Community impacts of the Guide to the proposed Murray-Darling Basin Plan

Volume 1: Executive Summary

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Community impacts of the proposed

Murray-Darling Basin Plan

Preface

This report is Volume 1 in a suite of documents that has been prepared by the EBC consortium on the potential community impacts of the proposals in the Guide to the proposed Murray-Darling Basin Plan.

The MDBA commissioned the consortium to assess the potential community impacts of the proposals in the Guide. The primary objective was to understand the impacts on local, small-scale, human issues and costs during the short and medium term. A key aim was to consult with communities to understand how they would be impacted by proposals in the Guide.

A round of interviews with key informants was conducted from January to April 2011, covering 48 social catchments, 80 local government areas and 119 towns and regional centres. The discussions involved nearly 700 people from across the full range of sectors and employment groups. Additional economic analysis was undertaken to supplement and inform the outcomes of the community interviews.

The outcome of the project is reported in nine volumes:

- Volume 1: An Executive Summary - provides an overview and condensed report on the core outcomes of the project;
- Volume 2: Methodology - sets out the framework and analytical methodology for the study;
- Volume 3: Community Impact - provides a comprehensive report on the breadth of the issues raised in the community impact assessment. This includes the identification of a number of significant issues which are material for the roll-out of the draft Basin Plan;
- Volume 4: Informing choices - takes the key issues from Volume 3 and provides further analysis and assessment of the issues to provide information to optimise decisions on the development and implementation of the draft plan at least cost to the community;
- Volume 5: Regional analysis: Southern Connected Basin Overview;
- Volume 6: Regional analysis Queensland - provides detailed reports on the key findings from the community engagement process at a regional scale. These regional analyses focus on the short to medium term impacts of the proposals in the Guide on industries and communities at the local level;
- Volume 7: Regional analysis New South Wales;
- Volume 8: Regional analysis Victoria; and
- Volume 9: Regional analysis South Australia.
1 Introduction and summary

1.1 A pathway to the Basin Plan

The last one hundred years have seen a structural shift towards more intensive irrigated agriculture across the Basin. This expansion of irrigation has come at an increasing cost to the environment, as a greater percentage of average surface water flows and ground water have been diverted.

Under the Water Act 2007 (Cth), the MDBA is responsible for preparing a Basin Plan which will rebalance the relative allocation of water between consumptive use and the environment with the objective:

...to promote the use and management of the Basin water resources in a way that optimises economic, social and environmental outcomes;¹

The process of developing the Basin Plan involves a journey with a number of stages and players. This study and report form part of that journey. The key stages in that journey have been:

- the Guide to the proposed Basin Plan was published in October 2010. This was the outcome of significant work over eighteen months. The intention was that the Guide would provide an overview to assist people to understand the basis of the proposed Basin Plan, and the rationale behind the proposals;²
- members of the Authority then undertook an extensive round of public meetings to explain the contents of the Guide and the draft proposals at locations across the Basin;
- the Guide and those meetings highlighted concern across the community as to the possible socio-economic impacts of the proposals at a local scale; and
- as a result, the Authority commissioned this study to assess the socio-economic impacts of the proposals in the Guide to the proposed Basin Plan at a community scale. That involved an extensive program of interviews with key informants³ across the Basin between January and April 2011, which documented the basis for the community concerns. The outcomes are reported further below.

Since the study was commissioned, the Authority has acknowledged greater complexity in respect of the decision making process and all arms of government have agreed to work together to achieve better outcomes. This commitment was confirmed in the Communiqué from the Murray-Darling Basin Ministerial Forum on 1 April.

¹ Section 3(c), the Water Act 2007.
³ ‘key informants’ are people who were selected by the Consortium as being well-placed to talk about their sector of their community. They were identified in consultation with regional stakeholders, including councils, Basin Community Committee members, and Regional Development Australia committees. They were not asked to act as representatives of their communities, but rather, to answer Lines of Enquiry as best they could given their knowledge of their communities.
Ministers agreed there was a need for a new broader approach that brings together all relevant programs and involves local communities.

In particular, Ministers agreed the need to better align Commonwealth and State programs and policies aimed at improving water use efficiency and infrastructure programs, recovery of water for the environment and environmental water use and infrastructure.  

The MDBA has also acknowledged community concerns about the potential impacts of the proposals in the Guide and of the limited community engagement process during 2010. In a speech to the Sustaining Rural Communities Conference in Narrabri on 6 April, the Chair of the Authority emphasised the importance of working more closely with local communities to further develop the Basin Plan, and to reviewing opportunities to better align water purchasing, infrastructure, and environmental water management programs.

The main thrust of the current planning process is to recognise that there is a suite of policy options that can be developed and implemented in a way that will help to optimise the outcomes – generating the desired environmental result but at a lower socio-economic cost to the Basin communities.

1.2 Objectives of this study

The Authority commissioned this study, in November 2010, to assess the likely social, human, cultural, financial and economic implications of the proposals in the Guide on local communities across the Basin’s 19 regions. The study team was to consult with local communities, including local governments, and consider the local, small-scale, human issues and costs during the short and medium term, including:

- direct effects on agricultural production and other industries in the Basin;
- indirect or flow-on effects on other industries and business activities in the Basin;
- human costs and benefits, including in relation to mental health;
- wider social and cultural implications;
- financial implications; and
- mitigation strategies, including the capacity of communities to adapt.

1.3 Community impact assessment

The community impact assessment was targeted at ‘social catchments’. This is a level of social grouping that reflects community identity and local economic interaction. The approach enabled the study to capture impacts that occurred at a small scale. Forty-eight social catchments were selected across the Basin, mostly centred on towns that are at the heart of regional communities.

A comprehensive consultation program was undertaken early in 2011, with nearly 700 key informants interviewed across the Basin. These semi-structured interviews assessed the potential impact of the *Guide* on farmers, businesses and communities within each social catchment. The assessment was structured to take account of the wider factors impacting on regional communities, to identify the additional impacts that the *Guide* would have, over and above an agreed baseline.

The relative impact of the *Guide* at a local level depended on the scale of the proposed change and the relative vulnerability of the relevant social catchment. That vulnerability depended on two attributes: ‘size’ (with a threshold at a figure around 10,000 people) and ‘dependency’, (with a threshold at around 15% of total employment in agricultural related sectors). Figure 1-1 plots a range of communities within the Basin against these two parameters, where the size of the marker in the figure shows the irrigation expenditure per head of population in the town.

![Figure 1-1. Risk factors for selected towns in the Basin.](image)

Figure 1-1 suggests that many of the communities assessed in this study are at risk from reduced water availability, as they are both small in scale and highly dependent on agriculture. In this figure, the percentage of employees strictly refers to all agriculture. However, in the relevant communities irrigated agriculture is predominant.

Clearly, the most vulnerable communities are those that combine all three features: small population, high dependency on agriculture and high irrigation spend per capita. However, even a larger town such as Shepparton may still be at risk, as it provides significant services to a wide range of irrigation dependent communities across northern Victoria and southern NSW.

Using these two criteria then allows the multiple social catchments across the Basin to be clustered within four major categories. This ‘vulnerability matrix’ provides a tool to help assess the risks related to the likely effect of the proposals in the *Guide*. However,

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5 Source: EBC consortium analysis of ABS and ABARES data
this is not a predictive tool, as the effects, in practice, will depend on a range of factors including the scale of the changes in water availability, the location of willing sellers, the potential for irrigation system modernisation, the age profile of farmers, farm profitability and the capacity of communities to adjust. Possible outcomes may also be mitigated and transitions smoothed.

![Vulnerability Matrix](image)

**Figure 1-2. Vulnerability Matrix.**

The characteristics of these four categories of social catchment are:

- **Category 1:** Small towns that are highly dependent on irrigated agriculture and are often geographically isolated, such as Warren and Collarenebri. These smaller communities are often subject to wider economic and demographic forces that are driving a decline in their size and vitality. Reductions in water availability could increase the speed and extent of these changes for those communities;

- **Category 2:** Small diverse towns such as Mudgee or Stanthorpe that combine high-value irrigation with tourism and other sectors. They are insulated to some extent from the impacts of reduced water availability;

- **Category 3:** Larger towns that are highly dependent on irrigated agriculture, such as Griffith, Moree, Robinvale and Loxton. These centres are robust with current diversion limits but would be highly exposed to proposed reductions in water availability; and

- **Category 4:** Large, diverse growing regional centres, such as Toowoomba or Dubbo that have a breadth of activity and employment. These are relatively insulated from reductions in water availability in the region.

### 1.4 Concerns and issues from the community assessment

The interviews with key informants documented concerns that:

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6 source: EBC consortium analysis
The proposals in the *Guide* would reduce irrigated production across the Basin and have a significant impact on irrigation-focused communities at a local scale in the short and medium term;

any resulting reduction in irrigation production would create third party impacts for farmers who remain, businesses that service farmers, processing companies, and community level businesses and services; and

resultant social impacts could include loss of population and change in population mix, change in community identity, increased demand for social services and psycho-social impacts.

The impacts would be more profound for the vulnerable communities – that is, those identified as relatively smaller communities with greater dependence on irrigated agriculture.

The process for developing the *Guide* and the Basin Plan was also subject to adverse comment including:

- *Nobody asked my opinion*: There was a common complaint that nobody had asked local people what they thought was reasonable when drafting the *Guide*. The process was seen as being driven by Canberra, which was felt to be out-of-touch with the reality of life in regional Australia. Key informants also believed that the MDBA had ignored the previous hard work that communities had put into developing Water Sharing Plans and Sustainable Water Strategies;

- *It will have devastating impacts and you are not listening*: There was considerable anger and a profound sense of disbelief that the *Guide* had been presented as having only minor, temporary impacts, when this contrasted with key informants’ own perceptions of the likely significant impacts at a local level.\(^7\)

The over-riding response from communities was that they wanted to be given a chance to be part of the process.

The community assumed that the majority of the adjustment would be achieved through purchase of water entitlements, rather than through modernisation. The buyback program as currently operated was believed to generate a range of negative externalities:

- the speed of the proposed buyback program (with the proposals in the *Guide* meaning that most purchases outside of Victoria needed to be completed by the end of 2014) was felt to be well beyond the capacity of communities to adapt;

- the money received by sellers of water entitlements was widely believed not to stay in the region and thus the local impacts on non-irrigation businesses would not be offset;

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\(^7\) This dislocation is a good example of the general challenge identified by the Productivity Commission in reviewing policy implications that address structural adjustment, see Productivity Commission (2001), *Structural Adjustment – Key Policy Issues*, Commission Research Paper
many expect that the buyback program would result in a ‘Swiss cheese’ effect whereby randomly located sales throughout a region resulted in holes in irrigation supply systems with resultant increased costs for the remaining irrigators. Communities suggested that a co-ordinated targeted buyback would be preferable; and

- water sales were seen to leave abandoned properties as dryland with weed, pest and disease problems.

### 1.5 Assessing the scale and location of impacts

The study used several methods to inform judgments on the likely scale and distribution of the changes and impacts of the proposals in the Guide. These methods included:

- on-ground interviews with key informants, based on an assumption that there would be a pro-rata reduction in each class of entitlement in that region equal to the overall reduction in the Guide for that region;

- economic modelling undertaken by ABARES, based on a two stage process:
  - the relative change in water use for each activity in each region was simulated using the ‘Water Trade Model’; and
  - the results and the capital inflows from buyback and modernisation investments were then used to populate a CGE model\(^8\), to estimate the wider economic implications for the regions and the national economy; and

- developing an informed judgement based on the consortium’s experience of the history of water use, farm operations and budgets, and water trade within the Basin, especially during the recent drought.

The different methods predicted different socio-economic outcomes, with the economic modelling generating the lower bound of the predicted impacts. The reason for this variance was that the outcomes were sensitive to the assumptions made about the type of entitlement that would be sourced to meet the reductions required. The cost impact was higher when the method assumed a higher proportion of the environmental portfolio would be comprised of higher security entitlement.

### 1.6 Large and small impacts at the scale of the Basin economy

Taking decisions about water use in the Basin requires recognition of the scale of irrigated agriculture within the economy of the Murray-Darling Basin and the distributional effects of the proposed Basin Plan. In summary, changes to irrigated agriculture may have a significant impact if assessed at a local scale but appear not to be material if assessed at the scale of the regional economy.

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\(^8\) ‘CGE’ stands for Computable General Equilibrium. A CGE model is a dynamic representation of the interaction between all sectors of society to estimate how changes in policy, technology or other external factors in one sector or location might impact on the economy across a wider region.
The Murray-Darling Basin generates 39% of Australia’s agricultural production by value. Of this production, approximately 40% is accounted for by irrigation (15% of national agricultural output). Over the past 100 years, the Basin’s agricultural base has been transformed from a low intensity, volatile dryland sector to a more intensive, mixed irrigation and dryland system. Agriculture now represents 93.7% of land use across the Basin, 32% of businesses and 10.8% of jobs. This contribution of agriculture to total employment is much higher in smaller regional communities. Agriculture has also demonstrated sustained growth in productivity over the last twenty years, at a rate that is greater than the rest of the national economy. These figures confirm the considerable importance of irrigated agriculture to the socio-economic characteristics of the Basin.

However, despite this significance, irrigated agriculture only accounts for 7% of the gross regional product of the wider Basin economy. This means that a large impact on irrigated production appears relatively small, when assessed at the scale of the Basin. For example, the 3,000 GL scenario in the Guide involved an average 27% reduction in water diversions for NSW and Victoria. That reduction seems large at the local scale but represents a direct reduction of less than 2% in the wider Basin’s productive capacity, if applied pro-rata to average irrigated production. As the Basin’s economy is growing at more than 2% per year, this loss would be made up within the year at the Basin scale, even if there were no re-allocation of capital or labour from the affected activities.

However, these figures do not include the substantial activity and employment in the processing of food and fibre, nor the major sectors that exist to service both primary production and secondary processing, such as transport, light engineering, wholesale supplies and machinery sales. Taken together, these represent a far greater percentage of the total Basin economy, particularly within some regional communities.

Furthermore, any change to irrigated agriculture would not be applied equally across the Basin as a whole. It would be concentrated in certain towns and locations where the reduction represents a higher percentage of local economic activity and employment. There is therefore a strong distributional effect. The community impact assessment indicated that the effects may be particularly profound in smaller and more irrigation dependent communities.

These strong distributional impacts on vulnerable irrigation communities validate the current focus of the planning exercise which is to identify approaches to the Basin Plan that will optimise outcomes at least cost to these communities.

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9 ABS/ABARE/BRS (2009), *Socio-economic context for the Murray-Darling Basin*, report for the MDBA
1.7 Options and opportunities

The *Guide to the proposed Basin Plan* was based on the understanding and analysis available at the time of its production. Similar assumptions also informed modelling by ABARES and wider community expectations. These earlier assumptions, some of which were explicit, and some of which were implicit, included that:

- uniform targets for end-of-valley flows should be applied to each region;
- SDLs should be considered largely as average diversions;
- a pro-rata suite of entitlements would meet the environmental needs of most valleys;
- the security of an entitlement is not significant in assessing the likely impact of the Basin Plan as all entitlements are assumed to be broadly interchangeable with reference to their long-term cap equivalent value;
- water trade will see entitlements move between sectors based on relative gross margins without reference to security;
- the Basin can be treated as a single system, with little distinction between the northern and southern systems;
- buyback will be the major source of water for the environment; and
- the Commonwealth Environmental Water Holder will not trade water that it owns.

Since the *Guide* was published, there has been the opportunity to explore and develop a richer analysis of a number of the key issues and variables that will influence the socio-economic cost of the plan. This helps broaden the analysis away from a focus on the aggregate reduction sought, to an understanding of the choices available to create optimal outcomes.

The analysis of these options provides the Authority and community with insights and information on opportunities to meet the environmental outcomes required at a lower overall socio-economic cost. The policy options will also be material for any further development and refinement of the buyback program and any potential future programs that might arise.

The key policy insights are:

- **different types of entitlement are not equivalent.** Both irrigators and the environment will need to hold high security entitlements if they want to guarantee the ability to water every year. Neither can rely on low security entitlements for this purpose. The higher market prices for higher security entitlements, at the same LTCE confirm that they are not equivalent.\(^\text{11}\) This insight has significance both for buyback decisions and also for modelling of water trade that has assumed that dairy and horticulture could off-set buyback through purchase of low security entitlements;

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\(^\text{11}\) The long-term cap equivalence (LTCE) of an entitlement equates to the long-term average volume of water that could be expected to be provided by that entitlement, drawn from the historical time series of hydrological modelling.
• the type of entitlement determines its economic cost impact. A portfolio of environmental water entitlements with a higher proportion of high security entitlements will generate a higher economic cost than one that consists more of low security entitlements. There is a higher opportunity cost from the loss of that high security entitlement, both from the loss of high value products and from the loss of high intensity of investment by the sector in the regional economy. The mix of entitlement types in a watering portfolio will therefore determine its cost, a portfolio with a high ratio of high security entitlement will impose a higher cost than one with greater reliance on low security entitlement;

• the type of entitlement will determine the location of the impact in the southern Basin. If most of the environmental portfolio is held as lower security entitlement then much of the impact is likely to be felt in the rice growing regions of southern NSW. By contrast, if the portfolio is mainly higher security then more of the impact is likely to be in the dairy sector in northern Victoria and in horticultural areas such as the Riverland, Sunraysia and Riverina;

• different watering objectives will drive different cost outcomes. Environmental water managers will seek to achieve a complex mix of environmental objectives. The environmental watering plan will determine the portfolio of different water entitlement types that the CEWH needs to hold to meet those objectives. The portfolio will vary between regions. The cost impact and its location will depend on the total volume and the mix of entitlement types;

• economic cost may not be linear to the volume acquired. The overall socio-economic cost of the environmental portfolio will depend on the mix between the types of entitlement held. This may not be linear to the total volume sought. If a small total volume requires a large proportion of higher security, that could generate a higher unit cost than a larger volume that might rely on a larger proportion of lower security entitlement;

• water for the environment could be obtained from a range of sources at lower socio-economic cost than buyback. Increasing infrastructure spending could potentially help to reduce the socio-economic cost of the Basin Plan without reducing the environmental benefits. Similarly, environmental works and measures may be able to reduce the demand for environmental water without reducing the benefits of the Plan. The way the river is operated and the use of ‘carry-over’ may also be able to further reduce the need for buyback. These approaches may be able to reduce the socio-economic cost of the Plan by reducing the total of the volume required or the ratio between high and low security entitlement within the watering portfolio. These alternative approaches may have a higher budgetary cost. However, the third party effects of any procurement method, means that the assessment of options needs to be framed in terms of a wider cost benefit analysis rather than a limited financial analysis.

1.8 The impact of buyback depends on the procurement schedule

Buyback is one of the major tools available to government to obtain water entitlements to promote environmental watering requirements. Buyback is a voluntary scheme
whereby irrigators have the opportunity to offer their entitlement for sale. The price that the individual receives should offset the loss of the productive capacity of the water.

However, that process may also create third party impacts for other players in the regional economy. The nature of that impact depends on the procurement strategy and schedule adopted:

- if buyback is relatively small in scale within a district then it can be a positive aid by helping promote restructuring and exit of smaller, less viable players;
- if buyback is implemented over a reasonable time period then communities have time to adjust. Communities consider that the current procurement schedule is very front-loaded and is expected to impose unrealistic adjustment challenges;
- where buyback seeks to purchase a major percentage of the total entitlement within a district, then key informants were concerned that it can create adverse third party impacts by reducing aggregate production with knock-on effects for the regional economy. The key informants considered that termination fees do not necessarily address this issue;
- if buyback is integrated with modernisation then it may provide an additional incentive to promote change to create a lower cost, more resilient delivery system and to facilitate wider water savings;
- if buyback is targeted then it can be used to generate multiple outcomes including reduction in salinity and retrenchment of irrigation from poor quality soils. However, targeted purchases may be unwound by the market if not confirmed through system rationalisation; and
- if watering requirements require high security entitlements, buyback may need to be targeted to obtain this portfolio.

1.9 Integrating choices and opportunities

The suite of variables and factors outlined above provide information on a set of choices and options to optimise the future design and implementation of the Basin Plan. The three main categories of choices relate to:

- buyback, which can be targeted to promote more positive outcomes, particularly if accompanied by system rationalisation. The extent of the costs to communities will depend on the mix of entitlement types. Its impact will depend on the scale of the exercise and the speed of implementation;
- investment in delivery system modernisation and on-farm works. These could create a portfolio that has high security and may also generate positive economic benefits; and
- investment in works and measures, river operations and carry-over, which provide opportunities to achieve similar outcomes but with lower volumes or lower costs to communities.
Decisions in respect of the future Basin Plan therefore involve policy choices on the primary route to use to acquire water for the environment, in particular the relative balance of investment between buyback and modernisation.

The preceding analysis identifies that any assessment of options should be framed in terms of a wider cost benefit analysis rather than a limited financial budget. The rollout of the proposed Basin Plan and Water for the Future should therefore take account of the full costs and benefits when ranking alternative projects.

1.10 Factors which mitigate adjustment impacts

Greater clarity on a range of factors will also affect the flow-through adjustment impacts. These factors include:

- **Trading by the Commonwealth Environmental Water Holder (CEWH)** (consistent with section 106 of the Water Act 2007). It would be advantageous if the CEWH could clarify that it can and will trade, and to articulate clearly how it will trade. The irrigation community would benefit from a clearer understanding of the CEWH’s objectives and intentions.

- **The timing and pace of environmental water acquisition.** From a socio-economic perspective, the timeframe over which acquisition takes place is significant. A slower paced acquisition process may allow smoother, less costly adjustment, while speeding up infrastructure investment would boost regional communities, through injection of further capital.

- **Labour and capital flexibility.** Flexibility of labour and capital mobility are important factors in the adjustment process. Freer movement of labour and capital will allow the Basin economy to adjust to a new equilibrium (for example, after buyback of water) under which resources are used most efficiently. To maximise longer-term Basin economic and social outcomes, there is a need to improve capital and labour market flexibility. The adjustment process also needs to be managed so that it occurs at a pace and scale that communities can deal with.

- **Materiality of buyback proceeds** (i.e., what is done with buyback receipts). The water purchase program is transferring considerable funds to sellers of water entitlements. The effect of the capital injection on local economies will depend on decisions taken by the seller on how and where to use that capital. Most models assume that the payment to the irrigator is used to pay off debt. This then frees up income equal to the previous debt servicing fees, typically modelled as the equivalent of a 5% annuity of the capital sum. Analysis indicates that, at this level, the stimulus effect of the proceeds is not material when compared with the effects on irrigated production or the scale of the benefits from infrastructure investments.

- **The potential for targeting water purchases**, in light of concerns about the ‘Swiss cheese’ risk to irrigation infrastructure, and the potential for generating environmental benefits from a more targeted approach:
- the water purchasing program will remove water entitlements from irrigation delivery schemes. However, it may leave total costs largely unchanged. This may reduce the economic viability of remaining irrigators and irrigation water providers;

- There is a need for further analysis to estimate the increased unit costs of delivery systems and the reduction in production due to the increase in input costs, and the extent to which termination fees and infrastructure planning assistance address these costs;

- targeted purchases may be unwound by the market if not reinforced by system rationalisation; and

- further work is needed to estimate the extent to which buyback can be used to deliver wider environmental benefits.

- **Coordination:** The landholder currently faces three separate decisions with three different contacts: a tender to sell water, a tender for farm works for savings, and a proposal to reconnect to the rationalised system. These decisions and processes should be coordinated to facilitate optimal business decisions at the farm scale and reduce the risk of perverse inter-program outcomes.

### 1.11 Localism and engagement

One of the key issues raised in the community interviews was that:

> Nobody asked my opinion.

There was a common complaint that nobody had asked local people what they thought was reasonable when drafting the *Guide*. The process was seen as being driven by Canberra, which the community felt to be out-of-touch with the realities of life in regional Australia. Key informants also believed that the MDBA had ignored the previous hard work that communities had put into developing Water Sharing Plans and Sustainable Water Strategies.

The over-riding response from communities was that they wanted to be given a chance to be part of the process.

The Authority has given a commitment to engage local communities far more fully in the exercise in the future, particularly in developing implementation programs that draw on local knowledge and understanding. As noted, in a speech to the *Sustaining Rural Communities Conference* in Narrabri on 6 April, the Chair of the Authority emphasised the importance of working more closely with local communities to further develop the Plan, and to reviewing opportunities to better align water purchasing, infrastructure, and environmental water management programs.

There is a continuing tension between the desire to coordinate and control decisions at a central level and the recognition that local people need to be involved in those decisions. Localism describes the process by which central government devolves
responsibility and resources for policy making or implementation to a local level, thereby providing the ‘local’ with greater autonomy:

- this offers a potential role for local communities in identifying how the objectives of the Basin Plan can best be met within the specified timeframes and the social and economic impacts within those communities most affected by water reform. This delegation to a local level may secure greater local ownership of the Plan; however
- the potential downside of localism is that it can be swayed by place-based competition with little regard for the consequences of the actions of one group on their neighbours, a failure to appreciate the ‘big picture’, and the introduction of regional inefficiencies through the pursuit of localised interests.

In adopting localism, governments must define the extent and limits of such local autonomy and the continuing degree of continuing central agency oversight. In practice, this is not an “either/or” decision but a judgment as to the extent of the relative roles of different players.

There are many examples of governments implementing successful devolved decision-making models in water resource management. For example, in Victoria, the Northern Region Sustainable Water Strategy involved an 18 month collaborative process involving a wide range of stakeholders with a regional consultative committee providing strategic guidance and oversight of the Strategy’s development. However, it becomes increasingly challenging to delegate authority as the scale and significance of the decision is increased.

Developing and implementing the Basin Plan involves a complex set of interlocking stages and activities. It is suggested that different decisions will involve different groups at different scales and that individual communities will need to craft solutions that best match their circumstances. In some cases this will be based on existing agencies and structures and in others it may justify setting up new time-limited arrangements. In all cases the first principle ought to be that decisions are delegated to the lowest practical level, subject to the need for coordination.
## 2 Glossary

<table>
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<th>Term</th>
<th>Definition</th>
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<tr>
<td>ABARES</td>
<td>Australian Bureau of Agricultural and Resource Economics and Sciences (formerly ABARE and BRS)</td>
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<tr>
<td>ABS</td>
<td>Australian Bureau of Statistics</td>
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<tr>
<td>Adaptive management</td>
<td>A structured, iterative process to improve decision-making when knowledge is uncertain. Adaptive management aims to reduce uncertainty over time by incorporating new knowledge and learning into decision-making, such as from system monitoring. (source: MDBA)</td>
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<tr>
<td>Allocation (water)</td>
<td>The specific volume of water allocated to water access entitlements in a given season, given accounting period, defined according to rules established in the relevant water plan.</td>
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<td>AusRegion model</td>
<td>ABARE’s general equilibrium economic model used to estimate implications for economic activity in response to shocks to the Murray–Darling Basin economy. As a general equilibrium model, AusRegion incorporates direct and indirect impacts of shocks to the economy, including feedback from regions. This is in contrast to partial equilibrium models that restrict analysis of impacts to a particular industry or region. (source: MDBA)</td>
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<tr>
<td>Basecase</td>
<td>Conditions regarded as a reference point for the purpose of comparison.</td>
</tr>
<tr>
<td>Basin Plan</td>
<td>A plan for the integrated management of the water resources of the Murray–Darling Basin, to be adopted by the minister under s. 44 of the Water Act 2007 (Cwlth). Note there are two related documents: 1. The Guide to the proposed Basin Plan was published in October 2010; and 2. The Proposed Basin Plan is a statutory requirement that must be published as part of a consultative process set out in the Water Act 2007 (Cwlth). It has not yet been published as at May 2011.</td>
</tr>
<tr>
<td>BCC</td>
<td>Basin Community Committee</td>
</tr>
<tr>
<td>broadacre</td>
<td>Large-scale cropping (rice, cotton, grain etc.) In this report, the term refers to grain and fodder crops excluding cotton and rice.</td>
</tr>
<tr>
<td>Buyback</td>
<td>Purchase of water for the environment. Buyback may target allocations or entitlements, and may be undertaken by a range of entities. To date, most buybacks have been by state government or Commonwealth agencies, but non-government organisations have also recently engaged in buyback.</td>
</tr>
<tr>
<td>Cap (the Murray–Darling Basin Cap on diversions)</td>
<td>A limit, implemented in 1997, on the volume of surface water that can be diverted from rivers for consumptive use. Under the Basin Plan, the Cap will be replaced by long-term average sustainable diversion limits (SDLs). (source: MDBA)</td>
</tr>
<tr>
<td>Carryover</td>
<td>A way to manage water resources and allocations that allows irrigators to take a portion of unused water from one season into the new irrigation season. (source: MDBA)</td>
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<tr>
<td>CEWH</td>
<td>Commonwealth Environmental Water Holder</td>
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<td>CDL</td>
<td>Current Diversion Limit (Long-term average diversions allowable under existing state and territory water resource management plans, or the Cap on diversions where no plan exists, or the current level of development where neither a plan nor the Cap exists. (source: MDBA))</td>
</tr>
<tr>
<td>CSIRO</td>
<td>Commonwealth Scientific and Industrial Research Organisation</td>
</tr>
<tr>
<td>Cth, Cwlth</td>
<td>Commonwealth (Australian) Government</td>
</tr>
<tr>
<td>Cultural flows (or cultural water flows)</td>
<td>Both the Murray Lower Darling Rivers Indigenous Nations (a confederation of 10 Aboriginal nations in the southern part of the Basin) and the Northern Murray–Darling Basin Aboriginal Nations (a confederation of 21 Aboriginal nations in the northern part of the Basin) have developed their own definition of cultural flows: ‘Water entitlements that are legally and beneficially owned by the Aboriginal nations and are of a sufficient and adequate quantity and quality to improve the spiritual, cultural, environmental, social and economic conditions of those Aboriginal nations. This is our inherent right.’ (source: MDBA)</td>
</tr>
<tr>
<td>DAFF</td>
<td>Department of Agriculture, Forestry and Fisheries (Cth)</td>
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<tr>
<td>DERM</td>
<td>Department of Environment and Resource Management (Qld)</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
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<tr>
<td>dryland Farming that is dependent on natural rainfall</td>
<td></td>
</tr>
<tr>
<td>EBC Environment and Behaviour Consultants</td>
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<tr>
<td>EC Exceptional Circumstances</td>
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<tr>
<td>Entitlement (water) A perpetual or ongoing entitlement to exclusive access to a share of water from a specified consumptive pool as defined in the relevant water plan.</td>
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<td>Environmental Entitlement (water) A plan to restore and sustain the wetlands and other environmental assets of the Basin and to protect biodiversity dependent on the Basin water resources. (source: MDBA)</td>
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<tr>
<td>Environmentally Environmentally sustainable level of take</td>
<td>The level of water extraction from a particular system which, if exceeded, would compromise key environmental assets or ecosystem functions and the productive base of the resource.</td>
</tr>
<tr>
<td>GMID Goulburn Murray Irrigation District (Victoria)</td>
<td></td>
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<tr>
<td>GVAP Gross Value of Agricultural Production</td>
<td></td>
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<tr>
<td>GVIAP Gross Value of Irrigated Agricultural Production</td>
<td></td>
</tr>
<tr>
<td>ha Hectares</td>
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<tr>
<td>Key environmental asset An environmental feature deemed ‘key’ for the purposes of the Basin Plan because it meets at least one of five criteria set by the Murray–Darling Basin Authority. (source: MDBA)</td>
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<tr>
<td>LTCE Long Term Cap Equivalent. An average that takes into account the different characteristics of water entitlements and allocations in New South Wales, Victoria and South Australia, and their reliability. This creates a common unit of measure, allowing equitable comparison of a broad range of water recovery measures. (source: MDBA)</td>
<td></td>
</tr>
<tr>
<td>MDB Murray-Darling Basin</td>
<td></td>
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<tr>
<td>MDBA Murray-Darling Basin Authority</td>
<td></td>
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<tr>
<td>MIL Murray Irrigation Limited</td>
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<tr>
<td>MJA Marsden Jacob Associates</td>
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<tr>
<td>MLDRAIN Murray Lower Darling Rivers Indigenous Nations (MLDRIN) is a confederation of 10 Aboriginal nations in the southern part of the Basin, comprising representatives of the Wiradjuri, Yorta Yorta, Taungurung, Wamba Wamba, Wadi Wadi, Mutti Mutti, Latji Latji, Ngarrindjeri, Barapa Barapa and Wergaia peoples. (source: MDBA)</td>
<td></td>
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<tr>
<td>NBAN Northern Basin Aboriginal Nations. A shortened term sometimes used for Northern Murray–Darling Basin Aboriginal Nations (NBAN), a confederation of Aboriginal nations in the northern part of the Basin. NBAN recognises 21 nations eligible to be members. These include Barkindji (Paakantyi), Barunggam, Bidjara, Bigambul, Budjiti, Euahlayi, Gamilaroi, Githabul, Gunggari, Jarowair, Gwamu, Kunja, Kwambal, Malangapa, Mandandanji, Mardigan, Murrawarri, Ngemba, Ngiyampaa, Wailwan and Wakka Wakka peoples. (source: MDBA)</td>
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<tr>
<td>NRSWS Northern Region Sustainable Water Strategy (Vic)</td>
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<td>NSW New South Wales</td>
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<tr>
<td>NVIRP Northern Victoria Irrigation Renewal Project. A two-stage project to modernise and rationalise irrigation infrastructure in the Goulburn-Murray Irrigation District of northern Victoria, to deliver improved water efficiency, better service delivery and increased on-farm productivity. The project's resulting water savings are to be shared between irrigators, the environment and supply to Melbourne. (source: MDBA)</td>
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<td>NWI National Water Initiative</td>
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<td>Overallocation Occurs when the total volume of water that can be extracted by the holders of access rights at a given time exceeds the environmentally sustainable level of take for those water resources.</td>
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<tr>
<td>Qld Queensland</td>
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<tr>
<td>Ramsar Convention The Convention on Wetlands of International Importance is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.</td>
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</tbody>
</table>
Risk allocation When there are reductions to the volume or change to the reliability of an entitlement holder’s water allocation from the Basin Plan, the risks are shared between individual entitlement holders and governments, according to a formula in the Water Act 2007 (Cwlth) that recognises climate change and other natural events, new knowledge and changes in government policy. (source: MDBA)

RMCG RM Consulting Group
ROP Resource operations plan (Qld)
RTB Restoring the Balance buyback program (Cth)
SA South Australia
SDL Sustainable Diversion Limit. Long-term average sustainable diversion limits, or SDLs, set the maximum long-term annual average quantities of water that can be taken on a sustainable basis from the Basin water resources as a whole, and from the water resources or particular parts of the water resources of each water resource plan area. (source: MDBA)

Social catchment Mutually interdependent towns and communities dispersed throughout a region.¹²
SRWUI Sustainable Rural Water Use and Infrastructure program
Stock and domestic right Allows rural landholders to extract water for domestic household and stock watering purposes, without an access licence.
Swiss Cheese effect A term used to describe the ‘holes’ in irrigation districts caused when some irrigators decide to terminate their irrigation delivery rights. The costs of maintaining the irrigation district may not be reduced as demand for water delivery in the area falls. As a result, there is a risk that the operators may have to increase water delivery charges to remaining irrigators. The term is also used to cover concerns about impeded system rationalisation.
Termination Fees Operators of irrigation districts may levy termination fees when an irrigator decides to discontinue or reduce water delivery services. Government rules state that an operator can charge a fee of up to 10 times the annual delivery fee. This provides the operator with the equivalent of 12-15 years worth of delivery charge revenue, and is intended to mitigate the risk of ‘Swiss cheese’ impacts.

TLM The Living Murray river restoration and buyback program
Vic Victoria
Water for Rivers program A program established by the Australian Government and the governments of New South Wales and Victorian to recover 282 GL of water for the Snowy River and River Murray. This volume of water savings is aimed at being achieved through investment in water-efficiency infrastructure projects, innovation and technology, and — where appropriate — by acquisition of water entitlements. (source: MDBA)

Water for the Future program An initiative to prepare Australia for a future with less water. It has four key priorities: taking action on climate change, using water wisely, securing water supplies, and supporting healthy rivers and wetlands.

Water market A framework for the buying, selling and transfer of tradeable water rights. (source: MDBA)
Water resource plans Statutory management plans — recognised under provisions of the Water Act 2007 (Cwlth) — developed for particular surface-water and groundwater systems, currently known by different names throughout the Murray–Darling Basin (e.g. ‘water sharing plans’ in New South Wales and ‘water allocation plans’ in South Australia). (source: MDBA)

Water Trade Model The ABARES economic model of land and water use in the agricultural sectors of the Murray–Darling Basin. The model incorporates irrigated agricultural activities and models water trade.
WRP Water resource plan (Qld)
WSP Water sharing Plan (NSW)

Volumes of water

¹² Fenton, M. 2005, Guidebook on Social Impact Assessment, prepared for the Comprehensive Coastal Assessment (DoP) by Environment and Behaviour Consultants, Townsville, QLD.
Volumes of water referred to in this document are expressed as either megalitres (ML) or gigalitres (GL) where:

<table>
<thead>
<tr>
<th>Volume Description</th>
<th>Conversion</th>
<th>Conversion</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>One litre</td>
<td>1 litre</td>
<td>1 litre</td>
<td>1 L</td>
</tr>
<tr>
<td>One thousand litres</td>
<td>1,000 litres</td>
<td>1 kilolitre</td>
<td>1 KL</td>
</tr>
<tr>
<td>One million litres</td>
<td>1,000,000 litres</td>
<td>1 megalitre</td>
<td>1 ML</td>
</tr>
<tr>
<td>One billion litres</td>
<td>1,000,000,000 litres</td>
<td>1 gigalitre</td>
<td>1 GL</td>
</tr>
</tbody>
</table>

As a point of comparison, 1 ML of water is approximately the amount of water need to fill an Olympic swimming pool.