



National Irrigators' Council

Level 2, NFF House, 14-16 Brisbane Ave
Barton ACT 2600

Ph: 02 6273 3637
ABN: 92133308326

House of Representatives Standing Committee on Regional Australia

Inquiry into the impact of the Murray- Darling Basin Plan in Regional Australia

Submission by the National Irrigators' Council

December 2010

Contact: Danny O'Brien
CEO - National Irrigators' Council
Ph: 02 6273 3637
M: 0438 130 445
danny.obrien@irrigators.org.au

Introduction

The National Irrigators' Council (NIC) is the peak body representing irrigators in Australia. The NIC's objective is to develop projects and policies to ensure the efficiency, viability and sustainability of Australian irrigated agriculture and the security and reliability of water entitlements. NIC currently has 29 member organisations covering all MDB states, regions and commodities. Our members represent water entitlements of nearly 6 million megalitres.

While this document has been prepared by the NIC, each member reserves the right to independent policy on issues that directly relate to their areas of operation, or expertise, or any other issues that they may deem relevant.

NIC requests the opportunity to address the committee at a mutually agreeable time.

Overview

“This was clearly an impossible task given to the Authority, because they were somehow supposed to just use science but also somehow relieve political leaders of their responsibilities to make this choice. That is a political issue....You cannot tell a technical agency to optimise both [environment and economy] because there are trade-offs between them.”

- Professor John Briscoe, Harvard University, World Bank Senior Water Adviser, International Adviser to the MDBA¹

The National Irrigators’ Council welcomes the opportunity to provide a submission to the Regional Australia committee’s Inquiry into the impact of the Murray-Darling Basin Plan in Regional Australia. We will attempt through this submission to highlight deficiencies in the MDB reform process with respect to policy decisions, science, data and assumptions and highlight areas where the Federal Government might look for alternative solutions to the problems facing the MDB.

While the NIC aims to be a constructive player in the reform process, we make it clear from the start that we reject the proposals outlined in the Guide released by the Murray Darling Basin Authority as unbalanced and detrimental to our members, our communities and the wider Australian population. In our view, the proposals would devastate many of our communities and threaten the viability of some of our irrigation industries.

Irrigators are, and have been, willing to play their part in the water reform process to ensure we have healthy ecosystems, sustainable food production and strong regional communities in the Basin. One of the reasons that irrigators have been supportive of the water reform process is the National Water Initiative’s prescription that management of surface and groundwater resources should “optimise economic, social and environmental outcomes”.² This is replicated in the objectives of the *Water Act 2007* (at 3 c) but is not reflected in Section 21 of the Act and as such, neither is it a feature of the Guide.

NIC believes that if we are to have a truly inclusive reform process that optimises environmental, social and economic outcomes, there must be trade-offs for all three. The Act and the Guide give primacy to the environment to the detriment of social and economic outcomes and as such we believe they fail our communities and the nation.

Irrigators accept there needs to be some water returned permanently to the environment.

We can have a healthier environment – but to ensure we also have strong regional communities and food and fibre production, we must consider alternatives to the “just add water” approach of the Act and the MDBA. This will include a range of environmental works and measures projects to deliver more efficient environmental outcomes, as well as a more holistic approach to the environmental issues facing the Basin.

It is clear to us from the critique of the science and process outlined in this submission that it is not possible to have the “science” tell Government what the environment “needs”. We believe the science cannot deliver in any meaningful way and will always be open to interpretation in any event, particularly given the highly variable nature of Australia’s river systems.

¹ “Water expert rebuts claims”, Australian Financial Review, November 2, 2010, p. 7

² National Water Initiative, para 23

The quote above from a highly respected international water expert best explains our view on where this process has gone wrong. That view has again been endorsed most recently in the comments of the outgoing MDBA chair who noted that:

“...a successful plan would require both Commonwealth and States to work together on a comprehensive range of policy, planning and implementation issues in consultation with relevant community, industry and environmental groups. While the Authority has an important part to play, it is neither empowered nor equipped to undertake the entire complex task.”

- Mike Taylor, outgoing chair of the MDBA³

In short, we believe the Committee must advise the Parliament that:

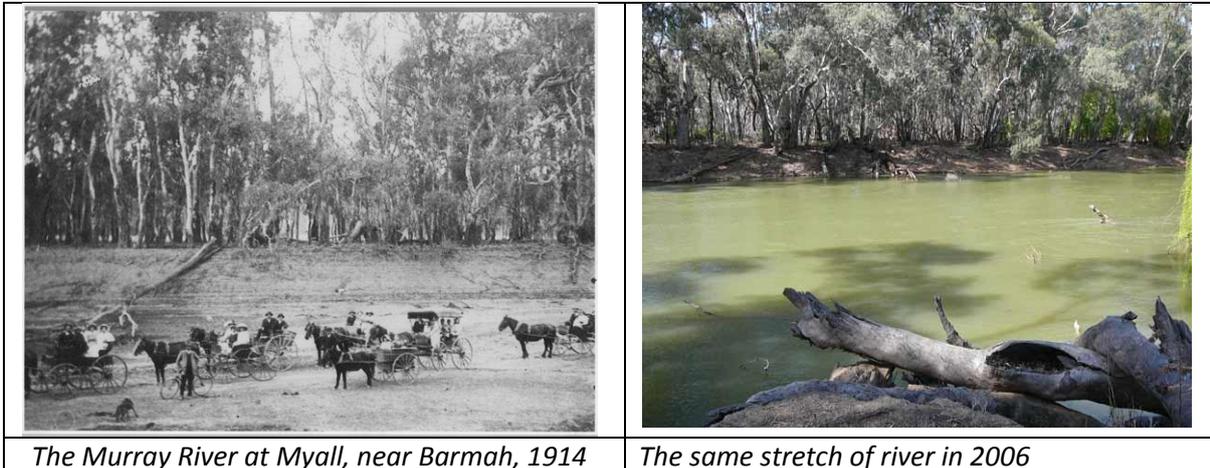
- The *Water Act 2007* does not deliver a triple bottom line outcome as promised by the National Water Initiative and should be amended. Failure to amend the Act could result in legal challenges against any final plan.
- The “best available science” is of at-best medium quality and advice from the MDBA should only form a part of the decision-making process - ultimately the outcome must be decided by elected politicians after wide consultation with affected stakeholders.
- Environmental works and measures projects developed largely by State Governments or local authorities and supported by the Commonwealth and the MDBA must form a critical part of any solution.

In our submission, a balanced outcome cannot simply be about how much more water is needed for the environment. A balanced outcome will entail consideration of the best available science along with community views before a judgement call from elected politicians – it cannot be delivered as a definitive technical answer from the Authority.

³ MDBA media release, 7 December 2010

The Murray Darling Basin's health and drought

The Murray Darling Basin, like the rest of Australia, is naturally a highly variable system. Unlike the rivers of the northern hemisphere which run deep, long and continuously, our rivers are highly variable with extended periods of drought followed by periods of flood and abundance, just as we are seeing right now.



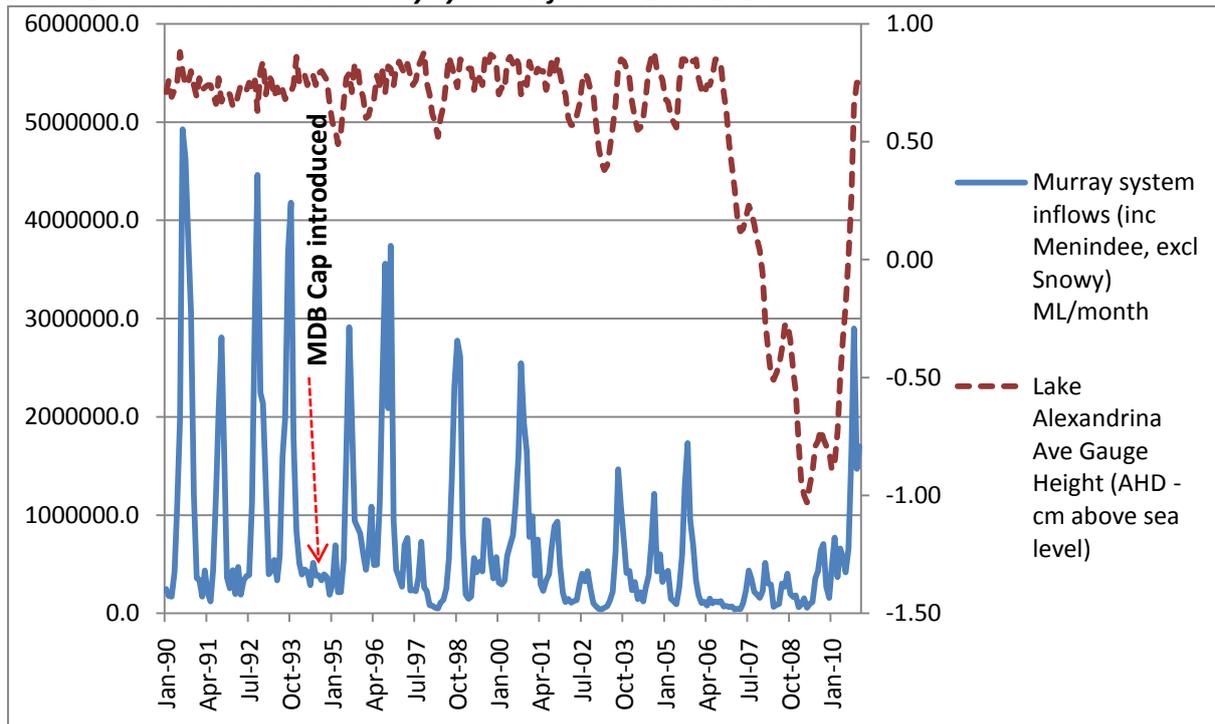
It is therefore extremely difficult to quantify the ecological health of the system at any given point in time. The MDBA has relied significantly on the Sustainable Rivers Audit for much of the justification of the current sick state of the Basin. That audit was undertaken between 2004 and 2007 in the middle of the worst drought in recorded history - not surprisingly, the results were not particularly good. Later in this paper we will argue further why the SRA is not the best basis for assessing environmental watering needs of the basin.

NIC does not contend that there is no need for reform or that the current arrangements for sharing water between the environment and the consumptive pool are perfect.

But we think it is critically important the Committee understands that the vast bulk of the environmental problems in the Basin in recent times have been caused by the worst drought in recorded history.

The following chart demonstrates this to best effect. While there has been considerable social and economic pain and environmental damage in the Lower Lakes region of South Australia in recent years, this chart – which plots inflows to the River Murray system against the water level of Lake Alexandrina – clearly demonstrate that those problems have been caused by drought. As inflows dropped, and then eventually collapsed, so did the level of the Lakes. The breaking of the drought this year has seen both levels make a dramatic recovery.

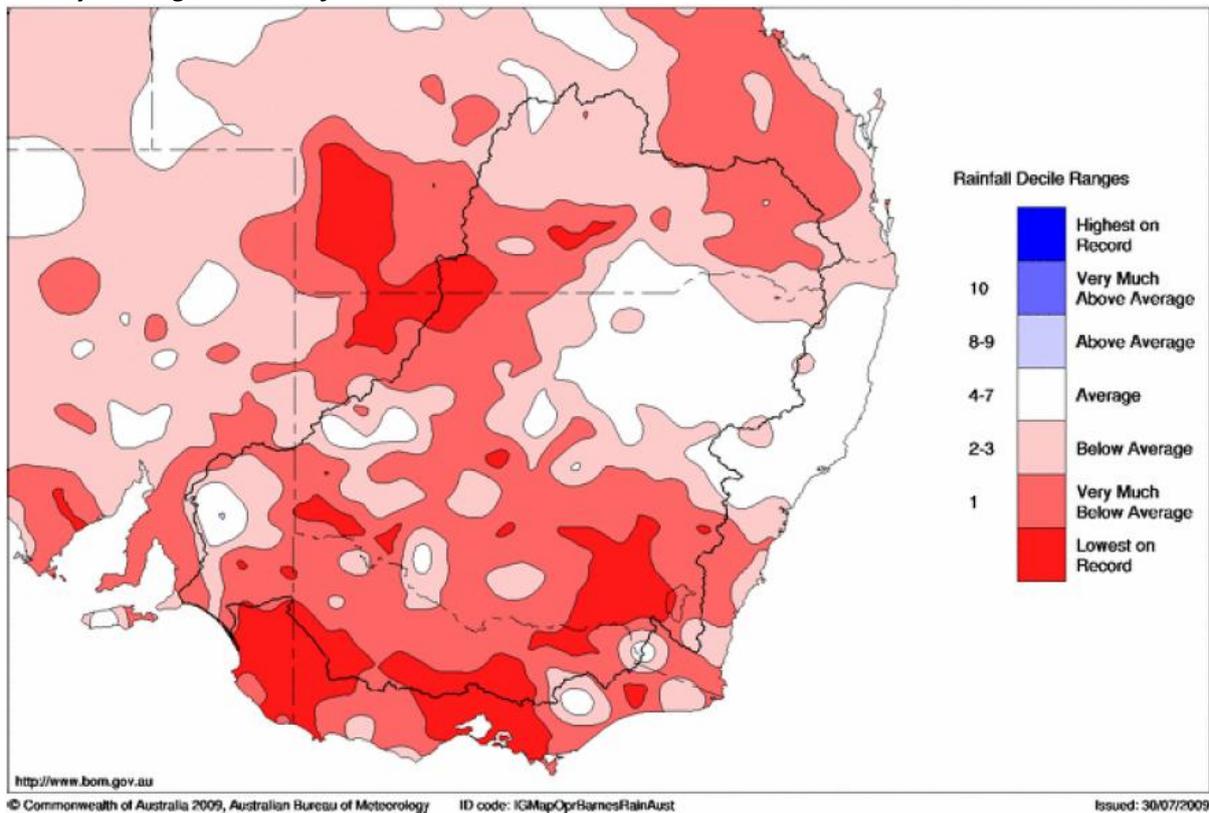
Lower Lakes water level vs Murray system inflows – 1990-2010



Source: MDBA

The drought's severity is also apparent in following figure from the Bureau of Meteorology which shows rainfall deciles for the Basin from 2001-2009:

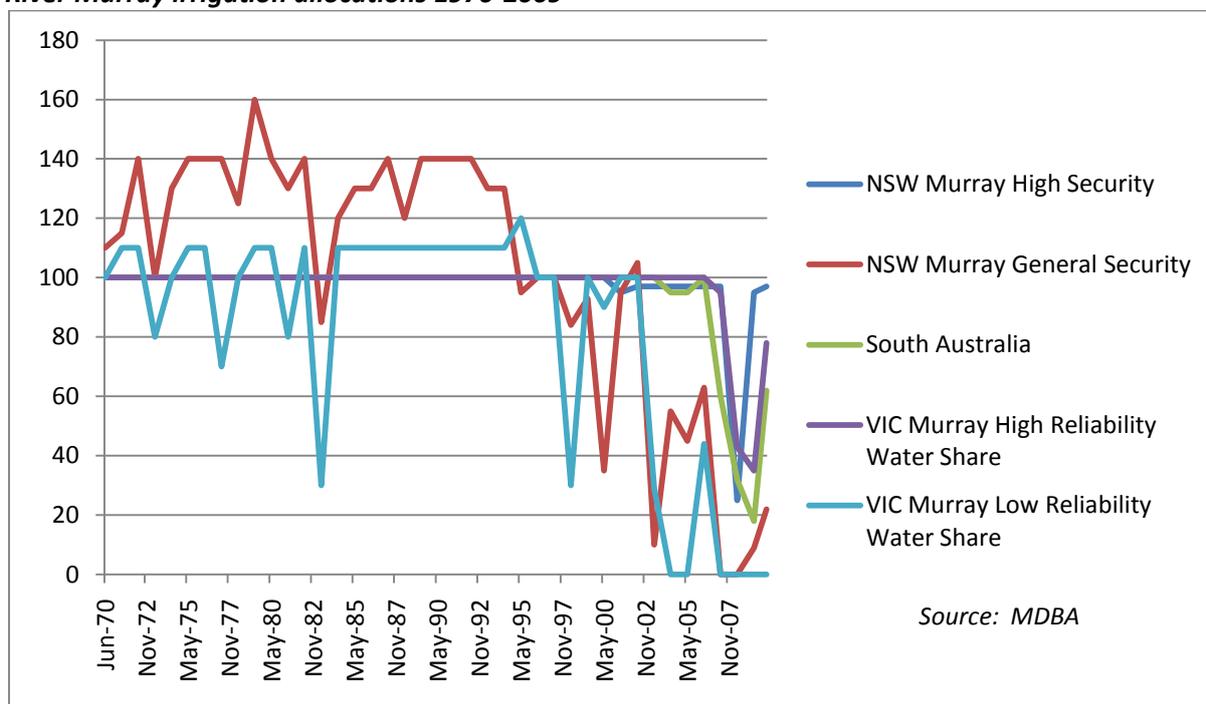
Murray Darling Basin Rainfall deciles – 2001-2009



Of course irrigators and their communities have suffered through the drought too. Irrigators' entitlements give them access to a share of the available pool each year. As that pool has been

limited in recent years, so have irrigator allocations been low or non-existent as the following chart shows:

River Murray irrigation allocations 1970-2009



The following chart outlines similar numbers for the most recent years in a table format, with the addition of the Lachlan system which was one of the worst hit valleys throughout the drought:

End-of-season irrigation allocations (% of entitlement)

Water Product	06/07	07/08	08/09	09/10
South Australia	60	32	18	62
Lachlan High Security (NSW)	80	30	30	10
Lachlan General Security	0	0	0	0
Vic Goulburn High Reliability	29	57	33	71
Vic Murray High Reliability	95	43	35	100
NSW Murray High Security*	50	25	95	97
NSW Murray General security	0	0	9	27

Source – MDBA, Goulburn Murray Water (Goulburn only), Lachlan Valley Water
 *NSW Murray High Security comprises less than 15 per cent of the NSW Murray Valley resource

These figures highlight the fact that irrigators only have access to water when it is available and that their share is significantly reduced (or non-existent) when inflows recede. Irrigators have had greatly reduced access to water throughout the drought. To illustrate this point further, Murray-Darling Basin diversions in 2008–09 totalled 4,133 GL - the lowest annual diversion since 1956–57 and only 32% of the record diversion of 12,964 GL in 1996–97⁴.

We outline this information to ensure the Committee is fully cognisant of the fact that the climatic conditions of the past 10 years have been the overwhelming determinant of environmental health – not diversions for irrigated agriculture or any other use.

⁴ MDBA, Review of Cap Implementation 2008-09, p. 55

The shortcomings of the Water Act 2007

“The way in which the Act is framed leads to this sort of result, which is ‘we have to do this for the environment and you’re gonna have to suck it up and live with it’. Now this cannot be a viable point, you have to find a reasonable balance between this.”⁵

- Professor John Briscoe, Harvard University, World Bank Senior Water Adviser, International Adviser to the MDBA

NIC has long made known its concerns about the *Water Act 2007* although we have generally not raised it publicly until we saw how the MDBA interpreted the Act.

Minister Burke and the Government have made it clear that the MDBA must take a triple bottom line approach in the Basin Plan. Advice from the Australian Government Solicitor released by Minister Burke is open to interpretation. However, as we have seen no other advice to the contrary, we expect the MDBA to rewrite the Plan based on this interpretation. If, has been stated publicly by the Chair, the MDBA has alternate legal advice on how it should implement the Basin Plan then it must be released. Given the MDBA Chair’s statement when he resigned, it is clear there is continuing conflict in interpretation of the Act.

The National Water Initiative, agreed by the Commonwealth, all states and industry in 2004, and the foundation of ongoing water reform, committed this nation to a triple bottom line outcome from water management – one that “optimises economic, social and environmental outcomes”⁶.

It went further to say there was a continuing imperative to “increase the productivity and efficiency of Australia’s water use, the need to service rural and urban communities, and to ensure the health of river and groundwater systems...”⁷ and that “...settling the trade-offs between competing outcomes for water systems will involve judgements informed by best available science, socio-economic analysis and community input...”⁸.

It was these principles of balance, trade-offs and equal consideration of environmental, social and economic considerations that irrigators welcomed and was the reason they supported, and continue to support, the NWI as the basis for water reform. Unfortunately, the Act fails to maintain that holistic approach and as the foundation for the Basin Plan, it is not surprising that we now have a proposal that does not deliver balance.

In our view, the current Act is biased to the needs of the environment given its reliance on the external affairs powers to achieve a head of power under the Constitution. The external affairs powers focus wholly on delivering the needs of the environment in order to meet our international treaty obligations (Ramsar etc.). We do not claim that there is no consideration of social and economic impacts, but under the Act they are only considered “subject to” the delivery of the environment’s needs.⁹

Our position has been publicly supported by a number of legal minds, including Constitutional law expert Professor George Williams of the University of NSW¹⁰ and Sydney Barrister Josephine Kelly¹¹.

⁵ Excerpt from interview, ABC Radio National Breakfast, 4 November 2010

⁶ Intergovernmental Agreement on a National Water Initiative, para 23

⁷ Ibid, para 5

⁸ Ibid, para 36

⁹ The Water Act 2007, s21 (4)

¹⁰ “When water pours into legal minefields”, Sydney Morning Herald, October 26, 2010

¹¹ “The river’s needs are the only consideration”, Australian Financial Review, November 16, 2010

NIC believes that in order to deliver on the triple-bottom-line promise of the NWI and deliver a balanced Basin Plan, the Act must be amended. We believe it is incumbent on this committee to consider the Act and make strong recommendations to the Parliament to have it amended to reinstate the triple-bottom-line promise of the NWI. While the Government has made clear its intention to deliver a triple-bottom-line outcome, we remain concerned that any resulting Plan could then be subject to legal challenge on the basis of the Act.

A second concern of the Act, and indeed the entire Basin reform process, is the focus on water and flow alone as a solution to the environmental problems of the river system. Indeed, the Act specifically precludes the Basin Plan from dealing with “land use or planning, management of natural resources other than water and control of pollution”¹².

This is a repudiation of some 30 years of integrated catchment management in this country that has acknowledged that management must extend to matters such as land use, riparian vegetation, noxious weeds, invasive species and foreign fish species such as European carp.

It is simply not possible to address all the environmental problems of the Basin by using flow as the only remedy. “Just add water” is not a solution to a complex problem. For further discussion, see the section later in this paper on the Sustainable Rivers Audit.

¹² *Water Act 2007*, Section 22 (10)

Direct responses to Terms of Reference

- The direct and indirect impact of the Proposed Basin Plan on regional communities, including agricultural industries, local business activity and community wellbeing

Many of the communities in the Murray Darling Basin are heavily, if not solely, reliant on irrigation as their economic base.

Communities such as Griffith, Coleambally, Mildura, Renmark and Dirranbandi would not exist if it weren't for the availability of water for agriculture. Many others such as Moree, Narrabri, Shepparton and Dalby would be substantially smaller or less economically diverse.

The irrigated production of food and natural fibre is a great stimulus to regional economies:

- irrigated farms tend to have relatively high levels of labour per hectare
- engineering and technical support is needed for irrigation delivery and drainage systems
- local processing, packaging and transport generate more jobs and maintain communities
- local produce (fruit, nuts, wine and cheese) complements tourism and dining experiences.¹³

Numerous studies indicate that the flow-on effects of irrigation in rural communities are very significant, with one showing that irrigation in the Murray Darling Basin has an economic multiplier of 3.5, meaning that for every \$1,000 of farm gate revenue generated there is an additional \$3,500 of dependent economic activity.¹⁴

It is clear therefore that removing water from the productive pool and returning it to the environment will have a significant social and economic impact.

Perhaps the best demonstration of the reality of that impact is not through citing various different studies or reports (although we will also do this), but in seeing the response of the communities affected by the proposed Basin Plan.

That 20,000 people attended the public information sessions run by the MDBA on the "Guide to the Proposed Basin Plan"¹⁵ and that almost all of them were there to express their frustration, anger and concern at the proposals, is the clearest indication that these communities know they rely on water and are worried about what will happen if water availability is reduced.

Contrary to many of the reports about "angry farmers" turning up at these meetings, at many of them farmers were outnumbered by townsfolk and business people. In Griffith for example, some 200 businesses closed their doors to attend the session and make their voice known and the first question was asked not by an irrigator, but by the president of the local chamber of commerce.

A report by Judith Stubbs and Associates for the Cotton Catchment Communities CRC in July 2010 clearly demonstrates the impact they are concerned about. It put numbers on the fears that we have held for some time, and to devastating effect.

¹³ National Program for Sustainable Irrigation 2008, Irrigation Facts and Figures

¹⁴ The Irrigation Industry in the Murray and Murrumbidgee Basins - CRC For Irrigation Futures Technical Report No. 03/05

¹⁵ MDBA Media Release: "MDBA receives Basin Plan Guide feedback", 15 November 2010

The report estimated that a 25 per cent cut in water availability for irrigation in the MDB would cost the national economy \$1.4 billion annually and 14,000 jobs, while a 50 per cent cut would cost 28,000 jobs and \$2.7 billion in economic activity every year.¹⁶

This report, produced by a credible economic research organisation, highlights that the impacts of the Basin Plan would not be just felt by a few farmers – this will hurt corner shops, accountants, bakeries and service stations and the flow-on effects will be felt by urban Australians and others outside the basin. It indicated that the annual cost of removing 50 per cent of irrigation water would range from \$380 per household at a national level through to \$16,000 per household in Mildura.

This statistic also highlights the fact that while the overall impacts across the economy may be small, they will be dramatic at local level.

The JSA report also calculated possible employment impacts, concluding:

“Averaged across the eight case study areas, a 50% reduction in water availability predicted job losses of around 9.0%; and a 10% reduction in water availability predicted job losses of around 2.0%. Impacts are quite variable, reflecting the degree to which a community is dependent on irrigated agriculture, with job losses as high as 18.9% predicted in some areas from a 50% reduction in water availability. These estimates are probably low for regional centres, as jobs in such areas are likely to reflect a wider area, outside the scale of our modelling.”¹⁷

What is perhaps most alarming is that the estimates are considered by the report’s authors as being conservative.

Our colleagues at the NSW Irrigators’ Council have also demonstrated some of the impacts using publicly available data.

Prior to the release of the Guide, NSWIC collated, assessed and made publicly available a spreadsheet which interrogated existing data in the public domain to assess economic impacts in terms of both lost productivity and lost employment by valley across NSW. That “impact calculator” is publicly available at the NSWIC website¹⁸.

NSWIC drew upon existing data sources (most notably ABS) to calculate linear impacts and used standard statistical multipliers to calculate flow on employment and productivity impacts.

Their model shows that at the lowest levels of proposed cuts advocated by the Guide and at the bare minima across data sets, jobs losses in NSW alone would exceed 17,000 and productivity loss would approach \$2.4 billion annually.

MDBA Assessment

The MDBA has admitted that it has a paucity of accurate data and analysis of the likely impacts of removing water from the productive pool and that it is undertaking further work. The data it has presented in the Guide does not fill us with great hope of what might be forthcoming.

¹⁶ Social and Economic Impacts of Reduced Irrigation Water, Judith Stubbs and Associates, July 2010

¹⁷ Ibid

¹⁸ <http://nswic.org.au/pdf/basinplan/Basin%20Plan%20Impact%20Calculator.xls>

In particular, the notion that change of this magnitude would only cost 800 jobs was laughable from the start and it is not surprising that the Authority backed away from it rather quickly. This does beg the question though as to why the figure was included in the first place.

The two main figures presented in the Guide in relation to impacts make no sense when presented side by side – a reduction in Gross Value of Irrigated Agricultural Production (GVIAP) of \$805 million and a loss of 800 jobs basin-wide (or 3000 jobs nationally). On that scale, each job is worth \$1 million – clearly not accurate.

We understand that the work contributed by ABARE to come up with these numbers is considered to be “state of the art” and that the models are “the best we have”.¹⁹ This may well be true, but it is also clear that these estimates are not particularly useful to describe the immediate impact on people and communities. As noted by the Secretary of the Department of Agriculture, Fisheries and Forestry, Dr Conall O’Connell:

“I think it is probably important to understand that that percentage which results in those numbers—the 800 and 3,000, and Mr Morris can help me here—is looking at the effects over the medium to long term once the economy manages to adjust. It is not talking about the numbers of individual people that may be affected region by region and town by town.”²⁰

As Dr O’Connell notes, these are figures that consider what has happened when the “economy manages to adjust”. If the Parliament is to make an informed decision on what the likely social and economic impacts of reform are going to be, it needs to be acutely aware of the scale of those impacts in the short term and at local level – not 20 years down the track when the whole world has changed.

In our view, it was grossly misleading for the MDBA to use those numbers in the Guide when it clearly knew the social and economic impacts in the short term, and at local level, would be far more significant.

Summary – avoid the “Bollard Principle”

NIC acknowledges and accepts that the impacts can be partly mitigated over time through more efficient use of water (including for the environment), investment in infrastructure and research and development and through water trading. However our view is that the short to medium term impacts of removing the amount of water as proposed in the Guide will be horrendous and would not be tolerated by any other sector in the country.

As such, it is critical that any social and economic impact analysis is used to actually *change* the volume of water that is proposed to be delivered back to the environment. In our experience, too many governments have established the impacts of a particular policy proposal but then proceeded with it regardless with what is often a well-intentioned but fruitless package of “adjustment assistance”.

It is what we have dubbed the “Bollard Principle” – where a government, usually for environmental reasons, removes the economic base of a community and tries to placate that community with adjustment assistance that includes measures such as beautification of the main street – new

¹⁹ Mr Phillip Glyde, Senate Hansard, ABARE at Rural Affairs and Transport Committee estimates, 20 October 2010, p. 62

²⁰ Dr Conall O’Connell, Ibid, p. 51

bollards and a lick of paint. Too many communities are all too well aware of this principle and reject it outright.

We understand that the Authority accepts that a figure above 4000 GL would cause too high a price for people and communities, but this decision is based on the flawed long-term and Basin-wide projections.

We submit that when proper consideration is given to the local and short-term impacts, it will be necessary to further revise down the figure in order to ensure a triple-bottom-line outcome.

Otherwise, to undertake work on the impacts but do nothing to then reduce those impacts would be pointless. It would be akin to a bystander watching a house burn down and describing what is happening, but doing nothing to help.

- Options for water-saving measures or water return on a region-by-region basis with consideration given to an analysis of actual usage versus licence entitlement over the preceding fifteen years
- The role of governments, the agricultural industry and the research sector in developing and delivering infrastructure and technologies aimed at supporting water efficiency within the Murray-Darling Basin.

Irrigation infrastructure upgrades

NIC is strongly supportive of measures that will improve efficiency of water use. Our policy priority has always been for governments to invest in irrigation infrastructure efficiency ahead of purchases in the market.

This is not because (as some academics have claimed) infrastructure upgrades are a direct subsidy for the irrigation sector. It is because improving water efficiency enables farmers to produce at least the same amount of produce with less water and that, at the very least, maintains the health of regional communities reliant on irrigation. It keeps the truckies employed, maintains throughput in wineries, dairy plants, rice mills, cotton gins, packing sheds etc, and keeps the local economy ticking along without the need to revert to the “bollard principle” (see above).

Government investment – particularly in off-farm delivery systems is also recognition of the fact that most irrigation delivery infrastructure (particularly in the southern basin) was traditionally government-owned and in many cases there has been under-investment in the past leading to degraded assets for which irrigators have had to pay increased maintenance or replacement costs, and which has resulted in increased water losses.

Importantly it also recognises the quantum change in the compact between governments and irrigation communities. Up until the 1990s or later, governments at all levels and of all persuasions have actively encouraged the development of irrigation throughout the basin under the banner of “nation-building”. Many of today’s irrigation schemes were developed for soldier settlers and of course one of the key drivers of the Snowy Mountains Scheme was the opening up of parts of inland Australia for irrigation development.

In the last decade or so, that compact has changed direction completely – irrigation is now discouraged and governments are actively seeking to reduce it. This is a bewildering situation for those communities who thought they were doing the right thing by the nation in setting up food and fibre production industries. In a very short space of time, they have gone from having strong government support to active government opposition.

Coleambally, for example, is the newest town in NSW, having only been settled in the 1960s and 70s in part based on using the waters of the Snowy Scheme. Irrigators find it ironic and perplexing that the Snowy Scheme is regularly championed by politicians as a great nation-building exercise that we should all be proud of and yet the people who use its waters to provide food for that same nation are now demonised.

Much of the development of the cotton industry in northern NSW and Queensland has occurred in the same period including up to the 1990s, again with the active encouragement of governments.

To now have governments – or the wider populace – completely change tack is a quantum shift in that “development” compact and another reason why government has a moral obligation to assist with the transition to the new reality.

NIC members have been part of many infrastructure upgrade programs – from the piping of the SA trusts over many years, to The Living Murray program, Water for Rivers and the current Water for

the Future programs as well as numerous privately funded projects. We are happy to refer the Committee to any examples of previously completed projects and can also provide outlines of new projects.

Environmental works and measures

NIC is disappointed at the scant regard paid to environmental works and measures as a source of both water savings and alternative environmental outcomes.

NIC, the National Farmers' Federation and the Australian Conservation Foundation have previously approached the MDBA seeking further development of such proposals as part of a suite of measures to address environmental needs. Our calls have fallen on deaf ears – the MDBA devotes just a few paragraphs to this option in the Guide.

The MDBA, through its predecessor the MDBC, has put considerable effort into such works and measures through programs such as The Living Murray. It clearly has the necessary capacity to bring forward a suite of projects that could be considered for funding (and estimates of cost) and the estimates of the available water savings and/or environmental outcomes from such projects.

Such savings could play a significant part in offsetting the impacts of new SDLs on basin communities.

Ideally, the MDBA should be able to advise government on the options available to it. To give a hypothetical example: "The SDL for the entire Basin is 9,200 GL, but with the full implementation of the attached works and measures projects at a cost of \$750 million, the SDL could be 10,000 GL".

We also detect disinterest from within the Department of Sustainability, Environment, Water, Population and Communities in any such projects.

NIC is working with State Governments and other organisations to bring forward prospective projects to the Commonwealth for consideration. As the states generally are the managers of the rivers and water infrastructure, we have been strongly lobbying them for assistance in this regard. We do not yet have such a list available for the Committee's consideration but hope to have something publicly available early in 2011. Indications are that there will be significant options – Victoria has already provided a list of possible projects to the Commonwealth.

As an example of the works that could be undertaken, we cite the following from the Victorian Government:

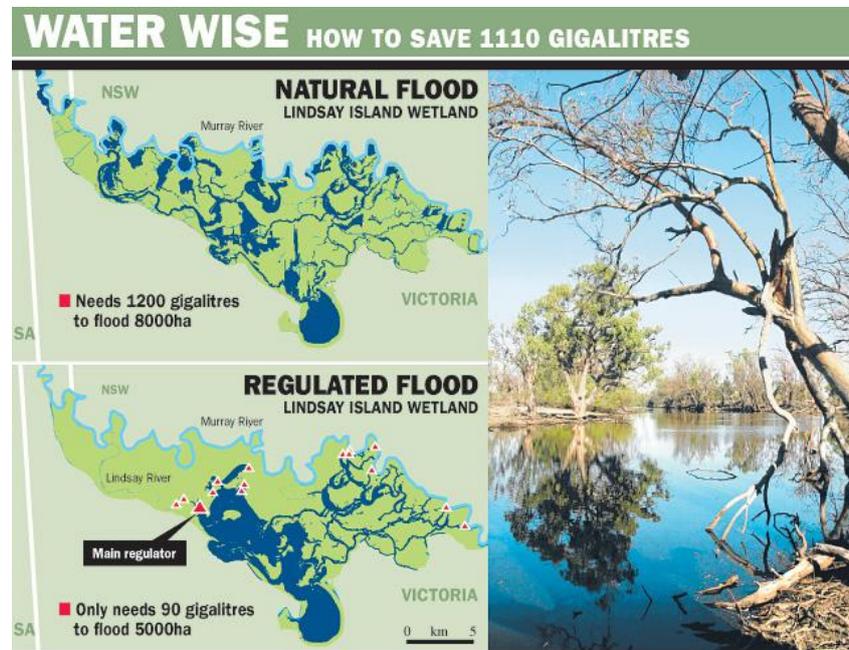
Works at Lindsay Island will enable flooding of 30 per cent of the floodplain (about 5,000 ha), and reduce the amount of environmental water required for each event from 1,200,000 ML to 90,000 ML. To purchase allocation on the temporary market and provide this difference – just once – would cost around \$200 million. To purchase high-reliability water share and provide it more permanently would cost over \$2 billion.²¹

The Victorian Government estimates the cost of these works (installation of a weir on the Lindsay River and eight smaller regulators to retain water on the floodplain) at \$36 million. The works would enable flooding of river red gum communities, permanent and semi-permanent wetlands and provide permanent habitat for fish, turtles and frogs (including the endangered Growling Grass Frog)

²¹ "Priority works to increase the effectiveness and efficiency of environmental water delivery in northern Victoria, July 2010", Unpublished report, Victorian Department of Sustainability and Environment

as well as increased breeding opportunities for water birds including species listed under international treaties.

This is a perfect example of a project that can deliver an environmental outcome for significantly less water and at far less cost than purchase of entitlements. This graphic shows how the project would work:



Graphic courtesy The Weekly Times, 2010

In our submission, the entire Federal Government process has ignored this type of approach for too long, focussing more on buybacks of entitlement which have the potential to suck the wealth out of many of our communities. By investing in more efficient environmental watering outcomes, the Government can deliver on its environmental objectives while limiting the damage to regional communities.

An approach that would be more acceptable in delivering triple bottom line outcomes has already been delivered through co-operation between governments: *Water for Rivers* is a company established by joint agreement between the Commonwealth, NSW and Victorian Governments to recover water for the Snowy and Murray Rivers.

Water for Rivers is on track to meet its target of returning 282 GL of water to the environment (212 GL for the Snowy, 70 GL for the Murray) and it has done this through a strong emphasis of infrastructure investment and environmental works and measures. It has achieved at least 70 per cent of the water recovered through infrastructure and works and measures programs, with only 84 GL directly purchased from irrigators, much of it in conjunction with infrastructure works or irrigation system rationalisation projects.

River Operations

Water for Rivers is pursuing an additional method of recovering water for the environment through more efficient river operations. This is an avenue that has not received significant attention but which can deliver water to the environment and consumptive users by reducing “losses” and unaccounted for water.

The principle uses computer management tools, upgrades of infrastructure and operational processes that enable better, more precise control of flows through river systems. Such a model is proposed for the Murrumbidgee River where a project costing \$80 million could recover 80,000 ML of water. Further information on the Murrumbidgee proposal can be found at www.waterforrivers.org.au/projects/current/murrumbidgee.asp and www.statewater.com.au/Current+Projects/Water+for+Rivers+Projects.

NIC accepts that works and measures may not necessarily achieve the same environmental outcome as a purely flow-related regime. However this is an example of the trade-offs that will need to be considered if we are to achieve a true triple bottom line outcome.

Research, Development and Extension

NIC believes there is a strong role for RD&E in achieving the water efficiencies necessary to deal with the change process.

Irrigation has been served by previous investment in the CRC for Irrigation Futures, the National Program for Sustainable Irrigation (NPSI) and various industry-specific irrigation programs over the years. But with the former two either completed or winding up, there will be a need for further co-investment from government to continue achieving advances in irrigation technology.

NPSI and Irrigation Australia Limited, after consultation with NIC and other industry bodies, have developed a *Future Vision and Options for Irrigation Research, Development and Extension Report* that was released in May 2010. The report outlined a framework for future irrigation research, development and extension in Australia, consisting of a vision, priorities, implementation options and immediate actions. The framework will aid the forward planning of delivery of research results for the industry and has assisted industry input to the various reviews considering research management during 2010.

This process has identified the development of a new “Enduring Joint Venture” as the preferred industry option for ongoing irrigation R&D. We would anticipate this proposal may be seeking government support at some stage in the future and should be actively considered by the Committee.

One of the key factors in improving irrigation efficiency will be adoption – it is apparent that there has been plenty of research and development on irrigation in recent years, the next step is to ensure it is adopted. The decade long drought, commodity prices and availability of capital have been considerable barriers to irrigators investing in new technology in recent years.

• Measures to increase water efficiency and reduces consumption and their relative cost effectiveness;

We have outlined above the types of programs and projects that could be pursued to reduce consumption and improve the effectiveness of environmental watering.

“Relative cost-effectiveness” is an important consideration when balancing water recovery between purchase of entitlements (buyback) and investment in irrigation infrastructure.

We have seen a view put forward in recent months (Treasury, Finance, the Productivity Commission, the Wentworth Group) that infrastructure upgrades are an expensive way of recovering water for the environment and the Commonwealth should redirect funds towards buyback.

This may be true in terms of returning water to the environment, but the commitments to infrastructure spending by both the Howard Government and the Rudd/Gillard Government are a reflection that this process is not just about recovering water. It is also about sustaining communities and that needs to be considered when weighing up “relative cost-effectiveness”.

We are not arguing that infrastructure upgrades should be pursued at any cost. But they will deliver a better return to the nation in the long-run than the very blunt instrument of simply purchasing water with no care for the consequences for communities, family farms or food and fibre production.

• Opportunities for economic growth and diversification within regional communities; and
• Previous relevant reform and structural adjustment programs and the impact on communities and regions.

As outlined above, many of the communities likely to be most affected by the Basin Plan exist because of irrigated agriculture. The availability of productive farming land and water is their competitive advantage. If you take away that advantage, what is left for them?

Those communities with a large enough population have the critical mass to survive, smaller towns close to regional centres might become satellite or commuter towns while others may be sustained by mining or other nearby activities. But the vast majority have few options available to them other than irrigation and opportunities to develop new “blue sky” industries without a competitive advantage of some sort are likely to fail, particularly if driven by well-meaning government programs, rather than by market realities.

A comment on tourism: Tourism is often cited as the great saviour of communities going through structural change, particularly that driven by environmental considerations. The timber and fishing industries come to mind. In our view it rarely offers any sort of comparable replacement to primary industry (a rare exception may be the whale-watching industry in some circumstances).

While it is true that water-related tourism is a significant industry in the Basin, the bulk of it is based on recreation on the many man-made lakes, weirs and dams. There is comparatively little that is completely “eco” in its nature so to suggest that a healthier environment will stimulate greater eco-tourism is simplistic at best.

To support this, we quote one of the reports prepared for the MDBA in assessing the social and economic impacts of the Plan:

Tourism cannot replace agriculture as it is a minor part of the economy.²²

We offer no particular commentary on previous reform except to refer to the “Bollard Principle” outlined above.

²² Economic and Social Profiles and Impact Assessments for the Murray Darling Basin Plan Synthesis Report – Marsden Jacobs and Associates, 7 July 2010

Comments on process

The strong reaction of Basin communities to the release of the Guide is not surprising given for many people in the Basin, this was the first they had heard about the Basin Plan. In our view, an inclusive and consultative process would have been completely different. We believe the MDBA should have started the development of the plan by going to regional communities to:

- a) Outline the “problem” – many stakeholders do not accept or understand that there is a long-term problem with the health of the system
- b) Provide provisional advice as to the possible numbers to be contemplated in the Plan (such as the “range” that was ultimately released)
- c) Discuss possible solutions to returning the rivers to health, including alternatives to current government programs; and
- d) Ensure the community is engaged *before* any recommendations were made.

While we acknowledge that the MDBA was present at various Departmental and other information forums in the Basin, there was little information of substance ever provided and the Basin Community Committee has been so shrouded in secrecy and confidentiality agreements as to be almost pointless.

Confusion over the legal interpretation of the Act has also hampered the process and led to frustration in our communities. As highlighted above, we believe the Committee has a role in advising the Government to amend the Act to ensure it provides a triple-bottom-line outcome.

Quality of science

NIC does not intend to provide a critique of the full gamut of the science as presented in the Guide. However we outline below examples of where imperfect science, assumptions or data is being used or where common sense has been left by the side of the road. This is important if the Committee is to understand why we believe that decisions of this nature cannot simply be left to the “science”, even if it is the best available.

At the technical workshops run by the MDBA in November, it was astounding how often participants were told that there was “more work to do” on issues or that the information had not been “fully developed yet” or that the staff are “aware of the limitations” of the data or science used.

The MDBA admits that most of the evidence base that it uses falls into “the medium confidence category” which “...may not have been subject to formal peer review”²³.

We note the Authority’s comment on page 230 of Volume 2 of the Guide that there is a “lack of available scientific data and research to elicit specific empirical cause-effect relationships for many environmental assets”. In other words, we don’t know that if we provide more water to this site what the outcome might be.

This is further highlighted by the statement that “[the national and international] technical peer review recommended that the Authority specify a range of environmental water requirements for the Basin because its river systems are dynamic and the current level of understanding of ecological responses to environmental water is relatively poor”²⁴ (our emphasis added).

²³ Volume 1, p. 38

²⁴ Volume 1, p. 69

Therefore, are we providing too little? Too much? Too frequently? Not often enough? With this lack of understanding, it is highly likely that the MDBA will fail to achieve its environmental objectives and/or create significant economic hardship for no reason.

To provide another example, salinity was raised as being extremely significant several years ago in the Basin Salinity Management Strategy with dire predictions about future salt loads, particularly in the lower end of the Basin.

We note that the Guide now states that recent data suggests that “future salt mobilisation from dryland catchments is unlikely to realise these predictions”²⁵.

Irrigators are concerned that, like the previous salinity science, some of the more dire predictions in vogue at the moment will prove to be equally unreliable in future, but with the Basin Plan already implemented, the social and economic consequences will have already occurred and the damage done.

The point we make is that the science may be the “best available” but it is clearly not very good and cannot be relied upon to provide definitive answers on the needs of the environment. Ultimately this will require a judgement call on the part of politicians who are elected to decide on how to best balance the competing needs of the community. This should be done after considering the “best available science” and community views. Any decision made simply on “science” or by “expert” groups will fail the triple-bottom-line test.

NIC is aware that the Act requires the Authority to use the best available science and the precautionary principle (in the guise of the “principles of ecologically sustainable development”) in its deliberations. The precautionary principle can be summarised by saying: “Even if we don’t understand the problem or the solution, we should act to protect the environment to be on the safe side.”

As many attendees of the MDBA’s community information sessions have complained, it is disappointing that the precautionary principle is not applied to the social and economic side of the equation, particularly given the MDBA’s self-admitted paucity of accurate data in this area.

Notwithstanding the legislated direction to use the precautionary principle, it is clear that the best available science is indeed, not that great.

Use of Judgement

We are also concerned that significant judgement has been made in coming to final decisions on some key issues. While it is our view that this process does indeed require informed judgements to achieve a balanced outcome, these should be made explicit and justification for the decision made clear.

For example, Volume 2 of the Guide explains that a confidence limit of “+/- 20 per cent” should be applied to the end of system flow requirements at the high uncertainty end and +/- 10 per cent for the low uncertainty end²⁶ but gives no justification for why this figure has been used.

²⁵ Volume 2, part 1, p. 47

²⁶ Volume 2, p. 115

Environmental Watering Requirements

Appendix B of Volume two of the Guide contains a number of examples that highlight our concerns about the quality of the science, data and modelling that is being used.

The section on the Riverland-Chowilla Floodplain notes that the MDBA has predominantly used the “Riverland Ramsar site ecological character description...(Newall et al 2009)” to determine the site’s environmental water requirements.²⁷

In attempting to meet the target for the site of “80 per cent of black box woodland in good condition” the Guide cites Newall’s report as suggesting that flows of 250,000 ML per day would be required. It then goes on to highlight that such flows have only occurred once in 110 years and so are clearly not accurate or realistic. Even flows of 140,000 ML per day have only occurred 9 times in 110 years, so the Authority has settled on a figure of 125,000 ML per day at least 10 years in 100 to meet its targets.

It is not surprising then that the Guide states: “...recommended flow regimes and inundation requirements within existing literature are often inconsistent with the modelled without-development flow data (this is not uncommon)”.²⁸

The Guide attempts to explain these anomalies on page 664, but it does beg the question – if these numbers were so unrealistic, what other data is inaccurate or nonsensical?

The same section also notes that there are “inconsistencies between modelled floodplain inundation and modelled flows that are unresolved”²⁹.

Sustainable Rivers Audit – an appropriate evidence base?

The Guide relies heavily on the MDBA’s Sustainable Rivers Audit (SRA) as the basis for the health of the rivers and therefore the need to act. In our view, this is an unrealistic base from which to work.

Firstly, the SRA was undertaken between 2004 and 2007 in the middle of the worst drought in recorded history. It is therefore not surprising that in a period of extremely limited water availability, the health of the system was found to be under stress, even allowing for the fact that the data was compared against a “without-development” reference period.

But secondly, and as mentioned earlier in relation to the *Water Act 2007*, the SRA considered three distinct measures of river health of which hydrology (water flow) was only one.

The overall results of the SRA indicate that only three of the 23 river valleys were assessed as being in “good” or “moderate” ecosystem health and the remaining 20 were rated “poor” or “very poor”. However on the hydrology measure, the result is almost exactly reversed: only five valleys were in the “poor to moderate category”, while the remaining 18 are rated “moderate to good”.

As the Guide points out: “More than two-thirds of sites were rated as being in moderate to good condition in terms of long-term hydrologic regimes”³⁰.

²⁷ Volume 2, Appendix B, p. 661

²⁸ Ibid, p. 663

²⁹ Ibid, p. 661

³⁰ Volume 2, part 1, p. 31

So the SRA indicates that the problem is not just lack of water, but the only solution the MDBA is offering is - more water.

Given the Basin Plan is all about returning flows to the rivers, we fail to see how it will address the non-flow measures of fish and macroinvertebrate condition given that neither of these are entirely reliant on flow for their health and are of course influenced by other factors such as introduced species, land use, cold water pollution and migration paths.

Inconsistency of targets

Appendix B of Volume 2 of the Guide outlines the environmental watering requirements for the key hydrologic indicator sites. For the sites along the River Murray, there is an inconsistency in the targets that are set and with no explanation of why.

For example, consider the following table which outlines the targets set for river red gum and black box communities:

Indicator site	Red gum forest ^a	Red gum woodland ^a	Black box ^a	Reference ^b
Barmah Millewa	100	100	100	p.611
Gunbower-Koondrook-Pericoota	100	100	100	p.635
Hattah Lakes	100	80	50	p.651
Chowilla Floodplain	80	80	80	p.660

^a Percentage target to maintain in "good condition"

^b From Volume 2, Part II, Appendix B

The Guide provides no explanation as to why these differing targets have been chosen for the same species on the same river.

In addition, the same section also provides the requirements for the Edwards-Wakool system and yet couches the targets in terms of area: >15,000 ha for red gums and >2000 ha for black box, however no explanation is given for why a different unit of measure is used.

Potentially unrealistic targets

As per the above, we submit that it is inappropriate and misleading to target 100 per cent of a given species to be in good condition. Even under completely natural situations we submit that a percentage of trees would be less healthy given distance from the river channel or proximity on the flood plain, disease and pest attack.

End-of-system flows

Irrigators understand the need for adequate end-of-system flows to maintain a healthy system, however we believe the Authority has failed to justify the arbitrary targets it has set. It indicates that 60 to 80 per cent of without development flows in a certain catchment is considered "moderate" and should be an aggregate target³¹.

NIC asked MDBA staff at the November workshop what the scientific justification was for using end of system flows as an indicator of catchment health. The answer we got was: "We looked at all the options and that's the one we thought was the best". Hardly scientific.

³¹ Volume 2, Part 1, p. 104

We believe the end of system flow data is highly questionable to begin with.

According to the Guide³², Gwydir River inflows are 1,131GL and without development end-of system flows have been calculated at 429 GL or 38 per cent of inflows. The Gwydir is essentially a terminal wetland system. Local knowledge around the Gwydir strongly indicates that the only time the Gwydir made significant contributions to the Barwon Darling was during large floods – about five times over the past century. By comparison the same table shows total Border Rivers inflows of 2195 GL with pre-development outflows of 797 GL or 36 per cent, while the Namoi has pre-development outflows of 39 per cent. It is inconceivable that a terminal wetland river system has a higher without development outflow than freely flowing systems like the Border Rivers and Namoi.

Ramsar – time of listing

The environmental water requirements for the Barmah-Millewa Forest provide an insight into another difficult-to-comprehend component of the process, albeit not one of the MDBA's making.

Barmah and Millewa forests were listed under the Ramsar convention in 1982 and 2003 respectively, yet they are effectively the same environmental asset divided by the river channel which happens to also be the state border (hence the different time of listing).

The Guide indicates that one of the objectives is maintain the ecological character of the site at the time of listing³³. Subsequently it indicates that the ecological character of Barmah has been used as the driver of targets for the whole forest. So we have a character description based on 1982 circumstances being used to set targets for half an asset that must be kept at 2003 conditions (according to Ramsar).

We acknowledge that this is not an issue of the MDBA's making and its approach in the circumstances is logical, but it does highlight one of the problems of using agreements such as the Ramsar treaty for the purpose of the Basin Plan.

Current Diversion Limits

NIC is concerned that the method used by the MDBA for establishing Current Diversion Limits is opaque, inconsistent across water resource plan areas and confusing.

Many of our members have reported complete bewilderment as to how the MDBA has calculated the CDLs for both surface water and groundwater and why the final numbers have been used.

In our view, the previous "Cap" should be the starting point for any water source. The use of any other measure will undoubtedly create further inequities between regions and states. Section 75 [4] of the *Water Act 2007* states that the relevant diversion limit (the starting point) is "the earliest long-term average sustainable diversion limit for those water resources or part of those water sources, that applied:

- (a) During the 10 years immediately preceding the reduction..."

It is not clear to us that the MDBA has in fact followed this directive from the Act, particularly in a number of instances where it appears that "current use" has been used, as opposed to current allowable diversions.

³² Volume 1, p. 47

³³ Ibid, p. 610

Interception activities (plantations and farm dams)

General policy

NIC understands that the treatment of interception activities is a highly complex and fraught area of policy. We also note that regulation of these activities is a matter for the states.

However we are extremely concerned at the implication in the Guide that, while interception and watercourse diversions are both considered forms of “take”, only watercourse diversions can actually be cut to meet new SDLs.

It is clear that the interception of water by plantation forestry and farm dams has increased considerably in recent decades and has had a marked impact on available water in the system. That irrigators are now being asked to bear the full load of any cuts to restore the system to health, when other sectors have had a demonstrated impact on the resource is completely unfair and cannot be tolerated.

In our view, the Committee should advise governments of the need to ensure that all forms of take are fully accounted for and included in the licensing system. That is, if interception activities are considered to have an impact on the available resource, then those responsible for the activities must be made to purchase entitlements in the market place like any other economic user. The creation of new entitlements to meet the needs of these activities in a capped system would have detrimental third party effects and cannot be tolerated.

Data contained within the Guide

NIC believes the Authority has made a significant error in both the presentation of interception estimates and the estimates themselves.

On the one hand it indicates that floodplain harvesting is included in calculations of water course diversions (pgs 47 and 48, volume 1), but then Table 5.3 on page 52 of volume one would appear to indicate that dams used for floodplain harvesting are included in interception. The figures for valleys such as the Condamine-Balonne (203 GL), Namoi (139 GL) and Macquarie-Castlereagh (156) would appear to be very high if they did not include floodplain harvesting, as there is relatively little in the way of peri-urban development or other developments that would necessitate such large farm dam figures in these catchments.

Additionally, the numbers for the Lachlan (230 GL) and Murrumbidgee (344 GL) are very significant and highly doubtful. It is very hard to believe that either of these catchments have farm dams of this magnitude that are not already included in water course diversion calculations.

The Authority practically admits on page 109 that it has little confidence in the data, while the note to the table on page 52 also advises that the “Authority will work to improve estimates of interception...”. Personal discussions with MDBA staff also indicate a lack of confidence in these estimates.

The table indicates an estimate of 1803 GL of water is intercepted by farm dams that are not used for basic rights, not floodplain harvesting and not already counted in watercourse or groundwater diversions. That equates to 13 per cent of all take in the Basin and would appear to be a highly questionable figure.

Environmental watering or deliberate flooding?

A matter of considerable concern that has been raised with the MDBA through the public consultation process and regularly with NIC is the ability of authorities to provide environmental watering without flooding private land.

We note that on page 199 of volume 1 of the Guide, the MDBA addresses this significant issue (in two paragraphs) and concludes that “the overall risk of flood inundation is low”. This is based on the view that most requirements for key environmental assets recommend flows up to the five year flood average.

However, we remain concerned that this risk assessment is flimsy at best and we offer the following example of why.

The environmental water requirements for the Lower Goulburn Floodplain include a target of flows measured at McCoy’s Bridge of 60,000 ML per day for seven days (with a one day minimum). The Guide targets this level of flow at between 15 and 20 per cent of years, whereas under current conditions it occurs only 6 years in 100.³⁴

In early September of 2010 after significant rainfall, the flow rate at McCoy’s Bridge happened to peak at almost exactly 60,000 ML per day.³⁵ This particular event caused significant flood damage throughout the Shepparton area (upstream), particularly to local infrastructure with the City of Greater Shepparton estimating damage of up to \$2 million.³⁶ This does not account for the costs incurred by landowners through lost crops and stock.

So even at the bottom end of the proposed range, the MDBA is proposing to almost *triple* the frequency of a flood of this magnitude. This raises significant issues of risk that are not adequately addressed by the Guide.

To provide another example the Commonwealth recently gave up the opportunity to use some of the supplementary entitlements it has purchased on the Gwydir River apparently because the Gwydir wetlands were already flooded and to provide further water would have exacerbated flood damage already occurring to dryland crops surrounding the wetlands.

Finally, the Guide regularly refers to the timing of high flow events as being “constrained to reflect the fact that high flows are dependent on heavy rainfall and will be largely unregulated events”³⁷. This highlights the difficulty of planning environmental watering when high flows rely on rainfall events – we can model how they might be allowed to happen, but we can’t control them.

The Committee needs to be aware of the minefield of legal issues thrown up by the proposed watering regimes that will potentially create significant issues for governments.

Offsets

In our submission, the Authority has poorly explained its methods for accounting for previous savings projects or offsets.

³⁴ Volume 2, Appendix B, p. 531, Table B4.5

³⁵ http://riverdata.mdba.gov.au/sitereports/405232c/405232c_0100.00_0400.00.csv, See 10 September, 2010

³⁶ <http://www.abc.net.au/news/stories/2010/09/23/3019964.htm?site=shepparton>

³⁷ Numerous repeats, for an example see Volume 2, Appendix B, p. 531, Table B4.5

Section 11.1 on page 152 of Volume 1 outlines the “Bridging the Gap” aspect of the *Water for the Future Program* and also outlines other relevant government programs that “could” help offset the proposed reductions. This should be revised to make it abundantly clear which previously saved water will be used as offsets. As a starting point, the 70 GL saved by Water for Rivers for the River Murray should be included.

This is an issue that has caused considerable concern for the irrigation sector and must be outlined with more clarity in the proposed Basin Plan.

We believe the Committee can play a role in this process by helping to collate the water that can be used as offsets.

Conclusion

In NIC’s submission, the Guide does not deliver on the triple-bottom-line promise of the National Water Initiative. This is both a failing of the MDBA and of the process more generally, in particular the *Water Act 2007*.

Irrigators accept there needs to be some water returned permanently to the environment.

But it is clear to us from the critique of the science and process outlined above that it is not possible to have the “science” tell Government what the environment “needs”. Clearly the science cannot deliver in any meaningful way and will always be open to interpretation in any event, particularly given the highly variable nature of Australia’s river systems.

In our submission, a balanced outcome will entail consideration of the best available science along with community views before a judgement call from elected politicians – it cannot be delivered as a definitive technical answer from the Authority.

END OF SUBMISSION

Attachment A

Summary of recommendations given to the MDBA

Some of the contents of this submission are replicated from NIC's submission to the MDBA. That submission contained the following list of recommendations. These recommendations relate to specific issues raised in the submission requiring a response from the MDBA and should not be seen as a compendium of the only issues that need to be addressed in the Guide.

Recommendation 1a: That the MDBA immediately release any legal advice it has relied on in preparing the Basin Plan pursuant to the *Water Act 2007*.

Recommendation 1b: That the MDBA advise the Government of the need to amend the *Water Act 2007* to provide equal consideration of social, economic and environmental outcomes to ensure compliance with the National Water Initiative.

Recommendation 1c: That the MDBA advise the Government of the need to place a focus on and/or amend the *Water Act 2007* to adequately consider non-flow related environmental problems throughout the Murray-Darling.

Recommendation 2: That the MDBA produce a list of recommended environmental works and measures projects, along with indicative costs, water savings and environmental outcomes, for consideration by governments.

Recommendation 3: That the MDBA clearly advise Government that it cannot be sure of achieving environmental outcomes based on the "best available science" and that current programs such as Water for the Future (current forward estimates programs), The Living Murray and Water for Rivers be allowed to proceed and then assessed for measurable outcomes before additional water recovery is pursued.

Recommendation 4: That the MDBA clearly explain where judgement has been used in finalising decisions and fully justify how it arrived at such judgements.

Recommendation 5: That the MDBA use wider measures of river health than just hydrology and solutions other than "just add water" must be provided.

Recommendation 6: That future work by the MDBA in assessing the social and economic impacts of the Basin Plan focus specifically on the local, regional and short-term impacts, rather than those of a Basin-wide or national scale and in the long-term.

Recommendation 7: That the MDBA provide a scientific justification for the use of 60-80 per cent of natural end-of-system flows as its main indicator of environmental health, including alternative measures that were considered and rejected.

Recommendation 8a: The MDBA should advise governments that interception activities need to be fully accounted for in water accounts and that any interception regarded as take should be licensed and entitlements to reflect that licensing purchased in the open market.

Recommendation 8b: That the MDBA explain how it will improve estimates of interception activity.

Recommendation 9: That the MDBA undertake further work on the potential for flood inundation of private land if its recommendations are followed and explain how the risk and legal issues of such events is to be managed.

Recommendation 10: That the MDBA work with other government agencies to compile all of the water available to be used as offsets and indicate the volume of water previously recovered that has already been included in the current diversion limit calculations.