



National Irrigators' Council

Northern Basin Review

Proposed Basin Plan amendments

February 2017

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Executive Summary

National Irrigators' Council (NIC) provides this submission in good faith, on the basis that there will be a genuine effort to take into account our concerns. Our Northern Basin members will provide their individual submissions to the proposed Basin Plan amendments and in doing so will go to specific detail relevant to their respective valley groups. In this context, we make the point that submissions provided to the proposed Basin Plan amendments are coming from the communities that are already experiencing the real, and severe, consequences of a 'No Regrets' Basin Plan.

We take the opportunity to reiterate the points we have made repeatedly:

- **ENOUGH IS ENOUGH:** there must be no further water recovery in the Northern Basin.
- Communities are paying the price for the deeply flawed 'just add water' approach.
- Concern is palpable in Northern Basin communities where recovery targets are having significant, indeed unacceptable, socio economic impacts.
- The focus needs to shift from recovery targets and modelling to achieving outcomes.
- The adoption and implementation of complementary measures provides the pathway for genuine environmental gains while minimising social and economic pain.
- Given the now overwhelming evidence of socio economic impact, there should be no more **water acquisition across the Northern Basin**. Communities must not be expected to bear further economic and social damage as a consequence of the flawed 'just add water' approach and the ill-conceived 'no-regrets' buyback – this is especially so given that after the recovery of 278GL (71% of the original target of 390GL), and severe to catastrophic impacts on communities, the extent of environmental improvement is marginal or in some instances almost indiscernible. The recovery of 278GL to date has cost the Northern Basin \$139 million annually in lost farm-gate production. Based on a conservative 3:1 multiplier effect, this accounts for over \$400 million lost to communities in the Northern Basin annually.
- There must be a clear and real key focus on the sustainability of northern irrigation communities, because that is what the Government has promised throughout the Basin planning process and indeed committed to in the Plan. Communities must be given the opportunity not just to survive, but to thrive..
- Greater effort must be directed to the development of a suite of non-flow measures, as proposed by the Northern Basin Advisory Committee (NBAC), and advocated by NIC including:
 - carp control through the release of the Carp Herpes virus
 - appropriate management of cold water pollution
 - improvement of fish migration through fish-ways
 - restoration of native fish habitat
 - feral animal and weed control in wetlands and riparian areas
 - increased ability for CEWH to trade water.
- The implementation of non-flow approaches to achieve environmental outcomes (rather than the recovery of more water entitlement) and proper measurement of long term environmental outcomes is critical to the sustainability of communities throughout the Northern Basin, but also, critical to the sustainability of the Basin Plan itself. It provides the best chance of delivering real environmental outcomes.
- The Northern Basin review has indicated that notwithstanding the recovery of 278 GL, there is little concrete evidence that the 278 GL recovered to date is providing genuine environmental benefits. It should therefore be clear to the MDBA that the achievement of some of modelled

Site-Specific Flow Indicators from the water recovered to date is not synonymous with the actual delivery of environmental outcomes. While that situation remains the case, there is no case for the recovery of more water; indeed consideration ought to be given to returning some of the 278 GL back to productive use.

Introduction

The National Irrigators' Council (NIC) welcomes the opportunity to comment on the proposed Basin Plan amendments that have arisen largely as a result of the Northern Basin Review.

The issues highlighted in this submission have been raised with Murray-Darling Basin Authority (MDBA) officials repeatedly by our Northern Basin members in various forums.

NIC has consistently advocated a 'triple bottom line' approach. NIC has highlighted on many occasions that the strategy of just adding water was flawed, that it would have major impacts on producers and communities and would fail to produce the desired environmental outcomes. It is hoped that this latest opportunity for consultation on the proposed amendments represents a genuine opportunity to restore balance to the Basin Plan and achieve the promised 'triple bottom line'.

There is no dispute that we all agree on the need for a sustainable working river system into the future, yet disagree on how best to achieve this. There is no good reason why 'environmental capital' must be restored at the expense of existing social and economic capital, particularly when other alternatives exist. NIC is, therefore, very concerned that the very recent momentum around non flow/complementary measures is backed up with a real commitment to their implementation as part of a Basin Plan that is supposed to embrace adaptive management.

Irrigated agriculture plays a vital part in producing the food and fibre Australians consume, as well as producing jobs and export income for our nation. It contributes to the living standards of every Australian, regardless of where they live and, in particular, to families living in regional communities.

The total gross value of irrigated agricultural production in Australia in 2014-15 was over \$15 billion. (ABS) Irrigated agriculture contributes to the social and economic wellbeing of rural and regional communities and to the national economy, producing goods such as milk, fruit, vegetables, rice, grains, sugar, nuts, meat and other commodities like cotton.

It is refreshing that the Northern Basin review:

- Acknowledges that the socio-economic impacts have been greater than predicted by the MDBA and indeed severe in many communities. This "official" recognition has been a long time coming and the associated findings must now inform all future decisions on the implementation of the Basin Plan.
- Recognises that that improving environmental outcomes is about much more than just adding water and that complementary measures are essential to achieve positive environmental improvements;
- Implicitly accepts the need for the Commonwealth to provide a 'whole-of-Government' response to provide structural adjustment assistance to communities impacted by the Basin Plan. Again, this was a commitment made by the Commonwealth early in the Basin Plan process.

The MDBA summary documenting the amendments to the Basin Plan states: *The purpose of the review was to improve the Authority's knowledge of the northern basin, including the water needs of water-dependent ecosystems and how water recovery has affected communities.* NIC's members in the Northern Basin believe that the information in Table 1, which comes from the MDBA, answers that question unequivocally. NIC also submits that even these numbers do not tell the full story because they do not take account of the impact of the recovery of water by Government that occurred prior to the Basin Plan – as such, the 'baseline' used by the MDBA did not address the extent to which the potential of communities across the Northern Basin had already been limited. Further, the MDBA's modelling failed to adequately address the fact that the impact in one community is not contained to that community i.e. that there is a 'distributed' effect across regions.

What these numbers do say is that the question of whether or not more water can be recovered in the Northern Basin through programs like Sustaining the Basin and Healthy Headwater, in a way that is social and economically neutral, has been answered unequivocally!

Table 1. Employment Outcomes from Water Recovery Scenarios

Town	390 GL employment effects	320 GL employment effects	278 GL employment effects
Boggabri	<5	<5	0
Bourke	25	28	28
Collarenebri	54	54	54
Dirranbandi	64	49	33
Goondiwindi	17	24	+21
Gunnedah	18	12	<5
Moree	152	96	116
Mungindi	<10	<10	+3
Narrabri	17	<10	0
Narromine	55	41	55
St George	137	83	49
Trangie	17	13	17
Walgett	<5	<5	0
Warren	114	89	114
Wee Waa	32	23	8
Total	Approx. 710	Approx. 530	Approx. 450

Source MDBA: provided on request

Notwithstanding some of the limitations of the modelling within the Northern basin review, NIC acknowledges the work required of the MDBA to undertake and complete the review, and to conduct the subsequent recent series of community and stakeholder consultations. It also recognises that the clock cannot be turned back. As such, NIC remains committed to working with the Commonwealth and the MDBA for as long as it feels they are genuinely committed to redressing the limitations of the Basin Plan; delivery of the 'triple bottom line' and amelioration of the economic and social disadvantage that has occurred as a consequence of the Plan thus far.

In the context of the proposed amendments to the Basin Plan, we submit the following broad comments on the principles that should govern decisions about where we go from here.

Response to Individual Recommendations

MDBA Recommendation 1: *The Authority recommends the water recovery target for northern Basin catchments be amended to 320 GL on the basis that the Australian, Queensland and New South Wales governments agree to implement a number of so-called 'toolkit measures' designed to improve water management.*

NIC submits that the recovery target cease at the current level of 278 GL because the Northern Basin Review has cast very real doubt on the value of more water recovery, while making it starkly apparent what the social and economic consequences of such action will be.

We further submit that the revised distribution of Local and Downstream recovery targets proposed will create perverse outcomes, and will see communities within the Northern Basin being pitted against each for survival. In making this submission, NIC asks why the alternative modelled volumes that demonstrate similar environmental outcomes (i.e. the same number of flow indicators achieved with a smaller recovery volume) are, in effect, being set aside? NIC also submits that if the Authority is intent on ignoring these alternative scenarios, it must explain its reasons for doing so because to date, there has been no such explanation.

While NIC supports the concept of toolkit measures, it must reserve its position beyond that until it has been provided with an opportunity to understand the full suite of measures proposed by the Northern Basin Advisory Committee and the risk assessments that underpin them. In this regard, NIC needs to be satisfied that there will not be third-party impacts on reliability and or availability of water allocations and access to delivery and that the characteristics of water entitlements will remain unchanged.

MDBA Recommendation 2. *The Authority recommends the targeted recovery of water, both in terms of geographic location and the class of entitlement, to improve environmental benefits.*

This recommendation is noted, and in particular the reference to 'potential to mitigate social and economic impacts in the Condamine-Balonne by recovering water upstream of the Beardmore Dam'. We endorse the principle that the Commonwealth should only own water that will be of the greatest value to its desired outcomes and guided by minimising the potential impacts of its recovery to the greatest degree possible.

MDBA Recommendation 3. *The Authority recommends improvements to state water management arrangements to safeguard low flows across the north (particularly in the Condamine–Balonne and Barwon–Darling).*

The commentary in this recommendation on active management of environmental flows is noted. However, protection of environmental flows through water shepherding has the potential to cause negative third-party impacts, to change the characteristics of water entitlements and may impact reliability and availability. As a result NIC must reserve its position until it has had an opportunity to review the related detail.

NIC does support, however, the more flexible approach to achieving environmental outcomes through use of private infrastructure, commercial arrangements between water users and other adaptive management of the Commonwealth's water assets.

MDBA Recommendation 4. *The Authority recommends the proposed infrastructure measure at the Gwydir wetlands be implemented.*

NIC supports, in principle, projects that efficiently deliver environmental outcomes. However, such projects must be pursued only when the scientific, economic and social evidence supports them. Further work is required to assess the potential of this project including scientific review of outcomes being targeted, particularly given that most SFIs (site-specific flow indicators) are met in the Gwydir and those not being met are being addressed through current management arrangements. There also needs to be a thorough cost-benefit analysis of the project to ensure that the outcomes being targeted can be efficiently and economically achieved.

MDBA Recommendation 5. *The Authority recommends works to promote native fish health through improving their ability to move through the river system and access habitat in the northern Basin.*

NIC has long advocated complementary measures, such as fish-passage, as a way of improving river health. In particular, investment in reducing cold water pollution is strongly supported.

Fish passage is a critical issue that determined flow thresholds as the SSFI sites in many northern valleys and funding of practical measures to provide for native fish passage is strongly supported.

Cold water pollution is another key issue impacting fish outcomes in regulated tributary catchments instream and further investigation of measures to mitigate this issue should be explored in conjunction with water users. Funding of these measures, both initial capital and ongoing maintenance costs, should be apportioned not just to licenced water holders, but across all sectors of the community.

MDBA Recommendation 6. *The Authority recommends there be a preference for water recovery based on irrigation infrastructure improvements rather than through water entitlement purchasing.*

NIC's strong view is that surface water recovery in the Northern Basin should cease at the current level for reasons that we have already outlined. Water is the factor that underpins most Northern Basin communities and the amount of water entitlement that has already been surrendered across this area, both before and as a consequence of the Basin Plan, has already reduced the long-term viability of many communities. Given the amount of water recovery that has already occurred, the notion that more water recovery from farms can occur and will be socially and economically neutral is fundamentally flawed.

MDBA Recommendation 7. *The Authority recommends that governments consider support for the following measures, to address the concerns of Aboriginal people in the Northern Basin:*

- *Ensuring Aboriginal access to waterways*
- *Replacing or refurbishing weir pools at certain locations, such as Wilcannia and Cunnamulla*
- *Continuing to improve the capacity of Aboriginal people to engage in water planning and decision-making, in order to factor in their social and cultural imperatives.*

NIC supports the use, access and management of both planned and held environmental water entitlements by indigenous groups in a way that is consistent with, and complementary to, environmental needs. NIC notes that the economic downturn across the Northern Basin brought about by the Basin Plan has been felt by all sectors of the population within the region, including indigenous Australians (many of whom used to work in the Cotton industry).

MDBA Recommendation 8. *The Authority recommends that governments consider further support, particularly for Dirranbandi and Warren.*

NIC agrees that the communities of Dirranbandi and Warren have been severely impacted by the Basin Plan and that these, and many other communities need, and deserve, further support from government. It notes that throughout the development of the Basin Plan assurances were given that a 'whole of government' approach would be taken to respond where there was a need for structural adjustment as a result of the Basin Plan. NIC looks to government to honour this commitment and notes that the need for commitment will extend beyond these two communities. It also notes that the public funding that has been committed to date in this regard, through the Murray-Darling Basin Regional Economic Diversification Program (MDBREDP), has been insufficient and poorly targeted.

Social, environmental and economic impacts

The MDBA should be in no doubt that, notwithstanding the release of the Northern Basin review report and the subsequent community consultation, community concern regarding the Basin Plan remains 'palpable'.

Irrigated agricultural production is being impacted through the water recovery that has occurred to date, and especially by that secured by buyback, and the resulting impacts is reverberating across many communities. By way of example, cotton is the lifeblood of many regional communities, employing 10,000 Australians in Queensland and New South Wales in a non-drought year. One megalitre of water produces a bale of cotton worth \$500 on farm, with a 3:1 multiplier effect within our Basin communities. Each gigalitre of water used for cotton production results in 1.3 direct jobs and generates \$500,000 in gross value of agricultural production. *{Source: Stubbs Report, 2012}.*

The loss of between 25-30% water has had varying impacts across the Northern Basin, but as the MDBA's own review has shown, up to 35% of agricultural jobs have already been lost in some communities – and NIC notes that even this estimate is conservative.

If further water is to be recovered, further job losses and broader impacts are inevitable. The research is damning and it must form the basis of future action to ensure that adjusted targets are met without future water buyback. The current level of impact is made even more damning by the knowledge that the level of environmental outcome is less than expected. Results so far show little to no measured environmental benefits of water recovery to date. 278 GL of water recovery (which is only 71% of the planned recovery target) has cost the Northern Basin \$139 million annually in lost primary production and as Table 1 shows the rate of social and economic impact is exponentially higher with each additional tranche of water recovery, while the level of environmental improvement is only marginally increased – NIC considers this a classic example of the law of diminishing return.

NIC is in complete agreement with the finding in the Northern Basin Review document titled *Understanding the economic, social and environmental outcomes from water recover in the northern basin* that it is not only the volume of water recovery that affects communities. It is also *where, when* and *how* that recovery affects a community and its ability to adapt, and uncertainty around future water recovery impacts community confidence.

The social and economic condition report produced for Collarenebri highlights the significant changes in Collarenebri and surrounding areas over the past fifteen years. While the cause of these changes can be attributed to a range of factors including drought, mechanisation and changes in technology, it is clear that the recovery of water has been a significant factor. The report notes that the Collarenebri community will be seriously challenged to respond and adapt to more large changes, and that some of the changes associated with water recovery in the Collarenebri community have had a flow-on effect to Moree-based businesses and the Moree community.

The social and economic condition report produced for St George notes that much of the 16 GL recovered from the area through purchase by the Australian Government, from an original total entitlement held by the St George community of 216 GL, was purchased in 2012-13 – this represents a significant loss over a short period.

Most water in the Dirranbandi-Hebel community was purchased in 2011-12, representing a 20% reduction in available water for irrigation.

Governments have been quick to point the resilience of farmers and farming communities over time but such accolades are becoming increasingly hollow, indeed offensive, across the Northern Basin because it is one thing to cope with the uncertainties of nature, weather, pestilence, market prices and currency fluctuation but something completely else to have to deal with a Plan that has been shown to overly aspirational, lacking in detail and flawed in some major regards.

Complementary measures

The focus for the Basin Plan must shift from numbers to outcomes as the Northern Basin review clearly illustrates that the acquisition of more water for the environment will only deliver a questionable level of environmental benefit while guaranteeing exponentially higher levels of social and economic pain. The focus should shift towards achieving better ecological outcomes through a range of non-flow measures, such as those that used to be part of the Caring for Our Country, and improving riparian management. A package of measures with short, medium and long term outcomes must form the basis of any approach, to ensure that native species have the greatest opportunity to thrive. This form of approach will deliver the Basin Plan's environmental objectives over time without additional collateral damage to regional communities. Such measures fall into two categories, fundamental interventions or actions required to achieve improved ecological outcomes in our river systems, or new opportunities for operation and management of environmental resources.

Examples of such measures are:

a) Carp control through the release of the Carp Herpes virus

Carp make up around 80% of the fish biomass in the Murray Darling Basin, and this level of presence costs the nation up to \$500 million in lost opportunity annually. There is empirical evidence that shows Carp impact on water quality, plankton levels, the frequency and duration of algal bloom, native fish, macrophytes and water birdsⁱ - sadly, much of this impact is wrongly attributed to productive water-users.

Research has shown that a carp specific virus known as Cyprinid herpesvirus 3 is highly effective on the carp species present in Australia. International case studies indicate the virus will kill 70-100% of carp in a native population within a very short time. The virus also has been shown to only affect Common carp and Koi carp (same species) and that it not impact adversely on other fish species, birds, reptiles, amphibians, mammals or crustacea.

While the types of environmental flows built into the Basin Plan might deliver some benefits to some valuable components of the ecosystem, they are also known to increase carp breeding if delivered onto floodplain habitats during warmer months.

The Australian Government's announcement of a \$15 million investment to undertake the necessary work with a plan to release a carp-specific herpes virus into waterways is welcomed by NIC. The work will focus on:

- Planning for introduction of a carp biocontrol agent, including:
 - public consultation
 - virus preparation
 - monitoring and research
 - planning for release and clean up
- International case studies to inform clean-up methods, along with field-based research to determine carp biomass levels. Areas important to social amenity will also be mapped to inform prioritisation of clean-up efforts.
- Research will be undertaken over the next two years to improve the precision of carp biomass estimates in the Murray-Darling Basin, and to identify options for use of harvested carp biomass following the release of the virus.

To ensure that carp numbers do not rebuild after release, it will be necessary to employ additional measures to suppress carp and promote recovery of native fish communities (with the latter being estimated at 10% of pre-existing condition). NIC notes that 30-40% of the freshwater fish species in the Murray-Darling are now listed as threatened or are conservation dependent without appropriate measures in place to recover stocks.

While Carp is the biggest threat to the health of aquatic ecosystems across the Basin, other factors are contributing to the decline of native species, including:

- degradation of habitat and water quality;
- overfishing;
- thermal pollution; and,
- barriers to fish migration.

Significant social and economic benefit, derived from improved inland fish resources, is likely to occur as a result of the eradication of carp and the rectification of the above matters.

NIC recommends that the any carp biocontrol program and improvements to environmental flow delivery need to be accompanied by parallel efforts to:

- re-establish populations of locally extinct native fish species through re-stocking following carp removal
- mitigation cold water pollution at four priority dams
- restore native fish habitat along river reaches within priority river valleys through the Murray-Darling Basin

b) appropriate management of cold water pollution

The importance of water temperature for breeding, feeding, growth and larval survival in native fish species has been well understood for over a decade, as is the impact of cold water pollution on aquatic organisms and river health in the Murray-Darling Basin. A recent study noted that mortality levels in Murray cod eggs can reach 100% at 13 degrees Celsius, and that low water temperatures can dramatically reduce growth rates in species including Freshwater catfish and Murray cod, and can cause up to 30% mortality in Silver perchⁱⁱ. All of these species are 'listed'

under either national or state environmental legislation and over 2500km of riverine environment is now understood to be affected by thermal pollution in the Murray-Darling Basin.

There are cost effective engineering solutions to cold water pollution and these measures must be given a proper place in the Basin Plan.

c) improvement of fish migration through fishways along the Barwon-Darling & tributary catchments

Many native fish species are now known to migrate during various stages of their life and barriers to migration are now listed as a key threatening process in state and Commonwealth threatened species legislation.

Future-focussed investment from the MDBA in the Sea to Hume program has seen fish passage restored over 2225 km of riverine habitat by installation of fishways at 15 barriers in the southern MDB. Reinstatement of fish passage at 13 barriers in the main stem of the Darling, Barwon, Paroo and Warrego Rivers would reinstate continuous access 5180 km. This outcome would exceed the Sea to Hume program, which is currently, and rightfully, lauded as one of the largest ecological rehabilitation projects undertaken in Australia. Tributary fishways also open up significant kilometres of passage and improve environmental outcomes associated with instream site specific indicator sites.

d) restoration of native fish habitat

A healthy habitat is vital to the condition of native fish communities. Numerous studies throughout Australia have demonstrated the value of restoring fish habitat for native fish communities. In the Condamine River, habitat improvement along the Dewfish Demonstration Reach resulted in significant increases in Golden perch (5 x increase), Murray cod (from absent to captured every survey), Spangled perch, Bony bream (11 x increase), Carp gudgeon (1200 x increase), and Murray-Darling Rainbowfish (60 x increase).

Re-snagging in the lower Murray resulted in a threefold increase in Murray cod, and was estimated to significantly increase overall population sizeⁱⁱⁱ It would also result in lower flow thresholds being required if re-snagging occurred at lower heights to provide adequate habitat that is submerged for periods long enough to be of benefit.

e) feral animal control in wetlands such as the Narran Lakes, Gwydir Wetlands and Macquarie Marshes.

Feral pigs are one of Australia's most successful and widespread invasive species. Their success is largely due to their omnivorous diet, comprising mostly green grasses and herbs. They also eat a variety of native vertebrate species including reptiles, amphibians, birds and mammals.

Feral pigs have been present in the Macquarie Marshes since 1896 and they threaten important native wildlife species in the marshes such as the snipe, storks and ibis.

Studies undertaken on the stomach content of feral pigs in the Macquarie Marshes have revealed grasses, roots, ferns, fruits, crops, frogs, lizards, snakes, turtles, birds, mammals, invertebrates and carrion. Five different vertebrate species were found, including eastern bearded dragon, barking mash frog, green tree frog, spotted marsh frog and De Vis banded snake.

In recent years, pig populations in the Gwydir have exploded. This is partly due to the delivery of environmental water to wetland areas during dry-sequences as this is assisting the pigs to survive during drought.

f) Riparian land management

The health of our waterways is inextricably linked to the surrounding land and land use.. Grazing management adjacent to water ways is essential to maintain stream bank stability and limit erosion, sedimentation and poor water quality.

Riparian buffers should continue to be encouraged in high risk and vulnerable locations as should programs to encourage improved grazing and cropping strategies upstream, to limit poor quality runoff. It is critical that measures be implemented to mitigate the significant damage occurring due to livestock and feral animals on icon sites such as Gwydir Wetlands, Macquarie Marshes and Narran Lakes, beneficiaries of government water.

g) Weeds

Weeds are well known as a significant threat to Australia's natural environment and primary production industries. They displace native species, contribute significantly to land degradation, and reduce farm productivity. Aquatic weeds continue to spread through flooding, moving the plants to other waterways. Many aquatic weeds have been introduced or have colonised new waterways.

Invasive species, including weeds, animal pests and diseases, represent the biggest threat to biodiversity after habitat loss. Weed invasions change the natural diversity and balance of ecological communities, threatening the survival of many plants and animals as the weeds compete with native plants for space, nutrients and sunlight.

It is estimated that nationally, the impact of invasive plants continues to increase with exotic species accounting for about 15% of all flora. This figure is increasing yearly by about ten new species per year.

In sum, a more integrated, holistic, plan focused on non-flow measures from hereon is the key to undoing the damage that has been, and continues to be done, to communities in the Northern Basin. Such a focus would:

- deliver equivalent ecological outcomes required to meet Basin Plan objectives that will not be met through existing water recovery measures
- lead to the rehabilitation of native fish species
- improve productivity within aquatic ecosystems
- increase the resilience of threatened species
- improve social and economic prosperity from aquatic resources
- contribute to the achievement of cultural water objectives

Conclusion

NIC considers the Northern Basin review has the potential to be a 'game changer'. If the opportunities presented in the review are fully grasped, there is the possibility of the Basin Plan being implemented in a way that delivers the promised triple-bottom line. Conversely, if government and the MDBA choose to continue to be slaves to what has been revealed to be flawed assumptions or limitations in modelling or to 'cherry-pick' from the review, the inevitable outcome will be that highly-stressed communities will

be pushed to a point of no return and environmental outcomes will be much less than those identified in the Plan.

NIC asks the question, if the Northern Basin Review does not signal the need for a more adaptive approach to the implementation of the Plan, how does Government intend to cope with the social and economic aftermath and environmental failure that inevitably ensue?

About the National Irrigators' Council

The National Irrigators' Council (NIC) is the national peak body representing irrigators in Australia. The Council supports twenty-nine (29) member organisations covering the Murray Darling Basin states, irrigation regions and the major agricultural commodity groups. Council members collectively hold approximately 7,000,000 mega litres of water entitlements.

The national body is the policy and political voice of those who use water for commercial agricultural purposes, producing food and fibre for local consumption as well as making a significant contribution to Australia's export income.

NIC is funded by irrigators, for the benefit of irrigated agriculture which provides jobs in rural and regional communities. Members are not individual irrigators but members of their respective representative organisations. An irrigator is defined as *'a person or body with irrigation entitlement for commercial agricultural production'*.

Member organisations are located in irrigation regions across Australia within the Murray-Darling Basin and beyond. They represent a diversity of organisations from irrigation infrastructure operators, individual irrigators; processors through to agricultural commodity groups who produce and value add food and fibre for domestic consumption and significant export income.

NIC advocates on behalf of irrigated agriculture and aims to develop projects and policies to ensure the efficiency, viability and sustainability of Australian irrigated agriculture and the security and reliability of water entitlements. The NIC advocates to governments, statutory authorities and other relevant organisations for their adoption.

NIC aims to develop policy and projects to ensure the efficiency, viability and sustainability of Australian irrigated agriculture and the security and reliability of water entitlements.

NIC Guiding Principles

The National Irrigators' Council (NIC) objectives are to:

To protect or enhance water as a property right and to champion a vibrant sustainable irrigation industry.

NIC is the voice of irrigators and believes in the following principles to guide future policy decisions:

- A healthy environment is paramount
 - Sustainable communities and industries depend on it
- Protect or enhance water property rights.
 - Characteristics of water entitlements should not be altered by ownership
- No negative third party impacts on reliability or availability

- Potential negative impacts must be compensated or mitigated through negotiation with affected parties.
- Irrigators must be fully and effectively engaged in the development of relevant policy.
- Irrigators expect an efficient, open, fair and transparent water market.
- Irrigators require a consistent national approach to water management subject to relevant geographical and hydrological characteristics.
- Irrigators expect Government policy to deliver triple bottom line outcomes.
- Regulatory and cost burdens of reform must be minimised and apportioned equitably.

ⁱ Vilizzi, L., Tarkan, A.S. and Copp, G.H., 2015. Experimental evidence from causal criteria analysis for the effects of common carp *Cyprinus carpio* on freshwater ecosystems: a global perspective. *Reviews in Fisheries Science & Aquaculture*, 23(3), pp.253-290.

ⁱⁱ Lugg, A. and Copeland, C., 2014. Review of cold water pollution in the Murray–Darling Basin and the impacts on fish communities. *Ecological Management & Restoration*, 15(1), pp.71-79.

ⁱⁱⁱ http://www.depi.vic.gov.au/_data/assets/pdf_file/0013/282001/Murray-River-resnagging-fact-sheet-2014.pdf