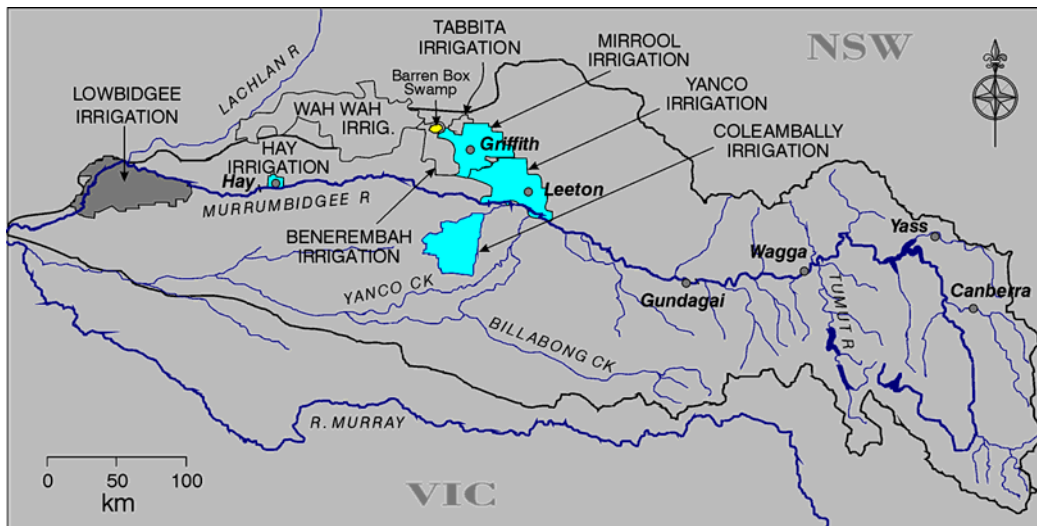


Figure 1: Murrumbidgee Catchment

The river provides water for wetlands and native fisheries of national and international importance. There is also a requirement to maintain flows to the River Murray downstream.

In future, reduction in water supply is anticipated through the expansion of Canberra and through reduction of catchment water yield as a result of plantation forestry and revegetation. Also, the need for more water downstream is likely to increase as the proposal to restore the health of the River Murray, is implemented (Murray Darling Basin Commission, 2002). Consequently the sharing of water is a passionate issue and the development of principles and agreement on a Water Sharing Plan is critical.

In New South Wales the development of catchment-based water sharing plans is a response to national and regional policies on water reform which are listed below:

WATER REFORM AND CATCHMENT BASED MANAGEMENT

Council of Australian Governments national framework and policy

In 1994 the Council of Australian Governments (COAG) developed a National Framework for Water Reform with the key objectives of pricing water to full cost recovery; separation of water access rights from land; specification of ownership, reliability of access and transferability of water; allocation of water to the environment; and processes of public consultation.

More recently a House of Representatives Committee began a detailed and wide-ranging inquiry into current and future water availability in rural Australia. *‘Rural industries and communities generate production of almost 30 billion dollars per year. Sales turnover and food processing is valued at 55 billion dollars a year. The entire sector employs more than 470,000 Australians,’* said MP Kay Elson, the House Agriculture, Fisheries and Forestry Committee Chair. *‘That production, those jobs, and those communities are all jeopardised if we do not get water management right’* (Commonwealth of Australia, 2002).

The Murray Darling Basin Cap

In 1995 the Murray Darling Basin Ministerial Council introduced a cap on the volume of water that could be diverted, based on the 1993/4 level of development. A key objective was to achieve and maintain ecologically healthy river systems and ensure sustainable consumptive use of water.

New South Wales Response

The New South Wales government established catchment-based committees to develop environmental flow rules. In September 1997 the Murrumbidgee River Management Committee (MRMC) was directed to consider flow rules for the regulated portion of the river and, along with other similar committees in the State, to prepare a management plan based on *River Flow Objectives* and *Water Quality Objectives*, which were established by prior public consultation (New South Wales Environment Protection Authority, 1997).

Later, legislation was enacted to set rules for water sharing between the environment and water users, and between water users with different types of licence (*The Water Management Act 2000*). In late 2000 the Murrumbidgee Regulated Management Committee was asked to prepare advice on recommendations for a draft Water Sharing Plan to be delivered by December 2001.

The various States’ responses to the issues of secure tenure, transferability and trading, and specification of water rights has been reviewed recently in a report to COAG from the Chief Executive Officers Group on Water (Natural Resource Management Ministerial Council, 2003).

Prime Minister’s National Action Plan

In 2000 the Murrumbidgee Catchment was listed in the twenty-one nominated priority catchments in the Prime Minister’s National Action Plan for Salinity and Water Quality (Figure 2). This plan provides 1.4 billion dollar in National and State investment by catchment-based communities with public involvement in priority setting and decision-making.

In the Murrumbidgee, a Board (MCMB) replaced the existing Total Catchment Management Committee, with greater focus on achieving targets on water quality, salinity, soil health, biodiversity and capacity building (New South Wales Department of Land and Water Conservation, 2001). The Board was required to present its draft report by 9 November 2001.

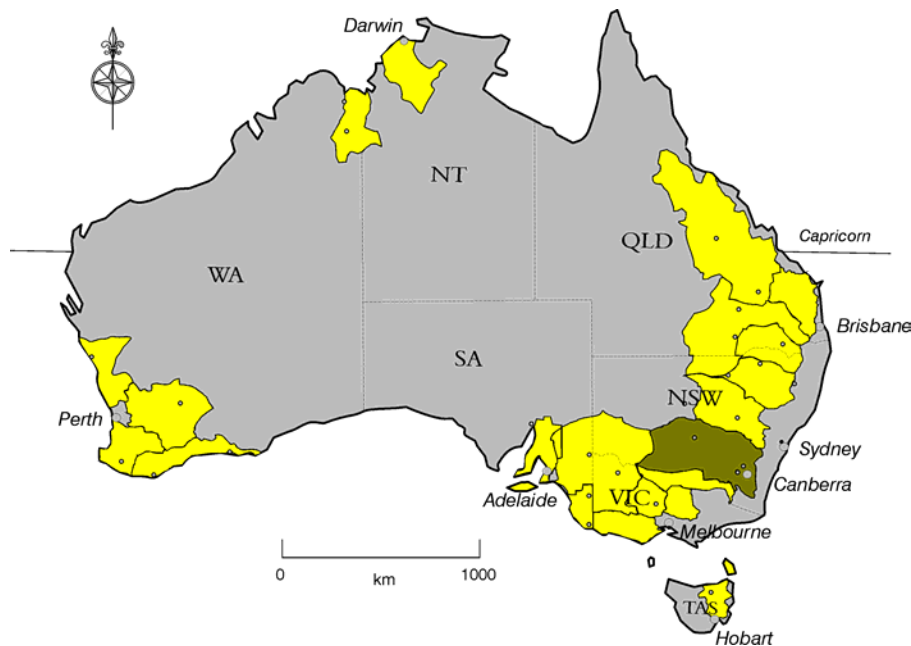


Figure 2: NAP Priority Catchments (Murrumbidgee is dark shaded)

Principles of public participation

In April 2002 the New South Wales Minister for Land and Water Conservation, John Aquilina, placed the draft Water Sharing Plan for the Murrumbidgee River on public display. Once finalised and gazetted under the Water Management Act 2000 the Plan will be binding for ten years. To quote the Minister *'the plan will provide a decade of security for all water users and secure provisions to the environment. For these reasons, we need to get it right'* (Murrumbidgee River Management Committee, undated).

The *"need to get it right"* is turning out to be critically dependent on resolving the tensions between community-based participation and top-down centralised governance. There is a large literature on adaptive management, integration of socio-economic and biophysical factors in decision-making, and continuous improvement in natural resource management (eg Cullen, 1999; Aitken, 2001; Bouilly, 2001) and on the need for institutional reform to decentralise authority to share power in planning and decision-making (Buchy *et al.*, 2001; Taylor *et al.*, 2002). Hajkowicz *et al.* (2000) reviewed the emergence of community-based natural resource management as a field of study, involving a shift in autonomy from government institutions to broader community empowerment. Here the definition of community is critical and is based on the notion that all its members will have a common interest in a decision. Perhaps, in the case study presented here, a better result could have been obtained by use of a larger range of decision-support frameworks. A stronger consensus at community level would certainly reduce the need for top-down intervention.

Also, the relationship between environmental benefit and water quality or flow patterns is poorly understood so there is a need for adaptive management that conflicts with the need for security of access for water users. Decision making on issues that are both uncertain and expensive is a great challenge to regional communities and successful case studies are few.

MURRUMBIDGEE CASE STUDY

Competition for water in the catchment

Water sharing in the Murrumbidgee Valley is particularly contentious because the river is the most regulated in the State with fourteen major dams, eight large weirs and more than 10,000 km of irrigation channels. The long-term diversion of water under the cap is 2289GL per year, or 37% of total NSW diversions. The two main storages, Burrinjuck Dam and Blowering Dam hold 2650GL (equivalent to 62% of the average annual flow at Wagga Wagga of 4300GL). About 3800 licences access 2754GL in entitlements. Agricultural production includes 25% of the State's fruit and vegetable production, 42% (\$80 million pa) of the State's grapes and 50% (\$200 million pa) of Australia's rice. The value of tourism is estimated at \$500 million per year. The catchment is home to 520 000 people and includes Canberra and Wagga Wagga, about 2 800 irrigated farms and many villages and communities (Murrumbidgee River Management Committee, undated).

The Lowbidgee Irrigation District includes a floodplain of more than 160 000 hectares with up to about 15 000 hectares of irrigated crops and wetlands of international significance (Kingsford and Thomas, 2000). In a recent submission the Nature Conservation Council have urged the Minister for Land and Water Conservation to ensure that the final plan meets the objectives of the Water Management Act, which specifically prioritises environmental needs. They point out that the Lowbidgee Area has lost up to 58% of its floodplain wetlands and more than 80% of its water birds (The Riverina Leader, 10 July 2002, p.11)

The health of the river was described by an expert independent panel as '*though variable, generally poor*' (Agribusiness Task Force, 2000). The Murray-Darling Basin Commission Sustainable Rivers Audit Group reported that biota (macroinvertebrates) were significantly, severely or extremely impaired in 46% of the reaches (Murray Darling Basin Commission, 2001). The National Land and Water Resources Audit (Land and Water Australia, 2002a) reports an index for aquatic macroinvertebrate biota of 0.74 indicating significant impairment relative to a reference site, and an environmental index of 0.46 (for New South Wales reaches of the Murrumbidgee) representing, as might be expected, substantial modification compared with conditions prior to European settlement. The environment index combines effects of catchment-scale features and local features including habitat, hydrology, nutrients and suspended sediment load.

Under the Fisheries Management Act 1994 a Fisheries Scientific Committee recommended in December 2001 that the aquatic ecological community in the Lower Murray River Catchment be declared endangered. As a consequence all native species in the Murrumbidgee River tributaries and anabranches are considered endangered species (New South Wales Fisheries, 2002).

Overall the estimates are that river health is poor. This reflects the impact of high summer flows between the storage and the irrigation off-takes and too little flow downstream, together with the effects of a range of other issues, which are unrelated to flow *per se*. These include low water temperatures as a result of release of cold water from deep storages, effects of weirs and barriers to fish passage, sand slugs, removal of snags, loss of riparian vegetation through grazing and invasion of feral species, especially carp.

The Living Murray-need for more water downstream

The Murray Darling Basin Commission (2002) have recently released a discussion paper on restoring the health of the River Murray with three reference points (350, 750 and 1500 GL per year) of environmental water over the next ten to fifteen years. The source of the water and whether it will be obtained by voluntary or compulsory re-allocation will be determined after community consultation. As well, \$150 million will be spent on modifying dams, weirs and locks and on other measures to make the best use of the water currently available to the environment. Under the heading *One Basin, One River System, One Environment* it is noted *'individual states and regions are making good progress in protecting their own rivers and catchments, but none of them look at the overall interactions between the tributaries and the resulting impact on the River Murray'*.

The Murray and Goulburn are listed as key contributors so the Murrumbidgee River Management Committee will need to carefully appraise the end-of-system flow targets currently imposed by State policy, and consider options for further enhancement of downstream flow should this be agreed during public consultation scheduled for later in 2003.

MURRUMBIDGEE RIVER MANAGEMENT COMMITTEE

Vision and guiding principles

The Murrumbidgee Regulated Management Committee (MRMC) represents five State agencies, nature conservation organisations, local government, Aboriginal interests, and the Murrumbidgee Customer Services Committee. Several of the MRMC members are also members of the Board.

The vision for water sharing is *'equitable sharing of limited water resources to sustain a healthy and productive river and the well-being of regional Murrumbidgee communities'*.

Guiding principles are:

- (1) That the diverse water uses and values supported by the river be acknowledged and provided for as far as possible.
- (2) That wherever possible rules for water sharing will be based on sound principles and quantifiable objectives.
- (3) That there should be an equitable sharing of costs and benefits accruing from water savings.
- (4) That the plan will identify and quantify, as far as possible with existing information, environmental flow regimes, water quantity and water quality requirements.
- (5) That, where water is allocated to meet environmental needs every effort will be made to maximise the resulting environmental outcomes

- (6) That impacts on water users resulting from water allocations made to environmental needs will be minimised as far as possible.
- (7) That existing water quality be maintained and where possible improved.
- (8) That the development and reinstatement where possible of aspects of natural flow regimes to protect the water source and its dependent ecosystems be provided.
- (9) That, where possible, riparian and instream vegetation and habitat should be protected and restored.
- (10) That the plan will recognise, and integrate into management programs where appropriate, aspects of Aboriginal and European history and culture.
- (11) That monitoring should provide for the assessment of planned management programs/activities where possible.
- (12) The development of low cost and non-flow solutions where appropriate and possible should be supported.

Role and purpose

Key events in the work of the Murrumbidgee River Management Committee are described in Table 1. In summary, three tasks were attempted:

- (1) Environmental Flow Rules -A consensus was achieved on environmental flow rules ('water for the environment') within six months of establishment in September 1997. Subsequently, following an unexpected combination of weather conditions (very low storage levels in spring combined with high tributary flow downstream of the storages) the initial flow rules were modified and a new consensus was reached in August 1999. Compared with baseline 'Cap' conditions, the environmental flow rules reduced long-term average annual diversions (modelled for the last 108 years) for general security irrigators by 4.2%, corresponding to 17.1% in the highest three impact years, 14.2% in the highest ten impact years, and 11.4% in the highest 25 impact years.
- (2) River Management Plan-Good progress was made in developing a River Management Plan. The draft Plan includes a reach-by-reach analysis of river condition based on local knowledge, the input of a scientific panel, and biological monitoring by the New South Wales Department of Land and Water Conservation. It also includes a score of issues papers from a range of state agency, academic and CSIRO authors.
- (3) Water Sharing Plan-In April 2001 the MRMC was diverted from developing a River Management Plan to work, as a priority, on a draft Water Sharing Plan.

By 1 December 2001 the draft Plan was submitted to the Minister for Land and Water Conservation, John Aquilina, for review by an inter-agency panel. The panel determined that the flow rules were too complex; that the environmental water was not given absolute

priority (because in the draft plan the environmental share is contingent on resource availability and a portion of the 'environmental water' can be consumed); and that environmental benefit was not adequately demonstrated. The legal standing of the plan was therefore questioned.

The Committee agreed to take the advice of the review panel and, within three weeks, to re-write the plan to improve expression and clarity, but not to make any changes of substance or principle unless otherwise advised by expert legal opinion.

Unfortunately, during this period one of the Committee breached agreed protocol and went to the press. A barrage of letters of dissent followed and are published in the Plan under eight signatures. A sample of the range of views (extracts from the letters from three Customer Service Committee representatives and the Australian Conservation Foundation, respectively) are given below:

CSS: The original rules for water sharing between the environment and consumptive users were agreed to unanimously by the committee. Subsequent amendments were made to those rules by a majority decision in November 2001. Both decisions will cost the irrigation industry access to water and (conservatively) about \$25 million in lost production. If you take account of the multiplier effect then the community will lose a significantly greater amount. We find that some members now want to renege on their original agreement and make the irrigation industry contribute even more for environmental flows. The rules for the committee were well understood by all those who participated and we now find that some groups have sought to use their influence with the politicians outside of the agreed committee process. We have participated in this process in good faith and now find the rules of the game are changing and the ground is moving. People have participated on the basis that they will get a fair hearing and their opinion will be valued.

This grab for environmental water by some members is never ending and we do not believe that we can ever satisfy their dynamic demands. The invocation of the threatened species legislation is nothing more than a political stunt, it was done without any public consultation and no objective data to back the stream of subjective assertions that attempt to support the so called scientific committee's deliberations. There is an average of over 2 million megalitres of environmental water that flows down the river every year. To say that more environmental water is going to make a significant difference is simply nonsense. We have to manage the environmental water we have better and start to be more mindful of the 500,000 people who live and work here because of the industries and businesses built on the Murrumbidgee River.

ACF: The Environmental Flow Rules are severely inadequate given the general poor health of the highly regulated and over-extracted Murrumbidgee River (see for example, The Murrumbidgee: Assessing the 'health' of a working river: The report of the expert panel, December 2000). As one of the most heavily regulated and seriously flow-stressed rivers in the Murray-Darling Basin, the Murrumbidgee is in poor shape, particularly in relation to floodplain and wetland connectivity. And while the EFRs negotiated to date go some way towards addressing these concerns, recently revised model rules show that volumes of environmental

'entitlements' are lower than previously understood. Further flow enhancements are clearly required.

The Environmental Health Water Account is inadequate to provide the required frequency and duration of inundation of wetlands in the flow range 25,000 to 45,000 megalitres/day between Wagga Wagga and Hay that ecologists recommend.

The draft contains no flexibility provisions to allow an adaptive management approach... Provisions are required to increase environmental flows in River Murray within the next two years, and to implement flow-related aspects of recovery plans for aquatic species and communities.

End-of-system flows appear to fall below the targets set in the State Interim State Water Management Outcomes Plan

In addition to the published letters of dissent in the draft Water Sharing Plan prepared by the Murrumbidgee River Management Committee, the draft Plan was annotated prior to public display with a series of Ministerial comments to highlight recommendations that are not consistent with policy.

As might be expected, the media have revelled in the conflict and water users who feel threatened by the new Plans have fuelled the debate. It is claimed that New South Wales Water Management Plans will cost regional communities more than \$1.7 billion and 4500 jobs across the State including nearly 1000 jobs in the Murrumbidgee (Wahlquest, 2002; Sheppard, 2002). Minister Aquilina rebuts the claims on the basis that the impact of the Water Sharing Plans should be based on comparison with 1998 flow rules rather than the Cap.

Constraints

Some of the critical issues and events that have contributed to the difficulties in developing a Draft Water Sharing Plan are:

Context issues

- (1) Some farmers regard the Cap as an erosion of their rights and see the impost of Environmental Flow Rules and the Water Sharing Plan as further encroachment on their rights to water. Further calls for water for the environment, whether with or without compensation provision, are seen as threats to their investment and livelihood, so it is not surprising that they will resist with passion and use every political avenue at their disposal.
- (2) The Murrumbidgee is highly regulated so competition for water will be fierce, especially during the series of dry years currently being experienced.

Table 1	Committee Role		Agency/Government Role
September 1997	MRMC established. Within six months accept the flow rules or improve them Consensus achieved on a revised set of rules	←	NSW Environment Protection Agency River Flow Objectives provided to MRMC together with flow rules. Water Quality Objectives provided as options for consideration in a River Management Plan.
March 1998	Consensus broken in Year 2 through low early season storage combined with high tributary flow. Majority decision presented.		Minister insists on consensus.
August 1999	New consensus achieved.	↔	Ministers direct that rules will operate for four years
1997 – Mid 2001	Development of a River Management Plan (incomplete)		
April 2001 ↔	MRMC hold industry workshop on water sharing and begins development of a draft Water Sharing Plan		Draft Water Sharing Plan required by December 2001. Water for the environment to have priority over other uses. Majority decisions permissible and need for quorum removed
Late November 2001	MRMC agrees by strong majority to maintain previously agreed flow rules with a marginal increase in environmental water designed to enhance river-wetland connectivity. Interim State Water Management Outcomes Plan arrives with MRMC, too late for proper consideration		Development of State Water Management Outcomes Plan.
1 December 2001	Draft Plan submitted	→	
January 2002	Plan re-written but only to improve expression Legal advice from NSW Department of Land and Water Conservation is that the draft plan is sound		Inter-agency review panel recommends re-write of plan
May 2002			Plan re-drafted, annotated with Ministerial comments, placed on public exhibition
July 2002	MRMC will receive 430 submissions and make recommendations to the Minister	→	Plan to be agreed by Mr Aquilina (Minister for Land and Water Conservation) and Mr Debus (Minister for Environment) before gazettal.

- (3) Changing cropping and water use patterns are exacerbating high peak demand in mid-summer. (In 2002 Coleambally Irrigation were unable to access water in storage in late summer and farmers were forced to drain their rice crops at an estimated loss of at least eight million dollars). The flow models used to determine the impact of Environmental Flow Rules on water users could not predict the effect of river channel limitations on supplying peak demand and water availability caused by storages being 'out of balance' - a situation that had never arisen before. Farmers were surprised and angry that they were unable to access water that they thought should be available, and blamed the spring - time release of environmental water for their demise.
- (4) Irrigators need security of access to water in order to manage bank loans and investment. They say that ten years of security is not enough.

Process issues

- (5) The Committee was confused by the changing goals and protocols for decision making during progress through its three main allotted tasks.
- (6) The change from community and regional planning to Ministerial decree became unclear, so the Committee felt used. Some committee members describe their situation as 'pawns' and 'meat in the sandwich'.
- (7) People in the community are also confused by poorly explained shifts in Government attitude and strategy. 'The approach is to turn irrigators against each other, to divide and conquer' (Letcher *et al.*, 2002).
- (8) There is insufficient interaction of the Catchment Board with the separate committees responsible for water sharing (regulated river, unregulated tributaries, groundwater and vegetation management), even though there is overlapping membership. For example:

The Board will control investment including National Action Plan and Natural Heritage Trust Funds in support of water quality targets, yet have not accessed the information in the draft River Management Plan (developed by the MRMC but remaining incomplete)

Separation of Committee responsibilities also inhibits the exploration of non-flow options for improved river health and consideration of linked water quality issues.

- (9) Undue haste, often caused by delays in the political process has resulted in the Committee being 'snowed'. The last minute appearance of key documents such as the audit of flow rules and the Interim State Water Management Outcomes Plan (SWMOP) are good examples. In fact, as the critical phase of assessing public comments is approached, the final SWMOP is still held up in Cabinet.

- (10) Resources have been totally inadequate. Even though State Departmental officers have supported the Committee to the best of their ability, many are exhausted with Committee work. Community members are paid only sitting fees, and not for travelling or preparation time, or for working group meetings. Consequently the time and energy available for effective business meetings and for setting up opportunities for public participation has been insufficient.
- (11) It was agreed that socio-economic impact studies would underpin the Environmental Flow Rules and the Water Sharing Plan but the advisory group set up by the state did not provide much support. In November 2001 Minister Amery announced that he would make available a grant of \$20,000 for a socio-economic study of the impact of water sharing. (Too little, too late!).
- (12) The interagency review process was perceived to be flawed with some individual agency representatives '*having several bites of the cherry*', once at the MRMC meetings, again at the inter-agency review and again at the MRMC meetings.

Knowledge issues

- (13) Local knowledge was poorly integrated into academic or agency policy. For example, when local anglers can frequently catch 'endangered' fish the veracity of official statements about river health becomes difficult to defend.
- (14) Committee Members have widely different cultural backgrounds and values and some are unfamiliar with hydrological modelling and modern technology, so carefully designed agency support and translation is critical. A useful package on meeting procedures was provided and agency staff are well versed in hydrology, hydrological modelling, agricultural economics, agronomy and some aspects of aquatic ecology. They are less knowledgeable in other critical areas such as geomorphology, property rights, environmental law, socio-economic impact assessment, formal and alternative methods for decision-making, and principles of interactive, procedural and distributive justice.
- (15) There was a dearth of local information on aquatic ecology such as the optimum frequency and duration of wetland and floodplain watering, the river height needed to achieve wetland inundation, or the rate and seasonality of river rise and fall for fish breeding. Some of this information has since been obtained. For example the relationship between river height and area and numbers of wetlands watered was investigated by using satellite imagery, allowing optimum management of river height for wetland/river connectivity (Hardwick *et al*, 2001). But much remains draft and unpublished in the River Management Plan. Other good work on biological indicators for performance has been conducted by Charles Sturt University (Watts *et al.*, 2001) and will emerge from the programs on *Integrated Monitoring of Environmental Flow* (New South Wales Department of Land and Water Conservation, undated b). However, the best available information on environmental flows required for a healthy river remains very coarse and simplistic. In a recent report from the CRC for

Freshwater Ecology, for example it is suggested that a ‘two thirds natural’ scenario could be considered, as an ‘interim flow guidance value’ for a healthy working river (Jones, 2002). This is not very helpful for a situation where important issues are too much water and seasonal reversal of flow, though it might be considered as a rule of thumb for downstream reaches. Water consumers will need much greater certainty of environmental benefit before they would be prepared to contemplate such major changes.

Methods for translation of research findings into credible knowledge at local level has been reviewed by Ewing *et al.* (2002)

- (16) There is a perception in the community that the benefits of environmental flows have not been demonstrated and there is a call for access to supporting research and documentation. It is said by some members of the community that ‘*reports are not available publicly because they don’t actually exist*’ (Letcher *et al.*, 2002).
- (17) Notwithstanding some excellent contributions it was difficult overall to access the expertise in a wealth of research agencies such as Universities, Cooperative Research Centres and CSIRO. There may be several reasons for this lack of connection. These include tension between state agencies and other research organisations, lack of staff resources especially in the lead agency (NSW Department of Land and Water Conservation) and insufficient time and energy for following up.

Committee Achievements

- (1) In spite of the constraints outlined above, the MRMC can claim some influence in shaping community interest in river health and in developing a range of creative solutions. For example:

The environmental flow rules are criticised as too complex but they have been carefully crafted to achieve a balance between the needs of the environment as far as they could be determined, and the needs of irrigators for early-season allocation and protection from extremes in year-to-year variation of water availability.

A range of non-flow options for improving river health has also been recommended for agency and other support even though they cannot be included in the Water Sharing Plan. Options include investigation of the feasibility and costs off-river storages to reduce the pressure of summer demand on peak river flows; prospects for storage management to reduce cold water releases; better use of environmental health water for wetland watering by piggy-backing pulse flows from storages onto unregulated tributary flows; removal of a flow constraint in the river (‘the Gundagai choke’) to improve the efficiency of wetland watering; manipulation of wetland watering regimes by river pumping to achieve timely benefits without high river flows; operational changes in storage management to reduce the risk of algal blooms; operational

management of the river to ‘shepherd’ peak flows far downstream; and a stewardship scheme for wetland management through the River Restoration Program of Land and Water Australia.

- (2) Attitudes in regional cities and towns, and in the general community are beginning to change. People, and school children in particular, are taking an interest in water quality and biodiversity. The commodity groups and irrigation corporations as well as groups like Landcare can claim some of the credit. The rice industry have developed an environmental policy to protect biodiversity and to manage water and soil with diligence (Rice Growers Association, 2001). An exchange of views between people from upstream and downstream has been achieved by tours and workshops so that people can understand more about each other’s needs.
- (3) Some of the rules on allocation of water, for example to the Lowbidgee, which were said to depend on the whim of the Regional Director of the NSW Department of Land and Water Conservation, have been made transparent.
- (4) The link between on-farm practice and catchment scale impact is firmly on the agenda and further supported by new programs in the Cooperative Research Centre for Sustainable Rice Production and new catchment-based courses at Charles Sturt University. Market-based instruments and commodity labelling that reflect environmental responsibility are being debated and developed (Williams, 2002) and water use efficiency continues to be enhanced through financial incentives for improved irrigation farm management through the implementation of Land and Water Management Plans and the action of irrigation corporations (eg McAffery, 2002).
- (5) Improved water use efficiency and spread of the peak summer demand for water is being explored by considering changes to river management (off river storages), changed irrigation cropping systems (Cooperative Research Centre for Sustainable Rice Production, 2002), and intervention to reduce leakage of supply and drainage channels (Anon, 2002).

LOOKING TO THE FUTURE

Reduction in available water

It is important that this Water Sharing Plan is gazetted soon because it will be ‘a line in the sand’, or a sound base, beyond which further negotiation can occur. Achieving agreement on water sharing in the catchment is important because the challenges ahead are substantial and the processes for re-distribution of water, both within and between catchments, are still evolving. Challenges include:

- (1) The impact and costs of water trading.

Issues of concern include potential reduction in profitability and demise of individuals, farm families and many small communities; change in demography

resulting in population reduction and loss of services in smaller rural centres; and corporations who are concerned about the potential effects of ‘stranded infrastructure’.

Industry leaders and community representatives are concerned that third-party impacts on industry, co-operatives and irrigation are underestimated in proposed frameworks for trading interests in water (eg Young et al., 2002a), in current thinking on property rights and responsibilities (Land & Water Australia, 2002b), and in assessing the economic and social costs of environmental flow increases for the Murray River (Young et al., 2002b).

(2) The effects of climate change on water security.

(3) Reduced runoff.

Expansion in plantation forestry, while providing economic benefits and environmental services, may reduce yield substantially (Vertessy *et al.*, 2002).

(4) Urban and industrial growth

Canberra, the National Capital, is located above the major storage in the upper reaches of the catchment.

(5) The growing demand for water for improved river health.

Savings from the Murrumbidgee will contribute to the increase in Snowy River flow to 21% of natural within ten years (Snowy Water Inquiry, 2001).

The needs of the Murray River downstream from the Murrumbidgee are still being considered, but are likely to be substantial as described earlier.

Need to demonstrate effective regional decision-making

The effective integration of levels of governance is a critical challenge in natural resource management generally. The development of the Murrumbidgee River Water Sharing Plan is an important case study in that has been one of the first opportunities to demonstrate that catchment-based communities can develop options for water sharing that are compatible with basin-wide, state-based, national and international policies.

The catchment basis for governance and investment was foreshadowed by several important discussion papers and highlighted more recently by the Prime Minister’s National Action Plan on Salinity and Water Quality that focuses on 21 priority catchments (Agriculture Fisheries and Forestry Australia, 1999). This move towards democratic participation at regional level is supported by wide opinion and a substantial literature (eg Dore and Woodhill, 1999; Gray and Lawrence, 2001; Bouilly, 2001).

As noted earlier, the process for developing the Water Sharing Plan has been hindered by lack of clarity about interaction between the community-based committee and overarching government. In particular there was poor synchrony between development of the State Water Management Outcomes Plan (SWMOP), confusion over the role and power of inter-agency review panels, uncertainty about the interaction of various catchment-based water and vegetation committees and the Murrumbidgee Catchment Board, and insufficient resources for adequate community participation in the process.

Overall the process generated scepticism in the community because the ground rules were not clearly defined and the State government imperatives enshrined in the SWMOP lagged behind the regional planning process. Consequently there was a general feeling among the Committee members and their constituent communities that the process was unfair.

Importance of fairness and justice in decision-making

Many of the problems of process listed previously under 'constraints' are features of unsatisfactory institutional arrangements, tensions between levels of governance, and an inexperienced and poorly resourced regional catchment community. However, as stated by the Director General of the New South Wales Department, Dr Bob Smith, at a recent meeting of Catchment chairs from the State, developing Water Sharing Plans on a catchment basis, and involving regional communities, are important and exciting initiatives in the Water Reform process.

It is attractive to imagine that the principle of democratic participation can be developed further in the future and that Australia could become a network of supporting regions, sharing ideas and solutions - a far different approach from the destructive competition currently evident.

This will require much more attention to setting up processes that are fair and just (Syme and Sadler, 1994; Syme and Nancarrow, 2002). Interactive justice is about a process of engagement and interaction that is pleasant, dignified and adequately informed. Procedural justice requires fairness and adequate representation so that all participants can be heard by decision-makers. Distributive justice will be achieved when there is satisfaction with the decision itself. Finally there is a very telling judgement on progress so far. *'Would people participate again on this or related issues with the process and agencies involved in the Water Sharing Plan?'*

Community participation, organisational learning and adaptive management in natural resource management are not new. However, the draft Water Sharing Plan developed in the Murrumbidgee, if successfully gazetted, will be one of the first plans to be developed through a community-led process. Many people and pressure groups would prefer a different approach and a greater influence on state or national programs.

My view is that local and regional solutions are better than those imposed by central authority, so it is important, far beyond the Murrumbidgee, that this opportunity to demonstrate responsible regional decision-making is made to work. Constraints in this critical area of fairness and justice include the difficulties imposed by the size and

complexity of the catchment and individual and industry agendas. Adequate participation requires more time and energy than was available, better and more credible scientific and socioeconomic analysis to underpin debate, and clear rules, process and timetable for interaction between levels of government. In the final critical stages the issue of state politics and a looming election are dominating the decision-making, with a frenzy of activity at Ministerial level from lobbyists and pressure groups. This is a recipe for dysfunction.

Changes required for progress are summarised by Harris (2002): *'We must shift the paradigm to get a more inclusive magic circle of science, governance, policy development, the community and the media. The importance of interactions between the various voices in society and the various ways of knowing has to be acknowledged... People value ethics and trust and they are critical factors in building relationships. We need stewardship that displays justice, equity and fairness to all'*.

Those messages are also reflected in the philosophy of respect enshrined in *Yindyamarra (to be kind, be polite, to honour and respect, to do carefully)* and in the wisdom of the Wiradjuri saying, an ancient point of reference for facing the challenges ahead:

Ngangaaana-gu Kairai billa's dya Kairai billa's durai ngangna ngindu
Look after the land and the rivers and the land and the rivers will look after you!

Postscript (written 31 January 2003)

20 August 2002

The MRMC considered 430 submissions on the Draft Water Sharing Plan. A substantial majority generally supported the Plan but rejected the Minister's annotated notes. A minority of submissions did not support the plan for various reasons. These included concerns about inadequate socio-economic assessment, lack of supporting scientific information, and insufficient water for the environment. Many submissions requested an explicit process for continuation of access to water beyond the ten-year life of the plan. The MRMC submitted an analysis of comments, and the Committee's recommendations, to Minister Aquilina.

20 December 2002

The State Water Management Outcomes Plan was gazetted (New South Wales Department of Land and Water Conservation, undated a).

27 December 2002

The Murrumbidgee Water Sharing Plan was gazetted (Aquilina, 2003) and, assuming no successful legal challenges, will be effective from 1 July 2003 for ten years. The main change from the draft plan is an increase in end-of-system (downstream at Balranald) flow to 40% of the predevelopment 95 percentile monthly flow, to be achieved by the end of the fifth year after the plan is gazetted. Information on the potential environmental benefits and impact on water available for consumptive use remains to be provided by the New South Wales Department of Land and Water Conservation, and

discussed at the February 2003 meeting of the Murrumbidgee River Management Committee.

January 2003

A coalition of green groups in NSW criticised the NSW Government for its environmental performance with river protection rated as the biggest failing (The Hot Issues, 2003) The State election in New South Wales is scheduled for March 2003.

References

Agribusiness Task Force (2000) The Murrumbidgee: Assessing the “Health” of a Working River. Agribusiness Task Force and NSW Government, December 2000, 71 pp + App.

Agriculture Fisheries and Forestry Australia/Environment Australia [undated] The National Action Plan for Salinity and Water Quality.
<http://www.affa.gov.au/actionsalinityandwater>

Agriculture Fisheries and Forestry Australia (1999). Managing Natural Resources in Rural Australia for a Sustainable Future. A Discussion Paper for Developing a National Policy, Canberra.

Aitken, L. (2001) Social and Community Dimensions of Natural Resources Management. A Position Paper prepared for partners in the Consortium for Integrated Resource Management, Queensland Department of Natural Resources and Mines, QNRM 01190, 52pp.

Anon (2002) ... Pratt's pipe dream, *Water*, Journal of the Australian Water Association 29 (4) June 2002, p. 12.
<http://www.awa.asn.au/poll/>

Aquilina, J. (2003). Minister for Land and Water Conservation. Water Sharing Plan for the Murrumbidgee Regulated River Water Source 2003. Order under the Water Management Act 2000, 84pp.

Bouly, L. (2001) How Community Expectations are Shaping Future River Management. Report of the Inland Rivers Workshop, 27-28 March 2001, Alice Springs, National Rivers Consortium, Land & Water Australia, R. Webster and Mike Williams and Associates Pty Ltd, pp 80-81.

Buchy, M., Ross, H. and Proctor, W. (2001) Enhancing the Information Base on Participatory Approaches in Australian Natural Resources Management. Research Report ANU21 of the Social and Institutional Research Program, Land & Water Australia, Fact Sheet, 4pp., July 2001.

Cooperative Research Centre for Sustainable Rice Production (2002), Annual Report 2000/2001, 141 pp.

<http://www.ricecrc.org>

Commonwealth of Australia (2002). Inquiry into Future Water Supplies for Australia's Rural Industries And Communities – House of Representatives Committee on Agriculture, Fisheries and Forestry.

<http://www.aph.gov.au/house/committee/primind/index.htm>

Cullen, P, (1999). Water, Politics And Power: Can We Integrate Natural Resource Management in Rural Australia? In "Preserving Rural Australia – Issues and Solutions". Eds A. Robertson and R. Watts. CSIRO Publishing, pp.24-32.

Dore, J. and Woodhill, J. (1999) Sustainable Regional Development Final Report, Greening Australia, Canberra (Cited in Gray and Lawrence)

Ewing, S. A., Braszell, J. S., Grayson, R. B. and Argent, R. M. (2002) Integration of R&D in Catchment Planning. Land & Water Australia Project UME 29, 29 pp.

Gray, I. and Lawrence, G. (2001) A Future for Regional Australia. Escaping Global Misfortune, Press Syndicate of the University of Cambridge, 247 pp.

Hajkovicz, S., Young, M., Wheeler, S., Hatton MacDonald, D. and Young, D. (2000). Supporting Decisions. Understanding Natural Resource Management Assessment Techniques. A Report to the Land and Water Resources Research & Development Corporation, CSIRO Land and Water, 143 pp.

Hardwick, L., Maguire, J, Foreman, M. and Frazier, P. (2001). Providing Water for Murrumbidgee Billabongs – Maximising Ecological Value, Riversymposium, Brisbane, 5 pp.

Harris, G (2002) – Ensuring Sustainability – Paradigm Shifts and Big Hairy Goals. Speech to Enviro 2002, Melbourne, 8 April 2002.

http://www.csiro.au/index.asp?type=blankrid=Enviro2002_Graham.Harris

Jones, G. (2002) Setting Environmental Flows to Sustain a Healthy Working River, *Watershed*, CRC for Freshwater Ecology, February 2002, pp 1-2.

Kingsford, R.T. and Thomas, R.F. (2000) Changing Water Regimes and Wetland Habitat on the Lower Murrumbidgee River in Arid Australia. Draft Report to Environment Australia and Land and Water R&D Corporation, December 2000, 94pp.

Land & Water Australia (2002a) National Land and Water Resources Audit, Australian Catchment, River and Estuary Assessment 2002, Vol 1: 279 pp. Vol 2: 386 pp, Land & Water Australia.

Land & Water Australia (2002b) Property Rights and Responsibilities. Current Australian Thinking. 147 pp.

Letcher, R.A., McKenzie, F. and Griffith, M. (2002) Socio-economic Indicators for Assessing Catchment Management Options in the Murrumbidgee Catchment. Project 3.1 Interaction of Water Balance, Climatic and Economic Models, CRC for Catchment Hydrology, Workshop Report, 12 June 2002, 16 pp.

Mcaffery, A. (2002) Water Works, Newsletter for MIA Envirowise. No. 4, March 2002, Land and Water Management Plan Incentives, Murrumbidgee Irrigation, Griffith and Leeton, 4pp.

Murray Darling Basin Commission (2001) Snapshot of the Murray Darling Basin River Condition. 48 pp.

Murray- Darling Basin Commission (2002), The Living Murray. A Discussion Paper on Restoring the Health of the River Murray. Stage 1: Informing and Engaging the Community, July 2002, 54 pp.
<http://www.thelivingmurray.mdbc.gov.au>

Murrumbidgee River Management Committee [Undated] Draft Water Sharing Plan for the Murrumbidgee Regulated River Water Source, Murrumbidgee River Management Committee Part A 54 pp, Part B 64pp + App.
<http://www.dlwc.nsw.gov.au>

Natural Resource Management Ministerial Council (2003). Chief Executive Officer's Group on Water. Public Consultation on Water Property Rights. Report to COAG from the Water CEO's Group, 14pp.
<http://www.affa.gov.au/waterconsult>

New South Wales Department of Land and Water Conservation (2001) Draft Murrumbidgee Catchment Blueprint, Murrumbidgee Catchment Management Board 65 pp.
<http://www.murrumbidgee.catchment.org.au>

New South Wales Department of Land and Water Conservation [undated a] Water Management Act 2000, Interim State Water Management Outcomes Plan, NSW Department of Land and Water Conservation, 36 pp. (Note minor changes in final version gazetted on 20 December 2002)
<http://www.dlwc.nsw.gov.au/care/water/sharing/pdf/swmop.pdf>:

New South Wales Department of Land and Water Conservation [undated b] Integrated Monitoring of Environmental Flows: An Overview, NSW Department of Land and Water Conservation, 8 pp.

New South Wales Environment Protection Authority (1997) Proposed Interim Environmental Objectives for NSW Waters, Inland Rivers, Ch. 7 Murrumbidgee River Catchment, Environment Protection Authority, EPA 97/8, pp 213-229.
<http://www.epa.nsw.gov.au>

New South Wales Fisheries (2002) Species Impact Statement on Fishing in the Lower Murray River Catchment, NSW Fisheries, Pamphlet, 7 pp., May 2002.
<http://www.fisheries.nsw.gov.au>

Rice Growers Association (2001). Rice Environmental Policy, 6pp+App.

Sheppard, M. (2002) Water Reform Could Leave 1000 Jobless, *The Daily Advertiser*, 2 July 2002.

Snowy Water Inquiry Outcomes Implementation Deed, 21 September 2001, 4pp.

Syme, G. J. and Sadler, B. S. (1994) Evaluation of public involvement in water resources planning: a researcher-practitioner dialogue. *Evaluation Review*, **18**, 523-542.

Syme, G.J and Nancarrow, B. E. (2002) Evaluation of public involvement programs: Measuring justice and process criteria. *Water*, Journal of the Australian Water Association, **29** (4), 18-24.

Taylor, N., Dale, A and Lane, M. (2001). Conclusions: Social Assessment, Natural Resource Institutions and the Future. In 'Social Assessment in Natural Resource Management Institutions', CSIRO Publishing, pp 283-296.

The Riverina Leader, Wagga Wagga, 10 July 2002, Protecting the 'Bidgee, p11.

The Hot Issues. A Report Card on the Carr Government's Environmental Performance in 2002, Total Environment Centre, Nature Conservation Council of NSW Inc., The Wilderness Society, Australian Conservation Foundation, National Parks Association of NSW, Colong Foundation for Wilderness, 2pp.
<http://www.envote.info>

Vertessy, R., Lu Zhang and Dawes, W. (2002). Plantations, river flows and river salinity. *Catchword*, Newsletter of the Cooperative Research Centre for Catchment Hydrology, **109**, September 2002, pp. 1-2.

Wahlquest, A. (2002) Water Plans to Drain Off Jobs, *The Australian*, 1 July 2002, p. 4.

Watts, R.J., Ryder, D.S., Chisholm, L.A. and Lowe, B.J. (2001). Assessment of Environmental Flows for the Murrumbidgee River: Developing Biological Indicators of River Flow Management. Final Report to New South Wales Department of Land and Water Conservation and the Project Technical Advisory Group, Johnstone Centre, Charles Sturt University: Wagga Wagga, 341 pp.

Williams, R. (2002) Greening the Economy (Robyn Williams with Stefan Hajkowitz), Broadcast 19 May 2002, Transcript accessed 14 July 2002
<http://www.abc.net.au/rn/science/ockham/stories/s558170.htm>

Young, M. D. and McColl, J.C. (2002a) Robust Separation. A Search for a Generic Framework to Simplify Registration and Trading of Interests in Natural Resources. CSIRO Land and Water Policy and Economic Research Unit, 48pp.

Young, M., Young, D., Hamilton, A. and Bright, M. (2002b) A Preliminary Assessment of the Economic and Social Implications of Environmental Flow Scenarios for the Murray River System, Murray Darling Basin Commission, July 2002, Ref Folio02/360 S/STR/98, CSIRO Land and Water Policy and Economic Research Unit and PIRSA Rural Solutions, 40pp.